CITY OF HAMILTON

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Planning Division
and
HEALTHY AND SAFE COMMUNITIES DEPARTMENT
Healthy Environments Division

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 1, 2022
SUBJECT/REPORT NO:	Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Spencer Skidmore (905) 546-2424 Ext. 1274 Andrea McDowell (905) 546-2424 Ext. 5288 Christine Newbold (905) 546-2424 Ext. 1279 Trevor Imhoff (905) 546-2424 Ext. 1308
SUBMITTED BY: **SIGNATURE:**	Jason Thorne General Manager Planning and Economic Development Department
SUBMITTED BY: **SIGNATURE:**	Angela Burden General Manager Healthy and Safe Communities Department

RECOMMENDATION

(a) That the draft “ReCharge Hamilton – Our Community Energy + Emissions Plan” (CEEP) attached as Appendix “A” to Report PED22058/HSC22030 be received;

(b) That “Hamilton’s Climate Vulnerability and Risk Assessment Report” as completion of Milestone 2 of ICLEI Canada’s Building Adaptive and Resilient Communities Framework attached as Appendix “B” to PED22058/HSC22030 be received;

(c) That staff be directed to undertake final public and stakeholder consultation on the draft "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP) and the "Hamilton's Climate Change Impact Adaptation Plan" (CCIAP) and report back to the General Issues Committee with the results of the public consultation and the recommended final CEEP and final CCIAP, which together will form Hamilton's Climate Change Action Strategy for Council's consideration;

(d) That staff be directed to report back to the General Issues Committee on the recommended approach for establishing an advisory committee structure for Hamilton's Climate Change Action Strategy;

(e) That staff be directed to report back to General Issues Committee on a recommended scope, governance and organizational structure, and resourcing for the centralized implementation, monitoring and reporting of Hamilton's Climate Change Action Strategy.

EXECUTIVE SUMMARY

On March 27, 2019, Council approved Item 3 of Board of Health Report 19-003, declaring a climate change emergency and directed staff to form a Corporate Climate Change Task Force (CCTF) to investigate actions to reach net zero by 2050. In December 2019, the CCCTF completed the "Corporate Goals and Areas of Focus for Climate Change Mitigation and Adaptation".

This report between the Planning and Economic Development (PED) Department and the Healthy and Safe Communities (HSC) Department represents the next phase of the work to finalize the two foundational components of the City's Climate Change Action Strategy, which together form Hamilton's Climate Change Action Strategy:

- Climate Change Mitigation – "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP)
- Climate Change Adaptation – "Hamilton's Climate Change Impact Adaptation Plan" (CCIAP)

The CEEP addresses climate change mitigation through the reduction of greenhouse gasses. The CCIAP addresses climate change adaptation with a focus on building the City's resiliency to the impacts of a changing climate. The plans contain different objectives and actions and will require different expertise and resources. These two initiatives provide the framework and actions to address the climate change emergency and, together, they form Hamilton's Climate Change Action Strategy.

This report is organized around these two distinct bodies of work, each at a different stage in their plan development processes. The purpose of this report is to:

- present the draft "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP) and to seek Council authorization to release the draft plan for consultation; and,
- provide an update on the work completed to date on "Hamilton's Climate Change Impact Adaptation Plan" (CCIAP).

This report is also seeking Council direction to:

- prepare and report back to Council on the creation of an advisory committee for both the CEEP and the CCIAP; and,
- report back to Council on a recommended scope, governance and organizational structure, and resourcing for the centralized implementation, monitoring and reporting of the City's Climate Change Action Strategy (including both the CEEP and the CCIAP).

Alternatives for Consideration – See Page 36

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: There are no financial implications associated with this report. Existing approved budgets will be used to undertake the consultations and complete the final plans. Financial impacts for the implementation of the CEEP and the CCIAP will be brought forward for Council's consideration with the final CEEP and CCIAP.

Staffing: There are no staffing implications associated with this report. Existing staffing resources will be used to undertake the consultations and complete the final plans. Staffing and associated budget impacts for the implementation of the CEEP and the CCIAP will be brought forward for Council's consideration with the final CEEP and CCIAP.

Legal: Not applicable

HISTORICAL BACKGROUND

Hamilton's response to the climate crisis has followed parallel tracks including actions and planning for both climate change mitigation as well as climate change adaptation, with the development of planning frameworks (the CEEP and the CCIAP) as well as the concurrent implementation of immediate actions.

Hamilton City Council passed a motion on July 7, 2015, directing "that Planning and Public Works staff investigate and report back on the feasibility and terms of reference for a Community Energy Plan (CEP) including but not limited to renewable energy

projects, appropriate planning policies, methods and uses, in consultation with Hamilton Utilities Corporation".

In October 2015, Council endorsed "Taking Action on Climate Change in Hamilton – A Community Plan (2015)". The Plan, developed as a collaborative effort from multiple City departments and community partners, identified ten "Priority Actions" including "Develop a Community Energy Plan to guide the Hamilton community's energy future," and "Conduct a local community vulnerability assessment of public health impacts from climate change."

On May 16, 2018, GIC approved the Climate Reserve and Adaptation Planning motion, which directed "That Hamilton's Senior Leadership Team be directed to work with all City Departments to develop climate change adaptation plans that may be eligible for funding from a Climate Change Reserve and funding from the Provincial and Federal Governments, and report back to the Board of Health".

In 2018, Council also approved the Terms of Reference for a Community Energy Plan and authorized staff to apply for available funding. In 2020, the City was notified of a successful application under the Province of Ontario's Municipal Energy Plan Program for up to 50% of the project costs.

Concurrently with the early stages of the CEEP, on March 27, 2019 Council approved Item 3 of Board of Health Report 19-003, declaring a climate change emergency and directing Staff to form a Corporate Climate Change Task Force (CCCTF) to investigate additional actions to reach net zero by 2050.

The CCCTF created a centralized reporting approach where all City departments compile a list of existing climate change initiatives. In December 2019, the CCCTF completed the "Corporate Goals and Areas of Focus for Climate Change Mitigation and Adaptation," identifying steps the City Corporation could take immediately to address the climate crisis. One of the identified Areas of Focus for Further Work for Goal 4 was the adoption of the Community Energy Plan.

The CCCTF report also outlined "Goal 7 Climate Adaptation – 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" and an Area of Focus of "The City will undertake a city-wide climate vulnerability and risk assessment through ICLEI Canada's Building Adaptive and Resilient Cities (BARC) framework."

In October 2019, the City retained Sustainability Solutions Group (SSG) and WhatIf? Technologies to develop the Community Energy and Emissions Plan.

Public engagement occurred throughout the development of the draft CEEP and is discussed in the "Relevant Consultation" section of this Report.

In 2020, the Adaptation Project resumed. Hamilton obtained the services of ICLEI Canada to support this work through membership in their BARC program. ICLEI completed a new *Climate Science* report, with updated climate change projections, and an internal and external process to conduct the Vulnerability and Risk reassessment.

The updated Climate Science report was received by General Issues Committee (CMO19008(b)-HSC19073(b)) on December 8, 2021.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

There is significant alignment between the draft CEEP and forthcoming CCIAP, and the legislation and related provincial and local land use planning frameworks.

Provincial Policy and Legislation

Planning Act

Section 2 of the *Planning Act* lists the matters of provincial interest, which municipalities must have regard to when carrying out their responsibilities under the Act. Subsection 2 (s) states that the mitigation of greenhouse gas emissions and adaptation to a changing climate is a matter of provincial interest.

Section 16 of the *Planning Act* contains the policy guidance and requirements for municipal official plans. Subsection 16 (14) states that an official plan shall contain policies that identify goals, objectives and actions to mitigate greenhouse gas emissions and to provide for adaptation to a changing climate, including through increasing resiliency.

Actions recommended through the CEEP include a review and update of the City's Official Plans to ensure that a climate change mitigation lens is applied to reduce GHG emissions, including updated goals, objectives and actions. The update to the City's Official Plans are already underway through the GRIDS2/Municipal Comprehensive Review process. Proposed changes to the City's Official Plans were brought forward to Planning Committee and Council in May 2022. Further official plan amendments may be required regarding GHG emission reduction targets and climate adaptation objectives to implement certain land use planning actions proposed in the draft CEEP and forthcoming CCIAP.

Provincial Policy Statement (2020)

The PPS provides policy direction on matters of provincial interest related to land use planning and development. The PPS identifies that healthy, liveable and safe communities are sustained by preparing for regional and local impacts of a changing climate and states that land use patterns within settlement area shall be based on densities and a mix of land uses which minimize negative impacts to air quality and climate change and promote energy efficiency, and, prepare for the impacts of climate change (Policies 1.1.3.2 c) and d)).

The PPS also identifies that long-term economic prosperity should be supported by promoting energy conservation and providing opportunities for increased energy supply, and, minimizing negative impacts from a changing climate (Policy 1.7 j) and k)).

Subsection 1.6 of the PPS directs infrastructure and public service facilities including sewage, water and stormwater be provided in an efficient manner that prepares for the impacts of a changing climate while accommodating projected needs. This section also specifies that planning authorities should provide opportunities for the development of energy supply including electricity generation facilities and transmission and distribution systems, district energy and renewable energy systems and alternative energy systems to accommodate current and projected needs.

Subsection 1.8 of the PPS contains policies related to energy conservation, air quality and climate change. This Section includes direction that municipalities shall support the establishment of development patterns that promote energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate.

Finally, the PPS directs planning authorities to prepare for the impacts of a changing climate that may increase the risk associated with natural hazards such areas susceptible to flooding or erosion.

The CEEP, through its recommended actions, supports energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate, which is consistent with the PPS. The CCIAP will recommend adaptive actions that will address the priority climate impacts identified through the Risk and Vulnerability Assessment.

The Greenbelt Plan (2017)

The Greenbelt Plan provides permanent protection to the agricultural land base and the ecological and hydrological features, areas and functions occurring on this landscape. The vast majority of Hamilton's rural area falls within the Plan Area of the Greenbelt.

Section 1.2.2 of the Greenbelt Plan contains the goals related to the Plan's vast Protected Countryside. Policy 1.2.2.6 contains a climate change goal promoting the integration of climate change considerations into planning the agricultural, natural heritage and water resource systems to improve resiliency and incorporating techniques to reduce greenhouse gas emissions and increasing community resiliency when managing growth in settlement areas.

Section 3.4.2 of the Greenbelt Plan contains the general settlement area policies. Policy 3.4.2.5 states that for lands within the Protected Countryside, municipalities shall integrate climate change considerations into planning and managing growth in settlement areas in accordance with policies in Subsection 4.2.10 of the Growth Plan. Section 4.2.10 of the Growth Plan is discussed in the policy Section below.

The CEEP and CCIAP support the integration of climate change considerations into planning and managing growth in settlement areas and the management of our natural resources through their recommended actions, which include updates to the City's Official Plans, enhancements to the tree canopy and natural areas, and the establishment of sustainable building and development guidelines, among others.

The Growth Plan (2019, as amended)

In coordination with the Greenbelt Plan, the Growth Plan provides a high-level policy framework that guides growth and development in the Greater Golden Horseshoes (GGH). The Growth Plan contains general policy guidance to include the integration of climate change considerations into planning and managing growth such as planning for more resilient communities and infrastructure that are adaptive to the impacts of a changing climate and moving towards environmentally sustainable communities by incorporating approaches to reduce greenhouse gas emissions.

Section 3.2 of the Growth Plan contains policies for infrastructure to support growth and required infrastructure planning to be integrated with land use planning and should involve the consideration of climate change impacts. Policy 3.2.1.5 directs municipalities to assess infrastructure risks and vulnerabilities, including those caused by the impacts of a changing climate and identify actions and investment to address challenges.

Section 4.2.10 contains the policies that are directly applicable to climate change. This

includes guidance on policies that municipalities must develop and include in their official plans related to encouraging energy efficiency, reducing the dependence on the personal automobile, and the reduction of greenhouse gas emissions, among others.

Furthermore, Policy 4.2.10.2 encourages municipalities to undertake a number of further actions to reduce greenhouse gas emissions and address the impacts of a changing climate, including the development of strategies to reduce greenhouse gas emissions and improve community resilience through the identification of vulnerabilities to climate change; developing community greenhouse gas inventories; establishing interim and long-term greenhouse gas emission reduction targets that reflect the goal of low-carbon communities; and, monitoring and reporting on progress made towards the achievement of these targets.

The CEEP completes a detailed inventory of community-wide greenhouse gas emissions and puts forth a strategy to reduce community-wide GHG emissions. The CEEP also recommends a framework for monitoring and reporting on progress made towards the achievement of community-wide GHG reduction targets. Future updates to the City's Official Plans may be required to reflect these targets.

The CCIAP is in the process of identifying vulnerabilities to climate change and will be recommending actions to improve resiliency. The implementation of the CCIAP actions may also require policy changes in the City's Official Plans.

Healthy Environments and Climate Change Guideline, 2018

The Ontario Public Health Standards: Requirements for Programs, Services, and Accountability (Standards) are published by the Minister of Health and Long-Term Care under the authority of section 7 of the Health Protection and Promotion Act (HPPA) to specify the mandatory health programs and services provided by boards of health. The Standards identify the minimum expectations for public health programs and services.

The Healthy Environments and Climate Change Guideline lays out requirements for Public Health Units in Ontario on Climate Change Adaptation. Requirement 3 states:

"The Board of Health shall assess health impacts related to climate change in accordance with the Healthy Environments and Climate Change Guideline, 2018 (or as current)."

This includes vulnerability assessments and adaptation plans, community consultation and education, and coordination with municipalities.

As Hamilton's Public Health Services (PHS) operates as part of the Municipal government, and as the Air Quality and Climate Change program was designated as

the lead team for climate-related work within the municipal government, the required CCIAP aims to coordinate all adaptation work within the municipal government to ensure consistency and efficacy from a broad health-protection and equity-promotion viewpoint.

Municipal Planning Policy

The City is currently undertaking its Municipal Comprehensive Review (MCR). Part of this MCR process is ensuring that the City's Rural Hamilton Official Plan (RHOP) and Urban Hamilton Official Plan (UHOP) are in conformity with the applicable Provincial Policy highlighted in the Sections above.

Staff are in the process of updating the climate related policies in the Urban Hamilton and Rural Hamilton Official Plans part of the MCR. Proposed changes to the UHOP and RHOP were presented to Council in February 2022. Public and stakeholder consultation on the proposed policy amendments has recently occurred. Staff will bring forward the proposed amendments to Planning Committee on May 17, 2022 and for Council adoption no later than July 2022, as required by Provincial legislation.

It's also important to note that the CEEP recommends City Staff conduct additional review of the Official Plan as part of the next phase of the RHOP and UHOP review that go beyond Provincial Plan conformity, to ensure the appropriate land use policy framework is in place to facilitate the reduction of greenhouse gas emissions across the City. Those reviews and proposed amendments will occur upon adoption of the CEEP by Council.

As the MCR amendments have not yet been adopted, and CEEP is only at the draft stage, an analysis based on the existing RHOP and UHOP policy frameworks is as follows:

Rural Hamilton Official Plan (RHOP)

The Rural Hamilton Official Plan provides direction and guidance on the management of our communities, land use change and physical development over the next 30 years in the City's Rural areas and Hamlets.

Section B.3.6.2 of the RHOP contains policy direction related to air quality and climate change within the City that acknowledges that addressing climate change requires two complementary actions: mitigation and adaptation. Many of the goals and policies of the RHOP are both directly and indirectly contribute to and support the reduction of greenhouse gases. This includes integrating the transportation network to include all modes of transportation, promoting active transportation, protection and enhancing the City's natural heritage system, and enhancing vegetative cover.

Policies B.3.6.2.1 and B.3.6.2.2 highlight partnerships that the City can build with community groups to advance air quality and climate change objectives. This includes policy direction to work with other levels of government, other municipalities, academics, community groups, and local industries to develop actions that reduce greenhouse gas emissions.

Policies B.3.6.2.4 to B.3.6.2.7 relate to monitoring air quality and greenhouse gas emissions in the City, while providing direction relating to developing actions to reduce greenhouse gas emissions and track progress.

The CEEP recommends actions to reduce community-wide greenhouse gas emissions and establishes a framework to track progress towards emissions reduction targets. The CEEP also establishes a collaborative framework between the City, academics, community groups, local industries, and the broader public to accelerate climate action across the community.

Urban Hamilton Official Plan (UHOP)

The Urban Hamilton Official Plan (UHOP) as amended by the proposed GRIDS2 MCR OPA, provides direction and guidance on the management of the urban communities, land use change and physical development to 2051.

Section B.3.6.2 of the UHOP contains the policies directly applicable to air quality and climate change. This Section summarizes goals and policies found in other sections of the UHOP that also directly and indirectly contribute to improved air quality, reduced GHG emissions, climate change adaptation and increased resiliency. These goals and policies include promoting compact, mixed use communities; promoting active transportation and public transit, protecting natural heritage features and functions, enhancing vegetative cover and reducing heat island effects through the use of reflective roofs, natural landscaping and increased tree canopy as well as prohibiting new development on hazard lands.

Similar to Policies B.3.6.2.1 to B.3.6.2.7 of the RHOP, policies B.3.6.2.1 to B.3.6.2.7 of the UHOP provides policy guidance related to community partnerships and monitoring related to air quality and climate action.

Section B.3.7 of the UHOP contains policies related to energy and environmental design. This includes policy guidance on increasing energy efficiency and increasing the supply of renewable energy systems and alternative energy systems in a way that protects the global climate. Policies B.3.7.1 through B.3.7.3 highlight how the policies of the UHOP support energy efficiency through energy efficient land use patterns, energy efficient and environmental designed development, and how the City is supporting energy efficiency through its corporate efforts.

Policies B.3.7.4 through B.3.7.7 contain policy guidance on increasing the energy supply of sustainable energy, and renewable and alternate energy system locations throughout the City. This includes permitting energy generation facilities, including alternative energy systems, in all land use designations, subject to other relevant policies of the UHOP and compatibility with surrounding land uses, in accordance with the provisions of the Zoning By-law. These policies also direct the City to work jointly with the Province to investigate the need, feasibility, implications, and suitable locations for renewable energy projects throughout the City.

Section F.3.4.5 of the UHOP contains the City's targets for air quality and GHG emissions reduction. The GHG emissions reduction targets in Table F.3.4.2 are in the process of being updated through the proposed OPA to implement the City's MCR.

The CEEP recommends further review of both of the City's Official Plans in order to ensure the policy framework is in place to support the acceleration of the development of low carbon buildings and communities, the reusing and retrofitting of existing buildings and the circular economy, enhancing the City's natural environment as a carbon sink, building community resilience, and accelerating the adoption of low-carbon transportation options. The CEEP and CCIAP are foundational documents to inform and support the policy review and any future policy updates/revisions to the City's Official Plans. The CEEP also recommends the investigation and identification of suitable strategic locations for renewable energy projects across the City.

RELEVANT CONSULTATION

Consultation and community engagement are important components of our Climate Change Action Strategy, and the development of both the CEEP and CCIAP. The CEEP and CCIAP teams have used a variety of methods to consult with city staff, community agencies and stakeholders, and the public. Appendix "C" to Report PED22058/HSC22030 provides an infographic of consultation results achieved to date.

Climate Mitigation – Hamilton's Community Energy and Emissions Plan (CEEP)

Internal City Steering Committee

An Internal City Steering Committee was created to provide information and feedback on the project. This Committee involved staff from Planning and Economic Development Department (Transportation Planning, Transit, Planning, Growth Management, Building, and Economic Development Divisions), Corporate Services Department (Financial Planning, Administration and Policy Division), Public Works Department (Environmental Services, Office of Energy Initiatives), and Healthy and Safe Communities Department (Health Hazards and Vector Borne Diseases, and Neighbourhood Development Divisions).

Community Stakeholder Advisory Committee

A Community Stakeholder Advisory Committee (CSAC) was formed to provide feedback, guidance and advice to the City Staff Project Team and Consultant Team at key project intervals. The CSAC has met four times and hosted two additional workshops.

The CSAC is comprised of representatives from the following:

Alectra Utilities	Hamilton Community Enterprises Inc.
ArcelorMittal Dofasco	Hamilton Oshawa Port Authority
Bay Area Climate Change Council	Hamilton-Wentworth Catholic District School Board
CityHousing Hamilton	Hydro One
Centre for Climate Change Management at Mohawk College	McCallumSather Architects
Clean Air Hamilton	McMaster University
Enbridge	Mohawk College
Environment Hamilton	Neighbour 2 Neighbour Centre
Faith and the Common Good	Smarter Alloys
Hamilton Burlington Society of Architects	Sustainable Hamilton Burlington
Hamilton Chamber of Commerce	Stelco
Hamilton Health Sciences	West End Home Builders Association
Hamilton Industrial Environmental Association	

Individual meetings with other stakeholders, organizations and experts in various fields were also held to discuss specific themes, including:

NRCan Canmet MATERIALS Lab at McMaster Innovation Park	Independent Electricity System Operator (IESO)
Federation of Canadian Municipalities	The Atmospheric Fund
the Canadian Steel Producers Association	Bay Area Climate Change Council
Hamilton Community Enterprises	Hamilton Regional Indian Centre
Green Venture	

Public Consultation

Community wide public consultation has also occurred at key intervals throughout the development of the CEEP. A brief outline of the public consultation on the project is outlined below:

May 2020 - Public Online Surveys - Nearly 100 survey responses to two surveys were received. The first survey asked “which criteria is more important to consider when selecting low-carbon actions for Hamilton?” The second survey asked “Which action do you think the community should prioritize to reduce greenhouse gas emissions?” The responses provided key feedback on the selection and prioritization of the low-carbon actions that were modelled within the low-carbon scenario.

January 2021 - Public Information Session - An online information session to provide the public with information about the CEEP, the results of the baseline and business-as-planned scenario and information on low-carbon actions was held. The project team also answered questions and provided information on how to get involved. A recording was made available online, along with answers to frequently asked questions. The session was advertised using newspaper ads, the City’s social media networks, and email invitations. This public information session was attended by approximately 40 attendees.

January - February 2020 - CEEP Informational Video - The City Project Team and various stakeholders created an informational video “5 Things You Need to Know About Hamilton’s Community Energy and Emissions Plan” that was released to the public via the City’s various social media platforms. https://www.youtube.com/watch?v=5bFedt1I8do. To date, the video has been viewed on the City’s YouTube channel approximately 400 times.

January - February 2021 - Implementation Survey and Forum Discussion - Using the City’s Engage Hamilton platform, feedback was collected from the general public on the CEEP, the implementation of the plan and related low-carbon actions. This feedback generally focused on the implementation actions and the prioritization of those actions. There were approximately 40 responses to the survey materials.

Climate Adaptation – Hamilton’s Climate Change Impact Adaptation Plan (CCIAP)

Internal Staff Consultation

In 2016, the Climate Change Working Group considered 52 climate change impacts in a Vulnerability and Risk Assessment. Twenty-three priority impacts were identified.

In 2017 and 2018, Public Health Services (PHS) staff engaged with other departments and working groups (the Agricultural and Rural Affairs Committee, Chronic Disease Prevention Program, Food Security, Seniors at Risk, etc.) to inform them about climate change impacts in Hamilton, the links between those impacts and their mandates, and gauge the impacts of greater concern and relevance to them.

In 2020, a staff team was created to guide cross-departmental input into completion of the Adaptation Plan. This group has met monthly and includes the following:

Department/Division	Position
Healthy and Safe Communities, Healthy Environments	Project Manager (Project Lead)
Corporate Services, Risk Management	Risk Management Analyst
Planning and Economic Development, Strategic Initiatives	Director
Healthy and Safe Communities, Healthy Environments	Senior Project Manager
Healthy and Safe Communities, Healthy Environments	Manager
Public Works, General Managers Office	Senior Project Manager Sustainability
Healthy and Safe Communities, Emergency Management	Emergency Management Coordinator
Planning and Economic Development, Sustainable Communities	Manager
Healthy and Safe Communities, Emergency Management	Senior Emergency Management Coordinator
Healthy and Safe Communities, Children's Services and Neighbourhood Development,	Project Manager
Public Works, General Managers Office	Manager

In 2021, an online survey was created, supported by meetings where required, to reassess updated impact statements and ensure that impact prioritization is current. This survey was distributed to all participants from the original 2015/2016 process, and to contacts in each department as recommended by the internal core team. As this was a reassessment, participants were empowered to decide whether an update was required. Eighteen responses were received.

In January 2022, a staff workshop was held to determine goals, objectives, and adaptive actions to address priority impacts. ICLEI facilitated this workshop, and 44 staff attended. ICLEI also conducted an exercise on priorities for the Vision Statement.

External Community Consultation

The 2016-2017 Risk and Vulnerability Assessment identified impacts in the broader Hamilton community that the City of Hamilton either would not experience directly in its operations or had no authority to manage (e.g. increases in private landowner/tenants insurance rates, damage to private property, agricultural impacts, etc.). For Hamilton to successfully adapt to climate change, it was clear that we would need the engagement, communication, understanding and support of the broader Hamilton community. Hamilton PHS successfully applied to ICLEI Canada to run a set of community workshops on Impact Adaptation Planning through the Train the Trainer program to assess community Vulnerabilities and Risks.

Two ICLEI-funded workshops were held in February and March 2017, and two more were held in November and December. Twenty organizations participated, including:

Environment Hamilton	McMaster University	Hamilton Halton Construction Association
YWCA	Hamilton Conservation Authority	Wesley Urban Ministries
Royal Botanical Gardens	Green Venture	Limeridge Mall
Social Planning and Research Council of Hamilton	Sustainable Hamilton Burlington	Hamilton Health Sciences
Hamilton Port Authority (former)	Hamilton Industrial Environmental Association	Hamilton Utilities Corporation
Faith and the Common Good	Hamilton Regional Indian Centre	John C. Munro Hamilton International Airport
Union Gas	Hamilton 350	

Separate meetings were held with the Immigrants Working Centre, Hamilton Health Sciences, the John C. Munro Hamilton International Airport and the Social Planning and Research Council of Hamilton, and contacts were made with local school boards.

Major concerns identified in 2016 and 2017 by the community included extreme heat, health and safety impacts to vulnerable populations, power outages, impacts to schools and businesses, flooding, extreme weather events causing property damage and economic impacts, mental health impacts, and financial impacts relating to increases in utility and food prices.

A Vulnerability and Risk Reassessment was conducted in 2020-21. An online survey was created, and six mini-workshops were held for community organizations representing and serving equity-seeking groups to fully inform the Adaptation Plan through an equity lens.

Survey responses were received from:

Bay Area Climate Change Council	Social Planning and Research Council of Hamilton
Royal Botanical Gardens	Hamilton-Oshawa Port Authority
Green Venture	Hamilton Poverty Roundtable
West End Homebuilders Association	Hamilton Regional Indian Centre
Alectra Utilities	United Way Halton and Hamilton
Hamilton Industrial Environmental Association	EcoWHAM
Hamilton Health Sciences	Hamilton Regional Indian Centre
Mohawk College	Community Response to Extreme Weather

Workshop participants included:

Hamilton Health Sciences	ACORN Hamilton
Environment Hamilton	Welcome Inn
Faith and the Common Good	Immigrant Working Centre
Hamilton Roundtable for Poverty Reduction	Seniors Advisory Committee and Hamilton Council on Aging
YWCA	Social Planning and Research Council of Hamilton

A virtual workshop was held with all community organizations. Invitations were sent to any organization or person who participated in either the 2016/2017 process, or the 2020 Risk and Vulnerability reassessment. Attending organizations include:

McMaster University	Seniors Advisory Committee and Hamilton Council on Aging
Green Venture	Sustainability Leadership
Welcome Inn	Alectra Utilities
United Way Hamilton Halton	Bay Area Climate Change Council
Ward 3 Office staff	Hamilton Port Authority
Mohawk College/Centre for Climate Change Management	Hamilton Wentworth District School Board
Hemmera	West End Home Builders Association
Environment Hamilton	Hamilton Health Sciences
Royal Botanical Gardens	Environment Hamilton
Social Planning and Research Council of Hamilton	McMaster University
Hamilton 350	Grace United Church
YWCA	Hamilton Industrial Environmental Association

A captioned video with a transcript was posted on the Engage Hamilton website, and a set of materials produced to allow any interested organization unable to attend the workshop to provide their input afterwards. There were no submissions through this process.

In 2022, an online survey was sent to every external participant in the Adaptation Planning Project to ask what key elements and ideas should be included in the Vision Statement to guide the completion of the Adaptation Plan.

2022 Internal and External Action Prioritization

Over 320 ideas for potential adaptive actions were generated through the 2021 and 2022 engagement. ICLEI and City staff reviewed these to create a refined list of adaptive actions that would address the Priority Impacts and meet the established adaptation Goals and Objectives. Actions already underway or completed were removed as they are already a demonstrated City priority. Overlapping actions were combined where appropriate. This resulted in a list of 27 broad actions, with additional supporting actions. Internal and external stakeholders reviewed and ranked this list using worksheets developed by ICLEI Canada.

Internal stakeholders ranked actions on six criteria (feasibility, flexibility, affordability, community acceptability, equity and effectiveness) and external stakeholders on three (their organization's ability to participate, equity, and community acceptability). Participants were also given the option to suggest changes to action wording. ICLEI analysed the results of this exercise to prioritize adaptive actions as "urgent," "high," "medium" or "low" priority.

The majority of these actions were scored "urgent" or "high" by internal and external stakeholders; a small number were scored "medium," and none were scored "low." Therefore, all 27 adaptive actions are carried forward into implementation planning.

On April 22, an Action Validation workshop was held for internal and external stakeholders to review the final adaptive action wording and first thoughts on which stakeholders are critical to involve in carrying out these actions.

The final list of prioritized actions, with corresponding priority ranking, that will undergo implementation and resource planning are listed in this report (see Analysis and Rationale p.29).

Next Steps for Consultation on the CEEP and CCIAP

Ongoing consultation is a critical success factor for the City's Climate Change Action Strategy and through this report, staff are seeking Council's direction and authorization

to undertake final public and stakeholder consultation on both the draft "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP) and the "Hamilton's Climate Change Impact Adaptation Plan" (CCIAP). The consultations will include a series of public information sessions and an online engagement campaign using our Engage Hamilton platform. Staff have also planned targeted consultations, meeting with the Stakeholder Advisory Committees and with several Indigenous groups. Staff will also be engaging in further internal consultation across the City corporation.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Climate Mitigation – Hamilton's Community Energy and Emissions Plan (CEEP)

The Community Energy and Emissions Plan (CEEP) contains actions to achieve net zero carbon emissions by 2050. The International Panel on Climate Change (IPCC) has stated that decarbonization of the global economy by 2050, with a 45% reduction by 2030, is necessary to keep temperature rise to 1.5C and avoid the most catastrophic impacts of climate change. The table below shows GHG emissions reductions targets set by other Ontario municipalities, including the base year.

Table 1: GHG Emissions Reduction Targets of Ontario Municipalities

Municipality	GHG Emissions Target	Base Year
Town of Halton Hills	Net-zero by 2030	2016
City of Toronto	Net-zero by 2040	1990
City of Kingston	Net-zero by 2040	2011
City of Burlington	Net-zero by 2050	2016
City of Guelph	Net-zero by 2050	2016
City of Markham	Net-zero by 2050	2011
City of London	Net-zero by 2050	1990
City of Ottawa	Net-zero by 2050	2012
City of Mississauga	80% by 2050	1990
City of Brampton	80% by 2050	2016
Durham Region	80% by 2050	2007
Region of Waterloo	80% by 2050	2010

The City's GHG emissions reduction target of net-zero by 2050 is in-line with other municipal targets in Ontario and across Canada. The CEEP has also been modelled

with targets for a gradual decrease in GHG emissions of ±40% reduction from the baseline (2016) by 2030. This is in line with the best scientific evidence.

Vision and Principles

With extensive input from community stakeholders, the project team created foundational principles and a project vision at the outset of the project, including that the CEEP:

- supports an equitable energy transition;
- helps improve the City's resilience to climate change;
- is community-led;
- involves a public education campaign;
- promotes the development and use of clean energy;
- protects and supports biodiversity;
- encourages local economic development; and,
- promotes practical climate mitigation and adaptation actions.

These principles were then combined to formulate the following project vision:

> "ReCharge Hamilton identifies a pathway to net zero GHG emissions by 2050 that increases the resilience of the energy system and improves economic prosperity for all. Drawing on a history of work, policies and initiatives in this area, ReCharge Hamilton builds on Hamilton's historic and current strength as an industrial leader in the midst of a rich natural environment, and as a caring community."

The principles and project vision were consistently considered throughout Plan development and are reflected in the Draft Plan.

The draft CEEP was developed in five stages:

Stage 1 – Energy use and emissions data were gathered from across the City.

Stage 2 – Baseline energy and emissions mapping and modeling of the City was developed using 2016 as the base year. A "business-as-planned" scenario based on existing policies and trends was projected for the City through to 2050.

Stage 3 – Low-carbon targets (including increased energy efficiency, use of renewable energy, sustainable transportation and green building practices), in consultation with the public, were considered for further modelling.

Stage 4 – With technical review and public engagement, the Project Team developed a short list of low-carbon targets, and the Consultant Team modelled a low-carbon scenario, setting a path to net-zero by 2050.

Stage 5 – A final scenario and its associated targets were developed into a Draft Plan with a short-term implementation strategy.

The final stage (Stage 6) is a final public consultation on the Draft Plan, after which the plan will be revised accordingly, and a final Plan will be presented to General Issues Committee for approval.

Establishing the Baseline

In order to formulate a path to net-zero by 2050, the existing sources of energy use and GHG emissions within the community were estimated. Sustainability Solutions Group and WhatIf? Technologies were retained to complete this work. This baseline model measures emissions from 2016, as this year has the most recent and best available data. In the baseline model, the City was estimated to emit approximately 8.7 megatons of carbon dioxide equivalent ("Mt CO2e") in 2016, which equates to 15.5 tons of CO2 equivalent per Hamilton resident per year ("tCO2e"). The majority of these emissions are coming from the industrial sector (64.3%), followed by the transportation sector (19.3%), and the building sector (14.3%). The remaining ±2% of GHG emissions are from fugitive emissions (0.7%), waste (0.7%), the agricultural sector (0.3%), energy production (0.2%), and the City's corporate emissions (0.2%). Table 2, below contains details of the City's baseline GHG emissions.

Business as Planned (BAP) Modelling

A model was developed that accounts for current trends, patterns, projected population, and existing policy interventions in order to project what the City's energy use and GHG emissions profile will be in 2050 without significant further intervention or action. This model is called the "business-as-planned" model (BAP).

In the BAP model, the City is projected to emit approximately 9.6 Mt CO2e in 2050, an increase of approximately 0.9 Mt CO2e or 10% from the baseline scenario (2016). The City's per capita emissions, however, are projected to decrease by 28% to approximately 11.2 tCO2e per resident per year due to the larger population in the BAP. The makeup of Hamilton's projected GHG emissions profile does not significantly change from the Baseline. Industry remains by far the City's largest emitter (64.0%), followed by the building sector (16.8%), and the transportation sector (16.7%). The remaining ±2.5% of GHG emissions continue to be from fugitive emissions (0.7%), waste (1.0%), the agricultural sector (0.3%), energy production (0.2%), and from the

City's corporate emissions (0.1%). Please refer to Table 2 below for details of the City's business-as-planned GHG emissions.

Table 2: Community Emissions Tabulated Results, 2016 (Baseline) and 2050 (BAP)

Sector	2016 (Baseline) (tCO2e)	Share 2016 (%)	2050 (BAP) (tCO2e)	Share 2050 (%)	% +/- (2016-2050)
Agriculture and Livestock (AFOLU)	32,070	0%	32,070	0%	0%
Commercial	565,821	6%	881,018	9%	55%
Energy Production	16,553	0%	19,776	0%	19%
Fugitive	58,178	1%	67,226	1%	16%
Industrial	5,594,389	64%	6,141,107	64%	10%
Municipal	21,475	0%	12,053	0%	-44%
Residential	691,884	8%	761,726	8%	10%
Transportation	1,671,042	19%	1,600,565	17%	-4%
Waste	58,155	1%	97,209	1%	67%
Total	8,709,567	100%	9,612,750	100%	10%

Low-Carbon Scenario Development and Modeling (Net Zero Scenario)

A total of 30 low-carbon targets were established and modelled in a low-carbon scenario. The actions represent a pathway to the goal of net-zero by 2050. Please refer to Appendix "A" of the CEEP Report, being Appendix "A" attached to Report PED22058/HSC22030 for a complete list of the 30 low-carbon targets modelled in the low-carbon scenario.

In the low-carbon scenario, by 2050 GHG emission are reduced by 96% over the business-as-planned scenario. A small "carbon gap" of approximately 0.4 Mt CO2e is projected to remain following the implementation of the 30 low-carbon targets. It is anticipated that this "carbon gap" will be addressed via the purchase of renewable energy offsets or through future updates and iterations of the CEEP that incorporate new technologies, regulations, or policies. Please refer to Table 3 below for details of the City's low-carbon scenario GHG emissions.

Table 3: Community Emissions Tabulated Results, 2050 (BAP) and 2050 (LC)

Sector	2050 (BAP) (tCO2e)	Share BAP (%)	2050 (Low-Carbon) (tCO2e)	Share Low-Carbon (tCO2e)	% +/- (BAP-LC)
Agriculture and Livestock (AFOLU)	32,070	0%	32,070	8%	0%
Commercial	881,018	9%	7,826	2%	-99%
Tree Planting	0	0	-37,624	-9%	100%
Energy Production	19,776	0%	0	0%	-100%
Fugitive	67,226	1%	0	0%	-100%
Industrial	6,141,107	64%	159,435	40%	-97%
Municipal	12,053	0%	174	0%	-99%
Residential	761,726	8%	12,386	3%	-98%
Transportation	1,600,565	17%	200,476	50%	-87%
Waste	97,209	1%	22,360	6%	-77%
Total	9,612,750	100%	397,103	100%	-96%

The Plan – Five Key Low-Carbon Transformations and Implementation Strategy

The CEEP is centered around key short-term actions organized into five Low-carbon Transformations. Achieving net zero by 2050 requires a robust implementation strategy for these actions and all of these actions can be started immediately. Implementing the Low-carbon Transformations is a community-wide effort and will be pivotal in achieving Hamilton's low-carbon future. The Transformations and actions are summarized below. Details of the implementation strategy are found in Appendix "C" of the CEEP Report, attached to Appendix "A" of Report PED22058/HSC22030.

Low-Carbon Transformation #1: Innovating our Industry

Industrial emissions account for approximately 64% of emissions in both the baseline and BAP scenarios. Industrial-related actions support the City's industries in decarbonizing and increasing their energy efficiency.

The following three short-term (0-5 year) implementation actions are recommended to reduce industrial GHG emissions:

1. Establish an Industrial Energy Efficiency and Decarbonization Working Group;
2. Establish a Clean-tech Accelerator; and,
3. Expand Local Industrial Energy Management Training Programs.

Low-Carbon Transformation #2: Transforming our Buildings

Building emissions account for approximately 14% of estimated GHG emissions in the baseline scenario and 17% in the BAP scenario. Building-related actions support deep-energy efficiency retrofits of existing buildings, encourage fuel switching, and improve the energy efficiency and GHG emissions of new buildings.

To achieve the modelled building related GHG emissions reductions, the following three short-term (0-5 year) implementation actions are recommended:

4. Development of Green Standards for New Buildings/Moving toward Net Zero Buildings;
5. Encourage the Establishment of Solar PV on New Buildings; and,
6. Development and Implementation of a Deep Energy Retrofit Program for Existing Buildings.

Low-Carbon Transformation #3: Changing How We Move

Transportation emissions account for approximately 19% of estimated GHG emissions in the baseline scenario and 17% in the BAP scenario. Transportation related actions are focused on increasing the modal split of transit and active transportation and decreasing the number of trips taken in personal vehicles. These actions also focus on decarbonizing the remaining personal and commercial vehicles and the City's fleet.

To achieve the modelled transportation related GHG emissions reductions, the following seven short-term (0-5 year) implementation actions are recommended:

7. Expand the City's Active Transportation Networks;
8. Decarbonize the City's Transit;
9. Expand the City's Transit and Investigate E-mobility Services;
10. Establish a City-wide Electric Vehicle Strategy;
11. Establish a Commercial Fleet Decarbonization Working Group;
12. Support the Transition of Automotive Mechanics; and,
13. Limit Parking and Incentivize EVs.

Low-Carbon Transformation #4: Revolutionizing Renewables

Renewable energy sources are essential to the City achieving its target of net zero by 2050. Renewable energy related actions promote renewable and alternative energy generation. This includes leveraging existing renewable energy initiatives in the City such as expanding and decarbonizing our district energy systems, the conversion of household organics and wastewater to biogas and RNG and exploring the opportunities of green hydrogen deployment throughout the City.

To enhance the production of renewable energy across the City, the following six short-term (0-5 year) implementation actions are recommended:

14. Advocate for and Build an Electricity Grid for the Future;
15. Encourage Local, Alternative Renewable Energy Ownership Structures;
16. Ensure Land Planning Policies Support Solar Array Installations;
17 Increase Organics Diversion and Expand Anaerobic Digester Systems;
18. Complete a Technical Analysis of Green Hydrogen; and,
19. Decarbonize and Expand our District Energy Systems.

Low-Carbon Transformation #5: Growing Green

Carbon sequestration plays a relatively small but important role in the reduction of the City's GHG emissions and offers important co-benefits. The Growing Green Transformation contains actions that promote carbon sequestration through the growth of the City's tree canopy and preserving the City's existing natural heritage features through land use planning processes. This Transformation also includes updates to the City's land use planning policy documents to ensure a climate change and energy planning lens is applied to land use planning decisions.

The following three short-term (0-5 year) implementation actions related to land use and carbon sequestration are recommended:

21. Review and Update Official Plan(s) with a Climate Lens;
22. Incorporate Community Energy/Climate Action Policy into Secondary Plans; and,
23. Encourage Carbon Sequestration Through Tree Planting Targets.

Financial Analysis and Co-benefits of the CEEP Actions

The net-zero scenario offers many direct financial and economic benefits to the City, including new jobs, a positive return on investment, and reduced household and business energy costs. All low-carbon actions included in the net-zero scenario with publicly-available financial data were evaluated in a financial analysis (See Appendix "B" attached to Appendix "A" of Report PED22058/HSC22030**.**

The net-zero scenario requires an estimated $367 M per year of investment, excluding the cost of changes to the steel and marine sectors, and the expansion of active transportation infrastructure. This investment will have a marginally net-positive return for the community of $1 per tonne of GHG reduced, or $63 M, over the life of the investments. These annual investments, which amount to just over a third of the City's annual tax operating budget, will not be the sole responsibility of the City, but rather will be shared across the community and by various levels of government. For example, a mass home energy retrofit program is contingent on the investment of homeowners to

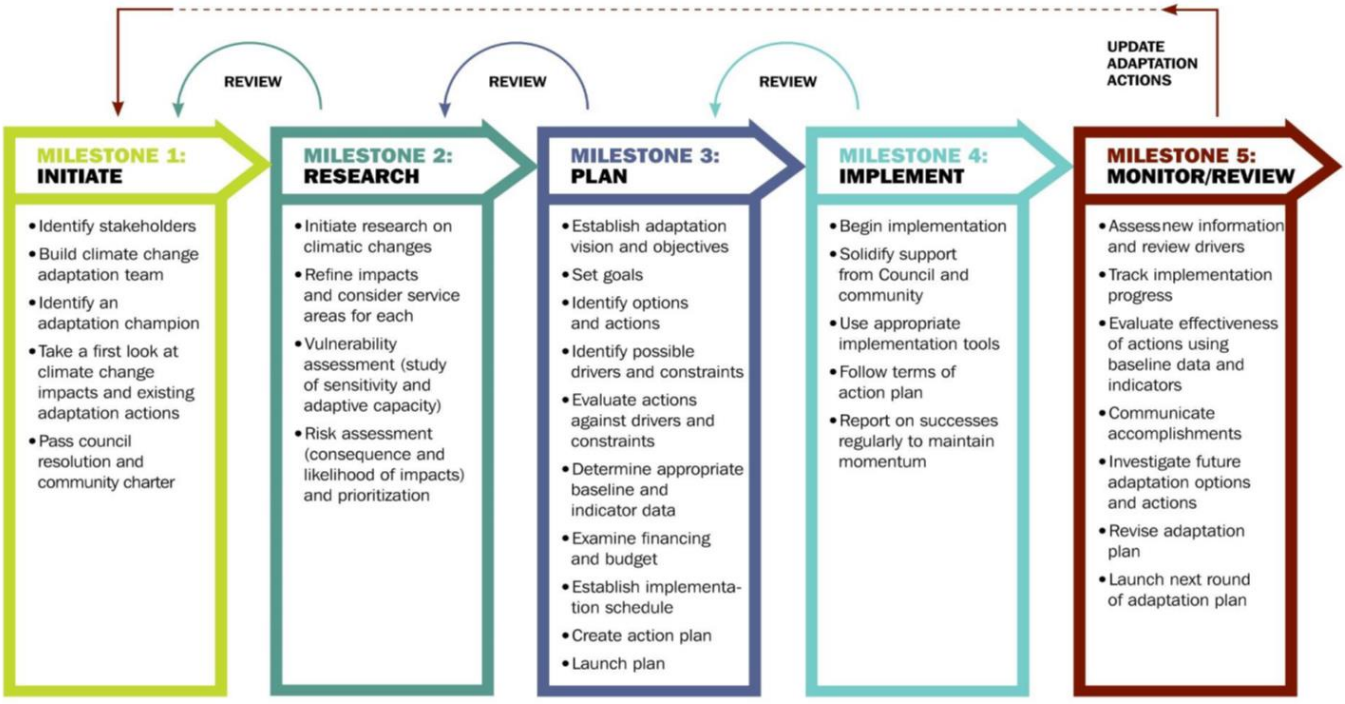
improve the efficiency of their homes; however, there will be low-interest financing and grants available from various levels of government to improve the business case and return on investment, while also reducing the burden of the large up-front capital cost on the homeowner.

Climate Adaptation – Hamilton's Climate Change Impact Adaptation Plan (CCIAP)

Climate Change is already affecting the City of Hamilton. There has been increased flooding, more extreme weather events (ice storms, freezing rain, high winds), warmer winters and hotter summers with more heat waves and droughts.

In 2015, the City of Hamilton initiated a climate change adaptation planning process using ICLEI Canada's Building Adaptive and Resilient Communities (BARC) program to identify potential risks to programs, assets and service delivery resulting from a changing climate. ICLEI Canada's BARC program is a planning framework guiding municipalities through a series of five milestones to develop and implement a climate change adaptation plan.

Figure 1: Building Adaptive and Resilient Communities (BARC) Framework



Milestone 1: Initiate

Through a cross-departmental working group, internal and some external stakeholders were identified, and regular meetings held to determine initial impacts of concern.

Milestone 2: Research

The global carbon cycle is very slow. It takes many years for carbon to achieve its warming strength in the atmosphere, and it takes centuries to millennia for that carbon to be permanently stored in geological processes. While 2100 is used in national and global climate planning processes as a long-term deadline for emissions modelling, this is an artificial deadline; the climate will continue to change after 2100.

Thus, regardless of any successes or failures in emissions reductions, we will need to plan for continued climate change. Historic emissions have 'baked-in' further breakdown over the next several decades. In Hamilton's Climate Science report, projected climate changes do not significantly differ between 2050-net-zero and Business-as-Usual scenarios until the 2070s or 2080s.[1]

The City (and the country as a whole) has made significant investments in infrastructure designed for a cold, stable climate; it will take decades of planning and work to refashion this infrastructure for the climate predicted for the 2080s. The sooner this work is begun, the more resilient and more protected our communities will be.

Hamilton's Climate Science (both the 2016 original and the 2020 update) report laid out projected changes to our local climate in the coming decades. Based on this work, and in consultation with internal and external stakeholders, the Project Team identified impacts of concern. For example, we anticipate that by the 2080s, Hamilton will experience on average two months each year above 30^0 C. Impacts arising from that change would include health and safety impacts of those without housing or without air-conditioning, health and safety impacts to outside workers, and so on.

Equity Considerations

Staff conducted a literature review of climate change, climate adaptation and equity concerns as part of engagement and work planning for this project. Key takeaways include:

[1] *Climate Science Report for the City of Hamilton*. ICLEI Canada. Retrieved from: https://engage.hamilton.ca/16238/widgets/94095/documents/58710

1. Racialized residents, newcomers, women, LGBTQ, low-income and disabled people suffer greater impacts from climate change than people and communities with more status and resources;
2. Best practices for adaptation planning include thorough, in-depth consultation and engagement. Ideally, this engagement moves well beyond passive communication methods and provides many direct opportunities for community members and equity-seeking groups to shape action planning;
3. Impacts vary significantly between equity-seeking groups. For example, low-income families may struggle to afford evacuation during extreme weather events, while disabled people may find them physically impossible to use. Racialized residents may worry about interactions with police during emergencies, while women's caregiving responsibilities may make emergency services impossible to access during business hours. This necessitates a broad and comprehensive engagement that does not rely on a few community stakeholders to provide an equity lens; and,
4. Multiple equity-seeking identities are compounding and multiplying, rather than additive, in their impacts on a person's or household's ability to cope with and recover from an emergency.

This requires a flexible approach to engagement with as much accommodation as possible provided to participating individuals and organizations.

To achieve this, a comprehensive list of organizations representing all disproportionately-affected communities in Hamilton was prepared, and invitations to participate were sent to all of them. Any feasible accommodation requested by that organization to enable their participation was provided, including additional meeting times on evenings and weekends, additional background information, scoping activities up or down to meet time availability, and multiple means for participating in any given engagement step. Participants are discussed in the Relevant Consultation section above.

Staff created a list of impact statements reflecting community concerns, potential service disruptions, environmental harms, health and safety risks, and equity risks such as food insecurity. These were refined, expanded on, or added to through community consultation, described above.

2020 Risk and Vulnerability Reassessment

In 2020, the Adaptation Project resumed with a Risk and Vulnerability Reassessment to bring the project up to date. This work described in the Relevant Consultation section above. In total, 74 Impact Statements were reassessed (see pp. 24-28 in Appendix "B" to Report PED22058/HSC22030).

Vulnerability is defined here as the outcome of a particular impact if it were to happen today, and the availability of resources to recover. For example, vulnerability to a flood would be higher for a tenant in a basement apartment without rental insurance, compared to a homeowner with insurance. On a city-wide basis, the City is highly vulnerable to erosion, due to the presence of the escarpment (exposure) and the time and expense involved in repairing transportation routes and protection measures.

Risk is a combination of likelihood and consequence. Likelihood, for this exercise, was calculated by subject-matter experts based on climate models and prior experience (i.e., an event such as extreme heat is highly likely to happen in the future because it is already happening more frequently now). Consequences were discussed with internal and external stakeholders to capture a broad picture of the full range of likely outcomes. Using the basement example again, consequences of a basement flood might range from a temporary inconvenience (a homeowner with unfinished basement), to a devastating upheaval (a basement tenant whose entire belongings are stored in that basement).

Non-Priority Impact Statements

There are impacts that are of high concern to smaller numbers of stakeholders, but not enough to be carried forward in this iteration of the Adaptation Plan. Staff's intention is to report back in the final CCIAP in such a way that community organizations and residents are empowered to use the results of City workshops and surveys to move forward on relevant actions to address those impacts, regardless of their inclusion in the Climate Change Impact Adaptation Plan.

Priority Climate Change Impact Statements

The Vulnerability and Risk Reassessment resulted in a list of 13 priority impact statements (Table 4). These Impact Statements reflect the issues of greatest concern to both City staff and the community.

Table 4: Priority Climate Change Impact Statements

Flooding	Reduced capacity of flood protection measures and water storage caused by an increase in rainfall intensity leading to flooding.
	Changes in the frequency of extreme rainfall events will result in increased instances of flooding on private and public properties.
Extreme Heat	Increased instances of heat related issues due to extreme heat.
	Dryer, hotter and longer summers may affect the health and safety of local vulnerable populations.
	More frequent and intense heatwaves will increase instances of heat related health and safety issues, particularly for households without access to reliable air conditioning and the homeless
	Rising summer temperatures and extreme heat will increase energy demand for air conditioning, causing a financial burden for low income households.
Health and Safety	Increased intensity and frequency of ice storms leading to increased hazardous roads, pathways and sidewalk conditions.
	Increased temperatures and changes in precipitation increasing incidences of infectious diseases and vector borne diseases as result of longer transmission periods or changes in geographic distribution of disease vectors.
	Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.
Water Quality	Increased intensity of rainfall leading to increasing runoff into rivers and lakes, and washing of sediment, nutrients, pollutants and other materials.
	More intense summer precipitation combined with increasing temperatures lowering water supply as well as increasing water demand for drinking, landscaping, and irrigation. (rural)
Erosion and Infrastructure Damage	Changes in precipitation resulting in erosion of natural systems (i.e. waterbanks, escarpment erosion) leading to washouts of bridges and roadways.
Power Outages	Prolonged power outages during winter months due to an increase in ice storms resulting in public safety concerns.
Food Insecurity	Increase in average annual temperatures (especially in the summer) leading to increased food insecurity in the region (i.e. decrease in local crop yields, food cost fluctuations, etc.)

Milestone 3: Plan

The detailed internal and external consultation activities highlighted in the Relevant Consultation Section for the CCIAP were used to create both the vision statement and the core values that have been considered throughout CCIAP development.

Adaptation Vision Statement

With the results from the consultation activities, the following Vision Statement was created:

> "The City of Hamilton will be a national leader on Climate Adaptation: a healthy, equitable, vibrant, and sustainable community that responds to the needs of residents, businesses and institutions, and is resilient in the face of a changing climate."

This reflects the core values identified by project participants through the engagement activities:

1. Health;
2. Equity/Inclusion;
3. Vibrancy;
4. Sustainability;
5. Resiliency; and
6. Responsiveness

These Core Values are central to the completion of the CCIAP and will be considered in all implementation discussions.

The list of Impact Statements in Table 4 above has since been used as the basis for two Goals, Objectives and Actions workshops (internal and external) held late 2021/early 2022. At these workshops, participants suggested 137 adaptive actions relating to 4 overall Adaptation Themes and 11 Objectives. Internal consultations scoped the 137 supporting actions down to 35, under 27 broad adaptive actions, by removing actions already underway, and combining overlapping actions where appropriate. The subsequent internal and external prioritization exercise was completed as described above.

Internal and external stakeholders scored these actions to create a final, prioritized list of Adaptive Actions. The wording of some of these may shift during implementation planning based on participants' concerns.

Priority #1: Short-Term Actions

- Establish a buddy systems/help-your neighbour programs to implement during extreme weather events;
- Develop requirements for homeowners and landlords to improve the resilience of residential buildings to climate-related risks through upgrades and/or retrofits;.
- Improve winter travel conditions through further expanding sidewalk clearing, beginning with evaluating the clearing expansion planned for 2022/2023;
- Create an educational campaign on communicating the risks associated with climate change (i.e. health impacts, property damage, etc.) and what residents can do to prepare (Green Development Standards, Low-Impact Development etc.);
- Explore opportunities to expand current cooling & warming centre programming and interventions; and,
- Educate and encourage community to participate in growing food locally (e.g. lot level or urban farms/gardens).

Priority #2: Medium-Term Actions

- Expand rainwater capture (i.e. rain barrels, cisterns etc.) as an irrigation source for more localized food production (i.e. backyard farming, urban gardens, soft landscapes, etc.);
- Encourage and promote safer travel practices, choices, and alternatives through considering all users of Hamilton's transportation network (e.g. motorists, pedestrians, cyclists, transit, etc.) and working with local groups to create a communications campaign around the benefits of work from home;
- Develop and implement a response program for vulnerable populations to protect residents from climate-related risks (i.e. extreme cold, extreme heat, etc.);
- Establish vulnerable persons' contact lists to guide emergency response and/or other assistance programs;
- Continue/Expand work to provide affordable housing to reduce climate-related impacts from extreme weather and temperatures;
- Evaluate and select programs for making emergency preparedness kits accessible to anyone, regardless of income (e.g. subsidies or free distribution campaigns);
- Continue to update existing municipal plans and policies to decrease health and safety risks associated with extreme weather and temperatures;
- Continue to enhance the management and restoration of existing natural areas and seek opportunities to dedicate land and natural areas for conservation, potentially as part of an Open Space Master Plan;

- Work with local partners to continue tree planting and preservation, explore community partnerships and naturalization programs to reduce urban heat island and enhance ecosystem function;
- Implement the Urban Forest Strategy and consider additional measures to support it or expand its impact;
- Engage with local agricultural leaders to understand existing resources for farmers in addressing climate adaptation, and how the City can support or expand on those efforts;
- Develop an educational campaign directed at restaurant and grocery industries, local farms and other possible food sources to better reduce and divert food waste and explore opportunities to reduce food waste; and,
- Work with local partners to conduct vulnerability and risk assessments on local energy systems and identify opportunities to reduce energy transmission loss and increase reliability (potentially as part of planned CEEP priority actions around identifying renewable energy generation sites within the City).

Priority #3: Long-Term Actions

- Conduct more studies or reviews to determine flooding and other risks throughout the City and develop plans (e.g. relocating sites where appropriate) to improve the resilience of infrastructure (i.e. building, roads, water/wastewater infrastructure, etc.) to climate-related risks from extreme weather and temperatures;
- Work with local partners to ensure vulnerable groups are informed about and have the means to be adequately protected from vector-borne diseases;
- Coordinate local efforts to address excessive indoor temperatures in rental housing;
- In conjunction with the Biodiversity Action Plan, develop an Open Space Management Plan to guide City of Hamilton Natural Open Space Stewardship, including maintenance schedules to minimize ideal conditions for vectors (e.g. plants and animals that can bring diseases to human communities, such as ticks);
- Improve monitoring, data collection, and notification surrounding flooding & extreme weather/temperatures;
- Establish low-carbon back-up power systems in all City-owned facilities to serve as community hubs during emergencies, and create a policy to support and promote the use of low or no-carbon emergency energy supplies such as batteries or energy storage for residents and businesses;
- Develop requirements for the incorporation of Low Impact Development (LID) features and green infrastructure into new development and redevelopment projects and consider watershed and landscape scales in the development of plans and objectives; and,

- Provide guidance to local businesses on how to maintain business continuity (e.g. supply chain) during extreme weather (i.e. through business continuity planning, green business practices, adaptation measures etc.).

These adaptive actions will form the basis of Hamilton's CCIAP following implementation plan development and engagement, bringing us to the end of Milestone 3 and the completion of "Hamilton's Climate Change Impact Adaptation Plan".

Administrative Framework and Resource Considerations for Implementing Hamilton's Climate Change Action Strategy.

To effectively implement Hamilton's Climate Change Action Strategy, (comprised of both the CEEP and CCIAP), it is important that the City establish an appropriate administrative and governance framework for implementation and coordination across internal Departments and external stakeholders, as well as for ongoing monitoring and reporting. Staff have reviewed various administrative frameworks throughout Ontario and Canada, along with guidance from available resources such as the Federation of Canadian Municipalities "Factsheet: Governance Components for Deep Decarbonization"[2].

Based on staff's review of best practices, an effective administrative framework should include both a centralized internal Climate Change Office within the City of Hamilton, as well as external advisory committees that include key stakeholder groups.

Best Practices for Climate Change Governance

A centralized staff team within the City could act as a hub for the coordination and implementation across the municipal corporation and reporting on corporate and community progress. A Climate Change Office could lead the implementation of City actions, and work with and support the proposed advisory committees on the implementation of community-led actions, report on climate progress throughout the City, lead public engagement on the City's climate change work and update the City's strategic climate change documents such as the CEEP and CCIAP, as needed.

Centralized municipal climate offices have been implemented in municipalities across Ontario, Canada and the world, including Markham, Toronto, York, Peel, Caledon, Halton Hills, Whitby and Durham in Ontario, and Edmonton (Office of Environment and Climate Resilience), Halifax (recommended as part of their CEEP), and Winnipeg (Sustainability Department) throughout Canada.

[2] Federation of Canadian Municipalities (2021). Factsheet: Governance components for deep decarbonization. Retrieved from: Factsheet: Governance components for deep decarbonization

A centralized Climate Change Office could be supported by a multi-departmental Climate Change Working Group with staff resources and capacity available from each City department. A multi-departmental Climate Change Working Group could be adapted from, and replace, the previously-created Corporate Climate Change Task Force, and could play an important role in monitoring and reporting on targets for City-led actions.

Community Advisory Structure

The CEEP recommends that an external expert committee be established, to review the City's corporate and community wide targets, actions, and progress, maintain accountability and transparency, and coordinate the implementation of community-led actions, data collection, education and awareness, and reporting. A Community Climate Change Advisory Committee (CCAC) would also serve as a liaison between the broader community and the proposed City Climate Change Office.

Staff have engaged the Bay Area Climate Change Council (BACCC) as a potential CCAC due to synergies and strategic alignments between the CEEP and BACCC's Areas of Focus, including the "big three" emitters of industry, buildings, and transportation. BACCC is already working towards several of the community-led climate mitigation actions proposed through the CEEP. Acting as the CCAC could leverage much of their existing work. BACCC also has a strong track record of working collaboratively with the City, such as on the Home Energy Retrofit Opportunity detailed design funding application submitted to the Federation of Canadian Municipalities in 2021. Lastly, BACCC is comprised of members with deep community roots in Hamilton, and they have a strong community presence and strategic relationships with key community stakeholders. These relationships will be valuable when implementing community climate action.

In addition to an advisory committee for the CEEP, it is anticipated that a second advisory committee may be necessary to guide the implementation of the CCIAP. A separate Community Climate Adaptation Advisory Committee would recognize the significant differences in objectives, resources and expertise between climate mitigation and adaptation.

As both the CEEP and CCIAP evolve, including knowledge and skills, there could be future alignment investigated between these two advisory committees. Community-based climate advisory committees have been successfully implemented in the City of Edmonton (Environmental Advisory Committee) and the Region of Durham (Roundtable on Climate Change).

Resourcing

In addition to governance and administration, there are also a series of potential options with respect to resourcing and funding mechanisms that the City can explore for the implementation of Hamilton's Climate Change Action Strategy.

Carbon Accounting – City-level carbon budgets are an emerging best practice that involve setting annual caps on how much communities can emit leading up to their target year(s). Staying within the world's carbon budget generally requires a steep decline in emissions starting as soon as possible. In setting its carbon budget, the City would need to determine its fair share of the global carbon budget. This question requires the City to consider its current per capita wealth and emissions as compared to those of other local and global jurisdictions. For example, the C40 organization, an international network of cities collaborating to deliver action on climate change, recommends that cities set their interim targets based on an average per capita emissions target. Using this method, Hamilton would have to limit emissions to 3.2 tCO2e per capita by 2030, assuming a goal of keeping global warming below 2°C; to remain below 1.5°C, the budget would be even lower. Many municipalities in Canada are exploring municipal carbon budgets to incorporate GHG emissions reduction into their decision-making process. Some recent examples are the City of Edmonton and The City of Halifax (proposed). Other municipalities across Ontario and Canada are beginning to plan for this type of decision-making structure.

Corporate Energy Reserve – The City has a successful revolving fund for corporate energy efficiency programs administered by the City's Office of Energy Initiatives. This successful program has the potential to be expanded to fund a broad range of low-carbon actions across the corporation, helping the City achieve its corporate goals for emissions reduction.

Municipal Green Bonds – Cities can issue green bonds to raise the capital to finance corporate and community GHG-reduction initiatives. For example, funding from green bond issuances could be used to provide loans/grants for deep home or business retrofits. The scope of eligible projects would need to be determined through the development of a bond framework. Some municipalities are also exploring the issuance of Community Bonds, where smaller private investors can purchase bonds and help fund climate action in their community. The City of Toronto has established a Green Debenture Program to help finance capital projects that contribute to environmental sustainability. The Green Debenture Program has successfully issued green bonds on four occasions since the initial offering in 2018.

Climate Change Reserve – The City has established a Climate Change Reserve and policy that guides corporate and community spending of climate actions; however, a clear long-term sustainable funding source for this reserve still needs to be developed.

This reserve can be used to fund climate change mitigation and adaptation initiatives across the City.

Next Steps for Administrative Framework and Resource Considerations

This report is recommending that staff be directed and authorized to report back to General Issues Committee on the recommended approach for establishing advisory committees to support the implementation of Hamilton's Climate Change Action Strategy.

This report is also recommending that staff be directed and authorized to report back to General Issues Committee on a recommended scope, governance and organizational structure, and resourcing for the centralized implementation, monitoring and reporting of the City's Climate Change Action Strategy, which includes both the CEEP and the CCIAP.

These recommendations will be based on a consideration of the issues and opportunities discussed above, as well as the feedback received through public consultations.

ALTERNATIVES FOR CONSIDERATION

Council may direct staff not to go out for final consultation on this draft of the Community Energy and Emissions Plan (CEEP) and/or Hamilton's Climate Change Impact Adaptation Plan (CCIAP). Council could also direct staff to make revisions to the Draft CEEP and/or Hamilton's Climate Vulnerability and Risk Assessment and bring revised drafts back to Council prior to going out for final consultation.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement and Participation
Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Healthy and Safe Communities
Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

Clean and Green
Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Built Environment and Infrastructure
Hamilton is supported by state-of-the-art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Culture and Diversity
Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PED22058/HSC22030 – ReCharge Hamilton – Our Community Energy and Emissions Plan (DRAFT)

Appendix “B” to Report PED22058/HSC22030 – Hamilton’s Climate Vulnerability and Risk Assessment

Appendix “C” to Report PED22058/HSC22030 – Consultation Results to Date for Community Energy and Emission Plan and Climate Change Impact Adaptation Plan