Re-Charge
Hamilton

Climate Mitigation – Community Energy and Emissions Plan (CEEP)

Climate Adaptation – Climate Change Impact Adaptation Plan

Approved August 2022
Climate Adaptation

Hamilton

Hamilton’s Climate Change Impact Adaptation Plan (CCIAP)

- National leader on Climate Adaptation
- Healthy, equitable, vibrant and sustainable community that responds to the needs of all
ICLEI’s BARC Framework

**MILESTONE 1: INITIATE**
- Identify stakeholders
- Build climate change adaptation team
- Identify an adaptation champion
- Take a first look at climate change impacts and existing adaptation actions
- Pass council resolution and community charter

**MILESTONE 2: RESEARCH**
- Initiate research on climatic changes
- Refine impacts and consider service areas for each
- Vulnerability assessment (study of sensitivity and adaptive capacity)
- Risk assessment (consequence and likelihood of impacts) and prioritization

**MILESTONE 3: PLAN**
- Establish adaptation vision and objectives
- Set goals
- Identify options and actions
- Identify possible drivers and constraints
- Evaluate actions against drivers and constraints
- Determine appropriate baseline and indicator data
- Examine financing and budget
- Establish implementation schedule
- Create action plan
- Launch plan

**MILESTONE 4: IMPLEMENT**
- Begin implementation
- Solidify support from Council and community
- Use appropriate implementation tools
- Follow terms of action plan
- Report on successes regularly to maintain momentum

**MILESTONE 5: MONITOR/REVIEW**
- Assess new information and review drivers
- Track implementation progress
- Evaluate effectiveness of actions using baseline data and indicators
- Communicate accomplishments
- Investigate future adaptation options and actions
- Revise adaptation plan
- Launch next round of adaptation plan

**Deliverables:**
- Science of Climate Change (2016 & 2021)
Understanding Local Climate Change Impacts

- Downscaled global/national climate models → future local climate scenarios
- **Vulnerability and Risk Assessment** on local climate change impact statements
- Identified **13 priority risks** such as:
  - Extreme Heat
  - Flooding
  - Health & Safety
  - Food Security
  - Extreme Weather
  - Infrastructure & Erosion
# Linking Hamilton’s Climate Impacts

ICLEI Canada developed a municipal, provincial and national assessment and research report as Appendix “B” on 4 (of the 13) climate risks Hamilton is likely to experience:

<table>
<thead>
<tr>
<th><strong>RISK 1:</strong> Increasing frequency of extreme precipitation events leading to overland flooding and damage to buildings and homes</th>
<th><strong>RISK 2:</strong> Increasing temperature and precipitation leading to increased replacement and maintenance cost of roads and transportation infrastructure</th>
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</table>
| Related Cost to this Risk:  
  • Climate change projected to add an **additional $47 B** in operating and maintenance costs to Ontario buildings and facilities by end of the century (The Financial Accountability Office of Ontario Report) (Appendix “B” p. 16) | Related Costs to this Risk:  
  • Temperature-related damage is projected to be the costliest of climate impacts on transportation infrastructure, accounting for 87% of expected costs (Ness et al., 2021).  
  • At the municipal level, projections indicate climate change-induced damage to road maintenance and repairs could cost an **additional $3.1 B annually** by 2050 (CICC, 2021) (Appendix “B” p. 27) |
## Linking Hamilton’s Climate Impacts Cont’d...

### RISK 3: Increasing frequency of extreme precipitation events leading to overland flooding and loss of local business and public services.

- Estimated across Canada there are over 5,000 healthcare centres across Canada (1,440 in Ontario) at risk of flooding that can disrupt medical supply chains and critical services (Clark et al., 2021).
- In 2013 Alberta floods estimated workforce was unable to work over two-weeks; equivalent of **5.1 M hours of lost work and $601 M of lost economic output** (Sawyer et al., 2020) (Appendix “B” p. 33)

### RISK 4: Increasing frequency of extreme heat resulting in negative health outcomes, particularly to vulnerable populations, from reduced air-quality and increased heat-stress.

- In Quebec there are estimates of health expenditures attributed to climate change (e.g. increased vector-borne diseases, extreme heat events and aeroallergens) at just under **$1 B over 50 years** through 2065. (Boyd & Markandya, 2021).
- Climate change can increase mental health stressors (e.g. grief, worry, anxiety etc.) and some medications including those for schizophrenia, increase heat sensitivity and likelihood of negative health outcomes (Government of Canada, 2011) (Appendix “B” p. 39)
4 Theme Areas, 11 Objectives and 27 Adaptative Actions

RESILIENT THEME 1: Built Environment/Systems
- Action 1.3: Conduct more Studies and Reviews

RESILIENT THEME 2: People and Health
- Action 6.3: Improve Monitoring/Data Collection

RESILIENT THEME 3: Natural Environment, Agriculture and Water
- Supporting Actions: Consistent & Accurate Metrics/Monitoring Programs

RESILIENT THEME 4: Energy and Economy
- Action 11.1: Energy Systems VRA Approach
Comparing to Incremental Capital Costs for Mitigation

Figure 7. Present values of net-zero scenario costs, savings, and the net present value of the scenario (Adapted from Appendix “C” p. 79)

- Net Present Value (NPV) of implementing CEEP estimated to be have ~$63 M in savings

Estimated total incremental investments from all sources (i.e. all levels of government, private investments etc.) = $11.4 B

Estimated total savings and revenues combined (modelled beyond 2050) = $11.463 B
Challenges

- Data Availability and Accuracy
- Uncertainty of Data to Collect
- Staff Capacity and Expertise

Lessons Learned

- Data Rich ≠ Knowledge
- Need for Robust Data Collection Methodology
- Buy-In/Support, Dedicated Staffing, TIME!
THANK YOU