City of Kingston

We are committed to sustainability so we can meet the needs of citizens now and in the future.

- Kingston’s Strategic Plan
Our Community’s Commitment to Sustainability and Climate Protection

Sustainable Kingston Plan
Our Vision: Kingston – Canada’s Most Sustainable City
Facilitating Community Sustainability

Community Sustainability Means Place Making

- Committed to openness and innovative solutions to housing, poverty and food security solutions
- Sustainable neighbourhood initiatives
- Shoreline enhancements
- Immigration strategies
- Creation of a new community operated arts hub
- Rejuvenation of contaminated ‘brownfield’ properties
- Community GHG reduction and energy planning
- Urban planning goals include intensification and the sustainable development of employment lands
Achieving Intelligent Sustainability

- Top 7 Finalist – Intelligent Community Forum
- Provincial top recycling city
- Provincial top commuter challenger city
- Ontario Bronze medal bicycle friendly city
- Provincial Walk-Friendly city
- National award winning for innovation in brownfield management
- Advisory member for Great Lakes climate change adaptation advisory
- National top Corporate Knight sustainable city
- World class entertainment venues with a culture of talent cultivation
City of Kingston

FCM PCP Milestone Three

Kingston Climate Action Plan:

Corporate and Community Partners for Climate Protection
Kingston Climate Protection Timeline

PCP Milestone One – Creating a GHG Inventory
2002 - Council resolution to sign on to PCP program
2003 - First GHG inventories completed for baseline year 2000
2006-09 - Inventory completed
2010-11 - Inventory completed

PCP Milestone Two – Emissions Reduction Target
2004 - Council endorses reduction targets:
   Community: 10% below year 2000 levels by 2014
   Corporate: 25% below year 2000 levels by 2014

PCP Milestone Three – Developing a Local Action Plan
2013 - Launch Kingston Climate Action Plan
2014 – June Clean Air Day release of Climate Action Plan

PCP Milestone Four – Implementing the Local Action Plan
Framework discussions underway as part of the action plan

PCP Milestone Five – Monitoring Progress and Reporting Results
Corporate and Community emission and energy now monitored for progress and reported upon
In 2011 the community produced 1.5 million tonnes of GHG emissions or 10.6 tonnes/capita spending $599 million or $4224/capita on energy.

2011 - Canada’s total greenhouse gas emissions were estimated to be 702 mega tonnes of carbon dioxide - an increase of approximately 1 Mt (0.14%) from 2010.
2011 Community GHG Emissions: Trends

Figure 5: Tonnes of GHG Emissions (2000 and 2006 to 2011)

Total GHG emissions increased by 4.1% from 2000 to 2011

Target of 10% below year 2000 levels by 2014 = 1,366,373 tonnes
Estimated GHG Emission

Estimated GHG Emission Reduction Wedges

- **HISTORICAL**
- **FUTURE PROJECTIONS**

- **Business as usual**
- **2011 Baseline**
- **Rationalized Reduction**

- **Historical Data Point**

- **15% Reduction by 2020 compared to 2011**
- **30% Reduction by 2030 compared to 2011**

- **1,783,533**
- **1,633,656**
- **1,498,767**
- **1,281,156**
- **1,042,733**

- **Energy**
- **Transportation**
- **Waste**
## Summary of Potential Reductions

### Transportation Potential Reductions

<table>
<thead>
<tr>
<th>Action</th>
<th>2020 (tCO₂e)</th>
<th>2030 (tCO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Transit Ridership</td>
<td>1,600</td>
<td>10,200</td>
</tr>
<tr>
<td>Increased Carpooling</td>
<td>3,400</td>
<td>11,400</td>
</tr>
<tr>
<td>Active Transportation</td>
<td>600</td>
<td>4,700</td>
</tr>
<tr>
<td>Federal Fuel Standards</td>
<td>6,800</td>
<td>145,600</td>
</tr>
<tr>
<td>Vehicle Efficiency: Anti-Idling</td>
<td>3,500</td>
<td>5,800</td>
</tr>
<tr>
<td>Vehicle Efficiency: Proper Maintenance</td>
<td>3,800</td>
<td>9,600</td>
</tr>
<tr>
<td>Vehicle Efficiency: Non-Aggressive Driving</td>
<td>7,700</td>
<td>15,400</td>
</tr>
<tr>
<td>Transition from Old Cars</td>
<td>300</td>
<td>48,400</td>
</tr>
<tr>
<td>Total Potential Transportation GHG Emission Reductions</td>
<td>27,700</td>
<td>251,100</td>
</tr>
</tbody>
</table>

### Energy Potential Reductions (Homes and Workplaces)

<table>
<thead>
<tr>
<th>Action</th>
<th>2020 (tCO₂e)</th>
<th>2030 (tCO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives for Energy Retrofits: Local Improvement Charges (Lic), On-Bill Financing</td>
<td>6,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Community Improvement Plan (CIP) Program - Energy Retrofits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SaveOnEnergy Incentive Program</td>
<td>21,100</td>
<td>32,600</td>
</tr>
<tr>
<td>Natural Gas Local Distributing Company Incentives</td>
<td>72,300</td>
<td>155,400</td>
</tr>
<tr>
<td>Energy Audits at Time of Sale</td>
<td>7,000</td>
<td>12,200</td>
</tr>
<tr>
<td>Incentive for Energy Audits through Permit Process</td>
<td>1,300</td>
<td>5,300</td>
</tr>
<tr>
<td>Ontario Electricity Mix: Retiring of Coal-Fired Plants</td>
<td>157,000</td>
<td>173,000</td>
</tr>
<tr>
<td>Reg.397/11: GHG Inventories and Energy Plans</td>
<td>40,800</td>
<td>45,100</td>
</tr>
<tr>
<td>Ontario Building Code Update</td>
<td>3,800</td>
<td>8,500</td>
</tr>
<tr>
<td>Queen’s Climate Action Plan</td>
<td>11,500</td>
<td>31,700</td>
</tr>
<tr>
<td>Total Potential Energy GHG Emission Reductions</td>
<td>320,800</td>
<td>481,800</td>
</tr>
</tbody>
</table>

### Waste Potential Actions

<table>
<thead>
<tr>
<th>Action</th>
<th>2020 (tCO₂e)</th>
<th>2030 (tCO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Diversion of Organics from Landfill</td>
<td>4,000</td>
<td>7,900</td>
</tr>
<tr>
<td>Total Potential Reductions (t CO₂e)</td>
<td>352,500</td>
<td>740,800</td>
</tr>
</tbody>
</table>
Kingston Climate Action Plan

Are You Climate Ready!
Kingston Climate Action Plan

Our Research Team:

Heather Audt, B.Sc., M.Sc.
Risk Sciences International

Don Maclver, B.Sc, M.Sc.
Risk Sciences International
Warmer Kingston Temperatures

Changes in Kingston Area Climate: 1961-90 Temperatures vs 1981-2010

Observed CANGRID-10km BASELINE Run 1 Air Temperature – Mean (2m)
Annual 1961–1990 (°C)

Observed CANGRID-10km BASELINE Run 1 Air Temperature – Mean (2m)
Annual 1981–2010 (°C)

Kingston

Warming
NEW 1981-2010 average

Typical climate analyses uses a 30 year period average ("Normals")
Increased Kingston Precipitation

Wetter: 1961-90 Average Annual Precipitation vs 1981-2010

New precipitation contours added with each set of updated Normals
Warmer Kingston Winters
Projected Kingston Temperatures

2020s (2010-40) and 2050s (2040-70): Projected Future Mean Annual Temperatures for Kingston (IPCC AR5, RCP8.5)

Equivalent Climate Patterns (Kingston ➔ Syracuse ➔ Columbus)
# Kingston’s Weather Modeling Projections

<table>
<thead>
<tr>
<th>Climate Variable</th>
<th>Current (1981-2010)</th>
<th>2020 Projection</th>
<th>2050 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature (°C)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>7.8 °C</td>
<td>9.2 ± .4 °C</td>
<td>11.1 ± .7 °C</td>
</tr>
<tr>
<td>Winter</td>
<td>-5.1 °C</td>
<td>-3.4 ± .6 °C</td>
<td>-1.2 ± .9 °C</td>
</tr>
<tr>
<td>Spring</td>
<td>6.3 °C</td>
<td>7.5 ± .6 °C</td>
<td>9.4 ± .8 °C</td>
</tr>
<tr>
<td>Summer</td>
<td>20.2 °C</td>
<td>21.5 ± .4 °C</td>
<td>23.4 ± .8 °C</td>
</tr>
<tr>
<td>Autumn</td>
<td>9.7 °C</td>
<td>11.0 ± .4 °C</td>
<td>12.8 ± .7 °C</td>
</tr>
<tr>
<td>Cold (min)</td>
<td>-34.0 °C</td>
<td>-32.2 °C</td>
<td>-29.7 °C</td>
</tr>
<tr>
<td>Heat (max)</td>
<td>35.0 °C</td>
<td>36.4 °C</td>
<td>38.5 °C</td>
</tr>
<tr>
<td>Days/Yr &gt;30 °C</td>
<td>4 days/yr</td>
<td>12 days/yr</td>
<td>30 days/yr</td>
</tr>
<tr>
<td>Cooling Degree Days (CDD)</td>
<td>280</td>
<td>404</td>
<td>611</td>
</tr>
<tr>
<td>Heating Degree Days (HDD)</td>
<td>3984</td>
<td>3597</td>
<td>3096</td>
</tr>
<tr>
<td>Growing Season Days</td>
<td>203 days</td>
<td>219 days</td>
<td>233 days</td>
</tr>
<tr>
<td>Freeze-Free Days (&gt;0°C)</td>
<td>172 days</td>
<td>190 days</td>
<td>206 days</td>
</tr>
<tr>
<td><strong>Precipitation (mm)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Annual</td>
<td>951 mm</td>
<td>980+/-.28 mm</td>
<td>1024+/-.39 mm</td>
</tr>
<tr>
<td>Average Winter</td>
<td>232 mm</td>
<td>247 +/- 12 mm</td>
<td>266 +/- 18 mm</td>
</tr>
<tr>
<td>Average Spring</td>
<td>219 mm</td>
<td>228 +/- 11 mm</td>
<td>347 +/- 14 mm</td>
</tr>
<tr>
<td>Average Summer</td>
<td>218 mm</td>
<td>218 +/- 11 mm</td>
<td>217 +/- 14 mm</td>
</tr>
<tr>
<td>Average Autumn</td>
<td>283 mm</td>
<td>289+/-.15 mm</td>
<td>299 +/- 11 mm</td>
</tr>
<tr>
<td>Average Annual # Days with &gt;25mm</td>
<td>4.6 days/yr</td>
<td>5.9 days/yr</td>
<td>8.1 days/yr</td>
</tr>
<tr>
<td>Max. Daily</td>
<td>72 mm</td>
<td>76 mm</td>
<td>83 mm</td>
</tr>
<tr>
<td>50 day max</td>
<td>91.2 mm</td>
<td>95.5 mm</td>
<td>101.9 mm</td>
</tr>
<tr>
<td><strong>Extreme Precipitation (mm)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Freezing Rain events lasting 6 hrs or more during Dec. – Feb.</td>
<td>1.5 events/last 40 yrs</td>
<td>N/A</td>
<td>50% increase (3.2 events/40 yrs)</td>
</tr>
<tr>
<td># days with wind gusts &gt; 90 kph</td>
<td>0.7 days/year</td>
<td>N/A</td>
<td>15-20% increase</td>
</tr>
</tbody>
</table>
### Risk to Municipal Assets

<table>
<thead>
<tr>
<th>STRUCTURES</th>
<th>Ice Storms and Wet Snow</th>
<th>Rainfall Intensity &amp; Accum.</th>
<th>Extreme Winds</th>
<th>Summer Storms &amp; Tornadoes</th>
<th>Extreme Snow Accum.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Lines &amp; Transmission Structures</td>
<td>FAILURE ice + wind</td>
<td>BURIED... for VERY EXTREME</td>
<td>FAILURE</td>
<td>FAILURE</td>
<td>FOR VERY EXTREME</td>
</tr>
<tr>
<td>Buildings</td>
<td>WET SNOW</td>
<td>DRAINAGE &amp; FAILURE</td>
<td>FAILURE</td>
<td>FAILURE</td>
<td>FAILURE</td>
</tr>
<tr>
<td>Roads, Bridges</td>
<td>OPERATION RISKS</td>
<td>DRAINAGE &amp; EROSION</td>
<td>OPERATION RISK</td>
<td>FAILURE RISK</td>
<td>OPERATION</td>
</tr>
<tr>
<td>Stormwater &amp; Wastewater</td>
<td>POWER FAILURES</td>
<td>TOTAL FAILURE</td>
<td>POWER FAILURES</td>
<td>POSSIBLE FAILURE</td>
<td>RISKS</td>
</tr>
<tr>
<td>Water Supply &amp; Distribution</td>
<td>POWER FAILURES</td>
<td>LACK OF DROUGHT</td>
<td>POWER FAILURE</td>
<td>POWER FAILURE</td>
<td>POWER FAILURE</td>
</tr>
</tbody>
</table>
Kingston Climate Action Plan Implementation

- Online Action Toolbox
- Strategic projects
- Marketing
- Sustainability CoLab
- Local Improvement Charges
- Transportation Master Plan
- Intensification Strategy
- Hydro On-bill Finance
- Renewed Community Strategic Plan
Kingston Climate Action
Kingston Climate Action
Corporate Carbon Reduction Network

sustainable kingston

DESIGNING OUR COMMUNITY’S FUTURE... TOGETHER

Emerging Member of

SUSTAINABILITY CO-LAB

$132,000  115 Members  524 Actions

Congrats to the First Members of the CoLab Network

Durham SustainAbility

envirocentre

NIAGARA SUSTAINABILITY INITIATIVE

sustainable kingston

sustainable WATERLOO REGION
Sustainability CoLab member organizations are adapting the following core approaches to launch and grow a local target-based sustainability program for businesses:

1. **Community-Driven**
   Each program is developed and led by a non-profit or public sector organization operating within the community it serves.

2. **Business-Focused**
   Each program builds a network that engages businesses and public sector organizations to advance environmental sustainability.

3. **Social Enterprise**
   Each program generates revenue from participants to cover costs related to supporting participants in setting and achieving sustainability goals.

4. **Target-Setting and Public Reporting**
   Each program engages organizations to set and achieve sustainability targets and publicly reports on progress. Carbon is the minimum target-setting component required.
Emerging Communities Milestone Process

Phase 1: Engagement and Design

1. **Stakeholder Engagement:** Convene key stakeholders from public, private and voluntary sectors.
2. **Community Analysis:** Understand community landscape, goals and considerations.
3. **Lead Selection:** Identify the lead organization(s) that will operate the program.
4. **Market Research:** Assess interest from local businesses in a GHG target-setting program.
5. **Initial Plan:** Create an initial business plan with input from the community.
6. **Resource and Awareness Building:** Secure resources and begin awareness building for program development.

Phase 2: Business Planning and Development

7. **Program Framework Co-Design:** Co-design the GHG reduction framework with a cross-sectoral working group.
8. **Final Plan:** Finalize business plan, business model, value proposition, and 3-year strategy.
9. **Movement Building:** Begin community engagement and awareness building.
10. **Seed Funding:** Secure sufficient funding and human resources to begin initial service delivery.

**Conversion to Affiliate Community**
Lessons Learned - Third Party Implementation

1. Consultant Driven Projects
   • Excellent final product and project management technique
   • Limited scope of community engagement
   • Limited follow-through; tied to funds
   *Keep implementing leaders out front and keep bureaucrats/consultants behind the scenes*

2. Facilitate Community Engagement and Sustainability
   • Municipal led project secures on-time/on-budget result
   • Lag time and funding limits in implementation hand-off diminish overall engagement
   *Build implementation framework first – fund it straight through*

3. Community Leadership
   • Limited municipal control over staffing and priority setting
   • Increased efficiency, minimal bureaucracy, less cost, community based
   *Integrate third-party from start-up/planning; avoid the project hand-off*

4. Organizational Capacity
   • Larger resource base at municipal level; political leveraging opportunities
   • Volunteer driven, conflicting interests, limited funding, unrealistic expectations
   *Scale project to capacity of implementing organization; not project team*