

**Guidebook for Climate Mitigation in Canadian Municipalities: Governance  
Options for Deep Decarbonization and Reaching Carbon Neutrality**

**April 30, 2021**

Dr. Amelia Clarke  
Ying Zhou

## **Acknowledgements**

This guidebook has been developed through a partnership between the Federation of Canadian Municipalities (FCM) and Dr. Amelia Clarke from the University of Waterloo's School of Environment, Enterprise, and Development. It was funded by FCM's Municipalities for Climate Innovation Program, University of Waterloo and the Government of Canada's Social Sciences and Humanities Research Council (SSHRC).

We would like to thank Samantha Linton and Jean-Patrick Toussaint for their involvement in the research for this guide. Also, thanks to Transition 2050 partner organizations and participating municipalities who were part of this research. We appreciate the expert feedback from (in alphabetical order) Dr. Sarah Burch, Simon Glauser, Dr. Eduardo Ordonez-Ponce, Dr. Manuel Riemer, Dr. Steffanie Scott, and Dr. Jeffrey Wilson on the content for this guidebook. A thank you also goes out to Dr. Amelia Clarke's research team (Saveena Patara, Jillene Diamond, Naima Samuel, Aleksandra Spasevski, Divya Arora and Bayo Akomolafe) and to the FCM staff (Devin Causley and Jasmine Lum) for their suggested improvements.

# TABLE OF CONTENTS

<b>ACKNOWLEDGEMENTS</b>	<b>2</b>
<b>1. INTRODUCTION TO THE GUIDEBOOK</b>	<b>5</b>
1.1 PURPOSE OF THE GUIDEBOOK	5
1.2 WHAT IS DEEP DECARBONIZATION?	5
1.3 DEVELOPMENT OF THE GUIDEBOOK	6
1.4 STRUCTURE OF THE GUIDEBOOK	6
<b>2. FROM INCREMENTAL CLIMATE MITIGATION TO DEEP DECARBONIZATION IN CANADIAN MUNICIPALITIES</b>	<b>7</b>
2.1 CURRENT EFFORTS IN CANADIAN MUNICIPALITIES	7
2.2 COMMUNITY EMISSIONS PROFILE	10
2.3 DEEP DECARBONIZATION PATHWAYS	11
2.4 UNDERSTANDING THE SPHERE OF INFLUENCE FOR CANADIAN MUNICIPALITIES	13
<b>3. GOVERNANCE STRUCTURE FOR CANADIAN MUNICIPALITIES</b>	<b>15</b>
3.1 STRUCTURAL FEATURES AT CORPORATE AND COMMUNITY-WIDE LEVELS	17
3.1.1 COORDINATION AND OVERSIGHT	18
3.1.2 COMMUNICATION	20
3.1.3 REPORTING AND MONITORING	21
3.1.4 STRATEGY INTEGRATION AND IMPLEMENTING ACTIONS	21
3.1.5 RESOURCES AND BUDGETING	23
<b>4. GOVERNANCE STRATEGIES FOR CANADIAN MUNICIPALITIES</b>	<b>27</b>
4.1 POLICY TOOLS	27
4.2 FINANCIAL TOOLS	28
4.3 GREEN ECONOMIC DEVELOPMENT	28
4.4 ENGAGEMENT STRATEGIES	28
4.4.1 STAKEHOLDER ENGAGEMENT	29
4.4.2 RIGHTSHOLDER ENGAGEMENT	29
4.4.3 ADVOCACY AND LOBBYING	30
4.4.4 PARTNER ENGAGEMENT	30
<b>5. KEY SUCCESS FACTORS FOR REACHING CARBON NEUTRALITY</b>	<b>33</b>

<b>6. EMERGING TOPICS FOR DEEP DECARBONIZATION AND CLIMATE MITIGATION</b>	<b>35</b>
6.1 FOOD AND AGRICULTURE	35
6.2 CLIMATE/ENERGY JUSTICE	35
6.3 CARBON BUDGETING FOR CITIES	35
6.4 EMBODIED CARBON	36
6.5 CONSUMPTION-BASED GHG ACCOUNTING	36
6.6 INTEGRATING CLIMATE MITIGATION AND ADAPTATION	36
<b>7. ADDITIONAL RESOURCES</b>	<b>37</b>
<b>8. GLOSSARY OF TERMS</b>	<b>39</b>
<b>APPENDIX</b>	<b>40</b>

## FIGURES

<i>FIGURE 1. ILLUSTRATED FIGURE OF THE NECESSARY COMPONENTS AND PRIORITY AREAS FOR LOCAL DECARBONIZATION</i>	12
<i>FIGURE 2. EXAMPLE OF A SPHERE OF INFLUENCE FOR COMMUNITY-WIDE GHG EMISSIONS FOR CANADIAN MUNICIPALITIES</i>	14

## TABLES

<i>TABLE 1. CURRENT STATE OF DEEP DECARBONIZATION EFFORTS AMONG CANADIAN MUNICIPALITIES</i>	8
<i>TABLE 2. EXAMPLES OF COMMUNITY-WIDE GHG EMISSIONS PROFILES FOR DIFFERENT SIZE MUNICIPALITIES</i>	11
<i>TABLE 3. EXAMPLES OF LEADING ACTORS AND APPROACH FOR GHG EMISSIONS REDUCTION FOR VARIOUS SECTORS</i>	16
<i>TABLE 4. DEEP DECARBONIZATION GOVERNANCE COMPONENTS FOR CORPORATE STRUCTURE</i>	23
<i>TABLE 5. DEEP DECARBONIZATION GOVERNANCE COMPONENTS FOR COMMUNITY-WIDE STRUCTURE</i>	25
<i>TABLE 6. EXAMPLES OF GOVERNANCE STRATEGIES AND THE ASSOCIATED PRIORITY SECTORS</i>	31
<i>TABLE 7. KEY SUCCESS FACTORS IN REACHING CARBON NEUTRALITY</i>	33
<i>TABLE 8. USEFUL RESOURCES FOR DECARBONIZATION PLANNING</i>	37
<i>TABLE 9. EXAMPLES OF COMPLETE PLANS WITH AMBITIOUS 2050 CLIMATE TARGETS</i>	38

# 1. Introduction to the guidebook

## 1.1 Purpose of the guidebook

This guidebook is a how-to manual for Canadian municipalities to support planning for climate mitigation efforts. The guide establishes a common understanding of the decarbonization pathways, strategies, and governance structures for significant greenhouse gas (GHG) emissions reduction at the local level. Canadian municipalities may use the guide as a framework when planning and implementing their climate mitigation efforts toward carbon neutrality.

## 1.2 What is deep decarbonization?

Climate change has long been recognized as a complex and grand challenge globally and locally. Since 2015, 197 countries have endorsed the Paris Agreement and are pursuing efforts to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius. The Intergovernmental Panel on Climate Change (IPCC) determined in 2018 that a 45% reduction in global GHG emissions is required by 2030 (based on 2010 levels) and carbon neutrality by 2050, in order to be on track for a 1.5 degrees Celsius warming. In Canada, the federal government has pledged to the goal of carbon neutrality (net-zero) by 2050, and a 40-45% reduction in GHG emissions below 2005 levels by 2030.

On the local level, approximately 500 Canadian municipalities have declared a climate emergency, and many have adopted the federal GHG emissions reduction targets<sup>1</sup>. To address longer-term targets, many of the municipalities are working toward adopting a decarbonization approach by planning and implementing deep GHG emissions reduction efforts in their communities. **Deep decarbonization for Canadian municipalities** refers to the community-wide transformation to carbon neutrality in the various sectors and systems within the municipal boundary while considering the social and political dynamics<sup>2</sup>. In other words, changing systems to ensure net-zero GHG emissions by the year 2050 and significant reductions by 2030. Even though the word carbon is often used, all GHGs are considered as part of a deep decarbonization plan and carbon neutrality goals.

Addressing the climate emergency within Canadian municipalities requires urgent action by many actors. As land use, infrastructure and transportation decisions have long-term implications, to reach 2030 and 2050 targets a climate lens will be needed for all decisions from now on. Adopting the appropriate governance strategies and structures will benefit local efforts in climate change mitigation.

---

<sup>1</sup> Random Acts of Green. (2019). 498 Canadian Municipalities have Declared a Climate Emergency. Retrieved from <https://raog.ca/2019/04/03/457-canadian-municipalities-have-declared-a-climate-emergency/>

<sup>2</sup> Linton, S., Clarke, A., & Tozer, L. (2021). Strategies and Governance for Implementing Deep Decarbonization Plans at the Local Level. *Sustainability*, 13(1), 154.

### ***1.3 Development of the guidebook***

Through the Municipalities for Climate Innovation Program (MCIP), the Federation of Canadian Municipalities (FCM) delivered the Transition 2050 (T2050) initiative. FCM provided Transition 2050 Partner Grants to 13 organizations in the Transition 2050 program to help the participating Canadian municipalities develop strategic plans and projects for significant community-wide GHG emissions reductions.

This guidebook contains a synthesis of knowledge gained from reviewing current literature and from interviews with 11 partner organizations and 51 local governments that were engaged in the T2050 program. The guide also draws on “Deep Decarbonization in Cities: Pathways, Strategies, Governance Mechanisms and Actors for Transformative Climate Action”, a master’s thesis written by Samantha Linton under the supervision of Dr. Amelia Clarke. The literature review included a combination of academic literature, policy documents, tool kits and practitioner literature on the available local governance structures and strategies for climate mitigation. This review captures and reflects the necessary governance structures and strategies and decarbonization pathways for Canadian municipalities to reach their deep decarbonization targets by 2050. Each participant in the T2050 initiative was invited to participate in a 30–60-minute open-ended interview. The interviews focused on specific pathways, strategies and governance structures that led to reduction in corporate and community-wide GHG emissions. The list of participating partner organization and Canadian municipalities are listed in Appendix A. The results from the interviews also reflect the current state of climate mitigation efforts among Canadian municipalities and reinforce the need for a guidebook on the governance strategies and structures for corporate and community-wide GHG emissions reduction.

### ***1.4 Structure of the guidebook***

This guidebook has eight sections, each highlighting an important aspect for deep decarbonization governance:

- 1. Introduction to the guidebook**
- 2. From incremental climate mitigation to deep decarbonization in Canadian municipalities**
- 3. Governance structure for Canadian municipalities**
- 4. Governance strategies for Canadian municipalities**
- 5. Key success factors for reaching carbon neutrality**
- 6. Emerging topics for deep decarbonization and climate mitigation**
- 7. Additional resources**
- 8. Glossary of terms**

Sections 3 and 4 include story highlights and best practice examples of specific governance strategies and structures from Canadian municipalities – please note, not all featured municipalities have finished their decarbonization plans or reached their GHG emissions reduction targets.

## 2. From incremental climate mitigation to deep decarbonization in Canadian municipalities

### 2.1 Current efforts in Canadian municipalities

In Canada, municipalities have developed both corporate and community-wide climate action plans in response to climate change. Corporate plans focus on reducing emissions from the actions within the control and direct influence of the local governments (e.g., corporations). While community-wide plans reflect actions on reducing GHG emissions within the community boundaries, including emissions from industrial and residential actors.

Scope 1 emissions in the corporate plan are from the local government's operations, such as from the operating of buildings, the municipal vehicle fleets (including public transportation, public works vehicles and emergency vehicles), and the landfill. Scope 1 emissions in the community-wide plan are from the operations of all buildings (including businesses and residential homes), transportation (including private vehicles), etc. In other words, scope 1 captures emissions generated locally. Scope 2 emissions are from electricity used locally, though the emissions are likely to be produced outside the municipality. Most deep decarbonizations plans in Canada focus on scopes 1 and 2. Scope 3 emissions are emissions that occur outside the region from consumption or investment by people in the municipality. Examples of scope 3 emissions are business travel, emissions from aircrafts activity at the local airport, emissions from investments for pensions, and emissions from purchased goods manufactured elsewhere. When the entire product lifecycle emissions of the construction materials or goods are considered, this is called embodied carbon. Leading edge deep decarbonization plans are starting to consider embodied carbon in construction materials, for example.

Over 350 Canadian municipalities have committed to the Partner for Climate Protection (PCP) program developed jointly by ICLEI Canada and the Federation of Canadian Municipalities<sup>3</sup>. Also, 47 municipalities are members of the Global Covenant of Mayors (GCoM) in Canada, a collaboration between FCM, ICLEI Canada, the Global Covenant of Mayors Secretariat, and the International Cooperation Project. GCoM combines the domestic PCP program with a climate adaptation program and a global climate program<sup>4</sup>. Municipalities have utilized the PCP framework to support their climate action planning and implementation. The PCP framework consists of a five-step milestone on reducing both the corporate and community-wide GHG emissions<sup>5</sup>,

---

<sup>3</sup> Federation of Canadian Municipalities (FCM) and ICLEI. (2018). Partners for Climate Protection: National Measures report 2018. Ottawa: Federation of Canadian Municipalities. Retrieved from <https://fcm.ca/Documents/reports/PCP/2018/pcp-national-measures-report-2018-en.pdf>

<sup>4</sup> Global Covenant of Mayors for Energy and Climate Canada (2021). About Us. Retrieved from: <https://globalcovenant-canada.org/about-us/>

<sup>5</sup> Federation of Canadian Municipalities. (2021). Partners for Climate Protection. Retrieved from <https://fcm.ca/en/programs/partners-climate-protection>

Milestone 1: Create a GHG emissions inventory and forecast

Milestone 2: Set an emissions reduction target

Milestone 3: Develop a Local Action Plan

Milestone 4: Implement the Local Action Plan

Milestone 5: Monitor Progress and Report Results

Municipalities have begun to move from incremental action on climate change to a more ambitious and transformative approach. Many have revised their PCP targets from 20% corporate reduction and 6% community-wide reduction to at least an 80% reduction in GHG emissions by 2050 (with varying baseline years). Recently, some are increasing their ambition to target carbon neutrality by 2050. Although the PCP framework remains a valuable resource for reducing GHG emissions among Canadian municipalities, additional considerations for reaching deep decarbonization in Canadian municipalities should be incorporated.

*Table 1. Current state of deep decarbonization efforts among Canadian municipalities*

<b>PCP framework</b>	<b>Additional considerations for deep decarbonization efforts</b>	<b>Current state in Canada</b>
Sign-up to be a member of PCP	<ul style="list-style-type: none"> <li>Recognize the urgency for addressing climate change and declare a climate emergency.</li> </ul>	Over 500 municipalities declared a climate emergency. All the interviewed municipalities recognized climate change as one of the pressing issues in their community.
Milestone 1: Create a GHG emissions inventory and forecast	<ul style="list-style-type: none"> <li>Use current GHG protocol for calculating scope 1 and 2 emissions.</li> <li>Adopt a back-casting approach to create a carbon budget for the community.</li> </ul>	Most municipalities have conducted either a corporate GHG inventory, a community-wide GHG inventory or both for their municipality. However, only select municipalities have adopted a back-casting approach to assess the allotted emissions and the carbon budget for the community
Milestone 2: Set an emissions reduction target	<ul style="list-style-type: none"> <li>Set ambitious climate targets with interim targets, in line with the latest science (i.e., carbon neutrality by 2050, and 45% reduction from 2010 levels by 2030).</li> </ul>	The majority of the interviewed municipalities have adopted ambitious corporate and community-wide GHG emissions reduction targets and interim targets. Most municipalities aim for an 80% reduction in GHG emissions by 2050 (with varying baseline years) or for carbon neutrality.



<p>Milestone 3: Develop a Local Action Plan</p>	<ul style="list-style-type: none"> <li>• Identify priority areas/sectors and significant GHG emissions reduction opportunities.</li> <li>• Adopt a back-casting approach using climate scenario modelling to identify GHG reduction trajectories that will lead to carbon neutrality.</li> <li>• Align climate plans with other departments and/or plans.</li> <li>• Ensure the appropriate stakeholders and partners are being engaged during the planning phase for both corporate and community-wide plans.</li> </ul>	<p>All municipalities interviewed have recently completed or are in the progress of developing a climate action plan (often both a corporate and community-wide plan). Most municipalities still need to consider the alignment of decarbonization plans and actions with municipal service/operations, financial budgeting, strategic priorities/direction and the identified GHG reductions trajectory of the community.</p>
<p>Milestone 4: Implement the Local Action Plan</p>	<ul style="list-style-type: none"> <li>• Dedicate a climate change staff person or team to support the implementation.</li> <li>• Establish appropriate governance structures for implementing both the corporate and community-wide plans.</li> </ul>	<p>Only a few municipalities have begun implementation and most lack a clear implementation plan to achieve the desired climate targets. Moreover, most municipalities have yet to develop appropriate governance structures for the implementation stage.</p>
<p>Milestone 5: Monitor Progress and Report Results</p>	<ul style="list-style-type: none"> <li>• Support a cross-department entity to oversee corporate efforts and a cross-sector entity to oversee community-wide efforts.</li> <li>• Establish a consistent and long-term reporting structure on the community-wide decarbonization progress.</li> </ul>	<p>Most municipalities have yet to give much thought to the formal monitoring and reporting structure to track the community-wide progress of their decarbonization efforts.</p>

Continuous Improvement	<ul style="list-style-type: none"> <li>Recognize that deep decarbonization will require a cyclical environmental management system, including updating the plan and interim targets approximately every five years.</li> </ul>	For many municipalities, their deep decarbonization planning/plans build off their earlier commitments and initiatives, so they are in a cycle of continuous improvement.
------------------------	--	---

**TIP:** Stakeholder engagement (corporate emissions reduction planning) and cross-sector collaborations/partner engagement (community-wide emissions reduction planning) need to be incorporated throughout the different stages of the planning and implementation cycle to ensure efficiency, effectiveness, equity, and accessibility of these decarbonization plans. Ensuring diverse representation of the stakeholders and rightsholders is essential to the engagement process, especially the inclusion of representation from equity-seeking groups and Indigenous organizations. Additionally, thoughts on implementation strategies, monitoring and evaluation process should be developed concurrently with the actual content of the decarbonization plan to ensure alignment of desired outcomes and actions.

Although most of the Canadian municipalities are still developing plans for reaching their climate targets, it is also inspiring to acknowledge there are a number of municipalities leading the decarbonization efforts and are on track to reach net-zero. Some examples of completed deep decarbonization plans are available in Section 7 of this document (additional resources).

**2.2 Community emissions profile**

Usually, GHG emissions are categorized by sectors or fuel type. For most Canadian municipalities, the primary sources of emissions are from the electricity, buildings, transportation and waste sectors. The relative contribution of each sector toward the community-wide GHG emissions can vary significantly between municipalities. At the local level, these variations in GHG emissions are affected by the economic base, urban form, density, and wealth of the municipality, as well as the sources of electricity in the grid. Although variations in the proportions of the sectoral emissions exist between Canadian municipalities, electricity, building, and transportation are always priority sectors for significant GHG emissions.

Table 2. Examples of community-wide GHG emissions profiles for different size municipalities

Municipality	Population	Electricity and buildings	Transportation	Waste
<b>City of Toronto, ON (2018)</b>	2,956,024 (Urban)	55%	36%	9%
<b>City of Victoria, BC (2017)</b>	92,141 (Urban)	51%	40%	9%
<b>Town of Canmore, AB (2015)</b>	13,992 (Urban)	54%	40%	6%
<b>Town of Mahone Bay, NS (2016)</b>	1,036 (Rural)	68.8%	28%	3.2%

Note, while agriculture is not included here, for some municipalities it can be a significant source of GHG emissions and/or carbon sinks. For example, the Region of Waterloo calculated that 5% of their community-wide emissions are from the methane produced by livestock.

### 2.3 Deep decarbonization pathways

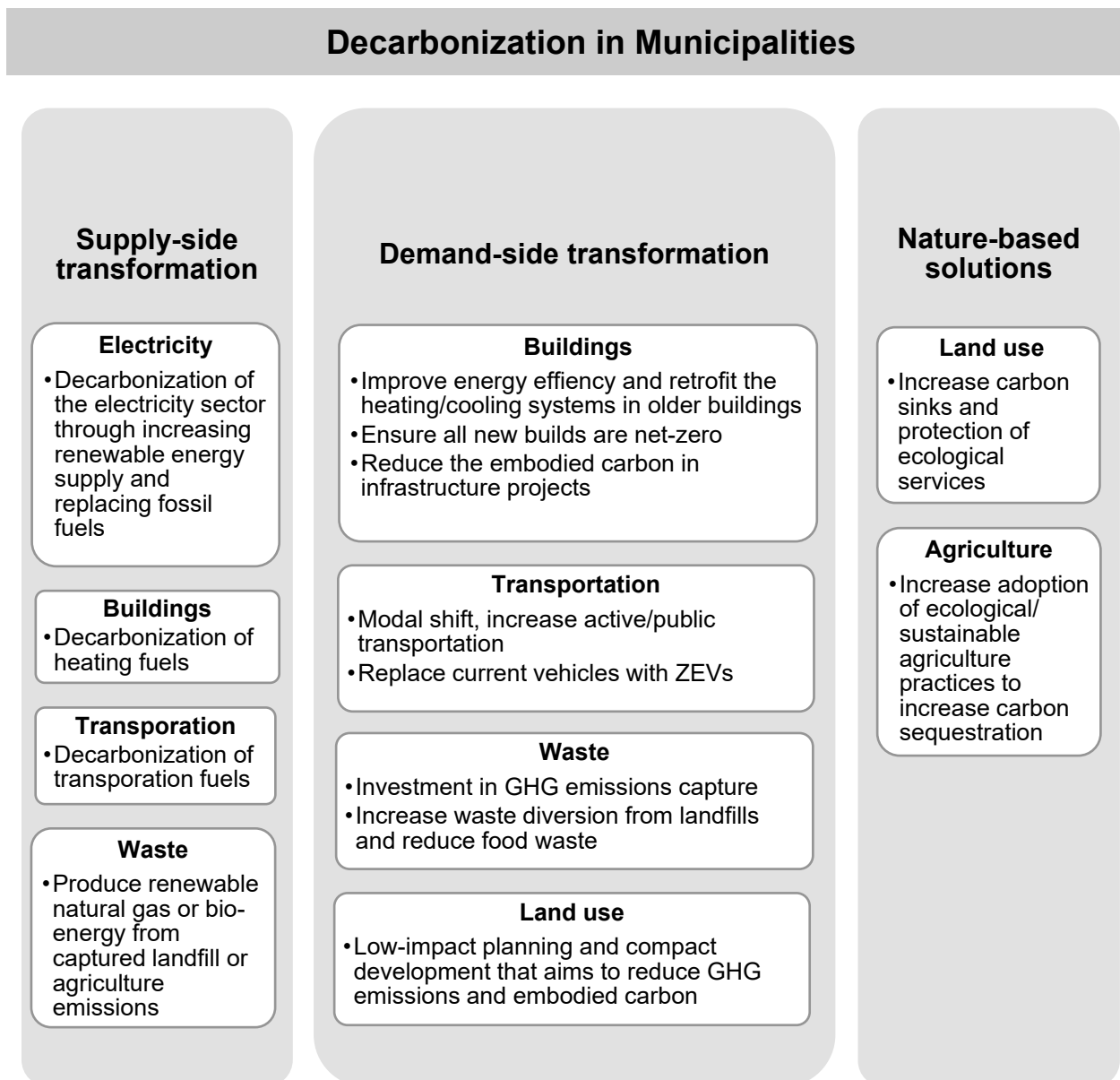
Deep decarbonization pathways are essential for establishing climate policies and advancing climate action. This section provides a high-level overview of the typical pathways.

- For **electricity supply** (supply-side) transformation, increasing investment in renewable energy and phasing out fossil fuels will be critical for reducing GHG emissions. Demand-side efforts in electrification and fuel shift in the heating of buildings and the transportation sector will also stimulate increasing need for supply-side transformation.
- For energy demand (demand-side) transformation, decarbonization needs to occur in three priority sectors - building, transportation, and waste. The decarbonization pathways for the **building sector** include increasing building efficiency and decarbonize heating systems through retrofitting old buildings, as well as ensuring new buildings have low/zero carbon emissions.
- For the **transportation sector**, the modal shift toward the use of active (e.g., walking and cycling) and public transportation, and transitioning to electric vehicles or other zero-emission vehicles (ZEV) can significantly reduce transportation-related GHG emissions.
- Additionally, transformations in the **waste and wastewater sector** include reducing waste to landfills and investment into alternative technologies to capture emissions from waste and wastewater treatment processes.
- Lastly, **nature-based solutions** include increasing carbon sinks through urban forests and wetlands, and through the adoption of sustainable

agriculture. As cities continue to adopt ambitious emissions reduction targets, many seek to utilize local carbon sinks and carbon offsets to achieve decarbonization goals. Thereby, effective planning of green space and protection of ecological services should be a consideration for urban carbon sinks.

- While current deep decarbonizations are focused on scopes 1 and 2, increasingly thought is being given to scope 3 emissions from consumption, business travel, pension investments and to embodied carbon. For example, diet choices will influence agriculture practices.

Figure 1. Illustrated figure of the necessary components and priority areas for local decarbonization



## **2.4 Understanding the sphere of influence for Canadian municipalities**

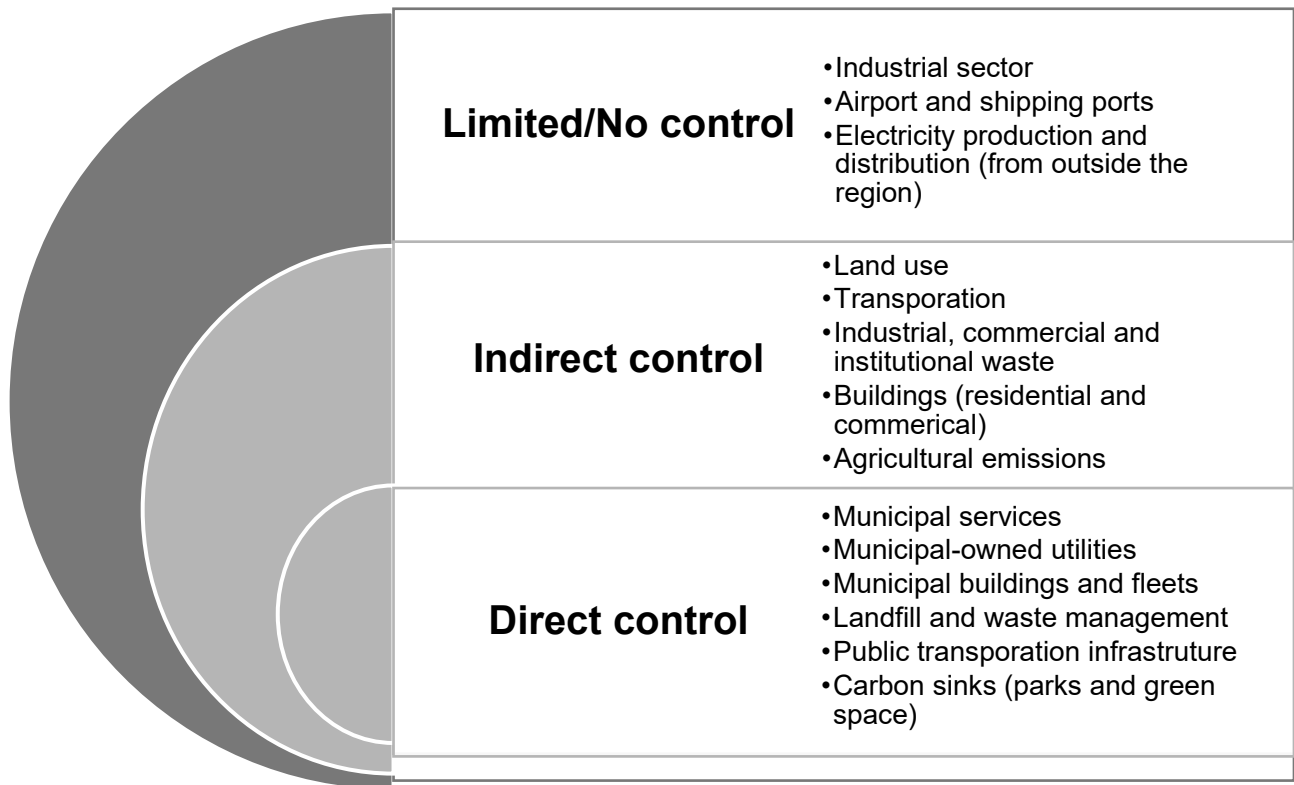
With up to 70% of global GHG emissions occurring in cities, Canadian municipalities need to be at the forefront of deep decarbonization practices and play a critical role in the effort to reach carbon neutrality. Municipalities have direct and indirect influence over 52% of the GHG emissions within their communities<sup>6</sup>, but the power that Canadian municipalities hold is bequeathed by the province and varies across Canada. Some larger Canadian municipalities such as Calgary, Edmonton, Halifax, Montreal, Saint John, Toronto, Winnipeg and Vancouver are all charter cities. These municipalities are governed by their own "stand alone" legislation and have more powers and responsibilities. In addition to the broad permissive powers to pass by-laws on climate change, the majority of Canadian provinces have also provided municipalities natural person powers (NPPs). NPPs give municipalities the flexibility to manage their organizational affairs (e.g., hire climate staff, enter into agreements with partner organizations, acquire lands for carbon sinks) without more specific legislative authority. NPPs have some financial assistance and borrowing limitations, but generally allow municipalities to have some opportunity and flexibility in delivering programs and services to their community.

Figure 2 offers an example of a municipality's sphere of influence but needs to be adapted to each municipality's unique situation. When municipalities know what they can directly control, it will inform what should go into their corporate climate action plan versus the community-wide plan. Provincial and federal policies and initiatives, and business product and service offerings, directly impact the support available to municipalities (and other local actors) to achieve their corporate and community-wide emissions. A municipality's primary focus should be on reducing their corporate emissions, and furthering community-wide deep decarbonization (especially where federal and provincial initiatives are not achieving sufficient reductions on their own).

---

<sup>6</sup> Federation of Canadian Municipalities. (2009). Act locally the municipal role in fighting climate change. Ottawa. Retrieved from <https://fcm.ca/sites/default/files/documents/resources/report/act-locally-municipal-role-fighting-climate-change.pdf>

Figure 2. Example of a sphere of influence for community-wide GHG emissions for Canadian municipalities



### 3. Governance structure for Canadian municipalities

GHG emissions reductions and climate mitigation efforts will require broad and deep participation. Assessing the municipal capacity and jurisdiction to implement GHG reduction efforts helps municipalities identify areas that need collaborative efforts. Conducting a stakeholder map will also help municipalities determine key actors. Table 3 highlights an example of the main actors and approaches for GHG emissions reduction, which each municipality will need to adapt to their situation.

Municipalities have been experimenting with various governance structures that engage internal and external actors to enhance their efforts in addressing climate change. The collaborative approach includes public-private partnership (contract); joint ventures/projects (agreement); sector-specific multi-stakeholder working group (voluntary); large cross-sector partnership (voluntary), community NGOs with a multi-stakeholder Board (incorporation). The fundamental difference between a participation/consultation approach versus a partnership/collaborative approach is the former operates in an advisory capacity to the local government while the latter involves shared decision-making and participation in the implementation process<sup>7</sup>.

The collaborative approach is ideal for topics that are beyond the direct control of local governments. The design of the collaborative approach(es) will depend on the municipality and its needs. A large cross-sector partnership might be ideal for organizing all major employers and having them commit to a wide range of actions (transitioning their fleet, offering incentives to encourage active/public transit to employees, retrofitting their heating/cooling systems, adding renewable energy generation to their operations, improving their organic waste diversion, etc.) or it may make more sense to take a sector-specific approach (e.g., coordinate with key partners focused on designing, developing and retrofitting residential buildings), or both. Public-private partnerships or joint ventures might be appropriate for resourcing specific corporate initiatives.

**TIP:** Municipalities can conduct a stakeholder map to identify all the key actors and organizations for climate mitigation within their community. Ensure that equity-seeking groups and Indigenous organizations are included.

---

<sup>7</sup> Clarke, A., & Erfan, A. (2007). Regional sustainability strategies: A comparison of eight Canadian approaches. *Plan Canada*, 47(3), 15.

Table 3. Examples of leading actors and approach for GHG emissions reduction for various sectors

<b>Sectoral emissions and areas of potential emissions reduction</b>	<b>Leading actors (adapt to your situation)</b>	<b>Approach for GHG emissions reduction</b>
<b>Electricity</b>		
Electricity production	Provincial Crown utilities and regulatory agencies; Municipalities; relevant businesses; Indigenous organizations	Collaborative approach
Electricity transmission and distribution	Provincial Crown utilities and regulatory agencies; Municipalities	Collaborative approach
<b>Buildings</b>		
Municipal-owned buildings	Municipalities	Municipal-led
Residential housings	Real estate developers; Trades; Homeowners; Municipalities; Material Suppliers; Energy auditors; NGOs (e.g., environmental groups, equity-seeking groups; poverty groups; newcomer groups); Indigenous organizations	Collaborative approach
Commercial buildings	Businesses; Developers; Trades; Municipalities; Chamber of Commerce; NGOs (environmental groups, equity-seeking groups); Indigenous organizations	Private-sector led with municipal, Indigenous and NGOs influence/support
Industrial and institutional buildings	Industrial and institutional organizations and companies	Industry-led with municipal, Indigenous and NGOs influence/support
<b>Transportation</b>		
Municipal fleets (including public transit)	Municipalities	Municipal-led
Personal vehicles	Citizens; vehicle sales locations; ZEV groups	Collaborative approach
Business/organization owned vehicles	Businesses; Institutions	Collaborative approach



Mode shift	Municipalities; bicycle groups; ride-share/rental/taxi companies; NGOs (e.g., environmental groups; equity-seeking groups; seniors' groups); businesses	Collaborative approach
<b>Waste</b>		
Wastewater operations	Municipalities	Municipal-led
Landfills	Municipalities; Citizens; Waste businesses; Industry, commerce, and institutional entities with food/agricultural waste	Municipal-led
<b>Carbon Sinks</b>		
Municipal parks and green spaces	Municipalities; Indigenous organizations	Municipal-led
Protected areas and historic sites	Other levels of government; Municipalities; Indigenous organizations	Multi-level governance and municipal advocacy

**TIP:** Municipalities do not have complete control or influence over community-wide implementation efforts. Thus, it is recommended that municipalities adopt a collaborative approach when necessary and engage representatives from key partner organizations to leverage collective resources and action.

**3.1 Structural features at corporate and community-wide levels**

The structural features discussed for both corporate and community-wide levels are coordination and oversight; communication; reporting and monitoring; strategy integration and implementing actions; and budgeting<sup>8</sup>. The recommended structural features and best practice examples in this section are intended to guide Canadian municipalities in how they may want to structurally organize to achieving their climate targets.

Corporate-level governance aims to address GHG emissions within municipal control and that can be accomplished through municipal efforts alone. Existing corporate-level governance structures within the municipality have important implications on communications, internal collaborations, and decision-making for corporate GHG emissions reduction.

Community-wide governance focuses on tackling all GHG emissions within the geographical boundary of a municipality with a collaborative approach. Successful decarbonization actions will involve significant community investment and collective

---

<sup>8</sup> Clarke, A. (2012). *Passing Go: Moving Beyond the Plan*. Federation of Canadian Municipalities. Retrieved from: [https://data.fcm.ca/documents/tools/GMF/SS\\_PassingGo\\_EN.pdf](https://data.fcm.ca/documents/tools/GMF/SS_PassingGo_EN.pdf)

action. Therefore, a community-wide structure is also critical for decarbonization planning and implementation.

**TIP:** Although corporate-level governance and community-wide governance share similar categories of structural features, it is important to differentiate between the corporate structure and community-wide structure when designing the governance components for decarbonization.

### ***3.1.1 Coordination and oversight***

Coordination for the plan formulation and implementation is typically the role of a climate staff person or team. At the corporate level, climate change staff situated within the CAO's office are commonly seen in smaller municipalities. The advantage of this structure is that the decisions made by climate staff will have direct influence over the entire organization. The overall municipal strategy and/or official plan (or equivalent) will likely be aligned with the climate action plan, as climate staff are in close proximity to the senior management and councillors of the municipality.

Larger municipalities tend to have their climate team situated within various departments within the municipality. The advantage of this setup is the decarbonization actions and implementation is distributed across relevant departments. Each department will take ownership and play a key role in implementing the climate action plan. This allows for pursuing of cross-departmental mandates and collaboration, as well as enabling knowledge sharing between policy and service departments. In such a setup, the climate change team plays a supportive role in steering and overseeing the overarching progress towards decarbonization.

Ideally, a corporate-level oversight committee consists of diverse internal actors from different departments. Depending on the municipality, these actors may include staffs or managers from corporate services, finance, transportation, planning, etc. FCM's Municipal Climate Change Staff Guide can be used as a resource to help identify potential internal actors and the type of support they may be able to offer to the internal oversight committee. This committee would also be likely to oversee the renewal process when it is time to update the corporate climate action plan. Ultimately, oversight of both the corporate and community-wide plans rests with the municipal council.

### ***Examples of coordination and oversight at the corporate level***

*The climate change staff from the Town of Bauline, NL (population: 475), is situated within the Town Manager's office. The climate staff can work directly with the CAO (Town Manager) to implement the plan to decarbonize the electricity supply to 100% renewable energy.*

*The City of Vancouver, BC (population: 631,486) has partially decentralized the efforts on decarbonization to embed responsibilities among various departments within the City. The Sustainability Department steers the direction of the Greenest City Action Plan. While each departmental team is responsible for implementing relevant climate action and strategies.*

At the community-wide level, either a municipal-based secretariat or a third-party multi-stakeholder organization coordinates the community-wide GHG emissions planning and reduction efforts, enables partner engagement, and supports a multi-stakeholder oversight entity (e.g., multi-stakeholder committee or board). They also support the community-wide climate action plan renewal process when the time comes.

The municipal-led multi-stakeholder partnership/initiative usually consists of steering committee members representing key partnering organizations, including municipal government representatives. Some of the key committee members on the community-wide governance team should consist of representations from utilities, Indigenous organizations, environmental NGOs, equity-seeking groups, chamber of commerce, large employers from industry/commerce/institutions and other organizations relevant to the specific municipality. The committee oversees progress towards community-wide decarbonization. For those communities where a third-party organization leads the community-wide decarbonization effort, it is responsible for engaging with key partners, and overseeing the decarbonization progress and actions. Typically, the multi-stakeholder partnership/initiative receives core funding (or staff support) from the municipality and reports to the municipal council.

### ***Examples of coordination and oversight at the community-wide level***

*ClimateActionWR is an organization funded by the regional government and the City of Waterloo, City of Kitchener, and City of Cambridge to implement climate change mitigation initiatives within the region (regional population: 583,500).*

*ClimateActionWR leads the creation and implementation of the community-wide climate action plan. The four municipal governments and two lead organizations (REEP Green Solutions and Sustainable Waterloo Region) form the management committee.*

*Partnering with Sheridan College and the Region of Peel, the City of Brampton, ON (population: 656,900) is planning to set up a Centre for Community Energy Transformation, which will be a non-profit organization at arm's length from the City working with the community residents, institutions, and local businesses to achieve Brampton's GHG emissions reduction targets.*

### **3.1.2 Communication**

All potential municipal actions require formal presentation to council, as all final decisions rest with them. However, depending on the municipality, the internal communication system may adopt an informal or formal structure. Establishing formal and regular communication between various departments within the municipality is encouraged, as transparency is essential. Public (citizen) engagement is also important in the planning phase and for some implementation actions. For example, public engagement is important to the success of municipal-led initiatives on public transportation and mobility. Other aspects of the communication system include having a public website, offering staff training opportunities, providing internal progress updates, and launching public information campaigns.

Formalized communication structures are essential for the efficiency and effectiveness of the decarbonization planning and implementation process. Similar on the community-wide level, a formalized communication structure should exist for enabling information and knowledge exchange between all stakeholders/partners for community-wide decarbonization. Communication recommendations include creating a website to encourage partner engagement, recognizing significant achievements (e.g., through awards and/or a gala), providing updates through an e-newsletter and/or social media, offering training sessions (e.g., lunch and learns), and arranging sector-specific information campaigns.

### ***Example of communication***

*The City of Montreal, QC (population: 1,704,694) has hosted mandatory online training on the carbon-neutral transition for its municipal staff and plans to create an expertise hub to promote knowledge-sharing among the municipality and local actors. The City has also launched initiatives to recognize municipal staffs' efforts and highlight success.*

### **3.1.3 Reporting and monitoring**

Aside from regular reports to council, Canadian municipalities should establish a formal monitoring and reporting structure to track both corporate and community-wide progress, ensure accountability, and enable adjustments in actions to ensure significant progress toward their 2050 climate goals. Monitoring is done by the coordination team and the oversight entity (to varying extents), and actions are revised as needed. Reporting is often public-facing, showing progress at regular intervals. Reporting focuses on GHG inventories and progress toward 2050 and interim climate targets, but it can also capture actions taken, co-benefits achieved and process indicators (such as the citizen groups consulted). Climate mitigation reporting can be integrated into a broader sustainability report, enabling an integrated performance measurement system that shows the interconnection between climate actions and other municipal goals.

For larger municipalities with multiple departments working on decarbonization, monitoring should occur within the individual departments and be reported to the oversight committee for consolidation. Municipalities and committed partners should also determine the frequency of the reporting and adopt standardized performance indicators on progress towards the corporate and community-wide targets. The outcomes of the individualized decarbonization initiatives within the local government and partner organizations should also be captured and differentiated.

#### ***Example of reporting and monitoring***

*At the corporate level, the City of Guelph, ON (population: 131,794) is working to comply with ISO 50001 and utilize the ISO standard to optimize energy management system practices and ensure creditability and compliance. Community-scale GHG inventories will be updated annually. For community-wide progress, Our Energy Guelph reports quarterly to the City Council. Three updates report on the qualitative progress while the fourth provides updates on the quantitative metrics. Progress toward the 2050 climate targets is reported and updated annually.*

### **3.1.4 Strategy integration and implementing actions**

To have deeper transformational GHG emissions reduction and reach the corporate and community-wide targets, decarbonization efforts should be embedded into all related municipal planning, services and operations. Moreover, an integrated approach is a potential strategy to address potential equity-deficits in municipal climate actions, thus ensuring the municipality's social and environmental goals are met. All municipal plans should be coherent with the climate action plan and ensure careful considerations for inclusivity and equity.

### **Examples of strategy integration at the corporate level**

*The City of Guelph, ON (population: 131,794) continues to work on integrating a “climate lens” in all city departments for decision-making through the “Sustaining our Future” pillar of the Corporate Strategic Plan. The City of Toronto, ON (population: 2,956,024) is also developing a “climate lens” that evaluates and considers the climate impacts of all major City of Toronto decisions, including financial decisions. Additionally, the City of Montreal, QC (population: 1,704,694) has also adopted a similar strategy, named “climate test” to minimize GHG emissions and maximize climate adaptation in all city decisions.*

*The Town of Whitby, ON (population: 128,377) has hired the Sustainability Solutions Group to develop a carbon budget and carbon management framework for the Town, titled Zero Carbon Whitby. This framework will assist with reaching its corporate carbon goal of net-zero by 2045.*

At a community-wide level, municipalities and other committed actors should adopt a collaborative process for undertaking decarbonization actions and aligning partner organization initiatives with community-wide targets. Stakeholders and potential partners should also identify areas for implementing actions within their organizations. Sector-specific multi-stakeholder working groups and/or joint projects are a common approach to targeting specific sector emissions.

### **Examples of community-wide implementation**

*Our Energy Guelph has implemented a collaborative governance structure for a community-wide implementation where each action is implemented by a task force that has representation from community organizations, businesses and the municipality.*

*Ville de Victoriaville, QC (population: 47,796) adopted a collaborative approach where they collaborate with the Chamber of Commerce, Economic Development Corporation, Cégep de Victoriaville, the University of Quebec and various other community organizations in moving forward their climate-related projects.*

*City of Saskatoon, SK (population: 245,181) engaged with the public, and other stakeholders in shaping the design of their Home Energy Loan Program (HELP). Through the Retrofit Roundtable, a collaboration with the Saskatoon & Region Home Builders' Association, the City was able to engage the building industry, mechanical trades, and the realtors' association to identify ways these stakeholders can inform and utilize this program. The program design was approved by City Council in February, 2021.*

**3.1.5 Resources and budgeting**

Implementing a decarbonization plan requires internal and external funding. Aside from tax revenue and provincial and federal funding, municipalities should explore additional funding options such as establishing a revolving fund, public-private investments, and green bonds. Municipalities should also plan for decarbonization initiatives and projects ahead of the budgeting cycle and align resources and finances with current and future climate objectives.

**Examples of resources and budgeting**

*For the past 10 years, the City of Markham, ON (population: 353,000) has strategies for reinvesting financial savings from emissions reduction directly into upcoming energy conservation/climate mitigation projects.*

*City of Toronto, ON (population: 2,956,024) has established a green debenture program to finance or re-finance new and existing capital projects that contribute to environmental sustainability.*

*Town of Bauline, NL (population: 475) was able to re-allocate some of its budget and leverage provincial and federal funding to invest in renewable energy infrastructure.*

Table 4 and 5 show the governance components for the corporate structure and community-wide structure. While the same people might support both, the corporate and community-wide governance should be considered separately, ensuring progress is being monitored separately and the correct stakeholders are appropriately involved in each.

*Table 4. Deep decarbonization governance components for corporate structure*

<b>Corporate structure</b>	
<b>Coordination and oversight</b>	<ul style="list-style-type: none"> <li>• Identify and resituate climate change staff to the appropriate location(s) within the local government, ideally where they can influence change within the municipality, and play the coordination role(s) needed.</li> <li>• Identify an inter-departmental governing committee and internal technical group.</li> <li>• Identify the responsibilities and mandate of the oversight committee (e.g., maintaining continuous momentum on decarbonization; and aligning priorities, resources, and funding to advance decarbonization efforts).</li> <li>• Formal reporting to council.</li> </ul>

<b>Communication</b>	<ul style="list-style-type: none"> <li>• Establish a regular communication channel for enabling information and knowledge exchange between departments.</li> <li>• Establish a public consultation and information-sharing process and structure.</li> <li>• Conduct staff training and profile success stories.</li> </ul>
<b>Monitoring and reporting</b>	<ul style="list-style-type: none"> <li>• Establish a formal internal reporting structure to track progress among various municipal departments.</li> <li>• Utilize input/feedback from stakeholders to improve the monitoring and decision-making processes.</li> </ul>
<b>Strategy integration and implementing actions</b>	<ul style="list-style-type: none"> <li>• Establish cross-departmental implementation within the organization.</li> <li>• Strategically align decarbonization efforts and the municipal strategy/plan.</li> <li>• Adopt a “climate lens” for decision-making across all municipality departments and integrate other priorities within climate action.</li> <li>• Integrate asset management and the decarbonization plan.</li> <li>• Develop a climate budget.</li> <li>• Identifying areas for implementing strategies, and initiatives within each department.</li> </ul>
<b>Resources and budgeting</b>	<ul style="list-style-type: none"> <li>• Align with the budgeting cycle to allow for funding initiatives and projects.</li> <li>• Establish a revolving fund for capital projects.</li> <li>• Adopt lifespan costing and commit to projects with a longer timeframe.</li> <li>• Consider innovative funding options such as public-private partnerships and green bonds.</li> </ul>



Table 5. Deep decarbonization governance components for community-wide structure

<b>Community-wide structure</b>	
<b>Coordination and oversight</b>	<ul style="list-style-type: none"> <li>• Establish an entity (e.g., a municipal-led secretariat or a third-party organization) to coordinate community-wide GHG emissions reduction efforts.</li> <li>• Conduct a stakeholder assessment to ensure diverse representation on the key committees.</li> <li>• Identify a core leadership team of cross-sectoral representatives (e.g., key municipal and partner organization representations) that that oversee the community-wide plan and implementation.</li> <li>• Identify the responsibilities of the oversight entity (e.g., maintaining continuous momentum by partner organizations; aligning community-wide actions with targets, and attract funding and investments to advance decarbonization efforts).</li> </ul>
<b>Communication</b>	<ul style="list-style-type: none"> <li>• Establish regular communication channels for disseminating information and knowledge exchange between all actors for community-wide decarbonization.</li> <li>• Identify communication strategies for attracting new partners who will commit to supporting decarbonization within their organization.</li> <li>• Offer training opportunities for capacity building (e.g., lunch and learn).</li> <li>• Reward significant undertakings with recognition.</li> </ul>
<b>Monitoring and reporting</b>	<ul style="list-style-type: none"> <li>• Adopt a standardized assessment framework and reporting structure to track GHG emissions over time.</li> <li>• Also create a monitoring and reporting process for tracking community-wide actions and outcomes of the committed partners.</li> </ul>
<b>Community-wide implementation of actions</b>	<ul style="list-style-type: none"> <li>• Identify stakeholders and potential partners for implementing actions within their organizations.</li> <li>• Launch sector-specific multi-stakeholder working group as needed.</li> <li>• Establish a collaborative process for undertaking joint decarbonization actions.</li> </ul>

<b>Resource and budgeting</b>	<ul style="list-style-type: none"> <li>• Identify opportunities for private-sector investments (e.g., EV charging stations).</li> <li>• Encourage partners to fund internal initiatives that further community-wide goals (e.g., greening their fleet).</li> <li>• Encourage partnerships, if appropriate (e.g., solar installation by one company on another company's roof, or EV charging stations by one company on another company's property).</li> <li>• Municipality provides core funding support for multi-stakeholder entity.</li> </ul>
-------------------------------	---

**TIP:** Differentiate between stakeholder consultation and cross-sector collaboration when establishing the corporate and community-wide governance structures. Stakeholder consultation may be sufficient at the corporate-level governance, whereas a collaborative approach to planning and implementation is essential for the success of community-wide decarbonization efforts.

### Assessments and reflection questions

- Where is your climate staff situated? Is it an ideal location for supporting coordination, communication, monitoring and enabling action within the organization?
- For mid to large municipalities, is there a cross-departmental group overseeing the progress and implementation of the decarbonization plan?
- Is there alignment between the content of the decarbonization plans and the proposed governance structures?
- Do both the governance structures have all five of the key components?
- What barriers do you face in implementing a decarbonization plan? Is your current community-wide structure set up to address the identified challenges and does it involve a diverse range of partners?
- Do you have a process that enables continuous improvement if adjustments are needed to achieve your targets?

## 4. Governance strategies for Canadian municipalities

Aside from developing governance structures, municipalities also utilize strategies to implement climate actions. Governance strategies for decarbonization refer to programs, processes and policies that are designed to achieve the GHG emissions reduction target. Strategies for decarbonization among Canadian municipalities can be categorized into four broad areas<sup>9</sup>: policy tools, financial tools, green economic development, and engagement strategies. The strategies discussed in this section offer suggestions to Canadian municipalities on initiatives that could help them achieve their climate targets. Depending on the context of the municipality, the relevance and the impact of the suggested strategies may vary. Therefore, municipalities may adopt various combinations of the suggested strategies to achieve their desired outcomes.

### 4.1 Policy tools

One of the predominant climate change strategies adopted by all Canadian municipalities is policy tools in the forms of bylaws and codes. The command-and-control approach has a direct impact on GHG emissions by limiting actions with negative climate impacts. When planning and implementing decarbonization actions, municipalities need to consider the feasibility of such action given the current state of existing policy and jurisdiction, and of enforcement mechanisms. Additionally, when designing policy tools, municipalities need to carefully assess the advantages and barriers for a diverse range of stakeholders and ensure all equity-seeking groups are considered. Moreover, municipalities could also consider include various information-based policy tools, such as certification tools as part of their governance and implementation strategies.

#### ***Examples of policy tools***

*Anti-idling bylaw policy has been adopted by many local governments to discourage idling in all vehicles and encourage alternative options (non-idling options) to keep cars warm in winter. The City of Rossland, BC (population: 3,729) has implemented an anti-idling bylaw and also has downtown signage to support the bylaw.*

*The City of Vancouver, BC (population: 631,486) implemented an energy bylaw for existing buildings and a stretch code for all new buildings to reduce all new builds to zero-emission and embodied emissions by 40%.*

*The City of Saint John, NB (population: 71,364) has made zoning bylaw amendments to include a new land-use zone, “green energy”, for large-scale renewable energy projects. The City also revised their asset management policy to ensure climate mitigation and adaptation are being considered for any new infrastructure or infrastructure renewal.*

---

<sup>9</sup> Linton, S., Clarke, A., & Tozer, L. (2021). Strategies and Governance for Implementing Deep Decarbonization Plans at the Local Level. *Sustainability*, 13(1), 154.

## 4.2 Financial tools

Financial tools are price-based tools and incentives. These tools have the power to stimulate behavioural changes through combinations of pricing, taxes, low-interest loans, charges, fees, subsidies and community grants.

### **Examples of financial tools**

*Town of Halton Hills, ON (population: 61,161) is exploring the option of a third-party partner (e.g., NGO, non-profit, or cooperative) for administering climate change related investments and loans.*

*The City of Saskatoon, SK (population: 245,181) is now planning for the launch of the Home Energy Loan Program (HELP). Implementation planning, including applying for funds from The Federation of Canadian Municipalities, bylaw approval, and other planning are underway with an expected launch date of September 2021. Similar to property assessed clean energy (PACE), this program will provide loans for energy efficiency retrofits and energy generation on residential properties.*

## 4.3 Green economic development

GHG emissions reductions are often accompanied by significant economic development opportunities and savings. Canadian municipalities have explored co-benefits to climate action, green procurement policies, and alignment of their decarbonization plans and economic development strategies. For municipalities which are more reluctant to pursue/fund climate action, integrating decarbonization efforts with economic development may accelerate local actions.

### **Examples of green economic development**

*The Town of Bridgewater, NS (population: 8,532) has framed their Community Energy Investment Plan as a green economic development strategy and plans to create green jobs in the building, transportation and energy sector.*

*Ville de Victoriaville, QC (population: 47,796) is in collaboration with Economic Development Corporation to develop an industrial eco-park and a greener industry.*

## 4.4 Engagement strategies

Prior to the formation of community-wide steering committee or governance team, municipalities should have identified all the key community actors and organizations through a stakeholder mapping exercise. To increase the engagement of residents and organizations, municipalities are actively communicating and involving key stakeholders throughout the decarbonization planning and implementation cycle. The engagement activities among Canadian municipalities range from acquiring public feedback on a proposed decarbonization plan to a collaborative decision-making model.

The advantage of utilizing engagement activities is to increase transparency between municipalities and key stakeholders, improve climate literacy and awareness, and promote climate action. As detailed previously in this guide, corporate and community-wide plans require different types of engagement. The corporate plan involves consultation and perhaps some partnerships for implementation, while the community-wide plan requires a collaborative approach (e.g., shared decision-making, and collection action).

#### **4.4.1 Stakeholder engagement**

Stakeholder engagement is vital for inclusivity and integrated decision-making, and thus, is key throughout in the decarbonization planning process. When planning for decarbonization and community-wide change, municipalities should continuously build trust among stakeholders, and ensure that the decarbonization plan continues to align with the values and needs of stakeholders (while also achieving its deep decarbonization targets). Additionally, municipalities should encourage meaningful participation by ensuring diverse stakeholder representation and by equipping different stakeholders with the appropriate tools and capacities for action. Stakeholders are both people (the public) and groups/organizations.

##### ***Example of stakeholder engagement***

*The Town of Drayton Valley, AB (population: 7,235) hosted a series of energy literacy workshops that encourage participants to envision an energy future that is a fit for the community and to envision how it can be realized. Participants included local residents, businesses, academia, and elected officials from neighbouring communities.*

#### **4.4.2 Rightsholder engagement**

In Canada, many municipalities are on the traditional unceded or treaty territories of Indigenous peoples. It is important to distinguish Indigenous rightsholders that might have their treaty and Indigenous sovereignty rights impacted by an implementation action or decarbonization strategy. Integrating Indigenous involvement into the engagement process will be necessary to ensure meaningful representation and participation of the Indigenous rightsholders within or with proximity to the municipalities. This type of engagement must be conducted in a timely, transparent, safe, and respectable manner.

Engagement with the Indigenous government representatives, urban Indigenous organizations, and/or sovereignty-seeking groups to contribute to decarbonization planning and implementation will be an important step in the overall engagement process. This will enable the process to ensure the deep decarbonization efforts are done in collaboration with Indigenous organizations, the plans incorporate Indigenous knowledge and wisdom, and they consider implications on traditional territories and land claims.

#### **4.4.3 Advocacy and lobbying**

To encourage increased actions and attention on decarbonization from other levels of government, municipalities can use advocacy tools and lobbying to leverage regulatory and financial supports from them.

##### ***Example of advocacy and lobbying***

*Intergovernmental department from the City of Guelph, ON (population: 131,794) and local community groups are advocating to the other levels of government for supports for climate action. For example, a community group named “Advocacy is our Story” is one of the lobbying groups.*

#### **4.4.4 Partner engagement**

Since GHG emissions reductions require collective efforts from multiple actors, partner engagement is critical in ensuring key actors are working toward the same vision. Partner engagement allows key organizations to be part of the community-wide transformation and actively connect with local government on decarbonization efforts. However, it is important to note that partner engagement may require negotiation of roles and of organizational contributions.

##### ***Examples of partner engagement***

*The City of Grande Prairie, AB (population: 69,088) was able to engage the downtown association in the decision-making of installing EV charging stations. The municipality was also able to leverage the resources of the Chamber of Commerce to involve the builder/developer community.*

*City Green Solutions has collaborated with nine municipalities in BC (Capital Regional District, City of Victoria, District of Saanich, District of Central Saanich, City of Campbell River, Regional District of Nanaimo, Comox Valley Regional District, Township of Esquimalt, Cowichan Valley Regional District) on a residential retrofit acceleration project to help reduce emissions from the building sector.*

*The City of Rossland, BC (population: 3,729) has partnered with Fortis BC (a local utility), Columbia Basin Trust, and the Nelson and District Credit Union in developing a Rossland Energy Diet and in retrofitting over 150 homes.*

Table 6 offers examples of policies, programs, and processes that fit the four strategies. These are suggestions that emerged through the literature review and through the interviews with municipal representatives. This is not a complete list, but representative examples. Depending on the municipal context which of these might be most appropriate and most impactful for reaching deep decarbonization targets.

Table 6. Examples of governance strategies and the associated priority sectors

<b>Policies</b>	<b>Priority sectors</b>
Agriculture-related policies that promote carbon sequestration by either increasing storage of carbon or reducing the loss of stored carbon	Agriculture
Policies that promote sustainable and equitable food options	Agriculture, transportation and waste
Policies that support innovation and pilot experimentation	All (buildings, transportation, waste, electricity, carbon sinks, agriculture and land use)
Carbon/climate lens to all decision-making and/or using a carbon budget	All
Legislation that supports energy audits and reporting for industrial, commercial and institutional buildings	Buildings
Voluntary energy labelling standards	Buildings
Voluntary building codes	Buildings
Green Development Standards	Buildings
Biodiversity/green space land-use policies	Carbon sinks
Renewable and district energy policies	Electricity
Anti-idling policies	Transportation
Compact and transit-oriented development policies	Transportation and land use
Waste bans, reduction, and diversion policies	Waste
<b>Financial tools</b>	
Carbon Local carbon credits	All
Local improvement charges	All
Divestment of pension funds	All
Green bonds	All
Property Assessed Clean Energy (PACE) program	Buildings
Financing options for residential retrofits	Buildings
Financial incentives (e.g., rebates) for net-zero property development	Buildings
Public transit pricing (e.g., free), EV parking pricing, incentives for biking to work (and not needing parking), etc.	Transportation
Congestion pricing	Transportation
Stormwater charges and grants	Waste
<b>Green economic development</b>	
Creation of green jobs	All
Workforce training on climate-related knowledge	All
Investment in renewable energy	Electricity

Public/active transportation infrastructure, EV charging infrastructure	Transportation
Green procurement policies (e.g., green-fleet)	Transportation
Energy recovery from waste	Waste
<b>Engagement strategies</b>	
Advocating to other levels of government	All
Community social-marketing	All
Identifying and prioritize collaborations to implement community-wide or sector-wide decarbonization projects, programs, or actions.	All
Participation in Transnational/Regional Networks	All
Partner engagement through local membership programs	All
Partnership with educational institutions	All
Public engagement and education on energy and electrification, transportation, waste, building retrofits, etc.	All
Stakeholder assessment and consultation with community members and technical experts	All

**Assessments and reflection questions**

- What are some of your current strategies for implementing climate action? How effective have they been in reducing GHG emissions? Will they enable you to reach your interim and long term deep decarbonization targets?
- Do the existing policies accelerate or inhibit proposed actions in the decarbonization plan? Would revisions enable them to be more effective? Are new policies needed instead?
- Are the scale of action and speed of strategy implementation appropriate to achieve the targets? Will the implement efforts ensure the municipality is on track to reach the interim corporate and community-wide targets?
- Is the climate action plan benefiting community groups differentially, is it causing unintended consequences for already disadvantaged groups or is it helping address social goals simultaneously?



## 5. Key success factors for reaching carbon neutrality

Canadian municipalities have encountered multiple barriers as they work toward achieving their corporate and community-wide GHG emissions reduction commitments. Table 7 highlights some of the most important success factors mentioned by interviewees for reaching their climate targets and some of the potential solutions that may help municipal staff achieve success as they work toward decarbonization.

*Table 7. Key success factors in reaching carbon neutrality*

Key success factors	Potential solutions
<b>Gathering support from senior management and council</b>	<ul style="list-style-type: none"> <li>• Encourage participation in networks such as in Global Covenant of Mayors, PCP, Climate Caucus, and other opportunities offered by national, provincial and/or local NGOs</li> <li>• Share resources and training from FCM, Canadian Institute for Climate Choices, QUEST, etc.</li> <li>• Support a climate champion within council to encourage climate action</li> <li>• Ensure access to data to examine the progress on the achievement of their interim targets</li> </ul>
<b>Build community support</b>	<ul style="list-style-type: none"> <li>• Collaborate with climate champions within the community to promote climate and decarbonization initiatives</li> <li>• Ensure equity, diversity, inclusion and meaningful participation in all decision-making processes</li> <li>• Carefully craft messages to convey the co-benefits of decarbonization, and the cost of inaction</li> <li>• Support community groups working on climate action</li> </ul>
<b>Understand and communicate the comparative cost of fossil fuel to renewable energy sources</b>	<ul style="list-style-type: none"> <li>• Utilize scenario forecasting and climate budgeting to estimate long-term cost options including maintenance and an increasing price on carbon</li> <li>• Calculate the return on investment and savings from potential investments in renewable resources</li> <li>• Capture the true cost of using fossil fuels, including the health impacts</li> </ul>

<p><b>Align resources and finances with climate objectives</b></p>	<ul style="list-style-type: none"> <li>• Explore other financing mechanisms, such as green bonds</li> <li>• Collaborate with neighbouring municipalities to jointly apply for funding and investments</li> <li>• Strategically align climate initiatives with municipal operations and services</li> <li>• Join international/regional networks working on climate change capacity building and furthering ideas</li> <li>• Budget for decarbonization actions in upcoming budget cycles to ensure the continuity of climate actions and decarbonization efforts</li> <li>• Reduce redundancy in climate-related program offerings</li> <li>• Adopt a long-term perspective to budgeting and resource allocation, and consider long-term costs for non-action versus immediate acquisition cost</li> </ul>
<p><b>Align corporate operations with climate objectives</b></p>	<ul style="list-style-type: none"> <li>• Adopt change management strategies and promote change within the corporate culture</li> <li>• Establish a clear mandate to work on climate change</li> <li>• Ensure all decision-making considers climate change and aligns with the climate targets and actions</li> <li>• Increase cross-departmental collaborations by establishing an internal working group</li> <li>• Climate staff/team could also act as facilitators to support the integration of climate thinking into other departments</li> <li>• Ensure that the decision-making process considers climate change and aligns with the climate targets and actions</li> <li>• Introduce a climate budget as part of the accounting processes and auditing processes</li> </ul>
<p><b>Gathering support from other levels of government</b></p>	<ul style="list-style-type: none"> <li>• Increase advocacy efforts to all levels of government and political sectors</li> </ul>

## **6. Emerging topics for deep decarbonization and climate mitigation**

As climate mitigation and deep decarbonization efforts are gaining momentum in cities, some emergent areas have surfaced. The following are some topics to be considered when planning or implementing decarbonization actions.

### ***6.1 Food and agriculture***

Food choices influence and impact decarbonization pathways. Agriculture and organic waste are higher emitting sectors for small and rural communities in Canada. Deploying sustainable land use in agriculture increases carbon storage while utilizing ecological farming practices such as reducing fertilizer inputs, adjusting livestock feed to reduce emissions from digestive systems, and capturing methane emissions from manure, which can significantly reduce GHG emissions. Additionally, improving soil management practices such as soil conservation and carbon sequestration practices increases the carbon sink capacity of the agricultural land. Implementing crop rotations, decrease bare fallow and establishing agroforestry systems are some examples of farm practices that increase the storage of carbon or reduce the loss of stored carbon. While policies and strategies promoting sustainable food and local choices decrease emissions related to the waste and transportation sectors, it is also important to develop strategies that ensures food access and equity to sustainable food options among the low-income citizens.

### ***6.2 Climate/energy justice***

As cities are moving toward decarbonization action and implementation, emerging social issues and challenges when achieving decarbonization goals are of concern. Cities need to ensure a social, just and equitable decarbonization pathway toward carbon neutrality and develop energy and climate policies that promote secure and equitable access for all community members, particularly the vulnerable populations.

### ***6.3 Carbon budgeting for cities***

Oslo, Norway was the first to develop a municipal-level climate budget. Several Canadian municipalities are starting to adopt this decision-making approach. In essence, the municipality has a carbon budget within which its GHG emissions must fit. It is a tool that tracks GHG emissions with finances. It allows a carbon allocation to be added to each proposed project and ongoing operational cost so that it can be assessed for its climate mitigation potential against the municipality's remaining carbon budget. This approach ensures the municipalities are held accountable for their long-term climate targets and allows for transparent and accurate monitoring of their decarbonization progress.

#### ***6.4 Embodied carbon***

Embodied carbon considers GHG emissions of a material released from the extraction of raw resources to its end-life. Embodied carbon differs from a carbon footprint as it does not include any carbon emissions from use and operations. In essence there is embodied carbon and operational carbon. In an infrastructure project, embodied carbon includes the building materials emissions from raw material extraction/harvest, manufacturing, transportation, and emissions associated with construction and demolition practices.

#### ***6.5 Consumption-based GHG accounting***

Consumption-based GHG accounting differentiates from a sector-based approach, as it accounts for the direct lifecycle GHG emissions of goods and services consumed by residents within the municipal geographic boundary. The consumption-based GHG accounting captures goods and services that are produced outside the municipal boundary but are consumed within the municipality.

#### ***6.6 Integrating climate mitigation and adaptation***

Climate change has many impacts that negatively affect communities, for example, increases in flooding, heatwave, and fire events; sea level rise; permafrost melting; and degradation of ecological services. Many Canadian municipalities have planned and implemented climate adaptation strategies to increase resiliency and reduce the risks of climate change in their community. Integrating complementary adaptation and mitigation actions and strategies is critical for reaching the deep decarbonization targets and reducing climate change impacts at the local level. Municipalities with separate mitigation and adaptation plans and/or different climate teams should ensure coherency between the decarbonization and adaptation efforts. Additionally, municipalities need to consider the interaction, tradeoffs and co-benefits that might exist between climate mitigation and adaptation priorities. For example, building resiliency into electricity systems so that if there is a local power outage from an extreme weather event homes can still be heated, and electric cars still be charged.

## 7. Additional resources

Table 8. Useful resources for decarbonization planning

<b>Tools, reports and programs</b>	
<a href="#">Adopting a climate lens</a>	<a href="https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html">https://www.infrastructure.gc.ca/pub/other-autre/cl-occ-eng.html</a>
<a href="#">Climate budget</a>	<a href="https://www.c40knowledgehub.org/s/article/Oslo-s-Climate-Budget-2019?language=en_US">https://www.c40knowledgehub.org/s/article/Oslo-s-Climate-Budget-2019?language=en_US</a>
<a href="#">Consumption-based GHG emissions of C40 cities</a>	<a href="https://www.c40.org/researches/consumption-based-emissions">https://www.c40.org/researches/consumption-based-emissions</a>
<a href="#">Dr. Amelia Clarke’s research on climate mitigation and decarbonization</a>	<a href="https://uwaterloo.ca/implementing-sustainable-community-plans/dissemination">https://uwaterloo.ca/implementing-sustainable-community-plans/dissemination</a>
<a href="#">Embodied Carbon in Construction Calculator (EC3) tool</a>	<a href="https://carbonleadershipforum.org/what-we-do/initiatives/ec3/">https://carbonleadershipforum.org/what-we-do/initiatives/ec3/</a>
<a href="#">Global Covenant of Mayor’s in Canada</a>	<a href="https://fcm.ca/en/programs/partners-climate-protection/global-covenant-mayors-in-canada">https://fcm.ca/en/programs/partners-climate-protection/global-covenant-mayors-in-canada</a>
<a href="#">Global Protocol for community-scale greenhouse gas emission inventories</a>	<a href="https://ghgprotocol.org/sites/default/files/standards_supporting/GPC_Executive_Summary_1.pdf">https://ghgprotocol.org/sites/default/files/standards_supporting/GPC_Executive_Summary_1.pdf</a>
<a href="#">Partners for Climate Protection</a>	<a href="https://fcm.ca/en/programs/partners-climate-protection">https://fcm.ca/en/programs/partners-climate-protection</a>
<a href="#">QUEST Smart Energy Communities Benchmark</a>	<a href="https://questcanada.org/project/benchmark/">https://questcanada.org/project/benchmark/</a>
<a href="#">Strategies and Governance for Implementing Deep Decarbonization Plans at the Local Level</a>	<a href="https://www.mdpi.com/2071-1050/13/1/154/htm">https://www.mdpi.com/2071-1050/13/1/154/htm</a>
<a href="#">Sustainability Alignment Manual (Market-based instruments)</a>	<a href="https://institute.smartprosperity.ca/sam">https://institute.smartprosperity.ca/sam</a>
<a href="#">The Energy Poverty and Equity Explorer</a>	<a href="https://energypoverty.ca">https://energypoverty.ca</a>
<b>Networks and organizations</b>	
<a href="#">C40 Network</a>	<a href="https://www.c40.org/">https://www.c40.org/</a>
<a href="#">Canadian Institute for Climate Choices</a>	<a href="https://climatechoices.ca/">https://climatechoices.ca/</a>
<a href="#">Canadian Urban Sustainability Practitioners</a>	<a href="https://cuspnetwork.ca/">https://cuspnetwork.ca/</a>
<a href="#">Carbon Neutral Cities Alliance</a>	<a href="https://carbonneutralcities.org/">https://carbonneutralcities.org/</a>
<a href="#">Clean Air Partnership</a>	<a href="https://www.cleanairpartnership.org/">https://www.cleanairpartnership.org/</a>
<a href="#">Climate Caucus</a>	<a href="https://www.climatecaucus.ca/">https://www.climatecaucus.ca/</a>
<a href="#">Farmers and Climate Solutions</a>	<a href="https://farmersforclimatesolutions.ca/">https://farmersforclimatesolutions.ca/</a>

<a href="https://fcm.ca/en/programs/partners-climate-protection/global-covenant-mayors-in-canada">Global Covenant of Mayor's in Canada</a>	<a href="https://fcm.ca/en/programs/partners-climate-protection/global-covenant-mayors-in-canada">https://fcm.ca/en/programs/partners-climate-protection/global-covenant-mayors-in-canada</a>
<a href="https://fcm.ca/en/programs/partners-climate-protection">Partners for Climate Protection (ICLEI Canada and FCM)</a>	<a href="https://fcm.ca/en/programs/partners-climate-protection">https://fcm.ca/en/programs/partners-climate-protection</a>
<a href="https://questcanada.org/">QUEST</a>	<a href="https://questcanada.org/">https://questcanada.org/</a>
<a href="https://institute.smartprosperity.ca">Smart Prosperity Institute</a>	<a href="https://institute.smartprosperity.ca">https://institute.smartprosperity.ca</a>
<a href="http://naturalstep.ca/">The Natural Step Canada</a>	<a href="http://naturalstep.ca/">http://naturalstep.ca/</a>
<a href="https://vivreenville.org/">Vivre en Ville</a>	<a href="https://vivreenville.org/">https://vivreenville.org/</a>

*Table 9. Examples of complete plans with ambitious 2050 climate targets*

Municipality		Links to completed plans
City of Bridgewater	<a href="#">Community Energy Investment Plan</a>	<a href="https://www.bridgewater.ca/document-library/sustainability/sustainable-bridgewater/1511-bridgewater-community-energy-investment-plan/file">https://www.bridgewater.ca/document-library/sustainability/sustainable-bridgewater/1511-bridgewater-community-energy-investment-plan/file</a>
City of Guelph	<a href="#">Community Energy Initiative</a>	<a href="https://www.ourenergyguelph.ca/">https://www.ourenergyguelph.ca/</a>
City of Halifax	<a href="#">HalifACT</a>	<a href="https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM_HaliFACT_vNew Logo_.pdf">https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM_HaliFACT_vNew Logo_.pdf</a>
City of Montreal	<a href="#">Climate Plan 2020 – 2030</a>	<a href="https://res.cloudinary.com/villemontreal/image/upload/v1611255391/portail/ndbtwahsmb7x24rsiqxl.pdf">https://res.cloudinary.com/villemontreal/image/upload/v1611255391/portail/ndbtwahsmb7x24rsiqxl.pdf</a>
City of Toronto	<a href="#">TransformTO</a>	<a href="https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/transformto-climate-action-strategy/">https://www.toronto.ca/services-payments/water-environment/environmentally-friendly-city-initiatives/transformto/transformto-climate-action-strategy/</a>
City of Vancouver	<a href="#">Greenest City Action Plan</a>	<a href="https://vancouver.ca/files/cov/greenest-city-action-plan.pdf">https://vancouver.ca/files/cov/greenest-city-action-plan.pdf</a>
	<a href="#">Climate Emergency Action Plan</a>	<a href="https://vancouver.ca/files/cov/climate-emergency-action-plan-summary-2020-2025.pdf">https://vancouver.ca/files/cov/climate-emergency-action-plan-summary-2020-2025.pdf</a>
Region of Durham	<a href="#">Durham Community Energy Plan</a>	<a href="https://www.durham.ca/en/citystudio/resources/Durham-Community-Energy-Plan-Part-1.pdf">https://www.durham.ca/en/citystudio/resources/Durham-Community-Energy-Plan-Part-1.pdf</a>

## 8. Glossary of terms

**Carbon neutrality:** having a net-zero balance between emitting GHG emissions and absorbing carbon from the atmosphere in carbon sinks. To achieve carbon neutrality, significant reductions in GHG emissions are needed, and the last small percentage can be achieved through carbon sinks.

**Carbon sink:** any system that absorbs more carbon than it emits (e.g., forests, wetlands, oceans, and soil).

**Climate lens:** is a decision-making step that is intended to add consideration of climate impacts into planning and approval processes. One tool to bring a climate lens to municipal decision-making is using a climate/carbon budget.

**Collaboration approach:** a collaborative or partnership approach engages partner organizations in collectively making decisions, implementing actions, and monitoring progress.

**Community-wide climate action plan:** a community-wide climate action plan focuses on reducing greenhouse gas (GHG) emissions within the boundaries of the community. Actions to reduce community-wide GHG emissions require commitments and effort by many actors in the community.

**Consultation approach:** a consultation or participation approach engages stakeholders and gathers their feedback on an initiative. Decision-making rests with the municipality.

**Corporate climate action plan:** a corporate-wide plan focuses on reducing emissions that are directly controlled by the City (e.g., municipal operations and fleets).

**Decarbonization:** reduction of carbon dioxide emissions (and other GHGs) through transformation of supply-side structural reform and demand-side response to achieve no/low output of greenhouse gasses into the atmosphere.

**Deep decarbonization plan:** a climate action plan that aims for at least 80% reduction on GHG emissions. Used for both community-wide and corporate climate action plans.

**Equity-seeking groups:** communities that experience significant systemic barriers in participating in society. These are barriers to equal access to opportunities and resources due to systemic discrimination. The barrier may be due to age, ethnicity, race, nationality, disability, gender, sexual orientation, nationality, economic status, etc.

**Stakeholders:** persons or groups who are directly or indirectly affected by a project. They may also have interests in the project or influence (positively or negatively) on the project outcome.

## Appendix

### *Appendix A. List of partner organizations and Canadian municipalities interviewed*

<b>Partner organizations</b>	
City Green Solutions	
Clean Air Partnership	
Climate Action Waterloo Region	
Newfoundland and Labrador Environmental Industry Association Inc.	
QUEST	
reThink Green	
The Natural Step Canada	
Toronto and Region Conservation Authority (TRCA)	
Vivre en Ville	
West Kootenay Community EcoSociety	
<b>Canadian municipalities</b>	
Capital Regional District (CRD)	BC
City of Brampton	ON
City of Burlington	ON
City of Campbell River	BC
City of Castlegar	BC
City of Grande Prairie	AB
City of Guelph	ON
City of Hamilton	ON
City of Kitchener	ON
City of London	ON
City of Markham	ON
City of Mississauga	ON
City of Moncton	NB
City of Ottawa	ON
City of Peterborough	ON
City of Rossland	BC
City of Saint-John	NB
City of Saskatoon	SK
City of Toronto	ON
City of Vaughan	ON
City of Victoria	BC
City of Waterloo	ON
City of Winnipeg	MB
Comox Valley Regional District	BC
District of Saanich	BC
Municipalité de Saint-Alexis-des-Monts	QC
Municipalité de Saint-Paulin	QC
Municipality of Central Manitoulin	ON
Municipality of Clarington	ON
Region of Waterloo	ON



Regional District of Nanaimo	BC
Regional District of the Central Kootenay	BC
Town of Bauline	NL
Town of Caledon	ON
Town of Canmore	AB
Town of Drayton Valley	AB
Town of Halton Hills	ON
Town of Mahone Bay	NS
Town of Newmarket	ON
Town of Paradise	NL
Town of Torbay	NL
Town of Whitby	ON
Township of Esquimault	BC
Township of Wilmot	ON
Township of Woolwich	ON
Village of Warfield	BC
Ville de Candiac	QC
Ville de Longueuil	QC
Ville de Victoriaville	QC
York Region	ON