A Lot of Hot Air? Measuring Canadian Municipalities' Climate Change Mitigation Initiatives

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Introduction

More than two decades of international climate negotiations have failed to produce robust responses or binding greenhouse gas reduction commitments for national governments – and this failure strikes particularly close to home here in Canada. Recently, there has been an increasing emphasis by both academics and practitioners on the potential for sub-national governments, including cities, to take action that might substitute for national responses to global climate change mitigation.

Climate action by cities appears to be an attractive solution to this global crisis: more than half of the world's population currently lives in urban areas, including over 80% of Canadians, and cities produce a disproportionate share of per capita emissions. There also seems to be evidence that local governments are up to the challenge: like their counterparts around the world, Canadian cities have undertaken climate action plans, and many have joined intergovernmental networks such as the C40 Cities initiative and the Federation of Canadian Municipalities' Partners for Climate Protection.

However, these are only the first steps. Certainly, some Canadian cities have made strides towards creating climate policy that reduces greenhouse gas emissions and that may support and encourage actions in other

jurisdictions, but there is significant variation among cities in terms of the number of climate policies adopted and the likelihood that these will lead to significant emission reductions.

My broader research agenda seeks to explain this variation: What makes some cities leaders in urban sustainability? Why do some local governments enact more climate change policies than others? Today, I take a step back and ask a more basic question: What kinds of things are we talking about when we say that "cities are taking action on climate change" or that they are adopting climate change policy?

I argue that, to move beyond the symbolic rhetoric of emissions reductions targets and climate change strategies, we must be more rigorous in the *measurement* of municipal climate change policy. I suggest that, while it may not seem controversial or revolutionary, we need to begin by considering the impact that municipal climate change actions are likely to have on greenhouse gas emissions.

Incorporating the likely impact of climate policies into our measures of cities' achievements provides a more detailed picture of the policies adopted by cities, and will facilitate future research that explores why there is variation in cities' climate policies, both within Canada and between Canada and Europe.

What is Climate Policy?

What counts as climate change policy? Setting greenhouse gas emission reduction targets? What about publicizing Earth Hour? Or building separated bike lanes? Or requiring that new condo towers to be built to LEED standards? I argue that we should define local climate change mitigation policy as an activity, practice, or bylaw that is undertaken or adopted by the municipal government and that leads to the reduction or prevention of greenhouse gas emissions. It does not have to be explicitly designated as climate policy, but it must be a concrete action: plans that propose action to be taken in the future do not count.

The Dimensions of "Likely Impact"

A focus on the likely impact of policies rather than on their simple existence is important because, if we care about climate change as a real global problem, we should be interested in the usefulness of government efforts. I suggest that there are three key dimensions of a policy's likely impact: the *ambition* of the content of the policy, the *scope* of emissions affected, and the *coerciveness* of the policy instrument. The combination of these factors produces the likely impact of a policy. For example, at any given level of ambition and scope, changing the policy instrument to increase coercion should increase the impact of a policy.

The ambition of the policy content refers to what the targets of the policy are expected to do. The more ambitious the policy, the greater the emissions reductions expected to result from it, assuming full implementation across the widest possible range of existing sources of greenhouse gas emissions. For example, an energy efficiency policy that promoted or required a 20% reduction in energy use would be more ambitious than a similar policy that promoted or required a 10% reduction. This is important because if the policy's provisions are weak, the impact on greenhouse gas emissions will be minimal, even if the policy applies widely and is fully implemented. All else being equal, the more ambitious the conditions of the policy, the more likely it is to result in emission reductions.

The scope of a policy refers to the fraction of the municipality's greenhouse gas emissions that it covers. The scope of the policy matters because, even if a policy contains ambitious provisions, if it applies very narrowly, it will have minimal impact on the overall emissions in the city. Municipal climate policy may apply only to emissions resulting from the local government's activity ("corporate emissions") – a very small proportion of a city's total emissions – or to emissions produced by other actors ("community

emissions"). The distinction between corporate and community emissions is used extensively by practitioners, but is rarely incorporated into academic analysis.

The third relevant dimension is the policy instrument selected by the government: specifically, the degree to which the type of policy selected requires action by the targets of the policy, those whose behaviour the policy is intended to change. Information provision and exhortations for voluntary action do not require any action to be taken; subsidies and service provision provide a stronger push; and taxes and regulation are most coercive.

I argue that requiring action will be more likely to lead to reductions in greenhouse gas emissions than less compulsory exhortations, all else being equal. If taking action to substantially reduce greenhouse gases would result in clear and certain benefits, individuals and firms would already be doing so. However, it is unlikely that actions that will lead to deep greenhouse gas emissions reductions will have net financial benefits, and other benefits might be uncertain – perhaps because they are distributed over time.[3] In such cases, information provision will not lead to changed behaviour. Similarly, subsidies are not effective for countering non-financial costs and are impractical due to cities' limited revenue generating capabilities.

Measuring Municipal Climate Policy

As a first cut at measuring cities' climate policy, we could simply count the number of policies adopted using an inventory. In a deductive inventory, the researcher creates a list of potential policies and then counts the number of those policies a local government has adopted. This type of measure is straightforward and reliable, allows for direct comparisons between cities, and permits relatively easy data collection for a large number of cases.

Another approach to measuring climate policy is to work inductively: for the researcher to build a list of the policies adopted. Rather than starting with a pre-determined set of policies, a new list is generated for each jurisdiction using surveys, interviews, or government records.

While a count of climate policy actions is useful as a surface-level measure, it does not allow us to examine the impact of individual policies or the city's whole suite of policies. For example, a city that enacts a small number of broad, ambitious, and highly coercive initiatives may be accomplishing more than a city that enacts many narrow, weak, and minimally coercive measures. This difference will not be captured in the methods I have just outlined.

The deductive approach – that is, counting from a pre-determined list – has a further disadvantage of not capturing variation in policy instruments because the lists usually include particular types of actions. For example, Rachel Krause includes "incentives offered for residents to take public transit (i.e., free days, reduced fares)."[4] This means that if a municipality uses a different policy instrument to achieve the same goal, it is not counted.

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[3] For example, in the context of energy efficiency practices, Mark Jaccard argues that even if there is a net benefit over the long term, uncertainty creates risk and that a true assessment of costs and benefits must take into account the degree to which citizens and firms discount that risk. Rather than being like picking up the proverbial $20 bill, it is like gathering $20 in coins strewn across a potentially hazardous landscape. There is no guarantee that all can be retrieved, or that a further injury will not be incurred in the process. Jaccard, Mark. 2005. Sustainable Fossil Fuels: The Unusual Suspect in the Quest for Clean and Enduring Energy. New York, NY: Cambridge University Press.
[4] Rachel Krause. 2011. "Symbolic or Substantive Policy? Measuring the Extent of Local Commitment to Climate Protection," *Environment and Planning C: Government and Policy* 29, 51.

The inductive approach avoids this pitfall, but the more contextualized listing of policies makes comparisons among jurisdictions more complicated and may lead researchers to overlook policies that are not explicitly labeled as "climate policy" by policymakers.

My Approach

I propose to combine these two approaches. I begin with the deductive specification of the traditional substantive areas of policy-making that are likely to contribute to greenhouse gas reduction: transportation, buildings and planning, procurement, waste, and energy, as well as a residual category, and then I break these down into specific activities and issues (see Table 1 in Appendix).

I then identify policies adopted in each of the eleven Canadian cities with populations of over 500,000 residents, using the cities' official websites. Each category can include multiple specific actions, and in order to weight the actions – to give more credit for policies that are likely to result in greater reductions – I note whether each policy is designed to address corporate or community emissions. For those policies focused on community emissions, I identify the policy instrument selected – voluntary action or information provision, service provision or subsidies, or taxes or regulation (see Table 2 in Appendix).

As expected, the initiatives undertaken by the cities differ in number, scope, and instrument. If we only look at the number of policies adopted, this measurement process has the drawbacks of the approaches I just described: the measures are not weighted, so a minor action in one city is considered to be equal to a wide-ranging and ambitious regulation in another.

Although it is not a strict weighting, examining the content of the policies enacted and categorizing them by scope and coerciveness allows us to observe differentiation in the likely impact of climate policy across cities. We can see that most large Canadian cities adopt more policy aimed at community emissions than at emissions resulting from their own activities. With a few exceptions, the ratio is at least two to one. However, voluntary and information provision instruments make up an average of 38% of the cities' policies aimed at community emissions. Examples of these policy tools include encouraging citizens to participate in Earth Hour, or providing information about energy efficiency in home renovations. The prominence of voluntary and information-based policy instruments is notable because there is little evidence that this type of policy has a perceivable impact on emissions.

When policies that exclusively employ voluntary or information provision instruments are omitted, the gap between the two types of policy narrows substantially. These results also show that regulation of greenhouse gases is rare among Canadian cities. All of the cities except Calgary have formal anti-idling regulations, but only Toronto, Vancouver, and Montreal have any other type of greenhouse gas regulation.

Conclusion

While effective climate policy is predicated on knowledge about current emissions and well-considered plans, emissions inventories and climate action plans are not, in themselves, climate policy. When we examine and compare the climate change actions of municipalities, we should be considering not only the existence of policies, but also the level of greenhouse gas emission reductions that will be associated with their implementation. I argue that this level, what I call the "likely impact" of the policy, is a combination of the policy's ambition, scope, and coerciveness. Analysis of municipal climate policy that incorporates assessment of its impact on greenhouse gas emissions will, I hope, lead to a more realistic evaluation of cities' current actions and potential contributions.

Looking at Canadian cities, I find that, while cities have adopted a reasonable number of policies altogether, and many of these apply to the general public and to the private sector, many of them are also based on information provision and exhortations for voluntary action. Moreover, very few involve taxes or binding regulation. These findings should dampen our expectations about the potential for cities to take action that could substitute for a national or international response to climate change. However, these findings also suggest that there is potential for more nuanced comparison of cities' climate change actions, which will improve our ability to both understand and promote climate change mitigation at the local level.

Table 1: Deductive Specification of Substantive Policy Areas that Contribute to Greenhouse Gas Emissions

Policy Area	Specific GHG reducing activities
Transportation	Cycling
	Walking
	Transit
	Cars
	Goods movement
	Roads
Procurement	General
	Fleet
Buildings and Planning	Zoning
	Green roofs
	Building standards (e.g., LEED certification)
	Brownfield redevelopment
	Site-specific projects
	Other
Waste	Landfill gas capture
Energy	Electricity conservation
	Electricity generation
	Other
Other	Green business promotion

Table 2: Climate Policies Adopted in Canadian Cities (Scope and Coerciveness)

City	# of Actions	Scope Corporate	Community	Coerciveness (Community) Voluntary/ Information	Service Provision/Subsidy	Tax/ Regulation
Toronto	25	5	21	5	12	3
Vancouver	23	7	16	5	8	3
Montreal	20	8	12	3	7	2
Edmonton	20	5	15	8	6	1
Calgary	20	7	13	7	6	0
Ottawa	17	4	13	6	6	1
Winnipeg	16	4	12	6	5	1
Hamilton	15	5	10	4	6	1
Mississauga	13	4	9	4	4	1

Québec City	10	6	5	1	3	1
Brampton	9	3	6	2	3	1

Sources: Official websites of the municipalities, accessed May 2011