

# The Motivations Behind Municipal Climate Engagement: An Empirical Assessment of How Local Objectives Shape the Production of a Public Good

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## Abstract

*Cities engage in greenhouse gas mitigation efforts because of some combination of desires to achieve local co-benefits, respond to the preferences and pressures of influential political actors, and contribute to the public good by minimizing climate change. The relative importance of each motivation is hypothesized to affect the composition and comprehensiveness of subsequent climate initiatives. In some cities, initiatives appear to be ad hoc collections of tangentially related actions, whereas in others they are the result of a strategic planning process. This article uses survey-based data collected from U.S. cities that are explicitly involved in climate change-mitigation efforts and empirically examines two related questions: (1) What are the primary objectives and considerations that motivated these cities to engage in climate-change mitigation? (2) How do these considerations shape the relevant planning activities they undertake? Cities consistently point to cost savings as the primary rationale behind their initial decision to engage. When controlling for other relevant characteristics, however, a stronger direct concern about global climate change, as opposed to achieving financial savings or other co-benefits, is shown to be associated with the implementation of a more comprehensive climate-planning process.*

## Introduction

Voluntary local climate mitigation efforts have been viewed as a *paradox of collective action*. Since Mancur Olson's seminal 1965 work, the idea that, in the absence of coercion, independent entities will regularly fail to take actions that generate public benefits has retained a theoretically dominant position in studies of public policy and public choice (Olson, 1965). Although Ostrom (1990) famously identified conditions that facilitate the voluntary emergence of socially beneficial behaviors—that is, limited numbers of actors with repeated interactions and high levels of trust—these conditions do not readily characterize the problem of global climate change. Greenhouse gas (GHG) emissions disperse globally. Thus, regardless of the location or leadership of abatement efforts, those efforts yield nonexcludable global benefits in the form of climate-change mitigation. From the perspective offered by the theory of collective action, climate protection can be obtained only through national or international policy that compels subnational entities to comply with mitigation requirements. Along these lines, local governments are not expected to take initiative on climate protection, much less become some of its leaders, but they have done so in considerable numbers.

In an attempt to explain this phenomenon, researchers have pointed to the locally accruing *co-benefits* of climate protection—such as cost savings, improved local air quality, and decreased congestion—and have suggested that perhaps local climate involvement is not a collective-action paradox but is instead, at least partially, driven by the possibility of local gains. More specifically, Kousky and Schneider (2003) hypothesized four possible explanations for why free riding has not prevented cities' involvement in climate protection. First, municipalities may be altruistic and reduce GHG emissions to contribute to the public good even if is not “economically rational.” Second, mitigation activities may not be perceived to entail additional costs. Third, those activities may lead to economic or tangible benefits that can be captured by the local community. Fourth, they may result in political gains for local leaders. Although Kousky and Schneider's study of 23 cities pointed to economic benefits as the single most important explanation for climate action, the relative importance of these motivations varies by location. Moreover, their relative importance likely influences the nature and comprehensiveness of the climate actions implemented. In some cities, climate initiatives are ad hoc collections of tangentially related actions, whereas in others they are the result of a strategic and comprehensive planning process.

This study examines local motivations in a more rigorous manner than has been done in the past. It collects original data from climate-committed cities and empirically addresses two related questions: (1) What motivated these cities to engage in climate-change mitigation? (2) How do those motivations shape the climate initiatives developed? This article tests the hypothesis that, even when controlling for relevant city characteristics such as local government capacity and demographics, a strong public goods motivation will lead to more comprehensive climate planning.

## Framing Local Climate Protection

A clear understanding of local climate protection and the activities that comprise it is needed before launching into an examination of its motivations. This understanding, in turn, requires a discussion of issue framing. The way an issue is framed, or most commonly characterized, guides the prevailing perception about whether it actually is a problem, what should be done to address

it, and who has the responsibility for taking action (Rabe, 2004; Rochefort and Cobb, 1993). Because it involves a global public good, climate change is traditionally framed as a national or international issue requiring large-scale centralized responses (Brunner, 1991). At least partially because of stagnation in the traditional approach, however, the framing of climate change has shifted such that subnational governments are increasingly viewed as important climate actors. An emerging threefold framework characterizes the relationship between cities and climate change. In it, cities are seen as significant contributors to the problem of climate change, they are expected to suffer disproportionately from it, and—because of their authority over many urban land use, transportation, and energy decisions—they are considered strategically positioned to bring about reductions in GHG emissions (Bai, 2007; Bulkeley and Betsill, 2003; Kates and Wilbanks, 2003; Krause, 2011b; World Bank, 2010). Under this framework, the causes and consequences and the power to do something about both are squarely within the reach of local governments.

Wildavsky (1979: 42) observed an important psychological link between policy problems and solutions, noting, “a problem is only a problem if something can be done about it.” Lindseth (2004) further noted that public action is contingent on the political discourse presenting a problem in a manner that makes it solvable. These observations are applicable to climate-change reframing and the increasing localization of related policy. Although few observers would suggest that climate change can be “solved” by local action alone, proponents assert that municipal efforts can meaningfully contribute to overall mitigation. Proponents further suggest that climate protection initiatives also help mitigate other local challenges—which are almost inherently more “solvable” than climate change—making relevant action win-win (ICLEI, 2009; World Bank, 2010).

The presence of multiple motivations for pursuing GHG-relevant action can make it difficult to determine whether particular local actions constitute climate protection, *per se*. Along these lines, Aall, Groven, and Lindseth (2007) discussed two understandings of local climate protection: explicit and implicit. Explicit climate protection is specifically aimed at reducing GHG emissions, whereas its implicit form has a broader scope and encompasses actions with related but distinct objectives, such as those included in energy, land use, and transport planning. The explicit-implicit distinction can be described simply as the differences between actions taken *to* reduce climate change versus those taken *that* reduce it. Intent is the fundamental difference. Whereas actions explicitly taken to reduce GHG emissions clearly constitute climate protection, the proper categorization of implicit actions that have a side effect of reducing emissions is less obvious. When intent is removed from the equation, it can be difficult to establish what counts as local climate protection. For example, consider a city government that has no stated climate protection agenda but that purchases hybrid vehicles for its fleet. This act will reduce net emissions, but should it be considered part of a local climate protection effort? Moreover, should all other actions that lack a climate label but reduce GHG emissions be treated similarly? The answers to these questions are important for studies trying to measure local climate protection.

The existing literature alternates between the implicit and explicit understandings of climate protection according to the nature of the question being asked. In his work characterizing the internal dynamics that lead to the emergence of state-level climate policy in the United States, Rabe (2004) described the different ways that states label climate-relevant policies to match the prevailing political sentiment. Regardless of their label, he treated all the GHG-reducing policies he reviewed as

fundamentally climate policies. A series of papers by Krause (2011a, b, c), which examined the factors that influence local governments that implement many GHG-reducing actions, likewise did not require the term “climate protection” to be invoked for inclusion. Several other papers focused on cities’ stated commitment to climate protection (Zahran et al., 2008) or on the planning activities undertaken by climate-committed cities (Aall, Groven, and Lindseth, 2007; Sharp, Daley, and Lynch, 2011; Wheeler, 2008). This article examines how cities’ motivations to engage in climate mitigation influence the comprehensiveness of their related planning efforts. It therefore uses the explicit understanding of climate protection, and all cities in the analysis are *climate committed*.

Within the subset of climate-committed cities, the relative importance placed on achieving emission reductions compared with that of other co-benefits varies, such that each city may either (1) engage in policy reframing, whereby already existing activities are presented as part of a new climate initiative; (2) structure climate protection initiatives to maximize desired co-benefits; or (3) use co-benefits to help legitimize the development of a comprehensive climate protection regime. Although both climate protection and co-benefits appear in all three characterizations, the first two characterizations prioritize co-benefits and enable their pursuit to shape climate protection efforts. Climate protection is a secondary rationale for taking particular actions. The third characterization suggests that the objective of GHG reduction determines relevant actions, and co-benefits are treated as advantageous side effects.

Climate initiatives vary by city and range from ad hoc collections of related actions to the implementation of strategic and comprehensive plans. It is unclear whether, or the degree to which, holding climate protection as a primary as opposed to secondary motivation affects this structure. Existing views on this issue are mostly anecdotal or based on conjecture, and they are often contradictory. On the one hand, a co-benefits emphasis can tie climate protection to the goals of a variety of existing city departments, enabling policy integration and permanence. On the other hand, a co-benefits focus does not prioritize climate change and may relegate it to a place of secondary importance behind other interests and priorities (Bulkeley and Betsill, 2003; Lindseth, 2004). Skeptics of the *co-benefits-first* strategy have suggested that without being treated as an overarching objective, the emissions reductions that local climate protection initiatives can achieve are minimal (Lindseth, 2004). This article hypothesizes that motivations matter and that, when controlling for relevant external factors, they affect the composition and comprehensiveness of the subsequent climate initiatives.

## Sample and Data

Although cities can engage in actions that reduce GHG emissions without ever referencing climate protection as an objective, this study focuses on those that have explicitly adopted climate protection as a goal. Specifically, it considers the 425 cities in the United States with populations greater than 50,000 that have indicated involvement in climate protection, typically through their signing of the United States Conference of Mayors’ Climate Protection Agreement or their participation in ICLEI—Local Governments for Sustainability.<sup>1</sup>

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<sup>1</sup> Per the 2005 U.S. census estimates, 665 U.S. cities have populations greater than 50,000. The 240 of these cities that have no climate policy are excluded from the sample.

Data about local climate planning actions and motivations were collected in September and October 2011. A survey was sent to the individual in each city responsible for climate, sustainability, or environmental initiatives, as identified through a web-based search or phone calls to city hall. The questionnaire was initially administered via the Internet, and hard copies were then mailed to nonrespondents. Usable surveys were returned from 255 cities in 42 states, a 60-percent response rate. Exhibit 1 shows that the responding cities mirror the larger sample on several important measures; none of the differences are statistically significant at  $\alpha = .1$ . Thus, the likelihood of self-selection-induced bias in the analysis is slight. Of the responding cities, 10 stated that, despite their nominal membership in a climate protection organization, they were never involved in *any* climate-protection or GHG-reduction efforts (emphasis included in survey question). The subsequent empirical analysis is conducted on the remaining 245 cities.

### Exhibit 1

#### Characteristics of Responding and Nonresponding Cities

	Full Sample (N = 425)	Responding Cities (N = 255)	Nonresponding Cities (N = 170)
Mean population	202,508	213,853	185,590
Percent of cities by population			
50,000–100,000	53.4	50.6	57.3
100,001–200,000	26.6	26.3	26.9
200,001–500,000	12.9	16.5	7.6
> 500,000	7.1	6.7	8.2
Median household income (\$)	54,225	54,673	53,558
Educational attainment (percent with bachelor degree)	31.4	32.0	30.4
Percent voting Democrat in 2008 presidential election	58.9	58.8	59.1

## Cities' Motivations To Pursue Climate Protection

The factors that motivate local governments to voluntarily pursue climate protection have been addressed previously in the literature, primarily through the use of publically available city-level data and regression analysis to determine which characteristics lead to a greater likelihood of climate protection commitment (Krause, 2011a; Sharp, Daley, and Lynch, 2011; Zahran et al., 2008). Alternatively, several studies qualitatively examined the motivations of a few climate-committed cities. Although better able to examine the dynamic underlying adoption decisions, their findings are not generalizable (Betsill, 2001; Bulkeley and Betsill, 2003; Granberg and Elander, 2007). This article takes a third approach and, via survey data, examines the specific considerations that motivated many cities to engage in climate protection.

The questionnaire administered to local government officials as part of this research asks two related questions about the rationale behind their city's original decision to engage in climate protection. The first provides a list of 11 potential considerations (see the first column of exhibit 2) and asks respondents to characterize each as either extremely, somewhat, or not important factors in this decision. All the considerations listed, with the exception of "assisting in the global effort to minimize

worldwide climate change,” either yield or could be perceived as yielding some form of locally accruing co-benefits, whether tangible, economic, or political in nature. A followup question asks respondents to identify the single most important factor behind their decision to pursue climate protection. Exhibit 2 shows the relative frequency with which the 245 responding cities identified each motivation.

The responses in exhibit 2 appear to support the general idea that, for most cities, climate protection is the co-benefit rather than the primary objective of activities that fall under the local climate protection umbrella. Indeed, by a large margin, city governments point to the desire to reduce energy-related expenses as their primary motivation to engage in climate-related initiatives. A full 85 percent of responding cities describe it as an extremely important consideration and nearly 33 percent identify it as their single most important motivation. Accommodating the preferences and priorities of local government officials is the second most common reason that cities site for engaging in this issue. A variety of reasons might explain why an official places climate protection near the top of his or her personal agenda. Regardless of individual motivations, however, the fact that 43 percent of cities described their decisions to engage in climate protection as being extremely influenced by local officials adds support to the observed importance of policy and political entrepreneurs in subnational climate policy (Krause, 2011c; Rabe, 2004, 2007; Selin and VanDeveer, 2007).

Adherence to regulations or legislation passed by the state government emerges as the third single most important consideration motivating local climate action. Cities in California are driving this result, however, and they cause it to overstate the importance that state-level legislation has on

**Exhibit 2**

**The Relative Importance of Select Motivations in Cities’ Decisions To Pursue Climate Protection**

Motivation	Percent of Cities That Identified Each as:			
	Single Most Important	Extremely Important	Somewhat Important	Not Important
Achieving energy and cost savings for the city government	31.3	85.2	14.4	0.4
The preferences and priorities of particular city official(s)	19.7	43.0	45.0	12.0
State government requirements or legislation	14.2	24.7	26.3	49.0
Assisting in the global effort to minimize worldwide climate change	9.9	29.4	54.1	16.5
Developing a reputation as a “green city” to attract economic investment	8.2	53.3	39.3	7.4
Interest group or citizen demands	7.3	28.0	52.7	19.3
Improving local air quality	3.9	38.3	46.3	15.4
Increasing ability to attract grants and external funding	1.7	47.3	44.0	8.7
The influence of neighboring or “peer” cities	1.3	9.1	52.7	38.2
Reducing local traffic congestion	0.1	22.7	52.5	24.8
Reducing community’s risk of weather-related disasters (flooding, drought, storms, and so on)	0.0	22.0	46.3	31.8
Other	1.7	NA	NA	NA

NA = not applicable.

local decisions for the nation as a whole. Of the cities in the sample, 63 (approximately 25 percent) are in California. Of those, 27 cities (43 percent) point to state legislation as the single most important driver of their climate protection activities. Only 6 cities outside California describe state legislation as their single most important consideration. Indeed, as the breakdown in the last column of exhibit 1 shows, 49 percent of cities say state-level policy was not important to their decision. This finding suggests that, although state climate policy can influence local objectives, municipal actions need to be targeted directly. Many states outside California have engaged in some type of climate policy, including the development of climate action plans and membership in regional GHG-reduction initiatives, but their influence fails to trickle down to local actions. A few additional considerations in exhibit 1 have their overall importance misrepresented by the single most important measure. For example, although no cities identify ameliorating risk from weather-related disasters as their single most important reason for getting involved in climate-change mitigation, 22 percent of cities nonetheless describe it as an extremely important motivation.

In a noteworthy finding, only 10 percent of cities say that assisting in global climate protection is the primary reason that they engage in GHG-mitigation efforts. Indeed, 70 percent describe it as a somewhat or not important consideration. Thus, contributing to the public good of reduced global climate change appears to be at best a secondary motivation for many cities. This finding supports some previous observations made in the literature (Bulkeley and Betsill, 2003) and suggests that the common frame, which presents local climate initiatives as a paradox of collective action, may misrepresent the actual dynamic. In most cases, municipal involvement in climate protection appears not to violate the theory of collective action after all but instead is a locally beneficial rational choice.

When considering these descriptive statistics, keep in mind two qualifications. First, the questions are to varying degrees retrospective, asking respondents to recall the dynamic that led to the original decision to engage in climate protection. Second, one representative from each city is providing the response on behalf of the entire city, and that individual's perception and subjectivity are therefore influential. Because the surveys were sent directly to the individual in each city responsible for sustainability-related issues, who theoretically has the greatest level of relevant knowledge, these limitations should be minimized, however.

To further assess the factors that influence local governments' engagement in climate protection initiatives, I apply a factor analysis to the 10 motivation variables that offer the possibility of generating local co-benefits (that is, all those listed in exhibit 2 except "assisting in the global effort to mitigate worldwide climate change," which yields only public goods). Factor analysis examines the interrelationships among the observed variables and identifies the linear combinations that contain the most information. It assesses whether their common features can be expressed by fewer underlying variables and therefore whether the original variables can be reduced into fewer meaningfully related groups (Stewart, 1981). Factor analysis is employed here to transform the 10 motivation variables into orthogonal factors by assigning factor loadings, which are the correlation coefficients between each variable and factor.<sup>2</sup> Factor loadings greater than 0.6 are considered high and represent

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<sup>2</sup> The motivation variables in the factor analysis are coded such that 0 indicates that a variable was not important to the city's decision to engage in climate protection, 1 indicates that it was somewhat important, and 2 indicates that it was extremely important.

the main considerations within a decision (Hair et al., 1998). Typically, factors with eigenvalues greater than 1 are retained, as the Kaiser criterion suggests. The retained factors are then subject to intuitive or theoretical interpretation.

Four main factors appear to underlie the 10 co-benefit-generating motivation variables (see exhibit 3). The four retained factors each account for between 14.8 and 18.9 percent of the observed variance, resulting in a cumulative 66.3 percent of total variance explained. The dominant factor loadings, which are used to determine variables' placement within factors, are indicated with asterisks. The interpretation of factors is a necessarily subjective exercise; the variables load in an apparently meaningful manner, however. Factor 1 consists of variables related to the achievement of complementary local goals, namely, adhering to state legislation, improving air quality, and decreasing traffic congestion. Factor 2 includes variables related to economic and cost considerations: achieving energy and cost savings, improving access to external funding, and increasing the city's green reputation and related investment opportunities. The variable representing concern about vulnerability to weather-related disasters is dominant in Factor 3. Factor 4 contains variables associated with political influence, namely the influence of peer cities, public pressure, and the priorities of local officials. These factors loosely match the reasons hypothesized by Kousky and Schneider (2003) for why free riding has not prevented cities from engaging in climate protection.

The creation of a simple index illustrates the relative importance of these factors in cities' original decisions to engage in climate-change mitigation. Cities described each motivation as extremely, somewhat, or not important, and these responses were assigned a value of 2, 1, and 0, respectively. The values were then added together and divided by the maximum possible score for that factor. The resulting value, listed in the fourth column of exhibit 4, is a standardized measure of the

**Exhibit 3**

**Factor Loadings for the Considerations Behind Local Governments' Decisions To Engage in Climate Protection**

	<b>Factor 1: Complementary Goals</b>	<b>Factor 2: Financial Concerns</b>	<b>Factor 3: Vulnerability Concerns</b>	<b>Factor 4: Political Influence</b>
Reducing community's risk of weather-related disasters (flooding, drought, storms, and so on)	- 0.076	0.049	0.843*	0.095
Achieving energy and cost savings for the city government	- 0.186	0.735*	0.263	- 0.001
Increasing ability to attract grants and external funding	0.158	0.819*	- 0.017	- 0.042
Developing a reputation as a "green city" to attract economic investment	- 0.004	0.709*	0.067	0.381
Interest group or citizen demands	- 0.152	- 0.054	0.365	0.681*
The preferences and priorities of city official(s)	- 0.014	0.141	0.008	0.810*
The influence of neighboring or "peer" cities	0.419	0.049	- 0.008	0.609*
State government requirements or legislation	0.821*	- 0.136	- 0.149	- 0.050
Improving local air quality	0.546*	0.270	0.518	0.130
Reducing local traffic congestion	0.609*	0.262	0.494	0.026

\* Dominant factor loadings.

average importance of the overall factor. Exhibit 4 also contains a similarly developed index, which was not included in the factor analysis, representing the perceived importance of contributing to the reduction of worldwide climate change. This index represents an altruistic, public-goods-driven motivation. Factor 2, financial concerns, emerges as the most important consideration behind cities' decisions to become involved in climate-protection initiatives. The other indices—complementary goals, vulnerability concerns, political influence, and altruistic concern about global climate change—show levels of importance that hover around 0.50. Although still influential, they are secondary considerations for most cities.

#### **Exhibit 4**

##### **Relative Importance of Factors to Cities' Climate Decisions**

	<b>Cumulative Average</b>	<b>Maximum Potential</b>	<b>Standardized Factor Importance</b>
Factor 1: Complementary goals	2.97	6	0.49
Factor 2: Financial concerns	4.70	6	0.78
Factor 3: Vulnerability concerns	0.88	2	0.44
Factor 4: Political influence	3.12	6	0.52
Altruistic concern about global climate change	1.11	2	0.56

## **The Effect of Motivation on Climate Action**

The type, quality, and comprehensiveness of initiatives vary among cities that have made explicit climate commitments. A small but growing number of studies have tried to explain this variation by empirically examining the factors that influence cities' implementation of specific GHG mitigation measures. Feiock and Bae (2011) considered factors leading to the development of local GHG inventories. Sharp, Daley, and Lynch (2011) examined the drivers and barriers to the implementation of ICLEI milestones,<sup>3</sup> and Krause (2011c) constructed an index of GHG-reducing actions and assessed the factors that influence cities to implement more of the identified activities. These studies tested several models of local decisionmaking, which include independent variables variously representing interest-group influence, the structure of political institutions, governmental capacity, and physical vulnerability.

This analysis uses a base model similar to those developed in previous papers, but includes an additional set of key independent variables; namely, the considerations that cities describe as important motivations behind their original decisions to pursue climate protection. I hypothesize that, when controlling for all the policy supply and demand factors typically contained in models of local decisionmaking, the underlying objective(s) for climate action—whether they be monetary savings, compliance with state legislation, contributing to global GHG mitigation, and so on—will remain influential. Moreover, I expect that the nature of the dominant motivations will shape climate planning in a systematic manner.

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<sup>3</sup> ICLEI milestones are (1) complete a GHG emissions inventory, (2) adopt a GHG reduction target, (3) develop a climate action plan to reach that target, (4) implement the plan, and (5) monitor results (ICLEI, 2009).

Exhibit 5 contains a description of the control variables included in this model. Like many previous studies, this study includes a series of local demographic statistics to act as proxies for interest-group activity and civic pressure. Here, the variables income, education, political leaning, and manufacturing fill this role. Cities’ populations and general revenues indicate the overall level of resources available to the local government. Although political institutions are often considered mediating variables, best captured by interaction terms (Clingermayer and Feiock, 2001), recent studies observed governmental form as having a direct effect on the implementation of climate-relevant activities (Feiock, Francis, and Kassekert, 2010). A dichotomous variable indicating whether cities have a mayor-council or alternative form of government is thus used to control for the influence of local political institutions. Finally, cities’ location near a coast serves as a control for the effect of perceived vulnerability to weather-related risks.<sup>4</sup>

**Exhibit 5**

**Control Variables**

Description	Source
Income	Median household income, 2006–2008, in \$1,000s. Source: U.S. Census Bureau 2000, SF-3
Education	Percentage of population older than age 25 with a bachelor degree or higher. Source: U.S. Census Bureau, 2006–2008 American Community Survey 3-year data
Political leaning	Percentage of county votes supporting the Democratic candidate in the 2008 presidential election. Source: <i>Congressional Quarterly</i> , Voting and Elections Collection
Manufacturing	Percentage of city’s jobs in the manufacturing sector of the economy. Source: <i>County and City Data Book 2007</i>
Population	Logged population of each city in 2005. Source: <i>County and City Data Book 2007</i>
General revenue	Per capita general revenue for each city, 2001–2002, in \$100s. Sources: <i>County and City Data Book 2007</i> ; U.S. Department of Housing and Urban Development
Form of city government	Dichotomous variable indicating whether a city has a mayor-council (1) or different (0) form of government. Source: International City/County Management Association, <i>Municipal Year Book 2000</i>
Coastal community	Dichotomous variable indicating whether a municipality is (1) or is not (0) in a coastal county. Source: National Oceanic and Atmospheric Administration

This analysis aims to determine how the specific objectives that motivate cities to engage in climate protection influence the comprehensiveness of their subsequent climate initiatives. Thus, in addition to the previously described control variables, the indices presented in exhibit 4—most of which are based on a factor analysis of the responses to the survey’s motivation questions—are included as the primary variables of interest.

The dependent variables in this model measure different dimensions of cities’ climate initiatives. Namely, they consist of three dichotomous variables indicating whether cities have—

- Engaged in city-government-focused climate planning by developing both a GHG emissions inventory and a climate action plan addressing emissions from city government operations.

<sup>4</sup> Although climate change-related vulnerabilities may come in numerous forms, including increased drought, heat, and floods, the connection between climate change and sea level rise is particularly salient. Location near a coast is therefore used as a proxy for perceived local vulnerability.

- Engaged in communitywide climate planning by developing both a GHG emissions inventory and a climate action plan addressing communitywide emissions.
- Committed resources to climate protection in the form of both designated money in the city budget and the assignment of climate management responsibilities to specific individuals.

Exhibit 6 lists these dependent variables in order of increasing commitment and effort put toward climate protection on the part of the local governments. The development of an inventory and

### Exhibit 6

#### Results of Logit Regressions Indicating How Internal Motivations and External Controls Influence Local Climate Engagement

	City Government Climate Planning		Communitywide Climate Planning		Resource Commitment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
<b>Motivation factors</b>						
Complementary goals	-0.238 (0.534)	0.900 (0.669)	-0.144 (0.515)	0.391 (0.605)	-0.555 (0.600)	0.142 (0.691)
Financial concerns	-0.474 (0.674)	-0.751 (0.733)	-1.332** (0.650)	-1.504** (0.710)	-0.376 (0.743)	-0.855 (0.832)
Vulnerability concerns	-0.378 (0.468)	-0.531 (0.506)	0.571 (0.440)	0.409 (0.469)	-0.093 (0.488)	-0.296 (0.530)
Political influence	1.414** (0.655)	0.802 (0.735)	1.569*** (0.625)	1.192* (0.680)	1.283** (0.698)	1.342* (0.774)
Altruistic concern about global climate change	0.919* (0.520)	0.198 (0.594)	1.023** (0.493)	0.485 (0.536)	2.628*** (0.597)	2.209*** (0.634)
<b>External control variables</b>						
Income	—	-0.037*** (0.014)	—	-0.024** (0.012)	—	-0.029** (0.014)
Education	—	0.058*** (0.020)	—	0.040*** (0.016)	—	0.014 (0.016)
Political leaning	—	0.042*** (0.016)	—	0.025* (0.015)	—	-0.003 (0.018)
Manufacturing	—	0.014 (0.032)	—	-0.034 (0.031)	—	-0.050 (0.043)
Population	—	0.000 (0.001)	—	0.001 (0.001)	—	0.001 (0.001)
General revenue	—	0.127** (0.061)	—	0.054 (0.049)	—	0.124** (0.050)
Form of city government	—	-0.812** (0.367)	—	-0.621* (0.349)	—	-0.644* (0.402)
Coastal community	—	-0.417 (0.397)	—	0.062 (0.373)	—	-0.383 (0.419)
Constant	0.256 (0.561)	-1.911* (1.076)	-0.499 (0.546)	-1.663* (1.006)	-2.632*** (0.699)	-1.265 (1.205)
	N = 245 LRX <sup>2</sup> = 11.49 ProbX <sup>2</sup> = 0.04	N = 245 LRX <sup>2</sup> = 43.95 ProbX <sup>2</sup> = 0.00	N = 245 LRX <sup>2</sup> = 26.38 ProbX <sup>2</sup> = 0.00	N = 245 LRX <sup>2</sup> = 48.55 ProbX <sup>2</sup> = 0.00	N = 245 LRX <sup>2</sup> = 39.04 ProbX <sup>2</sup> = 0.00	N = 245 LRX <sup>2</sup> = 59.61 ProbX <sup>2</sup> = 0.00

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

Notes: Standard errors in parentheses. Model 1 = independent variables only. Model 2 = independent and control variables.

climate action plan for city government operations is less demanding than the development of similar plans for the community as a whole. The provision of designated resources, in the form of staffing and money, shifts the climate effort from planning to action. These dependent variables are also associated with decreasing frequency of implementation. Whereas 169 of the city governments in the sample have developed a GHG inventory and action plan for their own operations, 124 have done so for communitywide emissions, and only 70 have committed human and financial resources to the effort.

Logit regressions determine the factors that influence the achievement of the three dependent variables (see exhibit 6). The first model corresponding to each dependent variable contains only the motivation factors as independent variables: complementary goals, financial concerns, vulnerability concerns, political influence, and altruistic concern about global climate change. The second model associated with each dependent variable also includes cities' demographic, economic, and geographic characteristics, which serve as control variables. Because the coefficients from logit regressions are not directly interpretable, exhibit 7 presents their substantive effect in terms of odds ratios. This method describes the change in the dependent variable (Y) for a 1-standard-deviation change in the independent variable (X<sub>i</sub>) holding all other variables constant. For dichotomous independent variables, a 1-unit change is used.

Exhibit 6 makes it evident that all the models, but particularly the initial ones containing only the motivation factors, become more significant as the dependent variables reflect increasing amounts of commitment. The LRχ<sup>2</sup> for the motivation-only models increases from 11.49 for the least demanding dependent variable, city government climate planning, to 39.04 for the most demanding dependent variable, resource commitment. For the full models, the LRχ<sup>2</sup> increases from 43.95 to 59.61.

**Exhibit 7**

**Substantive Effect of Internal Motivations and External Controls on the Odds of Local Climate Engagement**

	<b>City Government Climate Planning</b>	<b>Communitywide Climate Planning</b>	<b>Resource Commitment</b>
<b>Motivation factors</b>			
Complementary goals	1.282	1.114	1.040
Financial concerns	0.846	0.715**	0.826
Vulnerability concerns	0.824	1.161	0.898
Political influence	1.216	1.337	1.387*
Altruistic concern about global climate change	1.069	1.177	2.105***
<b>External control variables</b>			
Income	0.526***	0.658**	0.601**
Education	2.199***	1.729***	1.213
Political leaning	1.668***	1.355*	0.964
Manufacturing	1.073	0.844	0.779
Population	1.109	1.615	1.510
General revenue	1.595**	1.219	1.581**
Form of city government (0 to 1)	0.451**	0.538*	0.525*
Coastal community (0 to 1)	0.493	1.064	0.682

\* p < 0.10. \*\* p < 0.05. \*\*\* p < 0.01.

Notes: Odds ratios. Results reflect a 1-standard-deviation increase in the independent variable, except where indicated by (0 to 1), which reflects a one-unit change.

Several external control variables are statistically significant. Their observed effects are relatively consistent across the models and reflect the findings of previous studies. Specifically, holding all else equal, cities with greater average household incomes and mayor-council forms of government are likely to have taken fewer climate actions. Those with higher education rates, greater political support for Democrats, and higher levels of per capita general revenue typically exhibit a greater likelihood of climate engagement.

With the control variables in place, none of the internal motivation factors significantly influences the likelihood of city-government-focused climate planning. Several remain significant for the dependent variables of communitywide planning and resource commitment, however. A 1-standard-deviation increase in the stated importance of financial concerns as a motivation for involvement decreases the likelihood of communitywide climate planning by 0.751. Holding all other variables constant, a 1-standard-deviation increase in the importance of political influence in a city's initial decision to become engaged in climate protection increases its odds of having conducted communitywide planning and committed resources by 1.337 and 1.387, respectively. Finally, holding all else equal, for a 1-standard-deviation increase in cities' altruistic concern about global climate change, the odds of having completed communitywide climate planning is 1.177 times greater and the odds of having committed resources are 2.105 times greater.

## **Discussion**

This study examines U.S. cities that are explicitly engaged in climate change-mitigation initiatives. It considers, among these already committed cities, whether the motivations behind their decisions influence the comprehensiveness of the relevant planning actions they have taken as followthrough. Asked more specifically: After cities have decided to get involved in climate protection, does it make any practical difference whether they were motivated by direct concerns about climate change or the pursuit of different types of local co-benefits? The results of this study suggest that the answer is yes.

The 11 motivations identified as being behind cities' decisions to engage in climate protection reduce to five underlying factors: achieving complementary goals, financial concerns, concerns about local vulnerability, political influence, and the desire to help mitigate worldwide climate change. The first four factors are based on the potential of accruing local co-benefits, whereas the fifth expresses an altruistic desire to contribute to the production of a public good. Of these factors, financial concerns—that is, achieving cost savings and attracting external funding and investment—were most frequently cited by cities when explaining the rationale behind their decisions to become involved in this issue.

After controlling for external characteristics that have previously been shown to influence local political decisionmaking—including interest-group pressure, governmental capacity, institutional form, and vulnerability to climate-induced threats—cities' internal motivations retain significance in shaping the type and comprehensiveness of followthrough action. Perhaps most notable are the effects that the objectives of achieving local financial benefit and mitigating global climate change have on cities' implementation of the more demanding climate actions: planning for communitywide GHG reduction and dedicating human and financial resources.

Although locally accruing co-benefits, such as cost savings, make participation in climate initiatives attractive for cities, they may be detrimental to the comprehensiveness of the followthrough activities undertaken. Specifically, the results from this analysis indicate that, holding all else equal, cities whose rationale for involvement in climate protection rests more strongly on achieving financial benefits in the form of cost savings and investment are less likely to have undertaken emissions-reduction planning for the community as a whole. This finding is logical because, unlike efforts that focus on reducing energy consumption in government operations, those that target the entire community are unlikely to yield cost savings for the city government and often require additional expenditures. Because the vast majority of urban emissions come from residential or commercial activities and not city government operations, however, a focus on achieving financial savings may inhibit some of the most significant emissions reductions. Indeed, Ramaswami et al. (2012) quantified the effect of several local abatement actions and found that many of those most commonly implemented yield negligible reductions in overall emissions. Local governments whose motivations for engaging in climate-change mitigation are strongly linked to the objective of minimizing its global effects are significantly more likely to have undertaken the more demanding initiatives of community-focused planning and resource dedication. The presence of political support—from local leaders, interest groups, or peer cities—also influences the completion of these actions.

In sum, the presence of co-benefits contributes to cities' initial decisions to engage in climate protection, but has a lesser effect on encouraging their substantive followthrough, which is particularly true for financial co-benefits. The altruistic motivation of helping to minimize the global problem of climate change, on the other hand, shows its greatest effect not with regard to cities' initial decisions to engage with the issue but in influencing their implementation of community-focused planning and resource allocation.

## Conclusion

Previous quantitative studies examining the factors that influence local governments to adopt or implement climate-protection initiatives have focused on the effect of community and city government characteristics. This focus has resulted in a fairly thorough assessment of the performance of several theories of local political decisionmaking in the context of climate protection. The analysis presented in this article controls for community and city government characteristics and targets attention directly on motivations; that is, the specific considerations within each city that led it to adopt an explicit climate protection objective. The stated motivations of climate-committed cities are interesting in and of themselves, with financial considerations (particularly cost savings) dominating the rationale. The desire to help mitigate worldwide climate change appears to be a secondary consideration for most cities' involvement, suggesting that voluntary local climate action may not be a paradox of collective action at all, but rather a rational choice made in the pursuit of co-benefits. The results of this analysis further suggest, however, that after cities are committed a strong public goods motivation does the most to increase the comprehensiveness of the overall climate-planning effort.

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