Innovation and Climate Action Planning

Perspectives From Municipal Plans

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Problem: Cities play a fundamental role in the production of greenhouse gases and, as a result, are places where proactive mitigation and adaptation can occur. While increasing numbers of municipalities have revised or developed climate action plans (CAPs), our understanding of the impetus to plan for the climate challenge, processes for creating climate plans, and their resultant form remains limited.
Purpose: We analyzed municipal CAPs to understand both their processes and their products, including the extent to which they represent innovation in planning. We ask the following questions: 1) Why do localities decide to undertake climate action planning, and what are the plans' chief drivers and obstacles? 2) How have localities structured their climate action planning processes? 3) How frequently are particular types of actions included in local CAPs, and how do localities determine which to adopt?
Methods: We read and evaluated the content of 20 CAPs from municipalities of a range of sizes and locations using a scoring matrix, reconciling coding differences. We also interviewed 16 individuals associated with 15 of the plans and coded notes from these interviews to identify themes relevant to the processes of plan development.
Results and conclusions: There is great diversity in what constitutes a CAP. Some plans are motivational documents, while others are extremely detailed implementation plans with concrete goals, clear objectives, and well-reasoned methods. The decision to prepare a CAP reflects the existence of local political will and leadership, which also influences the planning processes used, the form of the resultant plan, and the actions it identifies. We found CAPs to rely heavily on well-known land use and transportation solutions to the climate challenge such as enhanced transit, compact community design, and green building codes, to be implemented both by local government and the broader community. Informants reported that their CAPs favored actions that were highly visible (e.g., tree planting) or produced immediate results (e.g., energy or cost savings from weatherization).
Takeaway for practice: The CAPs we studied were special-purpose plans, and planning departments and planning commissions were not central to plan development in the majority of cases reviewed here. We advise professional planners to involve themselves more in CAP processes.
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Humans are now unequivocally implicated in triggering global climate change and the impacts on human and natural systems will be severe and far reaching (Intergovernmental Panel on Climate Change [IPCC], 2007). Society is responding to the threat of climate change by developing international climate treaties and national and sub-national plans that aim to mitigate impacts by reducing the sources and augmenting the *sinks* (areas that absorb CO_2, such as forests and oceans) of greenhouse gases (GHG). Some are considering adaptation measures to avoid, prepare for, or respond to potential adverse impacts from climate change (McMichael & Kovats, 2000). While the specific actions taken by public organizations may vary, they generally share the goal of reducing risks to public health and safety (Ebi & Semenza, 2008).

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Local climate action plans (CAPs) that encourage mitigation efforts across all sectors of the economy can help to mitigate GHG production through legislation, regulatory action, and voluntary or incentive programs (Brown, Southworth & Sarzynski, 2008; Ewing, Bartholomew, Winkelman, Walters & Chen, 2008). To date, planning scholars have paid little attention to climate change as a planning problem, and the planning literature contains little discussion of the potentials and pitfalls of this emergent type of planning. Specifically, we have little detail on the range of strategies and policies being adopted under the rubric of climate action planning or how such plans differ from place to place. Since climate change is a new challenge, we might assume that the policies and actions being developed to address it are likewise new or innovative. But we really don't know just how much CAPs represent innovation and how much they repackage old initiatives. We explore the CAP phenomenon and build on previous planning research by Wheeler (2008) on the first generation of state and local level CAPs. To do this, we scrutinized 20 completed CAPs prepared by local governments in the United States, focusing on both their processes and their products.

There are several aspects of the climate change problem that we expect might distinguish CAPs from previous planning efforts. First, the central problem to be addressed (GHG production) is highly technical and requires different types of data, more natural- and climate-science training, and a more nuanced understanding of risk than do traditional planning subjects like land use and transportation (Eden, 1998; Eliasson, 2000). Second, most citizens do not have first-hand experience with climate change, unlike congestion, farmland loss, and even nonpoint source pollution. People are unsure whether events like droughts, hurricanes or prolonged heat waves are the product of a changing climate. Americans have a "moderate perception" (Weber, 2006, p. 111) of climate change risk and do not see it as a crisis like some that have powerfully shaped plans and planning practice in the past (Leiserowitz, 2006). Finally, the topic has been politicized, with conservative think tanks and activists vigorously challenging the global warming predictions of mainstream climate scientists (Dunlap & McCright, 2008; McCright & Dunlap, 2003). This makes action on the subject risky for political leaders and may undercut community support for CAP processes.

In light of these differences, we ask several questions about the processes and products of this new endeavor for local governments. Without federal or state mandates or incentives to develop local climate plans, why do localities decide to undertake climate action planning? What are the chief drivers of and obstacles to undertaking it at the local level? How have localities structured their CAP processes? What individuals or agencies are involved? What types of actions or policies are localities adopting with their CAP processes? How do they determine which policies to adopt?

Policy Innovation and Climate Action Planning

The existing literature on policy innovation has two traditional models for understanding policy innovation and adoption: the internal determinants model and the regional diffusion model (Berry & Berry, 1999). The *internal determinants* model presents policy innovation as a function of the political, social, and economic characteristics of the innovator, predicting that places innovate if they are receptive to the innovation (perhaps politically inclined to favor it) and see it as beneficial or problem solving. The *regional diffusion* model depicts policy innovation as a regional phenomenon which occurs in clusters. In this model, proximity to other innovating units of government is a major influence on policy adoption.

While most research on policy innovation has taken place at the state level (see, e.g., Sapak, 2004), an increasing amount of research describes local policy innovation using these two models (Godwin & Schroedel, 2000; Shipan & Volden, 2006; White & Boswell, 2007). Ormrod's (1990) research suggests that three internal determinants affect the decision to adopt an innovation: the local relevance of the innovation, the availability of local resources to support adoption, and the local viability of the innovation. The local relevance of climate change planning may include factors such as whether local government officials believe anthropogenic impacts are causing climate change or the extent to which government officials perceive climate impacts on their municipality (Brody, Zahran, Grover, & Vedlitz, 2008). Research also suggests that the cities most successful at developing climate change policies are those that frame the global challenge of climate change in local terms (Betsill, 2001; Lindseth, 2004).

Policy innovation research at the state level has also illustrated the existence of geographic clusters of policy innovators, as the regional diffusion model predicts (e.g., state lotteries and growth management; Berry & Berry, 1999; Rosenbaum, 1976). Causal mechanisms for copycat behavior across governments include political advocates acting as policy entrepreneurs within a region (Mintrom, 1997; Schneider, Teske, & Mintrom, 1995) as well as the

existence and expansion of policy networks in which these entrepreneurs move and interact with decision makers (Mintrom & Vergari, 1998). Other studies suggest that the size of the municipality, the use of external consultants, and the extent of involvement by state or federal actors may influence the spread of innovation (Francis, Whittaker, Shandas, Mills, & Graybill, 2004; Shandas, Graybill, & Ryan, 2008).

The role of policy entrepreneurs, networks, and consultants seems paramount in climate action planning, although geographic proximity is no longer important. The establishment in 1993 of the transnational network, the International Council for Local Environmental Initiatives (ICLEI),[1] whose explicit goal of motivating local action on climate change globally through its Cities for Climate Protection program (ICLEI, 2008), has shaped and contributed to the adoption of many CAPs in the United States (Betsill, 2001; Betsill & Bulkeley, 2004, 2007). Membership in ICLEI worldwide and in the United States has grown dramatically in recent years. As the dominant policy entrepreneur, ICLEI and its network influence the climate action planning process and what its products look like. Since it provides direct assistance to municipalities agreeing to participate in its program, ICLEI can either act as a homogenizing force in planning, limiting innovation through standardization, or it can facilitate the development of robust place-based strategies that reflect local biophysical, political, and economic realities.

Finally, while the traditional models of policy innovation are still used, scholars increasingly argue that neither model alone fully accounts for the diffusion of innovation, and that a combination of factors explains policy change. Studies suggest that internal and external factors influence policy adoption differently over the course of time (Berry & Berry, 1999; Francis et al., 2004). Early adopters of policy innovations tend to have internal factors that make them amenable to the change. Later adopters learn from their regional context or networks, overcoming internal barriers to adoption once a policy innovation is perceived as widespread and legitimate (Tolbert & Zucker, 1983).

Research Approach

Our research approach consisted of three parts: plan selection, plan evaluation, and key informant interviews. We describe each of these below.

Plan Selection

While climate action planning has become a more common local government activity in recent years, there is no central clearinghouse for ascertaining how many units of local government in the United States have completed CAPs. To overcome this problem, we conducted a web-based search for CAPs among ICLEI-member cities as well as among the five largest municipalities in each state. As of October 2009, there were 707 members of ICLEI in the United States. Of these, 103 ICLEI members (15%) had actually completed CAPs as of March 2010.[2] This low percentage is not surprising given that ICLEI had fewer than 50 members as recently as 2001, so many localities have only been members for a short time.

In order to select a limited number of plans for in-depth review, we chose a subset of 20 of these plans (see Appendix Table A-1) using two criteria: size of city and geographic location. We divided the country into geographic zones based on the Environmental Protection Agency's (EPA) planning regions. Within each of EPA's 10 regions, we selected one to three plans from cities with over 125,000 residents in 2008 (U.S. Census Bureau, 2008). The cities whose CAPS we studied had populations ranging from 136,000 (Chattanooga, TN) to 8.3 million (New York, NY). This range of city size and geography provides two distinct advantages from a sampling perspective. First, early research suggests that the social-political and biophysical characteristics of cities vary across the country (Brody et al., 2008), and by selecting plans from different areas of the United States we are more likely to capture variation in climate planning actions. Second, by selecting cities of varied sizes, we hoped to gain an initial understanding of how cities with different levels of resources are addressing climate planning. However, our sample is narrow and not necessarily representative, and this limits the generalizations that are appropriate beyond the plans we examined.

Plan Evaluation

Our approach to plan evaluation built on those of planning researchers such as Berke and Conroy (2000), Berke and Godschalk (2009), Brody (2003), and Norton (2008). Previous plan evaluation studies have commonly measured plan quality by examining the extent to which a plan identifies clear goals and objectives, contains factual analyses that provide an appropriate or sufficient basis for policy or strategy development, and articulates these policies or strategies in a way that facilitates implementation as well as monitoring and evaluation.[3] Our plan evaluation matrix reflects this, emphasizing the factual basis for the plan, particularly the use of data and analyses for determining GHG levels and reductions and the extent to which cities relied on ICLEI software.

We developed a plan evaluation matrix using a two-part process. First, a core group of two graduate students

and two post-baccalaureate students worked with the authors to identify public policy interventions that could potentially affect urban GHG emissions and a separate list of strategies likely to be adopted only by the most committed municipalities. The group used the first draft of the resulting matrix to score four CAPs not used in our current analysis: those of Portland, OR;
San Francisco, CA; Burlington, VT; and Olympia, WA. These cities included examples with small (Burlington), medium (Olympia and Portland), and large populations (San Francisco), and different inception dates for plans, which allowed us to test and refine the robustness of our evaluation matrix. In addition, these plans were readily available and members of the research team were familiar with each of the cities. Following this, we reorganized the matrix and consolidated some categories of actions and split others apart based what we found in the reviewed plans. We divided the actions into those that city governments could take to reduce GHGs they produced, and those city residents could take to reduce emissions in the community.

We then evaluated plans on their *breadth*, or the array of climate-relevant policies identified for adoption, and *depth*, that is, how fully developed, justified, and operationalized each of the plan's proposed policies or actions were.[4] This article reports our findings related to breadth; we discuss the challenges of scoring CAP depth in the discussion section below.[5]

Key Informant Interviews

One of the graduate students working on the plan evaluation also interviewed, transcribed, and coded responses from 16 key informants. The first author read the transcriptions, double checked the coding, discussed the interviews with the graduate assistant, and interpreted the data for the article. The purpose of the interviews was to gather data from individuals involved in the planning process and to better understand the relationship between types of CAP actions and policies and the process of plan preparation.[6] We developed a semistructured interview instrument and used it in all interviews.

Findings

Our results are presented below. We recognize that the rapid rate of change in climate action planning makes our evaluation highly time sensitive. Our results are based on a review of plans and interviews conducted between January and August of 2009.

Plan Evaluation

All cities in our study are participating in one or more of the climate change policy networks in the United States. All of the cities except Los Angeles are ICLEI members, and all the mayors except Houston's are signatories to the U.S. Conference of Mayors Climate Protection Agreement. The CAPs are by and large quite new: Chula Vista's plan is the oldest of those we read; Chattanooga and Spokane's plans are the most recent. With only two exceptions, these cities are also located in states that have taken action on climate change, preparing state-level strategies. The two exceptions are Austin and Houston, as Texas has not completed a state-level CAP.

We found wide diversity in what constitutes a CAP. One indicator of this was the document size. The CAPs we reviewed ranged from a few pages of text (Austin) to extremely detailed implementation programs (Los Angeles). In most cases, the plans were stand-alone documents focused on the goal of achieving CO_2 reductions; others, however, were chapters on climate change integrated into comprehensive plans (New York City) or the CAP resembled a broader sustainability plan (Spokane). Moreover, CAPs are not necessarily being produced as traditional plan documents. Salt Lake City's CAP (not evaluated here), for example, is a series of web pages that lay out the city's actions and accomplishments. In contrast, Los Angeles produced two documents totaling hundreds of pages that describe actions to be taken, implementation strategies, and evaluation procedures.

In none of the localities in our study did a traditional city planning commission appear to play a role in leading climate action planning. All the cities we studied, except Los Angeles, Houston, and Austin, created specialized work groups or steering committees to spearhead their CAP processes, identifying goals, crafting strategies, and in more sophisticated plans attaching actors, dollars, and timelines to interventions. In Los Angeles, Houston, and Austin, the plans did not clearly indicate who was responsible for developing the CAP. The organizations and interests represented on the CAP working groups and steering committees varied widely. In Pittsburgh, for instance, the city's universities as well as the local foundations were heavily involved. An interviewee associated with that planning effort noted that this was not remarkable, saying "that's how business gets done here." Cincinnati stands out for its large-scale community mobilization. The Fort Collins CAP appears to have been the most bottom-up initiative reviewed; community members who realized the city's first plan would not achieve its emission reduction goals provided the impetus for the latest plan.

Table 1 shows the percentages of the reviewed plans we found to contain each of various types of actions.

Table 1. Action strategies present in 50% or more[a] of plans reviewed.

Scoring category	% of plans
Local government emissions	
Transportation	
Employee commutes (carpooling, alternative mode incentives, telecommuting, etc.)	55
City fleet fuel efficiency (new vehicle fuel efficiency, hybrids, etc.)	70
City fleet low carbon fuel (biofuels, electric vehicles, etc.)	50
Solid waste and recycling	
Procurement and purchasing (recycled content, purchasing products with minimal packaging)	65
Energy efficiency	
Existing buildings (weatherization, programmable thermostats, furnace retrofits, etc.)	80
New buildings (green building standards, etc.)	70
Streetlights and amenities (LED streetlights, traffic lights, etc.)	60
Renewable energy	
Renewable energy generation (wind turbines or solar panels on city hall, parking meters, etc.)	65
Require municipality to buy power from green sources	65
Community emissions	
Transportation	
Reduce carbon content of fuels, including for transit (biofuel standards, electric vehicles, etc.)	65
Increase fuel efficiency (idling policies, taxi fleet improvement incentives, etc.)	55
Reduce vehicle miles of travel	
Bicycle infrastructure (lanes, boulevards, etc.)	75
Pedestrian infrastructure (sidewalks, crosswalks, etc.)	50
Transit service (increased hours, extend number of lines)	80
Alternative transportation (discounted transit passes, free bike helmet programs)	55
Travel demand management policies (flex work hours, telecommuting, rideshare programs)	60
Solid waste and recycling	
Increase recycling (residential, e-waste, etc.)	65
Energy efficiency	
Existing residential buildings (weatherization, incentives, real-time utility bills, etc.)	70
New residential buildings (greening residential code, etc.)	65
Existing commercial and industrial buildings	55
New commercial and industrial buildings (green building practices)	55
Renewable energy	
Encourage buying power from green sources	50
Encourage using renewable energy (programs supporting solar hot water heaters, etc.)	60
Forestry	
Investments in reforestation and tree planting	75
Land use planning	
Compact development (increase densities, remove lot size minimums, etc.)	70
Zoning ordinances to reduce auto use (transit oriented development ordinances, parking maximums, etc.)	55
Education	
General (climate change, carbon footprint, raising awareness, etc.)	70
Energy efficiency (weatherization, behavior change, etc)	55
Waste reduction and recycling	60
Adaptation	
The plan enumerates specific anticipated local impacts (heat, flooding, drought, natural disasters, and vector-borne disease) and identifies adaptive actions.	25

Note:

a. The table also lists the percentage of plans with adaptation actions, even though it is less than 50%.

Overall, most plans contained elements in each of our broad analysis categories. The most common actions the reviewed plans recommended that local governments take themselves fell within transportation, energy efficiency, and renewable energy categories. The plans showed that municipalities are looking at their own operations critically and seeking to lead by example by weatherizing city buildings, ensuring all new public facilities meet green building standards (such as those of Leadership in Energy and Environmental Design [LEED]), and displaying a new green consciousness through actions like installing solar panels. The most common local government action was to weatherize existing buildings, followed by adopting new green building standards, and improving city fleet efficiency through new vehicle purchases.

CAPs most commonly focus on seven categories of actions affecting the wider community, three of which are quite familiar to planners: transportation, solid waste recycling, and land use. Most of the plans reviewed discussed the adoption of the following five elements for controlling emissions in the community: adopting zoning ordinances to reduce auto use (55%); enhancing transit services by actions such as increasing hours of operation or extending the number of lines (80%); developing infrastructure for bicycling (75%); supporting tree-planting programs (75%); and setting up programs to improve the energy efficiency of existing residential buildings through weatherization, energy audits and so forth (70%). Riverside, CA, for example, does all five (City of Riverside, 2008), proposing to "apply urban planning principles that encourage high density, mixed-use, walkable/bikeable neighborhoods" (p. 3), "expand affordable convenient public transit that will assist in reducing the per capital vehicle trips within the City limits" (p. 4), increase "the number of bike trails by 15 miles and bike lanes by 111 miles … before 2025" (p. 4), "plant at least 1,000 trees in city parks and right-of-ways" (p. 3), and "reduce the city's per capita base load energy consumption by 10% through energy efficiency and conservation programs by 2016" (p. 1). But not all of the actions are so familiar to planners. For example, 70% of the plans recommended undertaking campaigns to raise awareness of climate change and 55% recommended educating citizens about enhancing energy efficiency. Denver's CAP, for instance, discusses hiring a "highly effective social marketing subject matter expert" to formulate a communications campaign targeting business, neighborhoods and youth in order to advance the plan's goals (City of Denver, 2007, p. 37).

Finally, most plans avoid the critical, but highly difficult, topic of adaptation to climate change. Only five plans, all for large cities, contained any notable discussion of strategies for adapting to climate change. Seattle's plan devotes three pages to adaptation, discussing briefly the implications of climate change for water supply and hydroelectric power and steps currently being taken. The plan promises further development of adaptation strategies including a "Citywide adaptation strategy by the end of 2007" (City of Seattle, 2006, p. 34); however, as we completed this article there was no evidence of a completed strategy on its website. Discussions of adaptation acknowledge health disparities and environmental inequities, noting that certain populations are more vulnerable to climate impacts than others. Chicago has nine dimensions in its adaptation chapter, with an explicit focus on managing urban heat. New York focuses on protecting water supply, sewer, and wastewater infrastructure, as well as working with neighborhoods noted to have vulnerable coastlines. New York committed itself to drafting a comprehensive adaptation policy (City of New York, 2007), and the mayor convened the planning body for that purpose in August, 2008 (City of New York, 2008).

Informant Interviews

We conducted key informant interviews with 16 individuals we identified to be intimately involved with the processes and final plans we reviewed. The purpose of the interviews was to gather more detail on the plans and to enhance our understanding of how the CAP creation processes were structured, what types of obstacles were faced, and the roles planners and planning bureaus played, among other topics. We were also interested in learning about the extent to which localities learned from each other how to undertake CAPs.

Four main themes arose in the semistructured interviews. First, in relation to the decision to plan, informants stressed that the mayor or other elected leaders must be behind the plan. In all cases, key informants discussed the importance of political leadership both to the impulse to plan and to the energy and excitement behind the planning process. Having a Mayor Nickels or Mayor Daly helps. Since climate action planning is not yet mandated or enabled through state legislation, a political leader must be behind the plan even if it is staff members who initiated it or who are most interested in plan making. Having political leaders as advocates, however, can have drawbacks, and helps to explain some of the actions prioritized in the CAPs themselves. More than one informant noted that politicians have only limited time in office; if they are to put their political capital behind climate action planning, payoffs must come in the short term. Planning

processes cannot be protracted, and the actions undertaken to lower GHG must be tangible and visible, like solar panels on city hall or trees planted in a community-wide campaign.

The second theme relates to who does the planning. Despite the fact that so many of the actions we identified in the plan are established practices associated with smart growth or sustainability planning, planning departments are not seen as the natural leaders on climate change. Environment departments are seen as the most natural fit, with engineering and public works departments also taking lead roles. In places where environment departments did not exist, mayors established new sustainability desks, or bureaus, or staffers who reported to them directly. Planners did play roles on committees and work groups, and were called in on areas where their expertise was recognized, as in land use and transportation. In our interviews, several localities indicated that planners were quite central to the process, but in others they were not, either because of strains between planners and the elected leadership or because the mayor wanted an initiative associated with his or her office rather than going through the normal planning process.

The third theme relates to why CAPs are so diverse and why the plans and processes have taken the forms they have. The short answer here is that local culture and context matters. When we asked informants to explain the form their plan and planning process took, they commonly discussed the local context, particularly local political culture. One interviewee said that the community decided to create a hardcopy planning document rather than a series of webpages so that local advocates could waive the document in meetings to remind councilors and others that it had been officially adopted. In a setting described as politically conservative, another informant noted that their community chose not to mention the subject of climate in the title or to place the problem analysis in an environmental frame. What worked in their locality, this informant noted, was to emphasize economics and cost savings, since, if climate action planning were approached as an environmental issue, no one except "the same two Sierra Club members" would show up. This insight on framing plans echoes Betsill's (2001) recommendation that leaders search for "local hooks" (pp. 398-399) and present climate change as a compelling local concern with impacts on issues like quality of life or air quality.

Finally, our interviews revealed that those involved in climate action planning were and are paying close attention to what other places are doing. They are downloading each other's plans, examining other cities' strategies and actions, evaluating their own local potential, and attending events held by ICLEI and others. The lack of comparable plans is a challenge for smaller localities. One informant from a small city noted that their CAP was interesting both as an example of how to do a plan for a small community and for the fact that their community undertook such planning at all. The informant noted that their city is "not a Berkeley or a San Francisco," meaning it was not the type of place that one would predict to be concerned about climate change.

Discussion

While our findings are based on a subset of all CAPs, they appear to corroborate the model that suggests that the drivers of innovation are a mixture of internal and external factors. The presence of strong political support and a receptive community were essential internal determinants both of the decision to plan and the resultant process. As noted earlier, a political champion appears critical to the decision to plan and, among the CAPs we reviewed, we found mayors' names all over the plans, even in their titles, as in Denver or Chattanooga. In highly receptive places, informants described the public task forces or working groups convened as critical to public acceptance of the planning actions identified.

ICLEI plays an important role in regional diffusion and is acknowledged to be the premier policy entrepreneur in this area. Interviewees indicated that their municipalities decided to join ICLEI once an interest in developing a CAP was present at the local level. States appear to have been less significant actors in the vertical diffusion of climate action planning. In several of the interviews, respondents suggested that their states had had little impact on their municipality's interest in climate action planning, though others reported their states were important motivators of local action. Informants from California municipalities in particular noted that the state and its energy commission have been engaged in climate change activism and GHG reduction efforts since the late 1990s.

We draw mixed conclusions about whether CAPs represent innovation. We distinguish between *local innovation* ("it's something we've never done before") and broader *policy innovation* (notable changes adopted at a wider scale, perhaps updating best practices). The CAPs we read contained many elements familiar from sustainability planning[7] or, in some cases, comprehensive planning. For example, existing transportation or comprehensive plans often recommend reducing automobile dependence through transit-oriented development or expanding transit

service. Thus, while these CAP elements may be local innovations, they are not policy innovations. Yet, the climate challenge may have catalyzed action in some localities that was not politically viable in the past.

Our finding that plans were so diverse was both surprising and disconcerting. Because of the centrality of ICLEI in climate action planning, we expected to encounter a rather standardized plan format across cities, as often occurs in comprehensive land use plans prepared with the assistance of consulting firms, for instance. This was not the case. The diversity of the plans and our finding that plans are written with a particular political context in mind presents a special challenge to evaluating plan quality. In the work on comprehensive, transportation, and natural disaster plans, analysts have identified core principles of what constitutes a good plan (e.g., factual basis, linking of analyses to policy development and selection of alternatives, and measures of internal, horizontal and vertical consistency). In climate action planning at present, there is no set of core principles. While we could potentially develop such a set of principles against which to evaluate CAPs, our informants emphasized that the plans should be locally appropriate. Many of the plans do not really constitute action plans, as they do not identify actions, designate actors, or lay out timetables. Some do not even aspire to present technically sophisticated analyses. Yet, most of the informants we interviewed were satisfied with the performance of their plans thus far, feeling that they had opened dialogue on the issue in their communities and set up steps that could be taken to reduce municipal and community emissions.

Engaging Practicing Planners

This research has three findings with implications for practice. We argue that planners have an opportunity to strengthen current climate action planning approaches and that more active participation, or even advocacy, by professional planners could positively affect the future of climate action planning.

First, our informants and the plans themselves indicate that there is no established path for approaching climate action planning. ICLEI plays a role in the information used, but local actors are trying to craft local planning processes to local conditions and they are learning by doing. While this is exciting, according to several informants, it is also frustrating. When asked how strategies were selected, and whether any type of alternatives analysis took place, one informant described the process as "Pick something—anything," although they tried to select practical, implementable actions and looked for immediate results that would help the mayor or political official who championed the plan get reelected.

Second, traditional city planning departments have not consistently been deeply involved in climate action planning, although they authored the CAPs for Chattanooga and New York City. In most of the plans we read and in the interviews we conducted, neither planning departments nor professionals who self-identify as planners were driving forces moving the activity forward. Plans were spearheaded by public works departments, environmental services departments and sustainability bureaus. Consultants, including ICLEI, played roles. But planners appear to have been called in to participate on task forces and to contribute their traditional expertise in areas of land use and transportation.

Given the variety of plans we encountered, we see the potential for planners to take a more central role in future climate action planning. In particular, while many CAPs had significant levels of community participation in plan making (most frequently through steering committees or work groups) our impression is that these networks were often dominated by elites and technicians. Addressing climate change will require a broad-based understanding of the problem and support for planned interventions. Planners, who are trained in participatory techniques and have grappled extensively with the challenges of developing broad inclusionary processes, could provide outreach to engage the community in climate action planning. We also understand from interviews that the analysis of policy alternatives was challenging and sometimes frustrating. Greater involvement by planning professionals who have experience and training in plan making and policy analysis could strengthen this element of CAPs. Finally, as noted above, many of the plans we reviewed did not really constitute action plans, as they had no recommendations attached to actors, resources, evaluation indicators, or timelines. Again, planners could help design planned interventions or policy changes to make them more likely to be implemented.

Finally, CAPs require new types of inventories and data. Many of the people we interviewed indicated that they joined ICLEI out of concern over climate change, but also because they wanted access to the ICLEI data and modeling software for emissions. Yet these same people reported that some topics of interest (e.g., food systems and the degree to which eating local food reduces emissions) went unaddressed in the CAP because of insufficient data. ICLEI is an important source of data, but planners should think creatively about data collection for climate action planning, and make alliances with other agencies or

actors to get appropriate data. In some places, like Pittsburgh, PA, universities are working with climate planners to fill data gaps; in others, like Anchorage, AK, universities are even taking a lead role in preparing climate change plans.

Conclusion

Municipalities are increasingly addressing the threat of climate change by preparing a new type of plan: the local CAP. Our review of 20 municipal CAPs yielded insights into what motivated them, their processes, and the range of actions currently being taken. We found that the decision to address climate change through planning required leadership, which was commonly provided by a prominent elected official such as a mayor. Processes used for preparing the plans varied across cities, with most convening citizen or technical committees, and others using smaller, less visible technical work groups. Plans, moreover, reflect the ethos and political context of the locality doing the planning. The plans we reviewed ranged from one narrowly conceived to emphasize energy and cost savings but giving scant attention to the carbon problem, to one that was a broad aspirational call to build a more progressive, carbon-neutral city. Planned interventions included changes in the built and natural environment (e.g. expanding bike lanes, increasing mixed-used development, adding tree canopy), and programmatic efforts (e.g., educational and outreach campaigns; expanded weatherization programs) at a range of spatial and temporal scales.

While some of these planned actions can be considered innovative, many CAP interventions are traditional planning strategies tied directly to the long-range and current planning operations of city bureaus. Despite this, it appears that planning professionals and planning bodies are secondary actors, or even absent from CAP processes. Whether this is of professional concern depends largely on the future of climate action planning. We do not know at this point whether CAPs will continue to be stand-alone, special-purpose plans, or if they will be integrated into more established planning processes like those for local comprehensive plans. In the short term, however, planners have many reasons to become more proactively involved in CAPs. We see this as a win-win situation; planners should have greater input into plans that affect their professional lives, while bringing to the table skills, expertise, and training that can help strengthen CAP processes and products.

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Notes

1. ICLEI now refers to itself as "Local Governments for Sustainability."

2. The ICLEI website provides a list of sustainability and climate action plans as of November 30, 2009 (ICLEI, 2009), which indicates that 31 plans are in process and another 108 are completed. However, we found three localities on the list counted twice and no web evidence of completed CAPs for six localities said to have them. Additionally, some localities in California listed as having climate plans had county plans in process, but these were not yet complete. Our count, thus, is a more conservative 103 CAPs completed.

3. Plan quality studies also examine plans according to consistency (e.g., Norton, 2008). Three types of consistency are usually scrutinized: 1) *horizontal*, or the extent to which plans are compatible with other plans or regulations from neighboring jurisdictions; 2) *vertical*, or the extent to which plans are consistent with planning mandates or policies from higher levels of government, usually state or regional; and *internal consistency*, or the extent to which the plan is harmonious and compatible with other plans, policies and regulations within the locality. In our research, we did not evaluate the action plans for consistency, but future research should look at these plans in relation to local comprehensive plans, regional transportation plans, local regulatory structures, and state policies and mandates.

4. In the depth-of-plan score, we evaluated a policy or strategy according to whether it: 1) articulated a measurable target and specific indicator; 2) had an associated timeline; 3) clearly identified the actor responsible for implementation; 4) indicated a funding mechanism; and 5) was feasible, in that the local government had the power to implement it.

5. To ensure the reliability and validity of this technique, two readers read and evaluated each plan. We calculated inter-rater reliability (i.e., agreement or disagreement) using the Kappa statistic. Commonly used when comparing multiple observations, this index compares the agreement obtained to that expected by chance. Kappa can be thought of as the chance-corrected proportional agreement, and possible values range from $+1$ (perfect agreement) to 0 (no agreement above that expected by chance) to -1 (complete disagreement). When comparing summed scores across both readers, the Kappa statistic was, at worst, 0.33, and, at best, 0.55, values that are generally acceptable. After checking this, the readers reviewed the plan element under consideration together and came up with a reconciled score.

6. We identified informants in the following manner: If the city indicated a designated municipal contact person for climate action planning, either within the plan or on the city's website, we contacted that person first and asked for an interview. For cities without such a contact, we called the department most closely associated with climate action planning or sustainability measures and asked the department to identify an appropriate respondent. While we attempted to set up interviews in all of the municipalities whose plans we evaluated, only 15 responded to our requests (in one city we conducted two interviews). We used accepted qualitative analysis techniques (Rubin & Rubin, 2004) to analyze interviews. We took and transcribed extensive notes on all interviews, and then coded and analyzed these to identify

cross-cutting themes as well as tallying appropriate answers to closed-ended questions.

7. Planning for climate change is, in many ways, analogous to sustainability planning, and CAP processes often resemble ongoing municipal sustainability planning. Many sustainability plans emerge from state planning mandates or explicitly engage planners in the plan-making process (Conroy & Berke, 2004), but neither of these things was true of the CAPs we assessed. Yet, sustainability plans have many similarities to CAPs, and many principles used to develop sustainability plans inform CAP processes. For example, sustainability plans often contain language related to place-based economies, equity, and targets for reducing pollution. Place-based economics can help reduce a community's carbon footprint, particularly by lowering transportation costs associated with goods movement. Similarly, equitable policies and pollution-reduction strategies have long been a part of sustainability plans (Berke & Conroy, 2000), and municipalities preparing CAPs may appropriate similar approaches. Sustainability plans have also shown that participation by a diverse cross-section of the community, although replete with challenges, can make CAP targets more acceptable and increase the likelihood of success.

References

Berke, P. R., & Conroy, M. M. (2000). Are we planning for sustainable development? An evaluation of 30 comprehensive plans. *Journal of the American Planning Association, 66*(1), 21–32.

Berke, P. R., & Godschalk, D. (2009). Searching for the good plan: A meta-analysis of plan quality studies. *Journal of Planning Literature,* 23(3), 227–240.

Berry, F. S., & Berry, W. D. (1999). Innovation and diffusion models in policy research. In P. Sabatier (Ed.), *Theories of the policy process* (pp. 169–200). Boulder, CO: Westview.

Betsill, M. (2001). Mitigating climate change in US cities: Opportunities and obstacles. *Local Environment, 6*(4), 393–406.

Betsill, M., & Bulkeley, H. (2004). Transnational networks and global environmental governance: The cities for climate protection program. *International Studies Quarterly, 48*(2), 471–493.

Betsill, M., & Bulkeley, H. (2007). Looking back and thinking ahead: A decade of cities and climate change research. *Local Environment 12*(5), 447–456.

Brody, S. (2003). Are we learning to make better plans? A longitudinal analysis of plan quality associated with natural hazards. *Journal of Planning Education and Research, 23*(2), 191–201.

Brody, S., Zahran, S., Grover, H., & Vedlitz, A. (2008). A spatial analysis of local climate change policy in the United States: Risk, stress, and opportunity. *Landscape and Urban Planning, 87*(1), 33–41.

Brown, M. A., Southworth, F., & Sarzynski, A. (2008). *Shrinking the carbon footprint of metropolitan America.* Washington, DC: Brookings Institute. Retrieved October 1, 2009, from http://www.brookings.edu/reports/2008/~/media/Files/rc/reports/2008/05_carbon_footprint_sarzynski/carbonfootprint_report.pdf

City of Austin. (2007). *Austin climate protection plan.* Austin, TX: Author.

City of Boston. (2007). *Climate: Change: The City of Boston's climate action plan.* Boston, MA: Author.

City of Chattanooga & Chattanooga Green Committee. (2009). *The Chattanooga climate action plan: Recommendations to Mayor Ron Littlefield.* Chattanooga, TN: Author.

City of Chicago. (2008). *Chicago climate action plan: Our city, our future.* Chicago, IL: Author.

City of Chula Vista. (2000). *Chula Vista CO_2 reduction plan.* Chula Vista, CA: Author.

City of Cincinnati. (2008). *Climate protection action plan: The green Cincinnati plan* (Version 4.0). Cincinnati, OH: Author.

City of Denver. (2007). *City of Denver climate action plan: Final recommendations to Mayor Hickenlooper.* Denver, CO: Author.

City of Durham & Durham County. (2007). *Greenhouse gas and criteria air pollutant emissions inventory and local action plan for emission reductions.* Toronto, Ontario, Canada: ICLEI Energy Services.

City of Fort Collins. (2008). *Fort Collins climate action plan: Interim strategic plan towards 2020 Goal.* Fort Collins, CO: Author.

City of Houston. (2008). *Green Houston: Emissions reduction plan.* Houston, TX: Author.

City of Kansas City. (2008). *Climate protection plan.* Kansas City, MO: Author.

City of Los Angeles. (2007a). *Climate LA.* Los Angeles, CA: Author.

City of Los Angeles. (2007b). *Green LA: An action plan to lead the nation in fighting global warming.* Los Angeles, CA: Author.

City of Madison. (2002). *Climate protection plan: Final.* Madison, WI: Author.

City of New York. (2007). *PlaNYC: A greener, greater New York.* New York, NY: Author.

City of New York. (2008). *Mayor Bloomberg launches task force to adapt critical infrastructure to environmental effects of climate change* (Press Release 308–08), New York, NY: Author.

City of Philadelphia, Sustainability Working Group. (2007). *Local action plan for climate change.* Philadelphia, PA: Author.

City of Pittsburgh. (2008). *Pittsburgh climate initiative: Pittsburgh climate action plan* (Version 1.0). Pittsburg, PA: Author.

City of Riverside. (2008). *Green Riverside: Clean and green, sustainable Riverside action plan.* Riverside, CA: Author.

City of San Diego Environmental Services Department. (2005). *City of San Diego climate protection action plan.* San Diego, CA: Author.

City of Seattle. (2006). *Seattle, a climate of change: Meeting the Kyoto challenge.* Seattle, WA: Author.

City of Spokane. (2009). *Sustainability action plan: Addressing climate mitigation, climate adaptation, and energy security.* Spokane, WA: Author.

Conroy, M. M., & Berke, P. R. (2004). What makes a good sustainable development plan? An analysis of factors that influence principles of sustainable development. *Environment and Planning A, 36*(8), 1381–1396.

Dunlap, R. E., & McCright, A. M. (2008). A widening gap: Republican and Democratic views on climate change. *Environment 50*(5), 26–35.

Ebi, K. L., & Semenza, J. C. (2008). Community-based adaptation to the health impacts of climate change. *American Journal of Preventive Medicine, 35*(5), 501–507.

Eden, S. (1998). Environmental issues: Knowledge, uncertainty and the environment. *Progress in Human Geography 22*(3), 425–432.

Eliasson, I. (2000). The use of climate knowledge in urban planning. *Landscape and Urban Planning 48*(1–2), 31–44.

Ewing, R., Bartholomew, K., Winkelman, S., Walters, J., & Chen, D. (2008). *Growing cooler: The evidence on urban development and climate change.* Washington, DC: Urban Land Institute.

Francis, T., Whittaker, K., Shandas, V., Mills, A., & Graybill, J. (2004). Incorporating science into the environmental policy process: A case study from Washington State. *Ecology and Society, 10*(1), Article 35.

Godwin, M. L., & Schroedel, J. R. (2000). Policy diffusion and strategies for promoting policy change: Evidence from California local gun control ordinances. *Policy Studies Journal, 28*(4), 760–776.

Intergovernmental Panel on Climate Change. (2007). *Climate change 2007: Mitigation of climate change. Contribution of Working Group III to*

the fourth assessment report of the Intergovernmental Panel on Climate Change. New York, NY: Cambridge University Press.

International Council for Local Environmental Initiatives. (2008). *ICLEI climate program.* Retrieved July 3, 2010, from http://www.iclei.org/index.php?id=800

International Council for Local Environmental Initiatives. (2009). *U.S. local sustainability plans and climate action plans.* Retrieved March 13, 2010, from http://www.icleiusa.org/action-center/planning/List%20of%20U.S.%20Sustainability%20and%20Climate%20Plans.pdf

Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change 77*(1–2), 45–72.

Lindseth, G. (2004). The Cities for Climate Protection campaign (CCPC) and the framing of local climate policy. *Local Environment, 9*(4), 325–336.

McCright, A. M., & Dunlap, R. E. (2003). Defeating Kyoto: The conservative movement's impact on U.S. climate change policy. *Social Problems 50*(3), 348–373.

McMichael, A. J., & Kovats, R. S. (2000). Climate change and climate variability: Adaptations to reduce adverse health impacts. *Environmental Monitoring and Assessment, 61*(1), 49–64.

Mintrom, M. (1997). Policy entrepreneurs and the diffusion of innovation. *American Journal of Political Science, 41*(3), 738–770.

Mintrom, M., & Vergari, S. (1998). Policy networks and innovation diffusion: The case of state education reforms. *The Journal of Politics, 60*(1), 126–148.

Norton, R. K. (2008). Using content analysis to evaluate local master plans and zoning codes. *Land Use Policy, 25*(3), 432–454.

Ormrod, R. K. (1990). Local context and innovation diffusion in a well-connected world. *Economic Geography, 66*(2), 109–122.

Rosenbaum, N. (1976). *Land use and the legislatures: The politics of state innovation.* Washington, DC: The Urban Institute.

Rubin, H. J., & Rubin, I. S. (2004). *Qualitative interviewing: The art of hearing data.* Thousand Oaks, CA: Sage.

Sapak, A. (2004). Devolution and innovation: The adoption of state environmental innovations by administrative agencies. *Public Administration Review, 64*(2), 141–151.

Schneider, M., & Teske, P., with Mintrom, M. (1995). *Public entrepreneurs: Agents for change in American government.* Princeton, NJ: Princeton University Press.

Shandas, V., Graybill, J. K., & Ryan, C. (2008). Are planners using ecosystem-based management when developing environmental policy? Evidence from the Pacific Northwest (US). *Journal of Environmental Planning and Management 51*(5), 649–664.

Shipan, C. R., & Volden, C. (2006). Bottom-up federalism: The diffusion of antismoking policies from U.S. cities to states. *American Journal of Political Science, 50*(4), 825–843.

Tolbert, P. S., & Zucker, L. G. (1983). Institutional sources of change in the formal structure of organizations: The diffusion of civil service reform, 1880–1935. *Administrative Science Quarterly, 28*(1), 22–39.

U.S. Census Bureau. (2008). *Population estimates, July 1, 2008.* Retrieved October 15, 2009, from http://www.census.gov/popest/estimates.html

Weber, E. U. (2006). Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet). *Climatic Change, 77*(1–2): 103–120.

Wheeler, S. M. (2008). State and municipal climate change plans: The first generation. *Journal of the American Planning Association, 74*(4), 481–496.

White, S. S., & Boswell, M. R. (2007). Stormwater quality and local government innovation. *Journal of the American Planning Association, 73*(2), 185–193.

Appendix

Table A-1. CAP cities, plans, and summaries of planning processes.[a]

City	Population[b]	Plan name, year, and brief characterization	Participants
Austin, TX	757,688	*Austin Climate Protection Plan* (City of Austin, 2007) Summary aspirational statement of city's approach to becoming "the leading city in the nation in the fight against global warming" (p. 1) Identifies five elements or subplans (a municipal plan, utility plan, homes and buildings plan; community plan, and the "go neutral" plan—which highlights four actions to enhance carbon neutrality by households and businesses; p. 2) and lays out four or more objectives or actions for each one. Complementary Austin Climate Protection Program has two annual reports (April 2008 and April 2009).	Post planning: Convened nine-member Community Advisory Committee in November 2008; representatives include Chamber of Commerce, Austin EcoNetwork, University of Texas-Austin, industry, regional planning agency, transit agency, Meals on Wheels.
Boston, MA	609,023	*Climate: Change. The City of Boston's Climate Action Plan* (City of Boston, 2007) Presents overarching discussion of climate change and baseline data on emissions coupled with a description of ongoing actions and accomplishments to lower emissions. Form is more like a programmatic progress report of all city activities with GHG implications than a plan with forward looking objectives and set strategies (e.g., "City of Boston enforces Commonwealth's law against excessive idling of vehicles and conducts an extensive education campaign"; p. 17).	Post planning: Convened Climate Action Task Force through executive order. Undefined group is charged with reviewing climate action plan, completing community-wide emissions inventory, preparing educational materials, and marking recommendations to meet goals including those related to "economic and workforce development opportunities" (p. 22).
Chattanooga, TN	170,880	*The Chattanooga Climate Action Plan: Recommendations to Mayor Ron Littlefield* (City of Chattanooga & Chattanooga Green Committee, 2009) Detailed action plan with three overarching goals for GHG reduction by date. Presents data on city's carbon footprint as well as by topic area (e.g., energy efficiency, education and policy). Articulates objectives, potential actions with full justifications and methods for implementation, estimates GHG reductions that could be achieved, and estimates cost implications. Implementation matrix in appendix identifies lead agency, partners, and time frame.	Membership of Chattanooga Green Committee: City of Chattanooga Urban Forestry Division; Chattanooga Technology Council, U.S. Green Building Council, Hamilton County, Volkswagen Group of America, Chattanooga-Hamilton County Air Pollution Control Bureau, City of Chattanooga Tree Commission, Chattanooga Home Builders Association, Associated General Contractors of East Tennessee, University of Tennessee-Chattanooga faculty; Electric Power Board. Over 220 persons volunteered with initiative.
Chicago, IL	2,853,114	*Chicago Climate Action Plan: Our City, Our Future* (City of Chicago, 2008) Chicago's plan trumpets the city's accomplishments and acts as a very effective public relations document. Plan lays out five strategies (energy efficient buildings, clean and renewable energy solutions, improved transportation options, reduced waste and industrial pollution, adaptation). Evaluation criteria for action selection clearly laid out; most actions read like continuing action ("continue to support [weatherization] programs for low and moderate income families"; p. 22). Does not identify responsible actor or metric for evaluating actions and their outcomes.	Chicago Climate Task Force: mix of city, state and federal agencies (e.g. U.S. EPA, Mayor's office); foundations (e.g., Joyce Foundation), business (e.g., BP America), academia, environmentalists (e.g., Environment Illinois), think tanks (Center for Neighborhood Technology) and green industry advocates (e.g., Delta Institute).
Chula Vista, CA	219,318	*Chula Vista CO_2 Reduction Plan* (City of Chula Vista, 2000) Plan is a CO_2 reduction strategy with emission reduction strategies grouped around seven categories (e.g., land use, clean transportation fuels) and 20 action measures. In 2008, a Climate Change Working Group created an implementation plan with seven measures for which implementation steps, actors, timelines for completion, capital, and annualized costs were estimated and performance metrics established.	CO_2 Reduction Task Force: City staff (e.g., principal planner; traffic engineer), business interests (e.g., chamber), school districts, CALTRANS, academia (San Diego State University), state government (CA Energy Commission), utilities (SDG&E). 2008 Climate Change Working Group: is described as being "comprised of residential, business and community group representatives" (2008 Implementation Plan).

Table A-1. (Continued).

City	Population[b]	Plan name, year, and brief characterization	Participants
Cincinnati, OH	333,336	*Climate Protection Action Plan: The Green Cincinnati Plan* (Version 4.0) (City of Cincinnati, 2008) Cincinnati's plan presents the city's GHG emissions inventory, establishes a reduction goal, presents summary reduction measures for six areas (transportation, energy, waste, land use, advocacy and food-related) and grapples with the question of implementation, recommending a permanent Climate Protection Steering Committee. By action, lead implementers are identified, including non-city actors such as Duke Energy. Appendices present analyses for each recommendation looking at pertinent issues, proposed strategy, estimated GHG reductions from actions, implementation responsibilities, costs and benefits, and timeline for implementation.	Climate Protection Steering Committee: mix of municipal (e.g., City of Cincinnati Parks Department), metropolitan (e.g., Metropolitan Sewer District), and regional (e.g., Hamilton County) governments; business (e.g., GE Aviation); academia (University of Cincinnati); environmentalists (e.g., Sierra Club); utilities (e.g., Duke Energy); foundations (e.g., Greater Cincinnati Foundation), green industry advocates (e.g., U.S. Green Building Council); transit, labor (e.g., Greater Cincinnati Building Trades Council), ex officio representative of the Governor's and Mayor's offices.
Denver, CO	598,707	*City of Denver Climate Action Plan: Final Recommendations to Mayor Hickenlooper* (City of Denver, 2007) Plan is a series of recommendations to the mayor, as indicated in the subtitle. Contains overarching GHG reduction goal (25% reduction from 1990 by 2020) to be met through 10 strategies (e.g., increase energy efficiency in existing homes, compact growth boundary with incentives for density in urban areas). Also discusses regional, state and federal strategies. No implementation plans with responsible actors, timelines, costs or monitoring/evaluation indicators developed for Denver strategies in this document. Includes discussion of public engagement and use of social marketing to advance the Greenprint Initiative.	Greenprint Denver Advisory Council: city members (e.g., representatives from Community Planning, Parks and Recreation, Public Works; the Denver International Airport); political leaders (city council); academic (University of Colorado-Denver), environmentalists (e.g., Colorado Environmental Coalition); think tanks (e.g., Bighorn Center), foundations (Gates Family Foundation); developers (e.g., Forest City Stapleton), green industry advocates (e.g., Natural Capitalism Solutions).
Durham, NC (City and County joint plan)	223,284	*Greenhouse Gas and Criteria Pollutant Emissions Inventory and Local Action Plan for Emissions Reductions* (City of Durham & Durham County, 2007) Plan might be considered an ICLEI plan as ICLEI served as the main consultant. Presents detailed inventories/analyses of GHG emission sources; prepares forecasts/scenarios, examines alternatives, sets goals and identifies reduction measures, both existing and potential. In the action plan chapter, the recommendations are tentatively worded (e.g., "a rental property evaluation and retrofit program…could be applied to commercial rental properties"; p. 52.) No implementation plan with responsible actors, timelines, costs, or indicators in document.	Advisory Committee: academics (Duke University); utilities (Duke Energy); Durham Public Schools; environmentalists (Durham Environmental Affairs Board); county and regional government; business (Research Triangle Park Owners and Tenants Association) Technical Team: city-county-state agencies including City of Durham Water Management, City of Durham, Solid Waste; Durham City/County Planning; NC Dept. of Environment and Natural Resources, City of Durham, City Attorney's Office; MPO/City of Durham, Transportation.
Fort Collins, CO	136,509	*Fort Collins Climate Action Plan: Interim Strategic Plan Towards 2020 Goal* (City of Fort Collins, 2008) Plan represents a second climate action planning effort in the community. Current plan includes general discussion of climate change and potential for cities to affect change. Contains GHG inventory, climate protection strategies, and monitoring and evaluation plans. Reports on existing actions and their anticipated benefits; lays out new actions and assigns actors to them; estimates costs to city, identifies potential funding sources and stresses cost-saving potential. Plan also has "new qualitative measures," like "implement land use code changes…, promote transit-oriented development…, explore net-zero-ready homes" (p. 33).	Climate Task Force not named, but described as "representing key community organizations and stakeholders in local climate protection efforts." Website indicates membership as: business interests (Chamber of Commerce); utilities (Platte River Power Authority); Poudre School District; county and city government (Natural Resources Advisory Board); academia (Colorado State University); transportation, and community climate activists (Fort Collins Sustainability Group).
Houston, TX	2,242,193	*Green Houston: Emissions Reduction Plan* (City of Houston, 2008) Presented as a plan to reduce pollutants that affect air quality; GHGs are part of the pollutant mix along with NOx and VOCs. Plan contains baseline emission inventory from three sources (mobile, buildings and structures, waste). Fourteen emission reduction strategies identified ranging from using renewable energy, to	NA

Table A-1. (Continued).

City	Population[b]	Plan name, year, and brief characterization	Participants
		retrofitting traffic signals and city lighting, altering municipal fleet, to increasing residential recycling rates. Does not set out implementation steps, assign responsibilities, indicate timelines, or establish metrics for evaluation.	
Kansas City, MO	451,572	*Climate Protection Plan* (City of Kansas City, 2008) Plan contains GHG inventory and establishes an overall GHG reduction goal (30% reduction from 2000 by 2020) as well as an aspirational goal (80% reduction from 2000 by 2080). Each topical work group (e.g., energy, carbon offsets and waste management) produced city-specific and communitywide recommendations according to two phases. Phase 1 recommendations were focused on Kansas City government itself. In main text, recommended actions are broad (e.g., achieve an 80% diversion rate of organic material), these are better developed with implementation responsibilities, cost estimates, and timelines in appendices.	Climate Protection Plan Steering Committee: political leaders (Jackson County legislature); business (e.g., Chamber of Commerce); municipal services (e.g., KCMO Water Services Department); neighborhoods (Beacon Hill Neighborhood Assoc.); environmentalists (e.g., Kansas City Environmental Mgmt. Commission); labor (Heart of America Labor Council, Greater Kansas City AFL CIO); regional planning (Mid-America Regional Council); utilities (Kansas City Power and Light).
Los Angeles, CA	3,833,995	*Climate LA* (Los Angeles, 2007a) A very detailed implementation program written to complement *Green LA: An Action Plan to Lead the Nation in Fighting Global Warming* (2007b), the more popular version of Los Angeles' initiative. Green LA contains emissions profile and focuses on interventions in several focal areas including energy, water, transportation, land use, waste, port and airport, green economy as well as a small discussion of adaptation. *Climate LA* lays out departmental action plans (what city agencies are already doing and what they will do to reduce emissions; milestones are indicated as are deadlines, lead agencies and evaluation metrics).	Post planning: City's Environmental Affairs Commission contracted with Occidental College and the Green LA Coalition to develop outreach and participation strategy. Researched other efforts and conducted 150 interviews with key stakeholders representing diverse (business, media, youth, financial, environmental) interests.
Madison, WI	231,916	*Climate Protection Plan* (City of Madison, 2002) Madison presents its plan as a "living document" with input from the public sought and encouraged. The plan emphasizes city, county and state facilities and programs as well as utility and commercial sector energy efficiency (not residential or community-wide); sets GHG reduction target (20% below 1990); contains baseline inventory. Actions included are standard municipal interventions (green procurement; expanded curbside recycling; LED lighting, tree planting). Plan reads more like annual report indicating when actions have been done. Implementation plan and evaluation metrics not in this document.	City of Madison Environmental Action Team (city staffers from multiple departments, included two from planning, alderperson, transit authority, and mayor's office). Other contributors: local utility, State of WI agencies, Dane County, and ICLEI).
New York, NY	8,363,710	*PlaNYC: A Greener, Greater New York* (City of New York, 2007) NYC's climate change plan is embedded in its sophisticated comprehensive plan. Climate change is presented as both the greatest and a cross-cutting challenge. Climate chapter establishes singular goal (reducing emissions by more than 30%) and notes that this will take place by "extending and enhancing the inherent strengths of NYC itself" (p. 135). Identifies four key objectives (e.g., clean power) and actions to get there. Also stresses interaction with other plans (e.g., transportation, open space) in achieving goals. Adaptation well articulated with three main initiatives (including more planning to develop adaptation policy) and some limited actions (e.g. amend building code).	Post planning: In August 2008, in keeping with on action identified in the plan, Mayor Bloomberg launched the Climate Change Adaptation Task Force and the New York City Panel on Climate Change. Bodies are charged with developing adaptation strategies to secure the city's infrastructure from the effects of climate change.
Philadelphia, PA	1,447,395	*Local Action Plan for Climate Change* (City of Philadelphia, Sustainability Working Group, 2007)	Sustainability Working Group (SWG): interagency effort. Convened by: Managing Director's office

Table A-1. (Continued).

City	Population[b]	Plan name, year, and brief characterization	Participants
		Plan commits the city to reduce GHG by 10% from 1990 levels by 2010; appendices contain methodology and analysis. Plan outlines 28 actions by five elements: buildings, transportation, industry and waste, greening and open space, and policy, education and outreach. Actions include directives to reduce energy use in city buildings and fleet, to purchase green energy, etc. as well as community-focused actions to increase residential recycling rates, increase assistance for weatherization, and strengthen community-wide campaigns on GHG reductions. Implementation steps, actors, timelines or metrics are not laid out in plan. Goal 28 is to develop an agenda to address such points.	(2 members); Philadelphia City Planning Commission (2); Law Department (2); Commerce Dept. (2) Sub-group of SWG: 14 individuals convened for GHG inventory and plan; city agencies represented include Air Management Services, Dept. of Public Health; Commerce Dept., Law Department, Municipal Energy Office, Philadelphia City Planning Commission, Philadelphia Water Department and consultants from energy sector.
Pittsburgh, PA	310,037	*Pittsburgh Climate Initiative-Pittsburgh Climate Action Plan (Version 1.0)* (City of Pittsburgh, 2008) Plan outlines measures that multiple sectors (government, business, higher education, citizens) can take to mitigate local effects of climate change. By sector, the plan identifies existing actions taken as well as short-, medium-, and long-term measures. These strategies have implementation target dates (years), information contacts and at times projected GHG reductions. No implementation details for strategies, although plan indicates that the Sustainability Committee "will become the central body that oversees and advances the strategies" (p. 29). The formation of this seven member committee is a short-term recommendation in the plan; there is no evidence on the city's website that this committee has been formed to date.	Green Government Task Force: City of Pittsburg, academia (e.g., Carnegie Mellon University); Commonwealth of PA (e.g., Dept. of Environmental Protection, Dept. of Community and Economic Development); labor; environmentalists, green industry (Steel City Biofuels); foundations; sustainability groups, business and banking; Urban Redevelopment Authority of Pittsburgh; state legislator. Acknowledges ICLEI. Held eight neighborhood-level community visioning sessions in 2007 to discuss climate change and identify potential actions.
Riverside, CA	295,357	*Clean and Green Sustainable Riverside Action Plan* (City of Riverside, 2008) Plan is described as a working document to be continually reviewed with annual progress reports. Short document presents actions to be taken grouped under seven vital areas of city life: energy, GHG emissions, waste, urban design, urban nature, transportation, water. Action steps identify action and set measurable goals (e.g., generate at least 10 megawatts of electric load from regional zero-emissions sources by 2025, plant at least 1,000 trees, increase bike trails by 15 miles.) Relative to the GHG goal, actions identified include conducting an emissions baseline and implementing a plan.	Clean and Green Task Force (CGTF): City members are mayor and staffer, Riverside Public Utilities; community members include representatives from the Riverside Unified School District, The Wildlands Conservancy, Clean Air Now, University of California-Riverside, Riverside Bike Club, American Lung Association, and Victoria Avenue Forever, an historic preservation group.
San Diego, CA	1,279,329	*City of San Diego Climate Protection Action Plan* (City of San Diego Environmental Services Department, 2005) Plan grew out of the San Diego Sustainable Community Program through which the city set its GHG reduction target and established the ad hoc committee. Action plan presents emissions baseline and forecast, lacks explicit goal and objectives. Text identifies what city has done to date and weakly identifies additional community solutions (e.g., telecommuting, public education on energy conservation, expanding recycling programs, improving bike infrastructure) that are never fully developed to an actionable standard in the plan.	Climate Protection Plan Ad Hoc Advisory Committee (scientific/ professional committee): ICLEI, San Diego Regional Energy Office, U.S. Navy, academia (Miramar Community College, San Diego State University, University of California-San Diego); Scripps Institute, Regional Energy Office, and Community Forest Initiative representative (urban forestry overseen by board comprised of mayoral-appointed community members).
Seattle, WA	598,541	*Seattle, a Climate of Change: Meeting the Kyoto Challenge* (City of Seattle, 2006) Plan to implement the recommendations of the Mayor's Green Ribbon Action Commission report which had 18 recommendations for meeting or beating Kyoto's target. Focused on two sources: mobile emission and natural gas consumption by homes and	Green Ribbon Task Force: members indicated by name only with no affiliation; in general prominent local citizens (e.g., William Ruckelshaus, former Secretary of U.S. EPA and now a local attorney).

Table A-1. (Continued).

City	Population[b]	Plan name, year, and brief characterization	Participants
		businesses. City is the main implementing actor. The 18 actions include strategies such as increasing public transit, pricing of roads and parking, enhancing natural gas conservation plus community mobilization, continuing "the City of Seattle's strong leadership example" (p. 20) and creating a collaboration called the Seattle Climate Partnership. Action statements list accomplishments to date, proposed actions and evaluation measures.	
Spokane, WA	202,319	*Sustainability Action Plan: Addressing Climate Mitigation, Climate Adaptation, and Energy Security* (City of Spokane, 2009) Self-described as "the Plan is a portfolio of principles, strategies, and recommendations promoting energy efficient development, sensible conservation of resources, and investment in money saving alternatives to current materials, behaviors and practices" (p. 8). Recommendations "are not intended to be reactive responses to short-term problems, rather they should be considered the groundwork for the development of internal policy by decision makers within city government" (p. 9). Eight central strategies identified (e.g., emphasize renewable energy, enable optimal land use, prepare through planning).	Task force members included: academia, transit agency, business interests, environmentalists, state agencies, planning and design consultants, former member of regional growth management hearings board, realtors/homebuilders, and a utility. "Outreach partners" drawn from diverse community groups spread the word and generated over 800 contributions from the public (p. 5). A "sounding board" made up of technical staff, neighborhood business centers, the chamber of commerce, and representatives from neighborhood leadership applied a "feasibility filter to Task Force recommendations" (p. 5).

Notes:

a. California may appear overrepresented, with 4 out of 20 plans, however, 38% of ICLEI's members are California localities. Of the 103 completed plans we identified, 30 (29%) were in California.

b. The population estimates are for July 1, 2008 (U.S. Census Bureau, 2008).