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State and Municipal Climate Change Plans

The First Generation

Stephen M. Wheeler

Problem: Global warming has emerged as one of the new century's top planning challenges. But it is far from clear how state and local governments in the United States can best address climate change through planning.

Purpose: As of 2008, 29 states had prepared some sort of climate change plan, and more than 170 local governments had joined the Cities for Climate Protection (CCP) campaign that requires that a plan be developed. This article analyzes this first generation of climate change plans and seeks to assess the goals being set, the measures included or left out, issues surrounding implementation, and the basic strengths and weaknesses of state and local climate change planning to date.

Methods: I conducted this research by analyzing planning documents as well as interviewing state and local officials by telephone. I analyzed the plans of three types of governments: all states with planning documents on climate change; cities with populations of over 500,000 that are members of the CCP campaign; and selected smaller cities that are CCP members.

Results and conclusions: Most plans set emissions-reduction goals, establish emission inventories, green public sector operations, and recommend a range of other measures. Many recent plans have been developed through extensive stakeholder processes and present very detailed lists of recommendations with quantified emissions benefits. But emissions-reduction goals vary widely, many proposed actions are voluntary, few resources have been allocated, and implementation of most measures has not yet taken place. Most plans do not address adaptation to a changing climate. Officials see rapidly growing public awareness of the issue and general support for climate change planning, but reluctance to change personal behavior.

Takeaway for practice: Future climate change planning should (a) set goals that can adequately address the problem; (b) establish long-term planning frameworks in which progress toward these goals can be monitored on a regular basis and actions revised as needed; (c) include the full range of measures needed to reduce and adapt to climate change; (d) ensure implementation of recommended actions through commitment of resources, revised regulation, incentives for reducing emissions, and other means; and (e) develop strategies to deepen public awareness of the need for fundamental changes in behavior, for example regarding motor vehicle use.

In recent years, climate change[1] has emerged as one of the main challenges facing planning in the 21st century, and one of the core obstacles to sustainable development generally (Intergovernmental Panel on Climate Change [IPCC], 1990, 1995, 2001, 2007). The challenge is two-fold: to plan for reducing greenhouse gas (GHG) emissions so as to avoid dangerous climate change, and to plan for adapting to a changing climate.

Although a few U.S. states and cities adopted policies related to climate change in the late 1980s and early 1990s (Wexler & Conbere, 1992), these pioneers often either simply initiated study of the issue or targeted a few selected sources of emissions (Riggs, 1990). Climate change planning accelerated in the mid-to-late 1990s, with jurisdictions adopting more comprehensive plans to reduce emissions. The U.S. Environmental Protection Agency (EPA) made grants available to many states during this period to inventory GHG emissions

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and create mitigation plans. The International Council on Local Environmental Initiatives (ICLEI; recently renamed ICLEI—Local Governments for Sustainability) also initiated a Cities for Climate Protection (CCP) campaign in 1993 that over the past 15 years has provided technical assistance to more than 650 local jurisdictions worldwide. Local governments who become members of this campaign pledge to reduce GHG emissions by a locally determined amount and to develop a local action plan.

Since 2000, municipal efforts have been further advanced by the Sierra Club's Cool Cities campaign, launched in 2005, and the U.S. Conference of Mayors' Climate Protection Agreement, initiated by Seattle Mayor Greg Nickels, also in 2005. More than 500 mayors have signed this agreement, in which cities commit to meet Kyoto Protocol goals and to urge state and federal governments to take action. At the state level, experts affiliated with the Center for Climate Strategies, a nonprofit organization providing technical assistance, have worked with more than two dozen states and several regional climate change initiatives since 2000, typically helping to facilitate stakeholder processes to develop customized lists of recommendations in each jurisdiction and providing technical analysis.

By 2008, 29 U.S. states, scores of cities, and a few counties had prepared climate change plans of varying types. Action at the local government scale usually involved planning departments, while at the state level a variety of agencies took the lead, including departments of environmental protection, air quality agencies, and governors' offices. Many states were also involved in regional consortia aimed at coordinating investments and establishing market-based programs to reduce emissions. In the absence of federal leadership, such state, local, and regional efforts have been seen as a form of "bottom-up governance" (Rabe, 2002, p. 3) or "multi-level governance" (Bulkeley & Betsill, 2003, p. 5) on the issue. The pace of climate change planning is still accelerating, with new actions announced almost daily. But given more than a decade of initiatives at state and local levels, we can now step back and ask what can be learned from these efforts. Although various dimensions of climate change plans could be analyzed in great detail, I focus here on the big picture: the targets that are being set, the measures included or left out, issues surrounding implementation, and the basic strengths and weaknesses of state and local climate change planning to date.

Research Method

Three types of jurisdictions were analyzed in this study. The first of these was states. My assistant and I began with the database of state actions compiled by the EPA's Climate Change Division (EPA, 2007b), and checked to verify that this list included all states with extant planning documents. We considered only documents with climate change as a main focus, which excluded state energy plans, many of which predate public concern over climate change or have other goals such as improving reliability and affordability of energy.

We also considered two categories of cities. We began with the list of Cities for Climate Protection members and, in order to keep the sample size limited, selected two groups to investigate: all 18 U.S. municipalities with populations greater than 500,000 and 17 smaller jurisdictions known for planning innovation. Although this last group represents a subjectively chosen sample, it has the benefit of allowing us to investigate many best-practice local planning efforts on this topic. Figure 1 shows these governments included in the study.

We systematically obtained planning documents and materials from these states and cities. For each state or city we prepared a summary analysis of documents and associated actions, which was sent to officials for review and confirmation. We also created tables comparing plan characteristics and content at each level of government (summarized in six tables in the Appendix). To gain more in-depth insight, we sought to interview at least one official in charge of implementation in each state or city. We asked officials which parts of their climate change programs had been most successful thus far, and what factors had led to that success. We also inquired which efforts had been least successful, what barriers had prevented action, and what strategies had been developed to overcome those barriers. Lastly, interviewees were asked their perception of changes in public understanding of the issue. To encourage candor, we guaranteed anonymity to interviewees.

Overall, this method allows us to create a snapshot of the planning actions taken to date by U.S. states and municipalities. It helps address broad questions of planning and policy design, which are particularly important at this relatively early stage of climate change planning, but cannot address more detailed questions of implementation, which await case study analysis of particular jurisdictions.

It should be noted that a number of states and cities have taken action related to climate change in the absence of plans, such as adopting green building policies and renewable portfolio standards for utilities. Such actions have not been included in this study. The concern here is with planning that attempts to take a comprehensive approach to the topic. Plans are of course neither necessary nor sufficient for action. Yet, the presence of plans indicates systematic attention to the issue and plans can potentially

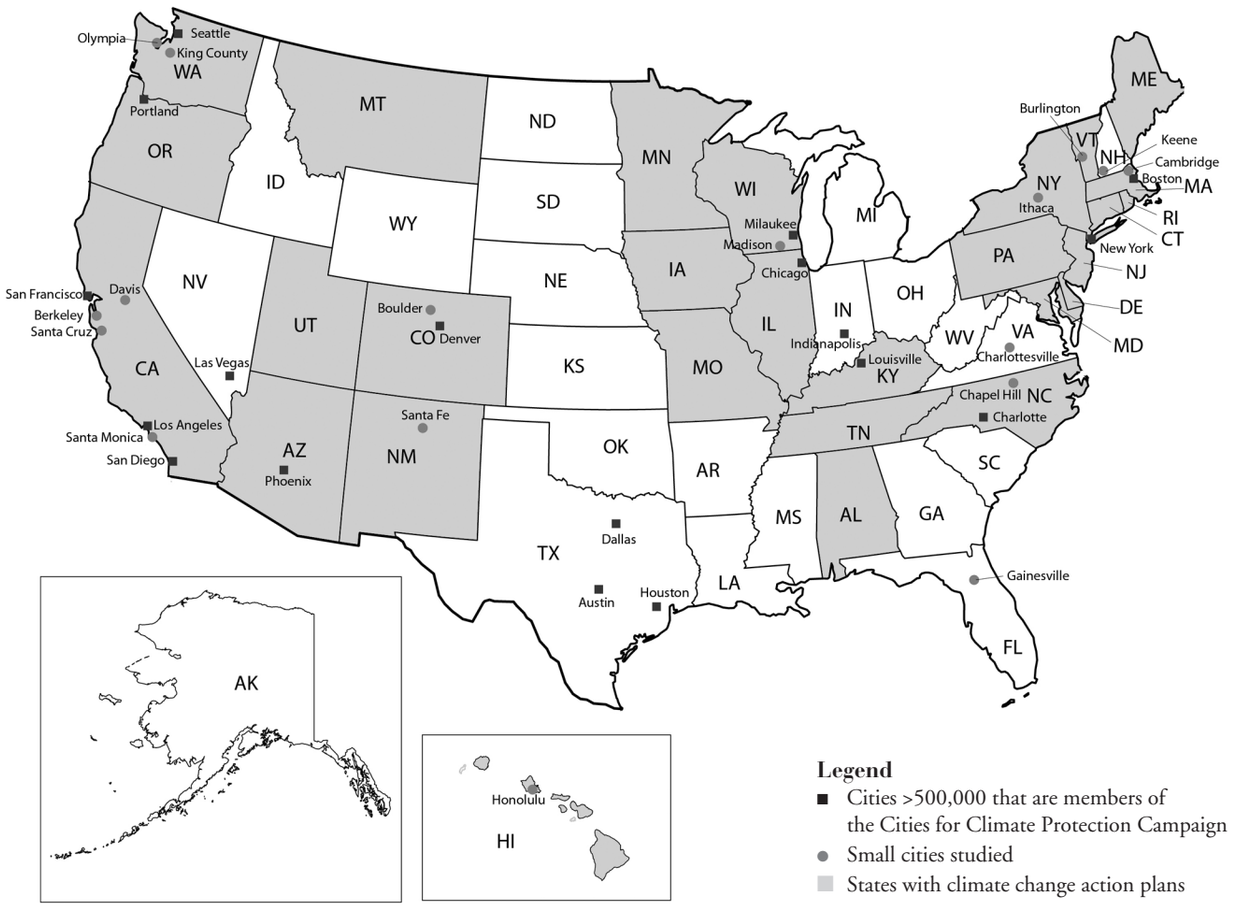

Figure 1. States and cities with climate change plans reviewed in this article.

establish an ongoing framework for action in which needs are analyzed, options are developed, the public is involved, and progress is evaluated.

Plan Form and Process

The nature of state and local climate change plans varies greatly. Some documents are brief and general, simply outlining goals, existing actions, or the elements of more detailed planning processes to follow. Others are hundreds of pages long and recommend specific policies in a wide range of areas, with the projected emissions savings and costs of each measure quantified. Some materials are very simple; others are lavishly designed and illustrated. Most are freestanding documents, not parts of other plans. However, a few local jurisdictions such as Santa Cruz have sought to incorporate climate change strategies into general plans. Other communities such as Santa Monica, Chicago, Milwaukee, Denver, Indianapolis, and Las Vegas have included climate change policies in more comprehensive sustainability plans, though often with a loss of focus on climate change per se.

One basic division between types of plans concerns those that seek to develop policy just for the public sector, usually by greening government buildings and fleets, and those that seek to develop policies for the geographic area over which that government has jurisdiction. Plans such as those of Los Angeles, Austin, and San Diego fall into the former category. The stated intent is usually to make government "lead by example." Plans in the second category also include public sector actions, but go well beyond these. The question of whether it is appropriate for cities or states to be taking action on what is essentially a global problem

was never raised in the plans or by the officials we interviewed. In cover letters for the documents, governors and mayors repeatedly expressed the belief that climate change action was a moral imperative. In interviews, officials repeatedly lamented the lack of federal action on this topic, but expressed the belief that in lieu of federal leadership it was imperative for states and cities to take action.

Plans dealt overwhelmingly with mitigation of emissions rather than adaptation to climate change. Only 6 of 29 states and 5 of 35 cities even mentioned the subject of adaptation in their documents. Almost all of these raised the subject simply as a topic for further research and planning. Many city plans did recommend steps to reduce urban heat island effects, primarily through urban forestry, which might be seen as adaptation strategies. Olympia, WA, has perhaps addressed adaptation most directly, developing plans to relocate city wells further inland to avoid salt water intrusion and taking steps to avoid flooding. The city has also reconsidered the site for a new city hall because this location in the city's low-lying downtown may eventually be underwater.

Processes through which climate change plans were prepared also vary greatly. Many early documents were prepared by a single department or outside consultant, such as a university, without significant public input. The 1990's state plans funded through EPA grants are of this type. These plans appear to have been intended in large part to generate policy alternatives and stimulate discussion; none are evaluated with follow-up reporting or appear to have been implemented in any systematic way. In recent years, plans have often been created through more extensive stakeholder processes involving dozens of diverse interests. Many state plans created in the 2000s with assistance from the Center for Climate Strategies created climate change advisory groups that met over many months to develop recommendations. These stakeholder-driven processes appear more common at the state level than at the local level, although most of the cities studied have held public meetings and workshops on the topic.

Plan Content

ICLEI promotes a climate change planning process based on five milestones: calculating emissions, adopting targets, developing policies, implementing measures, and monitoring results. This can be seen as a version of the traditional rational planning process familiar to planners. The first three of these steps have formed the basis of much climate change planning to date at both state and local levels, whether or not undertaken with ICLEI's assistance.

Developing an emissions inventory is an essential part of a climate change plan because these inventories form the means with which to evaluate GHG reduction efforts. The Kyoto Protocol uses 1990 as its base year, and since most cities and states adopted the Kyoto goal for the United States (7% below 1990 emissions by 2008–2012) or revised versions of this, they were faced with the task of estimating 1990 emissions. Software from ICLEI (for cities) and from the EPA and the Center for Climate Strategies (for states) has helped create those inventories.

The second of ICLEI's milestones concerns setting specific GHG reduction targets. Most states (22 of 29), large cities (15 of 18), and small cities (17 of 17) have adopted such goals for their jurisdiction. A few others set targets just for the public sector. The majority of cities have endorsed the Kyoto U.S. goal. States are somewhat less ambitious, often aiming to reach 1990 emissions levels by 2010 or 2020. In recent years, as concern about global warming has spread, these short-term targets have increasingly been coupled with stronger long-term goals. California and Oregon, for example, aim to reduce emissions to 80% and 75% below 1990 levels respectively by 2050. The most ambitious short-term city target is San Diego's (15% below 1990 by 2010), while ambitious longer-term goals are set by Los Angeles (35% below 1990 levels by 2030) and Boston, Berkeley, and Santa Cruz (80% below 1990 or 2000 levels by 2050). On a more limited scale, Austin has set the ambitious goal of making its municipal facilities and fleet carbon neutral by 2020, a step that will require renewable fuels and highly efficient buildings.

Developing policy recommendations is the third component of the planning process undertaken by most cities and states studied here. Given that GHG emissions originate throughout the economy (see Table 1), plans usually include recommendations in a broad range of areas including energy, transportation, land use, buildings, industry, and agriculture. The number of potential actions is impressive: the Connecticut plan sets out 55 action steps; Maine is pursuing 54, and Rhode Island, 52.

One of the most common actions states have taken has been to establish renewable energy portfolio standards for utilities. These standards require retailers of electricity to produce or purchase a certain percentage of their power from alternative sources within a specified time period, and appear to be increasingly ambitious and sophisticated in targeting different technologies (Rabe, 2006). However, there is very little consistency to these standards; levels range from 7.5% by 2019 in Maryland to 24% by 2013 in New York. A few cities, especially those with municipal utilities, have specified standards for using renewable energy sources: Austin intends its utility to provide 30%

Table 1. Main sources of greenhouse gas emissions in the U.S., 2005.

Sector/source	Percent of GHG emissions
Electricity generation	**33.5%**
Coal	27.0%
Gas	4.4%
Oil	1.4%
Other	0.7%
Transportation	**27.7%**
Cars	8.8%
Light trucks	7.8%
Heavy trucks and buses	5.5%
Aircraft	2.6%
Ships	0.9%
Trains	0.7%
Other	1.3%
Industry	**18.6%**
HFCs, PFCs, SF6[a]	7.8%
Cement	2.6%
Iron and steel	2.6%
Lime and limestone	1.2%
Ammonia and urea	0.9%
Petroleum systems	0.4%
Petrochemicals	0.2%
Nitric acid production	0.2%
Other	2.8%
Agriculture	**8.3%**
Soil management	5.0%
Manure and fermentation	2.2%
Fossil fuel combustion	0.7%
Other	0.4%
Commercial	**6.0%**
Fossil fuel use	3.1%
Landfills	1.8%
Coolants	0.5%
Wastewater treatment	0.5%
Other	0.1%
Residential	**5.0%**
Home heating	4.9%
Coolants	0.2%
Misc.	**0.8%**
Total	**100%**

Notes:

a. These are abbreviations for hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are used in a variety of refrigerant, medical, and industrial processes.

Source: EPA (2007a).

renewable power by 2020, and Los Angeles and San Diego aim for 20% by 2010. In 2005, Seattle's public utility claimed to be the first in the country to be net carbon neutral, although this achievement relies on extensive hydropower resources and the purchase of emissions offsets.

In the area of transportation, at least 16 states across the country have adopted California's vehicle emission standards, which, if eventually allowed[2] by the EPA would require that GHG emissions from new vehicles be reduced by 22% by the 2012 model year and 30% by the 2016 model year. This action would create a large subnational market that might force the motor vehicle industry to develop more fuel-efficient models. A number of plans mention smart growth land use policies as a way to reduce motor vehicle emissions, but generally do not make specific suggestions on how to implement these policies.

Most plans contain steps to green government buildings and activities. These initiatives typically focus on requiring Leadership in Energy and Environmental Design (LEED) certification for buildings, vehicle fleets that include hybrid vehicles or vehicles that run on alternative fuels, and environmental audits within agencies. Many plans also propose that the public sector use renewable energy, such as stating that the city or state will acquire a certain percentage of its electricity from renewable sources. Houston, for example, has entered into a contract providing one third of the electricity the local government consumes from wind power. San Francisco plans to receive all power consumed by the municipal government from renewable sources by 2010.

Plans include a wide variety of other actions. Many cities have initiated or expanded urban forestry programs; Denver, New York, and Los Angeles all have the goal of adding one million new trees. Many cities and states also contemplate expanding their recycling programs in order to save resources and reduce methane emissions from landfills. State plans frequently recommend strategies to increase use of alternative fuels; the Iowa plan calls for 25% of vehicle fuels to be biologically based by 2020. States such as Connecticut are developing energy efficiency regulations for appliances that go beyond federal standards. Interestingly, little mention is made of potential interactions between state and municipal climate change planning except in Illinois, where the state has directed its Environmental Protection Agency to assist local governments in developing their plans.

Analysis

At the most basic level, the existence of these state and local plans shows that elected officials and planners in much of the United States are taking the climate change problem seriously. Rabe (2002) notes that political action on climate change has often been bipartisan. Many documents are also remarkably detailed and comprehensive, even if many of the proposed initiatives have not been implemented.

That said, almost half of U.S. states have produced nothing even resembling a plan for climate change, and the majority of U.S. municipalities are not members of the Cities for Climate Protection campaign and have not signed the U.S. Conference of Mayors Climate Protection Agreement. Clearly, there is a long way to go in making climate change a central part of American planning. Even among those jurisdictions that have taken initiative, many questions can be raised concerning plans to date.

Near-Term Goals Are Too Low

Most cities with targets have adopted the Kyoto goal for the United States, due in part to the influence of the Conference of Mayors agreement, and most states have adopted somewhat weaker variants. All New England states except Vermont, for example, aim for 1990 levels by 2010, rather than 7% below 1990 levels. However, the Kyoto goal itself is too weak. It was based on political feasibility rather than scientific necessity, and the Kyoto timeframe ends in 2012 in any case. Much deeper cuts and a longer planning horizon appear necessary.

Given that the earth has already warmed 0.74°C (1.33°F) in the 1906–2005 period (IPCC, 2007, p. 1), and that the large amounts of GHGs already in the atmosphere would continue heating the planet even if human emissions stopped tomorrow, the best that can probably be hoped for is an eventual average global temperature increase of 2°C (3.6°F). To hold temperatures to this level, the IPCC asserts that levels of atmospheric CO_2 equivalents must be stabilized at 445–490 parts per million (ppm) compared with 375 ppm today, and that this stabilization level will require emissions reductions of 50–85% from the 2000 level by 2050 (IPCC, 2007, pp. 21–22). The Union of Concerned Scientists believes that 450 ppm should be the upper limit, and that even this target only offers a 50% chance of holding the temperature rise to 2°C (Luers, Mastrandrea, Hayhoe, & Frumhoff, 2007). Based on such uncertainties, critics such as Monbiot (2007) assert that even greater reductions are necessary, perhaps a 90% reduction from the 2000 level by 2030.

In the past few years, a small but growing number of U.S. states and cities have adopted long-term goals that would reduce CO_2 equivalents nearly 80% below the 2000 level by 2050. The problem is that they have also adopted weaker near-term targets that do not put them on track to meet this goal. California, for example, aims to reach 2000 levels by 2010 and 1990 levels by 2020 (that is, 12% below 2000). However, these goals fall short of the more than 3% annual reductions needed to meet the 2050 target. In such cases, the 2050 target does both inspire and institutionalize the concept of dramatic GHG reductions, but without stronger near-term goals, the chances that the long-term target will be met are slight. Indeed, this approach may give the impression of action while actual implementation of policies lags behind.

Progress Is Slow

No state for which data are available is meeting its goals in any case. Emissions appear to be increasing at the state and national levels in the United States, while progress is being made in some municipalities. The successes that are occurring still fall far short of the large GHG reductions that will be necessary.

As of 2005, GHG emissions were up 16.3% over 1990 in the United States as a whole and were rising at a rate of about 1% per year (EPA, 2007a, p. 2–8). Pennsylvania's emissions are projected to rise 10% between 1990 and 2010 (Pennsylvania Environmental Council, 2007, p. ES-6). Montana's emissions are projected to rise 19% over the same period (Governor's Climate Change Advisory Council, 2007, p. 2–2). Oregon's emissions rose 15% between 1990 and 2000 and are projected to rise 23% between 2000 and 2015 (Governor's Advisory Group on Global Warming, 2004, p. B-9). North Carolina's emissions are projected to rise 58% between 1990 and 2010 (Center for Climate Strategies, 2007, p. iv), while emissions in Arizona rose 56% between 1990 and 2005 (Arizona Climate Change Advisory Group, 2006, p. E2), and are projected to continue growing 3% per year through 2020 (Arizona Climate Change Advisory Group, 2006, p. 35).

Fewer inventory updates or projections are available at the city level, but those that exist show that cities may be making more progress than states. Cambridge, MA, forecasts a 23% increase in CO_2 emissions from 1990 to 2010 (City of Cambridge, 2002, p. 2–2). New York City saw an 8.5% increase in emissions between 1990 and 2005, although per capita emissions remain at about one third of the U.S. average (Office of Long-Term Planning and Sustainability, 2007, p. 7). Denver saw a 24% rise between 1990 and 2005, though population also rose 24% (Ramaswami et al., 2007, p. iv). Portland claims only a slight rise between 1990 and 2004, as well as a 12.5% drop in emissions on a per capita basis (City of Portland and Multnomah County, 2005). Los Angeles saw an actual reduction of 4% in CO_2 output between 1990 and 2004, despite a population growth of 400,000 (City of Los Angeles, 2007, p. 8). Seattle reports a reduction of 8% in GHG between 1990 and 2005 (City of Seattle, 2007, p. 1). The question of why some cities appear to be having greater success than states at reducing emissions merits further research.

Proposed Measures Are Inadequate

Plans to date overlook some strategies that appear necessary to reduce emissions. For example, few states or cities have proposed changing the basic economics of motor vehicle use, by taking steps like enacting steep charges on driving or purchases of inefficient vehicles. In 2006 Seattle instituted a business tax of $25 per year for each employee who drives to work alone, but this appears to be largely symbolic. Recommended transportation measures tend to focus on promoting alternative fuels or engine technologies, not on reducing vehicle miles traveled (VMT). Connecticut's otherwise very extensive plan aims only to reduce 2020 VMT 3% below what is now forecast, slowing the rate of increase rather than bringing about reductions from today's levels (State of Connecticut, 2005, p. 12).

Only Austin and Boston are revising building codes so as to move toward carbon-neutral structures. No jurisdiction mandates that buildings be designed to take advantage of passive solar heating, although this is an inexpensive and well-known strategy for reducing building energy use. Emissions resulting from to air travel, one of the most carbon-intensive human activities, are not mentioned by most plans. (Hawaii's plan specifically opposes regulating emissions from air travel.) Few plans set up substantial funding sources for GHG mitigation programs, and none recommends levying carbon taxes on the generation of GHG. Many state plans assume that future GHG cap-and-trade systems will reduce industrial emissions, although none has yet been tested in the United States. (Under such frameworks, government would set a limit on the amount of carbon that could be produced by certain industrial sectors, this cap would be reduced over time, and those polluters able to reduce their emissions below their allotted amount could sell credits for these reductions to firms unable to meet their targets.) At a more fundamental level, GHG emissions are driven by underlying factors such as population growth and high levels of material consumption (Angel et al., 1998), and this generation of plans does not address such topics.

Certain basic policy mechanisms may reduce GHG: regulating emissions, carbon taxes, cap-and-trade systems within industry, rationing of emissions allowances given to consumers (i.e., permitting each person to consume goods and services producing only a certain, limited amount of emissions), and voluntary reductions. Of these, most states and cities thus far have opted for voluntary approaches, though many state and city plans propose offering rebates or tax credits as incentives to encourage voluntary reductions. Many states also aim to eventually set up cap-and-trade frameworks either alone or together with other states in their regions. Yet voluntary approaches have done little to reduce overall GHG emissions to date. Cap-and-trade systems for greenhouse gases have yet to be developed in the United States and may reward the most inefficient companies or produce windfalls for certain players, as happened in Europe.

Plans focus relatively little on regulation, yet it may be essential to regulate the energy efficiency of buildings, motor vehicles, and appliances. The fastest growing form of electricity consumption is the small, constant power drain, or *plug load*, from electronic equipment that is plugged in all the time. These loads could be reduced by having equipment turn itself completely off when not in use, or by limiting the maximum power usage of appliances when inactive. However, it seems unlikely that manufacturers will design equipment to do these things without regulation from federal or state governments. In the area of adaptation, regulation to restrict building in flood-prone areas, especially along coasts, may be required to avert future New Orleans-type catastrophes.

Implementation Is a Problem

It is difficult to know how many elements of the planning documents reviewed in this study have been implemented because very few jurisdictions have issued progress reports or evaluations. Certainly, this is often the situation in planning, but in the case of climate change systematic evaluation of progress toward targets seems particularly needed. Given the broad scope of climate change plans, implementation requires numerous legislative and executive actions. Most plans do not mention specific needs for funding, and local governments have been unwilling to put their own money into climate change programs (Bailey, 2007), but substantial resources will eventually be needed. Tracking progress toward obtaining these actions and resources would help the public and decision makers understand how well climate change planning is proceeding.

Officials we interviewed often indicated that the kinds of measures most often being implemented related to greening public vehicle fleets, improving the energy efficiency of public buildings, and establishing renewable portfolio requirements for utilities. They also frequently viewed the creation of emissions inventories and climate change plans as significant achievements in themselves. But interviewees said frankly that many other recommendations were not implemented, and frequently cited politics as a barrier to this. For example, a program in Connecticut that would have raised fees on highly polluting motor vehicles and rewarded purchasers of efficient vehicles was scrapped by the legislature in favor of a labeling requirement. Smart growth programs in a number of states had also faced

opposition and suffered setbacks. Transit improvements had languished for lack of funding.

Many interviewees said uncertainty about which strategies were best had hindered action. Controversies around the use of corn ethanol as a fuel are a case in point; over the past several years this seemingly desirable strategy has been shown to have a number of negative repercussions. Several of those interviewed also cited institutional obstacles to implementing green measures. For example, the fact that public-sector capital-spending decisions are made separately from decisions on operating costs, and face different and more severe constraints, makes it difficult to factor in future savings from green construction, even though many measures will end up saving money in the long term. A related problem is that the parties gaining long-term benefits from carbon-reduction steps are not the ones who would have to implement those measures. For example, developers have little incentive to create energy-efficient housing if they will not reap the long-term savings. Interviewees suggested that offering government incentives to the parties whose action is needed could help overcome such barriers.

Some officials expressed a sense of powerlessness, saying there was little a state or city could do to affect a problem as large as climate change. States are collaborating with their neighbors to form regional alliances as one strategy to gain greater collective power. But a large majority of those interviewed at both state and local levels felt that leadership should come from the federal government. Many said we would need national legislation to get things moving faster. Another frequent comment was that leaving states and localities to act on their own would risk creating a patchwork quilt of responses that would be confusing to the public and leave many areas with relatively weak policies.

Public Understanding and Involvement Is Insufficient

All officials interviewed agreed that public attention to climate change has been growing in recent years, and many credit the media for that. One official stated that "you can't pick up a newspaper, local magazine, or turn on the TV without seeing something about climate change." Another said "I've worked in the environmental field since the early 1980s and have never seen any issue take off like this one."

Citizen mobilization also appears to be growing on this issue. In Connecticut, for example, the Connecticut Climate Coalition represents over 90 individual groups, many of which are organizing public awareness events and legislative lobbying campaigns. The Pennsylvania climate change plan was written not by the state but by the Pennsylvania Environmental Council, a nonprofit statewide organization. Strong citizen efforts were also noted in other states such as Washington and Minnesota, and in cities such as Boston, New York, Seattle, and San Francisco.

Despite rising public awareness, however, many officials noted a public reluctance to change personal activities. One official commented, "the public is aware of climate change but hasn't made the leap to 'this is what I'm going to do myself, personally.'" Several interviewees also cited difficulties in getting members of the public to attend meetings on the subject of climate change.

Conclusions and Recommendations

The first generation of state and local climate change plans appear to help develop public awareness about climate change; set out specific, if often inadequate, goals; outline the breadth of action that will be needed; and develop some of the policy tools that will be required in the future. However, most of these plans lack the strong actions and political and institutional commitment needed to mitigate emissions or adapt to climate change. Adaptation, in particular, is rarely mentioned within these documents.

I recommend the following improvements to the next generation of state and local government climate change plans:

- Choose GHG reduction targets and timelines that adequately address the problem. In particular, near-term goals must be stronger if they are to allow states and cities to reduce GHG at least 80% below 2000 levels by 2050. A goal of reducing emissions by 3% per year, or 30% by 2020 could establish such a trajectory.
- Use a long-term planning framework that monitors progress toward these goals and revises planned actions as needed. Regular reporting on emissions inventories and the status of implementation is essential to know if progress is being made toward addressing climate change, and to revise policies accordingly. This reporting process needs to be institutionalized in such a way as to continue despite changes in political leadership, which have set back many state climate change efforts to date.
- Include the full range of measures needed to reduce emissions and adapt to climate change. Almost certainly, emissions cannot be sufficiently reduced without steps to reduce motor vehicle use, change land use patterns so as to lower mobility needs, improve public transit, improve building energy efficiency well beyond current-day codes, address air travel emissions, and regulate energy efficiency.

Adaptation will likewise require a broad range of initiatives before disaster strikes, especially to avert the types of environmental injustices seen in New Orleans in the aftermath of Hurricane Katrina.

- Implement the plan recommendations more effectively. To realize plan recommendations, resources must be committed, regulations revised, and incentives for reducing emissions adopted, among other things. Tax systems may need to be changed (e.g., to change the fiscalization of land use which undercuts smart growth), and institutional obstacles eliminated (e.g., by requiring future reductions in operating costs for green buildings to be taken into account within initial capital budgets).
- Initiate social marketing campaigns and educational strategies. In the last several years, the public has become vastly more concerned about climate change, but does not necessarily make connections to personal lifestyle and consumption patterns. Antismoking campaigns have been among the most successful social marketing efforts to date, but even greater marketing skills and financial resources appear necessary to get members of the public to reconsider, for example, the amount they drive or the embodied energy of the products they buy.

Global warming represents one of the most difficult challenges the planning profession has ever faced. The first generation of state and local climate change plans reflects increasing consciousness of this, and these plans have begun to take important steps, such as measuring emissions. But much stronger action is needed. Instead of pursuing slow, incremental policy changes, governments at all levels must adopt a *backcasting* approach, setting goals for both mitigation and adaptation based on the best available scientific knowledge, and working backward from these targets to develop plans and programs capable of achieving them. The initiatives would then be regularly reviewed and revised to ensure progress at an appropriate rate. The resulting strategies are likely to involve radical departures from business as usual. They may mean, for example, vastly revised transportation expenditures and pricing policies. They may mean much stronger regulation of appliance and building energy efficiency. They may include large new public investments in alternative energy technologies and strengthened public oversight over utilities. And they may mean state and even federal steps to mandate local land use decision making that will reduce transportation-related GHG emissions. Such steps would be controversial to say the least. But the climate change crisis may require them. Leadership from the planning profession can help society grapple with this growing challenge.

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Notes

1. The term *climate change* is used in this article because it is the predominant term in this field currently, and because it more fully reflects the range of effects of increasing atmospheric concentrations of greenhouse gases than terms such as *global warming*. These effects include warming, cooling, changes in precipitation patterns, and increases in storm events.

2. To implement its standard, California requires a waiver from the EPA. After much delay, the EPA denied this waiver in December 2007, a move widely criticized as unjustified and political. California has filed suit over this denial, and both major-party presidential candidates in the 2008 race promised to grant the waiver if elected.

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Appendix A. Characteristics of state plans.

State	State planning actions	Emissions inventory?	Estimates GHG reductions from measures?	Estimates cost of measures?	Funding identified?	Follow-up reporting?	Comments
AL	1997 policy planning report	1990	No	No	No	None	Prepared by university w/ EPA grant; advisory
AZ	2006 climate change action plan	1990, 2001	Yes	Yes	No	None specified	Stakeholder process; 49 policy options
CA	2006 law; 2005 EO[a]; 1997 plan	1990, 2004	Yes; ARB[b]	Some	Some	Biannual reports	Very detailed process to implement law
CO	1998 plan, 2007 climate action plan	1990, 1995	No	No	No	Inv. every 5 years	Stakeholder process; 31 strategies identified
CT	2005 climate change action plan	1990, 2000, 2006	Yes	Yes	Proposed	Annual	Plan contains 55 detailed action items
DE	2000 climate action plan	1990	Yes	Yes	No	None	Prepared by university w/ EPA grant; advisory
HI	1998 action plan; 2007 legislative act	1990	No	No	No	Updates in progress	1998 plan developed under EPA grant; advisory
IA	1996 GHG action plan; 2008 report	2000	Yes	Some	No	To be annual	1996 plan prepared under EPA grant; advisory
IL	1994 climate action plan	1990, 1998	No	No	No	Updated in 1996	New advisory group appointed in 2006
KY	1998 mitigation strategies report	None	Yes	No	No	None	1998 report prepared under EPA grant; advisory
MA	2004 climate protection plan	2002; govt. only	No	No	No	None	Joint effort of 15 state agencies
MD	2004 report; 2008 interim plan	1990, 1995	Yes	Yes	No	To be annual	New plan due in 2008
ME	2000, 2004 climate action plans	1990	Yes	Yes	No	Biannual reports	Stakeholder process; 54 recommendations
MN	2003 climate change action plan	None	No	No	No	None	Framework only; new plan being developed
MO	1991 report; 2002 options report	1990, 1996	Yes	No	No	None	Produced with EPA grant; advisory
MT	1999 foundation, 2007 action plan	1990, 2005	Yes	Yes	No	None	Stakeholder process; 55 measures
NC	2000 report; 2007 draft action plan	1990, 2000, 2005	Yes	No	No	None	Stakeholder process; 56 recommendations
NH	2001 climate change challenge plan	1993	No	Some	No	None	By state Env. Dept.; new plan being developed
NJ	1999 Dept. of Env. action plan	1990, 1995	Some	No	No	Revised in 2002	Other reports by Princeton & New Jersey Future
NM	2002 GHG action plan; 2006 report	1990, 1996	Yes	Yes	Some	New inv. in 2008	2006 stakeholder process; 69 recommendations
NY	2003 recommendations plan	1990, 2001	Yes	Some	Some	Annual inv. planned	Stakeholder process; new plan being drafted
OR	2004 strategy for GHG reductions	1990, 2000	Yes	Yes	Some	Updated in 2006	Stakeholder process; 46 recommendations
PA	2007 climate change roadmap	1990, 2000	Yes	Some	No	Annual on gov. actions	Stakeholder process; produced by an NGO[c]
RI	2002 GHG action plan	1990, 1996	Yes	Yes	Some	2004 status report	Stakeholder process; 52 recommendations
TN	1999 emissions mitigation strategies	1990	Yes	Yes	No	None	Written by university with an EPA grant
UT	1990s report; 2007 blue ribbon commission	1990, 2000, 2005	Yes for report	Yes for report	No	None	Stakeholder process; 57 recommendations
VT	1998 action plan; 2007 report	1990, 2003, 2005	Yes	Yes	No	Biannual updates	2007 stakeholder process; 38 recommendations
WA	1996 action plan; 2008 interim report	1990, 2000	Yes	Yes	No	Inv. updates 2006, 2007	2007–08 stakeholder process; 43 recommended actions
WI	1998 action plan; 2008 interim report	1990, 2000	Some	Some	No	Inv. updated 2007	Stakeholder process; 9 initial areas for action

Notes:

a. Executive Order.

b. California Air Resources Board.

c. Nongovernmental organization.

Appendix B. Content of state plans.

State	GHG emission targets	Renewable energy portfolio	Vehicle emissions	Building energy efficiency	Adaptation measures	Comments
AL	None	None	Study proposed transit, alt. fuels	Study proposed efficiency	None	No action following 1997 study
AZ	2000 by 2020, 50% below by 2050	15% renewable by 2025	CA standards, transit, efficient fleet	LEED Silver for state bldgs.	TBD	Helped form Climate Registry
CA	2000 (2010), 1990 (2020), 80% (2050)	20% (2010); 33% (2020)	Seeking to regulate motor vehicles	LEED Silver for state bldgs.	None	Large emitters must report GHG
CO	20% below 2005 (2020), 80% (2050)	20% by 2020	CA standards, 25% biofuels in fleet	LEED Basic for state bldgs.	TBD	Interested in carbon sequest.
CT	1990 by 2010; 10% below by 2020	10% by 2010	CA standards, VMT reduct. policy	LEED Basic for state bldgs.	None	Developing appliance standards
DE	1990 by 2010; 10% below by 2020	10% by 2019	Livable Delaware agenda on sprawl	LEED Basic for parks bldgs.	None	New Sustainable Energy Utility
HI	1990 by 2020	15% (2015); 20% (2020)	Plan called for transit, alt. fuels	Performance contracting	None	2007 Act requires new plan
IA	Targets to be set by December 2008	Requiring 105 MW ren.	25% of gas to be biofuels by 2020	More efficient state bldgs.	None	Emphasis on alt. fuels
IL	1990 by 2020, 60% below by 2050	8% (2013); 25% (2025)	Reducing emissions from state fleet	More efficient state bldgs.	Water law	State EPA to assist local govts.
KY	None	None	Biodiesel used in state fleet	Educational programs	None	Comprehensive energy strategy
MA	1990 by 2010, 10% below by 2020	Increase by 1% annually	CA standards, smart growth	LEED Basic for state bldgs.	TBD	Promotes wind energy
MD	10% below 2006 by 2012; 25% by 2020, 90% by 2050	9.5% by 2022	Interim plan promotes transit, smart growth, alt. fuels	Green bldg. tax credits, LEED Silver for state bldgs.	Flood mgt.	Rec. steps to protect the state's shoreline
ME	1990 by 2010, 10% below by 2020	3% (2010), 10% (2017)	CA standards	LEED Basic for state bldgs.	None	State to buy 100% ren. by 2010
MN	5% (2015); 30% (2025), 80% (2050)	25% by 2025	Promotes alt. fuels such as ethanol	Promotes Energy Star bldgs.	None	2006 Energy Act set GHG goals
MO	None	Plan seeks 11% (2020)	Rec. fleet efficiency steps	Rec. efficiency measures	None	Little implementation
MT	1990 levels by 2020	15% by 2015	Rec. smart growth, alt. fuels	Voluntary green bldg. prog.	None	Focus on biofuels, carbon seq.
NC	7% below 1990 levels by 2010	None	Incentives for alt. vehicles	Green builder training prog.	None	Focus on biofuels
NH	1990 by 2010; 10% below by 2020	25% by 2025	Rec. smart growth, alt. fuels	More efficient state bldgs.	None	Incentives for ren. energy
NJ	1990 (2020), 80% below 2006 (2050)	20% by 2020	CA standards, smart growth	Voluntary green home prog.	None	Mandatory CO_2 reporting
NM	2000 (2012), 10% (2020), 75% (2050)	10% (2011), 15% (2015)	Clean Car Program w/ alt. fuels	LEED Silver for state bldgs.	None	Incentives for ren. energy
NY	5% below 1990 (2010), 10% (2020)	24% by 2013	CA standards, alt. fuel tax incentive	Funding energy efficiency	None	State to buy 20% ren. by 2010
OR	Stabilize emissions by 2010; 10% below 1990 by 2020, 75% by 2050	5% (2011), 15% (2015)	CA standards, biofuel incentives, smart growth	Sustainable state facilities guidelines	TBD	State government goal of 100% ren. energy by 2010
PA	None	18% by 2020	CA standards, focus on biofuels	Voluntary green bldg. prog.	None	2007 Energy Strategy
RI	1990 by 2010; 10% below by 2020	16% by 2019	CA standards, greening state fleet	LEED Silver for state bldgs.	None	2006 Energy Agenda
TN	Rec. goal of 7% below 1990	None	Rec. smart growth, alt. fuels	Some green bldgs.	None	Focus on voluntary actions
UT	None	None	Clean Fuel Vehicle Tax Credit	2006 EO[a] on efficiency	None	Emphasis on energy efficiency
VT	25% below 1990 by 2012, 50% by 2028, 75% by 2050	10% by 2013	Report rec. feebates to reward vehicle efficiency	Commercial bldg. efficiency standards	None	Demand side management policies for energy
WA	1990 (2020), 25% (2035), 50% (2050)	15% by 2020	CA standards, alt. fuels incentives	LEED Silver for state bldgs.	None	Report on ec. impacts of climate
WI	1990 (2020), 60%–80% below (2050)	10% by 2015	Rec. smart growth, biofuels	Bldg. Code updated	None	Focus on biofuels market

Note:

a. Executive Order.

Appendix C. Characteristics of large city plans.

City	Planning actions	Emissions inventory status	Estimates GHG reductions from measures?	Estimates cost for measures?	Funding identified?	Follow-up reporting?	Comments
Austin, TX	2007 climate protection plan, utility green building program	Developing inventory	No	No	No	Not scheduled	Plan has strong goals but few details on implementation
Boston, MA	2007 climate action plan; 2007 EO[a] on climate change	Developing inventory	No	No	No	Updates every 3 years	Plan primarily reports on existing activities
Charlotte, NC	None; developing plan	Developing inventory	n/a	n/a	n/a	n/a	ICLEI member but has no plan to date
Chicago, IL	Part of 2005 environmental action agenda, updated 2006	Developing inventory	Yes	No	For some programs	Not scheduled	Reducing emissions is small part of city's environmental action agenda
Dallas, TX	None; developing plan	Developing inventory for 2005	n/a	n/a	n/a	n/a	3-year *Sustainable Skylines* project includes GHG strategies
Denver, CO	2007 *Greenprint Denver* plan	Inventories for 1990, 1995, and 2005	Yes for some	Yes for some	No	To issue annual report card	The integrating theme of *Greenprint Denver*
Houston, TX	None	n/a	n/a	n/a	n/a	n/a	Joined ICLEI's CCP in 2006
Indianapolis, IN	None; developing plan	Developing inventory	n/a	n/a	n/a	n/a	*Indy Greenprint* program underway
Las Vegas, NV	Mentioned within 2006 *Sustainable Las Vegas* plan	Developing inventory	No	No	No	Not scheduled	2006 plan is an outline of a future sustainability program
Los Angeles, CA	2001 energy climate action plan, 2007 *Green LA* plan	Developing inventory	No	No	No	To publish annual inventory	*Green LA* plan outlines climate change policies
Louisville, KY	None	Developing inventory	n/a	n/a	n/a	n/a	Signed the U.S. Conference of Mayors climate protection agreement
Milwaukee, WI	None	Developing inventory	n/a	n/a	n/a	n/a	Environmental sustainability plan does not include GHG emissions
New York, NY	2006 plan *NYC 2030* contains climate change section	Inventories for 1995, 2000, and 2005	Yes	No	For some programs	Not scheduled	$80 million in 2008 to reduce GHG emissions from city buildings
Phoenix, AZ	None	n/a	n/a	n/a	n/a	n/a	
Portland, OR	1993 Portland/Multnomah Co. action plan, updated 2001	Inventories for 1990, 1995, 1999, after	Yes	No	For some programs	2 follow-ups since 1993	First city in the U.S. to adopt a strategy to reduce CO_2 emissions
San Diego, CA	2005 climate protection action plan; 2002 sustainable community program	Inventory for 1990	Yes	No	No	Plans to review annually	Plan focuses mainly on city operations.
San Francisco, CA	2002 city council resolution; 2004 climate action plan	Inventories for 1990, 2000, and 2005	Yes	No	No	Not scheduled	Detailed plan with actions in 18 major areas
Seattle, WA	2006 climate action plan	Inventories for 1990, 2000, and 2005	No	No	For some programs	Inventory every 3 years	Plan implements 18 initiatives for transportation, energy, buildings

Notes:
n/a = not applicable.
a. Executive Order.

Appendix D. Content of large city plans.

City	GHG emission targets	Utility renewable requirement	Vehicle emissions	Building energy efficiency	Industry	Adaptation measures	Comments
Austin, TX	City govt. carbon neutral by 2020	30% by 2020	City is emphasizing plug-in hybrids	LEED Silver for city bldgs.; green builder program	None	None	Revised code reduces energy 65% for homes and 75% for com. by 2015
Boston, MA	Kyoto; 80% by 2050	15% of govt. power by 2012	All new fleet purchases must use alt. fuels	LEED Silver for city bldgs.; LEED for private >50K sq. ft.	None	None	First city to incorporate LEED standards into zoning code
Charlotte, NC	n/a	n/a	Purchasing hybrid and E85 vehicles for city fleet	Sustainable design permit fee rebate	n/a	n/a	Implementing centers and corridors land use strategy
Chicago, IL	6% below 1998–2001 levels by 2010	None	Increasing alt. fuel fleet 10% annually	LEED Silver for city bldgs., goal of Gold	Energy audits	None	Green roof program, urban heat island program, green streets program
Dallas, TX	Kyoto	n/a	>900 CNG and hybrid vehicles in city fleet	LEED Silver for new city bldgs.	n/a	n/a	Green building program under development
Denver, CO	10% below 1990 by 2012 per cap.	State requires 10% by 2015	51% of light duty vehicles use alt. fuels	LEED Silver for new city bldgs./renovations	None	None	Goal of 1million new trees by 2025; *Blueprint Denver* plan for land use
Houston, TX	Kyoto	⅓ municipal power from wind	The city owns >300 hybrid vehicles	LEED Silver for new city bldgs./renovations	n/a	n/a	Since 2000 has pursued program to reduce NOx for air quality reasons
Indianapolis, IN	Kyoto	n/a	Developing alt. fuel program	Developing recommendations	n/a	n/a	City working with community on climate change action plan
Las Vegas, NV	Kyoto	None	87% of nonemergency fleet uses alt. fuels	LEED Silver for new city bldgs./renovations	None	None	Voluntary green building program for homebuilders
Los Angeles, CA	35% below 1990 levels by 2030	20% by 2010	Fleet to be 85% powered by alt. energy	LEED certified for public bldgs. and private >50K sq. ft.	Promoting green econ.	Reduce heat island	Cool roof program; greening the port and airport
Louisville, KY	Kyoto	n/a	Some hybrid buses	n/a	n/a	n/a	Intergovernmental Partnership for a Green City investigating steps
Milwaukee, WI	Kyoto	n/a	Using biodiesel blend in city vehicles	Green features in public bldgs.	n/a	n/a	City agencies required to reduce energy use 15% over 2005 by 2012
New York, NY	30% below 2005 levels by 2030	None	More than 6,000 alt. fuel vehicles	LEED Silver for new city bldgs./renovations	None	Developing	Requiring hybrid taxi fleet by 2012; initiative to plant 1 million trees
Phoenix, AZ	Kyoto	n/a	1,400 alt. fuel vehicles	LEED certified public bldgs.	n/a	n/a	Expanding transit; infill incentives, urban forestry program
Portland, OR	10% below 1990 levels by 2010	11% of city govt. from renewables	Requires 10% ethanol in gasoline	LEED Gold or new city bldgs.	None	None	Per capita emissions had fallen 12.5% by 2005
San Diego, CA	15% below 1990 levels by 2010 for city op.	20% by 2010	Plan to reduce fleet gas consumption 5% by 2008	LEED Silver for new city bldgs./renovations	None	Reduce heat island	Expedited permit processing for sustainable bldgs.
San Francisco, CA	20% below 1990 levels by 2012	All municipal power green by 2010	More than 800 alt. fuel or hybrid vehicles	LEED Silver for city bldgs.; Gold for cmrcl. by 2012	None	None	Goal of 75% diversion of solid waste by 2010 and zero waste by 2020
Seattle, WA	Kyoto	Net-zero emissions through offsets	Goal of 100% low-emission vehicles	LEED Silver for new city bldgs./renovations	None	None	Seattle Climate Action Now educational campaign underway

Note:
n/a = not applicable.

Appendix E. Characteristics of small city plans.

City	Planning actions	Emissions inventory method/status	Estimates GHG reductions from measures?	Estimates cost for measures?	Funding identified?	Follow-up reporting?	Comments
Berkeley, CA	2006 Measure G; 2007 framework report; 2008 climate action plan	1990, 2000, and 2005 inventories	Yes	No	No	Plan to be updated every 3 to 5 years	Plan sets general policies; facilitated implementation process to follow
Boulder, CO	2006 climate action plan	2004, updated annually	Yes	Yes	Yes	Ann emissions to be reported	Plan proposes many programs and policies that would need to be adopted
Burlington, VT	2000 climate action plan	1990, 1997, and 2005	Yes	No	No	None specified	Emphasis on voluntary 10% reductions
Cambridge, MA	2002 climate protection plan	1990, 1998, 2005, and 2006 inventories	No	No	No	Progress reports in 2004, 2005, and 2006	Plan contains more than 100 proposed actions
Chapel Hill, NC	Plan in development	In progress	n/a	n/a	n/a	n/a	Sustainability committee formed in 2007
Charlottesville, VA	Plan in development	In progress	n/a	n/a	n/a	n/a	Climate change planning started in 2007
Davis, CA	Plan in development	In progress	n/a	n/a	n/a	n/a	Sustainable working group of staff established
Gainesville, FL	Plan in development	2006 inventory	n/a	n/a	n/a	n/a	Municipal utility developing renewable and efficiency programs
Honolulu, HI	2007 sustainability plan	None	No	No	No	None specified	Climate change is barely mentioned though plan helps reduce emissions
Ithaca, NY	2006 local action plan	2001 and 2004 inventories	Yes	No	No	None specified	Local action plan affects local government operations only
Keene, NH	2004 local action plan	1995 inventory	Yes	Yes	No	None specified	Plan covers 37 actions (private sector measures are voluntary)
King County, WA	2007 King County climate plan	2003 inventory	No	No	No	None specified	Plan covers county operations only; companion 2007 energy plan
Madison, WI	2000 climate protection plan; 2002 update	1990 and1996 inventories	No	No	No	None specified	Plan covers municipal operations only
Olympia, WA	2007 climate change report for municipal operations	2004, 2006, and 2007	No	No	No	Annual report on city energy use	Previous climate change reports in 1991, 1993; reports cover municipal operations
Santa Cruz, CA	2006 climate action declaration	1995 and 2000 inventories	No	No	No	None specified	Climate change actions to be incorporated into the general plan
Santa Fe, NM	2008 *Sustainable Santa Fe* plan	Developing 1990 and current baselines	No	No	No	None specified	Climate change actions are part of larger *Sustainable Santa Fe* plan
Santa Monica, CA	1994 Sustainable city plan updated in 2003 and 2006	1990, 1995, and 2000 inventories	No	No	No	Annual report cards	Climate change goals within sustainable city plans but little on implementation

Note:
n/a = not applicable.

Appendix F. Content of small city plans.

City	GHG emission targets	Energy initiatives	Vehicle emissions	Building energy efficiency	Industry	Adaptation measures	Comments
Berkeley, CA	33% by 2020; 80% below 2000 levels by 2050	Marketing Berkeley Climate Action Pledge to individuals	Supports car-sharing; implementing bike, pedestrian plans	LEED Silver for city bldgs.	Sustainable Business Action Plan	Conducting vulnerability assessment	Goal of zero waste by 2020; 50% of restaurant food packing recyclable; polystyrene foam prohibited
Boulder, CO	Kyoto	Nation's first carbon tax, passed by voters in 2006	VMT budget for city vehicles, 65% alt. fuel	LEED Silver for city bldgs.; residential green energy code	None	None	Solar rebates, energy audits, optional green energy purchasing
Burlington, VT	10% below 1997 levels by 2005	utility supplies 46% renewable energy	Transp. Demand Management prog.	Energy efficient municipal bldgs.	None	None	Initiated 10 % Climate Challenge campaign for individuals, businesses
Cambridge, MA	20% below 1990 levels	Climate Leader program promotes renewables	Transp. demand management requirement for parking facilities	LEED for city bldgs.	Voluntary pledge	None	Cambridge Energy Alliance works to improve energy efficiency
Chapel Hill, NC	60% below 2005 levels by 2050	Energy Bank revolving loan fund	Fare free transit since 2002	LEED Silver for city bldgs.	n/a	n/a	Tree protection ordinance calls for no net loss of trees/canopy cover
Charlottesville, VA	Kyoto	City/city schools energy sustainability init.	31 alt. fuel vehicles in fleet	New LEED transit center downtown	n/a	n/a	Aiming to achieve a 40% tree canopy coverage
Davis, CA	Kyoto	Solar roof inventory	Bike/ped./transit emphasis	Voluntary green building program	n/a	n/a	Only platinum level awarded bicycle friendly city in the U.S.
Gainesville, FL	Kyoto	Rebates ≤$40K to businesses for conservation	Rapidly growing bus system	Incentives to builders for green bldgs.	n/a	n/a	Rebates to consumers for solar hot water and photovoltaics; low-interest loans
Honolulu, HI	Kyoto	Rebates for lighting, AC retrofits	Hybrid buses	LEED Silver for city bldgs.	None	None	Action plan draws strongly on cultural heritage regarding sustainability
Ithaca, NY	20% below 2001 levels by 2016	Methane recovery at wastewater plant	Optimizing fleet usage	Energy audits for city bldgs.	None	None	81% of city hall's electricity provided via wind power
Keene, NH	10% below 1995 levels by 2015	Methane recovery at landfill	Fleet uses biodiesel	Energy audits and retrofits for city bldgs.	Voluntary actions	None	LED traffic lights installed at most intersections
King Co., WA	80% below 2007 levels by 2050	Goal of 50% nontransit renewable energy	32% of fleet cars are hybrids	LEED required for county bldgs.	None	None	Aims to acquire land or development rights to 100K acres by 2010
Madison, WI	Kyoto	2006 energy plan calls for building 11MW wind	Resolution prohibits idling >5 min/hr	Voluntary green building program	None	None	City has adopted the Natural Step framework and trained 140 staff
Olympia, WA	Kyoto	City purchasing 100% green power for agencies	Switching to hybrid, biodiesel for fleet	Tracking energy use in city bldgs.; efficiency retrofits	None	Moving city wells inland	Downtown subject to flooding; new city hall site will be under water
Santa Cruz, CA	30% by 2020 and 80% by 2050	Renewable energy portfolio of 40%, photovoltaics on city bldgs.	Emphasis on promoting bicycle use	Green components mandatory to obtain a building permit	None	None	All new buildings must be carbon neutral by 2030
Santa Fe, NM	Kyoto	Exploring options including large-scale solar	Buses run on compressed nat. gas; purchasing more efficient vehicles	All new single-family homes must post home energy rating scores	None	None	First to endorse 2030 challenge calling for carbon-neutral buildings by 2030; Build Green code being written
Santa Monica, CA	15% below 1990 levels by 2015; 30% below for City operations	By 2010 25% of electricity to come from renewables	82% of city fleet runs on alt. fuels	LEED to be required for all bldgs. >10,000 sq. ft. by 2010	None	None	City has achieved a 67% waste diversion (recycling) rate, resulting in lower landfill emissions