The 2013 City Energy Efficiency Scorecard

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Executive Summary

Energy efficiency may be the cheapest, most abundant, and most underutilized resource for local economic and community development. Considerable evidence documents that investments in energy efficiency can improve community self-reliance and resilience; save money for households, businesses, anchor institutions, and local governments; create local jobs; extend the life of and reduce the costs and risks of critical infrastructure investments; catalyze local economic reinvestment; improve the livability and the local asset value of the built environment; and protect human health and the natural environment through reducing emissions of criteria pollutants and greenhouse gases.

Local leadership and commitment to energy efficiency is strong in many communities around the United States. The specific responsibilities of local governments give them large influence over energy use in their communities. Cities and metropolitan areas can be the optimal scale at which to implement certain community-wide energy efficiency initiatives because of their interconnected labor markets, social networks, the physical proximity of interrelated economic activities to each other, and the resulting innovations and economies of scale. Local and metropolitan energy efficiency initiatives provide benefits where they are most tangible and visible to residents, directly improving the communities where residents live and work.

This first edition of the *City Energy Efficiency Scorecard* ranks 34 of the most populous U.S. cities on their policies and other actions to advance energy efficiency. It puts these actions in context by also presenting data on energy consumption in these cities when possible. By considering both policies and energy performance, the *City Scorecard* reflects the current activities and historical legacies in each city, and as a result provides actionable information to policymakers and residents. The data on policies and other local actions and resulting scores help to identify cities that are excelling and those that have room for improvement. We provide examples throughout the *Scorecard* of best practice actions being taken by leading cities in various policy areas. As a result, the *Scorecard* offers the beginning of a roadmap for any local government aiming to improve its city's energy efficiency through the most effective means possible, learning from other cities' successes and customizing best practice strategies to suit the local context and their community's priorities.

KEY FINDINGS

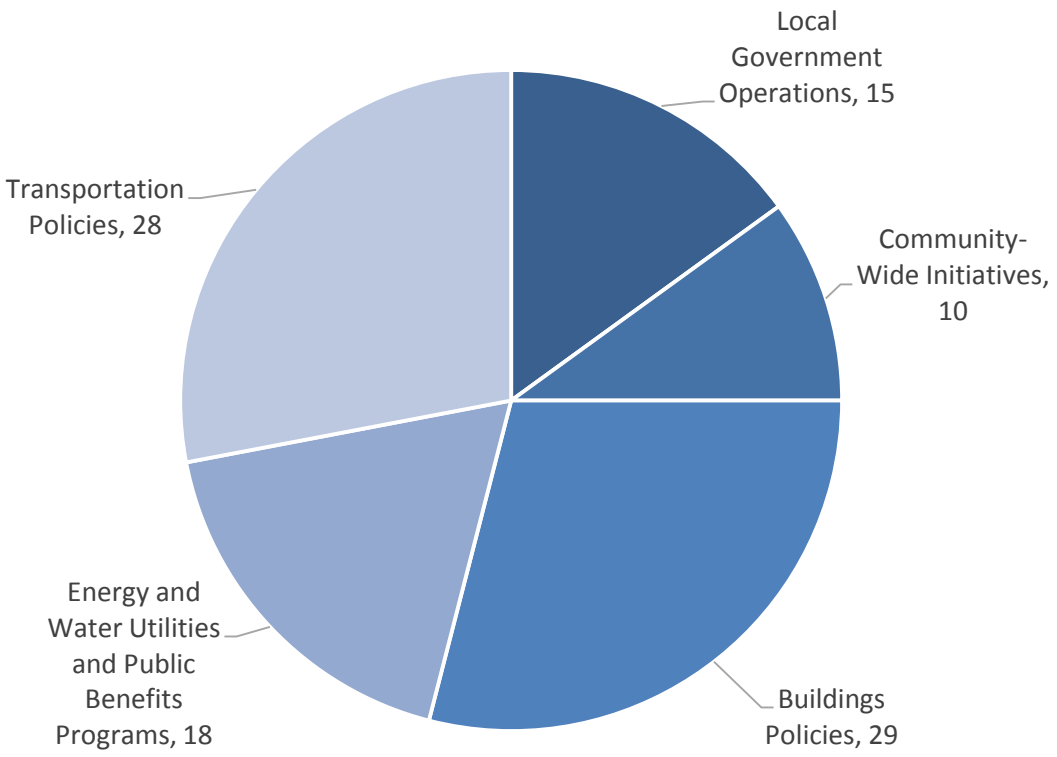
- **Boston** achieved the highest score overall, 76.75 out of a possible 100, and scored well in all policy areas. Particularly notable are its community-wide programs and utility partnerships, including the Renew Boston initiative.
- The other top-scoring cities include **Portland**, **New York City**, **San Francisco**, **Seattle**, and **Austin**. These cities all received more than 60% of possible points and are leaders in energy efficiency across the sectors of their economy. All currently have broad-ranging efficiency policies and programs and also have a significant history of implementing efficiency initiatives.
- Occupying the next tier are those cities receiving more than half of possible points, including **Washington, D.C.**; **Minneapolis**; **Chicago**; **Philadelphia;** and **Denver**. These cities, while slightly lower scoring, have developed comprehensive efficiency initiatives and are poised to rise in the rankings in future years.

- Leaders in efficiency in **local government operations** include **Portland**, **San Francisco,** and **Phoenix,** all of which have made significant efforts to develop efficiency-related goals for city government and improve procurement and asset management.
- The top-scoring cities on **community-wide initiatives** are **Boston**, **Austin, New York City**, and **Philadelphia**. These cities have efficiency targets for the entirety of their community, have developed systems to track progress, have outlined strategies for mitigating urban heat islands, and make significant use of efficient distributed-energy systems such as district energy and combined heat and power.
- Leading cities on **buildings policies** include **Seattle**, **New York City**, **Austin,** and **Boston**. These cities have made significant efforts supporting the adoption of stringent building energy codes, devoted noteworthy resources to building code compliance, established requirements and/or incentives for efficient buildings, set policies to improve the availability of information on energy use in buildings, and supported significant program and workforce infrastructure to provide residents access to comprehensive efficiency services.
- The leading cities on **utilities and public benefit programs** are **Boston**, **San Francisco**, **New York City,** and **Portland**. Residents and businesses in these cities have access to significant energy efficiency programs achieving high levels of savings. These cities also have productive relationships with their utilities on program implementation and access to energy data. Seattle, New York City, El Paso, and Fort Worth are leaders on water-related efficiency in their drinking water, wastewater, and stormwater utilities.
- Cities with the top **transportation policy** scores include **Portland**, **Boston**, **Atlanta**, **San Francisco**, and **Philadelphia**. High-scoring cities have implemented a variety of transportation efficiency initiatives including those related to location-efficient development, shifts to efficient modes of transportation, transit investments and service levels, efficient vehicles and vehicle infrastructure, and energy-efficient freight transport.
- **Austin** is notable as **the city furthest ahead of its state** on energy efficiency policy. While Austin led Texas in all policy areas, the difference was most significant on policies regarding building efficiency.
- **All cities**, even the highest scorers, **have significant room for improvement**. Boston, the highest scoring city, missed nearly a quarter of possible points. Only 11 cities scored more than half of the possible points. All cities can improve their efficiency initiatives to increase their scores.
- Our review of **energy performance indicators** for each city found no statistically significant correlation between the *Scorecard's* policy scores—at the overall or policy area level—and energy consumption for the city as a whole or in individual sectors. However, we found a correlation between energy consumption and policy scores for *specific metrics* within certain sectors, such as greater presence of ENERGY STAR®-certified buildings and greater share of commutes by less energy-intensive transportation modes, which were correlated with higher building and transportation policy scores respectively.

METHODOLOGY

The *City Scorecard* provides an assessment of policies and other actions to improve energy efficiency in cities, including in local government operations, buildings, energy and water utilities, transportation, and the community as a whole. Each policy area is divided into several individual metrics; scores were calculated for each metric and were aggregated to develop overall scores for each policy area and overall scores for the *Scorecard*. Scores were based on information on policies in each city as of June 2013. The maximum number of points possible across all policy areas and metrics was 100. Figure ES-1 includes the distribution of these points across the five policy areas.

Figure ES-1: Distribution of Points by Policy Area



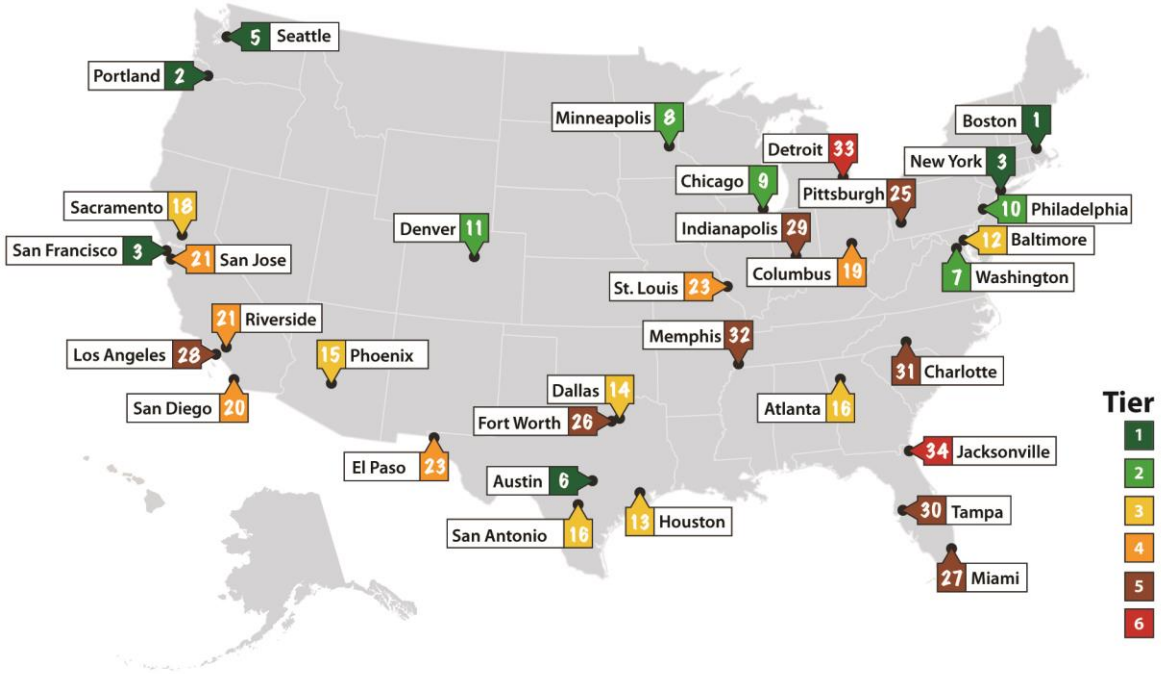
The development of the *Scorecard* was a multi-step process focused on engaging stakeholders, refining the methodology, and collecting and verifying data from a variety of sources. Early on, we shared a document containing a methodology review and proposed metrics and scoring with a diverse group of local government and efficiency stakeholders, and based on feedback from these groups we adjusted the methodology, metrics, and scoring allocation. We compiled data from publicly available data sources, using both organized databases and information available in various locations on the Internet, such as city sustainability and energy websites. Based on our initial research and information gaps we identified, we developed and sent data requests to local government staff (primarily city sustainability directors or energy managers) and other knowledgeable stakeholders in the cities. We applied the scoring methodology to the data collected to produce the initial draft of this report. We conducted an extensive review process in which experts, stakeholders,

and city staff reviewed and commented on the data on which scores were based and the methodology used before we finalized the report.

RESULTS

Figure ES-2 shows how cities ranked in the *City Scorecard*, dividing them into six tiers of similarly scoring cities. The policy-area-specific scores on which these overall scores were based are detailed in Table ES-1. The cities in each tier varied with regard to the policy areas in which they scored poorly or well, but in general they are at a similar level overall in the development of their actions on energy efficiency. In many ways the differences among individual cities, and particularly the fractions of points that separate many of them, are less important than the differences among these tiers.

Figure ES-2: City Rankings in the 2013 City Energy Efficiency Scorecard



Boston earned the highest total score of 76.75 points, followed by Portland with 70, and New York City and San Francisco both with 69.75 points. Seattle and Austin round out the top-scoring cities. The cities in the top two tiers have all made significant long-term commitments to energy efficiency, although the policy areas emphasized and the policy contexts in which they operate vary considerably. The six top-tier cities in this edition of the *City Scorecard* come from diverse geographies and energy markets—three from the Pacific coast, one from New England, one from the Middle Atlantic, and one from the South Central United States. The cities in the second tier—Washington, D.C. (7), Minneapolis (8), Chicago (9), Philadelphia (10), and Denver (11)—include representatives from the Midwest and the Mountain states.

Table ES-1: Summary of City Scores

Rank	City	State	Local Government Operations (15 pts.)	Community-Wide Initiatives (10 pts.)	Buildings Policies (29 pts.)	Energy & Water Utility Policies and Public Benefits Programs (18 pts.)	Transportation Policies (28 pts.)	TOTAL SCORE (100 pts.)
1	Boston	MA	11	9.5	21.5	15.75	19	76.75
2	Portland	OR	13.75	7.5	14.5	14.75	19.5	70
3	New York City	NY	10.5	9	22	15.25	13	69.75
3	San Francisco	CA	13	8	17	15.75	16	69.75
5	Seattle	WA	10.75	6	22.5	14.75	11.25	65.25
6	Austin	TX	9.75	9	21.5	10.75	11	62
7	Washington	DC	8.25	4	21	8.75	14	56
8	Minneapolis	MN	10	6.5	10	13.75	15	55.25
9	Chicago	IL	10.75	8	12	13.5	10.5	54.75
10	Philadelphia	PA	10.5	8.5	11.5	8.5	15.5	54.5
11	Denver	CO	11	7.5	7.5	14.25	12.5	52.75
12	Baltimore	MD	8.75	8	9	8.75	12	46.5
13	Houston	TX	8.75	6	11.5	9	10	45.25
14	Dallas	TX	9.5	6	7.5	8.25	13	44.25
15	Phoenix	AZ	12.25	4.5	11	10.25	5.5	43.5
16	Atlanta	GA	6.75	6	6	6.25	17.5	42.5
16	San Antonio	TX	9.5	6	7.5	8	11.5	42.5
18	Sacramento	CA	8.5	4.5	8.5	11.75	7.5	40.75
19	Columbus	OH	11.25	2	4.5	11.75	9	38.5
20	San Diego	CA	8.25	6	7.5	11.25	5.25	38.25
21	Riverside	CA	5.5	5.5	7.5	11.25	7.5	37.25
21	San Jose	CA	6.25	6	8	11.5	5.5	37.25
23	El Paso	TX	9.25	4.5	3	10	9.5	36.25
23	St. Louis	MO	7	7	7	3.25	12	36.25
25	Pittsburgh	PA	5.25	6.5	7	7.5	8	34.25
26	Fort Worth	TX	8.25	6.5	4.5	8.75	4.75	32.75
27	Miami	FL	5	6.5	6.5	5.5	8.5	32
28	Los Angeles	CA	3	4	6.5	10	8	31.5
29	Indianapolis	IN	5.75	3	3.5	7	9	28.25
30	Tampa	FL	5	4.5	6.5	5.75	5	26.75
31	Charlotte	NC	5.75	2.5	3	4.5	8	23.75
32	Memphis	TN	3.5	3.5	4.5	3	9	23.5
33	Detroit	MI	1.5	3	5.5	4.5	4.5	19
34	Jacksonville	FL	2.5	3	3.5	4.5	3.75	17.25

The differences among the total scores of cities within the middle scoring tiers are small. Only 3.25 points separate the cities in the second tier, and 5.75 and 2.25 points separate the cities in the third and fourth tiers, respectively. Small improvements in energy efficiency actions in these cities may have significant impacts on their future rankings. Conversely, cities in these tiers not actively improving may find their relative rank falling in future editions of the *City Scorecard*. Cities in the top and bottom tiers, however, had wider variations in scoring, as 14.75 points separate the six top-tier cities and 10.75 separate those in the fifth tier. Among high-scoring cities this likely represents some specialization in activities, such as a focus on policies related to either utilities or buildings, and intentional efforts to distinguish themselves among their peers. Among the lower-scoring cities this wide distribution may indicate that there are many cities that are relatively new to energy efficiency activities or that are just beginning comprehensive efficiency initiatives.

STRATEGIES FOR IMPROVING EFFICIENCY

Every city has considerable room for improvement. For cities wanting to improve their energy efficiency and also improve their ranking in the *City Scorecard*, we offer the following high-level recommendations:

- **Lead by example by improving efficiency in local government operations and facilities.** Energy efficiency can be integrated into the day-to-day activities of local government. City governments can systematically implement energy-efficient technologies and practices by adopting policies and programs to save energy in public sector buildings and fleets. They can encourage changes in employee behavior and in standard practices such as procurement. They can also adopt guidelines and policies to direct investment toward more energy-efficient infrastructure (Chapter 2).
- **Adopt energy savings targets.** Energy efficiency-related goals that are endorsed and codified by community and political leaders are often essential for focusing public and private sector resources to achieve energy savings. Goals can come in many flavors. The most common types are goals related to energy use in the community as a whole and those related to energy use in government operations, and these goals can lay the foundation for further policy activity (Chapters 2, 3, 4, and 5).
- **Actively manage energy performance, track and communicate about progress toward goals, and enable broader access to energy use information.** A systematic approach to strategy implementation, including regular tracking and reporting of progress toward goals, can help cities identify opportunities for improving the energy plans by revising timelines, targets, or program strategies. Staff members exclusively tasked with energy management are often needed to effectively implement tasks required to achieve energy-related goals. Performance management also requires data. Cities can work to improve access to energy use data for their own purposes, and can also help improve the energy data available to residents and businesses to encourage them to take efficiency actions (Chapters 2, 3, 4, and 5).
- **Adopt policies to improve efficiency in new and existing buildings.** To improve the efficiency of new buildings, cities can make sure that their efforts in compliance and enforcement of building energy codes are effective and well-funded. If a city has the authority under state law, it can adopt building energy codes with increased stringency. If not, it can advocate for the state to do so. To improve energy efficiency in existing buildings, cities can encourage better integration of energy information

into their local real estate markets through policies requiring energy benchmarking, rating, or disclosure for existing buildings. Cities can also provide incentives for efficient buildings, require energy audits, or implement energy performance requirements for certain building types (Chapter 4).

- **Partner with energy and water utilities to promote and expand energy efficiency programs.** Utilities are the primary funders and administrators of customer efficiency programs in most places around the country. Cities can partner with utilities to promote efficiency programs to their residents and provide additional value added to program delivery to help increase participation and savings. Cities can also be important voices in state utility regulation to encourage the expansion and improvement of efficiency programs run by investor-owned utilities (Chapter 5).
- **Implement policies and programs to decrease transportation energy use through location-efficient development and improved access to additional travel mode choices.** Cities can ensure that major destinations are accessible by more energy-efficient transportation modes through location-efficient zoning and policies that integrate transportation and land use planning. Local governments can expand residents' transportation choices and create neighborhoods that support safe, automobile-independent activities. Cities can implement policies that discourage residents from frequent driving and encourage a switch from driving to other modes of transportation (e.g., public transit, bicycling, walking) through the use of transportation demand-management programs and car- and bicycle-sharing efforts (Chapter 6).

Conclusions and Looking Ahead

Cities around the United States are demonstrating leadership on energy efficiency through a diversity of policy actions related to transportation, buildings, energy and water utilities, and local government operations, as well as policies that target the community as a whole. The benefits of these policies and practices range from economic development and environmental protection to reducing the costs of infrastructure and services.

But despite this significant level of local activity on efficiency, a wide gap exists between the cities at the top of the *Scorecard* rankings and those near the bottom, and even the highest-scoring cities did not come close to earning the total possible points overall. The highest-ranking cities have developed community-wide strategies to improve efficiency but are still working to improve their implementation. Cities ranking lower are more likely to have focused primarily on energy efficiency in local government operations or are at an earlier stage in the development of community-wide strategies.

The *City Scorecard* has examined and scored efficiency activities only in the largest U.S. cities, but the *Scorecard* and related tools provide value to all local governments. First, the policies described in the *Scorecard*, particularly those called out as best practices, can be adopted, perhaps with modifications, by local governments of all sizes.

Second, in order to assist other communities with applying our methodology to assess their policies, ACEEE is developing a *Local Energy Efficiency Self-Scoring Tool*, planned for release in late 2013.

Energy efficiency is an abundant resource in every city. And for all cities there is significant room for expanding and improving their efficiency activities. This is true even for the best performing cities, as demonstrated by the top-scoring city, Boston, which achieved only a little more than three-quarters of the total possible points. What progress will cities make over the next few years? Will Boston retain the top spot or be surpassed? Which city will be most improved and what strategies will it use to get there? The next edition of the *City Scorecard* is planned for 2015, and we will have answers to these questions then.

Introduction

Energy efficiency may be the cheapest, most abundant, and most underutilized resource for local economic and community development. Investments in energy efficiency improve community self-reliance and resilience (ACEEE 2012; Chittum 2012a; Goldman et al. 2012); save money for households, businesses, anchor institutions, and local governments (Mackres et al. 2011; DB 2012; Borgeson and Zimring 2013; Molina 2013; Mackres and Molina 2013); create local jobs (ACEEE 2011a; Goldberg et al. 2011; Bell 2012; Burr et al. 2012); extend the life and reduce the costs and risks of investments in critical infrastructure (Binz et al. 2012; Neme and Sedano 2012; Belzer et al. 2013; IEA 2013); catalyze local economic reinvestment (Hibbard et al. 2011; Muro et al. 2011); improve the livability and the local asset value of the built environment (Becker et al. 2013; IMT 2013b; Kaza et al. 2013; Pivo 2013); and protect human health and the natural environment through reducing emissions of criteria pollutants and greenhouse gases (NAPEE 2009; Hayes and Young 2013).

Local leadership and commitment to energy efficiency is strong in many communities around the United States. The specific responsibilities of local governments give them a large influence over energy use in their communities, including through land use and zoning, building codes, public finance, transportation investment decisions, economic and workforce development, and, in many cases, the direct provision of services such as water and electricity. Local governments can also lead by example through improving the energy efficiency of their own facilities and operations. Cities and metropolitan areas can be the optimal scale at which to implement certain community-wide energy efficiency initiatives because of their interconnected labor markets, social networks, the physical proximity of interrelated economic activities to each other, and the resulting innovations and economies of scale. Local and metropolitan energy efficiency initiatives provide benefits where they are most tangible and visible to residents, directly improving the communities where residents live and work.

The *2013 City Energy Efficiency Scorecard* compiles information on and compares local energy efficiency actions through a comprehensive scoring methodology. This first edition of the *City Scorecard* ranks 34 of the most populous U.S. cities on their policies and other actions to advance energy efficiency. It puts these actions in context by also presenting data on energy consumption in these cities when possible. By considering both policies and energy performance, the *City Scorecard* reflects the current activities and historical legacies in each city, and as a result provides actionable information to policymakers and residents. The data on policies and other local actions and the resulting scores help to identify cities that are excelling and those that have room for improvement. We provide examples throughout the *Scorecard* of best practice actions being taken by leading cities in various policy areas. As a result, the *Scorecard* offers the beginning of a roadmap for any local government aiming to improve its city's energy efficiency through the most effective means possible, learning from other cities' successes and customizing best practice strategies to suit the local context and their community's priorities.

THE IMPORTANCE OF CITIES AND TRENDS IN CITY ENERGY EFFICIENCY

Two-thirds of global energy consumption (World Bank 2010) and 80% of energy consumption in the United States (IEA 2008) occurs in cities. Similarly, over 75% of the world's global-warming greenhouse gases, the majority of which are energy-related, are generated in urban areas (UNEP 2013). Cities' large shares of energy consumption and greenhouse gas emissions

mean that energy efficiency actions in urban areas and by local governments are critically important for addressing the nation's and the world's energy and environmental challenges. Fortunately, despite their large share of consumption, U.S. cities already have lower *per capita* energy consumption than the national average (IEA 2008), indicating that the economies and development patterns of cities themselves can enable more efficient energy use, particularly in the areas of transportation and buildings. These and other opportunities for energy saving are available in all cities. Still, the considerable variation in energy use among cities (Newman and Kenworthy 1999; Brown et al. 2008; IEA 2008; Glaeser and Kahn 2008) means that while further improvements through concerted action are possible everywhere, the biggest opportunities may vary depending on the city.

Moreover, energy efficiency actions can be used as tools to advance the related priorities of local governments and residents, which also vary depending on the city. For many cities, energy efficiency means economic opportunity. Investments in efficiency can drive cost savings for city residents, businesses, and the government itself and also creates new industries and jobs. Cities recognize these opportunities and are leveraging their resources accordingly. A sample of 110 global cities reported savings of $40 million each year as a result of efficiency improvements in government operations alone, and two-thirds of those cities reported the development of new industries (CDP Cities 2013). For example, Boston's Renew Boston program, which provides residential energy retrofits, has to date provided savings of more than $2 million annually to residents and is expected to create 58 local jobs (Boston 2013). In 2010, Chicago saw 4.5% growth in jobs related to energy and resource efficiency. The city attributes the influx of new businesses into the city in part to its energy-related initiatives (Chicago 2012).

Energy efficiency is also seen by many cities as a central element of their expanding initiatives to improve the sustainability and resilience of their communities. These efforts aim to improve economic, social, and environmental well-being while developing the city's and residents' capacity to respond to rapid changes in one or more of these areas. Efficiency actions support these goals by reducing energy and infrastructure costs and reducing the impacts of energy on human health while improving economic opportunities and developing infrastructure that is less prone to risk.

Many cities have also been motivated to improve energy efficiency out of a growing concern for climate change. Many are forging plans to deal with a changing climate and shifting energy portfolios. Numerous U.S. cities have chosen to pursue energy efficiency measures in order to mitigate their contribution to climate change, as well as to protect their communities and economies through adapting to climate changes already taking place. Thirty-two of the 34 cities in the *City Scorecard* are signatories to the U.S. Conference of Mayors Climate Protection Agreement in which more than 1,000 local government executives around the country pledged to strive to meet or beat the Kyoto Protocol greenhouse gas reduction targets in their own communities, through actions ranging from improving building energy performance and location-efficient land-use policies to urban forestry programs and public engagement campaigns (U.S. Conference of Mayors 2008). Ten cities examined in the *Scorecard* have also joined the C40 Cities Climate Leadership Group, a group created in 2005 to reduce emissions and increase energy efficiency in large cities across the world (C40 2011).

Finally, over the past half-decade, a significant increase in efficiency policy and program activity by local governments was precipitated by availability of federal funding through the American Recovery and Reinvestment Act of 2009 (ARRA). Though many local government programs existed well before ARRA, the legislation funneled an unprecedented amount of federal dollars directly into energy efficiency programs. A portion of the $20 billion energy efficiency funding was directed to the Energy Efficiency and Conservation Block Grants, making federal funds for efficiency available to thousands of cities and counties for the first time since at least the 1980s. Many of the initiatives captured in this year's *City Scorecard* were developed in part due to funding made available through ARRA and the resulting prioritized investments. Since the initial block grants were made, the program has not received additional funding, leaving local governments with fewer resources to pursue efficiency now. But in spite of the lack of new money, many cities remain committed to efficiency efforts, demonstrating the value of energy efficiency that was shown to these communities during the few peak years of ARRA funding. This and future *City Scorecards* will reflect the shifts and sustainability of these initiatives as cities prioritize their efficiency programming after ARRA funds run out.

BENCHMARKING CITY EFFORTS AND SHARING BEST PRACTICES

The *City Scorecard*, to be updated biennially, can serve both as a regular benchmark on the status of local efforts and as a tool to inspire further action at the local level. As federal stimulus grants to local governments for energy efficiency initiatives wind down, the *Scorecard* aims to help cities learn from their peers and leverage their investments to develop effective, sustainable approaches for improving energy efficiency in the most cost-effective ways possible. Finally, this report highlights innovative policies being adopted at the local level that could be considered for adoption by other local governments as well as by policymakers at the state and federal levels. While this report focuses on the largest U.S. cities, many of the policies and practices documented are applicable to smaller localities as well as other levels of government.

Other ACEEE Scorecards at the state (Foster et al. 2012) and international (Hayes et al. 2012) levels have received much attention from policymakers, the media, and the public, and have influenced the adoption of improved energy efficiency policies. The goal of this new project is to similarly increase policymaker and public awareness of energy efficiency policy opportunities at the local level and to help foster an environment in which cities can collaborate and compete on advancing efficiency across the United States.

The report is organized into eight chapters. In Chapter 1, we describe the *Scorecard's* methodology, the results of this year's analysis, overall findings from the report, and key energy efficiency strategies for local governments. Chapter 2 scores cities' actions to improve the energy efficiency of local government operations, and Chapter 3 focuses on community-wide efficiency initiatives and policies. Chapters 4, 5, and 6 take a closer look at policies associated with three important energy-related sectors in cities: buildings, energy and water utilities, and transportation, respectively. Chapter 7 analyzes the relationships between policies implemented by the cities and the policies of other jurisdictions that directly influence the city, such as its county and state. Chapter 8 explores complementary, non-policy indicators related to efficiency outcomes and quantifies actual trends in energy use. Because the contents of these final two chapters are not focused on city policies or actions, but are instead intended to give context to and track the impacts of cities' actions, the two chapters do not factor into cities' scores. The concluding chapter discusses the value of the *Scorecard* to communities not scored

here and imminent plans for a *Local Energy Efficiency Self-Scoring Tool*, and areas where future research is planned.

Chapter 1: Methodology & Results

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The policy environment among local governments is complex and varied. Local governments in the United States number in the thousands and have varying sizes and varying authorities. Similarly diverse are the priorities of these local governments and the resulting local energy efficiency actions. To navigate this variation we focus the *City Scorecard* on specific cities and on defined policy areas. Our manageable sample of 34 large U.S. cities allows for the presentation of detailed policy information for each city. However, our metrics are designed based on common policy categories into which the specific efficiency-related activities of most local governments fit, and are therefore broadly applicable even beyond the cities included in the *Scorecard*.

Energy efficiency is important to policymakers, city residents and businesses, as an issue of livability, competitiveness, and economic growth and resilience. Our methodology and metrics attempt to reflect this diversity of stakeholders and interests. As a result, while this is primarily a scorecard that evaluates policies in the broad sense—including local initiatives, practices, and programs and their adoption and implementation—it also serves as a public awareness tool that documents local leadership and describes the availability of energy efficiency services to businesses and households in each city.

GOAL, APPROACH AND AUDIENCES

The Scorecard is designed to benchmark and compare the actions taken to enable or improve energy efficiency in U.S. cities. As a result, our metrics were selected based largely on policy actions that can be implemented or influenced by local governments. Additionally, because local government jurisdictions are our unit of analysis we made every effort to develop metrics that reflect the characteristics of the cities themselves. Whenever possible, data used to score a metric are collected at the geographic scale of the incorporated city itself. Information at the scale of the city jurisdiction can help to provide relevant benchmarks to city policymakers and to incentivize policy adoption in the jurisdictions. For example, most of our metrics measure whether the city itself has a policy or program regarding a particular topic. However, in a few cases the relevant data for a metric are not available or appropriate at the city level. In these cases we try to put the raw data—be it at the level of the county, metro area, or state—in the appropriate context for the city, such as through allocating a proportional amount of the data to the city. For example, because data on freight transportation traffic are only available at the metropolitan level, we normalize them using each city's population.

While all local governments have some direct influence over the policy areas that we analyzed in the *Scorecard*, the amount of influence can vary considerably between cities. This variation among local governments' "capacity to act," the policy mechanisms directly under their control, is due largely to their particular policy environments, including state laws and local control over utilities (Hammer 2009). These factors have a major influence on the policy mechanisms that a city uses to influence energy-related outcomes (ARUP and C40 Cities 2011; Hinge et al. 2013). In the *Scorecard* a city government's capacity to act was not directly addressed as its own metric in the scoring. Instead, we attempted to account for the variation of levels of authority among cities within the scoring for particular metrics where it was relevant. For example, the

scoring of cities with municipal energy utilities is differentiated from that for cities with investor-owned utilities to allow for more equitable comparison between them.

In some cases, we also account for actions taken by other local actors beyond the city government. The actions of other local or metropolitan authorities or even private entities were the basis of scores for particular metrics. For example, even if the water utility serving a city is not municipally governed, we still used it as the basis of our data for our water-related metrics. In the transportation sector, we developed scores by using data on regional transit agencies scaled to the city level. Some actions by private entities were also captured in specific metrics, such as efficiency investments of investor-owned utilities and the development and operations of district energy and combined heat and power systems.

In the cases where we scored actions that lie outside the direct influence of the city government, we did so for three reasons. First, we wanted the *City Scorecard* to act as a citizen awareness and education resource. We would be presenting readers with only a partial picture of the energy efficiency policy environment in a city if we focused on the city government exclusively, ignoring other important entities, such as independent local or regional authorities and investor-owned utilities. Second, it is important to acknowledge that city actions on energy efficiency take place in a local and regional policy ecosystem, and the greater consideration of energy efficiency is needed in the policies, planning, and decision-making of each of these entities. Where there is leadership among one or more of these entities, it is important that it be recognized as a way to encourage learning, emulation, and greater adoption of energy efficiency initiatives among other authorities in the local area. Third, in the cases where the city does not manage or regulate these entities, there are still methods that city governments can use to influence them. Large cities in particular have a combination of soft power options (e.g., use of the bully pulpit and adopting city practices that become de facto regional standards) and hard power options (e.g., funding and votes on governing boards) available to influence other entities in the region.

SELECTION OF CITIES

There are nearly 90,000 local governments in the United States, including over 3,000 counties, over 35,000 municipalities or towns, and over 50,000 special purpose districts such as independent school districts, transit agencies, or public utilities (Census 2012). In the *City Scorecard* we have scored the energy efficiency–related policy actions of 34 of the most populous U.S. cities.[1]

[1] Despite the limitations on the number of localities included in this report, the general methodology we have developed for the report can be used to assess energy efficiency actions in any local jurisdiction. The next phase of research related to the *City Scorecard* includes the development of a "self-scoring" tool that will assist localities, which have not been scored in this report, with applying the same methodology to assess their community. In addition to allowing for comparison to the 34 cities in the main report, the tool will include information on actions of additional comparison communities of various sizes and types, so that users can compare their scores to those of peer communities. In the longer term, we are considering developing a database to collect information on efficiency policies and actions in a larger number of localities, which will allow for sharing of best practices among a larger number of jurisdictions.

There are many units of local government, in addition to cities, that could be analyzed, most notably, counties, which are often as populous as cities, and also townships, school districts, special purpose governmental districts, and regional planning and transportation authorities. Cities and large counties were the obvious choices as units of analysis because of their large populations and broad powers. Small local governments or those with authority limited to only one topic area (e.g., transit or schools) were deemed to have too narrow of influence to include. Ultimately large counties were also excluded, in part because although many have broad policy authority, they often choose or are required to delegate a large portion of their authority to municipalities within their boundaries, diluting their influence. This is especially true of counties that contain the most populous cities. We chose to focus exclusively on cities and their governments because of their significant substantive and symbolic role as the center of economic and cultural activity in their metropolitan regions. As centers of employment and culture, central cities often have outsized influence on travel behavior and a large share of commercial and industrial buildings. The largest city in a metropolitan region can wield policy influence beyond what its population numbers reflect, because of its ability to informally veto or fast-track regional decisions and because other jurisdictions in the region often adopt the same or similar policies.

There are many ways to define a city. The political boundaries of a city government's jurisdiction is the most obvious definition, but an almost as frequent use of "city" is to describe the unit of economic and social activities in urbanized areas. Social and economic definitions, commonly used for statistical purposes, may include multiple political jurisdictions, core cities, suburbs and even some rural areas that share employment centers, similar levels of density, and social venues. For the purposes of the Scorecard, we defined cities by political jurisdiction, identifying the physical borders of local government jurisdictions with direct policy authorities (e.g., "city" as the City of Detroit rather than the Detroit-Livonia-Dearborn metropolitan statistical area).

Our primary considerations when selecting the cities to be included in the *City Scorecard* were:

1) Large energy consumption and energy saving opportunities, in this case determined in proxy by large populations
2) Indirect influence over policy beyond its borders in a populous metropolitan region (e.g., central cities that serve as a large employment center for a region in addition to having significant resident populations)
3) Clout among policymakers to influence the policy of other local governments, states, and the federal government, measured largely through population and economic activity as proxies

As a result of these considerations we applied two criteria—population of the city proper and the population of metropolitan statistical area in which the city was located—to select the cities to be our primary units of analysis. We collected population figures for both criteria from the 2011 American Community Survey (Census 2011). We identified the 25 most populous incorporated U.S. cities and the central cities of the 25 most populous metropolitan statistical areas. The 34 cities that appear on one or both of these lists were selected as our sample. These cities all have large resident populations within their borders (a median population of 730,000, with 305,000 in the smallest city) and are a central city in a metropolitan area with a large

population (a median of 3,230,000, and none smaller than 820,000). These 34 incorporated cities themselves include 12.4% of the population of the United States, and the metropolitan areas in which they are located contain 44.8% (Census 2011). The complete list of selected cities is in Figure 1 and Table 2.

Figure 1. Cities included in the *City Scorecard*

POLICY AREAS AND METRICS CONSIDERED

Our scoring is based on metrics that reflect the adoption and implementation of specific government policies, actions, or public services that can improve energy efficiency. Although the policy environments in cities vary considerably, our metrics are flexible enough to capture the broad range of city actions. These metrics measure policies and programs that:

- Directly reduce end-use energy consumption
- Accelerate the adoption of the most energy-efficient technologies
- Provide funding for energy efficiency programs
- Set long-term commitments to energy efficiency
- Establish or enforce mandatory performance codes or standards
- Reduce market, regulatory, and information barriers to energy efficiency

Each policy metric is related to one of five policy areas and is analyzed in detail in the chapters that follow:

1. Local government operations
2. Community-wide initiatives
3. Buildings policies

4. Energy and water utilities and public benefit programs
5. Transportation policies

SCORING METHOD

Each policy metric and each overall policy area has a maximum number of points assigned to it. As a result of its existing policies and actions, each city could earn between zero and the maximum for each metric. The total of all points for a city provides it with a final score that can be compared to other cities. The maximum number of points possible for a city across all policy areas and metrics is 100. Scores generated for each policy area and metric also enable comparison between cities at the sector or policy level. The policy areas, metrics, and maximum points available in each is included in Table 1 and in more detail in Appendix A, Table A-1.

The distribution of points among policy areas is intended to reflect a combination of the relative energy consumption related to each policy area, the level of opportunity for greater efficiency, and the degree of local government influence over the policy area. The distribution is based on studies of relative local energy savings opportunities (Eldridge et al. 2010; Geller et al. 2012; Laitner et al. 2012a; Mackres et al. 2011; Mackres and Molina 2013; Neubauer et al. 2011), analyses of city energy consumption patterns (UN 2008; IEA 2008; and also Chapter 8 of this *Scorecard*), and the judgment of ACEEE staff, in consultation with external experts, on the potential impacts of local government policies on improving energy efficiency.

Three-quarters of points, or 75 in total, were awarded in three sector-specific policy areas: buildings policies, energy and water utility actions, and transportation policies. Policies and programs related to efficiency in buildings were allocated 29 points. Those related to the actions of energy and water utilities to improve efficiency, primarily in buildings, were allocated 18 points. The point allocation to these two policy areas makes up 63% of end-use sector-specific points and reflects the approximate average percentage of building-related energy use among major cities (among the 13 cities for which we were able to gather detailed energy consumption data, see Chapter 8, buildings and industry combined accounted for an average of 70% of energy use). Transportation policies were allocated 28 points (or 37% of sector-specific points), approximately reflecting the average of 30% of city energy consumption from transportation among the cities for which we had consumption data. We choose not to exactly match the consumption and point allocations percentages for a number of reasons, including that the cities for which we have consumption data are primarily northern, older and denser cities with lower transportation-related energy use when compared to the average U.S. city. Additionally, consumption is not an indicator of the other factors we considered in distributing points: the energy efficiency potential of each sector differs from the consumption share of that sector and, finally, the level of local government influence over each of these three sector-specific policy areas are not equal.

The remaining 25 points were allocated to efficiency effort in government operations and non-sector-specific community-wide actions related to efficiency. Actions pertaining to efficiency in city government operations were allocated 15 points to reflect the importance of these activities as building blocks for broader efforts throughout the community, even though local government energy consumption as a percentage of the entire community is typically only in the single digits. The final 10 points were allocated to community-wide efforts that reached

beyond any specific sector, such as energy savings goals, management of energy strategies, the presence of efficient distributed energy systems, and strategies to mitigate urban heat islands.

Table 1. Scoring by Policy Area

Policy Area and Subcategories	Maximum Score
Local Government Operations	15
Local Government Energy Efficiency Goals	*2*
Energy Strategy Implementation	*4*
Procurement and Construction Policies	*4*
Asset Management	*5*
Community-Wide Initiatives	10
Community-Wide Energy Efficiency Targets	*2*
Performance Management	*3*
District Energy and Combined Heat and Power	*3*
Urban Heat Island Mitigation	*2*
Buildings Policies	29
Building Energy Code Stringency	*6*
Building Energy Code Implementation	*6*
Requirements and Incentives for Efficient Buildings	*9*
Benchmarking, Rating and Disclosure	*6*
Comprehensive Efficiency Services	*2*
Energy and Water Utilities and Public Benefits Programs	18
Electric Efficiency Spending	*4*
Natural Gas Efficiency Spending	*3*
Electric Savings	*2*
EE Targets and Requirements	*2*
Energy Data Provision	*2*
Efficiency Efforts in Water Services	*5*
Transportation Policies	28
Location Efficiency	*8*
Mode Shift	*8*
Transit	*6*
Efficient Vehicles and Driver Behavior	*3*
Freight	*3*
Maximum Total Score	**100**

Within each of the five policy areas we developed a scoring method for each individual policy metric, as described in detail in the subsequent chapters. Generally, points were allocated to metrics based on the approximate relative impact of various local policies on energy savings and weighted more heavily toward policies that reflect local leadership. Scores were assigned to each city for each metric based on these methodologies and were informed by policy

information collected through primary research, utilization of national databases, data requests to local energy or sustainability managers, and input from local stakeholders and efficiency experts.

The policy information contained in the *Scorecard* reflects existing policy as of early June 2013. As new research and data on policy implementation and local energy savings from efficiency become available, we will refine the methodology, metrics, and scoring for future editions of the *City Scorecard* to best capture and present the information regarding local efforts to capture efficiency opportunities.

DATA COLLECTION AND REVIEW

The development of our methodology and our data collection process consisted of multi-step outreach to local stakeholders in the cities we scored and energy efficiency experts nationwide. The five steps in the process included:

1. *Methodology review and development of metrics*—We shared a document containing a proposed methodology, metrics, and scoring with ACEEE project advisors, an advisory committee made up of energy-focused staff in local governments, and an external expert advisory group. We adjusted the methodology, metrics, and scoring allocation based on feedback from these groups.

2. *Primary and secondary data collection.* We compiled data relevant to our metrics for each city from publicly available data sources, using both organized databases and information available in various locations on the Internet, such as city sustainability and energy websites.

3. *Data request development, administration, and network building.* Based on our initial research and the information gaps we identified, we developed a prepopulated data request for each city and sent it to local government staff (primarily city sustainability directors and energy managers) or other knowledgeable stakeholders in the city. Of the 34 data requests sent to the 34 cities, 29 were returned to us. The cities and staff that completed and returned data requests are included in Appendix A, Table A-2.

4. *Analysis and writing.* We applied the scoring methodology developed in step one to the data received from each city and data we collected in step two above, and produced the first complete draft of the *City Scorecard*.

5. *External review and revision.* Before finalizing the report we carried out an internal ACEEE review and conducted an extensive external review process to allow experts and stakeholders to review and comment on the scores, the data on which they were based, and the methodology employed. External reviewers included the expert advisory group and local government advisory committee, local government representatives whom we had initially contacted with regard to our data requests, stakeholder contacts in the cities scored, and other stakeholders identified throughout the course of the research.

In this external review we attempted to engage a broad group of stakeholders in each city, soliciting in most cases comments from five or more contacts per city. In total, we received and

incorporated nearly 250 comments from over 40 individuals and organizations. These included representatives from government and private and non-profit organizations, in particular:

- Sustainability directors in city government (or, if no single point of contact existed, department contacts in facilities, transportation, buildings, and/or public works)
- Energy/sustainability staff persons at the metropolitan planning organization or council of governments
- Efficiency managers at energy and water utilities
- Staff at local non-governmental organizations focused on energy, environment, consumer advocacy, or economic development

"BEST PRACTICE" POLICY METRICS

A research exercise such as the *City Scorecard* is faced with challenges in translating detailed, nuanced, and often qualitative policy information into quantitative scores. To address this challenge we used "best practice" policy metrics. We scored cities on actions, policies, and the implementation of policies, rather than on metrics related to outcomes—such as energy performance or savings—whose exact relationship to policy actions can be difficult to gauge. For example, the evidence that building energy codes improve energy efficiency is well established, but determining the actual energy saved in a particular jurisdiction that is attributable to codes is a difficult task (Aroonruengsawat et al. 2012). To develop scores and weightings for particular policies and actions, we used information on documented potential savings, even in the absence of data on actual energy savings. In addition, we went beyond data on policy *adoption* and to also score information regarding policy *implementation*, where available, to better capture the actual energy saving activities in a city. To continue with a building code example, since building codes lead to the greatest energy savings when they are fully implemented and compliance is near universal, we allocated points not only for code adoption but for code implementation and compliance as well. We departed from this best practices approach in only two scored metrics. We include a metric on electricity savings from utility efficiency programs, because these savings have been verified as being directly attributable to efficiency programs and are regularly reported in a standardized format. Second, we include a metric on the presence of district energy and combined heat and power systems, rather than on related policies, because this data was more readily available. We hope to adjust this metric to be more policy-oriented in future editions of the *Scorecard*.

Our focus on policy metrics is in keeping with our goal of providing actionable information to residents, businesses, and policymakers. While it is interesting to see how one's city compares to others in energy use per capita, particularly for setting goals and tracking progress, such information about energy use cannot alone function as a roadmap. It does not provide detailed information on broad-based policy actions that can be taken to change the landscape of the city's energy usage overall. Policymakers most need to know what actions they can take to make improvements to their city's energy use based on their current situation. For residents and businesses, the information they most need is what services, policies, and incentives are available to help them take action to improve their efficiency and knowledge about the policies they might want to support for in their interactions with policymakers.

We do discuss energy outcome metrics and energy-related performance metrics to provide context for the policy scores, but these are mostly confined to Chapter 8, where they are

presented for informational purposes but are unscored. Outcome metrics describe the unique energy-related characteristics of a city that may be the result of historical legacy (e.g., past infrastructure investments, land use choices, or policies), the makeup of the local economy, or other factors that cannot be affected quickly by local policies. In many cases these metrics are not direct indicators of energy efficiency, but rather indicators of energy intensity—the amount of energy used per unit of economic activity or, in some cases, per capita—which may also reflect changes in economic activities and other non-efficiency variables. The collection of these data also allow for some analyses of the relationship between the policies evaluated in the *Scorecard* and outcomes metrics, including indicators such as ENERGY STAR–certified buildings, commuting behaviors, and vehicle miles traveled. Unfortunately, we do not have access to all of these data for all of our cities, limiting the value of these energy consumption indicators as variables to be compared with policy actions. Where possible, we present data from multiple years for these metrics in order to describe trends over time, and we will update these same energy outcome metrics in the next edition of the *City Scorecard*.

There are additional challenges that stem from this being the first edition of the *City Scorecard*, many of which have already been addressed in other regularly updated reports such as ACEEE's *State Scorecard* that are more established. Because this is a new report, many of the metrics themselves are, for practical purposes, new metrics. They have never been regularly tracked at this level of detail for a large sample of cities in a comparable format. Comparisons among cities is challenging, given the absence of established standard reporting protocols, the absence of standardized national datasets such as those available from the U.S. Energy Information Administration (EIA) for states, and the broad differences in how data are tracked and reported by the cities themselves. With time, the *City Scorecard* will help to address these challenges through establishing a common understanding of best practices, and related documentation, while still encouraging innovative actions in individual cities.

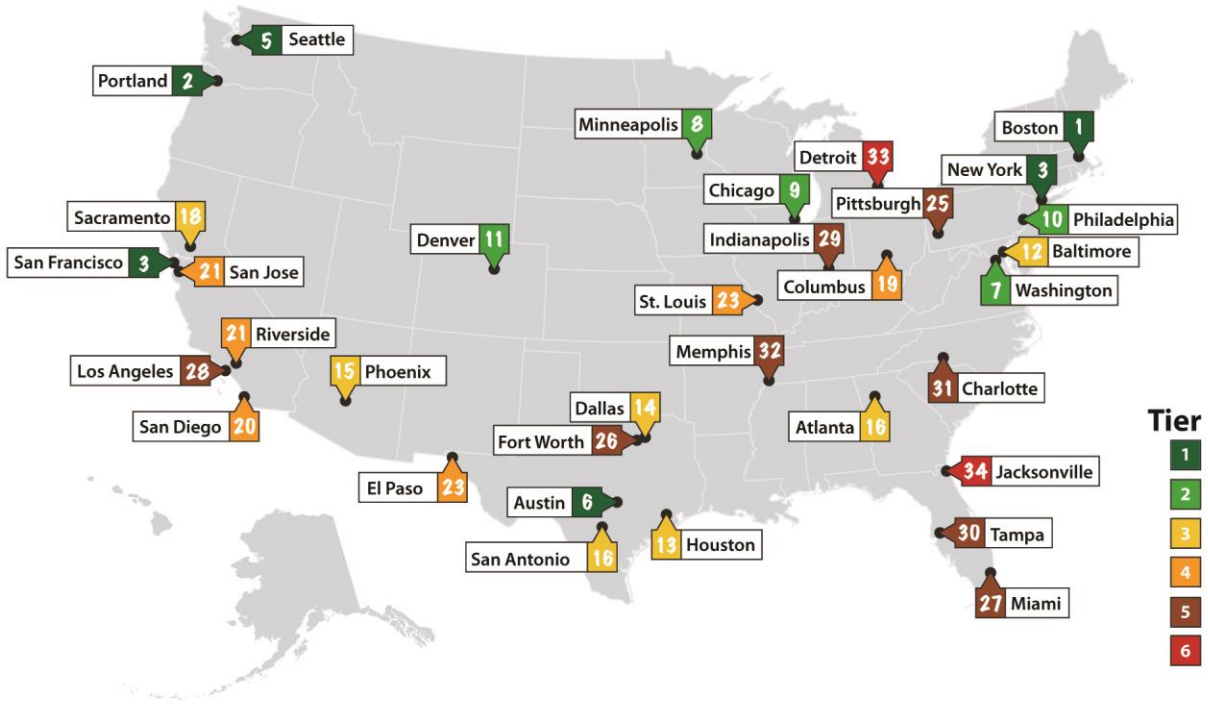
The varied data sources used for the project also presented challenges. Due to the absence for most of the topic areas of centralized, standardized data sources from which to assign scores, our data collection required the use of a dozens of primary and secondary sources. While there is a growing literature capturing some city practices, and nearly every city we scored has some online presence with regard to energy efficiency activities, this information alone was usually not enough to fully score cities on every metric. Our direct engagement with city staff members through the data requests helped to fill the remaining gaps. While the response rate to our data request was very high, with 29 of 34 cities participating, we were unable to verify all of the information we collected independently for the remaining five cities that did not respond (Detroit, Jacksonville, Los Angeles, Sacramento, and San Jose). In these cases, we used the most recent publicly available information and where no information was found the city was given zero points for that metric.

Another issue to note is the timeliness of data. For all metrics we used the most recent publicly available data, but for metrics that rely on national datasets, the most recent data available are often a few years old. For example, we used 2011 data on energy utility revenues and energy savings from efficiency programs because those were the most recent available from the EIA. Similarly, 2010 or 2011 data were the most recent available from some of the national datasets that we used in the transportation chapter.

2013 RESULTS

Boston earned the highest total score of 76.75 points, followed by Portland with 70, and New York City and San Francisco both with 69.75 points. Seattle and Austin round out the top-scoring cities. The full results of the *City Scorecard* are presented in Figure 2, and more fully in Table 2 and Figure 3. In the following sections we discuss how to interpret the overall results and highlight the efficiency-related efforts of the highest-scoring cities.

Figure 2. *City Scorecard* Rankings Map



How to Interpret the Results

Perhaps the most straightforward and valuable way to understand the performance of cities is through their relative positioning with regard to their peers. In Table 2 we present groupings of cities in tiers of five to eight cities based on clusters of cities with similar total points. The cities in each tier have variations regarding the policy areas where they scored poorly or well, but in general they are at a similar level overall in the development of their actions on energy efficiency. In many ways the differences between individual cities, and particularly the fractions of points that separate many of them, are less important than the differences between these tiers.

The differences among the total scores of cities within the middle scoring tiers are small. Only 3.25 points separate the cities in the second tier, and 5.75 and 2.25 points separate the cities in the third and fourth tiers, respectively. Small improvements in energy efficiency actions in these cities may have significant impacts on their future rankings. Conversely, cities in these tiers not actively improving may find their relative rank falling in future editions of the *City Scorecard*. Cities in the top and bottom tiers, however, had wider variations in scoring, as 14.75 points

separate the six top-tier cities and 10.75 separate those in the fifth tier. Among high-scoring cities this likely represents some specialization in activities, such as a focus on policies related to either utilities or buildings, and intentional efforts to distinguish themselves among their peers. Among the lower-scoring cities this wide distribution may indicate that there are many cities that are relatively new to energy efficiency activities or that are just beginning comprehensive efficiency initiatives.

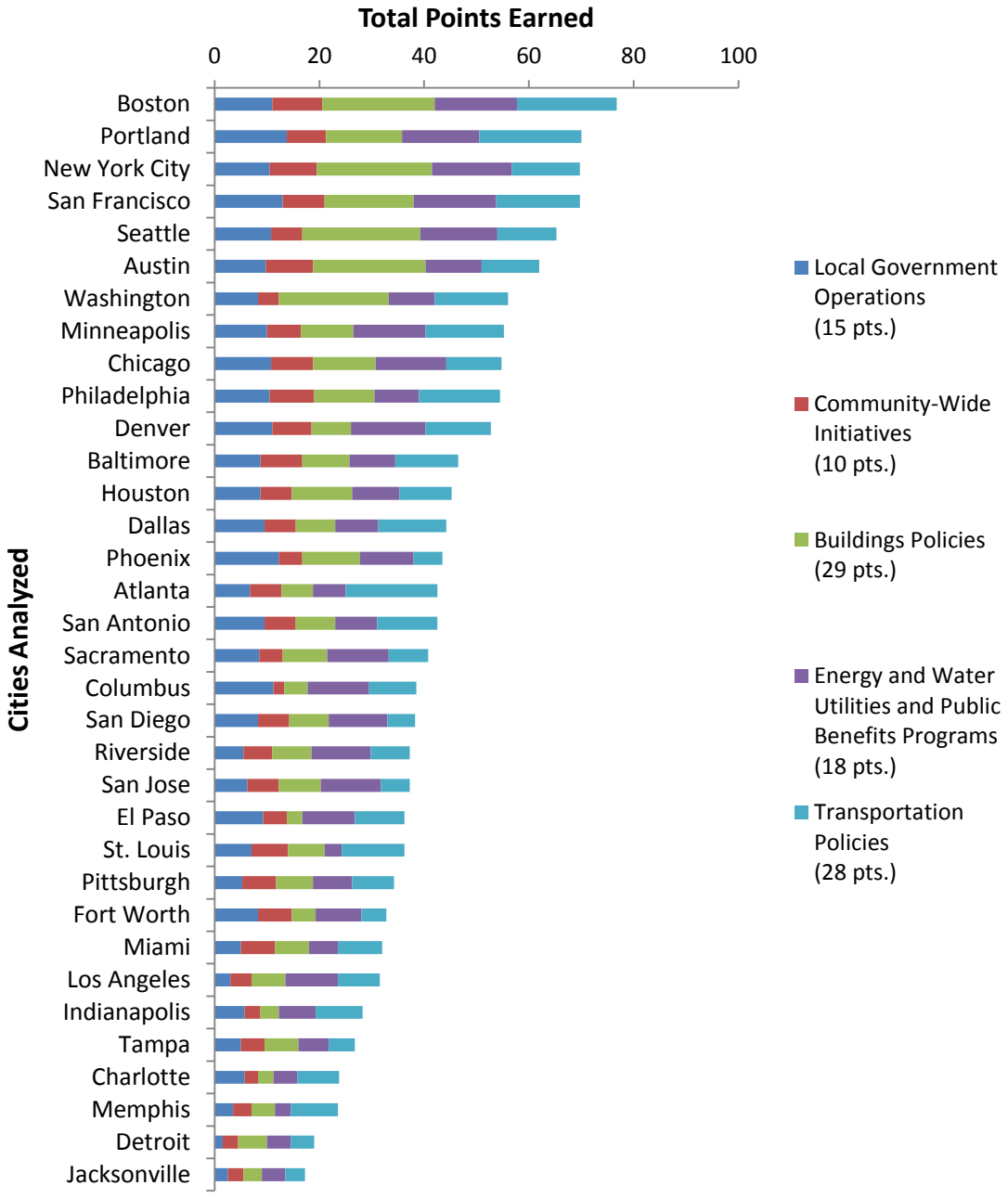
Table 2. Summary of City Scores

Rank	City	State	Local Government Operations (15 pts.)	Community-Wide Initiatives (10 pts.)	Buildings Policies (29 pts.)	Energy & Water Utility Policies and Public Benefits Programs (18 pts.)	Transportation Policies (28 pts.)	TOTAL SCORE (100 pts.)
1	Boston	MA	11	9.5	21.5	15.75	19	76.75
2	Portland	OR	13.75	7.5	14.5	14.75	19.5	70
3	New York City	NY	10.5	9	22	15.25	13	69.75
3	San Francisco	CA	13	8	17	15.75	16	69.75
5	Seattle	WA	10.75	6	22.5	14.75	11.25	65.25
6	Austin	TX	9.75	9	21.5	10.75	11	62
7	Washington	DC	8.25	4	21	8.75	14	56
8	Minneapolis	MN	10	6.5	10	13.75	15	55.25
9	Chicago	IL	10.75	8	12	13.5	10.5	54.75
10	Philadelphia	PA	10.5	8.5	11.5	8.5	15.5	54.5
11	Denver	CO	11	7.5	7.5	14.25	12.5	52.75
12	Baltimore	MD	8.75	8	9	8.75	12	46.5
13	Houston	TX	8.75	6	11.5	9	10	45.25
14	Dallas	TX	9.5	6	7.5	8.25	13	44.25
15	Phoenix	AZ	12.25	4.5	11	10.25	5.5	43.5
16	Atlanta	GA	6.75	6	6	6.25	17.5	42.5
16	San Antonio	TX	9.5	6	7.5	8	11.5	42.5
18	Sacramento	CA	8.5	4.5	8.5	11.75	7.5	40.75
19	Columbus	OH	11.25	2	4.5	11.75	9	38.5
20	San Diego	CA	8.25	6	7.5	11.25	5.25	38.25
21	Riverside	CA	5.5	5.5	7.5	11.25	7.5	37.25
21	San Jose	CA	6.25	6	8	11.5	5.5	37.25
23	El Paso	TX	9.25	4.5	3	10	9.5	36.25
23	St. Louis	MO	7	7	7	3.25	12	36.25
25	Pittsburgh	PA	5.25	6.5	7	7.5	8	34.25
26	Fort Worth	TX	8.25	6.5	4.5	8.75	4.75	32.75
27	Miami	FL	5	6.5	6.5	5.5	8.5	32
28	Los Angeles	CA	3	4	6.5	10	8	31.5
29	Indianapolis	IN	5.75	3	3.5	7	9	28.25
30	Tampa	FL	5	4.5	6.5	5.75	5	26.75

Rank	City	State	Local Government Operations (15 pts.)	Community-Wide Initiatives (10 pts.)	Buildings Policies (29 pts.)	Energy & Water Utility Policies and Public Benefits Programs (18 pts.)	Transportation Policies (28 pts.)	TOTAL SCORE (100 pts.)
31	Charlotte	NC	5.75	2.5	3	4.5	8	23.75
32	Memphis	TN	3.5	3.5	4.5	3	9	23.5
33	Detroit	MI	1.5	3	5.5	4.5	4.5	19
34	Jacksonville	FL	2.5	3	3.5	4.5	3.75	17.25

The cities in the top two tiers have all made significant long-term commitments to energy efficiency, although the policy areas emphasized and the policy contexts in which they operate vary considerably. Because of these demonstrated commitments, we expect that there will be considerable additional new policy activity in these cities over the coming years, setting the stage for expanded competition among cities regarding energy efficiency and creating a tight field of contestants for the next edition of the *City Scorecard*.

Figure 3. City Scores by Policy Area



2013 Leading Cities

The six top-tier cities in this edition of the *City Scorecard*—Boston, Portland, New York City, San Francisco, Seattle, and Austin—come from diverse geographies and energy markets, three from the Pacific coast, one from New England, one from the Middle Atlantic, and one from the South Central United States. The cities in the second tier—Washington, D.C. (7), Minneapolis (8), Chicago (9), Philadelphia (10), and Denver (11)—also include representatives from the Midwest and Mountain states. These cities have embraced energy efficiency for a variety of reasons in

different physical and political environments and as a result have developed different strategies, which are reflected in their scores.

Boston received the highest score overall, the highest score for community-wide initiatives, and tied with San Francisco for the highest score on utilities and public benefits programs. Boston has a broad set of efficiency policies, exemplified most recently by the adoption of an energy-use-disclosure requirement for buildings, and also runs its own efficiency program, Renew Boston. The city has community-wide targets for greenhouse gas emissions reductions and electricity savings, has put significant effort toward actively managing its progress, and is on track to hit its goals. Boston has also emerged as a strong voice for efficiency at the state level in Massachusetts, the highest-scoring state in the *2012 State Energy Efficiency Scorecard* (Foster et al. 2012). The city has been an advocate for the state's high levels of utility spending on electricity and natural gas efficiency programs and has worked directly with its investor-owned utilities to promote programs and fund city-run initiatives.

Portland was the overall runner-up and received the highest score for transportation policies and local government operations. With regard to transportation, Portland scored particularly well on location-efficient transportation and land use policies, such as zoning and incentives for compact development, mode-shift efforts such as integrated transportation and land use planning, and transportation demand management programs. The city is also a leader at integrating energy efficiency across the everyday activities of local government, such as procurement and asset management. It has set goals to improve energy efficiency in government and has made progress toward achieving them.

New York, tied for third overall with San Francisco, is a leader in building policies, receiving the second-highest score in the area, only 0.5 points behind Seattle. The city's Greater, Greener Buildings Plan and related policies require building rating and disclosure for commercial and multifamily buildings, and also require actions to improve efficiency in the largest buildings. Additionally, New York is tied for the top score (along with Seattle, El Paso and Fort Worth) for water-related efficiency activities and is tied for the second-highest score for community-wide initiatives.

San Francisco, also in third, had high-scoring activity in every policy area. San Francisco is a generalist and earned its high score by taking a broad approach to energy efficiency rather than excelling solely in a particular sector or policy type. San Francisco tied with Boston for the highest score on energy and water utilities, where it scored particularly well on the policies and programs related to its energy utilities such as high spending on electric efficiency programs and good access to energy use data. The city also received the second-highest score for local government operations, less than a point behind Portland.

Seattle, in fifth overall, received the top score on buildings policies. In addition having rating and disclosure policies for commercial and residential buildings, Seattle has been a leader in building energy code adoption and implementation. The city also scores well in the utility policy area thanks to a leading municipal electric utility with significant efficiency programs and a broad set of water-related efficiency activities, including in their drinking water, wastewater, and stormwater utilities.

Austin, in sixth place overall, is tied for third with Boston on buildings policies and is tied with New York for second-highest score related to community-wide initiatives. Austin has been a leader in implementing building energy codes, adopting building energy disclosure policies, and has a significant building performance workforce infrastructure. Beyond buildings, the city has also been a leader on district energy and combined heat and power and is a leading municipal utility on efficiency programs. Austin is also notable as the city furthest ahead of its state on energy efficiency policy and implementation. The city scores much better than Texas as a whole on equivalent metrics as discussed in Chapter 7.

Cities in Context

For many cities it is valuable to learn from other cities to which they are similar. Cities that have similar legal, institutional, cultural, and climate contexts can often provide examples of policy adoption and implementation that are most valuable to each other. Table A-3, in Appendix A, presents several of these contextual variables for each of the cities included in the *Scorecard*, including climate region, geographic region, ownership types for electric and natural gas utilities, authority over local building code adoption, city population, and grant sizes under the Energy Efficiency and Conservation Block Grant program. While there are many other variables that may be of interest, we hope that this information will help cities begin to identify and learn from cities included in the *Scorecard* with which they have similarities in particular areas.

As for how these contextual variables relate to scores: there is no statistically significant relationship between most of these factors and a city's score in the *City Scorecard*. This was even true of factors, such as climate, which might be expected to enable or encourage cities to take action on efficiency. The only exception was for the Census Division in which a city was located. Cities in the New England, Middle Atlantic, or Pacific divisions had a very weak but significant statistical relationship with higher scores. This lack of statistical relationships is unsurprising because the scoring method used for the *City Scorecard* was designed to control for cities' variation in governance structure and local authority in the individual metrics in order to allow for overall and policy area comparisons among cities. Chapter 7 explores in detail another important contextual issue, the relationship between cities and other levels of government, particularly their states.

STRATEGIES FOR IMPROVING EFFICIENCY

Notably, even the top-scoring city only earned three-quarters of the total possible points available in the *City Scorecard*. This highlights the considerable room for improvement available to all cities, even those ranked most highly. For cities wanting to improve their energy efficiency, and also improve their ranking in the *City Scorecard*, we summarize here several high-level recommendations. The subsequent chapters of the report provide more detailed information on where individual cities missed points and offer information about actions they can take to improve efficiency policies and earn more points in the next edition.

Lead by example by improving efficiency in local government operations and facilities. Energy efficiency can be integrated into the day-to-day activities of local government. City governments can systematically implement energy-efficient technologies and practices by adopting policies and programs to save energy in public sector buildings and fleets. They can encourage changes in employee behavior and in standard practices such as procurement. They can also adopt guidelines and policies to direct investment toward more energy-efficient

infrastructure. Efficiency initiatives focused on city operations are often a stepping stone to initiatives to improve efficiency throughout the community.

Examples: Portland and Houston (management of buildings, infrastructure, and public employee assets), Phoenix (procurement and construction policies)

Adopt energy savings targets. Energy efficiency-related goals that are endorsed and codified by community and political leaders are often essential for focusing public and private sector resources to achieve energy savings. Goals can come in many flavors. The most common types are goals related to energy use in the community as a whole and those related to energy use in government operations, and these goals can lay the foundation for further policy activity. Some communities also set goals for specific energy using sectors of the economy, such as buildings or transportation. For example, some communities are beginning to develop goals for building energy use, such as those participating in the DOE's Better Buildings Challenge. Additionally, some cities have the authority to set goals related to their utilities, such as energy or water savings goals for utility efficiency programs or target levels of efficiency investments.

Examples: Baltimore (community-wide energy target), Sacramento (local government energy target), Austin (municipal energy utility target), Philadelphia (buildings energy savings target), El Paso (water savings target and energy management efforts for water system)

Actively manage energy performance, track and communicate about progress toward goals, and enable broader access to energy use information. A goal is only as good as the effort put toward achieving it, and you can't manage what you don't measure. A systematic approach to strategy implementation, including regular tracking and reporting of progress toward goals, can help cities identify opportunities for improving the energy plans by revising timelines, targets, or program strategies. Staff members exclusively tasked with energy management are often needed to effectively implement tasks required to achieve energy-related goals. Performance management also requires data. Cities can work to improve access to energy use data for their own purposes, and can also help improve the energy data available to residents and businesses to encourage them to take efficiency actions. A core strategy for improving access to energy data is to work with utilities to improve the availability and use of utility energy consumption and billing data.

Examples: Denver (tracking progress and reporting on local government goals), Chicago (tracking progress and reporting on community-wide goals), San Francisco (access to utility energy data)

Adopt policies to improve efficiency in new and existing buildings. City governments often have considerable influence over buildings in their community. To improve the efficiency of new buildings, cities can make sure that their efforts in compliance and enforcement of building energy codes are effective and well-funded. If a city has the authority under state law, it can adopt building energy codes with increased stringency. If not, it can advocate for the state to do so. To improve energy efficiency in existing buildings, cities can encourage better integration of energy information into their local real estate markets through policies requiring energy benchmarking, rating, or disclosure for existing buildings. Cities can also provide incentives for efficient buildings, require energy audits, or implement energy performance requirements for certain building types.

Examples: Austin, Houston, and Seattle (local energy code adoption), Austin (third-party energy code enforcement; Energy Conservation Audit and Disclosure ordinance), Chicago (residential energy use disclosure requirement), San Francisco (residential energy conservation ordinance, commercial building benchmarking and disclosure requirement); New York City (Greener, Greater Buildings Plan; including requirements for building benchmarking, energy audits, and tune-ups)

Partner with energy and water utilities to promote and expand energy efficiency programs. Utilities are the primary funders and administrators of customer efficiency programs in most places around the country. Cities can partner with utilities to promote efficiency programs to their residents and provide additional value added to program delivery to help increase participation and savings. Cities can also be important voices in state utility regulation to encourage the expansion and improvement of efficiency programs run by investor-owned utilities.

Examples: San Francisco (SF Energy Watch utility partnership), Boston (Empower Boston utility partnership), Austin (joint programs targeting water and energy savings), Seattle (water utility planning and efficiency programs)

Implement policies and programs to decrease transportation energy use through location-efficient development and improved access to additional travel mode choices. Local governments take the lead in shaping land use, as they have jurisdiction over zoning laws and regulations. Likewise, central cities and other job centers can have significant influence over commuting behaviors and choices of residents in their region. Cities can ensure that major destinations are accessible by more energy-efficient transportation modes through location-efficient zoning and policies that integrate transportation and land use planning. Local governments can expand residents' transportation choices and create neighborhoods that support safe, automobile-independent activities. Cities can implement policies that discourage residents from frequent driving and encourage a switch from driving to other modes of transportation (e.g., public transit, bicycling, walking) through the use of transportation demand-management programs, and car- and bicycle-sharing efforts.

Examples: Boston (goal to reduce vehicle miles traveled), New York City (funding for and access to public transit), Indianapolis ("complete streets" ordinance), Portland (location-efficient zoning and parking policies), El Paso (location-efficient zoning)

Chapter 2: Local Government Operations

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INTRODUCTION

City governments have great opportunities to lead by example, as they advance energy-efficient technologies and practices by adopting policies and programs to save energy in public sector buildings and fleets. Local governments can see multiple benefits from investments in energy efficiency. Energy use can account for as much as 10 percent of a local government's annual operating budget, and that proportion may increase as energy prices rise (EPA 2011c). "Lead-by-example" initiatives can improve the operational efficiency and economic performance of the city's assets, while at the same time demonstrating the city's commitment to energy efficiency. Moreover, the demonstration of efficiency technologies and strategies can help speed their adoption in the broader local market and spur private sector investment. Efficiency initiatives focused on city operations are often a stepping stone to efforts to improve efficiency throughout the community.

In this category, we focused on four areas in which local government policies can impact energy efficiency in government operations:

- Energy efficiency goals for municipal operations
- Management and implementation of energy efficiency strategies for municipal operations
- Procurement and construction policies that include energy efficiency guidelines
- Strategies for managing existing government assets that integrate energy efficiency

Strategies in this section are often the result of mayoral goals, executive orders, or city council resolutions. These mandates can spur immediate action by clearly articulating goals, establishing time frames, and engaging key personnel. City governments vary considerably in the size and scope of their authority. For example, some city governments directly control their water and wastewater systems (which we examine in Chapter 5, Energy and Water Utility Policies and Public Benefits Programs) and school systems. In other places these functions are administered by independent authorities. But all cities can take some actions, including those included in this chapter, to demonstrate leadership in their community.

Policy Trends

Lead-by-example initiatives in some cities are based on cost considerations and as a hedge against volatile energy prices, with energy efficiency as the mechanism to achieve those cost savings. As cities begin to consider lifecycle costs of purchases and construction policies, energy efficiency upgrades often make good financial sense. Energy-efficient buildings can produce lifetime cost savings of millions of dollars compared to conventional buildings (EPA 2011c). By adjusting accounting techniques to capture these long-term savings, cities are beginning to prioritize energy-efficient investments across the board.

A further driver of local government operations initiatives is a growing commitment to climate change mitigation. While many cities are also taking city-wide action, they often begin implementation with their own government operations. Coordinating energy efficiency goals with climate policies often lowers the cost of meeting emissions reduction targets.

Finally, in the years since 2009, a significant increase in efficiency policies and programs focused on local government operations was precipitated by availability of funding through ARRA and the resulting Energy Efficiency and Conservation Block Grants to thousands of local governments. The program covers a variety of initiatives, including retrofits of municipal buildings and infrastructure, and the development of municipal energy use inventories (Black et al. 2009).

RESULTS

Cities could earn a maximum of 15 points for local government operations: two (2) points for energy efficiency goals, four (4) points for energy strategy implementation, four (4) points for procurement and construction policies, and five (5) points for integration of energy efficiency into asset management and maintenance strategies. The points for local government operations are 15% of the overall possible points for the *Scorecard*. This is not because local governments represent this portion of energy use (on the contrary; most often local government energy use as a percentage of total community energy use is in the single digits), but rather because of the role that actions in local government can play as a catalyst for the development of policy—and voluntary action—related to energy efficiency in the private sector. Points were allocated to individual metrics using a similar rubric: the approximate energy savings impact of the metric combined with its significance in demonstrating leadership. Table 3 presents the overall results of scoring on local government operations.

Portland received the highest overall score for local government operations as well as the highest or one of the highest scores in every subcategory, reflecting a broad strategy including a strong energy-related goal, a performance management strategy in place, and policies related to energy efficiency for both procurement and management of existing assets. San Francisco and Phoenix round out the top three.

Most of the points in this category were earned for policies, rather than specific energy-savings outcomes. However, we did attempt to capture information on the impact of policy implementation to the extent the data were available. For example, strategy implementation points were given to cities that showed progress toward their goals in their public progress reports. No data sources aggregate comprehensive information on city energy efficiency policies across the United States. As a result, unless otherwise noted, we relied primarily on cities' publicly available energy or sustainability reports and websites for the data presented in the following sections. We supplemented publicly available data with a data request to municipal sustainability officers. Many cities are in the process of formalizing internal policies that relate to energy-efficient operations. For the purposes of this report, draft policies did not receive points. Finally, many of the policies related to government operations included in this chapter have equivalent policies related to actions taken in the private sector (e.g., the requirement to benchmark buildings' energy use). Equivalent private sector policies are not included in this chapter but are accounted for in the chapters that follow.

Table 3. Summary of Scoring on Local Government Operations

City	State	Gov. Energy Efficiency Goals (2 pts.)	Energy Strategy Implementation (4 pts.)	Procurement & Construction Policies (4 pts.)	Asset Management (5 pts.)	Total Score (15 pts.)
Portland	OR	2	3.75	3.75	4.25	13.75
San Francisco	CA	2	3.5	3	4.5	13
Phoenix	AZ	2	2.5	3.75	4	12.25
Columbus	OH	2	2.5	3.75	3	11.25
Boston	MA	2	3	3.5	2.5	11
Denver	CO	1	4	3	3	11
Chicago	IL	2	2.5	2.75	3.5	10.75
Seattle	WA	2	1.75	3.5	3.5	10.75
New York City	NY	2	2.5	3	3	10.5
Philadelphia	PA	2	3.5	3	2	10.5
Minneapolis	MN	2	3	3.5	1.5	10
Austin	TX	2	3.25	2.5	2	9.75
Dallas	TX	1	3.5	3	2	9.5
San Antonio	TX	2	2	2.5	3	9.5
El Paso	TX	1	2.5	2.75	3	9.25
Baltimore	MD	2	3	1.25	2.5	8.75
Houston	TX	0.5	1.75	2.25	4.25	8.75
Sacramento	CA	2	1.5	3	2	8.5
Fort Worth	TX	2	1.5	1.75	3	8.25
San Diego	CA	1	1.5	3.75	2	8.25
Washington	DC	0	2.75	2.5	3	8.25
St. Louis	MO	1	2.25	1.75	2	7
Atlanta	GA	1	2	1.75	2	6.75
San Jose	CA	2	1.5	2.25	0.5	6.25
Charlotte	NC	0	1.5	3.25	1	5.75
Indianapolis	IN	0	1.5	1.75	2.5	5.75
Riverside	CA	0	1	3	1.5	5.5
Pittsburgh	PA	1	2	1.25	1	5.25
Miami	FL	2	0.5	2	0.5	5
Tampa	FL	1	1	2	1	5
Memphis	TN	0	1.25	1.25	1	3.5

Los Angeles	CA	0	0.5	1.5	1	3
Jacksonville	FL	0	0.5	2	0	2.5
Detroit	MI	0	0	1	0.5	1.5
Median		1.5	2	2.625	2	8.625

ENERGY EFFICIENCY GOALS

Many local governments have adopted energy policies and goals that include portfolio-wide energy reductions for their operations. Energy efficiency targets for local government operations help to coordinate and focus efficiency efforts across departments. Furthermore, setting a clear commitment helps provide a point of reference against which a city can measure its progress.

Efficiency goals in government operations are often intertwined with larger, community-wide efforts to improve efficiency or achieve other energy-related goals. For some municipalities, government goals are the first step in establishing city-wide targets. For others, government goals may mirror city-wide goals, showing commitment to community efforts. These targets can be used to bridge efforts to improve efficiency within municipal operations to larger community-wide sustainability initiatives. Finally, some cities do not have plans to take on city-wide goals, but may choose to adopt energy efficiency targets for municipal operations for internal reasons, including lowering energy bills and streamlining efficiency investments across departments.

Cities earned up to two (2) points for publicly disclosed goals for local government operations that specified energy efficiency targets or related goals that are commonly accomplished through energy efficiency actions, such as reductions in greenhouse gas emissions or reductions in energy intensity. Points were scaled based on a city's progress toward setting a goal. Cities that had engaged a formal agency stakeholder group to set goals, but had not yet publicized a specific target received one-half (0.5) point. We defined stakeholder groups as cross-departmental committees involved in sustainability planning. Some of these groups also included members of the public, although that was not a necessary condition for receiving points. Cities that had identified energy efficiency or related targets, but had not formally adopted those targets through an executive order, city resolution, or similar process, received one (1) point. If the target had been identified and formally adopted, the city received the full two (2) points. If the target was included in the city's general plan, it also received the full number of points for this metric. Where no energy efficiency-related target was identified, the city did not receive points. Table 4 describes the allocation of points in more detail. Table B-1, in Appendix B, presents scores for energy efficiency targets and details on each city's energy efficiency targets and related energy or greenhouse gas emissions targets.

Table 4. Scoring Methodology for Local Government Energy Efficiency Goals

Energy-Related Goals for Local Government Operations	Score (2 pts.)
The local government has a formal energy efficiency target (or a related target such as a greenhouse gas reduction goal) for municipal operations that has been formally adopted through an executive order or city resolution.	2
The local government has identified an energy efficiency target or related target for municipal operations, but it has not been formally adopted.	1
The local government has engaged a formal agency stakeholder group to set energy efficiency goals or related goals, although no targets have yet been identified.	0.5

ENERGY STRATEGY IMPLEMENTATION AND MANAGEMENT

Local governments must have mechanisms in place to monitor, track, and report their progress in order to verify that energy targets are being met or that efficiency programs are effective. Often, this requires dedicated staff members to identify and implement energy efficiency projects and strategies within operations. Governments can increase the number of potential efficiency projects identified and encourage energy efficient behavior by aligning staff incentives to encourage departmental action. This sub-category was allocated four (4) points. Table 5 summarizes each city's scores for strategy implementation and management, and the following sections describe the scoring in more detail.

Strategy implementation is often closely related to funding, but due to the cross-departmental nature of energy efficiency efforts, it is difficult to collect information about spending or budgets for efficiency that is comparable across cities. However, many of the policies scored in this sub-category do reflect local government investment decisions (for example, maintaining full-time staff for energy efficiency projects), so to some extent budgeting choices are picked up in the metrics we were able to score.

Progress toward Goals

In this metric area, cities could earn up to one and one-half (1.5) points based on progress toward their energy-related goals, which includes being on track to meet goals and having consistent funding to pursue goals. Cities that reported quantitative energy savings showing they were on track to meet energy goals received one (1) point. Cities that had implemented programs to drive savings, but could not quantify overall energy savings, were awarded partial credit (0.5 points). Cities could also receive an additional one-half (0.5) point for having a dedicated funding source for efficiency investments, or for institutionalizing the energy target through incorporating it into the capital planning and budgeting process or the city's general plan. Table B-2, in Appendix B, describes local government efforts in these areas.

Performance Management and Reporting

We also assessed performance management and reporting by local governments. A total of one and one-half (1.5) points were possible in this metric area. One-half (0.5) point was awarded if the city reported its progress toward operational energy goals publicly in a published form at

least annually. Cities received partial credit (0.25 points) if they did not release comprehensive reports annually but did regularly report on specific goals. One-half (0.5) point was awarded if the city used an independent firm for evaluation, monitoring, and verification of progress toward energy-related goals. Partial credit (0.25 points) was awarded to cities that followed standardized evaluation and monitoring procedures (for example, by following climate registry protocols) but did not employ a third party to verify data. In order to recognize public accountability, we awarded cities one-half (0.5) point for including a community outreach and education component within their government goals, such as holding regular public meetings to report on local government progress. Since community-wide goals are scored in Chapter 3, we did not give credit here to cities that held regular meetings or outreach events for city-wide efforts but not for internal operational efficiency goals. Table B-3 shows individual performance management details for each city we examined in the *Scorecard*.

Personnel—Staffing and Departmental Incentives

Finally, a city could earn a total of 1 point by allocating staff and developing departmental incentives to help achieve its energy efficiency goals. Sustainability offices or staff who are able to devote time to institutionalizing energy management into the way government operates are often very important factors in progress toward energy or sustainability goals (Parzen 2013). One-half (0.5) point was awarded to cities that employed one or more dedicated staff members to oversee operational energy management and coordinate efficiency efforts across municipal departments, such as an energy manager or sustainability director. Data on staffing focused on *community-wide* energy initiatives are examined separately in Chapter 3, Community-Wide Initiatives. One-half (0.5) point was also given to cities that offered departmental incentives for energy-efficient actions. Both financial and non-financial incentives received points. For example, cities that allowed departments to keep cost savings resulting from efficiency upgrades earned points, as did cities with employee recognition programs. We also awarded points for policies that required specific contributions of energy savings from departments. Table B-4 includes details on staffing and departmental incentives.

Table 5. City Scoring on Strategy Implementation & Management

		Progress toward Goals (1.5 pts.)		Performance Management (1.5 pts.)			Personnel (1 pt.)		Total Score (4 pts.)
City	State	On Track in Most Recent Report (1 pt.)	Dedicated Funding or in Capital Planning (0.5 pts.)	Public Outreach (0.5 pts.)	Annual Public Reporting (0.5 pt.)	Third Party EM&V (0.5 pts.)	Dedicated Staff (0.5 pts.)	Dept/Staff Incentives(0.5 pts.)	
Denver	CO	1	0.5	0.5	0.5	0.5	0.5	0.5	4
Portland	OR	1	0.5	0.5	0.5	0.25	0.5	0.5	3.75
Dallas	TX	1	0	0.5	0.5	0.5	0.5	0.5	3.5
Philadelphia	PA	1	0	0.5	0.5	0.5	0.5	0.5	3.5
San Francisco	CA	1	0	0.5	0.5	0.5	0.5	0.5	3.5
Austin	TX	1	0	0.5	0.5	0.25	0.5	0.5	3.25
Baltimore	MD	1	0	0.5	0.5	0.5	0.5	0	3
Boston	MA	1	0.5	0	0.5	0	0.5	0.5	3

Minneapolis	MN	1	0	0.5	0.5	0	0.5	0.5	3
Washington	DC	0.5	0.5	0.5	0.25	0.5	0.5	0	2.75
Chicago	IL	0.5	0.5	0.5	0	0	0.5	0.5	2.5
Columbus	OH	0.5	0	0.5	0.25	0.25	0.5	0.5	2.5
El Paso	TX	1	0	0.5	0.5	0	0.5	0	2.5
New York City	NY	1	0	0.5	0.5	0	0.5	0	2.5
Phoenix	AZ	0.5	0	0.5	0.5	0.5	0.5	0	2.5
St. Louis	MO	1	0	0.5	0	0.25	0.5	0	2.25
Atlanta	GA	0	0	0.5	0	0.5	0.5	0.5	2
Pittsburgh	PA	0	0.5	0.5	0	0	0.5	0.5	2
San Antonio	TX	1	0	0	0	0	0.5	0.5	2
Houston	TX	1	0	0	0.25	0	0.5	0	1.75
Seattle	WA	0	0	0.5	0.5	0.25	0.5	0	1.75
Charlotte	NC	0	0	0.5	0	0	0.5	0.5	1.5
Fort Worth	TX	0.5	0	0.5	0	0	0.5	0	1.5
Indianapolis	IN	0	0	0	0.5	0	0.5	0.5	1.5
Sacramento	CA	0	0	0.5	0.5	0	0.5	0	1.5
San Diego	CA	0	0	0.5	0	0	0.5	0.5	1.5
San Jose	CA	0.5	0	0	0.5	0	0.5	0	1.5
Memphis	TN	0	0	0.5	0.25	0	0.5	0	1.25
Riverside	CA	0	0.5	0	0	0	0.5	0	1
Tampa	FL	0	0	0	0.5	0	0.5	0	1
Jacksonville	FL	0	0	0	0	0	0.5	0	0.5
Los Angeles	CA	0	0	0	0	0	0.5	0	0.5
Miami	FL	0	0	0	0	0	0.5	0	0.5
Detroit	MI	0	0	0	0	0	0	0	0

PROCUREMENT AND CONSTRUCTION POLICIES

The policies covered in this sub-category of the *Scorecard* are varied, but at their core they are the policies that help cities do their jobs in energy-efficient ways. Purchasing and construction policies are necessary for any local government's operations, and here we assessed whether energy efficiency has been factored into these every-day decision making processes. Procurement and construction policies that specify energy efficiency requirements help institutionalize energy efficiency across all local government departments. Because we assessed policies related specifically to energy efficiency, we did not consider actions related to energy supply, such as green power purchasing, in our scoring. Typically, cities have made the greatest efforts to incorporate efficiency into investments in three general areas: vehicle fleets, public lighting, and government buildings and equipment. Cities could receive up to four (4) points for their procurement and construction policies, subdivided into these three metric areas. Scores for each city for procurement and construction policies are shown in Table 6.

Fleet Efficiency and Vehicle Infrastructure

Vehicle fleet efficiency policies were allocated two (2) points in total. Many city sustainability efforts have focused on policies related to the government's vehicle fleet as an effective measure to reduce carbon emissions and fuel expenditures. Cities have adopted policies calling for the purchase of the most fuel efficient vehicle appropriate for a particular task and/or high-efficiency vehicle types, such as hybrid or all-electric vehicles. City investments in electric-vehicle charging stations for their own fleet can also be made available to the public, encouraging private adoption of electric vehicles. Some cities also have government efforts to

"right size" their fleets, encourage alternatives to the use of city vehicles for certain tasks, or discourage vehicle idling.

Cities that had a fuel efficiency requirement for public fleet vehicles were awarded one (1) point. If a fuel efficiency requirement was not in place but a city had requirements for fuel-efficient vehicle types, such as hybrid or all-electric vehicles, they similarly received one (1) point. We did not award points to cities with alternative fuel vehicle (e.g., compressed natural gas) requirements, since alternative fuels are not inherently energy-saving. A city could also earn one-half (0.5) point if it had electric-vehicle charging stations available for private vehicles, or one-quarter (0.25) point if charging stations were available only for public fleet vehicles. We also considered the size, makeup, and operations of a city's fleet stock in this metric area. A city could earn one-quarter (0.25) point if it had right-sizing policies or culling requirements to ensure that its fleet was not too large or specialized for current applications, and it could earn an additional one-quarter (0.25) point if it had anti-idling policies for government vehicles or otherwise had programs or policies to encourage efficient driving behavior in the use of its fleet (e.g., through motorpools). Table B-5 outlines details of city fleet policies.

Public Lighting

Public lighting, such as streetlights, was also considered in this sub-category, and was allocated a total of one (1) point. Upgrades to public lighting are some of the simplest energy efficiency improvements a city can make. Light-emitting diode (LED) technologies can offer savings of 50 percent or greater compared to traditional light sources (Arnold et al. 2012). LED lights often have longer lifetimes than traditional outdoor fixtures, therefore requiring significantly less maintenance. Scheduling lighting to be turned on only during the hours needed can similarly extend lamp lifetimes while saving the city energy. Cities received three-quarters (0.75) points for having policies with efficiency requirements for outdoor lighting, including policies for upgrade at time of burnout. Many cities have begun significant outdoor lighting replacement and upgrade programs, but do not have an efficiency requirement in place, and these cities received partial credit of one-quarter (0.25) point. While we did not require any particular efficiency standard for a city to receive credit, standards based on the Model Lighting Ordinance, developed by the Illuminating Engineering Society and the International Dark-Sky Association (IES 2011), reflect best practice. Policies or actions related to traffic lights were not given credit because new traffic lights are now required under federal law to be of LED-equivalent efficiency. Cities with photosensors or scheduled outdoor lighting were also awarded an additional one-quarter (0.25) point.

New Buildings and Equipment

Cities could earn up to one (1) point for policies that encourage energy efficiency considerations in building construction and in procurement of equipment and supplies. One-half (0.5) point was awarded to cities that had energy efficiency requirements for new public buildings, such as ENERGY STAR certification. Many benefits accrue from building to Leadership in Energy and Environmental Design (LEED) standards, but the program is only partially focused on energy savings and is not focused primarily on active energy management. The result is that some LEED buildings do not have energy performance that matches their design intentions (Turner and Frankel 2008). Thus, cities with above-code LEED requirements for public buildings received only partial credit (0.25 points), unless energy efficiency points were specifically emphasized in the policy, in which case the city received the full 0.5 points.

We also considered procurement policies in this metric area. Installing energy-efficient products can reduce building energy loads by as much as five to ten percent (EPA 2011d). Local governments may see additional benefits, such as reduced maintenance costs due to the longer lifetimes of energy-efficient products. Pre-existing policy frameworks for this topic have proved instrumental to many cities. For example, the EPA's Environmentally Preferable Purchasing (EPP) Guidelines, originally created for the federal government, serves as the basis for many local government procurement policies. Adoption of the EPP at the local level can cause a variety of changes across local government portfolios, including energy efficiency being taken into account when desktop electronics, vehicles, and equipment are purchased. A city could earn one-half (0.5) point if it had an energy efficiency or lifecycle cost consideration in its procurement policy. For example, a city that had ENERGY STAR requirements for appliance and electronics purchases received a half-point for this metric. Table B-6 describes city above-code building requirements and procurement policies.

Table 6. Procurement and Construction Policies

City	State	Fleet Efficiency & Vehicle Infrastructure (2 pts.)			Public Lighting (1 pt.)		New Buildings & Equipment (1 pt.)		Total Score (4 pts.)
		Fuel Efficiency Requirement (1 pt.)	Right-Sizing and Anti-Idling Policies (0.5 pts.)	Charging Stations (0.5 pts.)	Outdoor Lighting Standards (0.75 pts.)	Scheduled Lighting (0.25 pts.)	Above Code Requirements for Public Buildings (0.5 pt.)	Energy Efficient Procurement Policy (0.5 pts.)	
Columbus	OH	1	0.5	0.5	0.75	0.25	0.25	0.5	3.75
Phoenix	AZ	1	0.25	0.5	0.75	0.25	0.5	0.5	3.75
Portland	OR	1	0.25	0.5	0.75	0.25	0.5	0.5	3.75
San Diego	CA	1	0.25	0.5	0.75	0.25	0.5	0.5	3.75
Boston	MA	1	0.25	0.5	0.75	0.25	0.25	0.5	3.5
Minneapolis	MN	1	0.5	0.5	0.25	0.25	0.5	0.5	3.5
Seattle	WA	1	0.5	0.5	0.25	0.25	0.5	0.5	3.5
Charlotte	NC	1	0.5	0.5	0.25	0.25	0.25	0.5	3.25
Dallas	TX	1	0.25	0.5	0.25	0	0.5	0.5	3
Denver	CO	1	0	0.5	0.25	0.25	0.5	0.5	3
New York City	NY	1	0.5	0.5	0	0	0.5	0.5	3
Philadelphia	PA	1	0.25	0.5	0.25	0	0.5	0.5	3
Riverside	CA	1	0.25	0.5	0.25	0.25	0.25	0.5	3
Sacramento	CA	1	0.25	0	0.75	0	0.5	0.5	3
San Francisco	CA	1	0.5	0.5	0.25	0	0.25	0.5	3
Chicago	IL	1	0	0.5	0.25	0.25	0.25	0.5	2.75
El Paso	TX	1	0.5	0.5	0.25	0.25	0.25	0	2.75
Austin	TX	1	0.25	0.5	0	0.25	0.5	0	2.5
San Antonio	TX	1	0	0.5	0.25	0	0.25	0.5	2.5
Washington	DC	0	0.25	0.5	0.75	0	0.5	0.5	2.5
Houston	TX	0	0.5	0.5	0.25	0.25	0.25	0.5	2.25
San Jose	CA	0	0.25	0.5	0.75	0	0.25	0.5	2.25
Jacksonville	FL	1	0	0	0	0	0.5	0.5	2
Miami	FL	1	0.25	0	0	0	0.25	0.5	2
Tampa	FL	0	0.25	0.5	0.75	0.25	0.25	0	2
Atlanta	GA	0	0.5	0.5	0.25	0.25	0.25	0	1.75
Fort Worth	TX	0	0.5	0	0.75	0.25	0.25	0	1.75
Indianapolis	IN	1	0	0.25	0.25	0.25	0	0	1.75
St. Louis	MO	0	0.5	0.5	0.25	0	0.5	0	1.75
Los Angeles	CA	0	0	0.5	0.25	0	0.25	0.5	1.5
Baltimore	MD	0	0.25	0.5	0.25	0	0.25	0	1.25
Memphis	TN	0	0	0.5	0	0.25	0	0.5	1.25
Pittsburgh	PA	0	0.25	0	0.25	0	0.25	0.5	1.25
Detroit	MI	0	0.25	0	0.25	0	0	0.5	1

ASSET MANAGEMENT

Local governments necessarily make large-scale long-term investments. While many efficiency opportunities exist during the initial decision-making process for new capital investments, there are also opportunities for energy savings as existing assets are managed. Local governments

have a portfolio of assets that will be with them for a long time—employees, buildings, and other infrastructure. Local governments can see significant energy and cost savings by systematically managing energy use, considering the lifecycle energy costs of their investments, and encouraging changes in employee behaviors. This sub-category covers three topics: benchmarking and energy retrofitting in public buildings, sustainable infrastructure policies including prioritization of investments in existing assets and strategies such as lifecycle cost analysis or fix-it-first policies, and managing employee energy use through teleworking or flexible schedules and transit benefits. A total of five (5) points were possible in the asset management sub-category. Table 9 shows the details of points received by each city.

Building Energy Benchmarking and Retrofitting

Buildings account for a large portion of city energy use, and rising energy costs mean that energy represents an increasing portion of operating budgets for cities. There are a variety of strategies available to local governments to manage their own energy use (DOE 2013a). Two of the most important steps a city can take are energy benchmarking and developing a comprehensive retrofit strategy. Many cities begin their efforts by benchmarking energy use in their buildings and other facilities, having found that a more holistic understanding of their energy use helps them to make prudent, cost-effective changes to building operations. Benchmarking can also help with the development of a comprehensive energy-saving retrofit plan tailored to individual existing buildings and the prioritization of capital investments. Efficiency opportunities uncovered through benchmarking and achieved through retrofitting can help bring down these costs.

Cities could score two (2) points for policies related to benchmarking and energy management of public buildings. Up to one (1) point was available based on the percentage of municipal building square footage currently benchmarked. Many cities could not provide reliable data on the percentage of square feet benchmarked, so some subjectivity was necessary for scoring this metric. For example, cities that reported that "the majority" of their buildings were benchmarked were awarded one-half (0.5) point, the equivalent amount of points a city would receive for benchmarking more than half of their buildings.

Cities could also earn up to one (1) point for comprehensive retrofit strategies. Local governments that had a portfolio-wide energy performance strategy received the full point. These strategies needed to incorporate both capital improvements (e.g., equipment replacement, building shell improvements) and operational improvements (e.g., active energy management, audits and retrocommissioning) that were customized to specific buildings. Cities that were Municipal Partners to DOE's Better Buildings Challenge or that were Community Partners that included municipal buildings as a part the commitment to the Challenge, also received the full point, since they had committed to specific energy reductions throughout their portfolio of public buildings. Cities that had made some significant efficiency investments (through an energy service company or otherwise) received half credit (0.5 points).

Our data sources included city sustainability plans and data supplied by sustainability officers, and we also relied on the Institute for Market Transformation's buildingrating.org initiative for the data used for the benchmarking metric, and the DOE's information on participants in the Better Buildings Challenge (DOE 2013f). Table 7 further explains our scoring methodology for

benchmarking and retrofitting. Table B-7 gives further details on benchmarking and energy performance initiatives in each of the cities we examine in the *City Scorecard.*

Table 7. Scoring Methodology for Municipal Building Benchmarking & Energy Retrofit Strategies

% of Building Square Footage Benchmarked	Score (1 pt.)
At least 75%	1
50-74.9%	0.5
25-49.9%	0.25
0-24.9%	0

Building Energy Retrofit Strategy	Score (1 pt.)
City has a comprehensive retrofit strategy covering all municipal buildings, which includes building-specific operational and capital improvement actions	1
City has made significant energy efficiency investments, but does not have a comprehensive strategy	0.5
City has not made significant recent investments in energy efficiency in municipal buildings	0

Sustainable Infrastructure Policies

Sustainable infrastructure polices that require cities to consider the lifecycle costs of investments (including operational energy costs) or to "fix-it-first" before investing in new infrastructure encourage cities to consider the long-term impacts of current capital investments. This can result in significant long-term energy savings if alternatives with lower lifecycle costs than traditional infrastructure are selected (e.g., transit improvements instead of highway expansion, locating new development near existing infrastructure rather than in greenfields, constructing green stormwater infrastructure instead of new separated stormwater and sewer systems).

Cities could earn a total of two (2) points for sustainable infrastructure policies. One (1) point was awarded to cities with sustainable infrastructure policies for capital investments, such as lifecycle cost analysis requirements, a "fix it first" policy, or development impact fees. Cities without a codified policy, but that used life-cycle costing methods were given partial credit of one-half (0.5) point. Cities could earn up to an additional one (1) point based on the percent of their capital budgets devoted to the maintenance of existing assets or distributed infrastructure (e.g., shade trees or transit improvements), as opposed to new infrastructure or major expansions. Table 8 details the scoring methodology for capital budget expenditures. Because of the variation in structure of city budgets, this metric was based primarily on self-reported values included in responses to our data requests rather than our own detailed analyses of city budgets. We relied heavily on city sustainability managers for categorizing and supplying these data. Where data were not supplied, the city did not earn points. In most cases, the score was based on the most recent available budget year rather than on multiple years of data, and is therefore subject to year-to-year variation. Table B-8, in Appendix B, details city policies for capital investments, including fix-it-first policies and lifecycle cost considerations.

Table 8. Scoring Methodology for Capital Budgets

% of Capital Budget Devoted to Existing Assets	Score (1 pt.)
At least 75%	1
50-74.9%	0.5
25-49.9%	0.25
<25%	0

Public Workforce

Employee behavior is also a major factor in municipal energy consumption. When public employees telework or take public transit, this reduces stress on the city's transportation infrastructure and can saves energy in municipal buildings (Laitner et al. 2012b). A city could earn one-half (0.5) point for policies that allowed flex schedules or teleworking or otherwise minimized the number of commutes by employees, and one-half (0.5) point for offering benefits to employees to encourage carpooling or their use of public transit. Cities that offered only pre-tax benefits did not qualify for points, but any city investment in transit subsidies for employees did qualify. Table B-9 details cities' strategies for encouraging energy-efficient employee behaviors.

Table 9. City Scoring for Asset Management

		Benchmarking & Building Retrofit (2 pts.)		Sustainable Infrastructure Policies (2 pts.)		Public Employees (1 pt.)		
City	State	Bench-marking (1 pts.)	Comp. Retrofit Strategy (1 pt.)	Fix-It-First or Lifecycle Cost Policy (1 pt.)	Capital Maintenance Budget (1 pt.)	Teleworking or Flex Schedules (0.5 pts.)	Transit Benefits (0.5 pts.)	Total Score (5 pts.)
San Francisco	CA	0.5	1	1	1	0.5	0.5	4.5
Houston	TX	1	1	1	0.25	0.5	0.5	4.25
Portland	OR	1	1	1	0.25	0.5	0.5	4.25
Phoenix	AZ	1	1	1	0	0.5	0.5	4
Chicago	IL	0.5	1	1	0	0.5	0.5	3.5
Seattle	WA	0.5	1	1	0	0.5	0.5	3.5
Columbus	OH	1	0.5	0.5	0	0.5	0.5	3
Denver	CO	0.5	1	0	0.5	0.5	0.5	3
El Paso	TX	1	1	0	0	0.5	0.5	3
Fort Worth	TX	0.5	1	1	0	0	0.5	3
New York City	NY	1	1	0	0	0.5	0.5	3
San Antonio	TX	1	1	0	0	0.5	0.5	3
Washington	DC	1	1	0	0	0.5	0.5	3
Baltimore	MD	0	1	0	1	0	0.5	2.5
Boston	MA	1	1	0	0.5	0	0	2.5
Indianapolis	IN	0.5	1	0	0	0.5	0.5	2.5
Atlanta	GA	0	1	0	0	0.5	0.5	2
Austin	TX	0.5	0.5	0	0	0.5	0.5	2
Dallas	TX	0.5	0.5	0	0	0.5	0.5	2
Philadelphia	PA	0.5	1	0	0	0	0.5	2

Sacramento	CA	0	1	1	0	0	0	2
San Diego	CA	1	0	0	0	0.5	0.5	2
St. Louis	MO	1	0.5	0	0	0	0.5	2
Minneapolis	MN	0.5	0	0	0	0.5	0.5	1.5
Riverside	CA	0	0.5	0	0	0.5	0.5	1.5
Charlotte	NC	0	0	0	0	0.5	0.5	1
Los Angeles	CA	0	1	0	0	0	0	1
Memphis	TN	1	0	0	0	0	0	1
Pittsburgh	PA	0	1	0	0	0	0	1
Tampa	FL	0	0	0	0.5	0.5	0	1
Detroit	MI	0	0.5	0	0	0	0	0.5
Miami	FL	0	0	0	0	0	0.5	0.5
San Jose	CA	0	0	0	0	0.5	0	0.5
Jacksonville	FL	0	0	0	0	0	0	0

CONCLUSION

The median score for local government operations was just over 8.5 points, slightly more than half of the total points possible in this policy area, indicating that there is still significant room for improvement in incorporating energy efficiency into local government operations. Cities tended, on average, to score well at integrating energy efficiency into procurement, fleets, and new buildings policies, with the median score nearly two-thirds of the maximum possible. This perhaps reflects that procurement-related policies have been a starting point for many local governments aiming to improve their energy efficiency. As these policies have become more common nationwide, the ease of adoption has also increased. Cities are able to use standard language from their peers to update existing policies, making this a particularly accessible area for incorporating energy efficiency into core local government activities such as procurement. Cities also scored relatively well on developing *goals* for energy efficiency in government operations, with a median score of 1.5 out of a possible two points. This is not that surprising considering the proliferation of climate and energy planning initiatives over the past decade. On average, cities' scores were weaker in the remaining categories, reflecting the challenges to increasing energy efficiency through active implementation of energy strategies (median score of two out of four possible points) and improving the energy performance of existing assets (median score of two out of five).

Some interesting patterns can be seen in the data presented in this section of the *Scorecard*. Energy strategy implementation scores were the best predictor of overall city scores for local government operations, suggesting that cities that devote resources to program implementation, monitoring, and evaluation are the most likely to have already considered the variety of other energy efficiency policies in the local government toolkit. These implementation strategies were more closely correlated to a city's overall score in this chapter than was goal setting, which suggests that while targets are important, their impact diminishes without strong systems for implementation, management, and tracking of progress. High overall scores were also highly correlated with scores for asset management, indicating that cities that are successfully managing energy using their existing facilities, infrastructure, and other resources are also having the greatest successes in improving efficiency in government operations overall.

Figure 4. Leading Cities and Best Practices: Local Government Operations

Portland, OR: Portland's Climate Action Plan calls for a 50% reduction in carbon dioxide emissions from 1990 levels by 2030. To reach this goal, the city looks to its employees to identify the most promising opportunities. Portland's City Energy Challenge encourages city staff to submit energy efficiency retrofit projects. Departments are able to recoup all savings from energy retrofits involving their own buildings, creating incentives for energy efficiency projects across city operations. Portland tracks and benchmarks the energy use of all of its buildings annually. The city is also working to convert a large portion of its fleet to electric vehicles, and it offers a trip reduction incentive program for employees. The city also interacts with the community through its Portland Climate Action Now! campaign, which publicizes municipal progress and encourages community involvement.

Phoenix, AZ: Phoenix has set several goals that affect local government operations, including a target to reduce greenhouse gas emissions from city operations to five percent below 2005 levels by 2015. The city plans to meet these targets in large part through energy efficiency measures, including building retrofits and more stringent energy standards for new construction. As part of the retrofit program, the city currently benchmarks about 75 percent of its square footage, with plans to expand benchmarking to account for 100 percent of the city's footprint. The city partners with Arizona State University for monitoring of municipal goals. Phoenix has also made efforts to convert to a more efficient fleet, using the EPA's SMART Way guide for purchasing the most fuel-efficient vehicles in class and installing 24 electric-vehicle charging stations available for public and municipal use.

San Francisco, CA: San Francisco has committed to reducing greenhouse gas emissions to 80% below 1990 levels by 2050, with several interim benchmarks along the way. The city's most recent greenhouse gas inventory showed that municipal operations had fallen nearly 7% from 2005 levels. Each department individually tracks its progress, and the city publishes results annually. San Francisco's commercial building benchmarking ordinance also applies to public buildings, requiring that the city disclose ENERGY STAR scores for all buildings of more than 10,000 square feet. San Francisco has five full-time employees focused on energy in municipal operations, and, in addition, leverages staff time across many agencies for climate and energy initiatives. The city has mandates that each city official with jurisdiction over passenger vehicles remove at least 5% of the vehicles from his or her fleet annually, and beginning in 2015 all vehicles over 12 years old will be phased out of the fleet.

Boston, MA: In addition to a municipal greenhouse gas reduction goal of 7 percent below 1990 levels by 2012 and 80 percent by 2050, Boston has developed an energy savings plan in part as a requirement of its designation as a Massachusetts Green Community. In 2011, the city began tracking energy use in municipal buildings, with the intention of benchmarking as data become more complete. The city's benchmarking policy calls for the city to annually disclose its energy and water use in all facilities beginning in 2012. Simultaneously, in 2011, the City leveraged a federal Energy Efficiency and Conservation Block Grant to hire two full-time energy managers to track energy use and implement energy efficiency throughout municipal operations and capital expenditures. After federal funding runs out, the energy manager positions will be self-financing by capturing a portion of energy savings each year.

Chapter 3: Community-Wide Initiatives

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INTRODUCTION

Community-wide initiatives are cross-cutting programs that engage community members in implementing the city's energy efficiency priorities. Many cities have energy initiatives that act as umbrellas for a wide array of focused programs to address energy use in buildings, neighborhoods, transportation systems, and landscapes throughout the city. Energy efficiency may address a variety of a city's needs, including climate change mitigation and adaptation, energy security, and economic development. In order for these energy strategies to have large-scale impact, cities need to expand beyond their own operations to include community members and the private sector. For example, Washington, D.C., has committed to cutting city-wide energy use by 50%. In order to reach this goal, it will need significant support from the community. The city has therefore set a complementary goal to ensure that 100% of District residents are informed about their community-wide sustainability initiative, Sustainable DC, in order to maximize results and ensure accountability and transparency. By developing a unifying vision for energy usage in the city, these community-wide programs allow governments to leverage outside resources—funding, staff, volunteers, knowledge—to improve energy efficiency throughout the community.

In this chapter, we focused on four policy areas commonly used by municipalities to encourage energy efficiency throughout their cities. We did not score every element of the umbrella focused on improving energy efficiency across the community; rather, the individual components of those programs are considered where appropriate in the other chapters of the *Scorecard*. Here, we focused on city-wide goals and strategies for energy management. We also looked at some specific interventions that cross multiple sectors. The four community-wide metric areas scored in this chapter of the *Scorecard* are:

- City-wide energy efficiency-related goals to guide programming efforts
- Management of city-wide energy strategies, including tracking progress toward energy goals and devoting staff, funding, and other resources to implement, monitor, report on, and evaluate programs
- The establishment of distributed energy systems within the city, specifically district energy and combined heat and power (CHP)
- Strategies and policies to mitigate the urban heat island effect

This section does not consider formula-allocated grants, such as the Weatherization Assistance Program, provided by the federal government to local agencies. Rather, it is concerned with the role that the city, specifically, plays in leading, funding, implementing, and promoting a community-wide energy initiatives. For our data we relied primarily on public city sustainability reports and websites for information on community-wide initiatives, and we supplemented the publicly available data with responses to our data request to city sustainability or energy staff.

Policy Trends

Many of the energy efficiency initiatives in this chapter are pieces of larger city-wide sustainability plans that address a variety of long-term community priorities, such as economic

development, transportation, water supply issues, and public health. Increasingly, cities are including their energy agendas and efficiency goals within these broad plans. In some ways, this trend has been amplified by funding from the American Recovery and Reinvestment Act of 2009 (ARRA). About 650 cities and counties out of 1,700 total formula grantees chose to apply a portion of their Energy Efficiency and Conservation Block Grant funds to develop a more comprehensive energy efficiency strategy for their community (Mackres and Kazerooni 2012). Sustainability plans have a broad reach, but often have significant overlap with energy issues, which cities target in a variety of ways. Cities have also begun to develop energy plans as a part of or in addition to complementary "climate action plans." Cities often choose to include several aspects of energy usage in their plans, creating policies that address energy sources as well as energy use. In this chapter of the *City Scorecard*, we considered city goals that are targeted at a wide array of sustainability or economic concerns— air quality, climate change, community beautification, community resilience, economic competitiveness, and energy affordability—and that have positive outcomes for energy efficiency, even if efficiency is not the main policy driver.

A variety of policy innovations is enabling community-wide initiatives across the country. For example, improved access to data has helped cities measure, monitor, and manage energy use in ways they could not several years ago. Community wide energy and greenhouse gas inventories and regular tracking and reporting of related metrics, for example, allow cities to set a benchmark for energy usage and target specific areas where savings can be achieved most readily. In part, the expanded use of community-wide energy metrics is enabled by ever-improving access to sector-specific data, such as through building benchmarking requirements and working with utilities to offer customers access to their energy use information, as highlighted in Chapters 4 and 5 of the *Scorecard*, respectively.

RESULTS

Cities could earn a maximum of ten (10) points for community-wide initiatives: two (2) points for community-wide energy- or climate-related targets, three (3) points for performance management strategies, three (3) points for the establishment of efficient distributed energy systems (district energy and CHP), and two (2) points for urban heat island mitigation policies and programs. Table 10 presents the overall results of scoring on community-wide initiatives.

Boston received the highest score in the community-wide policy area, closely followed by Austin, with both scoring particularly well for performance management strategies and heat island mitigation. Both also have community-wide energy and climate targets and significant CHP and district energy systems in place.

Table 10. Summary of Scoring on Community-Wide Initiatives

City	State	Community-Wide Targets (2 pts.)	Performance Management (3 pts.)	District Energy & CHP (3 pts.)	Urban Heat Island Mitigation (2 pts.)	Total Score (10 pts.)
Boston	MA	1.5	3	3	2	9.5
Austin	TX	1.5	3	2.5	2	9
New York City	NY	2	2	3	2	9
Philadelphia	PA	2	1.5	3	2	8.5
Chicago	IL	1.5	3	1.5	2	8
San Francisco	CA	1.5	3	1.5	2	8
Baltimore	MD	1.5	3	2.5	1	8
Denver	CO	1.5	3	3	0	7.5
Portland	OR	2	3	0.5	2	7.5
St. Louis	MO	1	1	3	2	7
Miami	FL	1.5	0.5	2.5	2	6.5
Minneapolis	MN	2	2	1.5	1	6.5
Pittsburgh	PA	1.5	1.5	2.5	1	6.5
Fort Worth	TX	1	2.5	1	2	6.5
Dallas	TX	1	2.5	0.5	2	6
Houston	TX	0.5	0.5	3	2	6
San Antonio	TX	2	2.5	0.5	1	6
San Diego	CA	1	0	3	2	6
San Jose	CA	2	1.5	1.5	1	6
Seattle	WA	2	2.5	0.5	1	6
Atlanta	GA	1.5	1	2.5	1	6
Riverside	CA	1.5	2	1	1	5.5
El Paso	TX	1	2.5	1	0	4.5
Phoenix	AZ	0.5	2.5	0.5	1	4.5
Sacramento	CA	2	0	2.5	0	4.5
Tampa	FL	1	1.5	1	1	4.5
Los Angeles	CA	1	0.5	1.5	1	4
Washington	DC	1.5	1	0.5	1	4
Memphis	TN	0.5	0.5	1.5	1	3.5
Detroit	MI	0.5	0	2.5	0	3
Indianapolis	IN	0	0.5	1.5	1	3
Jacksonville	FL	0	0.5	2.5	0	3
Charlotte	NC	0.5	1	0	1	2.5
Columbus	OH	0.5	1	0.5	0	2

ENERGY EFFICIENCY TARGETS

Community-wide energy efficiency targets allow for the coordination of several programs under a unifying policy. Targets not only provide a basis for the development of long-term sustainability programs, but they also can help mobilize funding for efficiency programs. Targets with specific time lines allow cities to establish regular monitoring regimes. The development of a community-wide target is often the result of long-term planning and outreach. Many municipal governments engage community members from many sectors—utilities, nonprofits, the business sector, and local citizens groups.

Cities earned up to two (2) points for community-wide energy or climate targets. Targets for energy efficiency, energy consumption, energy intensity, and reductions in greenhouse gas emissions all earned points in this section. Renewable energy targets did not earn points, since these targets solely address energy generation rather than end-use efficiency. Points were scaled based on the city's progress toward setting and implementing a comprehensive target. Cities that had engaged a community stakeholder group, but had not yet publicized an energy-related target received one-half (0.5) point. Cities that had identified a target but had not yet formally adopted the target through an executive order, city resolution, or similar process received one (1) point. If the target had been identified and formally adopted, but had not been integrated into the city's comprehensive plan, the city received one and one-half (1.5) points. If the city had formally adopted a target and had integrated that target and enabling guidelines into the general plan or across community-wide policies and programs, the city received two (2) points. Where no energy-related target was identified, the city did not receive points. Table 11 lists the basis for our scoring of community-wide energy targets.

Table 11. Scoring Methodology for Community-Wide Energy Efficiency Targets

Community-Wide Energy-Related Target	Score (2 pts.)
The city has formally adopted a long-term community wide energy efficiency target or related target, and has integrated the target and enabling guidelines into the city's general plan or otherwise has mainstreamed the target across community activities.	2
The city has formally adopted a long-term community wide energy efficiency target or related target, but has not integrated the target across community activities.	1.5
The city has identified an energy target through a proposal or draft action plan, but has not formally adopted the target.	1
The city has engaged a stakeholder group to set goals for a community-wide target, but has not yet identified a target.	0.5

Some cities did not have targets that spanned the entire community, but had identified targets for specific neighborhoods or areas within the city. For example, Pittsburgh has not set city-wide energy efficiency targets, but has set goals for its 2030 District, which includes the downtown area. We awarded one-half (0.5) point to cities that did not have city-wide goals but had targets for specific neighborhoods. Many cities identified energy efficiency as a strategy in their comprehensive plans but did not include specific targets. Only cities that specified greenhouse gas or energy targets in their comprehensive plans or adopted the documents that

included targets as amendments to comprehensive plans received the full two (2) points. City scores for this metrics are included in Table 10. Table C-1, in Appendix C, presents details on community-wide targets in each city.

PERFORMANCE MANAGEMENT STRATEGIES

If community-wide targets are a mobilization mechanism, performance management strategies help to measure and confirm success. Regular monitoring and verification holds local governments and community members accountable. A systematic approach to monitoring and verification helps to identify opportunities for improving the plan by revising time lines, targets, or program strategies (Mackres and Kazerooni 2012). Increasingly, cities are finding that to implement the wide array of energy-related community goals, dedicated staff members are a necessity.

The performance management sub-category is worth a total of three (3) points. Cities that tracked progress toward energy or climate goals and released progress reports at least annually received one-half (0.5) point. If the city could show quantitative evidence of progress toward energy targets, and was on track to meet them, it received an additional one (1) point. Cities could also earn one-half (0.5) point for engaging a third party to evaluate, monitor, and verify progress toward the goals. City staff often work across a variety of sustainability efforts. We awarded points to cities that employed staff that could influence energy efficiency outcomes across the city government in a holistic way. Cities that employed at least one full-time staff member dedicated implementing community-wide energy or climate goals received one-half (0.5) point. Finally, we awarded one-half (0.5) point to cities with a dedicated funding source for implementation that was not dependent on general funds. Cities that have separate budgets for efficiency energy or climate programs rather than drawing from general funds eliminate budget uncertainty from year to year, allowing for the sustainability of their programs over the long term.

City scores on each of these metrics are included in Table 12. Table C-2, in Appendix C, gives further details on cities' strategies for funding, monitoring, and implementing energy and climate programs.

Table 12. Scoring on City-Wide Performance Management

City	State	Annual Reporting (0.5 pt.)	On Track to Meet Targets (1 pt.)	Independent EM&V (0.5 pt.)	Dedicated Funding (0.5 pt.)	Dedicated Staff (0.5 pt.)	Total Score (3 pts.)
Austin	TX	0.5	1	0.5	0.5	0.5	3
Chicago	IL	0.5	1	0.5	0.5	0.5	3
Denver	CO	0.5	1	0.5	0.5	0.5	3
Portland	OR	0.5	1	0.5	0.5	0.5	3
San Francisco	CA	0.5	1	0.5	0.5	0.5	3
Boston	MA	0.5	1	0.5	0.5	0.5	3
Baltimore	MD	0.5	1	0.5	0.5	0.5	3
Dallas	TX	0	1	0.5	0.5	0.5	2.5
El Paso	TX	0.5	1	0	0.5	0.5	2.5
Phoenix	AZ	0.5	1	0.5	0	0.5	2.5
San Antonio	TX	0	1	0.5	0.5	0.5	2.5
Seattle	WA	0.5	1	0	0.5	0.5	2.5
Fort Worth	TX	0	1	0.5	0.5	0.5	2.5
Minneapolis	MN	0.5	1	0	0	0.5	2
New York City	NY	0.5	1	0	0	0.5	2
Riverside	CA	0	1	0.5	0	0.5	2
Philadelphia	PA	0.5	0	0	0.5	0.5	1.5
San Jose	CA	0.5	0	0	0.5	0.5	1.5
Tampa	FL	0.5	0	0	0.5	0.5	1.5
Pittsburgh	PA	0	1	0	0	0.5	1.5
Charlotte	NC	0.5	0	0	0	0.5	1
Columbus	OH	0.5	0	0	0	0.5	1
St. Louis	MO	0	0	0	0.5	0.5	1
Washington	DC	0.5	0	0	0.5	0	1
Atlanta	GA	0	0	0	0.5	0.5	1
Houston	TX	0	0	0	0	0.5	0.5
Indianapolis	IN	0	0	0	0	0.5	0.5
Jacksonville	FL	0	0	0	0	0.5	0.5
Los Angeles	CA	0	0	0	0	0.5	0.5
Memphis	TN	0	0	0	0	0.5	0.5
Miami	FL	0	0	0	0	0.5	0.5
Detroit	MI	0	0	0	0	0	0
Sacramento	CA	0	0	0	0	0	0
San Diego	CA	0	0	0	0	0	0

EFFICIENT DISTRIBUTED ENERGY SYSTEMS—DISTRICT ENERGY AND COMBINED HEAT AND POWER

District energy systems produce steam, hot water, or chilled water at a central plant. Buildings served by a district energy system often do not need their own heating and cooling equipment, and instead rely on efficient generation serving larger populations. Furthermore, buildings connected to district energy systems are able to use energy sources often unavailable to individual buildings, such as steam. As a result, district energy systems may convey significant efficiency benefits to users. With about one-third of the U.S. energy consumption going to heat and cool buildings and in industrial processes, district energy systems offer opportunities for communities to dramatically decrease the energy used in large buildings (Chittum 2012b). District energy systems provide the infrastructure needed to bring clean energy and improved efficiency to many sites, but their efficiency varies based on system type. When paired with combined heat and power (CHP), also known as cogeneration, district energy systems waste far less energy than traditional power plants. While the average U.S. power plant wastes about 60% of its fuel input in the form of heat, district energy systems with CHP turn the majority of that "waste" heat into useful energy for heating and cooling (IDEA 2009; EPA 2008).

District energy with CHP also offers a source of energy that is highly reliable, a benefit that was clearly illustrated in the aftermath of Hurricane Sandy in October 2012. More than eight million homes lost power as a result of the storm, but businesses, universities, and hospitals with installed CHP—operating independently of the electrical grid—kept occupants comfortable and kept the lights on (IDEA 2012). When CHP is incorporated into district energy, the value of the system greatly increases.

Many of the systems we examined in this metric area are the result of distributed energy choices made decades ago, before the consideration of climate and energy efficiency in a community-wide context and independent of current policies or actions. However, there are still significant opportunities for cities to develop new district energy systems or expand existing systems. While many district energy systems are privately owned, cities can help foster this new or expanded infrastructure by proactively identifying opportunities, conducting planning and feasibility studies, encouraging new buildings to be compatible with district energy, and facilitating district energy through zoning and permitting (PSI 2013). For example, Portland has committed to establishing new district systems by 2030 by making investment funds available to help to finance distributed generation. The potential to tie district energy incentives into climate and energy plans exists, though many cities are not yet utilizing the opportunity.

For these two metrics, cities could earn a total of up to three (3) points. Points were awarded on a sliding scale that considered both a city's use of CHP and its incorporation of district energy systems. District energy and CHP each conveys efficiency benefits; however, when combined into a single system, energy efficiency is maximized. We therefore considered both combined and stand-alone systems in our scoring. The scoring methodology is described in Table 13.

Table 13. Scoring Methodology for Distributed Energy Systems

Combined Heat and Power (CHP)	Score (2 pts.)
The city has CHP capacity of 15 MW or greater per 100,000 residents.	2
The city has CHP capacity of 10 MW or greater per 100,000 residents.	1.5
The city has CHP capacity of 5 MW or greater per 100,000 residents.	1
The city has CHP capacity of 2.5 MW or greater per 100,000 residents.	0.5
The city has CHP capacity of less than 2.5 MW per 100,000 residents.	0
District Energy	**Score (1 pt.)**
The city has at least one district energy system that integrates CHP.	1
The city has at least one district energy system, but it is not integrated with CHP. OR The city has done significant planning for future district energy systems (identifying high-priority areas, developing a spatial energy master plan, integrating district energy zoning into the comprehensive plan, and/or developing recommended building HVAC standards for compatibility with district energy).	0.5
The city has no district energy systems and has done no significant planning for future systems.	0

Table C-3 presents city scores for efficient distributed energy. Note that although we presented data on the number of district energy systems and the total CHP capacity within a city, for district energy we awarded points based on the presence of these systems rather than their number or size. Ideally, our scoring would incorporate data on system efficiency; however, those data are not widely available at the city level, so our scoring system is necessarily simplified.

MITIGATION OF URBAN HEAT ISLANDS

The clustering of unvegetated, impermeable surfaces in cities leads to a phenomenon known as the urban heat island effect. A greater amount of heat is absorbed by roofs, parking lots, and streets than would be by moist, shaded surfaces, causing these urban surface temperatures to rise to 50–90 degrees Fahrenheit warmer than air temperatures. The annual mean air temperature of a city with at least one million people, therefore, can be 1.8–5.4 degrees warmer than surrounding rural areas (EPA 2013a). Urban heat islands increase the demand for cooling energy, resulting in increased power plant–related air pollution. Cities can take steps to minimize the urban heat island effect by offering incentives for the deployment of vegetated and "cool" surfaces such as reflective roofs and pavements. Many cities also choose to increase vegetation and shade cover by implementing aggressive tree-planting and vegetation programs. Increasing tree canopy cover and increasing the number of green roofs and ground surfaces can reduce heating and cooling energy use and improve stormwater management and stormwater-related energy needs. Cool roofs also lower cooling energy use and peak energy demand. Some cities have begun installing cool pavement, which can indirectly reduce energy consumption.

Certain cool pavement technologies have additional benefits, including improved stormwater management and increased surface durability. Cool pavements technologies are often also permeable, allowing stormwater to soak into the pavement, thereby reducing runoff and filtering out pollution. Even in non-permeable form, cool pavements lower the temperature of runoff and protect aquatic life from potential thermal shock (EPA 2013b).

Cities could earn up to two (2) points in this metric, based on a sliding scale. Cities that had policies such as cool-roof requirements or tree-planting ordinances that ensure the continual implementation of heat island mitigation strategies earned the full two (2) points. In addition, many cities were pursuing programs to mitigate the urban heat island effect despite not having long-term policies. For example, New York City and Houston have set goals to plant one million trees in the coming years. Cities that are running programs but do not have policies in place that would require action or ensure the continuity and expansion of cool infrastructure adoption earned one (1) point. Cities with no heat island mitigation strategies did not earn points in this category. This scoring method is also described in Table 14. Table C-4 gives further details on cities' strategies for urban heat island mitigation, including both tree planting programs and cool roof and pavement policies, as well as relevant state policies.

Table 14. Scoring Methodology for Urban Heat Island Mitigation

Urban Heat Island Mitigation Strategy	Score (2 pts.)
The city has policies in place encouraging continual implementation of heat-island mitigation strategies.	2
The city implements heat island mitigation programs, but has no formal policies in place.	1
The city has no heat island mitigation strategy, programs or policies	0

CONCLUSION

City scores were highly variable in this chapter, averaging around 5.3 points out of a possible 10. No city scored perfectly, although Boston, Austin and New York came close. No clear tier of leaders emerged, however, as the points were spread fairly evenly from top to bottom. We saw variation in all four policy categories scored in this chapter, showing that there is ample opportunity for peer-learning across the board. Performance management had the lowest portion of points awarded on average—cities can do more to effectively monitor and track programs. For example, less than one-quarter of the cities we examined employed independent firms for evaluation, monitoring, and verification of program results. About half of cities did not score points for annual reporting, but as community-wide program efforts mature, it is likely that reporting will also improve. There is also room for improvement in other sections. For example, many cities have implemented programs to mitigate the urban heat island effect, but only about one-third of the cities we scored had formalized policies. Cool-roof technology and the accompanying policies are relatively new, so it may be that more cities will choose to formalize requirements in the future.

Many of the cities included in the *City Scorecard* indicated they were in the process of revising and updating climate action plans and community energy strategies. We expect to see continual improvement in this area, as more cities formalize policies and begin to monitor and evaluate newly designed programs. However, there is also the potential for stagnation. Several cities had outdated sustainability plans, or had never formalized the recommendations in their plans, underscoring the importance of monitoring and evaluation as key components for the continual implementation and improvement of community-wide strategies.

Figure 5. Leading Cities and Best Practices: Community-Wide Initiatives

Philadelphia, PA: Philadelphia has incorporated goals for energy and greenhouse gas emissions reductions in its comprehensive plan, Philadelphia2035. The city has specific medium-term goals, including a target to reduce energy consumption in buildings city-wide by 10 percent below 2006 levels by 2015. The city publishes annual GreenWorks reports to update community members on progress. The city leveraged Energy Efficiency and Conservation Block Grant funds to implement energy efficiency programs, and has a Sustainable Energy Authority with a mission to manage a revolving loan fund for home-energy improvements. Since 2009, publicly funded programs have supported the weatherization of more than 7,800 homes in Philadelphia. The city has also codified urban heat island mitigation policies, including a cool roof policy, and Retrofit Philly held a cool roof competition to educate residents about the benefits of cool roofs.

Boston, MA: Boston has set a specific target to reduce electricity demand throughout the city by 200 MW by 2017 through energy efficiency and alternative energy installations. The city also has greenhouse gas emissions reduction goals and has begun a public campaign to bring engage community members in taking actions. Boston has devoted city staff to its campaign, with about 30 full-time employees working on the Greenovate Boston campaign. The city also runs the Renew Boston program, focused on promoting energy efficiency programs throughout the community.

New York, NY: New York City has firmly entrenched energy goals in its comprehensive sustainable development plan, PlaNYC. The plan outlines a variety of targets, including an ambitious strategy for heat island mitigation. MillionTreesNYC, one the 132 PlaNYC initiatives, is a city-wide, public-private program committed to planting and caring for one million new trees across the city's five boroughs over the next decade. New York has also made it a mandatory requirement that all new buildings city-wide must have cool roofs.

Portland, OR: Portland, in partnership with Multnomah County, has committed to increasing the use of clean distributed energy systems in the region by including a goal in the 2009 city/county Climate Action Plan to produce ten percent of the total energy used in the county from on-site renewables and clean district-energy systems by 2030. The city commissioned a feasibility study, released in 2011, that identified barriers to development of district energy systems as well as target areas for their installation. The study recommended creating financing mechanisms, committing municipal buildings to district energy, offering density bonuses to green buildings that included district energy, and providing property tax relief to property owners that connect their buildings to district energy. The city planned to establish at least one new district energy system in 2012.

Chapter 4: Buildings Policies

Lead Author: Rachel Cluett

INTRODUCTION

Buildings are high energy users in cities, and clear targets for energy savings. Policies that relate to land use and buildings are two of the core authorities of local governments, and, as a result, there are a variety of energy-related buildings policies over which local governments have control. Some policies that affect buildings are determined at the state level, but many cities have gone above and beyond state requirements in an effort to meet city-determined objectives for the reduction of energy use and greenhouse gas emissions.

The energy use and greenhouse gas emissions from buildings is a particularly important target in large, dense cities, where much of the opportunity for reduction in energy use is through improvements new and existing buildings, since these cities' relatively low levels of industrial activity and sizeable shares for non-car transportation have often already reduced energy use in these other sectors. Buildings account for a disproportionate percentage of the emissions of large cities specifically, as compared to states and the nation as a whole. Whereas the proportion of buildings' carbon dioxide emissions in the United States overall is 38%, the share for buildings in the country's largest cities is 50–75% (Kerr 2013). For the 13 of the cities in this study for which we obtained detailed energy consumption data (see Chapter 8), buildings and industry combined accounted for an average of 70% of a city's energy use. Even though American cities vary considerably with regard to density, economic activity, and transportation systems, buildings are ubiquitously very important targets for reductions in energy use and carbon dioxide emissions. As a result, many city policies that set goals for energy and emissions reductions focus heavily on buildings.

City-adopted goals for energy and emissions reductions often provide the impetus for a city's consideration and implementation of a wide array of energy efficiency policies for buildings. City-wide energy initiatives for each city included in the *City Scorecard* are detailed in Chapter 3, Community-Wide Initiatives. In this chapter we focus on policies specifically focused on private buildings, which in some cases are related to these community-wide energy initiatives. In New York City, for example, the Greater Greener Buildings Plan sets out a plan for targeting energy efficiency in large buildings with a package of energy efficiency policies. This initiative was borne out of a larger effort called PlaNYC, which laid out long-term goals, as well as initiatives and milestones for reaching those goals, to help prepare the city for the future challenges including a growing population, aging infrastructure, changing climate, and an evolving economy (New York 2011a).

Many cities adopt policies for their own buildings and then extend efficiency policies to private buildings, after demonstrating energy improvements in city government operations. For example, in Washington, D.C., the first buildings required to be reported under its benchmarking requirements were public buildings of 10,000 square feet and larger. The city's "lead by example" efforts were intended to demonstrate to the private sector how benchmarking practices can drive energy and cost savings (DDOE and DGS 2013). The policies and goals that local governments have established for energy efficiency in their own operations, including buildings, is the focus of Chapter 2, Local Government Operations.

In this chapter, we scored cities on policies for energy efficiency in private buildings that they can establish directly or on which they can have an influence. The five metrics that we scored in this policy area are:

- *Residential and commercial code stringency* based on the city's adoption of building energy codes if it has authority to set its own, or the city's efforts to advocate for a more stringent code if it does not have the authority to set its own codes
- *Residential and commercial energy code compliance efforts*, based on the city's spending on code compliance and enforcement, the presence of a third-party energy code enforcement efforts, and upfront support provided by the city to builders related to energy code compliance
- *Requirements and/or incentives for efficient buildings, building retrofits, and energy audits* for all buildings or a certain portion of the building stock
- *Requirements for commercial and residential building benchmarking, rating, and/or energy use disclosure*, including policy design and implementation aiming to improve the availability of building energy performance information in the real estate market
- *Availability of comprehensive efficiency service programs and providers*, based on the number of Home Performance with ENERGY STAR programs serving the metro area

RESULTS

We allocated 29 points in the buildings policy area across the following categories: residential and commercial energy code stringency (six (6) points); residential and commercial code compliance (six (6) points); requirements or incentives for efficient buildings, retrofits, or audits (nine (9) points); commercial and residential building benchmarking, rating, and/or disclosure requirements (six (6) points); and comprehensive efficiency services (two (2) points).[2] The methodology and data sources used for each of these metrics are discussed in detail in the following sections, and a summary of scores across all categories is presented in Table 15.

[2] It is worth noting that while this is the primary buildings chapter, there are other building-related metrics included in other chapters of the *City Scorecard*. Most notably, utility policies and programs related to efficiency, the focus of Chapter 5, are primarily related to energy use in buildings. Chapter 2, Local Government Operations, includes metrics related to public buildings. Chapter 3, Community-wide Initiatives, includes district energy and cool roofs, both of which are related to building energy efficiency. As a result, depending on how you count, buildings-related metrics account for more than 50% of total possible points in the *City Scorecard*. Looking only at the sector-specific chapters (Chapters 4, 5, and 6), buildings-related metrics account for 63% of points.

Table 15: Summary of Scoring on Buildings Policies

City	State	Code Stringency (6 pts.)	Code Compliance (6 pts.)	Requirements, Incentives & Goals (9 pts.)	Benchmarking, Rating & Disclosure (6 pts.)	Comprehensive Efficiency Services (2 pts.)	Total (29 pts.)
Seattle	WA	6	5	4.5	5	2	22.5
New York City	NY	4	3.5	7	5.5	2	22
Austin	TX	6	4.5	4.5	4.5	2	21.5
Boston	MA	6	2.5	7	4	2	21.5
Washington	DC	4	4.5	5	5.5	2	21
San Francisco	CA	4	1	6.5	3.5	2	17
Portland	OR	5	4	3	0.5	2	14.5
Chicago	IL	3	2	3	2	2	12
Houston	TX	3	3	3	0.5	2	11.5
Philadelphia	PA	3.5	1.5	2	2.5	2	11.5
Phoenix	AZ	5	2	1.5	0.5	2	11
Minneapolis	MN	3.5	0.5	1.5	2.5	2	10
Baltimore	MD	3	2	2	0	2	9
Sacramento	CA	2	1.5	2.5	0.5	2	8.5
San Jose	CA	2	1.5	2	0.5	2	8
Denver	CO	2	0.5	2.5	0.5	2	7.5
San Diego	CA	2	0.5	2.5	0.5	2	7.5
Riverside	CA	2	1	2	0.5	2	7.5
San Antonio	TX	2	3	2	0.5	0	7.5
Dallas	TX	4	0.5	3	0	0	7.5
St. Louis	MO	2	1.5	1.5	0	2	7
Pittsburgh	PA	1	2	2	0	2	7
Los Angeles	CA	2	0.5	1.5	0.5	2	6.5
Miami	FL	2	2	2.5	0	0	6.5
Tampa	FL	2	2.5	2	0	0	6.5
Atlanta	GA	2	0.5	1.5	0	2	6
Detroit	MI	1	2	0.5	0	2	5.5
Memphis	TN	2	1	1	0.5	0	4.5
Columbus	OH	1	1	2.5	0	0	4.5
Fort Worth	TX	1	2	1.5	0	0	4.5
Jacksonville	FL	2	1	0.5	0	0	3.5
Indianapolis	IN	1	2	0.5	0	0	3.5
Charlotte	NC	2	0	0.5	0.5	0	3
El Paso	TX	1	0	2	0	0	3

Source: Data from independent research and/or city data requests

The highest-ranking cities showed strong leadership in all of the metrics we used to rank cities on buildings policies. A number of efforts stood out among the highest-ranked cities. In the code stringency category, all cities that were top ranked were not necessarily found within a state in which the city could adopt its own energy code. Seattle, for example, could not set a city residential energy code; however, the city has been an active advocate for development of a more stringent code on the state level through participation in the Washington State Building Code Council. Efforts to ensure code compliance have been led by cities such as Austin, where third-party performance testing has significantly increased residential code compliance.[3] The highest ranked cities have also developed and implemented benchmarking, rating, or energy use disclosure polices that increase transparency surrounding the use of energy in buildings and lay the groundwork for cities to better address energy use in specific building types. Cities that had benchmarking and disclosure policies that applied to both commercial and multifamily residential buildings received some of the highest scores. In New York City, for example, policymakers realized that excluding multifamily buildings from a benchmarking policy would have left out a significant portion of the building stock—in New York City, multifamily buildings are responsible for almost half of the energy used in large buildings in the city (PlaNYC 2012).

The following sections detail the importance of each metric to the scoring of cities on policies addressing building energy use, and provide a discussion on how each scoring metric was developed.

STRINGENCY OF BUILDING ENERGY CODES

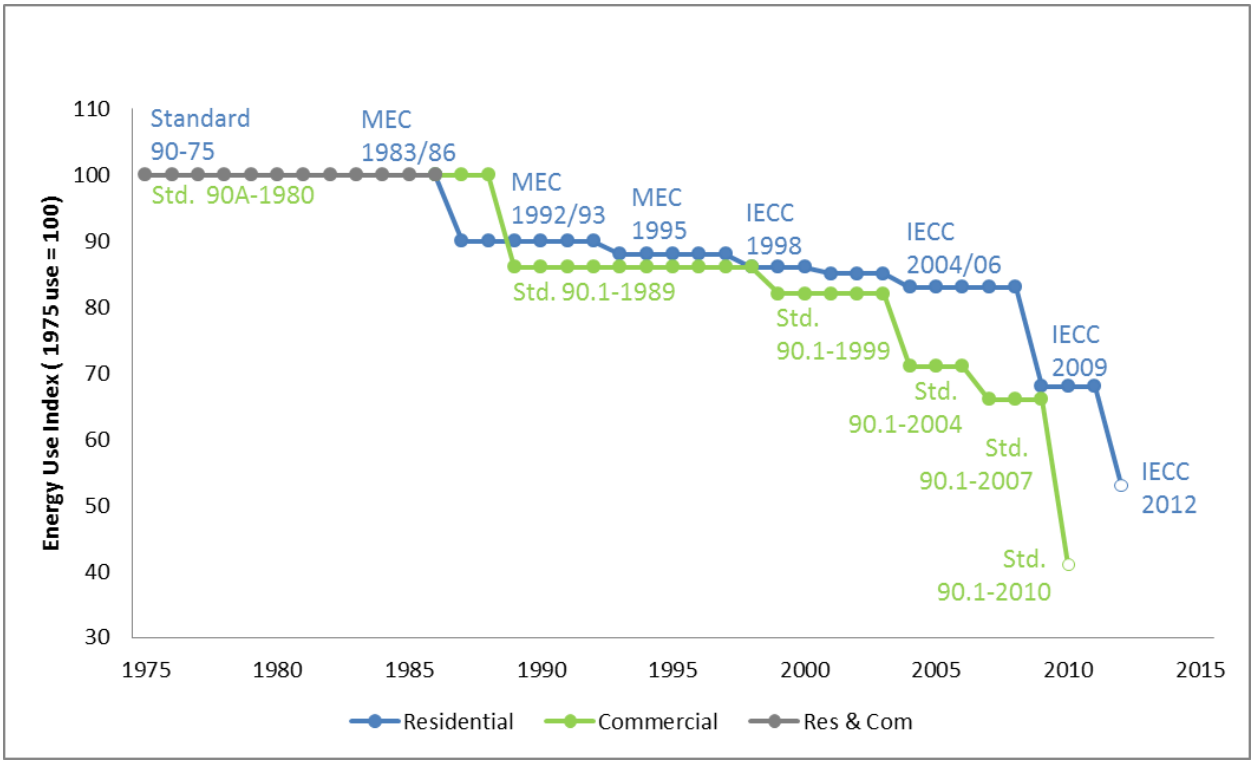
Mandatory building energy codes are one mechanism for improving the efficiency of new buildings and buildings undergoing significant remodeling. New buildings are a critical target for energy savings in the building sector, in part because it is significantly more cost-effective to proactively address energy use in a building when it is being constructed than to return to retrofit the building with efficiency measures later on. Although the United States does not have a uniform national building energy code, the federal government has taken an active role in developing national model energy codes and in encouraging state governments to adopt and implement codes, while also providing training, education, and tools to assist state and local agencies, as well as contractors, in meeting code requirements (Levine et al. 2012).

The national model codes for residential and commercial construction are the International Energy Conservation Code (IECC), developed by the International Code Council (ICC), and American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1, developed jointly by ASHRAE and the Illuminating Engineering Society (IES), respectively. When a new edition of either code is released, the Department of Energy (DOE) issues a determination of the relative energy impact of the new version compared to the current model code. The current model codes set by the DOE are the 2012 IECC and the ASHRAE 90.1-2010 standards. In each code cycle, codes have increased in stringency. As shown in Figure 6

[3] Austin Energy surveyed 50 new homes in 2009 and found that nearly all homes that had undergone mandatory third-party performance testing were in compliance with the energy code. In contrast, two out of every three homes that had not gone through performance testing (instead using a batch testing process, which is no longer permitted) were not in compliance. (Dwyer and Johnson 2011).

below, a building constructed under these current model codes uses half or less the amount of energy as a typical building constructed in the mid-1980s.

Figure 6: History of Code Revisions



Source: Building Energy Codes Program 2010

Code Adoption

Codes are generally adopted by legislative action, by regulatory action of administrative agencies, or by boards charged with code adoption at either the state or local level. The relationship between state and local governments with regard to code adoption varies from state to state. In home rule states, where municipalities are able to pass laws to govern themselves, local officials can adopt energy codes without permission from the state. Some states do not have a state-wide code, but encourage voluntary adoption of energy codes by local jurisdictions.

States may also allow local jurisdictions to adopt more stringent alternative compliance paths or more stringent code requirements than what the state has adopted, known as stretch codes. In these cases, cities can adopt a more recent version of the model code or add specific provisions to their code to meet certain energy performance levels or to address other specific issues. Cities have adopted a number of approaches to encourage stricter building efficiency standards and greater energy savings. An example in Massachusetts shows how states can facilitate a city's adoption of a stretch code above state requirements. Massachusetts adopted an above-code appendix to its state code called the 120 AA Stretch Energy Code, which was designed to be 20% more efficient than the base energy code for new construction (which at the time the stretch code was designed was IECC 2009) and was made available as a model code for adoption by local governments. The Massachusetts stretch code also put a greater emphasis on performance

testing, including blower door and duct leakage testing (Levine et al. 2012). As part of the Massachusetts Green Communities Act, cities and towns were encouraged to adopt this stretch code. As of December 2012, 110 communities had adopted the code (Pfister 2012).

Nationwide, energy code adoption was catalyzed at the state level with the passage of ARRA. A condition of access to $3.1 billion of funding through the State Energy Program for state energy offices for energy efficiency and renewable energy programs required the adoption and enforcement of the most recent residential and commercial building codes (ASHRAE 90-2007 and IECC 2009) (ASE 2009). As a result, states' adoption and upgrading of new and existing energy codes increased notably in 2009 and 2010. In states where code adoption is lacking, or where a state code has not been adopted, cities, often in growing metropolitan areas, have sometimes served as leaders in code adoption for areas where a majority of the building in the state is occurring.

In this year's *City Scorecard*, all 34 cities have a commercial and residential energy code that applies to the city, with significant variation in the stringency of these codes. The degree to which cities have control over code adoption also varies significantly depending on state policy. The following variations in code authority exist in the cities we ranked: (1) a code has been set at the state level and additional local adoption of codes was not permitted, (2) a code has been set at the state level and local adoption of more aggressive codes was permitted, or (3) no state-wide code existed and local adoption of codes was permitted. As a result we developed three respective scoring paths, with slight variations for residential and commercial stringency as outlined in Tables 16 and 17, that we applied based on the code adoption authority in a city's state.

Depending on the scoring path applicable to the city, we scored it based on a combination of whether the adopted residential and commercial building energy codes applicable in the city met or exceeded IECC and ASHRAE standards, whether the local government had taken specific initiative in implementing an energy-specific stretch code, and whether the city was an active advocate for code improvements. Cities could earn a maximum of three (3) points for residential code stringency and three (3) points for commercial code stringency.

For cities located where there was state code authority only, cities could earn points based in part on the state code and in part on if the city was an active advocate for code improvements at the state level, which we determined by (a) city official participation in technical advisory groups for building code development, (b) public comments submitted in support of code upgrades during the state code change rulemaking process, and/or (c) active advocacy and lobbying efforts. If code adoption authority was available to a city and this authority had been used, points were awarded based on the stringency of the code adopted by the city. If a city had not used its authority, a reduced number of points were awarded based on the stringency of the state code, or if no state or local code was in place the city received zero points for this metric.

Table 16: Scoring on Residential Code Stringency

Residential Energy Code Stringency	Score
IF CODE STATE AUTHORITY ONLY: Points were awarded based on the state-adopted code applicable in city	> or equal to 2012 IECC =1.5 points >2009 IECC = 1 point 2009 IECC = 0.5 point 1998-2006 IECC or greater = 0.25 point No mandatory code or state does not set codes= 0 points
PLUS: Additional points were available to cities in states with state code authority only, if the city was an active advocate for energy code improvements	Documented energy code advocacy by city = 1.5 points
IF LOCAL AUTHORITY PERMITTED AND USED: If a stretch code was adopted by city (either city- or state-designed) or the city energy code otherwise varied from state code, points were awarded based on stringency of the locally adopted code	> or equal to 2012 IECC =3 points >2009 IECC = 2 points 2009 IECC = 1 point 1998-2006 IECC or greater = 0.5 point (OR if less stringent than state code = 0 points)
IF LOCAL AUTHORITY NOT USED: If the city was permitted to amend code, but had not used this authority, reduced points were awarded based on stringency of the state code	> or equal to 2012 IECC =1.5 points >2009 IECC = 1 point 2009 IECC = 0.5 point 1998-2006 IECC or greater = 0.25 point No mandatory code = 0 points
IF LOCAL CODE AUTHORITY ONLY: For cities located in a state with no state-wide code, points were awarded based on the code adopted by the city	> or equal to 2012 IECC =3 points >2009 IECC = 2 points 2009 IECC = 1 point 1998-2006 IECC or greater = 0.5 point No mandatory code = 0 points

Table 17: Scoring on Commercial Code Stringency

Commercial Energy Code Stringency	Score
IF CODE STATE AUTHORITY ONLY: Points were awarded based on the state-adopted code applicable in city	> or equal to 2012 IECC or ASHRAE 2010 = 1.5 points >2009 IECC or ASHRAE 2007 = 1 point 2009 IECC or ASHRAE 2007 = 0.5 point 1998-2006 MEC/IECC or ASHRAE 1999-2004 or greater = 0.25 point No mandatory code or state does not set codes = 0 points
PLUS: Additional points were available to cities in states with state code authority only, if the city was an active advocate for energy code improvements	Documented energy code advocacy by city = 1.5 points
IF LOCAL AUTHORITY PERMITTED AND USED: If a stretch code was adopted by city (either city- or state-designed) or the city energy code otherwise varied from state code, points were awarded based on stringency of the locally adopted code	> or equal to 2012 IECC or ASHRAE 2010 = 3 points >2009 IECC or ASHRAE 2007 = 2 points 2009 IECC or ASHRAE 2007 = 1 point 1998-2006 MEC/IECC or ASHRAE 1999-2004 or greater = 0.5 point (OR if less stringent than state code = 0 points)
IF LOCAL AUTHORITY NOT USED: If the city was permitted to amend code, but had not used this authority, reduced points were awarded based on stringency of the state code	> or equal to 2012 IECC or ASHRAE 2010 = 1.5 points >2009 IECC or ASHRAE 2007 = 1 point 2009 IECC or ASHRAE 2007 = 0.5 point 1998-2006 MEC/IECC or ASHRAE 1999-2004 or greater = 0.25 point No mandatory code = 0 points
IF LOCAL CODE AUTHORITY ONLY: For cities located in a state with no state-wide code, points were awarded based on the code adopted by the city	> or equal to 2012 IECC or ASHRAE 2010 = 3 points >2009 IECC or ASHRAE 2007 = 2 points 2009 IECC or ASHRAE 2007 = 1 point 1998-2006 MEC/IECC or ASHRAE 1999-2004 or greater = 0.5 point No mandatory code = 0 points

We gathered data on code stringency and related activities from a variety of sources including: (1) state code stringency data from the 2012 ACEEE *State Energy Efficiency Scorecard*, (2) data request sent to local government officials in each city, (3) the Database of State Incentives for Renewables and Efficiency (DSIRE), and (4) independent city-by-city research. Scores for each city on code stringency is included in Table 18.

Table 18: Scoring on Residential and Commercial Code Stringency

City	State	Residential Code Stringency (3 pts.)	Commercial Code Stringency (3 pts.)	Code Stringency Total (6 pts.)	Residential Scoring Track	Commercial Scoring Track
Seattle	WA	3	3	6	State authority only, active advocate	Local authority permitted
Austin	TX	3	3	6	Local authority permitted	Local authority permitted
Boston	MA	3	3	6	Local authority permitted*	Local authority permitted**
Portland	OR	2.5	2.5	5	State authority only, active advocate	State authority only, active advocate
Phoenix	AZ	2	3	5	Local authority only	Local authority only
New York City	NY	2	2	4	Local authority permitted	Local authority permitted
Washing-ton	DC	2	2	4	Local authority only	Local authority only
San Francisco	CA	2	2	4	Local authority permitted	Local authority permitted
Dallas	TX	2	2	4	Local authority permitted	Local authority permitted
Philadel-phia	PA	2	1.5	3.5	State authority only, active advocate	State authority only, active advocate
Minneap-olis	MN	1.75	1.75	3.5	State authority only, active advocate	State authority only, active advocate
Chicago	IL	1.5	1.5	3	State authority only	Local authority permitted, but no stretch code adopted
Houston	TX	2	1	3	Local authority permitted	Local authority permitted
Baltimore	MD	1.5	1.5	3	Local authority permitted; no stretch code adopted	Local authority permitted, but no stretch code adopted
Sacra-mento	CA	1	1	2	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
San Jose	CA	1	1	2	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
Denver	CO	1	1	2	Local authority only	Local authority only
Riverside	CA	1	1	2	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
San Antonio	TX	1	1	2	Local authority permitted	Local authority permitted
San Diego	CA	1	1	2	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
St. Louis	MO	1	1	2	Local authority only	Local authority only
Los Angeles	CA	1	1	2	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
Miami	FL	1	1	2	State authority only	State authority only
Tampa	FL	1	1	2	State authority only	State authority only
Atlanta	GA	1	1	2	State authority only**	State authority only
Memphis	TN	1	1	2	Local authority permitted	Local authority permitted
Jackson-ville	FL	1	1	2	State authority only	State authority only
Charlotte	NC	1	1	2	State authority only	State authority only
Pitts-burgh	PA	0.5	0.5	1	State authority only	State authority only
Detroit	MI	0.5	0.5	1	State authority only	State authority only
Colum-bus	OH	0.5	0.5	1	State authority only	State authority only
Fort Worth	TX	0.5	0.5	1	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted
Indian-apolis	IN	0.5	0.5	1	State authority only	State authority only

City	State	Residential Code Stringency (3 pts.)	Commercial Code Stringency (3 pts.)	Code Stringency Total (6 pts.)	Residential Scoring Track	Commercial Scoring Track
El Paso	TX	0.5	0.5	1	Local authority permitted, but no stretch code adopted	Local authority permitted, but no stretch code adopted

Notes: *Boston does not have the ability to design its own energy code, but has the option to adopt a state designed stretch code, **State sets minimum codes, but Atlanta could choose to adopt 2011 Georgia State Minimum Residential Green Building Standard.

BUILDING ENERGY CODE ENFORCEMENT AND COMPLIANCE

Implementation of energy codes—including plan review and construction field inspections—is generally carried out by state and local agencies that are responsible for code compliance, enforcement, and training. For states that have building codes, state agencies often provide support to local code officials through technical and educational assistance, while also overseeing the enforcement practices of local agencies. Even when the code is set at the state level, states typically delegate the authority to enforce energy codes to local agencies, which typically carry out plan reviews and construction inspections. Agencies in different cities have different requirements for determining compliance. Much of the enforcement in local jurisdictions is centered on the permitting process. In jurisdictions without strict enforcement, engineers or architects for a building construction project have to certify that the plan they submit is code compliant, while in jurisdictions with stricter enforcement, plans must be submitted to code officials for review. Onsite field inspections are an additional requirement in some jurisdictions. Some support for building energy code enforcement comes from the federal government through the DOE for training and development of software tools for code officials to more easily assess code compliance of building plans, but local government enforcement is commonly funded by a combination of permit fees and municipal taxes. Some resources and planning to aid compliance come from the federal and state levels, but compliance funding falls predominantly in the hands of local governments (Meres et. al 2012). While local enforcement is the most common method of enforcement, a number of types of enforcement coordination between state and local governments are possible:

- *State agency enforcement.* State inspectors enforce a state-wide code by conducting inspections to supplement the efforts of local code officials and overseeing the enforcement practices of local governments. The effectiveness of this model depends largely on state resources, including the number of state staff relative to the size of the state (Levine et al. 2012). State agencies also sometimes offer technical and educational assistance to local jurisdictions.
- *Local enforcement.* City or county officials, often from the building department, conduct code enforcement activities, including plan reviews and inspections. Enforcement is typically carried out by the same officials that enforce fire and safety building codes (Levine et al. 2012). Most jurisdictions rely on permit and inspection fees as the source of funding for building departments (Meres 2013).
- *Third-party enforcement.* Independent parties approved by the local building department or relevant state agency carry out code enforcement tasks (generally plan review and/or field inspections). Typically, the builder is responsible for hiring the third party and bears the cost of the inspection.
- *Self-certification.* Builders are required to submit proof of compliance to the state or local agency in charge of enforcement. Although this model reduces staffing needs, it is the easiest to "game" and yields great uncertainty regarding compliance (Levine et al. 2012).

To date, few comprehensive studies to assess code compliance have been carried out, but it has been estimated that code compliance in finished buildings is between 50–60% (Levine et al. 2012). A lack of funding or resources is commonly cited as a local government's reason for not effectively enforcing building energy codes. Often energy codes are viewed as being outside the scope of work for protecting people against hazards that other building codes address, such as fire, lack of structural soundness, and other imminent dangers. As a result, the enforcement of building energy codes is often the first thing to be left out of the enforcement process when resources are limited. The development of a methodology to assess code compliance is underway at the Pacific Northwest National Laboratory, spurred by ARRA requirements for states to demonstrate 90% compliance with adopted codes by 2017. A pilot of this methodology has been undertaken to study compliance at the state level; however, no similar methodology is not yet in place or being developed to measure compliance at the local level.

Since assessment of energy code enforcement and compliance activity at the local level is limited, we took several factors into account when scoring cities on building energy code enforcement and compliance. Three primary metrics were used in this category to determine scoring on energy code enforcement and compliance:

(1) City spending on building code enforcement functions, including plan review and construction inspections
(2) Presence of alternative code compliance strategies such as third-party code compliance in the form of a testing requirement or plan review
(3) Presence of upfront support to developers/owners for building energy code compliance, which may include education prior to permit issuance, or application reviews with an eye toward energy code compliance

A city could earn up to six (6) points in this section, with two point available for each for the three metrics. The following methodology was used to score cities on these three metrics.

City Spending on Building Code Compliance

To assess city spending on building code department functions, we collected information on city budgets for the department that carried out building code plan review and construction inspection. Building department budgets rarely itemize spending on enforcement of the energy code separately from the general building code; as a result we relied on budget data for enforcement of all building codes—which may include codes pertaining to structural issues, fire, etc. As mentioned earlier, energy codes are typically the least-enforced code, typically because of budget constraints; thus, we use budget data as a proxy to measure the level of constraint that a city's budget has placed on code enforcement. We recognize that some concerted compliance efforts may not be captured under this methodology, hence our recognition of specific efforts in support of more stringent energy code enforcement in the following metrics.

Cities' spending for building code plan review and inspection is reported in different ways by different cities. While some city budgets had publicly available itemized budget information that clearly indicates where funds are spent, other city budgets were less transparent. In addition, since building code enforcement was tasked different city departments depending on the cities' administrative structure. In some cases the same department that is responsible for

enforcing housing or property maintenance codes was also responsible for enforcing building codes, and in others building code enforcement was a part of a community development or planning and development department that might incorporate many city functions including licensing of businesses, zoning, or long-range city planning.

Given the differences in data reporting and location within each department, we relied on three methods for obtaining budget figures in order to effectively compare spending between cities:

- *For cities that had buildings departments where the primary function of the department was to address construction code implementation and enforcement*, or for those that listed the spending of a specific office that issues building permits, conducts plan reviews, and/or conducts field inspections, we used that department's overall budget figure.
- *For cities that had itemized budgets and in which the code enforcement functions were part of a larger department*, we totaled the budgets for all primary code implementation and enforcement functions that were listed in the itemized budget. Itemized budget data accounting for code enforcement activity could include plan review, building inspection, development and assistance centers, and/or administrative functions of a code compliance office. We chose to include administrative functions in order to make the cities with itemized budgets more comparable to cities that presented overall budget figures for small departments that had the sole function of addressing building code functions.
- *For cities that did not have itemized budget data available*, we estimated the departmental budget allocated to code enforcement activity based on the percentage of spending on code activity in cities with similar department structures that did offer itemized budgets. The two kinds of city departments that most commonly housed code enforcement activity were planning and development departments, which tended to be responsible for more city functions and have larger overall budgets, and buildings departments, which tended to be responsible for fewer city functions and have smaller overall budgets. Cities with code enforcement functions within a buildings department tended to have a higher percentage of spending on compliance, while cities with code enforcement function within planning and development departments tended to have a lower percentage of spending on compliance. For the cities for which we had detailed information, planning and development departments devoted an average of 39% of the total budget to code compliance and enforcement, while in buildings departments these efforts had an average of 68% of the total budget. Each city without an itemized budget was placed into one of these two groups according to the type of department that housed its enforcement activities and then estimates of its code compliance spending were determined by multiplying the department's total budget by the average percentage devoted to code activities in other departments of the same type.

After code compliance spending was determined for a city, it was then compared to the total residential construction spending in the city for the year the budget data were collected, as reported by the U.S. Census (Census 2013).[4] The scores for this metric, then, were based on the

[4] We chose not to rely on a comparison of the city budget for code compliance with the number of building permits issued. While this may seem like a logical metric for normalization, the way that jurisdictions issue permits is inconsistent. While some jurisdictions issue permits for every trade that is working on the building, others issue one

ratio of a city's spending on building code enforcement to residential construction spending in its jurisdiction in the same year. Each city could earn up to two (2) points for compliance spending, the allocation of which is detailed in Table 19.

Third-party Code Compliance Strategies

Cities could receive up to two (2) points for additional code compliance efforts that were reflected in alternate code compliance strategies such as developing programs that included an option for third-party plan review or requiring third-party performance testing to verify and bolster compliance with energy codes. Third-party compliance programs have produced higher energy code compliance rates in jurisdictions where it has been enacted, such as Austin (Dwyer and Johnson 2011).

An additional benefit of the third-party compliance model is that it can reduce the costs incurred by a city's building department while increasing quality and timeliness (Meres 2012). These programs are administered and overseen by the city and yet lessen the burden on the city of much of the fluctuating training and staffing needs that result from fluctuations in construction activity. Third-party performance testing programs are particularly promising as a code compliance mechanism as performance testing becomes more prominent in building energy code. For example, in the 2012 IECC, performance testing is required of new construction for duct and building envelope air tightness.

A city received one (1) point if a third-party compliance program was set up as a compliance option but was not required for all new construction. A city received two (2) points if a third-party plan review or performance testing program was required for residential or commercial energy code compliance

Upfront Support for Building Energy Code Compliance

To account for additional specific efforts with which cities promoted compliance with building energy codes, we allocated two (2) points to cities that provided upfront support to developers, builders, or owners for building energy code compliance, which could include education prior to permit issuance and/or application reviews with an eye toward energy code compliance.

Scores for cities on all code compliance metrics are included in Table 20.

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permit per building. Permit fees are typically based on the cost of construction; therefore, a more accurate normalizing metric is construction spending overall (Meres 2013).

Table 19: Scoring Methodology for Building Energy Code Enforcement and Compliance

Building Energy Code Enforcement and Compliance	Scoring
City spending on building code compliance: building code budget per $1,000 of residential construction spending	More than $60 = 2 points <$30 to <$60 = 1.5 points <$20 to <$30 = 1 point <$10 to <$20 = 0.5 point Less than $10 = 0 points
Third-party compliance programs	IF participation in third-party plan review or performance testing program is *required*= 2 points IF a third-party compliance program is set up as a compliance option, but not mandatory =1 point
Upfront support for building energy code compliance	If upfront support is provided= 2 points

Table 20: Scoring on Building Energy Code Enforcement and Compliance

City	State	Department	Compliance Spending (2 pts.)	Third-Party Compliance (2 pts.)	Upfront Support for Energy Code Compliance (2 pts.)	Code Compliance Total (6 pts.)
Seattle	WA	Planning and Development	1	2	2	5
Austin	TX	Planning and Development Review	0.5	2	2	4.5
Washington	DC	Consumer and Regulatory Affairs*	1.5	1	2	4.5
Portland	OR	Bureau of Development Services	2	0	2	4
New York City	NY	Buildings Department*	1.5	0	2	3.5
Houston	TX	Planning and Development Services*	0	1	2	3
San Antonio	TX	Development Services Department*	1	0	2	3
Boston	MA	Building Division	0.5	2	0	2.5
Tampa	FL	Construction Services Department*	0.5	0	2	2.5
Phoenix	AZ	Community Development*	2	0	0	2
Chicago	IL	Department of Buildings	2	0	0	2
Baltimore	MD	Permits & Building Inspections*	2	0	0	2
Miami	FL	Building Department*	2	0	0	2
Pittsburgh	PA	Bureau of Building Inspection*	2	0	0	2
Detroit	MI	Buildings, Safety	2	0	0	2

City	State	Department	Compliance Spending (2 pts.)	Third-Party Compliance (2 pts.)	Upfront Support for Energy Code Compliance (2 pts.)	Code Compliance Total (6 pts.)
		Engineering and Environmental Department				
Fort Worth	TX	Planning and Development Department*	0	0	2	2
Indianapolis	IN	Department of Code Enforcement*	2	0	0	2
Philadelphia	PA	Licenses and Inspections*	1.5	0	0	1.5
Sacramento	CA	Community Development—Building	1.5	0	0	1.5
San Jose	CA	Dept of Planning, Building, and Code Enforcement	1.5	0	0	1.5
St. Louis	MO	Public Safety—Building Division*	1.5	0	0	1.5
San Francisco	CA	Department of Building Inspection	1	0	0	1
Riverside	CA	Community Development Department / Building and Safety	1	0	0	1
Memphis	TN	Planning and Development*	1	0	0	1
Jacksonville	FL	Planning and Development—Building Inspection Division*	1	0	0	1
Columbus	OH	Department of Building and Zoning Services	1	0	0	1
Dallas	TX	Building Inspection Division*	0.5	0	0	0.5
Minneapolis	MN	Construction Code Services	0.5	0	0	0.5
Denver	CO	Dept of Community Planning and Development: Development Services*	0.5	0	0	0.5
San Diego	CA	Development Services*	0.5	0	0	0.5
Los Angeles	CA	Department of Building and Safety*	0.5	0	0	0.5
Atlanta	GA	Department of Planning and Community Development, Office of Buildings*	0.5	0	0	0.5

City	State	Department	Compliance Spending (2 pts.)	Third-Party Compliance (2 pts.)	Upfront Support for Energy Code Compliance (2 pts.)	Code Compliance Total (6 pts.)
Charlotte	NC	Land Development Regulation, Plan Review, and Inspection*	0	0	0	0
El Paso	TX	Engineering and Construction Management: Building Permits & Inspections	0	0	0	0

Note: *Cities where code compliance spending was estimated based on department budget and average spending on compliance of other similar departments.

REQUIREMENTS, INCENTIVES AND GOALS FOR EFFICIENT BUILDINGS

A number of cities have employed strategies, requirements, and/or incentives to promote efficiency in their new and existing buildings. There are a variety of policy options on this topic available to cities (DOE 2013e). In this category we scored cities on policies requiring or incentivizing construction of efficient, above-code buildings; requiring energy efficiency retrofits or energy audits of existing buildings; or providing incentives or financing for efficiency improvements. Finally we also gave points to cities with a community-wide building energy savings targets. A city could earn up to nine (9) points from these metrics.

Green Building Requirements

Cities have adopted a variety of above-code green building requirements; some go into effect if public funding is used for a project, and other requirements are in place for specific classes or sizes of buildings. Some cities include green building requirements in the "stretch" code requirements for new construction. While we awarded points in the code stringency metrics to cities with green building requirements in their building codes that applied to the entirety of the residential or commercial building stocks, we wanted also to reflect any additional effort a city had made to extend more stringent, above-code requirements to specific categories of buildings, and we do so here. Some cities, for example, had green building requirements that were enacted for buildings built with public funds, others had requirements for commercial and residential additions over a certain square footage or construction price that would not otherwise be addressed by the building code, and yet others had requirements for new construction over a certain square footage. Efficiency requirements that are a part of the general building energy codes, and already scored in the codes stringency section, are not awarded points under this metric.

Green building requirements do not necessarily have a sole focus on energy efficiency improvements in a building, since often these requirements also address how a building impacts the surrounding environment and ecosystem through consideration of some or all of the following features: site selection; water conservation; storm water management; material use reduction, recycling, composting, and use of "green" building materials; indoor air quality; and reduction of the heat island effect (EPA 2013d). For a green building requirement to receive points for this metric, energy efficiency had to be explicitly noted in the policy or in the building standard referenced by the policy.

A city could earn up to two (2) points for this metric based on the classes of buildings included under the policy. Policies applying to some segment of both commercial and residential buildings were awarded two (2) points. Policies apply to some of portion of either commercial or residential buildings, but not both, were awarded one (1) point. Policies that applied only to buildings using public funds received one-half (0.5) point.

Energy Audit and Retrofit Requirements

Some cities have energy management requirements for existing buildings. For example, Austin requires all homes ten years and older to have an energy audit performed at the time of sale, with the results of the audit required to be disclosed to buyers or prospective buyers. This requirements is a component of the city's policy that also requires benchmarking of commercial and multifamily buildings called the Energy Conservation Audit and Disclosure ordinance. In addition, multifamily buildings in Austin that have five or more units must have an energy audit performed within the calendar year that the property is ten years old, results must be disclosed to current and prospective tenants, and energy efficiency improvements are required for the worst performing buildings (Austin Energy 2013). Other cities' policies also leverage the transaction period surrounding the time of sale of a building, requiring energy efficiency upgrades to be performed before a home is sold. Residential energy conservation ordinances (RECOs) such as the one in San Francisco, require all homes that are sold or substantially renovated to meet certain requirements for energy and water efficiency. These policies offer a way for cities to address energy use in the existing residential building stock, a segment of buildings with traditionally low rates of energy efficiency upgrade activity. Some cities also have similar retrofit requirements for commercial buildings.

A city could earn up to two (2) points for retrofit requirements and up to one (1) point for energy audit requirements. Full points were awarded if the retrofit or audit policy applied to both commercial and residential buildings. If the policy applied to either commercial or residential buildings, but not both, half credit was awarded.

Incentives and Financing for Efficient Buildings

Moving beyond requirements, a number of programs to create incentives for efficient new buildings and efficiency retrofits have been enacted at the city level. Some cities encourage developers and builders to construct green and efficient buildings by providing non-financial incentives that speed up the permitting process or allow the construction of larger and/or higher structures. For example, jurisdictions can provide a significant incentive to a builder with little to no financial investment by moving him or her up in the permitting and plan review process, which can sometimes take up to 18 months (USGBC undated). Density bonuses reward green builders with increases in the maximum allowable development on a property that would otherwise be restricted under zoning and land use designations. Financial incentives can also be used to encourage green building, including tax credits, permit fee reductions or waivers, grants, or property tax abatements. Financing mechanisms enabled by city policy and made available for use with properties making efficiency improvements—e.g., property assessed clean energy financing (PACE), tax increment financing (TIF), and revolving loan funds—can also encourage energy efficiency improvements to buildings.

Any city-provided incentives or financing mechanisms for efficient buildings that are not run through a utility program are captured in this metric. A city could earn up to three (3) points for

this metric, receiving one-half (0.5) point for each incentive or program provided by the city, and one (1) point if the incentive or program applied to both commercial and residential buildings.

Building Energy Savings Goals

Some cities have set energy reduction targets for the private building stock in the city in order to motivate and encourage increased energy efficiency in buildings specifically. While some of these building energy savings targets are components of broader goals aiming for the reductions of energy consumed in all sectors, others are stand-alone goals for the buildings sector. Many cities that have adopted stand-alone goals for buildings energy use have done so through the DOE's Better Buildings Challenge as Community Partners (DOE 2013f).

In this metric, cities that have adopted energy savings targets that are specific to the buildings sector are recognized with one (1) point.

The scoring methodology for these metrics is described in Table 21. Detailed score on these metrics and policy information on requirements and incentives for efficient buildings in each city is included in Table D-1 in Appendix D.

Table 21: Scoring Methodology for Requirements and Incentives for Efficient Buildings

Requirements, incentives or goals for efficient buildings, retrofits, or audits	Score (9 pts.)
The city has above-code green building requirements, which include energy efficiency standards, for certain categories of private buildings or for buildings using public funds.	2 points if yes for some private residential AND commercial buildings 1 point if yes for some private residential OR commercial buildings 0.5 point if yes for buildings using public funds
The city has building retrofit requirements (e.g., residential energy conservation ordinances or commercial energy conservation ordinances).	2 points if yes for BOTH residential and commercial buildings 1 point if yes for EITHER residential or commercial buildings
The city has building energy audit requirements.	1 point if yes for BOTH residential and commercial buildings 0.5 point if yes for EITHER residential or commercial buildings
The city provides incentives or financing programs for energy-efficient new construction or building improvements.	0.5 point per incentive or program (1 point if it applies to both residential and commercial) (3 points maximum)
The city has a building energy savings target for private buildings.	1 point if a buildings-specific target has been established

BUILDING BENCHMARKING, RATING AND ENERGY USE DISCLOSURE

Building benchmarking, rating, and energy use disclosure policies have gained traction in the United States at the state level, and even more so at the city level, in recent years. While these policies do not directly require upgrades or changes in behavior, energy use information is critical for quantifying and evaluating building energy use patterns in order to develop the most effective ways to reduce energy use in a city's building stock. Benchmarking and energy use disclosure can also reduce the informational gaps that limit investment in energy efficiency improvements. Finally, the process of benchmarking itself has been correlated with energy savings. In an analysis by the Environmental Protection Agency, energy consumption decreased by 7% over three years in a pool of 35,000 benchmarked buildings (EPA 2012b).

This category includes two metrics, each worth three (3) points, covering commercial and residential buildings, respectively. Some cities have gone a step beyond requiring disclosure of a building's energy use characteristics by *requiring* buildings that meet certain criteria to undertake an energy audits or improvements. These requirements are captured in the Requirements, Incentives and Goals for Efficient Buildings category earlier in this chapter.

Commercial Benchmarking and Disclosure

Benchmarking and energy use disclosure of commercial buildings is a great resource to a city for identifying high-energy-consuming buildings and building types, as well as determining opportunities for targeted energy savings programs in efforts to meet cities' carbon or energy use reduction goals. Initial results from the first report on New York City's benchmarking policy, for example, helped to determine the least and most efficient office building types (e.g., the most efficient buildings were also often the oldest) giving the city a better sense of what building stock to target with incentives and financing for upgrades (PlaNYC 2012).

Currently, eight cities and two states have energy disclosure requirements for private commercial buildings; five of these policies also cover large multifamily residential buildings. All of these jurisdictions require buildings to benchmark their energy use using the ENERGY STAR Portfolio Manager tool, but policies differ with regard to enforcement strategies, education and support for building owners, whether disclosure of data is public or only available to parties involved in a transaction for the building, and the timing of disclosure (Levine et al. 2012). Most cities required reporting of energy information to the local government, while other required public disclosure trough a database or other method. Public availability of energy use information increases the visibility of high-energy-consuming buildings, helping renters and buyers to incorporate energy use into purchasing or renting decisions. Some cities had chosen to analyze the reported information in order to use it to improve its efforts to reduce energy use. Tracking results of energy disclosure is crucial to the continual improvement of the policy, as well as for supporting and justifying disclosure efforts (Cluett and Amann 2013). In Austin, for example, tracking the number of audited homes that performed retrofit work revealed very low rates of action, prompting alterations to the required timing of disclosure of energy audit results. Energy disclosure policies for commercial buildings also differ with regard to the sizes of buildings included. Requirements for benchmarking of large buildings are often phased in over multiple years, according to building sizes and types. Commercial benchmarking policies range from including buildings of 10,000 square feet and larger to including only buildings of 50,000 square feet and larger.

Commercial building benchmarking and energy use disclosure policies were allocated three (3) points. Points were awarded based on whether a policy had been passed, the details of the policy, and its implementation. The best practices from which this scoring was based were adapted from Institute for Market Transformation reports on best practices for commercial and multifamily benchmarking (Burr et al. 2011; Krukowski and Burr 2012). One-half (0.5) point was awarded if the city had passed a benchmarking or energy use disclosure requirement for commercial buildings. One-half (0.5) point was awarded if the city had implemented its requirements. Many policies were structured with a phased-in approach, where compliance was phased in based on buildings' size and whether the buildings were private or public. To take this into account, credit for implementation was awarded if private buildings of any size had been required to start reporting energy use information. In a few cities, reporting of public building energy use under the policy had begun, but private building implementation had not yet begun.

Commercial policies could receive additional points for the following:

- If the city had resources in place to aid building managers and owners in meeting their benchmarking requirements, such as a benchmarking help center or hotline, training seminars, or guidance documents (which could include compliance checklists, FAQ documents, utility data request forms, and information sheets), the city received one-half (0.5) point.
- If there was a set schedule with compliance deadlines, fines for non-compliance, and/or another mechanism in place for enforcement, the city received one-half (0.5) point.
- If the city had released a report providing compliance data and/or analysis of building energy use data, the city received one-half (0.5) point.
- If commercial buildings were required to publicly disclose energy use data, the city received one-half (0.5) point.

These scoring criteria for commercial buildings policies are summarized in Table 22. Details on commercial building benchmarking and disclosure policies in each city, and resulting scores, are included in Table D-2 in the Appendix.

Table 22: Scoring Methodology for Benchmarking and Disclosure Policies for Commercial Buildings

Criteria	Points Awarded (3 pts.)
Benchmarking requirement had been **passed.**	0.5 point
Benchmarking requirement had been **implemented.**	0.5 point
Training and Guidance: the city had a benchmarking hotline, held trainings for building owners, etc.	0.5 point
Enforcement strategy: there were fines for non-compliance or other mechanisms in place for enforcement.	0.5 point

Criteria	Points Awarded (3 pts.)
Data reporting: the city had released a report or database providing compliance data and/or analysis of building energy use data.	0.5 point
Public disclosure of energy use data: commercial buildings were required to publicly disclose energy use	0.5 point

Residential Benchmarking, Rating and Disclosure

At the residential level, energy use disclosure policies can (1) highlight the value of energy-efficient homes in the home sale process, (2) encourage energy efficiency upgrades for sellers aiming to make their homes stand out in the market and/or for new buyers, and (3) generate information needed for better valuation of energy efficiency improvements in a home for appraisals and mortgage underwriting. There is strong evidence that providing homeowners with information on expected energy costs can go a long way toward their having a more complete picture of the costs of home ownership, resulting in lower rates of mortgage defaults and foreclosures. A recent report by the Institute for Market Transformation finds that energy-efficient homes are associated with lower mortgage default rates, suggesting that energy costs are significant elements of risk that are often complete ignored in the real estate market (Kaza et al. 2013).

A variety of jurisdictions—a total of 15—at the state, city, and county level, have energy use disclosure laws that apply to residential homes (including the five benchmarking policies that cover the multifamily sector). There is considerably more variation between energy use disclosure requirements for residential buildings than between commercial policies. Whereas commercial requirements are all based on energy benchmarking, current residential policies take four different forms: (1) disclosure of utility bills, (2) disclosure of energy efficiency features, (3) energy audit requirements and disclosure of audit report results, and (4) benchmarking (Cluett and Amann 2013). As a result, residential policies span a broad range from requiring utility bill disclosure from all single family homes and multifamily rental units to applying only to multifamily buildings that are 50,000 square feet and larger. Benchmarking requirements are most commonly applied to commercial buildings but have sometimes been written to include multifamily buildings as well. Some of these benchmarking policies qualify multifamily buildings for inclusion based on number of units, while others use square footage. Generally, number of units is a better-known descriptor for multifamily building owners than square footage, and can create less confusion around which buildings fall under the requirement (Cluett and Amann 2013).

The growing demand for green and energy efficient buildings, driven in part by the trends in benchmarking and energy disclosure, has also resulted in efforts within the real estate industry have led to improvements to regional Multiple Listing Services (MLSs) to better include information on the energy efficiency of homes at the time a home is listed on the real estate market. Disclosure of verifiable energy efficiency characteristics and/or energy use of a home on the MLS, rather than listing more arbitrary "green features," is encouraged by realtors involved in the *Green the MLS* movement. One city ranked in the *City Scorecard*—Chicago—has an energy disclosure policy that addresses both single family residential homes and units

within multifamily buildings. The Chicago policy also integrates energy use disclosure information into the local MLS.

Residential building benchmarking and energy use disclosure policies were allocated three (3) points. One-half (0.5) point was awarded if the city had passed a benchmarking or rating and energy use disclosure requirement applicable to at least some subset of its residential buildings. One-half (0.5) point was awarded if the city had implemented its requirements, and private buildings had been required to start reporting energy use information or other building energy characteristics.

Residential policies could receive additional points for the following:

- If the city had resources in place to aid building managers and owners in meeting their benchmarking or energy use disclosure requirements, such as a benchmarking help center or hotline, training seminars, guidance documents (which could include compliance checklists, FAQ documents, utility data request forms, or information sheets), or if the city provided energy use data for inclusion in the local MLS, the city received one-half (0.5) point.
- If there were fines for non-compliance and/or another mechanism in place for enforcement, the city received one-half (0.5) point.
- If residential buildings were required to publicly disclose energy use data, the city received one-half (0.5) point.
- If the MLS that serves the metro area included fields for energy efficiency features of homes, the city received one-half (0.5) point.

These scoring criteria for residential buildings policies are summarized in Table 23. Details on residential building benchmarking, rating and disclosure policies in each city, and resulting scores, are included in Table D-3 in the Appendix.

Table 23: Scoring Methodology for Benchmarking, Rating, and Disclosure Policies for Residential Buildings

Criteria	Points Awarded (3 pts.)
Benchmarking/energy use disclosure requirement had been **passed**	0.5 point
Benchmarking/energy disclosure requirement had been **implemented**	0.5 point
Training and guidance: the city had a benchmarking hotline, held trainings for building owners, provided worksheets for facilitating utility data disclosure, and/or provided energy use data to local real estate multiple listing service (MLS) database	0.5 point
Enforcement strategy: there were fines for non-compliance or other mechanisms in place for enforcement	0.5 point
Availability of reported data: reported building energy use data had been made publically available	0.5 point

Criteria	Points Awarded (3 pts.)
Green MLS Features: the local MLS included a field for energy efficiency features (specifically: documentation of HERS, LEED, other green ratings)	0.5 point

COMPREHENSIVE EFFICIENCY SERVICES

Existing buildings with the need for energy efficiency improvements are widespread in every city, and for the most part the technology to address specific issues with their energy consumption exists. However, it is less common to find professionals or programs that take a comprehensive approach to building energy efficiency. A comprehensive whole-building approach to saving energy—rather than a focus on single measures (e.g., the addition of insulation or replacement of a furnace)—can result in the identification of the most cost-effective improvements and fewest missed savings opportunities.

An important measure of the feasibility of comprehensive energy efficiency upgrades to homes and other buildings is the programmatic and workforce infrastructure that the city and regional economy have in place for energy efficiency services. In this metric, we assessed the availability of comprehensive energy efficiency services in a city, based on the availability of performance-based whole-home energy improvement programs. The Home Performance with ENERGY STAR program is a national program administered by the DOE and EPA that combines diagnostic assessment of homes with a pathway to complete recommended energy efficiency measures. The program focuses on a comprehensive "whole house" approach to improvements to increase the efficiency of a home, rather than targeting specific products or equipment. Approximately 50 sponsors of the Home Performance with ENERGY STAR program exist around the country—these sponsors include utilities, states, municipalities, non-profit organizations, and financial institutions (ENERGY STAR 2013a).

A city was awarded two (2) points if homeowners in the city had access to a Home Performance with ENERGY STAR or equivalent whole-home program. The program did not need to be administered by the city government to qualify for points in this metric. Instead, this metric assessed the capacity of the regional economy to effectively provide energy efficiency retrofit services. Details on the scores for in each city are included in Table D-4 in Appendix D.

While we recognize that a Home Performance with ENERGY STAR program is not the only pathway through which homeowners may obtain comprehensive whole-home retrofit services, it acts as an indicator of the access residents have to comprehensive energy saving solutions for homes. It also serves as an indicator of the availability of skilled and available contractors in a metro area, as Home Performance with ENERGY STAR programs require participating contractors to undergo a vetting process before they can participate. For future editions of the *City Scorecard*, we aim to develop additional metrics to assess workforce development for residential energy efficiency retrofit work and workforce infrastructure for the commercial energy efficiency retrofit market.

CONCLUSION

A number of cities are paving the way with smart policies that address the high energy consumption in buildings. Seattle, New York, Austin, Boston and Washington, D.C. top the rankings in this policy area, with a difference of one-half point between first and second place, and a difference of 1.5 points between first and fifth. These five cities have been very active in their commitments to reduce energy consumption, as a result of city-adopted energy and emissions reductions goals. While the top cities can serve as great models for lower-ranking cities, *all* cities have room for improvement, with the top ranked city (Seattle) earning 22.5 of 29 possible points. The average total score for buildings rankings was just over nine points, with the lowest-scoring cities—El Paso and Charlotte—scoring only three points each.

Cities scored best in the efficiency infrastructure category, earning an average of 1.4 out of two possible points, in this one-metric category. Cities also scored fairly well in the code stringency category, earning an average of 2.8 out of six possible points. Cities scored least well in the benchmarking and energy use disclosure category, earning an average of 1.2 points out of six, only 20% of the total possible points. Points in this category were highly concentrated in a few cities that currently had benchmarking or energy use disclosure policies in place; a majority of cities ranked do not have such policies and thus earned zero points. Cities also had room to significantly improve their energy code compliance efforts. In this category an average of 1.8 out of six points were earned, or 30% of the possible points. Action to lower buildings' energy consumption, particularly in the policy categories where many cities are lagging, is critical to cities' ability to achieve reductions in their energy consumption and greenhouse gas emissions.

Figure 7: Leading Cities and Best Practices: Buildings Policies

CODE COMPLIANCE

Austin, TX: Austin has seen improved compliance with residential energy codes upon its adoption and implementation of third-party testing requirements to verify compliance. A city task force charged with developing incremental goals toward requiring zero-net-energy-capable homes by 2015, recognized the role that code compliance plays in achieving energy efficiency in new buildings and recommended the adoption of a performance testing requirement for all new residential single and multifamily buildings. The city also leveraged the technical expertise in the private sector to design a third-party testing requirement that supports Austin's goal of greater energy efficiency in its housing stock. Austin's experience developing and implementing a third-party compliance scheme highlights the importance of specific elements to creating a successful code enforcement system: gaining stakeholder support for a third-party enforcement role, securing long-term financing for program administration, designing an effective but not overly burdensome administrative structure, and assessing program performance after implementation in order to make incremental improvements (Dwyer and Johnson 2011).

BENCHMARKING/ENERGY DISCLOSURE

Chicago, IL: Chicago has had a heating cost disclosure law in place since 1987, applying to all single-family and multifamily buildings at the time of sale or rental. There was recognition that the policy had not been utilized to its full potential, and efforts in the spring of 2013 focused on amending the utility disclosure requirements to streamline energy disclosure and increase the effectiveness of existing requirements. Discussions to amend the ordinance leveraged advances in technology that have occurred since the law was passed to make utility bills easier to access in a timely manner and easier to understand in a standardized format. Changes to the ordinance passed in City Council, included (1) permission for realtors to pull energy-use data from the web, making it easier for realtors to access utility data; (2) the requirement that both natural gas and electricity costs be disclosed to potential buyers or tenants, instead of solely those for heating energy costs; and (3) the simplification of the language requiring estimates for homes that have recently had heating systems replaced and clarifying the requirement for disclosure of the past 12 months of energy use data.

One major innovation was the development of an improved disclosure system in which a realtor enters utility information for a home when listing it on the MLS, using information from the MyHomeEQ platform. The platform, developed through a partnership between the Center for Neighborhood Technology (CNT) and RW Ventures, LLC, has provided a reporting method for energy use information that is standardized, automatic, and easy to understand. Existing relationships between Midwest Real Estate Data, owner of the local Chicago MLS, and CNT from earlier efforts to green the MLS proved important to developing a successful implementation strategy to meet the requirements of the amendments to the existing ordinance (Wheat 2013).

Chapter 5: Energy and Water Utility Policies and Public Benefits Programs

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INTRODUCTION

Utilities offer cities valuable partners in delivering energy efficiency programs. In nearly every state, customers of energy utilities fund energy efficiency programs through their utility bills. These programs are implemented by the electric and gas utilities themselves or through state-wide independent program administrators, and they have a long record of delivering energy savings to residential, commercial, and industrial customers (York et al. 2012; Nowak et al. 2013). As seen in the 2012 ACEEE *State Energy Efficiency Scorecard,* budgets for energy efficiency programs funded by electric and natural gas utility customers have increased steadily over the past decade, reaching $7 billion annually in 2011 (Foster et al. 2012). By comparison, the American Recovery and Reinvestment Act of 2009 (ARRA), which provided an one-time influx to energy efficiency programs, allocated just over $6 billion to the State Energy Program and the Energy Efficiency and Conservation Block Grant Program. This one-time infusion, while large, is equivalent to the budgets of programs funded by utility customers for a single year (Goldman et al. 2011). Energy utilities, therefore, play an important role in the resources available for energy efficiency in virtually every city.

While the policies that shape energy utility programs and the level of spending are often determined at the state level by public utility regulatory commissions, cities can partner with their energy utilities to promote these programs and can leverage utility resources for city-funded programs. Cities can also intervene and advocate for expanded spending and programs that serve their citizens by participating in state regulatory commission proceedings that approve energy efficiency program plans and budgets for investor-owned utilities. In cities where the electric or gas utility is municipally owned, local governments can more directly influence these programs. Cities with municipally owned energy utilities have more direct influence over the level of investment and the types of programs offered by their utilities, and many have been leaders in delivering energy savings (York et al. 2008). Municipal utility efficiency programs are often tied to local policies and sustainability and/or climate plans. While cities generally cannot directly regulate investor-owned utilities, these cities can partner to promote and implement utility-sponsored energy efficiency programs in their jurisdictions. By partnering with utilities as programs are developed, cities can help to align the incentives offered by the utility with local policy goals. Furthermore, cities are particularly well suited to help with program outreach and coordination, especially when it involves groups which they reach through other city programs such as services for small businesses or low-income residents (DOE 2013c).

Partnerships with energy utilities can also provide local governments, building owners, and consumers access to data on energy use. Community-wide data are important for local energy planning. For example, aggregated building data can enable building owners with multiple tenants to better manage and operate their buildings; and these data are needed for building owners to comply with mandatory building rating and disclosure policies in cities that have enacted such policies.

Water utilities are also important actors in influencing energy efficiency, and they often implement programs to improve energy and water efficiency in their systems and those of their

customers. Water usage results in significant energy consumption, as electricity and natural gas are used to source, treat, and transport potable water and to collect, transport, treat, and discharge wastewater. As a result, improving the water efficiency in municipal systems can also result in reduced energy consumption (NRDC 2009; Young and Mackres 2013). Wastewater treatment also consumes significant amounts of natural gas. In California, the state with the most complete data, sourcing, moving, treating, heating, collecting, and disposing of water is estimated to account for 19% of the state's electricity use and 30% of its natural gas consumption (CEC 2005). For many local governments the percentage of total energy consumption is even higher: water and wastewater typically account for 35% of the energy budgets of municipal governments (Pirne 2008; EPA 2013c). Water utilities are often directly controlled by city governments. In other cases the utilities are independent regional agencies serving multiple cities. A single city may have different utilities that provide drinking water supply, drinking water distribution, wastewater management and treatment, and stormwater management. As with energy utilities, taking advantage of the opportunities for water and energy efficiency requires cities to partner with each of the various utilities which serve them.

We scored cities based on the efficiency efforts of their utilities and the extent to which cities partnered with their local utilities to enable utility-sector efficiency programs. The five energy utility metrics that we scored in this section were:

- Spending on electricity energy efficiency programs by the primary electric utility serving each city as a percentage of the utility's revenue
- Spending on natural gas energy efficiency programs by the primary gas utility serving each city per residential natural gas customer served by the utility
- Electric efficiency program savings as a percentage of retail sales by the primary electric utility
- Policies requiring utilities to invest in energy efficiency at the state and local level including state energy efficiency resource standards (EERSs), local franchise agreements and other procurement agreements
- Provision of energy usage data by local utilities for use by customers, multi-tenant building owners, and local governments

We also scored cities based on six metrics related to efficiency efforts by drinking water, wastewater, and stormwater utilities:

- Funding for water efficiency programs
- Water savings targets
- Water-related energy efficiency targets
- Self-generation of energy by wastewater utilities through methane capture or other means
- Policies, rates, or incentives that encourage private developers to incorporate low-impact development or "green" infrastructure into projects to manage storm water
- Funding for "green" stormwater infrastructure projects on public property, such as streets, schools, and parks

Policy Trends

At the state level, utility investment in energy efficiency is driven by regulatory policy including EERSs, public benefit funds, and integrated resource planning as well as financial incentives. For an in-depth discussion of these policies, see the ACEEE *State Energy Efficiency Scorecard* (Foster et al. 2012).

At the local level, cities can require their utilities to invest in energy efficiency through franchise agreements and other procurement agreements. In states with deregulated utilities and where municipal aggregation is allowed by state-law, cities can require energy efficiency commitments as part of their contracts with their chosen energy suppliers. Energy utilities can also be valuable partners in achieving city-wide energy and climate goals. For example, Austin Energy, the city's municipally owned utility, has goals for energy savings, reductions in greenhouse gas emissions, and renewable energy generation that are consistent with Austin's Climate Protection Plan (Austin Energy 2010). Finally, energy utilities are critical to the success of building rating and disclosure policies, as building owners must be supplied with the necessary energy usage data to comply with the law.

In cities with privately owned utilities, state policy is usually the primary driver of energy efficiency programs. However, utilities' program plans and budgets are subject to review by utility regulatory commissions, and cities can intervene in these processes. Less formally, cities can partner with their local utilities to promote the utilities' programs and help utilities reach their savings targets.

RESULTS

Cities could earn up to 18 points in the energy and water utility policy area, 13 for energy utilities and five for water utilities. The energy utility points were allocated across the following metrics: electricity program spending, incremental savings from electricity efficiency programs, natural gas program spending, utility energy efficiency savings targets and requirements, and utilities' provision of energy usage data. Water utility points were awarded for water and energy efficiency targets, efficiency programs, self-generation of energy for wastewater systems, and polices encouraging green stormwater infrastructure. Table 24 includes the total scores for energy and water utilities.

The top-scoring cities in the utilities policy area were San Francisco and Boston, which also had the top scores for their energy utilities and scored well for water utilities policies and programs. Boston and San Francisco, followed closely by New York, scored highest for their energy utilities because of high investments in electricity and natural gas programs, significant partnerships with their utilities and advocacy, and good access to utility energy data. El Paso, Fort Worth, New York, and Seattle all received the maximum score for water utilities due to their comprehensive water-related energy efficiency initiatives, water saving policies and programs, and efforts to manage stormwater.

Table 24: Summary of Scoring on Energy and Water Utilities

City	State	Energy Utilities (13 pts.)	Water Utilities (5 pts.)	Total Utilities Score (18 pts.)
Boston	MA	11.75	4	15.75
San Francisco	CA	11.75	4	15.75
New York City	NY	10.25	5	15.25
Portland	OR	10.75	4	14.75
Seattle	WA	9.75	5	14.75
Denver	CO	9.75	4.5	14.25
Minneapolis	MN	9.75	4	13.75
Chicago	IL	10	3.5	13.5
Columbus	OH	8.75	3	11.75
Sacramento	CA	9.75	2	11.75
San Jose	CA	8	3.5	11.5
Riverside	CA	9.25	2	11.25
San Diego	CA	8.25	3	11.25
Austin	TX	6.25	4.5	10.75
Phoenix	AZ	9.25	1	10.25
El Paso	TX	5	5	10
Los Angeles	CA	7	3	10
Houston	TX	6	3	9
Baltimore	MD	7.75	1	8.75
Fort Worth	TX	3.75	5	8.75
Washington	DC	6.75	2	8.75
Philadelphia	PA	4.5	4	8.5
Dallas	TX	5.25	3	8.25
San Antonio	TX	4	4	8
Pittsburgh	PA	3.5	4	7.5
Indianapolis	IN	5.5	1.5	7
Atlanta	GA	2.25	4	6.25
Tampa	FL	2.25	3.5	5.75
Miami	FL	3	2.5	5.5
Charlotte	NC	3	1.5	4.5
Detroit	MI	3.5	1	4.5
Jacksonville	FL	3.5	1	4.5
St. Louis	MO	1.75	1.5	3.25
Memphis	TN	2	1	3
Median		6.63	3.25	9.50

EFFICIENCY EFFORTS OF ENERGY UTILITIES

Cities' ability to influence program spending and to require energy utilities to invest in energy efficiency depends largely on whether utilities are municipally owned or investor-owned. As a result, points were awarded differently depending on the type of utility serving each city as described in each section below. Studies suggest that electricity programs achieve up to three times more energy savings than natural gas programs (Eldridge et al. 2009; SWEEP 2007). Therefore, we allocated twice the number of points to electricity programs (based on annual spending and savings) as to natural gas programs. Furthermore, energy savings data for natural gas programs are not tracked nationally as electricity program savings are by the Energy Information Administration (EIA); therefore, it was impractical to develop scores for natural gas savings and we based these scores on annual spending alone.

Electricity Efficiency Program Spending

We scored cities on the spending for annual electricity energy efficiency programs that was reported by the primary electric utility serving the city. These programs are funded by utility customers through charges on customer bills or are included directly in utility rates. Weatherization Assistance Program funding, which is awarded by the federal government to state and local program implementers on a formula basis, was not included. In cities where customer-funded programs are administered by independent state-wide program administrators, we scored the spending attributable to the local utility.[5]

The scoring methodology varied depending on whether the primary electric utility was privately (investor) owned or publicly (municipally) owned. For municipally owned utilities the scores were based on their energy efficiency program spending as a percentage of total revenue, as shown in Table 25.[6] We scored spending in the entire utility service territory, which typically encompasses more than just the city itself. The intention was to evaluate the average level of spending on efficiency programs available in each city. Since cities have less direct control over the level of spending of investor-owned utilities, half of the available points were awarded based on spending, and the city could earn additional points for promoting utility programs or advocating for increased spending through state regulatory processes. The scoring for investor-owned utilities is described in Table 26. Descriptions of these partnerships and advocacy efforts for both electricity and gas programs are provided in Table E-1 in Appendix E, based on information gathered from our data request to the cities. Unless otherwise noted, data are from the EIA's *Annual Electric Power Industry Report* for 2011 (EIA 2012a), the most recent year available, and figures include direct and incentive costs for all energy efficiency programs. Scores for each city on electricity program spending are included in Table 27.

Table 25: Scoring Methodology for Electricity Program Spending—Municipally Owned Utilities

Spending as a Percentage of Annual Revenue	Score (4 pts.)
2.5% +	4 points
2.25-2.49%	3.5 points
2-2.24%	3 points
1.5-1.99%	2.5 points
1-1.49%	2 points
.5-.99%	1.5 points
.25-.49%	1 point
<.25%	0 points

[5] For example, in Oregon the Energy Trust of Oregon administers utility-customer-funded energy efficiency programs. For Portland we scored the Energy Trust's spending that they attributed to Portland General Electric, the local utility. In states where the independent program administrator does not attribute the total program spending to individual utilities, we instead based the score on state-wide spending, utility revenues, and number of customers.
[6] As a reference, in 2010 the national average for spending on electricity energy efficiency programs was 1.1% of total electric utility retail revenues (Barbose et al. 2013, 18).

Table 26: Scoring Methodology for Electricity Program Spending—Investor-Owned Utilities

Category	Score (4 pts.)
Spending as a percentage of annual revenue	Same distribution as for municipal utilities, but out of 2 rather than 4 points
City actively promotes or helps to implement utility programs	1 point
City is an active advocate for additional energy efficiency spending or policy	1 point

Table 27: Scoring on Electricity Efficiency Program Spending

City	Electric Utility or Energy Efficiency Program Administrator	2011 Spending ($1000)	% of Utility Revenue	Score for Utility Spending (4pts. for Municipal, 2 pts. For IOUs)	City Promotes Programs (IOUs only, 1 pt.)	City Advocates for Additional Spending (IOUs only, 1 pt.)	Total Score (4 pts.)
Boston[1]	NStar	95,998	4.26%	2	1	1	4
Seattle	Seattle City Light*	27,400	4.18%	4	0	0	4
Portland[2]	Portland General Electric	60,512	3.56%	2	1	1	4
San Francisco[3]	Pacific Gas & Electric	406,042	3.36%	2	1	1	4
Riverside	Riverside Public Utilities*	10,000	3.14%	4	0	0	4
Baltimore	Baltimore Gas & Electric (BGE)	67,180	3.09%	2	1	1	4
Sacramento	Sacramento Municipal Utility District*	27,983	2.26%	3.5	0	0	3.5
Minneapolis	Xcel (Northern States Power)	59,744	2.16%	1.5	1	1	3.5
Phoenix	Arizona Public Service	61,694	2.06%	1.5	1	1	3.5
New York[6]	Consolidated Edison & NYSERDA	157,266	1.93%	2.25	1	0	3.25
Denver	Xcel (Public Service Co. of Colorado)	45,364	1.70%	1.25	1	1	3.25
Dallas[4]	Oncor	46,604	1.57%	1.25	1	1	3.25
San Jose	Pacific Gas & Electric	406,042	3.36%	2	1	0	3
San Diego	San Diego Gas & Electric	75,598	2.69%	2	1	0	3
Columbus[8]	AEP Ohio (Ohio Power)	52,150	1.39%	1	1	1	3
Chicago	Commonwealth Edison	75,600	1.38%	1	1	1	3
Houston	CenterPoint Energy	28,644	0.67%	0.75	1	1	2.75
El Paso	El Paso Electric	3,615	0.59%	0.75	1	1	2.75
Los Angeles	LADWP*	49,530	1.69%	2.5	0	0	2.5
Indianapolis	Indianapolis Power and Light	4,651	0.42%	0.5	1	1	2.5
Fort Worth[4]	Oncor	46,604	1.57%	1.25	1	0	2.25
San Antonio	CPS Energy*	23,359	1.29%	2	0	0	2
Austin[3]	Austin Energy*	14,318	1.28%	2	0	0	2
Washington[5]	PEPCO	8,138	1.13%	1	1	0	2
Philadelphia	PECO	72,200	2.38%	1.75	0	0	1.75
Pittsburgh	Duquesne Light Company	18,203	2.15%	1.5	0	0	1.5
Jacksonville	JEA*	7,952	0.58%	1.5	0	0	1.5
Miami	Florida Power & Light	117,015	1.14%	1	0	0	1
Detroit	DTE (Detroit Edison Co.)	47,895	1.01%	1	0	0	1
Memphis[7]	Memphis Light, Gas, and Water*	NA	0.40%	1	0	0	1

City	Electric Utility or Energy Efficiency Program Administrator	2011 Spending ($1000)	% of Utility Revenue	Score for Utility Spending (4pts. for Municipal, 2 pts. For IOUs)	City Promotes Programs (IOUs only, 1 pt.)	City Advocates for Additional Spending (IOUs only, 1 pt.)	Total Score (4 pts.)
Atlanta	Georgia Power	16,370	0.20%	0	1	0	1
St. Louis	Ameren Missouri (Union Electric Co.)	26,738	0.95%	0.75	0	0	0.75
Charlotte	Duke Energy Carolinas	28,126	0.67%	0.75	0	0	0.75
Tampa	Tampa Electric Company	11,686	0.59%	0.75	0	0	0.75

*Municipally Owned Utilities

Sources and notes: Spending and revenue data are from the EIA (2012a), except where noted. [1] NStar spending is for electricity programs only as reported for 2010 (NStar Electric 2011, p. 8), [2]Energy Trust of Oregon 2012,[3]Spending as a percentage of revenue is for the entire PG&E service territory and does not reflect PG&E's efforts to concentrate program spending in the San Francisco area. PG&E was directed by the California Public Utility Commission to establish partnership programs with local governments (CAPUC 2010), leading to the creation of the SF Energy Watch program [3](Austin Energy 2012), [4]Oncor 2012, [5]In Washington, D.C., the DC Sustainable Energy Utility, an independent organization established by the District, administers programs funded by customers of PEPCO, the investor-owned electric utility (DC SEU 2011, DC SEU 2012). [6]Includes spending from NYSERDA, the state-wide agency that administers programs in New York, and Consolidated Edison. NYSERDA spending attributed to ConEd's service territory is approximately 41.5% of total spending according to NYSERDA's 2011 annual report (NYSERDA 2011). Revenue used is ConEd's. [7]State-wide spending as a percentage of revenue based on TVA (Foster et al. 2012). Memphis Gas Light Water & Power implements TVA-funded energy efficiency programs in Memphis. [8] A small number of Columbus customers are served by the municipal power group and are eligible for AMP Ohio's Efficiency $mart program. Those customers and spending are not included here (Miller 2013).

Natural Gas Efficiency Program Spending

Cities could also earn up to three (3) points for spending on natural gas energy efficiency programs. We gathered data on 2011 program spending from utility commission filings and our survey of city sustainability staff. Spending on natural gas programs is normalized by the number of residential gas customers served by each utility as reported by EIA in the *Annual Report of Natural and Supplemental Gas Supply and Disposition* (2012b). To normalize natural gas spending we used spending per residential customer rather than revenue because reliable natural gas revenue data are not widely available. As with electricity program spending, the natural gas program spending per residential customer represents the entire service territory, which may be larger or smaller than the city itself.

Scoring again accounted for the ownership of the local gas utility as with electricity program spending, as shown in Tables 28 and 29. Scores for each city are presented in Table 30.

Table 28: Scoring Methodology for Natural Gas Program Spending—Municipally Owned Utilities

Spending per Residential Customer	Score (3 pts.)
$35 or greater	3 points
$28 -34.99	2.5 points
$21-27.99	2 points
$14-20.99	1.5 point
$7-13.99	1 point
$1-6.99	.5 point
<$1 = 0	0 points

Table 29: Scoring Methodology for Natural Gas Program Spending—Investor-Owned Utilities

Category	Score (3 pts.)
Spending per Residential Customer	Same distribution as for municipal utilities but out 1.5 possible points, rather than 3
City actively promotes or helps implement utility programs	.75 point
City is active advocate for additional energy efficiency spending or policy	.75 point

Table 30: Scoring on Natural Gas Efficiency Program Spending

City	Gas Utility	2011 Spending ($1000)	$ Per Residential Customer	Utility Spending Score (3 pts. for Municipal, 1.5 pts. For IOUs)	City Promotes Programs (IOUs only, .75 pts.)	City Advocates for Additional Spending (IOUs only, .75 pts)	Score (3 pts.)
Boston	National Grid (Boston Gas)	34,068	56.11	1.50	0.75	0.75	3
Portland[1]	NorthWest Natural Gas	19,122	34.84	1.25	0.75	0.75	2.75
San Francisco[2]	Pacific Gas & Electric	119,850	29.57	1.25	0.75	0.75	2.75
Minneapolis	CenterPoint Energy	18,714	25.36	1.00	0.75	0.75	2.5
San Diego[3]	San Diego Gas & Electric	15,941	19.40	0.75	0.75	0.75	2.25
Columbus[4]	Columbia Gas Ohio	20,603	15.85	0.75	0.75	0.75	2.25
Denver	Xcel (Public Service Co. of Colorado)	17,091	14.18	0.75	0.75	0.75	2.25
San Jose[2]	Pacific Gas & Electric	119,851	29.57	1.25	0.75	0	2
New York[8]	National Grid	22,699	13.01	0.50	0.75	0.75	2
Indianapolis	Citizens Energy	2,755	11.52	0.50	0.75	0.75	2
Chicago	Peoples Gas	7,059	9.63	0.50	0.75	0.75	2
Seattle	Puget Sound Energy	15,489	22.13	1.00	0.75	0	1.75
Baltimore [7]	Baltimore Gas & Electric	1,763	3.50	0.25	0.75	0.75	1.75
Miami	Florida City Gas	3,572	36.95	1.50	0	0	1.5
Sacramento	Pacific Gas & Electric	119,851	29.57	1.25	0	0	1.25
Riverside	Southern California Gas	53,895	10.11	0.50	0.75	0	1.25
Detroit	DTE (MichCon Gas)	22,479	23.78	1.00	0	0	1
Jacksonville	TECO People's Gas	6,907	22.59	1.00	0	0	1
Tampa	TECO People's Gas System	6,907	22.59	1.00	0	0	1
Washington[6]	Washington Gas D.C./ D.C. SEU	707	5.40	0.25	0.75	0	1
Phoenix	Southwest Gas	2,777	2.94	0.25	0.75	0	1
Dallas[5]	Atmos	2,000	1.17	0.25	0.75	0	1

City	Gas Utility	2011 Spending ($1000)	$ Per Residential Customer	Utility Spending Score (3 pts. for Municipal, 1.5 pts. For IOUs)	City Promotes Programs (IOUs only, .75 pts.)	City Advocates for Additional Spending (IOUs only, .75 pts)	Score (3 pts.)
Fort Worth[5]	Atmos	2,000	1.17	0.25	0.75	0	1
Houston	CenterPoint Energy	0	0	0	0	0.75	0.75
Atlanta	Atlanta Gas Light	0	0	0	0.75	0	0.75
Los Angeles	Southern California Gas	53,895	10.11	0.50	0	0	0.5
Philadelphia	Philadelphia Gas Works	3,792	8.04	0.50	0	0	0.5
Austin	Texas Gas	1,791	3.07	0.25	0	0	0.25
Charlotte	Piedmont Natural Gas	1,319	2.16	0.25	0	0	0.25
El Paso	Texas Gas	1,100	1.88	0.25	0	0	0.25
Pittsburgh	Peoples Natural Gas	224	0.92	0	0	0	0
San Antonio	CPS Energy*	0	0	0	0	0	0
Memphis	Memphis Light, Gas, and Water*	0	0	0	0	0	0
St. Louis	Laclede Gas	0	0	0	0	0	0

*Municipally Owned Utility

Notes and sources: Spending on gas efficiency programs is as reported in public utility commission filings for 2011 unless otherwise noted. Residential customers are as reported to EIA (2012b). [1](Energy Trust of Oregon 2012, Pg. 19 Table E), [2]California IOUs do not report spending for electricity and gas programs separately so figure shown is share of total spending as reported (PG&E 2012) that is consistent with the state-wide share of gas programs for energy efficiency program budgets (23%) as reported in the 2012 *State Energy Efficiency Scorecard*. [3]23% of total spending as reported (SDG&E 2012). [4]Poe 2012, [5]Budget for 2013 (Atmos 2013), [6]Spending is fiscal year 2012 expenditures for natural gas programs by the D.C. Sustainable Energy Utility (D.C. SEU 2012, Table 1). FY 2011 data are not available for electricity and gas separately. [7]BGE does not report spending on electricity and gas programs separately. Figure shown is 3% of total spending which is consistent with the gas program's share of Maryland's total energy efficiency budget in 2011 (Foster et al. 2012). [8]Includes spending by ConEdison and Brooklyn Union Gas (National Grid 2011, 2012). Data on gas specific spending by NYSERDA were not available and are not included here.

Savings from Electricity Energy Efficiency Programs

The level of savings achieved by utility programs was a key metric by which to measure the performance of energy efficiency programs available to each city.[7] Cities can influence the performance of the utility-sponsored programs serving their citizens by helping to promote available rebates and other financial incentives, connecting businesses to the applicable programs, and utilizing programs for public facilities. Furthermore, if utility-sponsored programs are failing to deliver savings for city businesses and residents, cities can advocate for improvements. We scored the incremental annual savings[8] as a percentage of electricity sales, for the largest electric utility serving the city, as shown in Table 31. Data on savings and electricity sales are based on the EIA's 2011 *Annual Electric Power Industry Report* (EIA 2012a).

[7] We scored electricity program savings because data are widely available from electric utilities' annual reports to the U.S. Department of Energy. Data from natural gas programs are not as widely available.

[8]Incremental savings are new electricity savings achieved from measures implemented during the reporting year.

Table 32 includes the scores for all cities related to electricity savings, in megawatt-hours (MWh), as reported to EIA.

Table 31: Scoring Methodology for Savings from Electricity Efficiency Programs

Savings as a Percentage of Sales	Score
1.4% or greater	2 points
1-1.39%	1.5 points
.6-.99%	1 point
.2-.59%	0.5 point
<0.2%	0 points

Table 32: Scoring on Incremental Savings from Electric Utilities

City	Electric Utility	2011 Net Incremental Savings (MWh)	% of Retail Sales	Score (2 pts.)
Sacramento	Sacramento Municipal Utility District*	170,630	1.64%	2.00
Los Angeles	LADWP*	345,517	1.49%	2.00
Phoenix	Arizona Public Service	397,201	1.41%	2.00
Pittsburgh	Duquesne Light Company	193,717	1.38%	1.50
San Diego	San Diego Gas & Electric	269,224	1.38%	1.50
Minneapolis	Xcel (Northern States Power)	431,804	1.36%	1.50
Portland	Portland General Electric	252,376	1.30%	1.50
Boston	NStar	264,735	1.21%	1.50
San Francisco	Pacific Gas & Electric	1,082,225	1.17%	1.50
San Jose	Pacific Gas & Electric	1,082,225	1.17%	1.50
Seattle	Seattle City Light*	107,729	1.12%	1.50
Riverside	Riverside Public Utilities*	20,989	1.04%	1.50
Columbus	AEP Ohio (Ohio Power)	501,984	1.04%	1.50
New York[1]	Consolidated Edison	586,498	1.02%	1.50
Detroit	DTE (Detroit Edison Co.)	481,000	1.00%	1.50
Denver	Xcel (Public Service Co. of Colorado)	279,108	0.98%	1.00
Philadelphia	PECO	383,591	0.97%	1.00
Austin	Austin Energy*	117,400	0.92%	1.00
St. Louis	Ameren Missouri (Union Electric Co.)	301,876	0.81%	1.00
Chicago	Commonwealth Edison	636,000	0.71%	1.00
Baltimore	Baltimore Gas & Electric (BGE)	219,926	0.69%	1.00
Charlotte	Duke Energy Carolinas	349,896	0.63%	1.00
Jacksonville	JEA*	69,277	0.57%	0.50
El Paso	El Paso Electric	21,370	0.36%	0.50
Indianapolis	Indianapolis Power and Light	49,329	0.35%	0.50
Houston	CenterPoint Energy	145,908	0.33%	0.50
San Antonio	CPS Energy*	69,739	0.32%	0.50
Tampa	Tampa Electric Company	51,422	0.28%	0.50
Miami	Florida Power & Light	242,783	0.23%	0.50
Washington[3]	D.C. SEU	24,054	0.21%	0.50
Memphis[2]	Memphis Light, Gas, and Water*	29,134	0.20%	0.50
Dallas	Oncor	209,973	0.18%	0
Fort Worth	Oncor	209,973	0.18%	0
Atlanta	Georgia Power	135,363	0.16%	0

*Municipally Owned Utilities.

Sources and notes: All savings and sales data are as reported in EIA (2012x), unless noted. [1] Includes savings reported by NYSERDA and Consolidated Edison normalized using Con Ed's 2011 sales. NYSERDA savings attributable to the ConEd service territory are estimated at 38% of total reported savings using average of savings attribution reported in for both SBC and EEPS programs (NYSERDA 2012), [2] TVA 2012. [3] Savings from DC SEU (2012) for FY 2012.

Energy Efficiency Savings Targets and Local Utility Funding Agreements

Mandatory savings targets for utilities, often called energy efficiency resource standards (EERSs) at the state level, can be a highly effective driver of energy efficiency investment. Cities with municipally owned utilities, which may or may not be required to comply with state EERS policies, can enact similar savings requirements of their own. Cities without municipally owned utilities can still require their utilities to invest in energy efficiency or meet specific savings levels as part of their franchise agreements or through municipal aggregation agreements, described in more detail below. Local governments can also enter into voluntary agreements with their local utilities to set efficiency targets or establish funding for efficiency efforts, independent of any state policies.

Franchise agreements provide cities with a potential tool to require their investor-owned energy utilities to invest in energy efficiency or renewable energy; or the city can use the proceeds from fees paid by one or more utilities as part of their franchise agreement to invest in energy efficiency. Franchise agreements are negotiated between cities and privately owned energy utilities to allow the utilities to use public rights of way to provide energy services to residences and businesses. Utilities typically pay a fee for the use of the public space. Fee structures vary from flat fees to those based on utility revenues. In lieu of paying fees, some utilities may agree to provide cities with free electricity or gas for municipal operations (EPA 2009a; Minneapolis 2012a). However, local authority over franchise fees varies by state. For example, Minneapolis is exploring how it might/ways to encourage greater investment in energy efficiency and renewable energy through the upcoming renewal of franchise agreements with its electric and gas utilities. A review of existing authority revealed that while the city can determine the amount and formula for collecting fees as well as how to use the funds raised, the city does not have the authority to impose energy savings targets, as that would impact rates and services, which are the sole authority of the state utility commission (Minneapolis 2012a). Minneapolis is currently seeking state legislative changes to allow it to incorporate the state's energy efficiency and renewable energy goals into municipal franchise agreements.

In municipal aggregation (also known as community choice aggregation), which is allowed in six states that have deregulated their electric and/or gas utilities (Massachusetts, New Jersey, Illinois, Ohio, California, and Rhode Island), local governments arrange for the bulk purchase of electricity or gas through a competitively selected supplier (LEAN 2012). The bulk purchase allows for the local government to negotiate rates, often lower than existing rates, for all customers within the city. In addition to often saving local customers money, municipal aggregation can allow local governments to negotiate how much of the electricity supplied is generated by renewable energy or how much the supplier needs to invest in energy efficiency (Local Energy Aggregation Network 2012). For example, the Northeast Ohio Public Energy Council (NOPEC) is one of the largest public aggregation organizations in the country, representing ten Ohio counties. As part of its supply agreement with First Energy Solutions, NOPEC secured $16 million in funding for energy conservation and renewable energy project grants to local communities (NOPEC 2012). Chicago recently signed a municipal aggregation agreement with Integrys Energy that includes funding for energy efficiency programs as well as requires Integrys to obtain energy supplied to Chicago customers from sources other than coal-fired generation (City of Chicago 2012a).

Cities could earn up to two (2) points in this category. As with program spending, this metric was scored differently depending on whether a city had a municipal utility and could therefore establish a requirement directly, or whether the city had an investor-owned utility subject to a state policy. In some cases, municipally owned utilities are also subject to state EERS policies and are scored according to the state-wide policy. In cities with investor-owned utilities, one (1) point was awarded if the city had required its utility to invest in energy efficiency through a franchise agreement, municipal aggregation contract, or some other arrangement, such as a negotiated contract or a settlement in a utility commission proceeding. One-half (0.5) point was awarded if the city had a voluntary agreement with its utility to fund efficiency programs or to achieve an efficiency savings target, including agreements for the city to implement state-directed utility customer funded programs. An additional point was awarded if the city advocated for energy efficiency requirements at the state level. The details of this scoring method are included in Tables 33 and 34. Savings requirements and resulting scores of all cities with municipal utilities are included in Table 35, and scoring for cities with investor-owned utilities is in Table 36.

Table 33: Scoring Methodology for Energy Efficiency Savings Targets and Requirements—Municipally Owned Utilities

Percentage Annual Savings Target	Score (2 pts.)
Percentage Annual Savings Target	Score (2 pts.)
1.5% or greater	2 points
1%-1.49%	1.5 points
0.5%-0.99%	1 point
0.1%-0.49%	0.5 point
<0.1%	0 points
Cost cap in place	- 0.5 point
Natural gas included	+ 0.5 point

Table 34: Scoring Methodology for Energy Efficiency Savings Targets and Requirements—Investor-Owned Utilities

Category	Score (2 pts.)
Energy efficiency required or funded through Franchise Agreement, Municipal Aggregation contract, or other agreement with utility	1 point (0.5 point if a voluntary agreement)
City is active advocate for additional energy efficiency requirements	1 point

Table 35: Scoring on Savings Requirements in Cities with Municipal Utilities

City	Annual Electric Savings Target (% of Annual Sales)	Stringency	Score (2 pts.)
Sacramento[1]	1.5	Binding	2.0
Los Angeles[1]	1	Binding	1.5
Riverside[1]	1	Binding	1.5
Seattle[2]	0.9	Binding	1.0
San Antonio[3]	0.57	Binding	1.0
Austin[4]	1.00	Cost Cap	1.0
Jacksonville	None		0.0
Memphis	None		0.0

Notes and sources: [1]CMUA 2013, p. 37, [2] City of Seattle 2010, [3] Demand reduction target of 771 MW from 2009 to 2020 converted into annual MWh savings using a 20% capacity factor (CPS Energy 2012), 20% capacity factor used by the Texas Public Utility Commission (Sciortino et al. 2011, p 16) [4] Demand reduction target of 800 MW from 2009 to 2010 converted into annual MWh savings using a 20% capacity factor (Austin Energy 2010), 20% capacity factor used by the Texas Public Utility Commission (Sciortino et al. 2011, p 16).

While many cities advocate for energy efficiency savings targets at the state level, only two have incorporated energy efficiency into their aggregation or franchise agreements—Chicago and Denver. Chicago's municipal aggregation agreement is described above. Denver's Office of Strategic Partnerships has allocated $2 million annually from Xcel Energy's franchise fee for weatherization programs for single-family and multifamily dwellings, and for low-income residents (Bosco 2013). Several additional cities have entered into voluntary agreements to provide funding for city programs. Houston received one-half (0.5) point for its funding agreement with CenterPoint Energy for the city's Residential Energy Efficiency Program, an income-qualified weatherization program to which CenterPoint has committed $3 million (Lin 2013). Boston has entered into agreements with both NSTAR and National Grid to provide funding and staffing support for the Renew Boston building retrofit program. Additionally, National Grid has entered into a voluntary agreement with the city to provide energy planning assistance in order to help the city save 300,000 therms of natural gas in the operation of city buildings (Glickel 2013). New York has a contractual agreement with its power provider, the New York Power Authority, to provide funding for city-led energy efficiency projects (Lee 2013). San Francisco, San Jose, and San Diego each has implemented local government partnership programs funded by Pacific Gas & Electric (San Francisco and San Jose) and San Diego Gas & Electric (San Diego) (CPUC 2010).

Table 36: Scoring on Savings Requirements in Cities with Investor-Owned Utilities

City	Franchise Agreement, Municipal Aggregation, or Other Requirement (1 pt.)	City Is Active Advocate for State Energy Efficiency Requirements (1 pt.)	Total Score (2 pts.)
Chicago [1]	Aggregation	1	2
Denver[2]	Franchise	1	2
Washington[3]	Other	1	2
Houston[4]	Other	1	1.5
New York[5]	Other	1	1.5
Boston[6]	Other	1	1.5
San Francisco[7]	Other	1	1.5
Columbus	0	1	1
El Paso	0	1	1
Minneapolis	0	1	1
Phoenix	0	1	1
Portland	0	1	1
San Diego[7]	Other	0	.5
San Jose[7]	Other	0	.5
Atlanta	0	0	0
Baltimore	0	0	0
Charlotte	0	0	0
Dallas	0	0	0
Detroit	0	0	0
Fort Worth	0	0	0
Indianapolis	0	0	0
Miami	0	0	0
Philadelphia	0	0	0
Pittsburgh	0	0	0
St. Louis	0	0	0
Tampa	0	0	0

Sources and notes: [1] Chicago 2012b, [2]Bosco 2013, [3]Washington, D.C. is unique among our cities as it has many of the same regulatory authorities as a state. The District enacted the Clean and Affordable Energy Act that created a new public benefits fund, the Sustainable Energy Trust Fund. This fund is administered by D.C.'s third-party program administrator, the Sustainable Energy Utility, which was established in 2011. Responsibility for the implementation of energy efficiency programs was transferred from the utility PEPCO to DCSEU in 2011 (D.C. SEU 2012). [4] Houston has a voluntary agreement with CenterPoint Energy to partially fund the city's Residential Energy Efficiency Program (Lin 2013). [5]New York City has several ongoing energy efficiency programs in agreement with the municipal government's power provider, the New York Power Authority (Lee, 2013), [6] Boston has signed Memoranda of Understanding with its electric as well as gas utility that provides funding and support for Boston's energy efficiency programs for both residential and commercial buildings, including funding for a utility employee at City Hall, direct funding for outreach and marketing, and assistance with strategic planning. San Francisco, San Jose, and San Diego each received partial credit for their agreements to implement utility-funded local government partnership programs with their investor-owned utilities. The utilities were directed to fund local programs by the California Public Utility Commission, which is why the cities received partial rather than full credit (CPUC 2010).

Provision of Energy Data by Utility

Information about energy consumption is necessary to enable better energy management in homes, large buildings, and entire communities. Utilities are critical partners in providing customers, building owners, and local planners' energy usage data in a usable format, with the format and delivery mechanism depending on the user's needs. Customers should be provided easy, electronic access to their own consumption data in a standardized format through platforms such as the Green Button.[9] Managers or owners of multi-tenant commercial and residential buildings should have access to energy usage information aggregated at the building level to allow them to measure and improve the performance of their buildings. Local governments require data on community-wide energy usage for community planning purposes as well as building-level data in order to evaluate the performance of building energy efficiency programs.

Cities could earn up to two points for the accessibility of energy usage data from their electric and gas utilities, as shown in Table 37. The points were allocated across four metrics:

- The availability of historical consumption to individual utility customers through initiatives such as the Green Button
- The ability of owners of multi-tenant buildings to access aggregated energy data for their buildings through an easy, automated process to enable benchmarking and improved energy management in multi-metered buildings. (Specifically, we awarded full points in this metric to utilities that participated in ENERGY STAR's Automated Benchmarking Service, which uploads data from multiple meters directly to Portfolio Manager, ENERGY STAR's free online benchmarking software.[10] Partial points were awarded to cities in which the utility offers building owners access to aggregated data, but through a manual application process.)
- The availability of community-wide energy consumption data for use in city-wide energy planning and/or third-party program evaluation
- Advocacy directed at utilities and state regulatory commissions on the part of the city to improve customer access to utility data

Scores related to the provision of energy data are included in Table 38.

[9] The Green Button is a utility-industry-led effort in response to a call to action from President Obama's White House for utility customers to have access to information about their energy consumption in an easy, downloadable format. With access to this information, customers can use a wide variety of software and smart phone applications to better manage their personal energy consumption. More information on the Green Button initiative is available at www.greenbuttondata.org.

[10] ENERGY STAR's Automated Benchmarking Service allows utilities and other third parties to send electronic data on energy use and building characteristics directly to Portfolio Manager. This information is then automatically updated each month and is visible to the building owner (ENERGY STAR 2013c). This service is available in many cities that require the benchmarking of commercial buildings. Points were awarded for benchmarking requirements in the Buildings chapter (Chapter 4).

Table 37: Scoring Methodology for the Provision of Energy Data by Utilities

Data Type	Score (2 pts.)
Customer Data: Utilities have implemented the Green Button or a similar online service to provide customers with energy consumption data in a common electronic format.	0.5 point (0.25 point if has committed but not implemented the Green Button or similar service)
Aggregated Building Data: Utility provides automated benchmarking services (ABS) through ENERGY STAR Portfolio Manager for multi-tenant commercial and/or multifamily buildings.	0.5 point (0.25 point if aggregated building data are available upon request but not automated)
Community-wide Data: Energy usage information is available at the aggregate level for community-planning and evaluation purposes.	0.5
Advocacy: The city actively advocates for policy improvements in data provision by utilities or has established data-sharing agreements with its utilities.	0.5

Table 38: Scoring on the Provision of Energy Data by Utilities

City	Green Button—Online Data Access[1] (.5 pt.)	Aggregated Building Data[2] (.5 pt.)	Community-Level Data[12] (.5 pt.)	Advocacy[12] (.5 pt.)	Total Score (2 pts.)
Austin	0.5[3]	0.5	0.5	0.5	2
San Francisco	0.5	0.5	0.5	0.5	2
Chicago	0.5	0.5	0.5	0.5	2
New York	0.5[4]	0.5	0.5	0.5	2
Boston	0.5	0.25	0.5	0.5	1.75
Phoenix	0.5	0.25	0.5	0.5	1.75
Portland	0.5	0	0.5	0.5	1.5
Seattle	0.5	0.5[10]	0.5	0	1.5
Denver	0	0.25	0.5	0.5	1.25
Minneapolis	0	0.25[9]	0.5	0.5	1.25
Philadelphia	0.25[6]	0.5[6]	0	0.5	1.25
Washington	0.5[8]	0.25[11]	0.5	0	0.75
Columbus	0.5[4]	0	0.5	0	1
Sacramento	0.5	0.5	0	0	1
San Diego	0.5	0.5	0	0	1
San Jose	0.5	0.5	0	0	1
Baltimore	0.25	0.25	0.5	0	1
Dallas	0.5	0	0.5	0	1
Riverside	0	0.5[9]	0.5	0	0.5
Charlotte	0.5[13]	0	0.5	0	0
El Paso	0	0	0	0.5	0.5
Indianapolis	0	0	0.5	0	0.5
Los Angeles	0	0.5	0	0	0.5
Memphis	0.5[5]	0	0	0	0.5
San Antonio	0.5[7]	0	0	0	0.5
Fort Worth	0.5	0	0	0	0.5
Jacksonville	0.5	0	0	0	0.5
Pittsburgh	0	0	0.5	0	0.5
Atlanta	0.5[14]	0	0	0	0.5

City	Green Button—Online Data Access[1] (.5 pt.)	Aggregated Building Data[2] (.5 pt.)	Community-Level Data[12] (.5 pt.)	Advocacy[12] (.5 pt.)	Total Score (2 pts.)
Houston	0.5	0	0	0	0.5
Detroit	0	0	0	0	0
Miami	0	0	0	0	0
St. Louis	0	0	0	0	0
Tampa	0	0	0	0	0

Sources and notes: [1]All data from Green Button 2013 unless otherwise noted. [2]All data from ENERGY STAR 2012 unless otherwise noted. [3]Baumer 2013, [4]Consolidated Edison offers My Energy Toolkit to its residential customers (City of Columbus 2013), [5]Young 2013. [6]Dews 2013, [7]Burton 2013; APS 2013, [7]CPS Energy 2013, [8] PEPCO Holding 2012, [9] Slotterback 2013; ENERGY STAR 2012, [9]Automated Benchmarking Service provided by Southern California Gas (ENERGY STAR 2012) but not Riverside Public Utilities, [10]Caulfield 2013, [11]District of Columbia 2013, p. 15. [12]Scores based on responses to data request unless noted. [13]Duke Energy offers customers personalized energy reports and analysis. [14]Georgia Power's My Power Usage and EnergyDirect programs offer services similar to the Green Button.

The scores for all energy utility metrics are summarized in Table 39.

Table 39: Summary of Scoring on Energy Utility Efficiency Efforts

City	State	Electric Efficiency Spending (4 pts.)	Electric Savings (2 pts.)	Natural Gas Efficiency Spending (3 pts.)	EE Targets & Requirements (2 pts.)	Data Provision (2 pts)	Overall Energy Utility Score (13 pts)
San Francisco	CA	4	1.5	2.75	1.5	2	11.75
Boston	MA	4	1.5	3	1.5	1.75	11.75
Portland	OR	4	1.5	2.75	1	1.5	10.75
New York City	NY	3.25	1.5	2	1.5	2	10.25
Chicago	IL	3	1	2	2	2	10
Seattle	WA	4	1.5	1.75	1	1.5	9.75
Denver	CO	3.25	1	2.25	2	1.25	9.75
Minneapolis	MN	3.5	1.5	2.5	1	1.25	9.75
Sacramento	CA	3.5	2	1.25	2	1	9.75
Riverside	CA	4	1.5	1.25	1.5	1	9.25
Phoenix	AZ	3.5	2	1	1	1.75	9.25
Columbus	OH	3	1.5	2.25	1	1	8.75
San Diego	CA	3	1.5	2.25	0.5	1	8.25
San Jose	CA	3	1.5	2	0.5	1	8
Baltimore	MD	4	1	1.75	0	1	7.75
Los Angeles	CA	2.5	2	0.5	1.5	0.5	7
Washington	D.C.	2	0.5	1	2	1.25	6.75
Austin	TX	2	1	0.25	1	2	6.25
Houston	TX	2.75	0.5	0.75	1.5	0.5	6
Indianapolis	IN	2.5	0.5	2	0	0.5	5.5
Dallas	TX	3.25	0	1.25	0	1	5.25
El Paso	TX	2.75	0.5	0.25	1	0.5	5
Philadelphia	PA	1.75	1	0.5	0	1.25	4.5
San Antonio	TX	2	0.5	0	1	0.5	4
Fort Worth	TX	2.25	0	1.25	0	0.5	3.75
Pittsburgh	PA	1.5	1.5	0	0	0.5	3.5
Detroit	MI	1	1.5	1	0	0	3.5
Jacksonville	FL	1.5	0.5	1	0	0.5	3.5
Miami	FL	1	0.5	1.5	0	0	3
Charlotte	NC	0.75	1	0.25	0	1	3
Atlanta	GA	1	0	0.75	0	0.5	2.25

City	State	Electric Efficiency Spending (4 pts.)	Electric Savings (2 pts.)	Natural Gas Efficiency Spending (3 pts.)	EE Targets & Requirements (2 pts.)	Data Provision (2 pts)	Overall Energy Utility Score (13 pts)
Tampa	FL	0.75	0.5	1	0	0	2.25
Memphis	TN	1	0.5	0	0	0.5	2
St. Louis	MO	0.75	1	0	0	0	1.75
Median		2.75	1.00	1.25	1.00	1.00	6.50

EFFICIENCY EFFORTS IN WATER SERVICES

The actions of water utilities play an important role in the efficiency of a city. Considerable energy savings can be gained from improvements made to pumps and motors, and a significant, often uncaptured, opportunity exists for energy generation in processing wastewater, which can reduce a water utility's usage of (and costs for) off-site energy. Beyond efforts to directly conserve energy, energy demand can also be reduced through investments aimed at reducing water demand. This close relationship means that improvements in water efficiency result in energy savings.

Regardless of climate, wet or dry, water services use a great deal of energy at a significant cost to local governments and citizens. According to the Environmental Protection Agency's (EPA) ENERGY STAR program, 10% energy savings can be readily achieved by upgrading municipal water supply and wastewater systems to minimize leaks and improve the efficiency of pumps and motors, resulting in collective savings of about $400 million and 5 billion kilowatt-hours (kWh) annually (EPA 2012e). In this category, we highlight how the largest cities in the United States are tackling efficiency within their water systems. Cities could earn five (5) points in the water services category across six metrics. Table 40 shows the breakdown of cities' scores for water services.

We examined policies targeted at both energy efficiency and water efficiency. In some cases, cities had autonomous or regional water utilities and, therefore, did not have direct control over the utilities' internal operational policies. However, points were awarded regardless of the operating entity of the water utility or utilities serving the city. Table E-2 notes each city's water utility and management type.

Water Efficiency

Two (2) points were allocated to water efficiency. Cities could earn one (1) point if the local or regional water utility had funded water efficiency programs. In the absence of a municipal water utility, cities were awarded points if they, or their regional water authorities, funded end-use programs with the aim of water conservation. One (1) point was also awarded to cities that had water savings targets set by either the local water utility or formalized by the city government. Table E-3 gives further details on municipal water efficiency strategies.

Energy Efficiency in Water Services

Two (2) points were awarded for policies that encourage energy efficiency in drinking, wastewater, or storm water services. Cities could earn one (1) point if the water utility had a specific energy efficiency target or comprehensive energy efficiency strategy. Partial credit (0.5 point) was given for cities that did not have water-related energy saving targets or energy plans

but have pursued some energy efficiency initiatives at their local or regional water utilities. Cities also earned one (1) point if the wastewater utility self-generated energy through methane capture or another means. Partial credit (0.5 point) was awarded to cities that captured energy resources at their wastewater facilities but did not use them on-site. Table E-4 details city actions to incorporate energy efficiency into water services.

Green Stormwater Infrastructure

The final point in the water services category was based on stormwater management policies. Investments in distributed stormwater systems that integrate vegetation and permeable surfaces, commonly known as green infrastructure or low-impact development, reduce energy consumption required for water treatment (CNT 2010). Cities could earn one-half (0.5) point for policies, water rates, or incentives that encouraged developers and property owners to incorporate green infrastructure to manage stormwater on private properties. An additional one-half (0.5) point was awarded if the city had funding in place for green infrastructure projects on public property, such as streets, schools, and parks. Table E-5 details green infrastructure policies in the cities examined in the *Scorecard.*

Table 40. Summary of Scoring on Efficiency Efforts by Water Utility

		Water Efficiency		Energy Efficiency in Water Services		Efficient Stormwater Management		
City	State	Funded Water Efficiency Programs (1 pt.)	Water Savings Target (1 pt.)	Energy Efficiency Programs (1 pt.)	Self-Generation (1 pt.)	Stormwater Policies & Incentives (0.5 pt.)	Green Infrastructure Funding (0.5 pt.)	Total Score (5 pts.)
El Paso	TX	1	1	1	1	0.5	0.5	5
Fort Worth	TX	1	1	1	1	0.5	0.5	5
New York City	NY	1	1	1	1	0.5	0.5	5
Seattle	WA	1	1	1	1	0.5	0.5	5
Austin	TX	1	1	0.5	1	0.5	0.5	4.5
Denver	CO	1	1	0.5	1	0.5	0.5	4.5
Portland	OR	1	0	1	1	0.5	0.5	4
San Francisco	CA	1	1	0	1	0.5	0.5	4
Atlanta	GA	1	0	1	1	0.5	0.5	4
San Antonio	TX	1	1	1	0.5	0	0.5	4
Boston	MA	1	0	1	1	0.5	0.5	4
Philadelphia	PA	1	0	1	1	0.5	0.5	4
Pittsburgh	PA	1	0	1	1	0.5	0.5	4
Minneapolis	MN	1	0	1	1	0.5	0.5	4
Chicago	IL	1	1	0	1	0.5	0	3.5
Tampa	FL	1	0	1	1	0.5	0	3.5
San Jose	CA	1	1	0	1	0.5	0	3.5
Columbus	OH	1	0	0	1	0.5	0.5	3
Dallas	TX	1	1	0	1	0	0	3
Houston	TX	1	1	0	0	0.5	0.5	3
San Diego	CA	1	0	0	1	0.5	0.5	3
Los Angeles	CA	1	1	0	1	0	0	3
Miami	FL	1	1	0	0	0.5	0	2.5
Riverside	CA	1	1	0	0	0	0	2
Washington	D.C.	0	1	0	0	0.5	0.5	2
Sacramento	CA	1	0	0	1	0	0	2
Indianapolis	IN	0	0	0.5	0	0.5	0.5	1.5

Charlotte	NC	1	0	0	0	0.5	0	1.5
St. Louis city	MO	0	1	0	0	0	0.5	1.5
Phoenix	AZ	0	0	1	0	0	0	1
Detroit	MI	0	0	0	1	0	0	1
Memphis	TN	0	0	0	1	0	0	1
Baltimore	MD	0	0	0	1	0	0	1
Jacksonville	FL	1	0	0	0	0	0	1

CONCLUSIONS

It is clear from the results shown above that many cities, both those with municipally owned and those with privately owned utilities, are partnering with their local energy utilities to offer energy efficiency services to local residents and businesses. Of the 34 cities we studied, eight had either a municipally owned electric or gas utility, or both. Three cities with municipal utilities, Seattle, Sacramento, and Riverside, ranked among the top ten cities in the utility category. However, cities with municipal utilities on the whole did not appear to have an edge over investor-owned utilities in scoring, in part because we developed differentiated scoring methods for the different utility types. The high overall rankings of cities with private owned utilities shows that, despite much utility regulation occurring at the state level, cities can effectively influence the level of energy efficiency provided by their energy utilities through co-promoting utility programs, leveraging utility incentives for their own local energy efficiency programs, and advocating for improved policy at the state level.

There is considerable room for improvement in some of the metrics we examined, most notably local energy efficiency savings targets for both municipally owned and privately owned utilities. Only two of the cities with privately owned utilities, Chicago and Denver, had used their authority to establish franchise fees and municipal aggregation agreements to require their utilities to invest in energy efficiency. Interest in both of these emerging local policies is growing, as shown by Minneapolis' advocacy to gain greater flexibility from state regulators in using franchise fees to help achieve its clean energy goals. In addition, more cities should consider entering into voluntary agreements with their utilities like those in Houston, Boston, and New York to provide funding to locally administered energy efficiency programs. Future editions of the *City Scorecard* will assess any growth in the use of these policies.

Cities also have considerable opportunity to influence energy efficiency through their water-related utilities. Efficiency initiatives in this arena are of greater urgency in the growing number of drought-prone or water-resource-constrained communities, but all communities can adopt the policies and programs to reduce their energy and water consumption to reduce the capital costs associated with their water infrastructure.

Figure 8: Energy Utilities—Leading Cities

MUNICIPALLY OWNED UTILITIES

Seattle City Light, WA: Seattle City Light, the municipal electric utility is exceeding its 0.9% annual savings target established by the City Council. In partnership with Seattle City Light and the investor-owned gas utility, Puget Sound Energy, the city facilitates a local energy efficiency retrofit program called Community Power Works, designed for residential and commercial buildings and funded by a Federal Better Buildings Neighborhood Program grant. Community Power Works delivers energy efficiency services and leverages the utilities' existing rebate programs for residential, commercial, multifamily, and public buildings. Seattle has also partnered with its utilities to aid building owners in complying with the city's building energy benchmarking law. All of the local energy utilities (Puget Sound Energy, Seattle City Light, and Seattle Steam) offer automated benchmarking data to building owners.

Sacramento Municipal Utility District (SMUD), CA: Sacramento's municipal electric utility is exceeding its 1.5% annual savings target and is a key partner in the city's initiatives to meet its Climate Action Plan goals: to achieve an overall 15% reduction in energy usage in all existing residential and commercial buildings by 2020. In addition to working with SMUD, the city collaborates with PG&E, the investor-owned gas utility, and other local partners to provide information about energy efficiency programs residents and businesses. Both SMUD and PG&E are leaders in providing building owners with automated access to aggregated data on the energy usage in their buildings as well as providing customers with data on their historical energy use through the Green Button.

INVESTOR-OWNED UTILITIES

Boston, MA: The city of Boston has partnered with its utilities' leading energy efficiency programs through the Renew Boston initiative in order to offer homeowners and small businesses with no-cost energy assessments and incentives for energy upgrades. Renew Boston was established by the mayor in 2009 to enable Boston to meet city-wide goals for energy savings, greenhouse gas emissions reductions, and job creation. Renew Boston leverages both utility incentives and the city's Federal Energy Efficiency and Conservation Block Grant funding and is able to offer deep incentives to small business, renters, and middle-income homeowners—groups with previously low participation in existing utility programs. The city has also taken a leadership role in advocating for energy efficiency at the state level as a representative on the Energy Efficiency Advisory Committee, and it is seeking state legislation to require utility companies to make aggregated building-level energy use data.

San Francisco, CA: The city and county of San Francisco have partnered with their investor-owned gas and electric utility, Pacific Gas & Electric (PG&E) as well as with other local governments in the Bay Area to implement energy efficiency programs. SF Energy Watch is a partnership between the city and county of San Francisco and PG&E. The program is funded by utility customers and administered by PG&E in collaboration with the city, which implements the program. The program provides energy efficiency services to commercial and multifamily buildings throughout San Francisco. The California Public Utility Commission directed PG&E to form partnerships with local governments to implement similar programs throughout its service territory, and there are currently 16 local governments in Northern California involved in PG&E's Energy Watch program. Additionally, the city is a partner in the new Bay Area Regional Energy Network (BayREN) created by the nine counties in the Association of Bay Area Governments. BayREN was initially funded by federal ARRA grants, and will now receive funding from the utilities to continue local and regional energy efficiency programs created with ARRA funds.

Portland, OR: Portland has partnered with its utilities and Oregon's state-wide energy efficiency program administrator, the Energy Trust of Oregon, on a variety of programs that leverage utility-funded incentives to help Portland homeowners and businesses save energy. Portland has also long been a leader in advocating at the state level for energy efficiency requirements and increased utility funding for efficiency programs. It was a founding member of the Fair and Clean Energy Coalition in 1999, which led to the creation of the Energy Trust of Oregon. The city regularly participates in Oregon Public Utility Commission proceedings, including, most recently, submitting comments in favor of rules to facilitate the transfer and aggregation of energy data from utilities to energy efficiency service providers and building owners (Portland 2013a).

Figure 9: Water Utilities—Leading Cities

WATER UTILITIES

El Paso, TX: El Paso has adopted policies to encourage the management of stormwater using green infrastructure. In 2006, City Ordinance No. 016668 established the stormwater utility, funded by a drainage utility fee, and set aside 10% of revenue for green infrastructure projects. El Paso also installed three biogas recovery systems at its wastewater treatment plant, which allowed for 25% overall energy savings at these operations. The city has set goals for water conservation, with the aim of reducing per-capita water consumption from 139 gallons per person per day in 2011 to 130 gallons per person per day by 2020. In 2012, the city reduced its own water consumption by more than a half-billion gallons compared to 2011.

New York, NY: Water conservation and stormwater management are central components of New York's comprehensive sustainability strategy, PlaNYC. The Department of Environmental Protection is targeting a 5% overall reduction in water consumption city-wide by the year 2020 through a number of programs including leak detection in buildings and replacing old and inefficient toilets in public buildings. In order to reduce its own greenhouse gas emissions by 30%, the Department of Environmental Protection has completed greenhouse gas and energy efficiency audits at four wastewater treatment plants, and it is currently auditing four additional plants to identify where energy use and emissions can be reduced. Finally, New York's Sustainable Stormwater Management Plan provides the foundation for a number of policies and incentives to encourage green infrastructure including making changes to the zoning code, offering property tax abatements for green roofs, and implementing a pilot stormwater fee for stand-alone parking garages and surface lots. The city has allocated $1.5 billion for green infrastructure over the next 20 years.

Chapter 6: Transportation Policies

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INTRODUCTION

A comprehensive approach to transportation energy efficiency at either the federal, state, or local level must include a combination of policies that target both vehicle fuel efficiency and the overall efficiency of the transportation system, including its interrelationship with land use policies. Transportation energy use accounts for approximately 28% of overall energy use in the United States (Davis et al. 2013). Similarly, transportation accounts for between 25% and 38% of energy use in most cities in industrialized countries (UN 2008). For the 13 of our cities for which we were able to gather detailed energy consumption data (see Chapter 8), transportation accounted for an average of 30% of energy use. While the federal government and states have made big strides in recent years toward achieving significant energy savings in the transportation sector, local governments play a critical role when it comes to maximizing this sector's energy efficiency potential. Municipalities, for instance, must take the lead in shaping land use, as they have jurisdiction over zoning laws and regulations. Likewise, central cities and other job centers can have a significant influence over commuting behavior and choices, which are major factors in transportation energy use.

In general, transportation efficiency policies at the local level must respond to the changing landscape of transportation energy use and must address both the efficiency of vehicles and the efficiency of the transportation system as a whole. Americans have seen drastically fluctuating gasoline prices over the last five years, leading many to look toward more efficient and advanced technology vehicles to serve as a buffer against high costs during peak price periods. Cities that provide tax incentives for the purchase of efficient vehicles while also investing in appropriate charging infrastructure for the new wave of plug-in hybrid and battery electric vehicles can make the prospect of buying an advanced technology vehicle much more feasible for their residents. Likewise, cities play an important role in driving and responding to changes in the average American's travel behavior. The use of public transit has increased significantly in the last 30 years (T4A 2012), and more and more people are choosing to bike or walk (Alliance for Biking and Walking 2012). To accommodate the growing demand for alternatives to driving, local governments must take the lead to provide residents with transportation choices and create communities that support safe automobile-independent ways of getting around.

We scored cities based on a variety of transportation metrics having substantial energy savings potential. These categories are:

- Location efficiency policies
- Mode shift strategies
- Public transit policies
- Efficient vehicle policies
- Freight transportation policies

Metrics selected for this chapter are, in most cases, policies that city policymakers can have influence over in the short run. Importantly, transportation policies at the city level are often most effective when they interact with or build on policies from other jurisdictions. State

policies and programs can help significantly when it comes to creating compact communities or providing funding for the expansion of transit systems. Regional policies and agencies such as metropolitan planning organizations are important to the transportation planning and implementation process, bringing to the table both funding and analytical expertise. While state and regional policies are not included in city scores, we do discuss policies implemented by other jurisdictions in Chapter 7.

RESULTS

We allocated 28 points to transportation policies, which include those related to the adoption of efficient vehicle technology and improving the overall efficiency of the transportation system. Since location-efficient zoning and policies that integrate land use and transportation to ensure accessibility of major destinations are essential to reducing transportation energy use in the long run, a city stood to earn eight (8) points in the location-efficiency category. These strategies are largely a local government responsibility and are, therefore, highly indicative of whether or not a local government is taking a leadership role with regard to transportation policies. A city that focused on policies related to mode shift and public transit could earn an additional eight (8) and six (6) points, respectively. Finally, three (3) points were available to a city that had policies to encourage the proliferation of efficient vehicles, and another three (3) points were available in the freight category, for cities with significant intermodal freight facilities. Further details on the scoring methodology for transportation policies can be found below. The overall scores for this policy area are in Table 41 and are displayed by policy category. For scoring details on each of the individual policies within those groups, see the tables in the appropriate sections below.

Table 41. Summary of Scoring on Transportation

City	State	Location Efficiency (8 pts.)	Mode Shift (8 pts.)	Transit (6 pts.)	Efficient Vehicles (3 pts.)	Freight (3 pts.)	Total (28 pts.)
Portland	OR	7	7.5	2.5	1.5	1	19.5
Boston	MA	4	7	6	1.5	0.5	19
Atlanta	GA	3	4.5	5.5	1.5	3	17.5
San Francisco	CA	3.5	6.5	4	1.5	0.5	16
Philadelphia	PA	3.5	4.5	6	0.5	1	15.5
Minneapolis	MN	2.5	7	4	0.5	1	15
Washington	DC	2.5	3	3	2.5	3	14
New York City	NY	3	3	6	0.5	0.5	13
Dallas	TX	2	4.5	5	1	0.5	13
Denver	CO	3.5	3	3.5	1.5	1	12.5
Baltimore	MD	4	2.5	2.5	0	3	12
St. Louis	MO	2.5	1	4	1.5	3	12
San Antonio	TX	3.5	3	3.5	1	0.5	11.50

Seattle	WA	2	4.5	3.5	0.25	1	11.25
Austin	TX	3	1.5	4	2	0.5	11
Chicago	IL	2.5	1.5	4	1.5	1	10.5
Houston	TX	3	2	3	1.5	0.5	10
El Paso	TX	2	2	4	1	0.5	9.5
Columbus	OH	3.5	1	1.5	1	2	9
Indianapolis	IN	2	0.5	4	1.5	1	9
Memphis	TN	2	1.5	2.5	1	2	9
Miami	FL	2.5	1.5	3.5	0	1	8.5
Charlotte	NC	1.5	1	3.5	0	2	8
Los Angeles	CA	0.5	1.5	4	1.5	0.5	8
Pittsburgh	PA	0.5	1	6	0	0.5	8
Riverside	CA	0.5	3	2.5	1	0.5	7.5
Sacramento	CA	2	1.5	2	1.5	0.5	7.5
Phoenix	AZ	2	0.5	1.5	1	0.5	5.5
San Jose	CA	0	1.5	3	0.5	0.5	5.5
San Diego	CA	1.5	1.5	1.25	0.5	0.5	5.25
Tampa	FL	2	0.5	1.5	0	1	5
Fort Worth	TX	1	1	1.25	1	0.5	4.75
Detroit	MI	0	0.5	2.5	0	1	4
Jacksonville	FL	2	0	0.75	0	1	3.75

LOCATION EFFICIENCY

Where we choose to live and develop our neighborhoods has a huge impact on overall energy use. Living in compact, mixed-use communities that are well-connected and near established transit facilities means significantly lower transportation-related energy use for the average household (EPA 2011a). Policies that encourage this location efficiency are therefore important to improving the overall efficiency of the transportation system (Vaidyanathan and Mackres 2012).

In this category we scored cities on:

- The presence of location-efficient zoning codes
- The removal or reduction of minimum parking requirements
- The presence of a city-wide complete streets policy
- The provision of incentives to residents and developers to encourage the creation of mixed-use, compact communities

Zoning and Parking Policies for Location-Efficient Development

Well-crafted zoning codes promote the creation of walkable, mixed-use communities. Zoning practices since World War II have generally segregated industrial and residential uses of land, and some codes went so far as to divide land even further for commercial, institutional, and recreational purposes. This, in combination with federal transportation investment focused largely on highways, has worked against the creation of walkable, mixed-use communities, which can moderate overall vehicle miles traveled and energy use. Estimates of reductions in driving and related energy savings from these more location-efficient communities with greater transportation choices range from 7% to 36% (Ewing et al. 2008; Calthorpe 2011).

Changes to municipal zoning regulations can direct investment and development toward high density, mixed-use construction around existing transit facilities. Form-based zoning codes are particularly useful for the planning of mixed-use and transit-oriented communities, as they allow for easier creation of mixed use developments. Form-based codes focus on the relationships between building facades and the public, the form and mass of buildings in relation to one another, and the scale and types of streets and blocks. Additionally, the recognition that walkability and architectural design play a significant role in the creation of attractive communities makes form-based zoning ideal for location-efficient development projects (EPA 2010).

Other approaches to zoning for location-efficient communities include the use of overlays that add transit-related and density requirements to existing codes. These code modifications are particularly useful in areas that have already seen a certain amount of development and are attractive because of existing transit infrastructure. Incentive-based zoning is another option, an approach that incorporates incentives for developers such as density bonuses to encourage high density, mixed-use development around transit nodes (LGC 2003).

In general, zoning regulations enabling location efficiency should:

- Require mixed-use zones
- Recalibrate zoning standards to allow for compact development
- Increase building density in city centers and around transit nodes
- Modernize street standards or enact new standards to foster walkable communities
- Minimize the number of parking spaces required for new developments
- Designate preferred growth areas (EPA 2009b)

Four (4) points were available to a city that had implemented policies related to location-efficient zoning. We awarded two (2) points to a city that had adopted a zoning code to encourage location-efficient development that applied to the whole city, or one (1) point if the code applied only to certain areas or neighborhoods. While the code did not need to meet all of the requirements listed above, points were awarded to codes designed to increase density, require mixed zones, or allow for compact, walkable communities.

Another two (2) points were awarded if the city had sound residential parking policies. Conventional zoning and development standards often have minimum parking requirements: one or more parking spaces required on site per housing unit for all occupied units, and multiple spaces for commercial and institution buildings. Such parking requirements claim

significant surface area and drive up development costs, preventing denser, more compact development from flourishing while perpetuating automobile-oriented neighborhoods. To enable development in compact areas to respond to market demands, developers should be allowed to set aside less land devoted to parking. Two (2) points were available for a city with no minimum parking requirements for new developments, or a city could receive one and one-half (1.5) point if parking minimums were removed in more than one neighborhood. Even if a city did have minimum parking requirements, we awarded it one (1) point if the requirement was for an average of one-half of a parking space or less per residential unit, or one-half (0.5) point for a requirement of one parking space or less per residential unit. Cities with higher parking requirements received no points. Table F-1, in Appendix F, provides details on each city's zoning codes and parking requirements.

Complete Streets

"Complete streets" policies focus on the interconnectivity of streets and target safe, easy access to roads for all pedestrians, bicyclists, motorists, and public transportation users. Complete streets foster the increased use of alternatives to driving by creating a comprehensive network of connected streets, sidewalks and bicycle lanes or by connecting to transit facilities; therefore, they can have a significant impact on a community's overall fuel consumption and economic development as non-vehicle transportation options become more desirable and more often selected.

According to the National Complete Streets Coalition (NCSC), nearly 30% of all trips in metropolitan areas are of one mile or less and can be covered easily by walking or other forms of non-automobile transport, minimizing the need to drive and saving consumers money on their gasoline bills. Households located in neighborhoods with well-connected street networks and near transit hubs drive, on average, 16 fewer miles per day than those located in traditional suburbs (NCSC 2012a).

States and municipalities have made the most effort to incorporate complete streets policies into their land use planning tools. Eighteen states have adopted complete streets mandates (Foster et al. 2012), while more than 350 communities across the country have incorporated complete streets language in their planning guidance (NCSC 2012b). ACEEE's scoring of complete streets policies in this report is derived from the NCSC complete streets policy score, which ranges from zero to 100 according to the quality of the adopted policy rated on ten factors (NCSC 2013). NCSC separates its rankings by policy types (resolution, city ordinance, etc.). A city that scored 75 or above on the NCSC complete streets policy score earned two (2) points, one that scored 50 or above but below 75 earned one and one-half (1.5) point, one that scored 25 or above but below 50 earned (1) point, and one that scored more than zero but less than 25 earned one-half (0.5) point. Complete streets scores for each city that had a policy are included in Table 42.

Table 42. Complete Streets Policies by City

City	Complete Streets Policy	Year of Adoption	NCSC Score (out of 100)	ACEEE *Scorecard* Score (2 pts.)
Indianapolis, IN	Chapter 431, Article VIII	2012	89.6	2
Portland, OR[11]	Oregon State Complete Streets Legislation	1971	-	2
Washington, D.C.	Departmental Order 06-2010 (DDOT Complete Streets Policy)	2010	66.4	1.5
Baltimore, MD	Council Bill 09-0433	2013	62.8	1.5
Seattle, WA	Bridging the Gap (tax ordinance)	2006	56.8	1.5
Denver, CO	Complete Streets Policy	2011	52.4	1.5
St Louis, MO	Board Bill No. 7	2010	52.0	1.5
San Antonio, TX	Complete Streets Policy	2011	40.8	1
Chicago, IL	Safe Streets for Chicago	2006	39.6	1
San Francisco, CA	Public Works Code 2.4.13 (Ordinance No. 209-05)	2008	37.2	1
Tampa, Florida	Resolution N. 2814	2012	35.6	1
Philadelphia, PA	Executive Order No.5-09	2009	33.2	1
Columbus, OH	Ordinance No. 1987-2008	2008	29.2	1
Austin, TX	Resolution No. 020418-40	2002	29.2	1
Boston, MA[12]	Complete Streets Guidelines	2009	-	1
Dallas, TX	Complete Streets Initiative	2011	-	1
Miami, FL	Resolution No. 09-00274	2009	24.4	0.5

Source: NCSC 2013, City Data Requests

Location Efficiency Incentives and Information Disclosure

Cities may use a number of incentives to encourage compact growth and mixed-use projects, ranging from tax credits to expedited permitting. Such financial and non-monetary policy levers can make these projects deeply attractive to developers. Financial incentives can help to

[11] Oregon's complete streets policy is the only state policy to cover municipal roads in addition to state-owned roads, and the city has made significant efforts to incorporate complete streets language in a range of supporting transportation and land use policies.

[12] While Boston does not have a codified complete streets policy, the city has made every effort to include complete streets principles in all road creation and retrofit projects.

promote transit-oriented development or other community land use priorities since they bring down the overall cost of construction for developers. Commonly used measures include low interest loans and property tax abatement programs. Giving developers the opportunity to borrow at below-market interest rates makes combined land use projects significantly more financially attractive. Likewise, property tax abatement programs remove one more cost element, which also increases the attractiveness of investing in projects that combine land uses and provide greater transportation options.

Commonly used non-financial measures such as density bonuses and expedited permitting can similarly provide incentives for compact, mixed-use development. Expedited permitting speeds up development by fast-tracking the approval process for projects that meet certain location efficiency requirements. Density bonuses, allowing construction of a building with greater floor area than would otherwise be allowed, can be provided to projects that meet specific sustainability benchmarks and industry standards in their construction and can be a way to attract developers to an area. Regarding affordable housing, for example, developers can be allowed to construct more market-rate housing units than would typically be allowed in exchange for each unit of affordable housing they build near transit nodes or in mixed-used communities (RA 2006).

Information and incentives for potential residents can also increase demand for communities that have greater transportation choices. To attract potential residents to transit-oriented development and mixed-use communities, cities may require disclosure of information on the location efficiency of buildings (e.g., WalkScore) to potential buyers or tenants as a part of a real estate or rental listing or transaction.

A city that had financial or non-financial incentive programs for location-efficient development or had location efficiency information policies in place was awarded one-half (0.5) point for each incentive or policy in place, up to a maximum of two (2) points. Details on the location efficiency incentives in each city are included in Table F-2.

The scores related to each of the location efficiency metrics for each city are included in Table 43.

Table 43. Summary of Scoring on Location Efficiency

City	State	Location-Efficient Zoning (2 pts.)[1]	Parking Requirements (2 pts.)[1]	Complete Streets (2 pts.)[2]	Location Efficiency Incentives & Information (2 pts.)[1]	Total Score (8 pts.)
Portland	OR	2	1.5	2	1.5	7
Baltimore	MD	2	0.5	1.5	0	4
Boston	MA	1	1.5	1	0.5	4
Columbus	OH	1	0.5	1	1	3.5
Denver	CO	2	0	1.5	0	3.5
Philadelphia	PA	1	1.5	1	0	3.5
San Antonio	TX	1	0	1	1.5	3.5
San Francisco	CA	0	2	1	0.5	3.5
Atlanta	GA	2	0	0	1	3
Austin	TX	1	0	1	1	3
Houston	TX	0	1.5	0	1.5	3
New York City	NY	1	1	0	1	3
Chicago	IL	0	1.5	1	0	2.5
Miami	FL	2	0	0.5	0	2.5
Minneapolis	MN	1	1	0	0.5	2.5
St. Louis	MO	1	0	1.5	0	2.5
Washington	DC	1	0	1.5	0	2.5
Dallas	TX	1	0	1	0	2
El Paso	TX	2	0	0	0	2
Indianapolis	IN	0	0	2	0	2
Jacksonville	FL	2	0	0	0	2
Memphis	TN	2	0	0	0	2
Phoenix	AZ	1	0	0	1	2
Sacramento	CA	0	1.5	0	0.5	2
Seattle	WA	0	0.5	1.5	0	2
Tampa	FL	1	0	1	0	2
Charlotte	NC	1	0.5	0	0	1.5
San Diego	CA	1	0	0	0.5	1.5
Fort Worth	TX	1	0	0	0	1
Los Angeles	CA	0	0	0	0.5	0.5
Pittsburgh	PA	0	0.5	0	0	0.5

City	State	Location-Efficient Zoning (2 pts.)[1]	Parking Requirements (2 pts.)[1]	Complete Streets (2 pts.)[2]	Location Efficiency Incentives & Information (2 pts.)[1]	Total Score (8 pts.)
Riverside	CA	0	0	0	0.5	0.5
Detroit	MI	0	0	0	0	0
San Jose	CA	0	0	0	0	0

Source: 1. From independent research and our data request, 2. NCSC 2013

MODE SHIFT

For routine transportation needs, such as commuting to a workplace, 75% of all trips are made by single-occupant vehicles (EPA 2011b). To improve the overall efficiency of a transportation system, cities must make an effort to implement policies that discourage residents from frequent driving and encourage a switch from driving to other modes of transportation (e.g., public transit, bicycles, walking). This can be achieved through the use of transportation demand management programs, vehicle sharing efforts, and, more holistically, by ensuring that land use and transportation planning are properly integrated.

Integration of Transportation and Land Use Planning

Sound land use planning is vital in order to stem long-term growth in vehicle miles traveled (VMT) in the United States. Successful strategies for changing land use patterns to reduce the need to drive vary widely among cities due to their current infrastructure, geography, and political structure. Energy-efficient transportation is inherently tied to the integration of transportation and land use policies, and an approach to planning that successfully addresses land use and transportation considerations simultaneously is critical to overall reduction in vehicle miles traveled.

A number of policy levers can be used to integrate transportation and land use planning and thus shift travel from personal vehicles to other, more efficient modes of transport. These include VMT targets, modal share targets that aim to increase the percentage of trips taken on non-automobile modes of transportation, and growth boundaries that attempt to curb sprawl and concentrate development in a particular areas. VMT targets give cities specific benchmarks for reduction in driving and can subsequently encourage the development of transit-oriented communities as well as the use of non-motorized transportation options. Likewise, cities that commit to concrete, long-run modal share targets can significantly change the travel behavior of their communities in favor of modes of transportation that consume less energy. However, targets without a plan to achieve them will result in few changes in development patterns and travel behavior. As a result, we also collected data on the implementation actions related to these policies.

A total of four (4) points were available for this integrated planning metric. Two (2) points were awarded to a city if it had adopted through legislation a specific VMT reduction targets or modal share targets. If these targets were part of a general sustainability plan but not codified through formal adoption, only one (1) point was awarded. An additional 2 points could be

earned if a city was implementing a plan to meet its targets. The cities that received points in this metric are listed in in Table 44.

Table 44. Summary of Scoring on Land Use and Transportation Targets and Implementation

City	Land Use and Transportation Integration Policy
Atlanta	The Connect Atlanta plan includes a goal to increase the bicycle-commute-to-work share to 2.2% by 2016 (1 point).[1]
Boston	Boston's Climate Action Plan includes a VMT reduction goal of 7.5% below 2010 levels by 2020. Targeted policies that will be used to achieve this goal include the implementation of complete streets policies, expanding and maintaining public transit facilities, mode shift, and parking freezes (3 points).[2]
Dallas	Dallas adopted an annual VMT reduction target of 10% as part of the ISO 14001:2004 certified Environmental Management System. The city has made concerted effort to encourage workers to telecommute, carpool, and use flex schedules and mass transit to reduce overall VMT (2 points).[3]
Minneapolis	Minneapolis' Climate Action Plan, adopted in June 2013, includes a detailed plan to hold VMT flat and has a specific targets for a bicycle mode share of 7% by 2014 (4 points).[4]
Philadelphia	Philadelphia's Greenworks plan aims to reduce VMT in the city by 10% below 2005 levels by 2015. While the goal is not legally codified, the city has made considerable progress toward achieving it. As of 2013, the city has seen an overall reduction in miles of 7.4% below 2005 levels (3 points).[5]
Portland	The 2009 Portland Climate Action Plan, adopted by the City Council (Resolution 36748), includes a goal to reduce per-capita daily VMT by 30% from 2008 levels by 2030. Additionally, Portland has a goal to achieve a 70% transit and active transportation mode share by 2030 (4 points).[6]
Riverside	Riverside's Green Action Plan looks to decrease VMT by 15% by 2015 based on a 2009 baseline year. Specific strategies include encouraging the use of bicycles by increasing the number of bike trails, promoting alternative modes of transportation through the implementation of benefit programs for city employees and local businesses, and expanding public transit within city limits (3 points).[7]
San Antonio	The SA2020 city plan includes a loose, non-codified VMT reduction goal of 10% per-capita reduction in VMT by 2020 (1 point).[8]
San Francisco	The San Francisco Municipal Transportation Agency has adopted a 50% mode shift target for sustainable mode share by 2018 (3 points).[9]
Seattle	Seattle adopted Resolution 31312 in October 2011 calling for a 14% reduction in passenger VMT by 2020 and a 20% reduction in VMT by 2030 from 2008 levels (2 points).[10]
Washington, D.C.	Washington, D.C., aims to achieve a 75% increase in commuter trips by transit, biking, and walking by 2032 (1 point).[11]

Sources: 1. Atlanta 2013, 2. Boston 2011, 3. Dallas 2012, 4. Minneapolis 2013, 5. Philadelphia 2012, 6. Portland 2013b, 7. Riverside 2012b, 8. San Antonio 2011, 9. SFMTA 2013, 10. Seattle 2011, 11. District of Columbia 2012

Car and Bicycle Sharing

Car sharing services give drivers access to shared vehicles on a time-limited basis, providing an alternative or supplement to vehicle ownership while still providing convenient access when a

car is desired. The emergence of companies such as Zipcar, Car2Go, and other services in recent years indicates that these services are becoming more popular with metropolitan residents who do not want the cost and maintenance burden of owning underutilized personal vehicles.

Car sharing enables households to give up owning a first, second, or third vehicle and to rely on other modes of transportation for most travel. According to the Transportation Research Board, at least five private vehicles are replaced by each shared car (TRB 2005). A city that operated car sharing programs themselves or supported the provision of such programs by the private market through the use of permitting or incentives earned one (1) point, while a city with a program in the planning stage was awarded one-half (0.5) point.

Likewise, bicycle sharing programs present commuters and city residents with another alternative to owning or driving a personal vehicle. Bike sharing systems provide publicly accessible shared-use bicycles within an urban environment that are available for trips of short to medium duration. Bike sharing has been shown to increase the ease of urban mobility, increase the use of public transit, and reduce overall energy use within a metropolitan area (Shaheen et al. 2012). A city with a bike sharing program earned one (1) point if the program was operational and one-half (0.5) point for a program that was under development.

Transportation Demand Management Programs

The primary goal of transportation demand management (TDM) programs is to reduce the frequency of single-occupancy trips or to shift automobile trips out of peak traffic periods (SDOT 2008). TDM strategies that cities can support through policies and programs include:

- Telecommuting
- Flexible work schedules
- Subsidized transit passes
- Parking cash-out programs
- Ridesharing (carpooling, high-occupancy-vehicle lanes, etc.)

TDM programs can be implemented by either employers or municipalities. In many cases, employers receive incentives from cities to encourage their employees to change their travel behavior. TDM programs work best in collaboration with other initiatives such as transit improvements and parking pricing (VTPI 2012). Cities that provide TDM programs or support them through funding to organizations or the use of financial incentives for employers were eligible for up to two points. A city with a broad set of TDM policies and programs was awarded the full two (2) points. A city that offered some TDM programs or actively partnered with and funded TDM programs run by others was awarded one (1) point.

The scores for each mode shift metric for each city are included in Table 45.

Table 45. Summary of Scoring on Mode Shift Policies and Programs

City	State	Integration of Transportation and Land Use Planning (4 pts.)[1]	Car Sharing Programs (1 pt.)[1]	Bike Sharing Programs (1pt.)[1]	Demand Management Programs (2 pts.)[1]	TOTAL (8 pts.)
Portland	OR	4	1	0.5	2	7.5
Boston	MA	3	1	1	2	7
Minneapolis	MN	4	1	1	1	7
San Francisco	CA	3	1	0.5	2	6.5
Atlanta	GA	1	1	0.5	2	4.5
Dallas	TX	2	1	0.5	1	4.5
Philadelphia	PA	3	1	0.5	0	4.5
Seattle	WA	2	1	0.5	1	4.5
Denver	CO	0	1	1	1	3
New York City	NY	0	1	1	1	3
Riverside	CA	3	0	0	0	3
San Antonio	TX	1	1	1	0	3
Washington	DC	1	1	1	0	3
Baltimore	MD	0	1	0.5	1	2.5
El Paso	TX	0	0.5	0.5	1	2
Houston	TX	0	0	1	1	2
Austin	TX	0	1	0.5	0	1.5
Chicago	IL	0	1	0.5	0	1.5
Los Angeles	CA	0	1	0.5	0	1.5
Memphis	TN	0	1	0.5	0	1.5
Miami	FL	0	1	0.5	0	1.5
Sacramento	CA	0	1	0.5	0	1.5
San Diego	CA	0	1	0.5	0	1.5
San Jose	CA	0	1	0.5	0	1.5
Charlotte	NC	0	0	1	0	1
Columbus	OH	0	0.5	0.5	0	1
Fort Worth	TX	0	0	1	0	1
Pittsburgh	PA	0	1	0	0	1
St. Louis	MO	0	1	0	0	1
Detroit	MI	0	0	0.5	0	0.5
Indianapolis	IN	0	0	0.5	0	0.5

Phoenix	AZ	0	0	0.5	0	0.5
Tampa	FL	0	0	0.5	0	0.5
Jacksonville	FL	0	0	0	0	0

Source: 1. From independent research and city data requests

TRANSIT

Well-connected public transit networks can significantly reduce residents' need to drive and therefore, vehicle miles traveled, in a given metropolitan area. The demand for public transportation in the United States is higher today than it has been in the last fifty years (T4A 2012). A number of factors have contributed to this gradual increase in transit demand. Fluctuations in gasoline prices combined with the nation's aging population and the increasing preference of the "millennial" generation for living in well-connected communities has meant that more people are abandoning the personal automobile as their primary mode of transport (T4A 2012). As a result of this trend, a number of cities are putting significant effort into financing and expanding their transit infrastructure.

Transportation Funding

Federal, state, and local transportation funding continues to favor road and highway maintenance over transit expansion in general. However, a number of municipalities across the United States have come up with inventive funding mechanisms to foster transit development. Charlotte, for example, generated $148 million in local funding from a ½ cent sales tax that was approved by voter referendum (AASHTO 2012). In 2009 the sales tax generated between $75 and $77 million, which not only went toward the development of the LYNX light rail system but also toward bus line and bus service expansion (CATS 2008).

Local funding for transportation is generated in a variety of ways and can make up a significant portion of expenditures on transit expansion. Common strategies for funding transit include sales and property taxes, user fees, revenues from road and parking pricing schemes, and transit fares. We scored cities based on the ratio of regional transit funding per capita (as reported in the National Transit Database) to city funding of highways and parking per capita (as reported in the U.S. Census Local Government Finances dataset). A city could earn four (4) points for a transit-to-road funding ratio greater than 3 to 1, three (3) points if it achieved a ratio between 2:99 to 1 and 2 to 1, two (2) points for a ratio between 1.99 to 1 and 1 to 1, and one (1) point for a ratio between 0.99 to 1 and 0.5 to 1. Cities whose transit funding ratios were less than 0.5 to 1 but greater than zero earned 0.5 points. Although all of the cities we scored received some points, cities with no funding for transit would have received no points. While we recognize that mixing regional and local government data is not ideal, we made this choice to better enable local government representatives to understand how their investments in infrastructure for automobile travel compare to investments in transit, which are primarily tabulated at the regional level even though much of the funding comes in some form from local governments.

Access to Transit Service

The number of people who took some form of public transportation rose by 30% between 2000 and 2012 (APTA 2012b). For public transit to be a viable option in a city, the development of

quality transit services, including adequate service frequency, is essential. To improve transit ridership and overall access to transit, local agencies can use the following key strategies:

1. *Service adjustments*, in which cities focus service on the most productive and popular routes, ensuring that the frequency of service is sufficiently high
2. *Service coordination*, in which cities ensure that the coordination between different modes and routes (e.g., bus and rail services, services of different agencies) is in place so that the transit system is efficient, usable, and attractive to potential customers (TRB 2007)

Other strategies that can be used to improve transit ridership include using price reductions to encourage increased use of the transit infrastructure and educational initiatives that highlight the benefits of using public transit.

Efficient transit systems within metropolitan areas designed in connection with land use planning can make public transportation a viable substitute for many automobile trips taken across the country. We scored cities on their transit service using the Center for Neighborhood Technology's Transit Connectivity Index, which measures the frequency of transit service by estimating the number of rides available per week on transit within walking distance from the average household (CNT 2013). A city could earn up to two (2) points, which were allocated based on the criteria in Table 46.

Scores for all cities for the two transit-related metrics are included in Table 47.

Table 46. Scoring Methodology for Access to Transit Service

Transit Connectivity Index of city (rides per week available on transit)	Score (2 pts.)
>50,000	2
20,000 to 50,000	1.5
10,000 to 20,000	1
5,000 to 10,000	0.5
>0 to 5,000	0.25
0	0

Source: CNT 2013

Table 47. Summary of Scoring on Transit

City	State	Transportation Funding Distribution (4 pts.)[1]	Access to Transit (2 pts.)[2]	Total Score (6 pts.)
Boston	MA	4	2	6
New York City	NY	4	2	6
Philadelphia	PA	4	2	6
Pittsburgh	PA	4	2	6

Atlanta	GA	4	1.5	5.5
Dallas	TX	4	1	5
Austin	TX	3	1	4
Chicago	IL	2	2	4
El Paso	TX	2	2	4
Indianapolis	IN	2	2	4
Los Angeles	CA	2	2	4
Minneapolis	MN	2	2	4
San Francisco	CA	2	2	4
St. Louis	MO	2	2	4
Charlotte	NC	2	1.5	3.5
Denver	CO	2	1.5	3.5
Miami	FL	2	1.5	3.5
San Antonio	TX	2	1.5	3.5
Seattle	WA	2	1.5	3.5
Houston	TX	2	1	3
San Jose	CA	2	1	3
Washington	DC	1	2	3
Baltimore	MD	1	1.5	2.5
Detroit	MI	1	1.5	2.5
Memphis	TN	2	0.5	2.5
Portland	OR	1	1.5	2.5
Riverside	CA	0.5	2	2.5
Sacramento	CA	1	1	2
Columbus	OH	1	0.5	1.5
Phoenix	AZ	1	0.5	1.5
Tampa	FL	0.5	1	1.5
Fort Worth	TX	1	0.25	1.25
San Diego	CA	1	0.25	1.25
Jacksonville	FL	0.5	0.25	0.75

Source: 1. FTA 2011, 2. CNT 2013

EFFICIENT VEHICLES AND DRIVER BEHAVIOR

The U.S. vehicle market has seen a significant rise in high-efficiency options for consumers in recent years. Not only are manufacturers maximizing the efficiency of conventional internal-combustion-powered vehicles, many more conventional hybrids, plug-in hybrids, and electric vehicles are now available for sale in dealerships across the country. While these vehicle types provide significant energy saving opportunities, plug-in electric vehicles that require charging

stations also present infrastructure challenges. But beyond vehicle purchase and infrastructure, maximizing the efficiency of a vehicle depends on drivers' behavior. Driving the speed limit, keeping tires inflated, grouping trips together, and avoiding idling all serve to reduce a vehicle's overall fuel consumption.

In this section we evaluate cities based on their policies to encourage the purchase of efficient vehicles, electric vehicle (EV) readiness policies, policies to encourage more efficient driver behavior, and participation in regional initiatives to improve transportation efficiency. Government vehicle fleet procurement and behavior policies are not included in this chapter, but rather in Chapter 2, Local Government Operations.

Incentives for Energy-Efficient Vehicles and Vehicle Charging Infrastructure

A key barrier to the entry of advanced technology, fuel-efficient vehicles into the marketplace is their high cost. To encourage consumers to purchase these vehicles, financial incentives, including tax credits, rebates, and sales tax exemptions are an important policy lever. Currently, these incentives are provided largely at the state level. However, a small number of cities across the country are further subsidizing the cost of these vehicles with their own supplemental incentives.

A city was awarded one (1) point if it provided purchase incentives for hybrid, plug-in hybrid, or electric vehicles—all vehicle types that typically have high fuel efficiency—or for conventional vehicles with high fuel efficiency. While alternative-fuel vehicles—vehicles that use diesel, ethanol, hydrogen, or compressed natural gas—can provide substantial environmental benefits by reducing pollution, they do not generally improve vehicle fuel efficiency. Therefore, policies to promote the purchase of alternative-fuel vehicles, but not the purchase of high-efficiency vehicles, did not receive a point.

A city was eligible for an additional one-half (0.5) point if it had an incentive program to support the implementation of electric vehicle charging infrastructure. The arrival to the American vehicle market of a variety of new electric and plug-in hybrid electric models such as the Nissan LEAF and Chevrolet Volt has increased the need for a comprehensive network of electric charging stations. As a result, a number of cities have started to evaluate their EV readiness by using tools such as the Department of Energy (DOE) Plug-in Electric Vehicle Readiness Scorecard (DOE 2013b) and developing policies to enable the installation and availability of charging sites.

Efficient Driver Behavior

Efficient driving techniques can improve the fuel economy of the average vehicle by up to 10% (Greenercars.org 2013). Stop-start and aggressive driving, driving over the speed limit, and neglecting regular vehicle maintenance all contribute to inefficient fuel use. Vehicle idling, leaving a vehicle running while not in motion, also wastes fuel, in addition to creating unnecessary pollution that detrimentally affects human health. Anti-idling measures help to reduce fuel waste while simultaneously curbing vehicle emissions. We award points to cities that have anti-idling measures in place for all vehicles. We awarded one-half (0.5) point to a city that had one or more policy in place to address driving behavior that applied to all vehicles, including anti-idling policies. If these policies affected only a subset of private vehicles (e.g., only heavy duty trucks and buses), one-quarter (0.25) point was awarded.

Transportation Partnerships

Transportation partnerships and coalitions can be an important planning and organizing tool for cities interested in reducing their overall transportation-related energy use. These bring together relevant stakeholders—such as staff from city transportation departments, metropolitan planning organizations, and non-governmental organizations—to find comprehensive solutions to transportation challenges within a city's boundaries and throughout its broader region.

For the purpose of the *City Scorecard*, we focus on DOE's Clean Cities Program. Clean Cities Coalitions work to reduce petroleum use in communities by facilitating the adoption of new transportation technologies, with the goals of stimulating the local economy and creating more sustainable communities (DOE 2013a). A city that had a Clean Cities Collation organized in its region or state and that had demonstrated that city staff were actively engaged in the coalition (through acting as a coordinator or regular contributor to efforts) earned one (1) point for this metric.

The scores related to each vehicle efficiency metric for each city are included in Table 48.

Table 48. Summary of Scoring on Efficient Vehicles and Driver Behavior

City	State	Vehicle Purchase Incentives (1 pt.)[1]	Electric Vehicle Infrastructure Incentives (0.5 pt.)[1]	Vehicle Behavior (0.5 pt.)[1]	Transportation Partnerships (1 pt.)[2]	TOTAL (3 pts.)
Washington	DC	1	0	0.5	1	2.5
Austin	TX	0	0.5	0.5	1	2
Atlanta	GA	0	0	0.5	1	1.5
Boston	MA	0	0.5	0	1	1.5
Chicago	IL	0	0	0.5	1	1.5
Denver	CO	0	0	0.5	1	1.5
Houston	TX	0	0.5	0	1	1.5
Indianapolis	IN	0	0	0.5	1	1.5
Los Angeles	CA	0	0.5	0	1	1.5
Portland	OR	0	0.5	0	1	1.5
Sacramento	CA	0	0	0.5	1	1.5
San Francisco	CA	0	0.5	0	1	1.5
St. Louis	MO	0	0	0.5	1	1.5
Columbus	OH	0	0	0	1	1
Dallas	TX	0	0.5	0.5	0	1
El Paso	TX	0	0	0	1	1
Fort Worth	TX	0	0	0	1	1

Memphis	TN	0	0	0	1	1
Phoenix	AZ	0	0	0	1	1
Riverside	CA	1	0	0	0	1
San Antonio	TX	0	0	0	1	1
Detroit	MI	0	0	0.5	0	0.5
Minneapolis	MN	0	0	0.5	0	0.5
New York City	NY	0	0	0.5	0	0.5
Philadelphia	PA	0	0	0.5	0	0.5
San Diego	CA	0	0	0.5	0	0.5
San Jose	CA	0	0.5	0	0	0.5
Seattle	WA	0	0	0.25	0	0.25
Baltimore	MD	0	0	0	0	0
Charlotte	NC	0	0	0	0	0
Jacksonville	FL	0	0	0	0	0
Miami	FL	0	0	0	0	0
Pittsburgh	PA	0	0	0	0	0
Tampa	FL	0	0	0	0	0

Source: 1. From independent research and city data requests, 2. DOE 2013d

FREIGHT

The movement of freight accounts for 18% of oil consumption in the United States (Foster & Langer 2013) and offers broad opportunities for energy efficiency gains. In 2011, the Environmental Protection Agency and the Department of Transportation adopted fuel efficiency and greenhouse gas standards for medium- and heavy-duty vehicles, starting with the 2014 model year. While approximately 530 million barrels of oil will be saved by these federal standards for vehicles (EPA & DOT 2011), additional steps can be taken to improve the overall efficiency of the freight system.

As the majority of Americans live in cities, urban areas are a major source and destination of freight. Policies and infrastructure for the movement of freight in cities and their metropolitan areas can facilitate improvements in efficiency. Strategies that focus on optimizing the movement of goods, such as shifting to more efficient modes of transport (e.g., rail and barge) and streamlining logistics, are particularly useful for improving the overall efficiency of the freight system.

Intermodal Freight Facilities

Intermodal freight involves the transportation of goods through the use of multiple modes of transport at different points along the journey, for example, using rail or ship for the majority of the journey and then transferring goods to truck for final delivery. Intermodal freight movement enables the use of more efficient modes more often, therefore decreasing energy consumption. The ability to effectively move goods between modes requires intermodal

facilities, those specifically designed to allow the transfer of freight from one mode to another. While the potential of mode shifting to reduce energy use is difficult to determine exactly, shifting freight traffic from trucks to more efficient modes is generally estimated to reduce freight energy consumption by up to 7%, with much of these savings coming from increased use of intermodal shipments methods (Foster & Langer 2013).

We awarded a city up to three (3) points for the number of efficient intermodal facilities, defined as rail- or port-capable facilities, within its municipal boundaries per thousand ton-miles of regional freight, scaled by the city's portion of the regional population, as shown in Table 49. The scores for each city are included in Table 41 at the beginning of this chapter.

Table 49. Scoring Methodology for Intermodal Freight Facilities

Efficient Intermodal Facilities per Thousand Ton-Miles of City Freight Traffic[1]	Score (3 pts.)
2 or more	3 points
1 to 1.999	2 points
0.5 to 0.999	1 point
>0 to 0.499	0.5 point
0	0 points

Notes: [1] Efficient intermodal facilities are defined as those that are rail- or port-capable. A city's freight traffic was estimated by normalizing total metropolitan freight traffic by the city's share of total metropolitan population. Sources: Data on intermodal facilities 2012 National Transportation Atlas Database (BTS 2012). Data on metropolitan freight traffic from Freight Analysis Framework Data Tabulation Tool, 2011 preliminary (CTA 2013).

CONCLUSION

In general, while a number of cities are making great strides on transportation efficiency, they could all do more to take advantage of their efficiency potential. Our transportation rankings are topped by Portland, Boston, and Atlanta, three cities that are dedicated to reducing transportation energy use both by improving the transportation system and by encouraging the use of fuel-efficient vehicles. San Francisco and Philadelphia follow very closely behind in spots four and five. Nevertheless, there is significant room for improvement as the top-scoring city (Portland) managed to earn only 19.5 points out of a possible 28. The average total score for the transportation sector was a little over ten points, with one city scoring less than four points overall—Jacksonville.

In general cities scored fairly well in the transit category, with four cities earning the full six points: Boston, New York, Philadelphia, and Pittsburgh. However, many cities performed very poorly in the location efficiency category, where the average score was slightly over two points out of a possible eight. Portland earned the highest score of 7 points in this category, with Boston and Baltimore both scoring five points. Cities' performance in the mode-shift category was equally poor. The average score for this category was 2.5, with five cities scoring one point out of a possible eight points, and four cities scoring just 0.5 point. Boston scored the highest with 7 points, while Jacksonville rounded out the bottom with 0 points.

Our analysis serves as evidence that cities across the United States must make more of an effort to reduce their transportation-related energy consumption, using policies that target vehicles as well as the transportation system as a whole.

Figure 10: Leading Cities and Best Practices: Transportation

Portland, OR: The 2009 Portland Climate Action Plan, adopted by City Council, includes the goal to reduce per-capita daily vehicle miles traveled by 30% from 2008 levels by 2030. Additionally, Portland has set a goal to achieve 70% of commutes by transit, carpool, biking or walking by 2030. This commute mode goal places heavy emphasis on the use of public transit and bicycle commuting in the future, aiming to increase their travel share to 25% each. The city has begun making changes to the Bicycle Master Plan, Streetcar System Plan, and overall Transportation System Plan to achieve these goals by 2030. The City of Portland Zoning Code encourages mixed-use and infill development along nearly all portions of the city's main commercial streets and throughout most of the central city. The zoning map also identifies specific mixed-use centers, consistent with the regional growth plan, Metro 2040. With these efforts, in combination with regional growth boundary legislation and the state-run complete streets policy (that also applies to municipal streets), the city has made significant strides toward improving the overall efficiency of its transportation system.

Boston, MA: Like Portland, Boston excels in providing residents with alternatives to driving. With a vehicle-miles-traveled reduction target of 7.5% by 2020, Boston has been making an active effort to reduce driving overall within its city limits. The city spends approximately $5.50 on transit per dollar spent on highways and parking, and more than 244,000 transit trips are available on a weekly basis within walking distance of the average household (CNT 2013). The city has made significant progress on providing additional transportation options. Boston has attracted a number of car sharing services to the area. The city's bike share program, Hubway, has also become very popular among residents and visitors and will soon be expanding to 92 stations across the city. Approximately 675,000 trips have been taken using Hubway bikes in the last two years (Glickel 2013). Boston has also invested significant time and money in providing commuters with incentives to use driving alternatives in the form of transit pass subsidies and shared shuttle services.

Atlanta, GA: Atlanta has recently updated its Connect Atlanta plan, which incorporates a number of provisions that will improve the efficiency of the city's transportation system. These include a plan to make bicycling a viable commute option by doubling the number of bike lane miles and committing to a bicycle-commute-to-work share of 2.2% by 2016. Atlanta also has mandatory neighborhood form-based codes that encourage the development of compact, mixed-use communities, along with neighborhood-specific transit-oriented-development codes for certain neighborhoods. Atlanta is also a leader when it comes to the efficiency of its freight system, with 2.4 intermodal facilities within city boundaries per thousand ton miles of regional freight.

Washington, D.C.: Washington has been a leader in adopting policies to encourage the purchase and use of efficient and advanced-technology vehicles. The Department of Motor Vehicles Reform Amendment Act of 2004 exempts owners of hybrid electric and electric vehicles from the vehicle excise tax and reduces the vehicle registration charge for vehicles that achieve more than 40 miles per gallon. The city also has a Clean Cities coalition to reduce petroleum use in the Washington metropolitan area and a comprehensive anti-idling policy for all gasoline and diesel vehicles operated within the District of Columbia. Likewise, the city is a leader when it comes to the promotion of alternative modes of transportation. Washington aims to achieve a 75% increase in commuter trips by transit, biking, and walking by 2032. The city recently launched the Capital Bikeshare program and has attracted a number of car sharing companies to the metropolitan area including Car2Go and Zipcar.

Chapter 7: City Policies In Comparison to Policies of Other Influencing Jurisdictions

Lead Author: Eric Mackres

Cities operate in a milieu of policies determined by other levels of government ranging from the federal, state, county, and, in some cases, metropolitan, making the interactions of local policies with state and regional policies a critical issue across the policy areas. In keeping with our principle of designing the *City Scorecard* both to provide feedback to policymakers and to be a public awareness tool, we developed an "Other Jurisdictions" score, comparable to the city scores, for several of the policy areas. We hope that the ability to compare these two scores—for the city and for the city's other influencing jurisdictions—will help put the actions of the city government in the context of the actions of other levels of government, which in most cases are applicable within the city. For example, this additional knowledge of state policy actions can help identify potential reasons for city action or inaction, based on the policies adopted by other jurisdictions. These scores are meant for comparative purposes only and are not considered in cities' overall rankings and total scores in the *City Scorecard*.

We developed the Other Jurisdiction scores for the three policy areas: buildings, energy utilities, and transportation. We did not develop them for local government operations and community-wide initiatives. In many cases the data for these Other Jurisdictions scores were derived from the *2012 State Energy Efficiency Scorecard* (Foster et al. 2012); in other cases the data came from additional primary research. For most metrics the Other Jurisdiction scores are based primarily on state policies. However, where information was available on policies by counties or other units of government that influenced the city, we included it in the scoring—most notably in the transportation policy area. Because these results are based primarily on state data, we use the term "state" interchangeably with "other influencing jurisdictions"

Scores were normalized, using different methodologies for each policy area, so that city and Other Jurisdiction metrics had the same maximum score. Summary scores were developed for each city and their other influencing jurisdictions by adding together the sector-specific scores. Washington, D.C. was excluded from this analysis because it is in effect both a city and a state.

In our comparisons of these two scores for each city as a whole and by policy area that follow, we present both the differences between these scores (to show relative leadership between a city and its other influencing jurisdictions) and the raw scores (to allow for comparison to the policy environments of other cities). As a result of these analysis, simplified grouping are developed to allow for comparison between cities. For relative leadership, a city-other jurisdiction score pair is characterized as either "Cities leading Other Jurisdictions" or "Cities Following Other Jurisdictions." When comparing the raw scores, a score pair is put into one of four categories: "Low Scoring Cities in Low Scoring Jurisdictions," "Low Scoring Cities in High Scoring Jurisdictions," "High Scoring Cities in Low Scoring Jurisdictions," or "High Scoring Cities in High Scoring Jurisdictions."

The comparison of these two scores demonstrates the source of policy leadership within the community, i.e., city vs. other jurisdiction, including identifying whether the state or the local government is leading regarding energy efficiency. This scoring is useful for identifying cities whose states have taken only limited action on efficiency and therefore must make extra effort

to make progress. It also provides recognition to cities that are leading their states, while simultaneously demonstrating to the states that are lagging their major cities that they should consider adoption of additional policy.

In general we found that higher scoring cities tended to be found in jurisdictions that were also higher scoring, but the correlation was weak and varied between policy areas. This correlation does not imply any particular causality, and it is likely that cities influence the policy adopted by other jurisdictions just as those jurisdictions influence policies adopted in cities. These findings suggest that cities retain significant policy independence and can take a variety of actions with or without the support of other influencing jurisdictions.

After presenting of the overall results, the remainder of this chapter discusses the interactions between city policies and the policies of other jurisdictions for each of our policy areas, starting with those for which we did develop Other Jurisdiction scores and then those for which we did not. We also compare city and Other Jurisdiction scores for the individual policy areas and discuss their implications.

OVERALL RESULTS

Summary scores were developed for each city and their other jurisdictions by adding together the sector-specific scores related to buildings, energy utilities and transportation that are described in the following sections. Figure 11 highlights the differences in scores at these two scales for each city. Those cities with positive relative values (in the upper right corner of the figure) are leading their other influencing jurisdictions in energy efficiency while those with negative relative values (in the lower left) are lagging.

Austin is clearly the furthest ahead of its state on energy efficiency policies. Other cities that lead their states on energy efficiency policy are St. Louis, the five other Texas cities included in the *Scorecard*, Indianapolis, Columbus, Memphis, Philadelphia, and Denver. The cities that scored considerably worse relative to their states are, in many cases, in states that have been leaders on energy efficiency. This is most noticeable among many of the California cities—Los Angles, San Jose, San Diego, Sacramento, and Riverside—which scored the lowest by this metric. But it is also true of many of the top-scoring cities, including San Francisco and Seattle. Even in these active cities, many energy efficiency policies still appear to be driven primarily by state activity.

Figure 11. City Leadership on Energy Efficiency Relative to Leadership by Other Jurisdictions

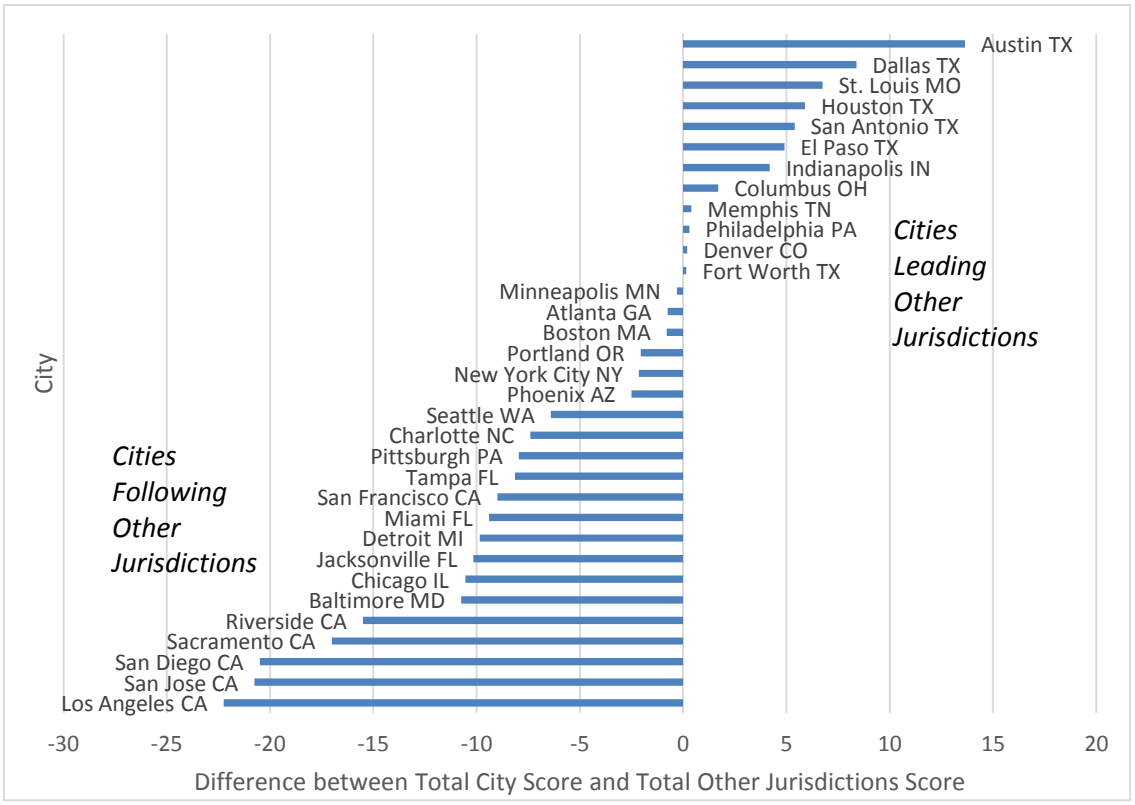
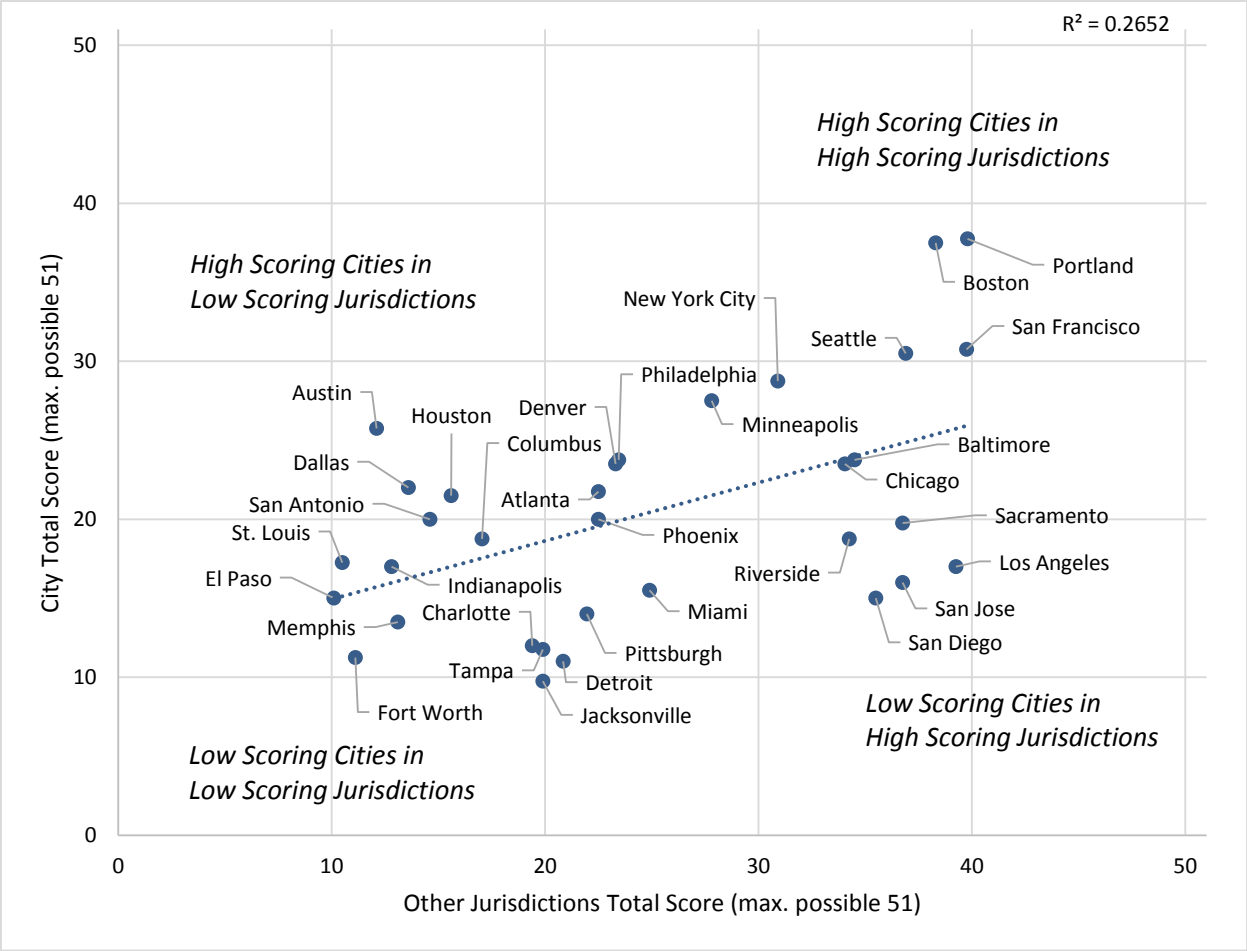


Figure 12 presents the same information in a different way to show the relationship between action on energy efficiency by cities and action by other jurisdictions. It shows that cities in high-scoring states are more likely to also have high scores. However, the correlation between the variables is not strong and other jurisdiction scores predict only about a quarter of a city's score (an R-squared of 0.27). This demonstrates that while state leadership, or lack thereof, is related to city action, states do not predetermine the opportunities or successes of their cities. According to our analysis, the vast majority of cities' success is the result of other factors.

Figure 12. Comparison of Overall City Scores and Equivalent Overall Other Jurisdiction Scores



BUILDINGS

To give a more complete picture of the policy environment regarding energy efficiency in buildings in the cities that we scored, we gathered state-level data on some of the same metrics that we evaluated for cities. In the buildings policy area, the city scores in the *City Scorecard* and the state scores in the *State Scorecard* overlapped in three metrics, all related to building codes:

- Residential energy code stringency
- Commercial energy code stringency
- Code compliance

Our normalization of points proceeded as follows. Points were awarded differently for these metrics in the *State Scorecard* versus the *City Scorecard*. Compliance efforts were given more weight at the city level because cities have greater influence over building code plan review and inspection efforts to ensure compliance, as well as with up-front support for building energy code compliance and third-party testing efforts and requirements. In contrast, cities generally have less influence over code adoption. We normalized the scores from the *State Scorecard* using the formulas in Table 50, resulting in 12 points as the maximum available for both the city scores and normalized state scores.

Table 50. Formulas Used to Normalize Other Jurisdiction Scores with City Scores in the Buildings Policy Area

State Scorecard Category	State Scorecard Points[1]	Normalized (12 pts.)
Residential Energy Code Stringency	> or equal to 2012 IECC =5 >2009 IECC = 4 2009 IECC = 3 1998-2006 IECC or greater = 2 No mandatory state code = 0	3 points 2 points 1 point 0.5 point 0 points
Commercial Energy Code Stringency	2012 IECC or ASHRAE 2010 or greater = 5 >2009 IECC or ASHRAE 2007 = 4 2009 IECC or ASHRAE 2007 = 3 1998-2006 MEC/IECC or ASHRAE 1999-2004 or greater = 2 No mandatory code = 0	3 points 2 points 1 points 0.5 point 0 points
Compliance Efforts	Substantial efforts (training code officials and funding studies of compliance) = 2 Multiple but not extensive efforts = 1.5 Some efforts, such as training = 1 Limited efforts = 0.5 No or unverifiable efforts = 0	points = (State Score/2)*6
TOTAL	7 possible points (commercial and residential stringency scores are averaged)	12 possible points

[1]Based on point allocations from Foster et al. 2012.

Figure 13 shows the differences between the *City Scorecard* results and the normalized results from the *State Scorecard*, and the relative leadership indicated by each. We saw a similar pattern here as in the overall results. Some notable changes from the overall results specific to buildings include that Phoenix is leading Arizona and that Atlanta has fallen much lower in the rankings compared to Georgia. Figure 14 shows that the relationship between state buildings scores and buildings scores for their cities are even weaker than for the overall results. The state scores predict only about 3.4% of the city's score. This is likely due in part to the differences in what data were used to develop the metrics (with city data based in part on code advocacy efforts and funding for code compliance activities, factors not considered in the state scores). But the weak correlation also, in part, likely reflects the independence with which many cities approach efforts related to energy codes, particularly compliance.

Figure 13. City Leadership on Building Energy Codes Relative to Leadership by State

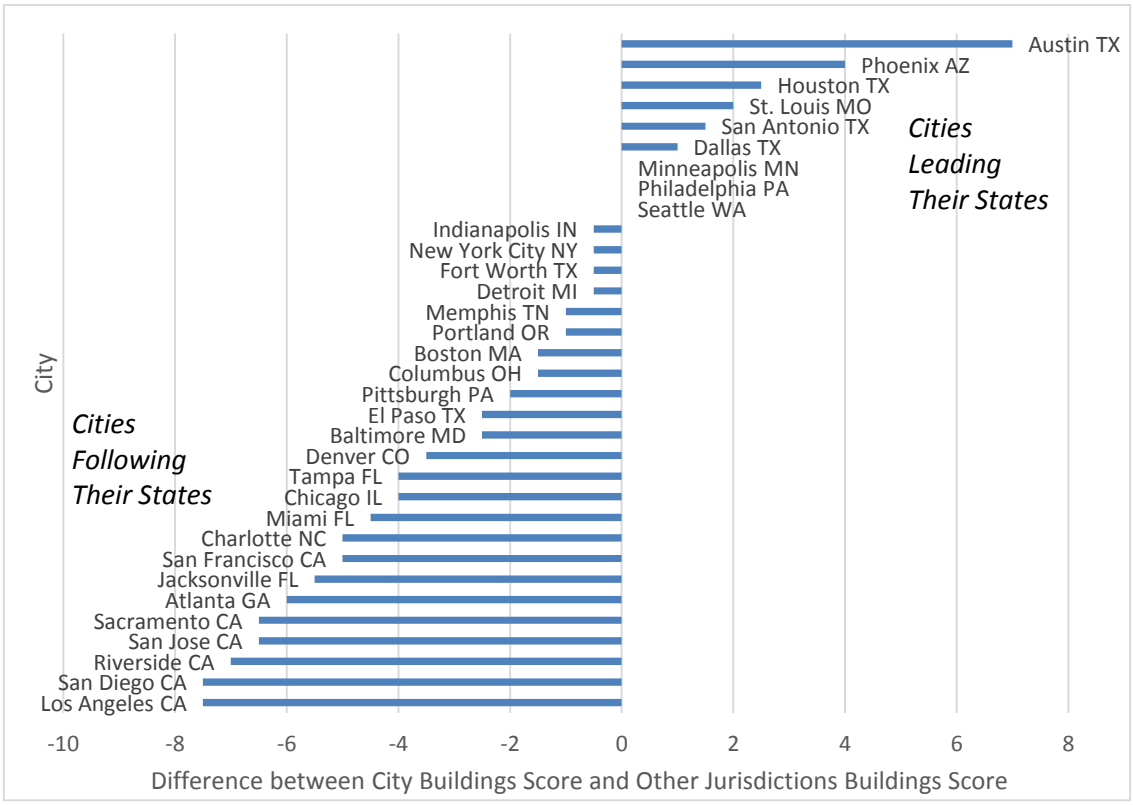
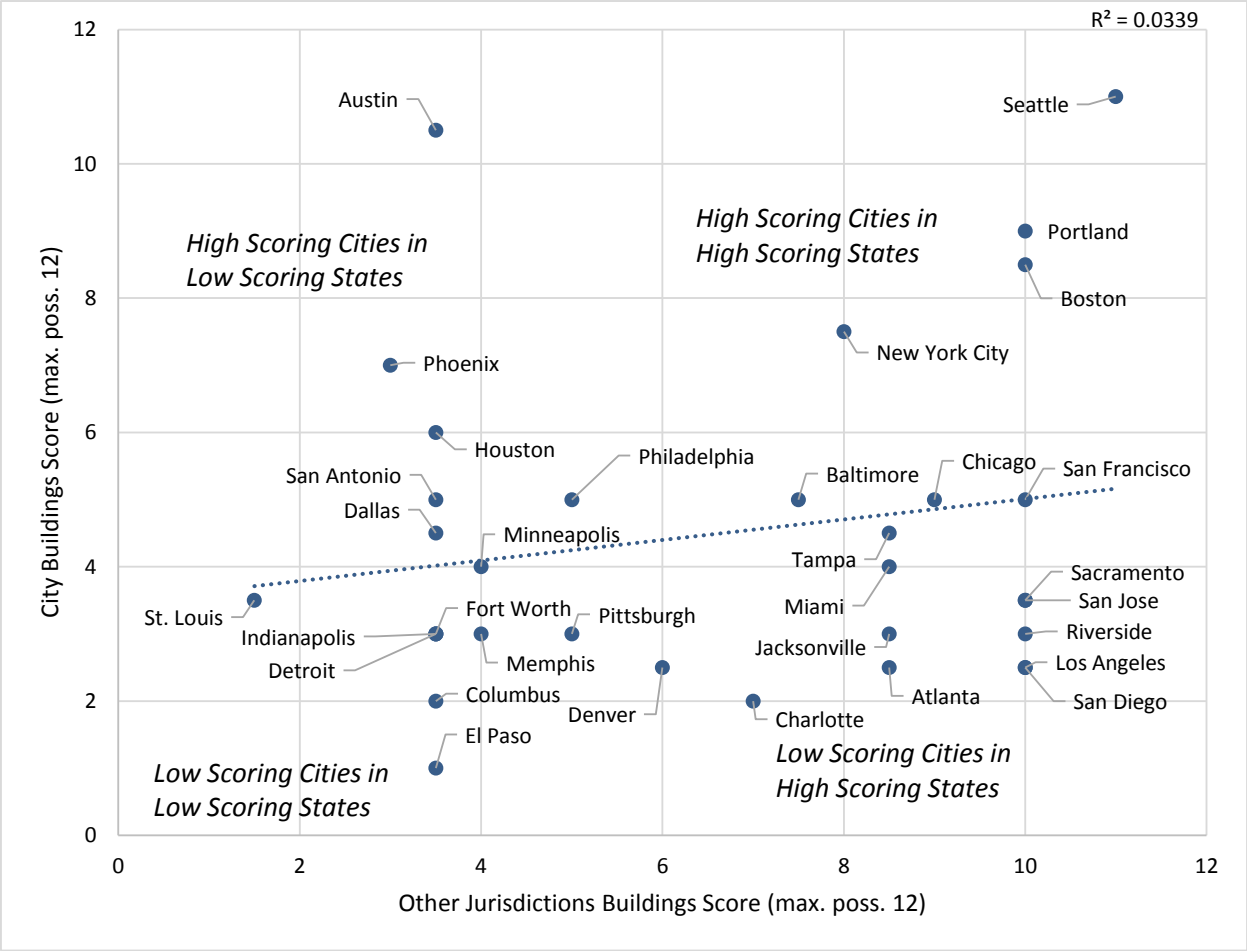


Figure 14. Comparison of City Buildings Scores and Equivalent State Buildings Scores



ENERGY UTILITIES

To compare utility-related policies and programs we again elected to use state data from the *State Energy Efficiency Scorecard.* The *State Scorecard's* category on Utility and Public Benefits Programs and Policies evaluates many of the same metrics that we evaluated for cities and individual utilities in the *City Scorecard*. Our metric for access to utility energy data was not included in the *State Scorecard*; therefore, we do not compare state- and city-level policy on this topic. We also did not compare state and city policies related to water utilities. The following categories overlap between the *City* and *State Scorecards* and are the basis for our comparison:

- Electric energy efficiency program budgets
- Natural gas program budgets
- Savings from electric energy efficiency programs
- Existence of an energy efficiency resource standards (EERS) or other energy savings target

Points were awarded differently in the *State Scorecard*, with Utility and Benefits Programs accounting for a greater share of the total points. This reflects the fact that states have more direct influence over utility policy and regulation than do cities, especially cities with investor-

owned utilities. In order to compare the scores in the *City* and *State Scorecards*, we normalized the 17 points awarded to the comparable categories in the *State Scorecard* to the 11 possible points in those categories in the *City Scorecard*, as shown in Table 51.

Table 51: Formulas Used to Normalize Other Jurisdiction Scores with City Scores

State Scorecard Category	State Scorecard Points[1]	Normalized Score (11 pts.)
2011 Electric Program Spending	5	points=(State Score/5)*4
2011 Gas Program Spending	3	points =(State Score/3)*3
2011 Electric Program Savings	5	points =(State Score/5)*2
Energy Efficiency Resource Standards	4	points =(State Score/4)*2
TOTAL	17 possible points	11 possible points

[1]Based on point allocations from Foster et al. 2012.

Figure 15 shows the differences between the *City Scorecard* results and the normalized results from the *State Scorecard*. Cities on the right are leading their states while those on the left are lagging. This shows that many cities in low-scoring states are leading the way on energy efficiency policy. The cities to the left did not necessarily score poorly on the *City Scorecard*, but may instead be located in states with some of the strongest utility and public benefit policies and programs. Figure 16 shows a relatively strong correlation between state utility policy and city action (an R-squared of 0.68). This coupled with a nearly equal number of cities scoring better than states as vice versa, indicates significant engagement by cities in this area, particularly in lower-scoring states.

Figure 15. City Leadership on Utility Energy Efficiency Relative to Leadership by State

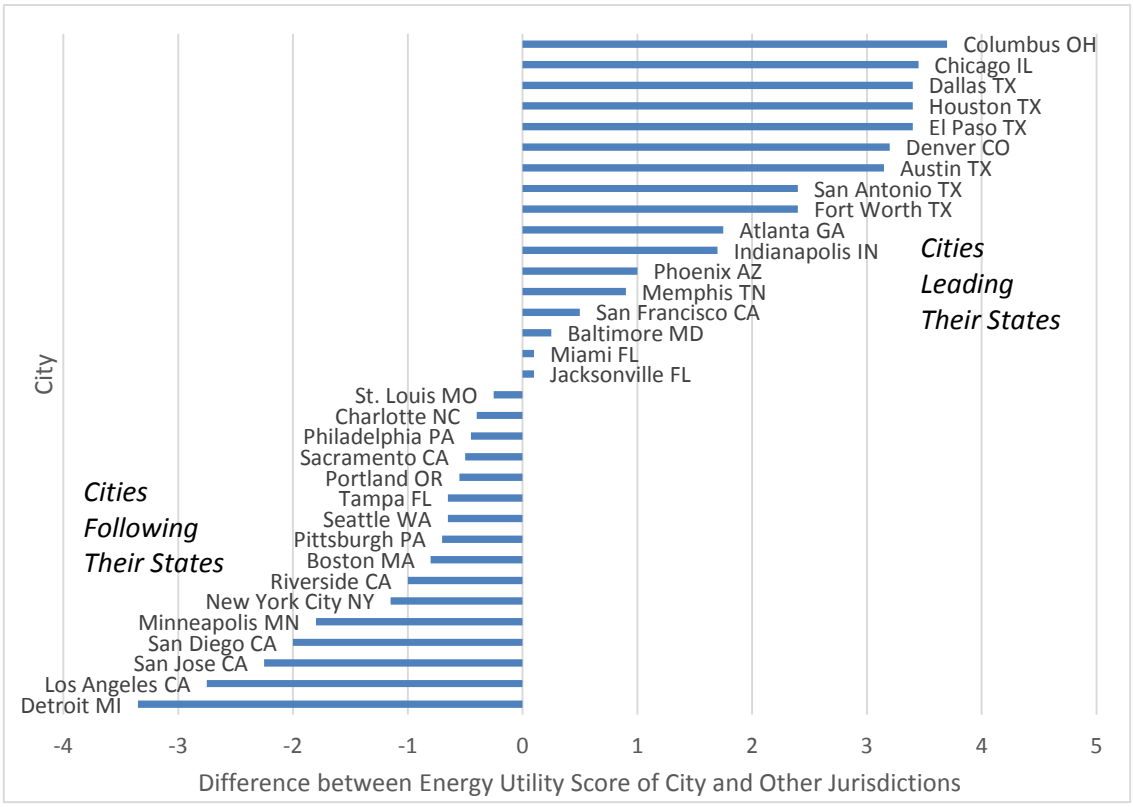
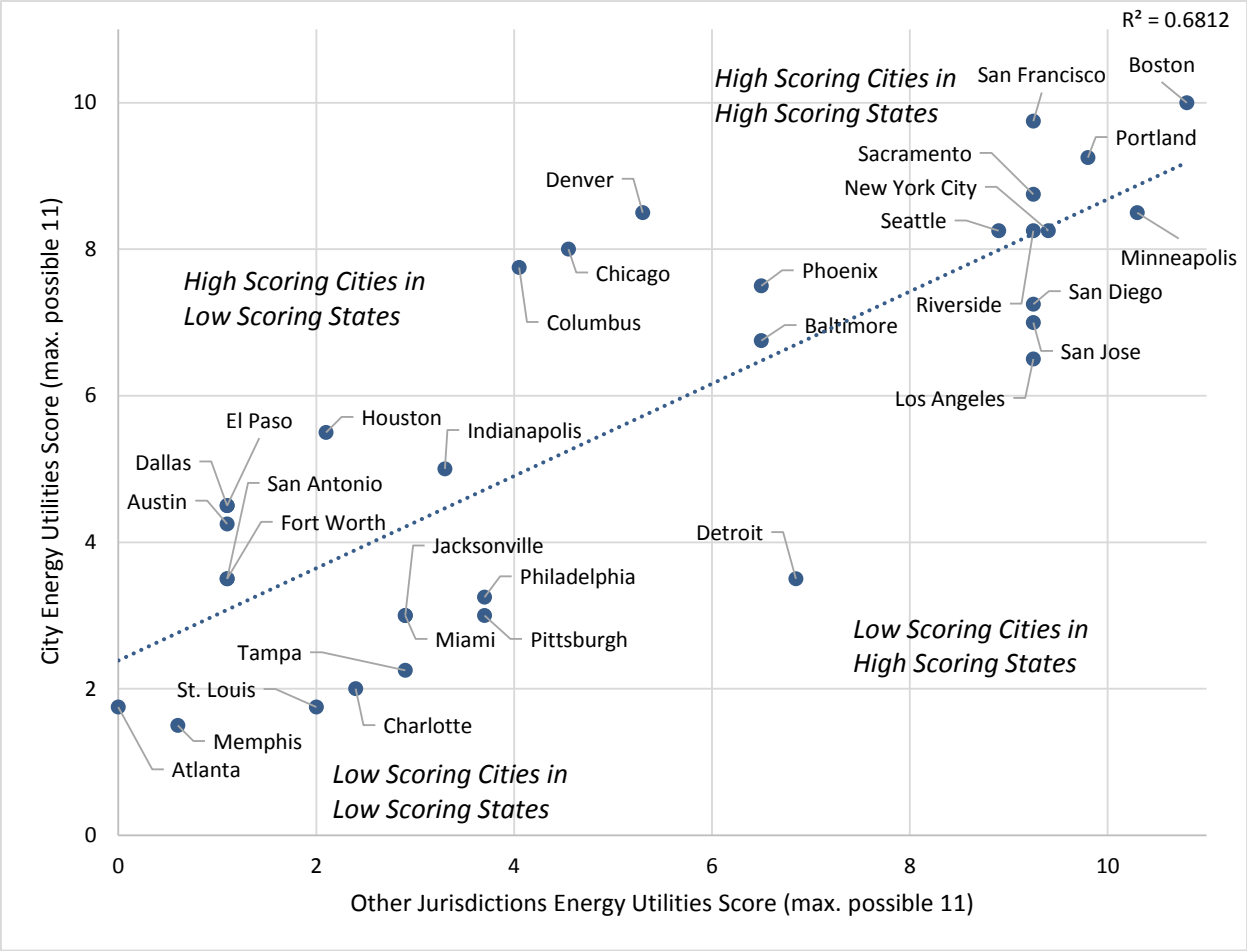


Figure 16. Comparison of City Energy Utility Scores and Equivalent State Energy Utility Scores



TRANSPORTATION

An ideal set of transportation strategies involves interaction among city, regional, state, and federal policies and programs. Many cities across the United States are also governed by regional transportation and land use plans in addition to their own policies and those of the state. Therefore, we scored regional and state policies that impact city transportation strategies using the same criteria as were used for city scores in the *City Scorecard*. This scoring gives each city a general idea of how it was performing on transportation policy implementation in comparison to its state government and regional planning agencies.

Information for regional and state scores was derived largely from independent research or from the city data requests. Regional and state transportation policies were evaluated for each metric considered in the city scoring and were scored out of a total of 28 points, the same number of points available to cities. Scores for the smart growth zoning, land use planning, and vehicle purchase incentives metrics were obtained from the *State Energy Efficiency Scorecard*. In these cases, we normalized the points awarded in the *State Scorecard* to the total points allocated to the relevant metric in the *City Scorecard*.

Figure 17 shows cities' efforts relative to those of their states and regions, indicating whether cities were leading or lagging in policy-setting relative to the other jurisdictions. Those cities on

the right are doing more on transportation efficiency, according to our metrics, than their states and regions, and those on the left are doing less. Cities that scored notably higher than their states and regions in this policy area include St. Louis, Dallas, El Paso, Austin, Atlanta, and Indianapolis. The correlation between city actions on transportation efficiency and equivalent actions at the state and regional level was weak (an R-squared of 0.12), as seen in Figure 18. Even in an area such as transportation, which is frequently planned from a regional perspective, these results show that cities often demonstrate independence in their policy activities.

Figure 17. City Leadership on Transportation Energy Efficiency Relative to Leadership by State and Region

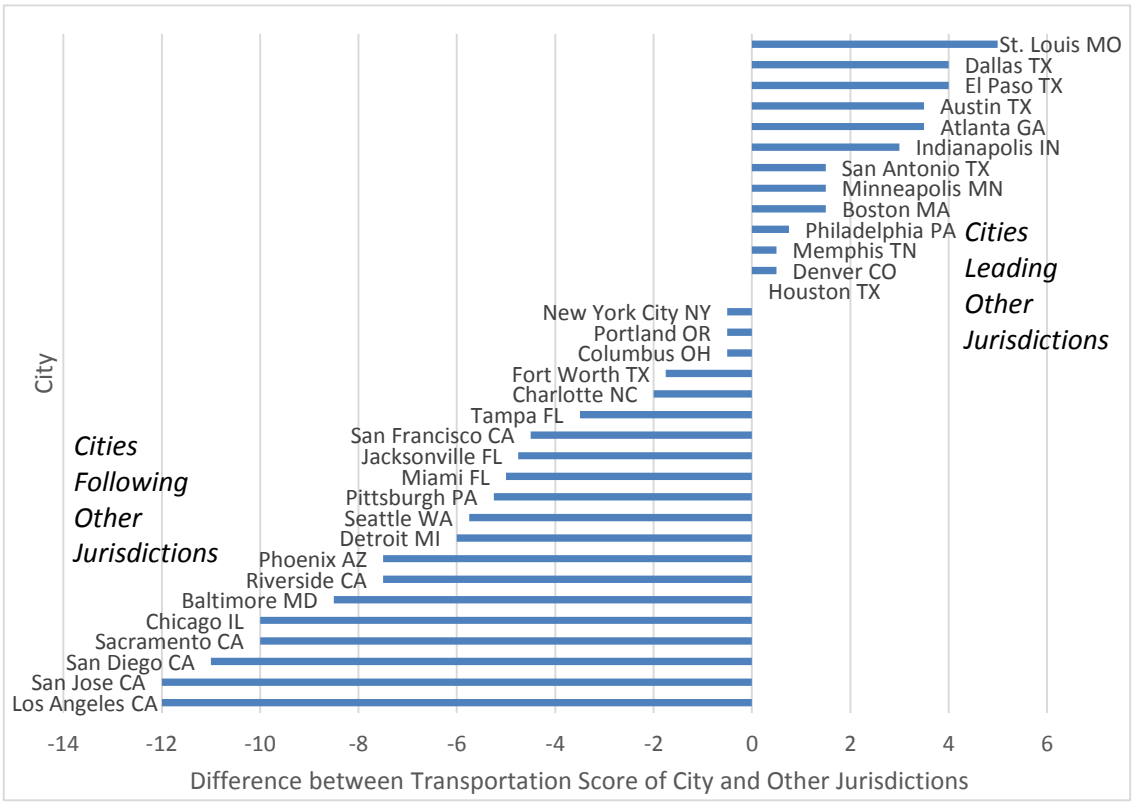
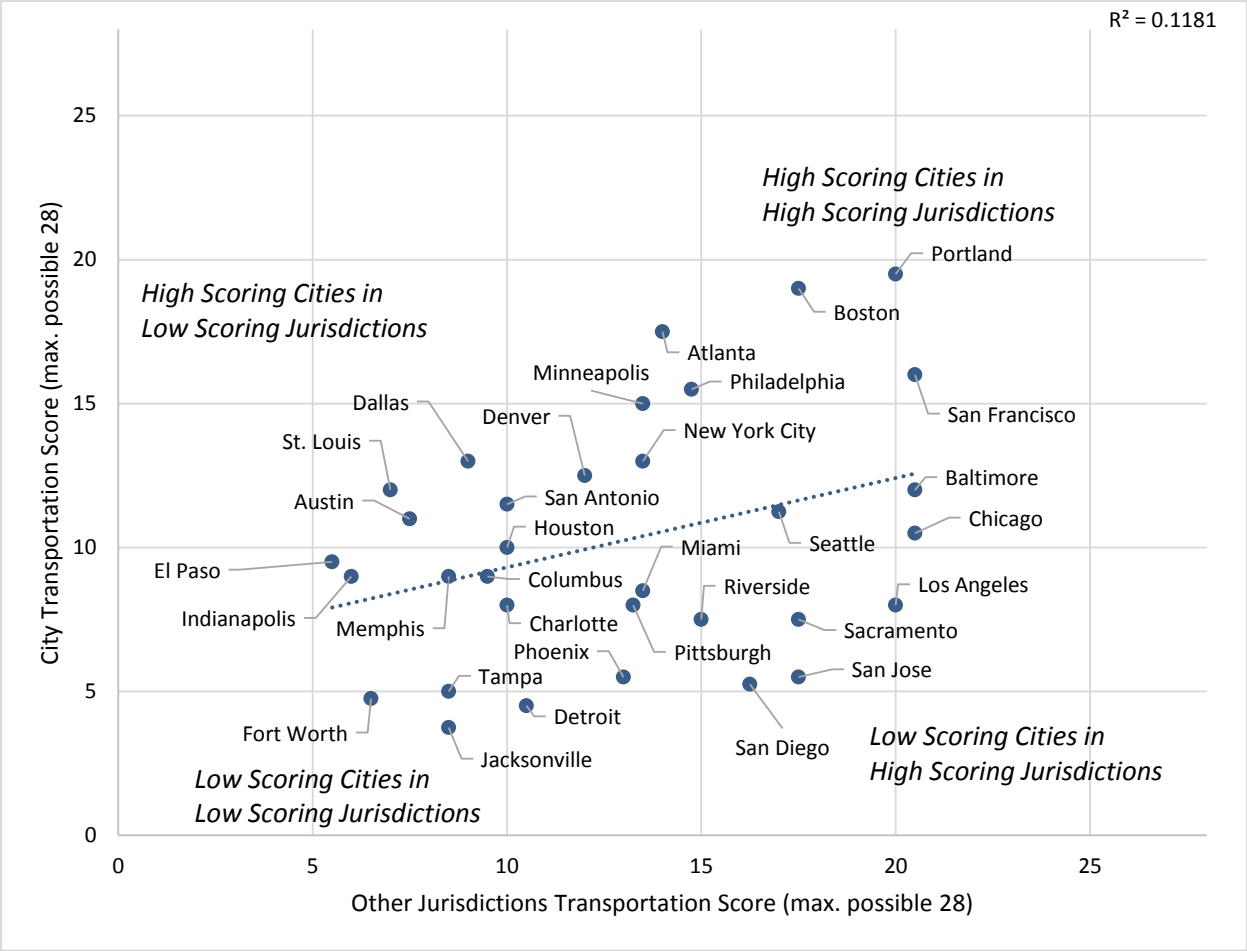


Figure 18. Comparison of City Transportation Scores and Equivalent Other Jurisdiction Transportation Scores



POLICY AREAS NOT SCORED

We did not develop Other Jurisdiction Scores for local government operation or community-wide initiatives. However, the influence of other jurisdictions on these policy areas is discussed briefly below.

Local Government Operations

The policies we examined in the *City Scorecard* related to local government operations include some of the most straight-forward ways for local governments to demonstrate their commitment to energy efficiency, independent of other actors. However, there are many ways in which policies at the state level and those of other jurisdictions may influence cities' decisions about local government operations. For example, California and Washington have state-wide benchmarking requirements that apply to certain categories of public buildings. San Francisco's and Seattle's benchmarking requirements complement these state-wide policies, and make clear that municipal buildings are included in benchmarking requirements (IMT 2013a). In such cases, state policies may have helped to push local governments toward the implementation of more energy-efficient practices. However, we did not compare city and state actions for this policy area because most states do not concern themselves with local government operations to

the level of detail covered in the *City Scorecard* metrics. We also found that most metrics covered in the Local Government Operations chapter do not have a state-level policy equivalent that applies to cities. State policies generally do not limit or hinder the implementation of energy-efficient policies for local government operations. While some cities have been pushed to implement such policies through state-led decisions, others have not, and these policy options are in general available to all municipalities.

Community-Wide Initiatives

There are several ways in which other levels of government influence actions by cities related to the metrics included in Chapter 3, Community-Wide Initiatives. Some community-wide targets are direct responses to state-level policies. For example, in 2008 Massachusetts passed the Green Communities Act, which includes a program to provide up to $10 million per year in technical and financial help to municipalities to promote energy efficiency and alternative energy. This state-level funding provides incentives to cities to set ambitious goals. Boston has taken advantage of the Green Communities program to fund programs to meet its greenhouse gas reduction goals and develop a stretch building energy code (Massachusetts 2013). Other cities also set targets that reflect state influence, even if there is no legal requirement to do so. Tampa's city-wide emissions goals follow Florida's adopted target (Tampa 2012). We have indicated where state policies may exert influence where relevant throughout the report. For example, states that have cool roof policies are noted in Table C-4 in Appendix C. While influence from other levels of government is certainly apparent, it is far from homogenous. Since no clear pattern of outside influence emerged and policy data were not easy available on state actions equivalent to many of our city metrics in the chapter, we did not develop Other Jurisdiction scores for this policy area.

CONCLUSION

The interplay between policies at the state level and those of local governments are key for improving the efficiency of cities across sectors. We identified four types of interaction between cities and states. First, cities can take the lead in the adoption of efficiency policies in states where action has been limited, as exemplified by Austin and, to a lesser extent, the other Texas cities. Second, we see that some cities in leading states are less active in implementing their own initiatives. This is most notable among the lower-scoring California cities. A third category of cities, those located in low-scoring states and themselves taking limited action, likely either lack political impetus to improve efficiency or face limitations in resources with little assistance from their states. Cities in this category include Fort Worth, Charlotte, Tampa, Detroit, and Jacksonville. And fourth, we found that most of the top-scoring cities were in states that were also taking considerable action—cities including Boston, San Francisco, and New York City. These cities saw additional needs and opportunities and supplemented state policies with their own initiatives.

Understanding these various interactions can shine light on the factors that lead to cities' action or inaction on efficiency, depending on the state policy environment in which it exists. However, our analysis also shows that cities retain considerable independence and can take action without the assistance of state leadership, even if the path may be more difficult.

Chapter 8: Energy Performance Indicators—Comparing Policies with Energy Consumption and Intensity and Other Energy-Related Outcomes

Lead Author: Kate Johnson

INTRODUCTION

The vast majority of metrics used to score each of the cities evaluated in this report measured policies, that is, actions taken by or supported by the cities themselves to encourage energy efficiency. While the strength of these policies can in some cases be measured quantitatively—for example, through the energy savings targets established by the city—most metrics reflect a qualitative evaluation. The metrics provided in this chapter, in contrast, reflect a city's actual energy performance, tracking the potential outcomes of polices scored in the preceding chapters. We have not scored these metrics. The energy context and performance of any city is shaped not just by its policies, but also the inherit characteristics of its built environment, regional energy supply, and climate. In addition, data availability and consistency were limited. We include them here, however, because an understanding of energy performance and how energy is used in a given city is critical for its strategic energy planning and evaluating the impact of energy-related policies. These metrics also help to highlight trends both locally and nationally.

Thanks in large part to the movement of cities to create greenhouse gas emissions inventories, and the federal funding for local energy planning provided by the Energy Efficiency and Conservation Block Grant program, cities are gaining a greater understanding of how energy is used within their borders. However, it remains difficult to compare energy use across cities. The various methodologies for conducting greenhouse gas inventories and categorizing energy use complicate any effort to normalize and compare energy use by sector across cities. The self-reported data on which we rely are also difficult to validate. Furthermore, while the Department of Energy's Energy Information Administration compiles data on energy supply and consumption at the state level, the same resources do not exist at the county, metro, or city level. Where official sources are available from the Department of Transportation, the U.S. Geological Survey, and the U.S. Census Bureau data are often not available at the city level; rather they are organized according to the county, metropolitan area, or larger urbanized areas classified by the U.S. Census Bureau. Perhaps the most comprehensive source of city-level energy data is compiled by CDP (formerly the Carbon Disclosure Project) from reports submitted by cities from around the world (CDP Cities 2013). This dataset allows for comparisons of greenhouse gas emissions across the largest cities, many of which are scored here in the *City Scorecard*. However, cities report their emissions based on the taxonomy they chose to use to conduct their inventories, making comparisons of individual sectors difficult. For example, some cities report emissions by end use (e.g., buildings, transport, waste) while others report by economic sector (e.g., residential, commercial, industrial). Furthermore, few cities report the underlying energy consumption information used to measure their greenhouse gas emissions.

As a result of these data limitations, we do not present a full comparative picture of energy use in each of the cities we assessed. Where data were available from CDP, or from individual energy and greenhouse gas inventories, we have attempted to show and compare the energy consumed within each city, showing greenhouse gas emissions when energy consumption data were not available. In addition to this baseline information, we present data on select indicators

related to the policies we scored in previous chapters, along with an analysis of the correlation between the performance indicators and *Scorecard* results for these policies. It is noted below when data from different geographical scales other than the city-level are used.

As in previous chapters, the metrics analyzed in this section are organized by sector: city-wide energy and water use, and energy used for local government operations, buildings, and transportation. Utility energy use is captured within city-wide energy performance, and consumption of utility-provided energy is captured primarily within the buildings section.

RESULTS

City-wide Energy & Water Use

A detailed breakdown of energy consumption by sector is an important building block for any strategic energy or sustainability plan. The results shown below summarize city-wide greenhouse gas emissions, energy consumption by end use, water consumption, and the growth of the urban heat island effect.

ENERGY CONSUMPTION

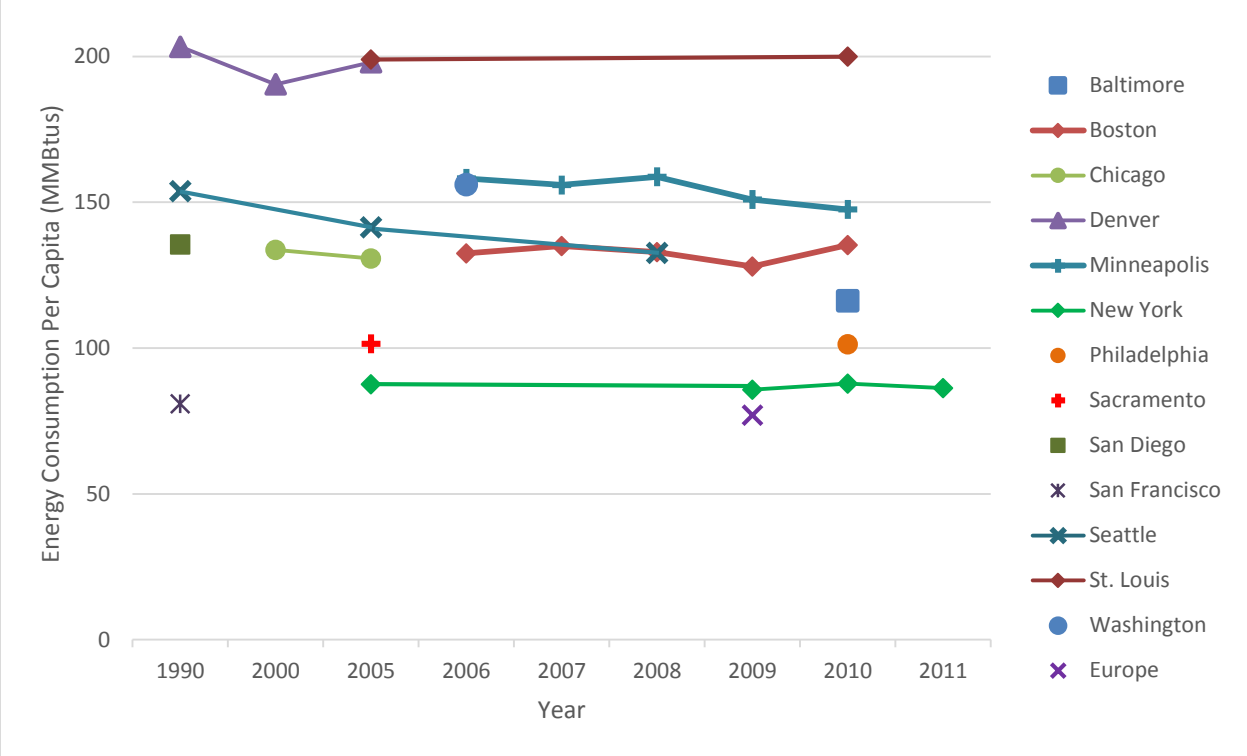
Using data from cities' greenhouse gas inventories, we present the total energy consumption in each city per capita in Figure 19.[13] In addition to reflecting efficiency, these energy consumption data also reflect differences in climate, the extent of industrial activity in the local economy, and a variety of other factors. Since methodologies and the scope of inventories vary from city to city, we excluded energy used for waste management, air travel and airports, and marine transportation, as it is not widely reported. Generally, the energy consumption figures shown below include energy used for transportation and in residential, commercial, and industrial buildings and facilities. Energy data were available from 13 cities' inventories. Trends are shown for cities with inventories from multiple years. Several cities with greenhouse gas inventories reported emissions by sector but did not provide the underlying energy use and are therefore not shown here. As a point of comparison, the average energy consumption per capita from Siemens' European *Green City Index* (2009) for 30 major European cities (77 MMBtu) is also shown.

Of the cities for which data were available, St. Louis and Denver (ranked 23th and 11th overall in the *City Scorecard*, respectively) had the highest per-capita energy consumption, while San Francisco (ranked third), New York (ranked fourth), and Philadelphia (ranked tenth) had the lowest. Of the five cities for which multiple years of data were available, Minneapolis (ranked eighth overall) experienced the largest decline in energy consumption per capita. There was not a strong correlation between the *Scorecard* results and energy use per capita. The *Scorecard*, however, measures policies, many of which address energy use over a long time horizon and may not yet be reflected in overall consumption per capita. Building energy codes, for example,

[13]National energy consumption is often also presented in terms of energy productivity or energy intensity, defined as energy consumption per unit of economic output. Without an easily accessible measure of cities' gross domestic product for all of the years for which we have consumption data, we have chosen to use population to normalize energy consumption throughout this section. Similarly, the energy consumption of buildings is typically presented as energy use per square foot of building space. City-level building square footage data is largely proprietary and not widely, freely available, so we relied on populations which does not include employees who commute into the city.

only address new buildings to reduce energy use overtime as new buildings replace older, less efficient buildings. The correlation between the average annual change in energy consumption and the overall Scorecard score (for those seven cities for which we have at least two years of data) was not statistically significant.[14]

Figure 19: Total Energy Consumption per Capita (MMBtu)



Sources: This figure and the following tables and figures use data from city greenhouse gas inventories as reported in Baltimore 2013, Boston 2012, CNT 2008, ICF International 2012b, University of Colorado-Denver 2007, Minneapolis 2012b, New York 2011b, New York 2012, Philadelphia 2012, ICF Jones & Stokes 2004, San Diego 2005, San Francisco 2004, Seattle 2008, St. Louis 2012, District of Columbia 2010. Values used to calculate the European average are from Siemens 2009.

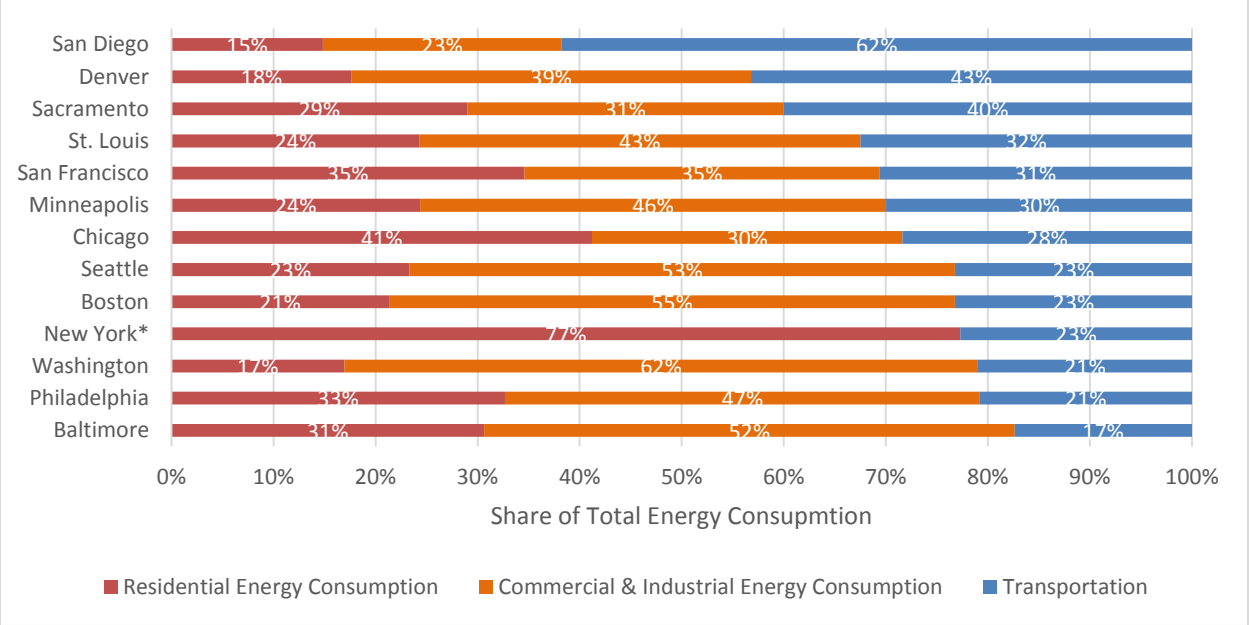
Notes: Data shown are total energy consumption as reported in city greenhouse gas inventories excluding energy used for waste management, air transportation, and marine transportation. All energy units have been converted to million British thermal units (Btu). Vehicle miles traveled (VMT) were converted to Btus using the national average for passenger cars (5,342 Btus per VMT) and transit buses (35,953 Btus per VMT) as reported in the 2012 Transportation Energy Data Book (Davis et al. 2012, Table 2.12). Population numbers used for per-capita calculation are from the corresponding year in the United States Census Population Estimates, accessed through American FactFinder2.

Figure 20, below, shows the share of total energy consumption by the residential, commercial and industrial, and transportation sectors. Residential and commercial/industrial buildings accounted for more than half of energy use in all the cities except San Diego. Commercial and industrial buildings contributed more to energy consumption than residential buildings in all of the cities except Chicago. On average, across these 13 cities, transportation accounted for 30% of total energy consumption while buildings accounted for 70%. These cities, however, do not include many of the newer, southern cities included in the *City Scorecard*, which generally have

[14] Similarly, correlations between the average annual change in building and transportation energy consumption and their respective scores were not statistically significant.

higher shares of travel by personal vehicle and higher vehicle miles traveled. Therefore, the average share for transportation would likely be greater across our full list of cities.

Figure 20: Share of Energy Consumption by Sector



Notes: Data shown are from the most recent year available from city greenhouse gas inventories. Differences in how individual cities classified sectors could lead to variations in which end uses are included in each of the different sectors. *New York building energy consumption not available by sector. All buildings represent 77% of energy consumption city-wide.

GREENHOUSE GAS EMISSIONS INTENSITY

Greenhouse gas emissions per capita collected from CDP's 2013 report are available for 14 of the cities we analyzed (CDP Cities 2013) and are shown in Table 52. Again, as with energy consumption, San Francisco, New York, and Philadelphia were among the lowest in terms of greenhouse gas emissions per capita, along with San Diego.

Table 52: Greenhouse Gas Emissions Per Capita

City	Year	Greenhouse Gas Emissions Per Capita (Metric Tons CO2e)
St. Louis	2010	24.0
Washington	2006	18.0
Houston	2007	16.0
Denver	2010	15.2
Austin	2010	14.6
Dallas	2010	14.1
Chicago	2010	12.4
Miami	2006	11.7
Seattle	2008	11.3

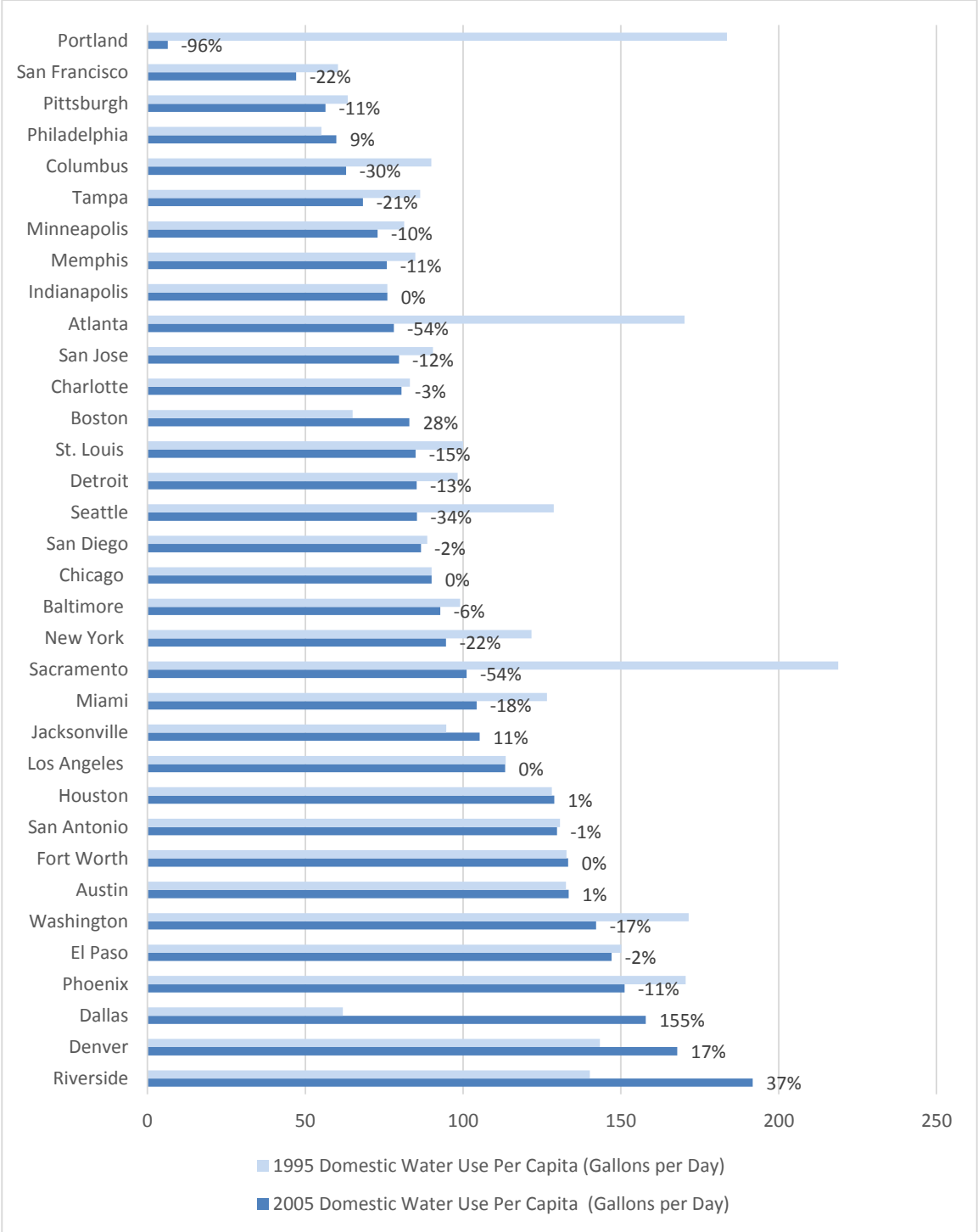
City	Year	Greenhouse Gas Emissions Per Capita (Metric Tons CO2e)
Portland	2010	10.4
Philadelphia	2010	9.9
San Diego	2008	9.4
New York	2010	6.5
San Francisco	2010	6.5

Source: CDP Cities 2013

DOMESTIC WATER USE

Water consumption is a significant driver of energy use at the local level, as water utilities use energy to treat and distribute water for domestic use. We collected data on water use for domestic purposes (i.e., not including agricultural, industrial, and power production uses) at the county level for each city using the U.S. Geologic Survey's National Water-Use Information Program for 1995 and 2005, the most recent year available. The data are shown in Figure 21 along with the rate of change in water use per capita from 1995 to 2005. Domestic use is defined as all indoor and outdoor residential uses including drinking water, water used for sanitation (e.g., toilets and showers), and lawn watering. Likely due to the inclusion of lawn watering, cities in the south and southwest with warmer climates and therefore longer lawn-watering seasons had the highest water use per capita. The relationship between the ten-year change in water use per capita and the *Scorecard* results for water utilities is not statistically significant. El Paso, which tied for the highest score for efficiency in its water utilities in the *Scorecard*, had the fifth highest water use per capita in 2005, though that was a slight decline (2%) from 1995. Similarly, Austin and Fort Worth had among the highest domestic water use per capita, but scored highly for the water policies and programs, indicating that these cities recognize and are attempting to address their high water use. San Francisco and Seattle, tied with Fort Worth and El Paso for the highest water efficiency scores, each saw significant declines in water use.

Figure 21: 2005 Domestic Water Use per Capita (Gallons per Day) 1995 and 2005



Notes: Data shown are for the county (or counties) in which the city is located. Data labels indicate change in water use from 1995 to 2005.
Sources: USGS 1999, Kenny et al. 2009.

URBAN HEAT ISLAND INTENSITY

Higher temperatures in urban areas caused by the urban heat island effect can drive higher energy consumption for cooling purposes. Cities were awarded points in the *Scorecard* for

developing strategies and adopting policies to mitigate the urban heat island effect including tree planting initiatives and cool roof and cool pavement policies. The Urban Climate Lab at the Georgia Institute of Technology has created a database of urban and rural temperature differentials in the largest metropolitan areas dating back to 1961. We used their data to show the growth in urban heat island intensity (the difference between average urban and surrounding rural area temperatures) for the metropolitan areas of each of our cities that are included in their database. Table 53 below shows the average decadal change in urban heat island intensity over the past three decades. The table also provides each city's urban heat island mitigation score from Chapter 3 of the *Scorecard*, Community-Wide Initiatives. Of the cities without an urban heat island mitigation policy or program, Detroit, Atlanta, and El Paso had the largest average change in the urban heat island over the last three decades. Nearly all of the 10 cities with largest increase in the urban heat island have mitigation policies or initiatives in place including Indianapolis, Minneapolis, Phoenix, Portland, Atlanta, St. Louis, New York, and Seattle.

Table 53: Change in the Urban Heat Island (UHI) (degrees Fahrenheit)

City	Average Decadal Change in UHI 1981 to 1990	Average Decadal Change in UHI 1991 to 2000	Average Decadal Change in UHI 2001 to 2010	Three-Decade Average	Urban Heat Island Mitigation Score in this *Scorecard* (2 pts.)
Detroit	0.54	2.91	0.01	1.15	0
Indianapolis	1.42	-0.05	1.95	1.11	1
Minneapolis	-0.04	0.34	2.21	0.83	1
Phoenix	0.90	-1.70	3.09	0.76	1
Portland	0.23	1.09	0.04	0.45	2
Atlanta	-0.87	-0.78	2.86	0.40	1
St. Louis	0.72	-1.09	1.51	0.38	2
El Paso	-1.01	0.52	1.55	0.35	0
New York	-0.03	-0.64	1.54	0.29	2
Seattle	0.54	-0.34	0.58	0.26	1
Charlotte	1.88	-2.60	1.28	0.19	1
Philadelphia	-0.15	-0.43	1.10	0.17	2
Jacksonville	-0.22	-0.65	1.27	0.13	0
San Antonio	-0.54	0.20	0.67	0.11	1
Pittsburgh	0.37	-0.25	0.11	0.08	1
Columbus	-0.09	0.14	-0.01	0.01	0
Houston	-1.22	-0.81	1.87	-0.05	2
Austin	-0.05	-0.50	0.36	-0.07	2
Washington	-2.08	-0.71	2.44	-0.12	1
Chicago	-0.22	-0.28	-0.29	-0.26	2

City	Average Decadal Change in UHI 1981 to 1990	Average Decadal Change in UHI 1991 to 2000	Average Decadal Change in UHI 2001 to 2010	Three-Decade Average	Urban Heat Island Mitigation Score in this *Scorecard* (2 pts.)
Baltimore	-0.02	-1.64	0.82	-0.28	1
Tampa	0.53	-1.25	-0.19	-0.30	1

Notes: The average decadal change is the total change in the urban heat island over a ten year period. It was calculated by multiplying the average annual change in urban heat island per decade by ten. The three-decade average is the average of the three figures shown for decadal change. Data were provided by the Urban Climate Lab at Georgia Institute of Technology (Stone 2013).

Local Government Energy Use

We used data reported to CDP by 14 cities to show energy consumption and greenhouse gas emissions from local government operations in Table 54. It is important to note, however, that the types of operations and services included in municipal operations varies; therefore, direct comparisons across the cities are not possible. For example, some cities include airports and water utility services in their inventories, while others do not. However, as long as cities use consistent methodologies from year to year, these data points enable individual local governments to measure the performance of policies to improve the efficiency of their own operations.

It is difficult to draw conclusions about the link between the policies scored in the Local Government Chapter and the performance shown below, again, because of the variations in how cities classify, measure and report their emissions.

Table 54: Local Government Operations: Energy Consumption and Greenhouse Gas Emissions (GHG)

City	Energy Consumption (Electricity, Heat & Cooling, MWh)	Energy Consumption Per Capita	GHG Emissions (Metric Tons CO2e)	GHG Emissions Per Capita	Year
San Diego	225,000	0.17	140,000	0.11	2008
Miami	79,609	0.19	81,327	0.21	2007
Seattle	155,871	0.25	246,360	0.40	2010
Los Angeles	1,002,839	0.26	116,650	0.03	2010
Dallas	495,674	0.41	402,560	0.33	2010
Phoenix	644,835	0.44	590,961	0.42	2005
Austin	410,484	0.50	445,612	0.56	2010
Philadelphia	769,923	0.50	500,800	0.33	2010
Houston	1,200,000	0.56	1,009,279	0.51	2005
New York	5,177,364	0.63	3,458,080	0.42	2010
St. Louis	316,643	1.00	279,424	0.88	2010
Atlanta	620,132	1.43	512,406	1.22	2010
Washington	947,345	1.53	719,896	1.19	2006

City	Energy Consumption (Electricity, Heat & Cooling, MWh)	Energy Consumption Per Capita	GHG Emissions (Metric Tons CO2e)	GHG Emissions Per Capita	Year
San Francisco	1,585,737	1.95	215,577	0.27	2009
Chicago			2,345,288	0.87	2010

Sources: CDP Cities 2013. Notes: Energy consumption includes electricity, heat, steam, and cooling for local government operations. Greenhouse gas emissions include scope 1 and scope 2 only. Scope 1 emissions include direct emissions from the burning of fossil fuels within the city (e.g., in vehicles). Scope 2 includes indirect emissions from the generation of electricity, heating and cooling, or steam generated outside the city, but consumed within the city. Population data used to calculate per capita emissions are from U.S. Census Population Estimates for the year corresponding to year for which emissions are reported.

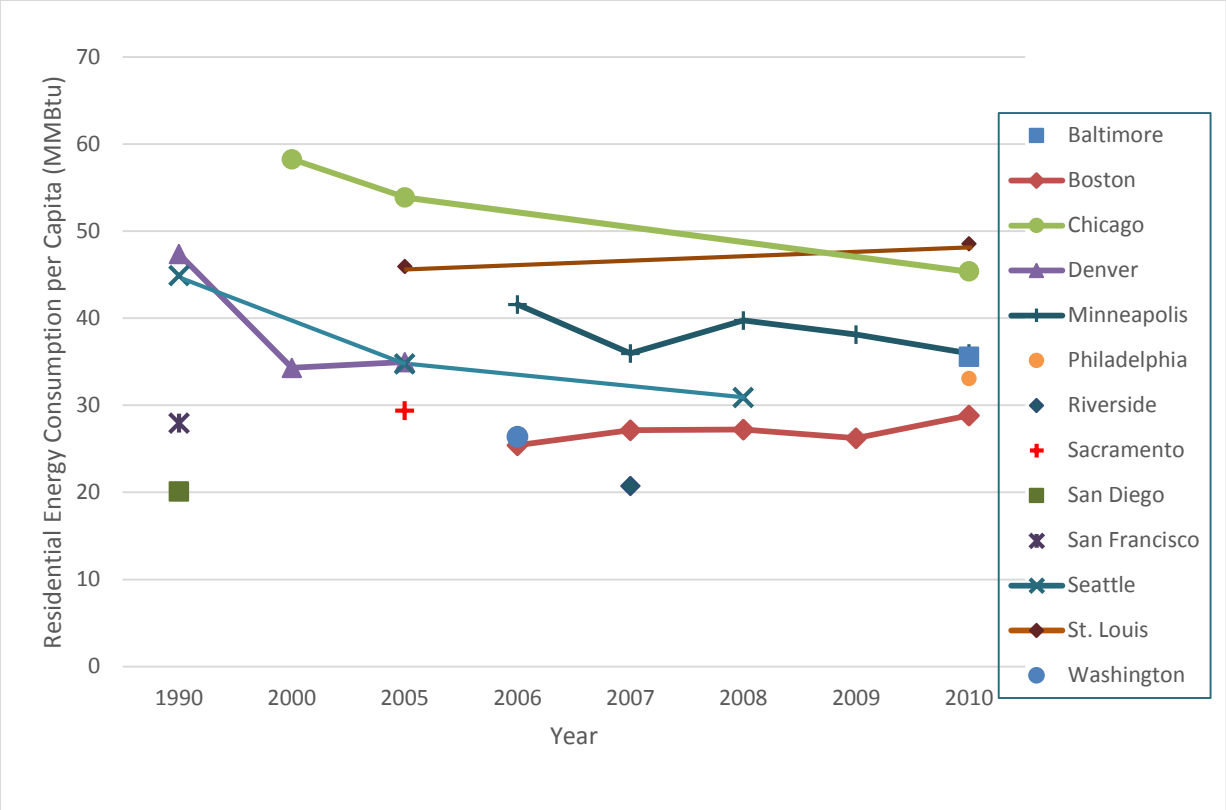
Buildings

Residential and commercial buildings are among the largest sources of energy consumption in many cities. Cities can influence the energy efficiency of their buildings through a variety of policies including building codes, energy disclosure policies, and green building requirements which were scored in Chapter 4, Buildings Policies.

BUILDING ENERGY CONSUMPTION

The total energy consumed in residential buildings and in the commercial and industrial sector is shown in Figures 22 and 23, respectively, for the cities with available data. Since industrial buildings are included along with commercial buildings in many of the city greenhouse gas inventories, differences in the economies and the energy intensity of the industries found in each city, in addition to the efficiency of the buildings, will influence the energy use per capita. Since buildings' energy consumption is driven in part by climate and related heating and cooling needs, it is not surprising that cities in more moderate climates, that is, the California cities of Riverside, San Diego, and San Francisco, had among the lowest building energy intensity. San Francisco also scored highly for its building sector policies, ranked sixth in *City Scorecard* for the sector. St. Louis, which ranked in the middle of the pack for its building sector policies, had both the highest residential building energy consumption per capita and the second highest commercial and industrial building energy consumption. Chicago, which ranked eighth in the *Scorecard* for the buildings sector, experienced a sharp decline in residential building energy consumption while its commercial building energy consumption remained among the lowest of the cities with available data. Both Seattle and Minneapolis, ranked first and 12th, respectively, for buildings sector policies, have experienced a decline in both residential and commercial/industrial energy consumption.

Figure 22: Residential Building Energy Consumption per Capita by City and Year

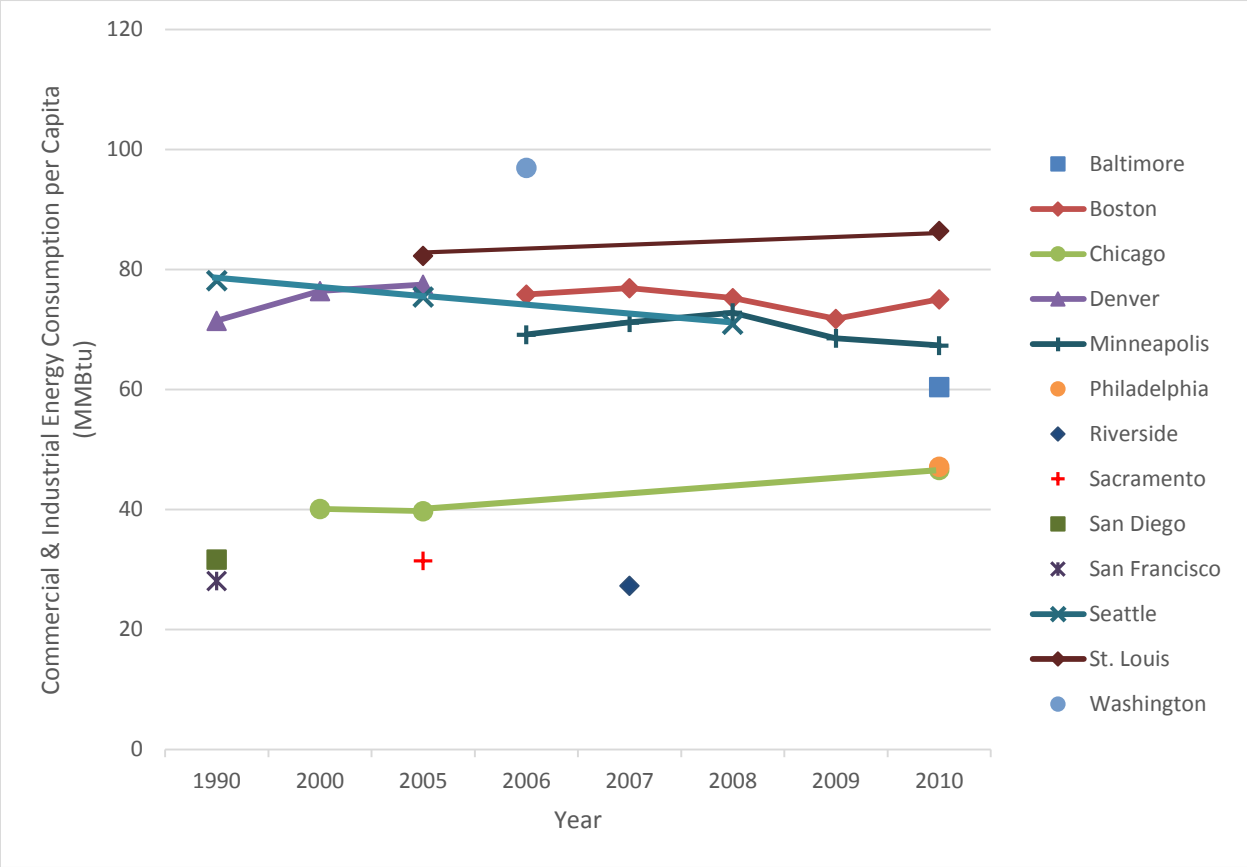


Notes: Includes all energy consumption classified as residential in each city's greenhouse gas inventory. New York is not shown because data were only available for all building categories combined. Population data used for per-capita calculation are from the corresponding year in the United States Census Population Estimates, accessed through American FactFinder2.

ENERGY STAR-CERTIFIED BUILDINGS

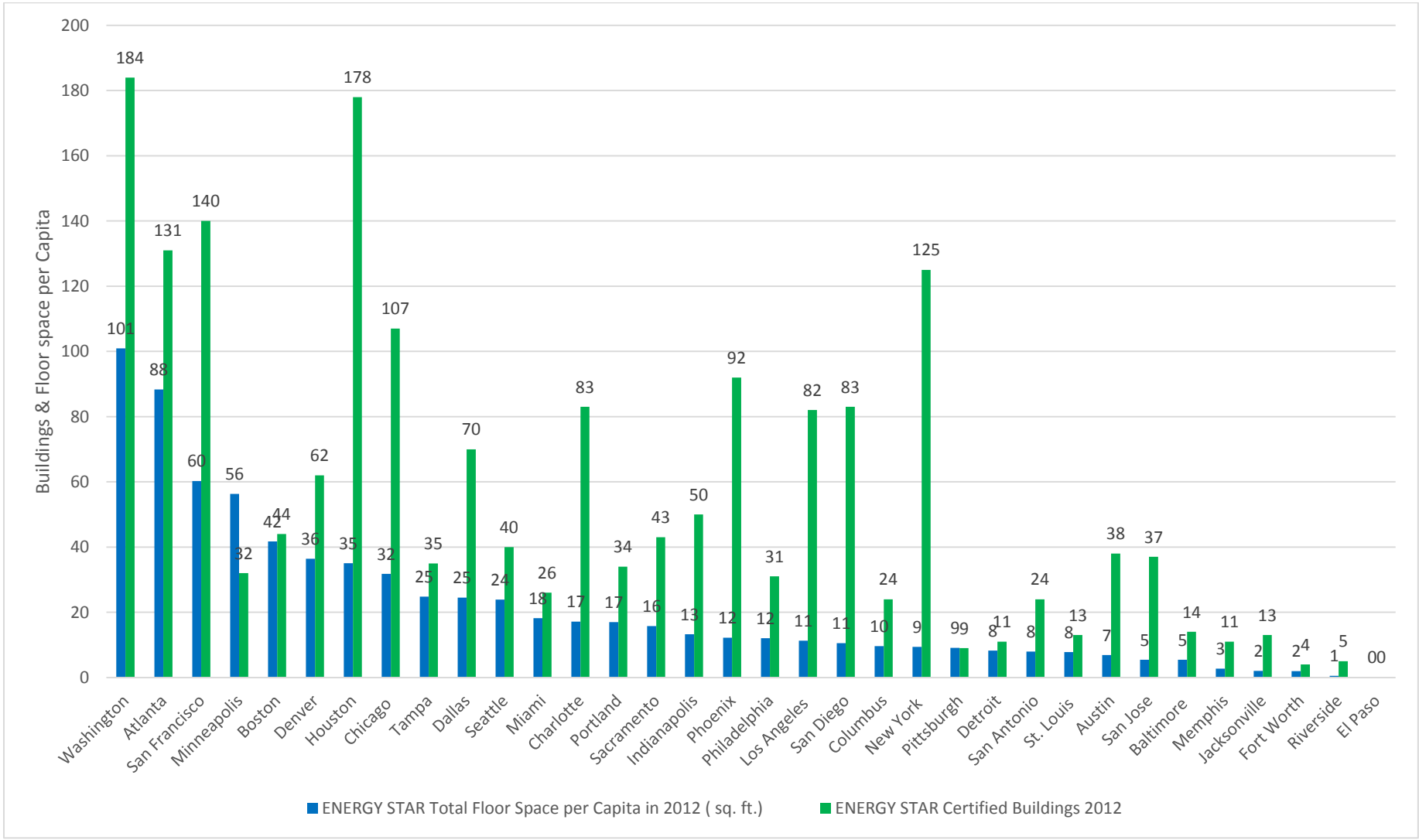
The number of commercial buildings within a city having exceptional energy performance can be expanded by a city's requiring or providing incentives for owners to certify their buildings with ENERGY STAR, sponsoring ENERGY STAR performance programs, and providing building owners with access to whole-building energy usage information to increase. Figure 24 shows the number of buildings per city certified by ENERGY STAR as of 2012 as well as the square footage of buildings certified per capita according to ENERGY STAR's database of certified facilities (EPA 2012a). Washington, D.C., with a significant commercial office buildings stock and which recently implemented a new energy benchmarking ordinance, led all cities in 2012 with the largest number of certified buildings and the highest amount of certified floor space per capita. Washington received the fifth highest score for its building sector policies in the *Scorecard*. Interestingly, Austin, with the third highest score for the buildings sector, had among the lowest ENERGY STAR–-certified-building square footage per capita. This is likely a reflection of the long-standing Austin Energy Green Building Rating System, which offers an alternative certification indicating high energy efficiency that is promoted by the city and it's municipally owned utility, Austin Energy. El Paso, the only city without an ENERGY STAR–-certified building, also tied for the lowest score for its buildings policies in the *Scorecard* overall. Jacksonville, Fort Worth, and Memphis also scored at the bottom of the cities for buildings polices and have a similarly small quantity of ENERGY STAR-certified building space.

Figure 23: Commercial & Industrial Building Energy Consumption by City and Year



Notes: Includes all energy consumption classified as commercial and/or industrial in each city's greenhouse gas inventory. Many cities do not report commercial and industrial energy consumption separately so they are presented as one sector here. Population data used for per-capita calculation are from the corresponding year in the United States Census Population Estimates, accessed through American FactFinder2.

Figure 24: ENERGY STAR– Certified Buildings & Floor Space Per Capita by City in 2012



Source: Square footage and number of buildings are the total for the 2012 certification year (EPA 2012a), Population is city population from the 2011 American Community Survey, One-Year Estimates.

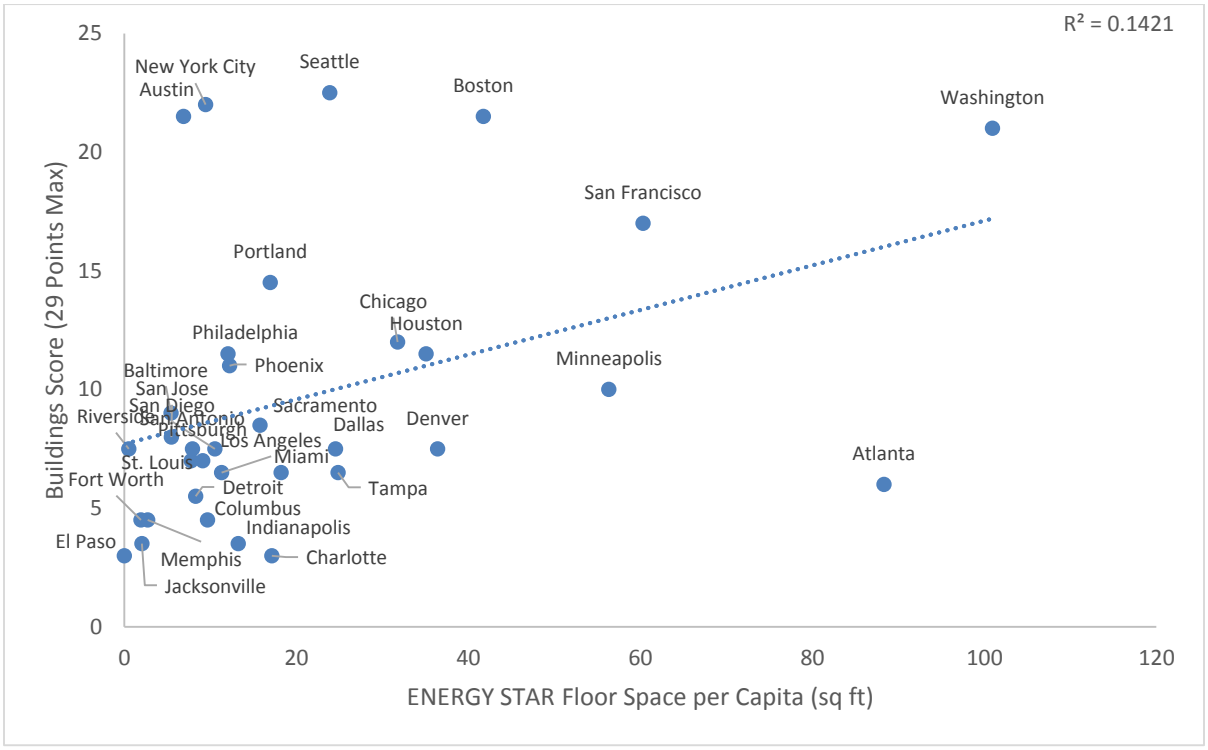
RELATIONSHIP BETWEEN SCORECARD RESULTS AND BUILDING PERFORMANCE

A regression analysis showed a statistically significant relationship between the overall *Scorecard* results for the buildings policy area and the quantity of ENERGY STAR-certified floor space per capita. A closer look at the policy metrics evaluated in the *Scorecard* related to building energy performance shows that of these policies, commercial building benchmarking had the strongest relationship with amount of certified floor space. This could be because benchmarking policies, which often utilize ENERGY STAR Portfolio Manager benchmarking software, are driving certifications. Also, in cities where large numbers of building owners have already certified their buildings voluntarily, it may be easier to establish mandatory benchmarking policies. For example, in Washington, D.C., the benchmarking ordinance went into effect in 2013, but in 2012 the city already had the highest amount of certified floor space per capita. Table 55 shows the strength of the relationship (r-squared) between each of the relevant policy metrics and the amount of ENERGY STAR floor space per capita. Figure 25 compares floor space per capita with the overall score for buildings policies.

Table 55: Regression Results, ENERGY STAR Floor Space Per Capita and Scorecard Results

City Scorecard Metric	Relationship	R Square	P-value
Overall buildings score	+	0.14	0.027
Green building requirements & incentives	+	0.13	0.031
Commercial Benchmarking	+	0.20	0.009

Figure 25: ENERGY STAR Floor Space Per Capita and *Scorecard* Results



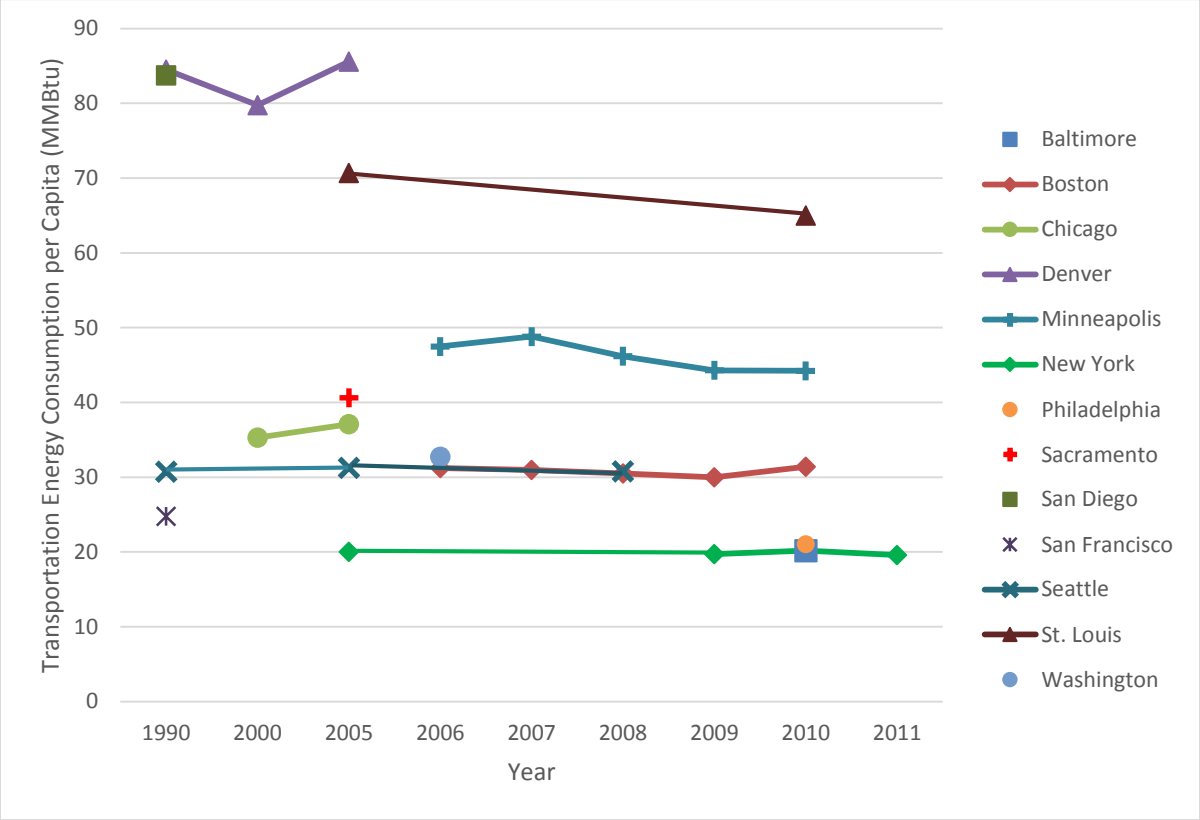
Transportation

In this section we present data on transportation-related energy consumption, vehicle miles traveled, and the use of alternative transportation modes for commuting and freight.

TRANSPORTATION ENERGY CONSUMPTION

The amount of energy used for transportation varies widely, as shown in Figure 26, with Denver and San Diego consuming more than four times as much energy per capita than the cities with the lowest consumption: New York, Philadelphia, and Baltimore. Both Philadelphia and Baltimore scored highly for their transportation sector policies, ranked fifth and 11th, respectively. Boston, which received the second highest transportation policy score in the *Scorecard*, also had among the lowest consumption. Denver also scored in the top ten for transportation policies, perhaps due to the fact that transportation is such a large source of energy consumption.

Figure 26: Transportation Energy Consumption per Capita (MMBtu)



Notes: Energy consumption includes both vehicle (on-road) and transit (off-road) transportation. Air travel and marine transport are not included. Data are from the greenhouse gas inventories of individual cities.

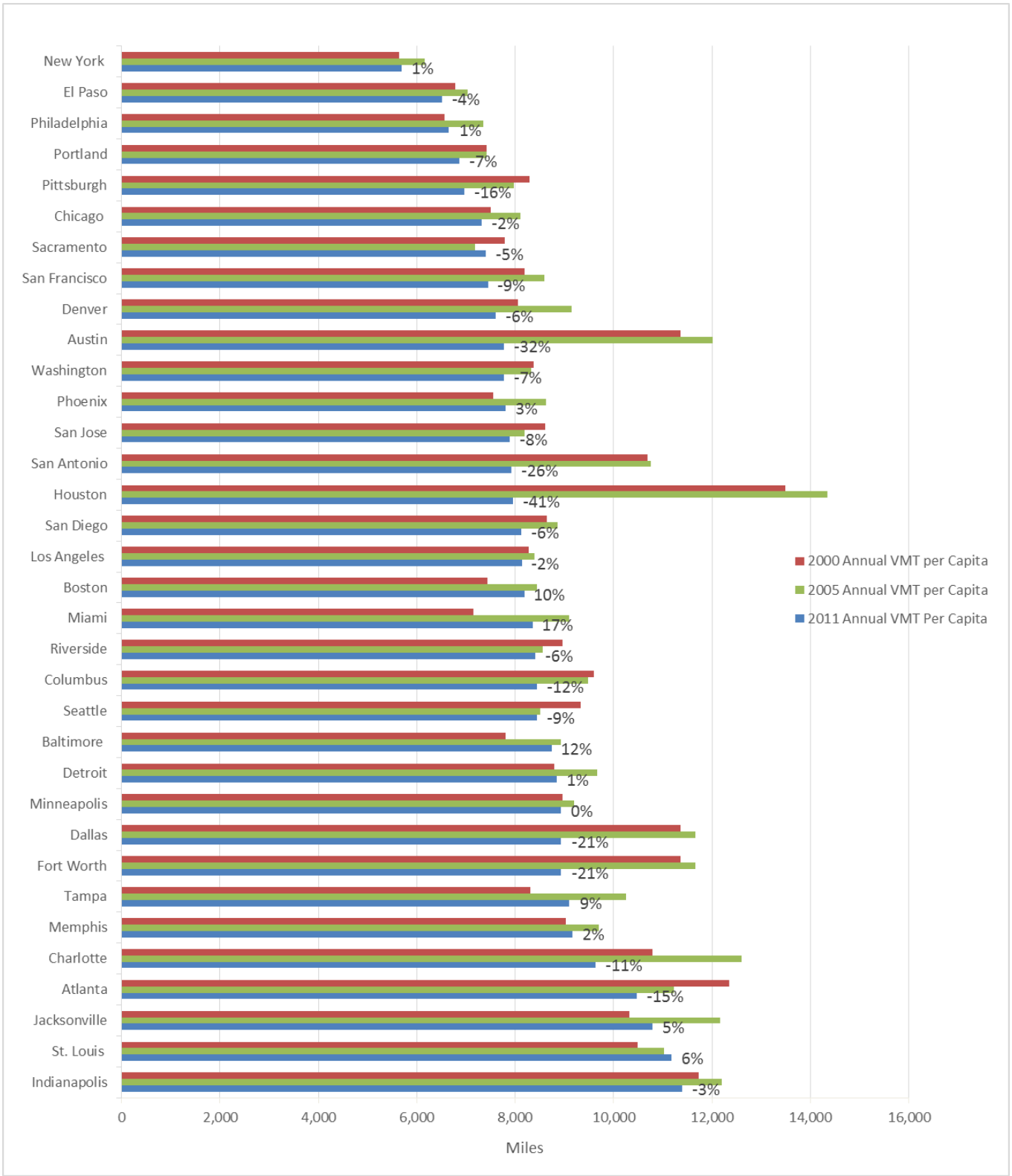
VEHICLE MILES TRAVELED (VMT)

The distance traveled by vehicles per capita over a city's roads is one of the best indicators of inefficient travel patterns and the inadequacy of alternative modes of transportation such as walking, biking, and public transit. The U.S. Department of Transportation's Office of Highway Policy Information annually publishes data reported to the Federal Highway Administration on vehicle miles traveled on roads within urbanized areas including

highways, and arterial, collector, and local roads. We calculated the average daily vehicle miles traveled in the urbanized areas[15] where each city is located for 2011, and calculated the VMT per capita using the population of each urbanized area as shown in Figure 27. Numbers shown have been annualized. VMT per capita seems to have less of a correlation with the *Scorecard* results for transportation policies than does the share of commuters who use alternative transportation (shown in Figure 28).

[15] Urbanized Areas are defined by the U.S. Census Bureau as a continuously built-up area with a population of 50,000 or more. Urbanized areas are used by the U.S. Department of Transportation to allocate federal aid for highway and transit projects.

Figure 27: 2011 Annual VMT Per Capita (miles)

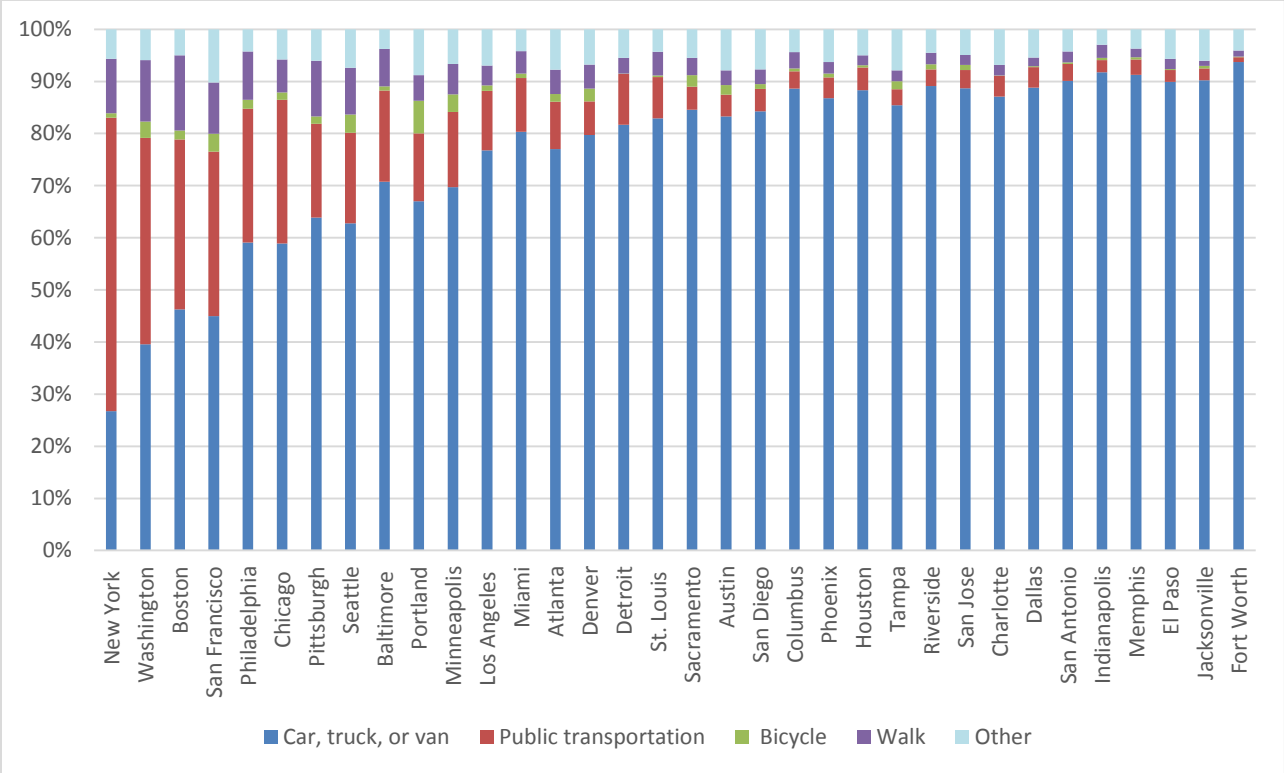


Notes: Percentage shown is the rate of change in annual VMT per capita from 2000 to 2011. Source: DOT 2013a (Table HM-71)

COMMUTE MODE

To determine the share of commuters driving or using alternative modes of transportation (bicycle, walking, or public transit) in each city we used data from the 2011 American Community Survey One-Year Estimates (Figure 28 and Table 56). "Other" modes of commute included motorcycles and taxis, and people who work from home. New York has by far the largest share of commuters, nearly 70%, using alternative modes of transportation. Boston, Philadelphia, Washington, and San Francisco received some of the highest scores in the *Scorecard* for their transportation policies and are all among the top cities in this performance metric. Jacksonville and Forth Worth had the lowest and third lowest transportation policy scores, respectively, as well as the lowest share of alternative mode commuters, 3.7% and 2.2%, respectively.

Figure 28: Share of Commuters by Mode of Transportation



Source: 2011 American Community Survey, One Year Estimates

Table 56: Total Share of Commuters Traveling by Alternative Modes

City	Alternative Mode Share (Transit, Bicycle, Walking)	City	Alternative Mode Share (Transit, Bicycle, Walking)
New York	67.6%	Sacramento	10.0%
Washington	54.5%	Austin	8.8%
Boston	48.7%	San Diego	8.0%
San Francisco	44.9%	Columbus	7.0%
Philadelphia	36.6%	Phoenix	6.9%
Chicago	35.3%	Houston	6.7%
Pittsburgh	30.1%	Tampa	6.7%
Seattle	29.8%	Riverside	6.4%
Baltimore	25.5%	San Jose	6.4%
Portland	24.2%	Charlotte	6.1%
Minneapolis	23.7%	Dallas	5.8%
Los Angeles	16.3%	San Antonio	5.7%
Miami	15.5%	Indianapolis	5.3%
Atlanta	15.3%	Memphis	5.0%
Denver	13.6%	El Paso	4.4%
Detroit	12.8%	Jacksonville	3.7%
St. Louis	12.8%	Fort Worth	2.2%

Source: 2011 American Community Survey, One Year Estimates

TRANSIT RIDERSHIP

Cities can encourage transit ridership in a number of ways, including through adjusting fare policies, coordinating services across modes, providing educational and route-finding resources, and, of course, through investments in expanding the transit system. Table 57 shows the number of transit trips taken annually per person in the urbanized areas that include each city. The table also shows the change from 2002 to 2011 and from 2010 to 2011. Not surprisingly, cities with robust rail transit systems, including New York, San Francisco, Washington, Boston, and Chicago, had the highest number of trips per capita. The cities were roughly split between those that saw an increase in transit ridership over the last decade (18 cities) and those where transit ridership fell (16 cities). Transit ridership may fall because of cuts in service, or because, as is likely the case in fast growing cities, transit access and use is not keeping pace with population growth. The four cities with the largest growth in transit trips per capita from 2002 to 2011 are in the Southeast and Southwest: Tampa, El Paso, Jacksonville and Phoenix.

Table 57: Transit Trips by Urbanized Area 2002-2011

City	2002 Transit Trips Per Capita	2007 Transit Trips Per Capita	2010 Transit Trips Per Capita	2011 Transit Trips Per Capita	Change 2002-2011	Change 2010-2011
Tampa	9	12	11	12	38%	6%
El Paso	16	19	19	20	26%	9%
Jacksonville	10	12	11	12	23%	10%
Phoenix	17	21	19	20	20%	4%
New York	190	227	223	224	18%	1%
Miami	26	34	28	30	15%	6%
Seattle	55	66	62	63	14%	2%
Minneapolis	31	37	34	36	13%	4%
San Diego	31	38	32	34	12%	7%
Charlotte	20	27	20	22	12%	9%
Boston	87	93	89	95	10%	7%
Philadelphia	61	66	65	66	8%	2%
Chicago	72	75	73	75	5%	3%
Los Angeles	52	59	54	55	4%	1%
Detroit	13	13	14	13	3%	-2%
Washington	104	120	103	106	2%	2%
Portland	61	66	60	61	1%	2%
Denver	41	48	41	41	1%	1%
Baltimore	54	54	55	54	-1%	-3%
Columbus	14	13	13	14	-4%	10%
St. Louis	23	28	20	22	-6%	8%
San Antonio	29	32	25	26	-9%	7%
San Francisco	144	143	127	130	-10%	3%
Indianapolis	7	7	6	6	-10%	9%
Pittsburgh	42	40	39	38	-11%	-2%
Sacramento	21	26	19	18	-13%	-6%
Dallas	18	19	14	14	-20%	6%
Fort Worth	18	19	14	14	-20%	6%
Riverside	16	15	12	13	-21%	7%
San Jose	33	29	25	26	-22%	3%
Memphis	13	12	11	9	-24%	-11%
Atlanta	44	45	34	32	-26%	-5%
Houston	25	27	16	17	-33%	1%
Austin	60	39	25	25	-59%	0%

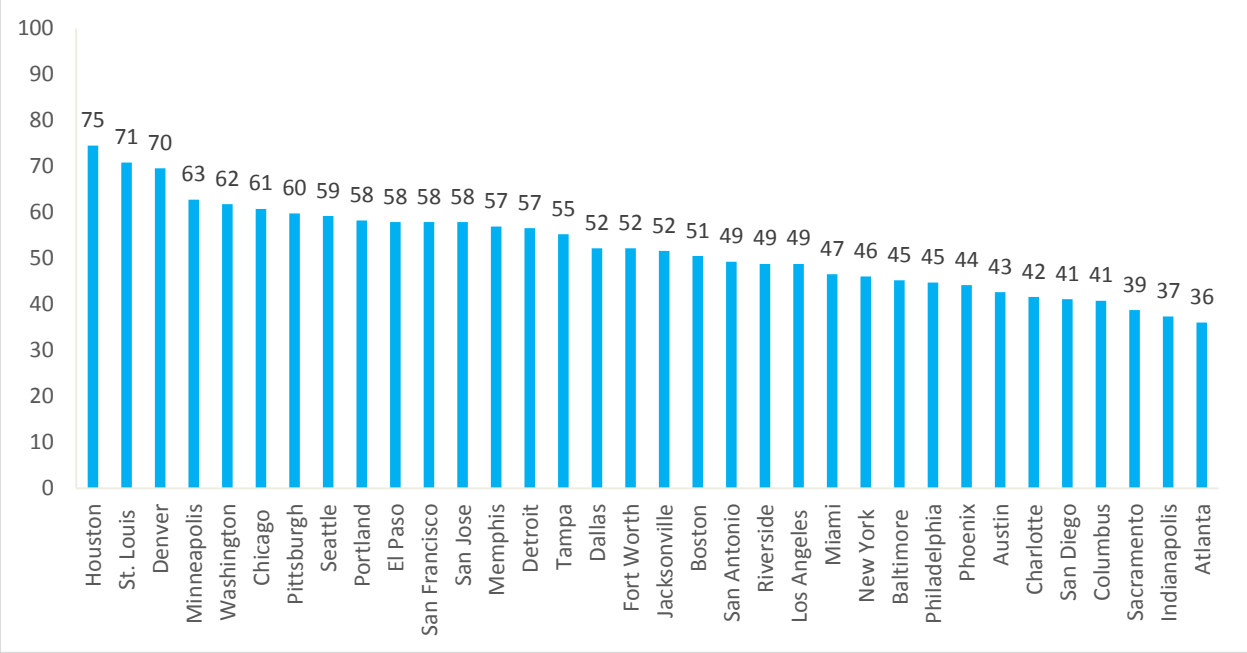
Source: DOT 2013b

FREIGHT TRANSPORTATION

Shipping freight via rail and water is less energy intensive than air and truck. The share of freight traffic transported using alternative modes (all except air and truck) or multiple modes is an indicator of the efficiency of the freight network within the region. We collected data on the total alternative freight traffic (regional exports and imports, in ton-miles) using all modes except air and truck from the Freight Analysis Framework Data Tabulation Tool from the Center for Transportation Analysis at the Oak Ridge National Laboratory. Data shown in Figure 29 are for 2011 and include the larger metropolitan statistical area or combined statistical area in which the city is located. The two cities with the highest alternative mode share, Houston and St. Louis, had a large share of freight transported via pipeline and rail, respectively. St. Louis, with 22 intermodal rail and port facilities, also tied

with Washington, Atlanta, and Baltimore with the highest intermodal freight score in the *Scorecard*.

Figure 29: Metro Area Percentage of Total Freight Imports and Exports Not Transported Exclusively via Truck or Air



Notes: Includes multi-modal transport. Data shown are for the metropolitan statistical area in which the city is located. Source: Center for Transportation Analysis 2013 (2011 Preliminary Data)

RELATIONSHIP BETWEEN SCORECARD RESULTS AND TRANSPORTATION PERFORMANCE

The results of the regression analysis of the relationship between the *Scorecard* results for transportation policies and the related performance metrics are shown in Tables 58 and 59. Overall, the share of commuters using various modes was most highly correlated with the *Scorecard* results, both the overall transportation score and the scores for the categories location efficiency, transit, and mode shift policies. Figure 30 shows the distribution of transportation scores and the share of commuters walking, the most strongly correlated performance metric. These correlations do not prove a causal relationship between the policies evaluated by the *Scorecard* and commute modes, as cities with large numbers of public transit, bicycle, and pedestrian commuters may be more open to policies to encourage location-efficient development and investments in transit and bicycle infrastructure. There was no statistically significant relationship between VMT, or the change in VMT, and the *Scorecard* results.

Table 58: Regression Results, Overall Transportation Score

Performance Metric	Relationship	R Square	P-Value
Commute Mode—% Walk	+	0.38	0.00
Commute Mode—% Car	-	0.36	0.00
Commute Mode—% Bicycle	+	0.36	0.00
Commute Mode—% Public Transportation	+	0.28	0.00

Figure 30: Transportation Score & Percentage of Commuters Walking

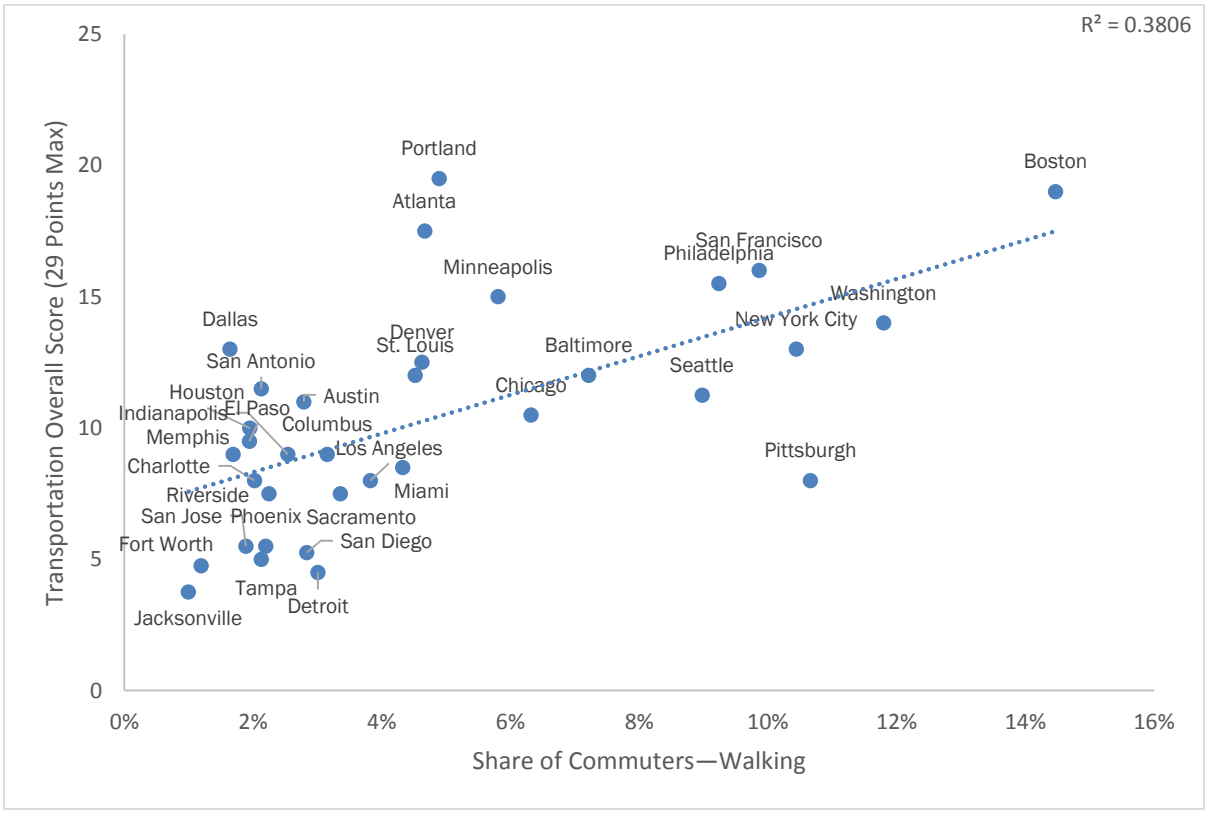


Table 59: Regression Results, Transportation Score Sub-Categories

City Scorecard Transportation Sub-Category	Performance Metric	Relationship	R Square	P-Value
Location Efficiency	Commute Mode—% Bicycle	+	0.318	0.001
	Commute Mode—% Car	-	0.119	0.045
Efficient Vehicles	*No statistically significant relationships*			
Transit	Commute Mode—% Walk	+	0.358	0.000
	Commute Mode—% Public Trans.	+	0.294	0.001
	Commute Mode—% Car	-	0.294	0.001
Mode Shift	Commute Mode—% Bicycle	+	0.489	0.000
	Commute Mode—% Car	-	0.286	0.001
	Commute Mode—% Walk	+	0.289	0.001
	Commute Mode—% Public Trans.	+	0.194	0.001
Freight	*No statistically significant relationships*			

Energy Efficiency Jobs

City-level energy efficiency policies and programs are being driven in part by the local economic benefits of efficiency. In particular, energy efficiency contributes to local economic development and job creation by supporting the direct creation of jobs in the installation and maintenance of energy efficiency measures, and indirectly through benefits of energy savings that accrue to consumers. We used data from the Brookings Institution's analysis of clean energy jobs to determine the jobs in the Energy and Resource Efficiency sector, as defined by the analysis, in each metropolitan area (Muro et al. 2011). Table 60 below shows jobs categorized as Energy and Resource Efficiency, which includes economic areas such as the production of energy saving products and materials, electric vehicles, green architecture and construction, transit, smart grid, and professional energy services. Nationwide, the number of Energy and Resource efficiency jobs grew an average of 3% per year from 2003 to 2010 and accounted for 0.6% of all U.S. jobs in 2010 (Muro et al. 2011, 48). San Francisco, tied for the third-highest-scoring city in the *Scorecard* overall, had the largest share of Energy and Resource Efficiency jobs in 2010, while San Diego and Phoenix saw the largest increase in the number of these jobs from 2007 to 2010.

Table 60: Energy and Resource Efficiency Jobs by Metropolitan Area

City	Energy & Resource Efficiency Jobs, 2010	Share of All Jobs, 2010	Change in Jobs, 2007-2010
San Francisco	24,443	1.3%	9%
Memphis	5,852	1.0%	8%
Minneapolis	15,965	0.9%	3%
Philadelphia	24,816	0.9%	4%
New York	73,158	0.9%	0%
Chicago	36,839	0.9%	5%
San Jose	7,119	0.8%	-11%
Atlanta	16,830	0.7%	7%
Boston	16,915	0.7%	5%
Pittsburgh	7,798	0.7%	4%
Seattle	11,169	0.7%	9%
Charlotte	5,207	0.6%	6%
Washington	18,243	0.6%	4%
Dallas	16,121	0.6%	3%
Fort Worth	16,121	0.6%	3%
Riverside	6,184	0.5%	-1%
San Antonio	4,665	0.5%	2%
Columbus	4,614	0.5%	4%
Houston	12,643	0.5%	5%
Sacramento	4,014	0.5%	6%
Indianapolis	4,152	0.5%	-10%
San Diego	6,273	0.5%	13%
Los Angeles	24,258	0.5%	5%
Baltimore	5,928	0.5%	4%
Denver	5,433	0.5%	7%
Austin	3,436	0.4%	5%
St. Louis	5,808	0.4%	-1%
Portland	1,133	0.4%	3%
Detroit	7,097	0.4%	3%
Jacksonville	2,349	0.4%	4%
Tampa	4,200	0.4%	2%
Phoenix	5,649	0.3%	12%
Miami	6,296	0.3%	3%
El Paso	546	0.2%	4%

Source: Muro et al. 2011. Notes. Jobs shown are those categorized as from the "Energy and Resource Efficiency" sector. Population used for jobs per 100 residents calculation is metropolitan statistical area population from the 2011 American Community Survey.

CONCLUSION

As with the policies scored in the *City Scorecard*, the measures of energy performance shown here vary widely from city to city. Some cities performed well across multiple categories, showing a high level of efficiency in their own operations, buildings throughout the community, and transportation options. As shown in Figure 20, however, the predominant energy-end use varies from city to city. While a correlation analysis between energy consumption and the policy information used in the *Scorecard* did not show any statistically significant relationships, there are a number of examples in which the leaders in policy tracked by the *Scorecard* were also among the highest performers. Equally important, there are examples of cities that scored well on policy but fell behind on performance. This may

be a sign that polices are too new, not aggressive enough, or improperly designed to have had an impact. However, this could also be a sign of strategic policymaking as cities are seeking to address the biggest opportunities for energy savings, rather than signs of failed policy.

Improved data collection and more standardized reporting, especially for city-level energy end uses, would enable a more robust analysis of the relationship between the strength of energy efficiency policies and energy performance. When conducting greenhouse gas inventories, cities should provide the underlying energy use data that was used to estimate emissions as well as break down energy demand into sectors in order to better inform policymaking.

Conclusions

Cities around the United States are demonstrating leadership on energy efficiency through a diversity of policy actions related to transportation, buildings, energy and water utilities, and local government operations, as well as policies that target the community as a whole. The benefits of these policies and practices range from economic development and environmental protection to reducing the costs of infrastructure and services.

But despite this significant level of local activity on efficiency, a wide gap exists between the cities at the top of the *Scorecard* rankings and those near the bottom; and even the highest-scoring cities did not come close to earning the total possible points overall. The highest-ranking cities have developed community-wide strategies to improve efficiency, but are still working to improve their implementation. Cities ranking lower are more likely to have focused primarily on energy efficiency in local government operations or are at an earlier stage in the development of community-wide strategies.

Energy efficiency is an abundant resource in every city. And for all cities there is significant room for expanding and improving their efficiency activities. This is true even for the best performing cities, as demonstrated by the top-scoring city, Boston, which achieved only a little more than three-quarters of the total possible points. For lower-scoring cities there are many areas to improve. The challenge going forward for many of these communities, especially for those with resource constraints, is prioritizing the efficiency activities that will achieve the greatest impact. While the recommendation for improving scores provided in Chapter 1 are high level guidelines, each city will need to develop or refine its own plan for advancing efficiency based on its local context and the community's priorities.

APPLICATION OF THE SCORECARD TO OTHER COMMUNITIES

The *City Scorecard* has examined and scored efficiency activities only in the largest U.S. cities, but the *Scorecard* and related tools provide value to all local governments. First, the policies described in the *Scorecard*, particularly those called out as best practices, can be adopted, perhaps with modifications, by local governments of all sizes.

Second, while we chose to focus the *Scorecard* on a specific subset of cities, the overall policy evaluation and scoring methodology can be applied to all communities and every kind of local government. In order to assist other communities in using our methodology to assess their policies, ACEEE is developing a *Local Energy Efficiency Self-Scoring Tool*, planned for release in late 2013. This spreadsheet-based tool will allow policymakers and other local stakeholders to evaluate the energy efficiency efforts of their own communities. It will enable users to generate scores comparable to those presented in the *Scorecard* and compare their community's performance to the energy efficiency efforts of similar communities. The *Self-Scoring Tool* will recommend policies and programs that local governments can consider in order to improve the energy efficiency in their community. Moreover, the tool will help communities prioritize actions that are likely to have the greatest impact. It is possible that at a future date the activities of a selection of smaller cities, counties, and other local governments, including those making use of the *Self-Scoring Tool*, may be featured in a subsequent ACEEE report.

ACEEE and other organizations cited throughout the *City Scorecard* are continuing to provide support to communities of all sizes in taking actions to improve efficiency. Over the coming years ACEEE will provide ongoing technical assistance to communities, based in part on the results of the *Scorecard* and communities' use of the *Self-Scoring Tool*. ACEEE will pursue additional research on best practices and provide assistance to communities in prioritizing, adopting, and implementing efficiency activities.

FURTHER RESEARCH

In future editions of the *City Energy Efficiency Scorecard* we will present information on the changes in policy activities and scores over time for individual cities and the sample group as a whole. Additional snapshots of activities in future years will build off of the baseline established in this first edition of the *Scorecard* to allow for the exploration of local policy trends over time. Subsequent editions of the *Scorecard* will refine some of our metrics and scoring to reflect new research and feedback we receive from cities making use of the *Scorecard*. Metrics likely to be refined in the next edition include building code compliance, location efficiency policies, and combined heat and power and district energy.

In addition to updated scores and rankings, future *City Scorecard*s will also present information on which cities are most improved and which are falling behind. We also hope to expand the comparison of policy scores and performance indicators in order to improve understanding of the relationships between policy actions and quantifiable trends in energy consumption.

Finally, we are investigating the possibility of sharing the large volume of information in the *City Scorecard* beyond this static format. This is likely to include some form of a local policy database, which would share detailed policy information on each city in the *Scorecard*—and perhaps on smaller communities using the *Self-Scoring Tool*—in an interactive web-based platform.

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Appendix A: Additional Tables Related to the Methodology and Results

Table A-1. Detailed Scoring by Policy Areas and Their Subcategories: Overall *City Scorecard* Point Allocation

Policy Area and Subcategories	Maximum Score	Percentage of Total Points
Local Government Operations	15	15%
Local Government Energy Efficiency Goals	2	2%
Energy Strategy Implementation	4	4%
On track to meet targets	*1*	
Dedicated funding or integrated into capital planning	*0.5*	
Public outreach	*0.5*	
Annual public reporting	*0.5*	
Third-party evaluation, measurement, and verification (EM&V)	*0.5*	
Dedicated staff	*0.5*	
Departmental/staff incentives	*0.5*	
Procurement and Construction Policies	4	4%
Fuel efficiency requirement	*1*	
Right-sizing and anti-idling policies	*0.5*	
Electric vehicle charging stations	*0.5*	
Outdoor lighting standards	*0.75*	
Scheduled lighting	*0.25*	
Above-code requirements for public buildings	*0.5*	
Energy-efficient procurement policy	*0.5*	
Asset Management	5	5%
Building benchmarking	*1*	
Comprehensive retrofit strategy	*1*	
Fix-it-first or lifecycle cost policy	*1*	
Allocation to maintenance in capital budget	*1*	
Availability of teleworking or flex schedules for employees	*0.5*	
Transit benefits for employees	*0.5*	
Community-Wide Initiatives	10	10%
Community-Wide Energy Efficiency Targets	2	2%
Performance Management	3	3%
On track to meet targets	*1*	
Annual reporting	*0.5*	
Third-party evaluation, measurement & verification (EM&V)	*0.5*	
Dedicated staff	*0.5*	
Dedicated funding	*0.5*	
Efficient Distributed Energy Systems	3	3%
Combined heat and power (CHP)	*2*	
District energy	*1*	

Urban Heat Island Mitigation Strategy	2	2%
Buildings Policies	29	29%
Building Energy Code Stringency	6	6%
Commercial	*3*	
Residential	*3*	
Building Energy Code Implementation	6	6%
Spending on code compliance	*2*	
Third-party code compliance strategies	*2*	
Upfront code support	*2*	
Requirements and Incentives for Efficient Buildings	9	9%
Above code requirements for certain private buildings	*2*	
Energy audit requirements	*1*	
Energy retrofit requirements	*2*	
Incentives or financing programs	*3*	
Building energy savings goals	*1*	
Benchmarking, Rating, and Disclosure	6	6%
Commercial	*3*	
Residential	*3*	
Comprehensive Efficiency Services	2	2%
Energy and Water Utility Policies and Public Benefits Programs	18	18%
Spending on Electricity Efficiency Programs	4	4%
Spending on Natural Gas Efficiency Programs	3	3%
Savings from Electricity Efficiency Programs	2	2%
Energy Efficiency Savings Targets and Funding Agreements	2	2%
Provision of Energy Data by Utility	2	2%
Availability of energy consumption data to customers	*0.5*	
Availability of aggregated building data to owners	*0.5*	
Availability of community-wide data for planning	*0.5*	
Advocacy to improve customer access to utility energy data	*0.5*	
Efficiency Efforts in Water Services	5	5%
Water efficiency	*2*	
Energy efficiency in water services	*2*	
Green stormwater infrastructure	*1*	
Transportation Policies	28	28%
Location Efficiency	8	8%
Location-efficient zoning	*2*	
Removal or reduction of minimum parking requirements	*2*	
Complete streets policy	*2*	
Location efficiency incentives and information	*2*	
Mode Shift	8	8%
Integration of transportation and land use planning	*4*	

Car sharing	*1*	
Bicycle sharing	*1*	
Transportation demand management programs	*2*	
Transit	6	6%
Transportation funding	*4*	
Access to transit services	*2*	
Efficient Vehicles and Driver Behavior	3	3%
Incentives for energy-efficiency vehicle purchase	*1*	
Incentives for electric vehicle charging infrastructure	*0.5*	
Efficient driver behavior	*0.5*	
Transportation partnerships	*1*	
Freight—Intermodal Freight Facilities	3	3%
Maximum Total Score	**100**	**100%**

Table A-2. Cities' Energy-Related Plans, Public Progress Reports, and Data Request Respondents

City	State	Energy or Climate Plan	Most Recent Public Progress Report	General Plan[1]	Data Request Respondent and Personal Communication Source
Atlanta	GA	Office of Sustainability Targets (2008)	--	--	Ruthie Norton, Senior Project Manager, Mayor's Office of Sustainability
Austin	TX	Climate Resolution (2007)	Climate Action Report (2012)	--	Zach Baumer, Climate Program Manager, Office of Sustainability
Baltimore	MD	Baltimore Sustainability Plan (2009)	2012 Annual Sustainability Report	--	Alice Kennedy, Sustainability Coordinator, Office of Sustainability
Boston	MA	Sparking Boston's Climate Revolution (2010)	A Climate of Progress (2011)	--	Jacob Glickel, Chief of Staff, Environmental and Energy Services
Charlotte	NC	Charlotte's Energy Future (2010)	--	--	Robert Phocas, Energy and Sustainability Manager
Chicago	IL	Sustainable Chicago 2015 (2012)	Chicago Climate Action Plan Progress Report (2010)	--	Aaron Joseph, Deputy Sustainability Officer, Office of the Mayor
Columbus	OH	Green Memo II (2010)	Get Green: A Year in Review 2012	--	Erin Miller, Environmental Steward, Mayor's Office
Dallas	TX	--	Green Dallas Fact Sheet (2011); 2012 Annual Progress Report	Forward Dallas!	Kevin Lefebvre, Senior Environmental Coordinator, Office of Environmental Quality
Denver	CO	GreenPrint Denver (2007); 2020 Sustainability Goals (2013)	GreenPrint Denver Progress Report (2012)	--	Cindy Bosco, Environmental Analyst II and Urban Fellow, Sustainability Office

Detroit	MI	--	--	--	--
El Paso	TX	Livable City Sustainability Plan (2009)	2012 Sustainability Report Card	--	Lauren Baldwin, Sustainability Program Specialist, City of El Paso
Fort Worth	TX	--	--	--	Sam Steele, Administrator of Sustainability Programs, Facilities Management Group
Houston	TX	Emissions Reduction Plan (2008)	Emissions Reduction Plan Updated (2009)	--	Lisa Lin, Sustainability Manager, Office of the Mayor
Indianapolis	IN	--	2012 Sustainability Report	--	Kristen Trovillion, Project Manager, Office of Sustainability
Jacksonville	FL	--	--	--	--
Los Angeles	CA	GreenLA Climate Action Plan (2007)	--	--	--
Memphis	TN	Sustainable Shelby Implementation Plan (2008)	--	--	Paul Young, Memphis and Shelby County Office of Sustainability
Miami	FL	MiPlan Climate Action Plan (2008)	--	--	Glen Hadwen, Environmental Programs Manager, Office of Sustainable Initiatives
Minneapolis	MN	Climate Action Plan (2013); Sustainability Indicators (2012)	2012 Greenprint Indicators	Minneapolis Plan for Sustainable Growth	Brendon Slotterback, Sustainability Program Coordinator
New York City	NY	PlaNYC Energy Chapter (2011)	PlaNYC 2012 Progress Report	PlaNYC	John H. Lee, Deputy Director for Green Buildings and Energy Efficiency, Mayor's Office of Long-Term Planning and Sustainability
Philadelphia	PA	Greenworks Plan (2009)	Greenworks 2012 Progress Report	Philadelphia 2035	Alex Dews, Policy and Program Manager, Mayor's Office of Sustainability
Phoenix	AZ	Living Like it Matters! (2008)	--	--	Laura Burton, Administrative Assistant II, Public Works Department
Pittsburgh	PA	Pittsburgh Climate Action Plan V2.0 (2011)	--	--	James Sloss, Assistant Director, Office of Sustainability and Energy Efficiency
Portland	OR	Portland Climate Action Plan (2009)	Climate Action Plan Progress Report 2012	Comprehensive Plan	Michael Armstrong, Senior Sustainability Manager, Bureau of Planning and Sustainability
Riverside	CA	Green Riverside Green Action Plan (2012)	--	--	Ryan Bullard, Sustainability Officer, Riverside Public Utilities

Sacramento	CA	Climate Action Plan (2012)	--	2030 General Plan	--
San Antonio	TX	Mission Verde Sustainability Plan (2009)	--	SA2020	Liza Meyer, Office of Sustainability
San Diego	CA	Climate Mitigation and Action Plan (2012)	--	--	Linda Giannelli Pratt, Chief Program Manager, Energy, Sustainability and Environmental Protection Division
San Francisco	CA	Updated Electricity Resource Plan (2011); Strategies to Address Greenhouse Gas Emissions (2010); Climate Action Plan (2004)	Annual Report (2012)	San Francisco General Plan	Cal Broomhead, Energy and Climate Programs Manager, Department of the Environment
San Jose	CA	Green Vision (undated)	Green Vision 2012 Annual Report	Envision San Jose 2040	--
Seattle	WA	Seattle Climate Action Plan (2013)	--	--	Michelle Caulfield, Environmental Sustainability Program Manager, Office of Sustainability and Environment
St. Louis	MO	St. Louis Sustainability Plan (2013); Sustainability Action Agenda (2013)	--	--	Catherine Werner, Sustainability Director, Mayor's Office
Tampa	FL	Energy Efficiency and Conservation Plan (2011)	Annual Sustainability Report (2012)	--	Thomas Snelling, Green Officer
Washington	DC	Sustainable DC (2013)	--	--	Taresa Lawrence, Associate Director, Department of the Environment, Energy Administration

Note: [1]Only general plans that include specific energy-savings targets are included in this table.

Table A-3. Contextual Variables for Cities

City	IECC[1] (2004) Climate Region	Census Division	Electric Utility Ownership	Gas Utility Ownership	Residential Building Code Authority	Commercial Building Code Authority	City Residential Population (2011)	ARRA EECBG Award[2]
Atlanta	3A	South Atlantic	Investor-owned	Investor-owned	State	State	432,425	$5,890,200
Austin	2A	West South Central	Municipal	Investor-owned	Local permit	Local permit	820,601	$7,492,700
Baltimore	4A	South Atlantic	Investor-owned	Investor-owned	Local permit	Local permit	619,493	$6,372,700

Boston	5A	New England	Investor-owned	Investor-owned	Local permit	Local permit	624,969	$6,506,200
Charlotte	3A	South Atlantic	Investor-owned	Investor-owned	State	State	751,074	$6,780,100
Chicago	5A	East North Central	Investor-owned	Investor-owned	State	Local permit	2,707,123	$27,648,800
Columbus	5A	East North Central	Investor-owned	Investor-owned	State	State	796,014	$7,403,500
Dallas	3A	West South Central	Investor-owned	Investor-owned	Local permit	Local permit	1,223,378	$12,787,300
Denver	5B	Mountain	Investor-owned	Investor-owned	Local only	Local only	619,968	$6,079,500
Detroit	5A	East North Central	Investor-owned	Investor-owned	State	State	706,640	$8,862,400
El Paso	3B	West South Central	Investor-owned	Investor-owned	Local permit	Local permit	665,577	$5,802,700
Fort Worth	3A	West South Central	Investor-owned	Investor-owned	Local permit	Local permit	760,758	$6,738,300
Houston	2A	West South Central	Investor-owned	Investor-owned	Local permit	Local permit	2,145,933	$22,765,100
Indianapolis	5A	East North Central	Investor-owned	Investor-owned	State	State	824,232	$8,032,300
Jacksonville	2A	South Atlantic	Municipal	Investor-owned	State	State	827,909	$7,891,500
Los Angeles	3B	Pacific	Municipal	Investor-owned	Local permit	Local permit	3,819,708	$37,017,900
Memphis	3A	East South Central	Municipal	Municipal	Local permit	Local permit	652,078	$6,767,200
Miami	1A	South Atlantic	Investor-owned	Investor-owned	State	State	408,760	$4,742,300
Minneapolis	6A	West North Central	Investor-owned	Investor-owned	State	State	387,736	$3,909,800
New York City	4A	Middle Atlantic	Investor-owned	Investor-owned	Local permit	Local permit	8,244,910	$80,802,900
Philadelphia	4A	Middle Atlantic	Investor-owned	Investor-owned	State	State	1,536,471	$14,108,700
Phoenix	2B	Mountain	Investor-owned	Investor-owned	Local only	Local only	1,469,484	$15,233,500
Pittsburgh	5A	Middle Atlantic	Investor-owned	Investor-owned	State	State	307,498	$3,403,000
Portland	4C	Pacific	Investor-owned	Investor-owned	State	State	595,325	$5,626,100
Riverside	3B	Pacific	Municipal	Investor-owned	Local permit	Local permit	310,654	$2,850,600
Sacramento	3B	Pacific	Municipal	Investor-owned	Local permit	Local permit	472,169	$4,708,000

San Antonio	2A	West South Central	Municipal	Municipal	Local permit	Local permit	1,359,730	$12,897,000
San Diego	3B	Pacific	Investor-owned	Investor-owned	Local permit	Local permit	1,326,183	$12,541,700
San Francisco	3C	Pacific	Investor-owned	Investor-owned	Local permit	Local permit	812,826	$7,739,300
San Jose	3A	Pacific	Investor-owned	Investor-owned	Local permit	Local permit	967,478	$8,840,600
Seattle	4C	Pacific	Municipal	Investor-owned	State	Local permit	620,778	$6,142,300
St. Louis	4A	West North Central	Investor-owned	Investor-owned	Local only	Local only	318,069	$3,717,500
Tampa	2A	South Atlantic	Investor-owned	Investor-owned	State	State	346,064	$3,712,100
Washington	4A	South Atlantic	Investor-owned	Investor-owned	Local only	Local only	617,996	

Note: [1] International Energy Conservation Code. [2] Federal formula allocation to the city as an Energy Efficiency and Conservation Block Grant funded through the American Recovery and Reinvestment Act of 2009 (DOE 2010).

Appendix B: Detailed Policy Information on Local Government Operations

Table B-1. City Scoring on Energy-Related Targets for Local Government Operations

City	State	Local Government Operations Energy-Related Target	Score (2 pts.)
Austin	TX	Resolution No. 20070215-023 passed in 2007 calls for carbon-neutral city operations by 2020.	2
Baltimore	MD	The city government participates in the city-wide goal to reduce energy use by 15% by 2015. The goals in the city's Sustainability Plan were adopted in 2009 (City Council Ordinance 09-0272).	2
Boston	MA	Executive Order issued in 2007 calls for reduction in municipal greenhouse gas emissions by 7% by 2012 and 80% by 2050 compared to 1990. Boston has also been designated a Massachusetts Green Community and is required to develop a plan to reduce energy use by 20% by 2014.	2
Chicago	IL	A goal to improve overall energy efficiency of municipal buildings 10% by 2015 is included in the 2015 Sustainable Chicago Action Plan.	2
Columbus	OH	The city has set a goal to reduce greenhouse gas emissions by 2% each year until 2030, with a short-term goal to reduce emissions from city operations by 10% by 2015. Goals are outlined in the mayor's Green Memo and carried out as part of the Get Green Columbus Initiative.	2
Fort Worth	TX	City Council resolution 4130-09-2012 established a goal to reduce the city's electricity consumption by 5% each fiscal year for ten years beginning in 2011, in compliance with Texas state law SB 898. City council resolution 4089-05-2012 authorized Fort Worth to join the DOE Better Buildings Challenge as a Community Partner with the goal of improving energy intensity in city facilities by at least 20% by 2020.	2
Miami	FL	MiPlan, the city's Climate Action Plan published in 2008, set a goal to reduce the city government's greenhouse gas emissions to 25% below 2007 levels by 2015.	2
Minneapolis	MN	Greenprint, the city's sustainability program, includes the goal to reduce carbon dioxide emissions from municipal operations by 1.5% annually. Sustainability indicators were approved by the city council in January 2012.	2
New York City	NY	Executive Order 109 of 2007 established a goal to reduce municipal greenhouse gas emissions 30% by 2017 (30 x 17 Plan).	2
Philadelphia	PA	GreenWorks, the city's sustainability initiative, includes a target to lower the city government's energy consumption by 30% from 2008 levels by 2015.	2
Phoenix	AZ	In December 2008, the city council adopted Resolution 20759 to reduce greenhouse gas emissions from city operations to 5% below 2005 levels by 2015.	2
Portland	OR	The city's Climate Action Plan includes a goal to reduce carbon emissions from city and county operations 50% from 1990 levels by 2030. The Climate Action Plan is codified as binding city policy BCP-ENN-5.02.	2

City	State	Local Government Operations Energy-Related Target	Score (2 pts.)
Sacramento	CA	The 2007 Sustainability Master Plan established a target of reducing energy use in city operations to 25% below 2005 levels by 2030.	2
San Antonio	TX	The Mission Verde Plan includes a goal to retrofit all city facilities by 2015, resulting in 12% average facility energy savings. The plan was adopted by the city council in February 2010.	2
San Francisco	CA	Section 902 of city code establishes goals to reduce greenhouse gas emissions by 20% below 1990 levels by 2012, 25% by 2017, 40% by 2025, and 80% by 2050.	2
San Jose	CA	In 2007, the city council adopted San Jose's Green Vision, which calls for a 50% reduction in municipal energy usage from 2007 levels by 2022.	2
Seattle	WA	In 2011, City Council Resolution 31312 outlined a goal for a 30% reduction in emissions from 2008 levels from city operations (72,600 Metric Tons C02e) by 2020. The energy reduction goal is 20% by 2020.	2
Atlanta	GA	The city has not codified a target, but has identified the goal to reduce energy use for existing municipal operations by 15% by 2020, 40% by 2030, and 80% by 2050.	1
Dallas	TX	A new greenhouse gas reduction goal for city operations was set in 2012 at 35% below 2009 levels. The next inventory is planned for 2016 using data from 2015. The goal has not been codified.	1
Denver	CO	Denver's 2020 goals include a target to reduce energy consumed in city-operated buildings and vehicles by 20% compared to a 2012 baseline.	1
El Paso	TX	The city's Livable City Sustainability Plan includes a goal to reduce City of El Paso's total energy consumption by 30% by 2014. The city is currently in the process of updating its targets.	1
Pittsburgh	PA	The Pittsburgh Climate Action Plan v2.0 included a recommendation to improve energy efficiency in city-owned buildings by 20% over five years.	1
San Diego	CA	The city's previous goal was to reduce energy use to 10% below 2000 levels by 2012. The current draft of 2012 Climate Mitigation and Action Plan sets a goal to achieve energy savings of 20% by 2020 and 30% by 2035.	1
St. Louis	MO	In 2013, the city published its Sustainability Plan and Sustainability Action Agenda. Its city-wide goal, also applicable to municipal operations, is to reduce greenhouse gas emissions by 25% by 2020 and 80% by 2050 compared to current levels.	1
Tampa	FL	The city has developed an energy efficiency and conservation plan that sets a goal of reducing emissions to 1990 levels by 2025.	1
Houston	TX	The city has engaged a stakeholder group to develop a comprehensive climate action plan in 2013, with energy efficiency targets for city operations.	0.5
Charlotte	NC	The city of Charlotte includes general lead-by-example goals for energy efficiency in its strategic plan. Although Mecklenburg County has identified specific energy-savings targets, the city of Charlotte has	0

City	State	Local Government Operations Energy-Related Target	Score (2 pts.)
		not.	
Detroit	MI	No goal publicly available.	0
Indianapolis	IN	No goal publicly available.	0
Jacksonville	FL	No goal publicly available.	0
Los Angeles	CA	Los Angeles has no single target for government operations, although Executive Directive No. 10, issued in 2007, directs all city departments to create individual sustainability plans.	0
Memphis	TN	No goal publicly available.	0
Riverside	CA	No goal publicly available.	0
Washington	DC	A city-wide energy-reduction target exists, but there is no specific target for government operations.	0

Sources: Energy or climate plan or annual report as noted in Appendix A.

Table B-2. City Scoring on Progress Toward Goals

City	State	Measured Success and Capital Planning	Score (1.5 pts.)
Boston	MA	The city government has met the 2012 energy goal established by the mayor. The city of Boston's Budget Office requires that all utility rebates/incentives generated from municipal energy efficiency projects be delivered to a dedicated account used specifically for future energy efficiency projects. Funding from this account can be used to fund a portion or the entirety of an energy efficiency capital project.	1.5
Denver	CO	In 2012 the city reduced the energy intensity of government operations by 9.4% compared to a 2011 baseline. There is funding that supports these efforts in the areas of building audits and retro-commissioning, enhancements to facility team resources, and capital improvements via the capital improvement program and a dedicated energy efficiency and sustainability fund.	1.5
Portland	OR	According to the Two-Year Climate Action Plan Progress Report, the city is on track to meet its climate goals. Carbon reduction is integrated into many of Portland's plans, budgets, and capital spending plans.	1.5
Austin	TX	The city government's total energy consumption has declined somewhat. It has a plan to meet carbon goals to reduce carbon emissions through green power purchasing.	1
Baltimore	MD	The city government is on target to exceed its goal to reduce energy consumption 15% by 2015.	1
Chicago	IL	As of year-end 2012, the city was 37% of the way toward its goal of doubling the number of LEED buildings goal. City projects are likely to be the first investments of the Chicago Infrastructure Trust, the infrastructure bank formed by Mayor Emanuel to accelerate transformative infrastructure projects.	1
Dallas	TX	In 2006, the city signed the U.S. Mayors Climate Protection Agreement, a committing to reduce greenhouse gas emissions to 7% below 1990 levels by 2012. The city of Dallas has met this goal, largely due to the purchase of 40% of its energy from renewable sources. The latest inventory, completed in 2012, shows that total greenhouse gas emissions for city operations decreased by 39%.	1
El Paso	TX	In fiscal year 2011, city operations used 23% less energy than fiscal year 2008.	1
Houston	TX	Emissions from the city's municipal operations decreased 26% compared to the 2007 greenhouse gas emissions inventory. The city has committed to and invested in many programs that reduce cost, improve efficiencies, and decrease greenhouse gas emissions. Projects, such as the municipal energy efficiency retrofit program that upgraded 6 million square feet of the city's buildings, have helped the city to achieve and surpass the goals stated in its Multi-Pollutant Emissions Reduction Plan.	1
Minneapolis	MN	The city has met its energy efficiency targets each year since 2008.	1
New York City	NY	Over 97% of the 127 initiatives in PlaNYC were launched within one year of its release, and almost two-thirds of its 2009 milestones have been achieved or mostly achieved. The city has reduced greenhouse gas emissions to 16% below 2005 levels. The updated plan has 132 initiatives and 400 milestones targeted for the end of 2013.	1

City	State	Measured Success and Capital Planning	Score (1.5 pts.)
Philadelphia	PA	City operations have reduced their energy usage by 5%.	1
San Antonio	TX	In recent years the city has been achieving its target of a 5% reduction in energy consumption reduction in existing infrastructure.	1
San Francisco	CA	According to the greenhouse gas inventory of municipal operations in 2010, municipal emissions dropped to 6.9% below 2005 levels.	1
St. Louis	MO	A recent greenhouse gas inventory showed that the city was on track to meeting its sustainability and energy goals.	1
Washington	DC	The DC Sustainable Energy Utility was on track to meet energy efficiency targets based on city contract. Energy efficiency funding for municipal operations is incorporated into the DC Sustainable Energy Utility budget.	1
Columbus	OH	In 2012, the city implemented facility projects that are projected to save nearly 1099 MWh.	0.5
Fort Worth	TX	The city is on track to meeting its DOE Better Buildings target.	0.5
Phoenix	AZ	The city is on track to achieve sustainability and energy goals according to the most recent City of Phoenix Annual Sustainability Report.	0.5
Pittsburgh	PA	No data found.	0.5
Riverside	CA	No data found.	0.5
San Jose	CA	The city is making progress, but has not been reaching its goal of a 5% reduction in per-capita energy use per year. By 2010 the city had reduced per-capita energy consumption by about 4%.	0.5
Atlanta	GA	No data found.	0
Charlotte	NC	The city has measured and established a greenhouse gas baseline using 2006 data, and is in the process of setting goals.	0
Detroit	MI	No data found.	0
Indianapolis	IN	No data found.	0
Jacksonville	FL	No data found.	0
Los Angeles	CA	No data found.	0
Memphis	TN	No data found.	0
Miami	FL	No data found.	0
Sacramento	CA	No data found.	0
San Diego	CA	Due to funding limits, a full assessment of the 2012 goal to "reduce energy use by 10% relative to 2000 levels by 2012 cannot be verified.	0
Seattle	WA	Unknown at this time. The city has a tracking program under development.	0
Tampa	FL	No data found.	0

Sources: data request responses as noted in Appendix A or independent research.

Table B-3. City Performance Management

City	State	Performance Management: Reporting and Independent EM&V	Score (1.5 pt.)
Baltimore	MD	The city contracted AECOM to complete a greenhouse gas inventory. The city publishes an annual sustainability report, and the Department of General Services' annual report includes energy metrics. The city participates in many community-wide programs to publicize lead-by-example initiatives including Baltimore Neighborhood Energy Challenge, Baltimore Business Challenge, the City Employee Energy Challenge, and Community Energy Savers Grants.	1.5
Dallas	TX	The city has conducted and posted two greenhouse gas emissions inventory. The city uses a third party to compile the information. GreenDallas.net has links to information, internal efforts. The city joins with local groups for sustainability events.	1.5
Denver	CO	A progress report was released in September 2012 covering Greenprint Denver's first set of goals. A second report is planned for 2014. Denver's environmental management system is ISO 14001-certified by third party auditors, who have authority to monitor and verify progress toward annual goals and targets. Each of Denver's 2020 Goals has a government operations piece and a community piece. The Office of Sustainability hosted community meetings in each of the four quadrants of Denver to publicize its internal initiatives.	1.5
Philadelphia	PA	The mayor's Office of Sustainability has worked with ICF International for the past several years to support metrics tracking and data verification, particularly for greenhouse gas inventories. The city releases annual progress reports. The city government publicizes lead-by-example initiatives on its website.	1.5
Phoenix	AZ	The city reports progress in its Annual Sustainability Report. Arizona State University oversees the city's greenhouse gas inventories.	1.5
San Francisco	CA	Reporting is done annually, or as data become available. Departmental Climate Action Plans are published annually. Third-party greenhouse gas inventory verification was completed by ICF International in 2012. In 2011, the Department of Environment convened five community advisory panels to provide feedback on the city's climate action strategy.	1.5
Austin	TX	The city reports publicly to the Climate Registry and Carbon Disclosure Project. It publicizes internal action on its website, with updates to city council, and with marketing pieces. The city received two awards for its climate policies in 2012.	1.25
Portland	OR	For its own operations, the city participated in the first phase of the Chicago Climate Exchange, which served as a third-party review and involved extensive auditing of city records and protocols. Currently, the city produces its carbon emissions inventory internally, releasing reports and data to the public to enable independent review. The city releases annual Climate Action Plan Progress Reports.	1.25
Seattle	WA	The city does not use a third-party evaluator, but follows Climate Registry protocols in an annual greenhouse gas inventory. The city releases inventories publicly and annually updates its municipal operations' Climate Action Work Plan.	1.25
Washington	DC	The District employs an independent third party to conduct EM&V activities. The Sustainable DC Implementation Plan is in its initial stages, but will eventually track progress toward achieving stated goals. The District government has incorporated community outreach and lead-by-example opportunities into its sustainability plan. The plan includes a goal of ensuring transparency by exposing 100% of District residents to sustainability plan initiatives by 2032.	1.25
Atlanta	GA	The city asked Georgia Tech to establish a baseline for carbon dioxide emissions for city government. The city recently formed a Focus on Results team to monitor and	1

City	State	Performance Management: Reporting and Independent EM&V	Score (1.5 pt.)
		track the city's progress in a variety of arenas.	
Columbus	OH	The city releases annual progress reports for the Get Green Columbus initiative as well as annual reports marking progress on the Green Fleet Action Plan. Reports do not include quantitative accounting of progress toward energy goals. Columbus does not employ a third-party verifier to monitor targets. The city has established a website, www.getgreencolumbus.org, for use in communicating sustainability initiatives. In addition, the city has established the GreenSpot program to engage residents and businesses. The city leads by example by registering its own buildings as GreenSpots.	1
El Paso	TX	El Paso has released a report card each year since 2009 to track progress toward goals. Johnson Controls oversees reduction targets in more than 100 buildings. The city publicizes energy efficiency upgrades using social media.	1
Minneapolis	MN	Sustainability reports and greenhouse gas inventories are released annually, but are not verified by a third party. The city reports to the community through its performance evaluation system, Results Minneapolis. Its most recent meeting was in March 2013.	1
New York City	NY	Greenhouse gas inventories and progress reports are published at least annually. Community involvement and government leadership is specified in PlaNYC.	1
Sacramento	CA	The city reports on sustainability initiatives in its General Plan annual reports.	1
Memphis	TN	A stand-alone progress report has not been published; however, as strategies from the plan are completed they are published on the website. No third-party evaluators have been hired to monitor plan progress. The verification is handled by Office of Sustainability staff. The Sustainable Advisory Committee serves as an information conduit from neighborhoods and green organizations to the Office of Sustainability. It has met monthly since September 2011.	0.75
St. Louis	MO	The city was piloted the STAR community rating-system, and was required to track and monitor local government sustainability initiatives. No current reporting process is in place. The city holds annual Mayor's Sustainability Summits (involving community participation) and has a community outreach partnership with the local public media broadcasting station.	0.75
Boston	MA	The city of Boston releases any annual report on municipal and community greenhouse gas emissions on the Climate Action website. The city uses an energy reporting software into which utility data is input directly, but there is currently no third-party certification of greenhouse gas emission survey results.	0.5
Charlotte	NC	The city publicizes its efforts through its power2charlotte website and is in the process of updating the website to include a city energy-use dashboard. The city does not produce an environmental report.	0.5
Chicago	IL	The city's development partner, the Public Building Commission, releases regular reports on environmental and energy efficiency performance. Sustainable Chicago 2015 will do regular updates as well. The city's main conduit for communicating progress on Retrofit Chicago is through the city's portal for energy efficiency in buildings, retrofit.cityofchicago.org	0.5
Fort Worth	TX	The city reports to the state, but does not publish reports itself.	0.5
Indianapolis	IN	The city releases an annual sustainability report to the public each April. The report details energy savings and highlights energy efficiency projects.	0.5
Pittsburgh	PA	Two climate action plans have been published but annual reporting does not appear to be available. The city has a goal to foster student involvement in government initiatives.	0.5

City	State	Performance Management: Reporting and Independent EM&V	Score (1.5 pt.)
San Diego	CA	The draft 2012 Climate Mitigation and Action Plan has not yet been adopted, but following its adoption, reporting on progress toward goals will resume. Due to funding shortfalls, no reporting was done based on the 2009 City of San Diego Energy Strategy. City staff provide educational and community outreach presentations ongoing at schools and community events.	0.5
San Jose	CA	Public Green Vision reports are released annually and published on the Green Vision website. Reports include benchmarking statistics showing progress toward goals. The 2011 work plan included an integrated Green Vision educational outreach program, but it was not accomplished due to lack of resources.	0.5
Tampa	FL	The city releases sustainability reports annually.	0.5
Houston	TX	The city reports to the Carbon Disclosure Project annually. Schneider Electric monitors and verifies energy reduction in buildings that have undergone retrofits.	0.25
Detroit	MI	No data found.	0
Jacksonville	FL	No data found.	0
Los Angeles	CA	The most recent greenhouse gas inventory reported to the California Climate Action Registry was in 2007. The last status report was issued in 2008.	0
Miami	FL	No data found.	0
Riverside	CA	The city reports progress to the Green Accountability Performance Committee, but does not release formal reports.	0
San Antonio	TX	A city resolution calls for the Office of Environmental Policy to report to the Council annually regarding the progress of city departments and the community toward sustainability and the goals of Mission Verde. These reports do not appear to be available publicly.	0

Sources: Data request responses as noted in Appendix A or independent research.

Table B-4. Staffing and Departmental Incentives

City	State	Allocation of Staff and Departmental Incentives for Energy Efficiency	Score (1 pt.)
Atlanta	GA	The Office of Sustainability has six full-time employees focused on instituting environmental protection practices into the city government.	1
Austin	TX	The Office of Sustainability has nine full-time staff, which include the Chief Sustainability Officer and the Climate Program Manager. Austin also requires that all departments develop and implement climate action plans. All departments have performance measures related to their departmental carbon footprint.	1
Boston	MA	Since 2011, the city government has had two FTEs in the Environment Department who work with all departments and the budget office to implement energy efficiency projects. The Office of Budget Management allows departments to use utility incentive payments for additional departmental capital projects.	1
Charlotte	NC	The city has a full-time energy and sustainability manager who sits in the city manager's office. The city is in the process of developing an internal environmental operations plan, and a key component of this program will be employee engagement and behavioral change. It has already used several competitions and games to encourage energy-efficient behavior.	1

City	State	Allocation of Staff and Departmental Incentives for Energy Efficiency	Score (1 pt.)
Chicago	IL	The city has dedicated staff for energy management for city-owned facilities. Installing a chief sustainability officer to the Mayor's Office has established a clear management structure and emphasized sustainability and energy efficiency as a policy priority. Representatives from ten departments oversee the implementation of the sustainability plan.	1
Columbus	OH	The mayor has an Office of Environmental Stewardship that houses three FTEs. In addition, there are 22 assigned staff (Green Coordinators) that work on the implementation of the Get Green Columbus initiative within their departments and divisions. If employees save the city money through efficiencies, they are paid 10% or up to $7,000 of the documented savings.	1
Dallas	TX	There are currently 22 positions in the Office of Environmental Quality. The city uses an environmental management system (EMS) to set goals, and it trains employees to implement EMS procedures and goals in their respective workplaces.	1
Denver	CO	The city employs four full-time staff to implement energy-related goals. The city uses Peak Performance, a mayoral initiative encouraging employees to identify opportunities for improvements, to gain efficiencies. The city establishes agency performance metrics, strategic resource alignment, and opportunities for continuous improvement. Since energy efficiency goals are included in XO 123, Peak Performance, and the city's environmental management system annual targets, all agencies are expected to work toward energy savings.	1
Indianapolis	IN	The city has seven full-time staff dedicated to the implementation of all sustainability goals. While all staff contribute to the pursuit of greater energy efficiency, one full-time staff member is specifically dedicated to the implementation of energy efficiency and conservation projects and policies. The city utilizes an employee energy conservation policy to educate employees and encourage energy conservation.	1
Minneapolis	MN	The city has two full-time staff focused on energy efficiency in city facilities. Staff are provided incentives for energy efficiency through Results Minneapolis, which requires departments to set detailed energy efficiency goals.	1
Philadelphia	PA	The city employs one full-time energy conservation coordinator. The mayor's Energy Efficiency Fund, offers funding to departments on a competitive basis to support the implementation of energy efficiency projects within city-owned facilities.	1
Pittsburgh	PA	The city's energy goals are managed by the sustainability coordinator, in the Office of Sustainability and Energy Efficiency, and the energy and utilities manager.	1
Portland	OR	The city has one full-time position dedicated to implementing energy efficiency and renewable energy goals. Portland has a relatively decentralized form of government, and any city bureau that completes an efficiency project keeps 100% of the savings, reducing its operating costs. The city also levies an internal energy surcharge of 1% of bureau energy bills, which fund the dedicated City Energy Challenge position, a senior energy manager who works with individual bureaus to implement energy reductions projects and track results.	1
San Antonio	TX	The Office of Sustainability has seven FTEs. Individual department sustainability plans are required for the city to move toward a greater application of sustainability principles, reduced operating costs, and a smaller environmental footprint.	1

City	State	Allocation of Staff and Departmental Incentives for Energy Efficiency	Score (1 pt.)
San Diego	CA	The Energy Conservation and Management Division of Environmental Services Department has approximately ten FTEs. The city has award programs for staff in buildings or departments with significant reductions in energy consumption. However, due to recent budget shortfalls, incentives such as time off with pay have been reduced or eliminated until the economy improves.	1
San Francisco	CA	Approximately five FTEs are focused on municipal facilities, and they leverage the time of staff across many agencies. In 2008, the Board of Supervisors approved an ordinance requiring each department to track its carbon footprint in order to produce the annual Climate Action Plan. Annual Green and Blue Awards celebrate outstanding accomplishments and leadership in the field of sustainability by city staff and departments.	1
Baltimore	MD	The city employs a director, five full-time staff, three full-time contractual employees, and two interns, in addition to on-call consultants. From 2011 to 2012, the Energy Office piloted an Employee Energy Challenge with three city agencies in four buildings, but there are no permanent incentive structures in place.	0.5
El Paso	TX	The city employs an energy manager whose priority is to drive down energy use. There are three full-time staff dedicated to energy efficiency goals. The city has not yet developed an incentive structure for energy efficiency, but is planning to create a program to select a "Green Team member of the month" who would be awarded his or her own parking space.	0.5
Fort Worth	TX	The city's Facilities Management Group oversees energy efficiency initiatives. All departments are provided incentives to improve energy and water efficiency actions.	0.5
Houston	TX	The city has a C40 City Director who assists in energy efficiency goals, in addition to an energy section that houses four employees. Green teams have been formed in many departments to engage employees in those buildings on implementing behavioral change strategies designed to conserve energy. Houston plans to create building performance reports to encourage occupants to understand how their actions affect their buildings' energy performance.	0.5
Jacksonville	FL	Energy efficiency projects are led by staff in the Office of Sustainability Initiatives.	0.5
Los Angeles	CA	Energy efficiency projects are led by staff in the Environmental Affairs Department.	0.5
Memphis	TN	The Office of Sustainability works on energy and climate initiatives and has three full-time staff. The city plans to develop a Sustainability Scorecard Program for all departments, with incentives for highest score and most improved divisions.	0.5
Miami	FL	The Office of Sustainable Initiatives houses two full-time employees.	0.5
New York City	NY	The Department of City Administrative Services Energy Management tracks energy for all buildings.	0.5
Phoenix	AZ	Ten city staff are dedicated to sustainability initiatives including energy efficiency. The city has an employee suggestion program, but does not offer incentives for participation.	0.5
Riverside	CA	The city has a full team of individuals dedicated to energy management.	0.5
Sacramento	CA	Energy goals are overseen by the Climate Action Plan team.	0.5
San Jose	CA	Sustainability goals are overseen by dedicated project leads on the steering	0.5

City	State	Allocation of Staff and Departmental Incentives for Energy Efficiency	Score (1 pt.)
		committee for Green Vision.	
Seattle	WA	The city employs two FTE resource conservation managers (one city-wide resource conservation advisor and two part-time resource conservation managers in city departments). The city is in the process of developing a resource conservation management plan across all departments.	0.5
St. Louis	MO	The sustainability director in the Mayor's Office and the facilities commissioner in the Board of Public Service oversee energy initiatives. The facilities division tracks data through Portfolio Manager.	0.5
Tampa	FL	The city employs a "green officer" to oversee energy initiatives.	0.5
Washington	DC	The city has dedicated staff for energy management and implementation of energy efficiency goals.	0.5
Detroit	MI	No data found.	0

Sources: Data request responses as noted in Appendix A, or independent research.

Table B-5. Fuel Efficiency and Vehicle Infrastructure Policies

City	State	Fuel-Efficiency Requirements, Right-Sizing Policies, and Charging Station Availability	Score (2 pts.)
Charlotte	NC	The city has a fuel efficiency requirement and an anti-idling requirement, and is creating a motorpool for employees. The city has installed 29 electric-vehicle charging stations, 27 of which are publicly accessible.	2
Columbus	OH	The city has adopted its Green Fleet Action Plan and provides annual progress reports. The plan includes targets to reduce overall fuel use of the city fleet by 2% by 2014, reduce petroleum use by 5% by 2014, and purchase at least 50% "green" light-duty vehicles. It also integrates right-sizing of the fleet and promotion of the anti-idling policy. The city has installed two electric vehicle charging stations open to the public. In addition, more than 22 units have been installed by private operators and are available to the public. EO 2005-02 prohibits idling, calls for improved trip planning, and encourages carpooling.	2
El Paso	TX	The general services department adopted a policy to purchase hybrid or alternative-fuel vehicles whenever those options are available for a given class of vehicles. The city has a goal to decrease the baseline number of fleet vehicles on the road by 20% from 2008 levels by 2015. As a vehicle is phased out or repaired, general services reassesses the vehicle to make sure that it is the right size for the purpose. The general services department is managing the installation of electric-vehicle charging stations in a city-wide partnership with University of Texas—El Paso, El Paso Community College, Sun Metro, the city housing authority, and the El Paso International Airport.	2
Minneapolis	MN	Green Fleet Policy requires the city to make every effort to obtain the vehicles that are the most efficient and emit the lowest levels of pollutants possible as measured by available emissions certification standards and standards published by manufacturers. The policy includes fleet size reduction and vehicle right-sizing. The city has installed several public electric-vehicle charging stations.	2
New York City	NY	The city is implementing the Clean Fleet Transition Plan to ensure that vehicles are replaced with right-sized and efficient vehicles to further "green" the fleet. As part of this effort, the city introduced 70 additional electric vehicles to the fleet in 2011. The city has also installed 70 new electric-vehicle charging stations through a DOE grant to	2

City	State	Fuel-Efficiency Requirements, Right-Sizing Policies, and Charging Station Availability	Score (2 pts.)
		support the expansion of charging station infrastructure. The city has a one-minute idling policy for city vehicles, with the exception of emergency vehicles.	
San Francisco	CA	Through July 1, 2015, each city official with jurisdiction over passenger vehicles and light-duty trucks must remove at least 5% of vehicles from his or her fleet annually. Beginning on July 1, 2015, city officials must remove all vehicles aged 12 years and older from the fleet. All city fleet vehicle purchases must comply with the San Francisco Transit-First Policy, which requires low-emissions, high-efficiency purchases. The city is installing charging stations in many city-owned public garages; and 80 chargers are now available. As an incentive to encourage electric vehicle purchase, the use of the chargers will be free through 2013.	2
Seattle	WA	The city has a policy to purchase "clean and green." A qualifying vehicle must either be an alternative-fuel vehicle or be a hybrid-electric vehicle that has at least a 25% higher EPA combined fuel economy rating than a comparable gasoline-powered vehicle. The city has a right-sizing policy for its fleet. It has installed 46 Level 2 chargers for its own fleet, and 20 more for the public. An anti-idling language is included in city contracts. An education initiative is underway to educate employees on the importance of proper tire inflation.	2
Austin	TX	The city has a goal to make its fleet carbon-neutral by 2020 through the use of vehicles run on electricity and non-petroleum fuels. In 2012, the city installed 33 charging stations for city staff at city buildings to charge a fleet of 33 after-market converted plug-in Prius vehicles. The city trains its employees on efficient driving behavior.	1.75
Boston	MA	Mayor Menino's 2007 executive order on climate action established that municipal departments must purchase hybrid, alternative-fuel, or high-efficiency vehicles whenever possible, which has led to the purchase of more than 70 hybrid vehicles. The city also has established a motorpool using car-sharing technology, allowing it to reduce its fleet size and maximize the use of existing vehicles. The city has installed three publicly available electric-vehicle charging stations in front of city hall and one at its Public Works Department maintenance facility.	1.75
Dallas	TX	The city introduced 25 electric vehicles into its fleet in 2012, although it does not have a specific fuel efficiency standard. City-installed electric-vehicle charging stations are available for public use. Idling is prohibited for city vehicles.	1.75
Philadelphia	PA	The city has a goal to increase fuel efficiency generally in its fleet. The city replaced 70% of the police fleet with more fuel-efficient vehicles in 2009 and 2010. Vehicle replacements have since slowed due to budget constraints. The city also plans to reduce its fleet by an additional 500 vehicles. The Mayor's Office of Sustainability received a $140,000 grant from the Pennsylvania Department of Environmental Protection to install 20 electric-vehicle charging stations as part of an early adoption program. The PhillycarShare fleet vehicles use 18 of these stations, and two are available for public use.	1.75
Phoenix	AZ	The city's sustainable fleet strategy includes the use of the EPA SmartWay guide for purchasing the most fuel-efficient vehicles in class. Twenty-four electric-vehicle charging stations were installed in public areas for use by city staff and the public. Standards in the city's administrative regulations address anti-idling, speed limits, tire inflation, carpooling, and preventative maintenance of city vehicles.	1.75
Portland	OR	The city's fleet services has a policy of purchasing the most efficient vehicle that meets the work requirements. The city has set a goal to convert 20% of the city's fleet to electric vehicles by 2030. The city has installed electric vehicle charging stations in its parking garages (for the public) as well as enabled stations in the public right-of-way and streamlined the permitting process for charging stations on private property. Vehicles	1.75

City	State	Fuel-Efficiency Requirements, Right-Sizing Policies, and Charging Station Availability	Score (2 pts.)
		are outfitted with GPS technology for more efficient trip planning. Fleet services has an idle-reduction policy.	
Riverside	CA	The city has surpassed its Green Action Plan goal to increase the number of clean vehicles in the non-emergency city fleet to at least 60%. The city has a minimum fuel-efficiency requirement of 25 mpg and an anti-idling policy. It has installed 11 electric-vehicle charging stations throughout the city to encourage local purchases of electric vehicles. City policy states that no city-owned or leased vehicle shall idle for more than five minutes.	1.75
San Diego	CA	Current policy (AR 90.73) calls for all new vehicles to be 50% better than CAFE standards by 2020, with interim goals. The policy also calls for a reduction in vehicle miles traveled of 5% compared to the previous year. A 2012 Climate Mitigation and Adaptation Plan goal is to increase the proportion of zero-emissions passenger and light-duty trucks to 50% of the city's municipal fleet by 2020 and 100% by 2035. The city is using a third-party contractor to install 117 charging stations at public facilities city-wide. The city is installing roundabouts and retiming traffic signals in order to decrease idling.	1.75
Chicago	IL	The city aims to reduce municipal fossil-fuel consumption by 10%, replace 3% of on-road fleet vehicles with cleaner vehicles annually, and reduce the energy intensity of Chicago Transit Authority rail service by 12% from 2011 levels. As of August 2012, more than 200 electric-vehicle charging stations were installed in the city.	1.5
Denver	CO	The 2020 Government Operations Energy Goal includes reducing the energy consumed in city vehicles by 20% by 2020 from 2012 levels. Chapter 3 of Executive Order 123 establishes a green fleet policy that requires light-duty vehicles in need of replacement to be replaced by the most fuel-efficient and least polluting vehicles possible. EO123 also calls for the use of GPS tracking to reduce vehicle miles traveled. The city has installed four public electric-vehicle charging stations in addition to three stations for exclusive use by the city fleet.	1.5
San Antonio	TX	The city's environmental fleet policy includes a directive to calculate the total cost of ownership when a vehicle purchase is considered and establishes a target of a 17% reduction in emissions by 2020. The city's alternative fuel policy includes a preference for natural gas vehicles. Non-emergency vehicle sedan hybrid purchases have been authorized for 2010. The city has installed six electric-vehicle charging stations.	1.5
Indianapolis	IN	Executive Order 6, 2012 calls for all new city vehicles to be electric/hybrid, with the exception of police vehicles. The entire fleet is to be converted by 2025. The city has developed a program facilitating the installation of 26 electric-vehicle charging stations on city property. There are no plans to make these stations available for use by the public.	1.25
Miami	FL	Green Fleet Ordinance Section 22.5 of city code requires consideration of fuel efficiency in vehicle purchases. The policy also calls for optimizing fleet size by eliminating unnecessary vehicles.	1.25
Sacramento	CA	The city has a goal to reduce fuel consumption by 15% from 2003 levels by 2010. Purchasing guidelines emphasize best fuel economy and lowest emissions in vehicle class. Operations policy encourages trip reductions, use of GPS for routing, and anti-idling.	1.25
Atlanta	GA	The city is seeking more fuel-efficient cars in new purchases and has a policy in draft form. The city is reducing the size of its fleet, revoking vehicle take-home policies to reduce use of city-owned vehicles, and launching a car-share program. The city has an anti-idling policy for employees and an alternative commute policy. The city is current	1

City	State	Fuel-Efficiency Requirements, Right-Sizing Policies, and Charging Station Availability	Score (2 pts.)
		installing electric-vehicle charging stations.	
Houston	TX	The city's strategic purchasing division uses lowest purchase cost to award bids for vehicle purchases and does not consider fuel efficiency. But there is interest in a change to best-value procurement that would include miles per gallon as part of the evaluation criteria. Approximately 50% of the city's non-specialty, light-duty fleet has been replaced with hybrid vehicles. The city also has 25 Nissan LEAFs in its fleet and 15 plug-in hybrids. The city has in its budget funds to purchase an additional 10 Nissans LEAFs in fiscal year 2013 The city has an anti-idling policy for municipal vehicles. The city also started Houston Fleet Share in August 2012. Through this program, 50 city-owned fleet vehicles were outfitted with Zipcar's proprietary car-sharing technology for use by city employees, which will help reduce and right-size the fleet. The city installed 28 electric-vehicle charging stations for public use in 2011 and 2012 using grant funding. The city will install 68 more charging stations in 2013, mostly for public use, and it is looking at additional locations for the stations, most likely at municipal court houses It also has 40 charging stations for the use of the municipal fleet only. The city has released guidelines and long-range plans to guide the deployment of electric-vehicle charging station.	1
Jacksonville	FL	The city has a policy that light-duty vehicles in need of replacement be replaced with hybrids or alternative-fuel vehicles, or the most fuel-efficient and least-polluting vehicles available, whenever cost and reliability are similar to traditional vehicles.	1
St. Louis	MO	The city is in the process of culling its fleet for essential uses. It runs a program that tests high-efficiency vehicles for consideration for fleet purchase. Telematics devices installed on 475 vehicles in fleet. The city installed five electric-vehicle charging stations at the airport, and these are available to the public. The city also uses a Telematics program—devices and policies—to improve efficiency and reduce fuel consumption.	1
Baltimore	MD	The city's sustainability plan calls for actions to explore options for more efficient fleet conversion. In July 2012 a memorandum of understanding was signed between the Department of General Services, which manages the fleet, and the Department of Finance. General Services, through its Energy Office, developed a 20-year fleet replacement plan to right-size the fleet. In 2012, the city installed two charging stations in each of its nine public garages. These are available to monthly pass holders and the general public, and there is no cost for charging.	0.75
San Jose	CA	The city has a goal for 100% of the public fleet to run on alternative fuels by 2022, but does not have a fuel efficiency requirement. It is working to optimize fleet size. The city installed 52 new electric-vehicle charging stations in 2012.	0.75
Tampa	FL	The city's fleet policies focus on alternative-fuel use rather than fuel efficiency. Electric-vehicle charging stations were installed in 2011 for public use.	0.75
Washington	DC	No fuel-efficiency policy is in place, although the District does have hybrid and electric vehicles in its fleet. The District is working to create a procurement policy for low-emission and fuel-efficient vehicles. The city currently has about 4.7 public charging locations for every 100,000 residents. By 2032, the District will install 500 charging stations throughout the city to expand electric vehicle infrastructure, in keeping with demand and to encourage more car owners to choose electric vehicles. The city operates a motorpool system for government employees.	0.75
Fort Worth	TX	The city does not have a fuel efficiency policy. Efforts to right-size the fleet are undertaken approximately every 5 years. The city enforces an idling limitation rule.	0.5
Los Angeles	CA	The city's action plan specifies the use of alternative fuels, but does not have specific fuel efficiency requirements. The city has installed more than 175 electric-vehicle charging stations through public-private partnerships and has started to replace the	0.5

City	State	Fuel-Efficiency Requirements, Right-Sizing Policies, and Charging Station Availability	Score (2 pts.)
		older electric vehicle supply equipment with the current generation of equipment.	
Memphis	TN	The city has no official fuel efficiency policy in place; however, such a policy is being considered by city and county administrators. Approximately 15 electric-vehicle charging stations have been installed throughout the city and county and are available for public use.	0.5
Detroit	MI	The city has an anti-idling policy for government vehicles.	0.25
Pittsburgh	PA	There is no fuel efficiency policy in place, although the city has added a few hybrid vehicles to its fleet. The city has a contract with Zipcar, which has cut its motorpool in half.	0.25

Sources: Data request responses as noted in Appendix A or independent research.

Table B-6. Green Building and Equipment Policies

City	State	Above-Code Requirements for Public Buildings and Energy-Efficient Procurement Policies	Score (1 pt.)
Dallas	TX	In 2003 the Dallas city council updated its green building program to require all new municipal and city-funded buildings larger than 10,000 square feet be constructed to meet LEED Gold certification standards. The update also included additional requirements for water use reduction (20%) and optimizing energy performance (3 points, 1 point above mandatory certification minimum) for these facilities. The city adopted its green procurement policy in 2004.	1
Denver	CO	Executive Order 123, Chapter 2, requires all new city projects and major remodels to achieve LEED BD+C Gold certification, with a goal of achieving LEED Platinum, and to meet ENERGY STAR guidelines. Any entity using city bonding capacity must design and build to achieve LEED Gold certification. The city has an environmentally preferable procurement policy that requires assessing total cost of ownership. Agencies are directed to procure energy-efficient products and services.	1
Jacksonville	FL	Executive Order 2008-3 states that all applicable new city buildings and major renovations should be built and certified to the appropriate LEED standards and achieve ENERGY STAR certification. Existing buildings should incorporate all appropriate LEED-EB principles into facility operation and maintenance. The city uses an environmentally preferable purchasing policy.	1
Minneapolis	MN	Resolution 2006R-381 calls for the city to utilize LEED standards in the planning, design, construction, and commissioning of municipal facilities financed by the city and utilized by the city's charter departments. All new or significantly renovated municipal facilities (financed by the city of Minneapolis and utilized by the city's Charter Departments) of 5,000 square feet or greater should be built to a LEED Silver standards with emphasis in LEED points in the category of Energy and Atmosphere. Requirements do not apply to publicly funded projects. The city's environmentally preferable purchasing policy calls for procurement of ENERGY STAR appliances where available.	1
New York City	NY	In 2005 the city passed Local Law No. 86 making a variety of green building and energy efficiency requirements for municipal buildings and other projects funded by the city treasury. The building requirements apply to new construction, building additions, and substantial reconstructions of existing buildings for all city-funded projects. Local Law 119 of 2005 requires the city to follow Federal Energy Management Program (FEMP) standards of energy efficiency in the use and	1

City	State	Above-Code Requirements for Public Buildings and Energy-Efficient Procurement Policies	Score (1 pt.)
		acquisition of energy-using products including those with an ENERGY STAR label.	
Philadelphia	PA	In December 2009, the city council passed Bill No. 080025 which calls for new construction and major renovation of large city government buildings to be designed, constructed, and certified as LEED Silver. To emphasize energy efficiency, the ordinance requires that projects be designed and constructed to use at least 20% less energy than code-compliant structures. The city encourages residential projects receiving public funding to use energy-efficient building practices but does not require it. Although it is the practice of the city's procurement department to purchase ENERGY STAR–-rated equipment, it is not policy.	1
Phoenix	AZ	The city's building standards were revised in 2006 to include additional energy-related standards for city-funded projects. The revisions supplement the LEED standards for green buildings, requiring landscape and exterior designs that reduce urban heat islands. When compared to the requirements of the federal Energy Policy Act of 1992, buildings are required to use 50% less water in landscaping, 20% less water in interiors, and 30% less overall energy. The city has environmentally preferable purchasing requirements including purchase of ENERGY STAR–rated products.	1
Portland	OR	For new construction, city projects must achieve LEED Gold certification, with energy performance 30% better than the LEED prerequisite. Tenant-led improvement projects and leased space must meet LEED-CI Silver standards. The Portland Development Commission, the city's economic development and urban renewal agency, requires projects receiving more than $300,000 in financial support from the city (and more than 10% of project cost) to achieve LEED Silver certification. The city's environmentally preferable purchasing requirements call for the city to procure products that meet or exceed ENERGY STAR criteria for energy efficiency where available.	1
Sacramento	CA	The city's green building policy requires city facilities to achieve the highest LEED rating, with an emphasis on energy-efficiency. Life-cycle costing must be utilized to determine the best selection of features and components for new buildings. For building of, 5,000 square feet and larger, the goal is a minimum of LEED Silver certification. Sustainable Operations Policy (API#57) includes the requirement to purchase ENERGY STAR appliances when practical and energy-efficient lighting	1
San Diego	CA	The city's sustainable building policy is directed by Council Policy 900-14. Among the directives is a commitment that all new city-funded facilities and major building renovation projects (more than 5,000 square feet) achieve LEED Silver certification and be constructed to be 15% more energy efficient than California's building code. The city has an environmentally preferable purchasing policy.	1
Seattle	WA	The city's sustainable building policy was adopted in 2000 and was significantly expanded in scope in October 2011. This policy calls for new city-funded projects and major renovations with more than 5,000 square feet of occupied space to achieve LEED Gold certification. In addition, these projects must meet additional energy efficiency requirements. Minor renovation and tenant-led improvement projects that impact 5,000 square feet or more and involve changes to mechanical, electrical, and plumbing systems must also meet LEED Gold standards. Projects that are under 5,000 square feet or not eligible for LEED rating must complete the Capital Green checklist. The city's green purchasing policy mandates at least EPA product standards, including ENERGY STAR.	1
Washington	DC	The Green Building Act of 2006 requires that new city building designs earn an ENERGY STAR target finder score of at least 75 and that new city buildings be ENERGY STAR– benchmarked annually. This policy applies to publicly funded buildings. DC's Procurement Practices Act was amended by the ENERGY STAR Efficiency Amendment	1

City	State	Above-Code Requirements for Public Buildings and Energy-Efficient Procurement Policies	Score (1 pt.)
		Act of 2004, which directs agencies to include a specification that energy using products be ENERGY STAR– labeled provided those products are widely available.	
Boston	MA	In 2007, Mayor Menino directed that all new municipal buildings should be LEED Silver–certified. Projects funded under the Department of Neighborhood Development's Green Affordable Housing Program must meet the LEED Silver standards. All projects of more than 50,000 square feet are subject to Article 37 requirements of being LEED-certifiable regardless of the source of funding. In 2008, the purchasing office and the Department of Innovation and Technology issued environmentally preferable procurement guidelines and a green information technology roadmap. Both policies include energy efficiency.	0.75
Charlotte	NC	The city requires that new facilities be built to reduce energy use and their carbon footprint. The city uses an environmentally preferable purchasing guide that includes ENERGY STAR guidelines.	0.75
Chicago	IL	The city requires LEED certification for all new municipal buildings. Under the city's sustainable development policy, any projects receiving assistance or in a planned development zone must meet LEED Silver standards or better.	0.75
Columbus	OH	Not only city–owned buildings, but also any building in which city dollars are invested is to be LEED-certified. The city's green procurement policy includes energy efficient equipment.	0.75
Houston	TX	The city has a green building resolution that sets a target of LEED Silver certification for new construction, replacement facilities, and major renovations of city-owned or -funded buildings, and facilities with more than 10,000 square feet of occupied space. Administrative Procedure 7-1 City Energy Efficiency Policy, Section 7.2.7 Equipment Purchasing, specifies that all purchases of equipment, appliances, and computers should be ENERGY STAR– rated when feasible.	0.75
Los Angeles	CA	The city's 2009 green building ordinance requires that the retrofitting of all public buildings of more than 7,500 square feet or built prior to 1978 meet LEED Silver requirements. The city uses environmentally preferable purchasing, which includes an energy efficiency consideration.	0.75
Miami	FL	Buildings of more than 50,000 square feet are required to achieve LEED Silver certification as per Miami 21 Section 3.13.1. In 2008, the city passed a green purchasing ordinance for all city departments that requires products to meet ENERGY STAR guidelines.	0.75
Pittsburgh	PA	The city requires that all publicly financed development of more than $2 million or 10,000 square feet attain a minimum of LEED Silver rating. The city uses environmentally preferable purchasing guidelines, which include energy efficiency stipulations.	0.75
Riverside	CA	Policy for all new municipal facilities of more than 5,000 square feet dictates that they be built to LEED standards. Energy efficiency is included in the city's environmentally preferable purchasing policy.	0.75
San Antonio	TX	In 2007, the city council adopted a resolution to require that all new buildings funded and used by the city must meet green building guidelines based on LEED Silver criteria. The city has an environmentally preferable purchasing policy.	0.75
San Francisco	CA	Environment Code Chapter 7 requires LEED Gold certification for all municipal new construction and major alteration projects of 5,000 square feet or more in city-owned facilities and city leaseholds. The city's green purchasing policy is updated every three years and includes energy efficiency considerations.	0.75

City	State	Above-Code Requirements for Public Buildings and Energy-Efficient Procurement Policies	Score (1 pt.)
San Jose	CA	The city's green building policy requires all municipal projects—including those receiving City funds—design, construct, and achieve at minimum LEED Silver certification. The city has an environmentally preferable purchasing policy.	0.75
Austin	TX	The city council passed a resolution (City Council Resolution No. 000608-43) in June 2000 requiring that all future public building projects of more than $2 million be built to the LEED Silver standards. The resolution further required the city manager to evaluate the feasibility of requiring that buildings maintained, leased, or financed by the city be operated and maintained in a way that improves indoor air quality and energy conservation.	0.5
Detroit	MI	The city's environmentally preferable procurement policy established in 2010 requires the purchase of ENERGY STAR– certified equipment.	0.5
Memphis	TN	The city has no specific above-code requirements for publicly funded buildings. The city procurement plan calls for consideration of lifetime cost of goods, services, and equipment.	0.5
St. Louis	MO	Municipal LEED Standards Ordinance 67414 (2007) requires all new municipal construction of more than 5,000 square feet to be built to LEED Silver standards, and Municipal Energy Efficiency Ordinance 67803 (2007) requires builders to analyze energy consumption, long-term operating costs, and possible energy-efficient measures for all new municipal construction or major remodels of municipal buildings. ENERGY STAR equipment is recommended for use by city departments, but departments are allowed to choose what to purchase.	0.5
Atlanta	GA	In December 2003, the city passed a green building ordinance that applies to city-owned facilities and city-funded projects. This green building ordinance applies to all new construction and renovation projects in which the building has 5,000 square feet of occupied space or the total project cost exceeds $2 million. These projects must incorporate sustainable design principles and must meet LEED Silver standards.	0.25
Baltimore	MD	Baltimore Green Building Standards (Council Bill 07-0602) require LEED Silver certification for public buildings and achievement of LEED certification for publicly funded buildings. The city is in the early stages of developing green purchasing guidelines.	0.25
El Paso	TX	In June 10, 2008, the city council unanimously passed an ordinance stating that all new city buildings of more than 5,000 square feet will be designed, contracted, and built to achieve the LEED Silver certification level and should strive for a higher level of certification whenever project resources and conditions permit. The city is currently developing criteria that would be incorporated into most city procurement processes to account for environmental factors including energy efficiency.	0.25
Fort Worth	TX	The city's Action Plan calls for a policy requiring new city buildings to be LEED Silver–certified (or better) when the certification cost does not exceed 5% of the construction cost. Major renovations must obtain LEED EB Silver certification or better when the cost of certification does not exceed 5% of the renovation cost.	0.25
Tampa	FL	Ordinance 17.5-203 requires all new construction of municipal buildings of at least 5,000 feet to be built to LEED Silver standards. Renovations of existing municipal buildings must incorporate building materials recognized by the U.S. Green Building Council for their sustainable qualities and recycled products whenever possible.	0.25
Indianapolis	IN	The city has implemented energy-efficient major renovations, but does not have a specific policy in place for building or procurement.	0

Sources: Data request responses as noted in Appendix A or independent research.

Table B-7. Building Energy Management and Retrofits

City	State	Energy Management Strategies Including Benchmarking Requirements and Retrofit and Retrocommissioning Strategies	Score (2 pts.)
Boston	MA	The city began tracking municipal building energy use in 2011, with the intention of benchmarking as data become more complete. The new benchmarking policy includes a lead-by-example initiative. The city will soon begin annual disclosure of its energy and water use in all of its facilities starting with 2012 building data. The city's integrated energy management plan, developed in 2004, laid out a retrofit plan for Boston's top ten municipal energy users, and the plan is currently being implemented. The city does not use energy performance contracts, but is considering a resolution that would allow the use of energy services companies. The city is a DOE Better Buildings Challenge Community Partner, with 16 million square feet committed, including municipal buildings.	2
El Paso	TX	The city benchmarked energy data for 2007 as part of establishing the goal of 30% energy reduction and is in the process of reviewing that energy use annually. The city has committed 2.5 million square feet to energy upgrades as part of its municipal partnerships with the DOE Better Buildings Challenge. The city is currently participating in an energy performance contract with Johnson Controls.	2
Houston	TX	The city has a green buildings resolution, which sets a target of LEED Silver certification for new construction, replacement facilities, and major renovations of city-owned or -funded buildings, and facilities with more than 10,000 square feet of occupied space. Administrative Procedure 7-1 City Energy Efficiency Policy, Section 7.2.7 Equipment Purchasing specifies that all equipment, appliance, and computer purchases be ENERGY STAR–rated, when possible. The city is a DOE Better Buildings Challenge Community Partner, with 30 million square feet committed, including municipal buildings.	2
New York City	NY	In December 2009, the city council passed four laws, collectively known as the Greener, Greater Buildings Plan, that require energy efficiency upgrades to and energy transparency in large existing buildings. Specifically, these laws call for annual benchmarking, energy audits, and retro-commissioning. This applies to both public and private buildings.	2
Phoenix	AZ	The city tracks approximately 75% of its square footage in Portfolio Manager, with a goal to expand to 100%. However, no specific benchmarking policy is in place. The city has set energy goals based on the assumption that a reduction of 1.5% of electricity use (compared to a 2005 baseline) can be achieved in approximately 60% of the buildings managed by the Public Works Department through retrocommissioning. The city has used an energy services company for building and traffic signal retrofits.	2
Portland	OR	Energy use is annually tracked for all of the city's electricity and natural gas accounts. Each account is benchmarked and compared to the prior year's energy usage and cost. City policy requires all occupied, city-owned buildings to pursue LEED-EBOM certification at the Silver level, which has a commissioning component. The city experimented with an energy savings performance contract in 2009, but has not signed one more recently.	2
San Antonio	TX	The city has a goal to retrofit all city buildings by 2015. The city benchmarks about 75% of its building portfolio, although no benchmarking requirement is in place. The city does not have a policy encouraging energy service performance contracts; instead, the city has developed an in-house division to manage, finance, and perform measurement and verification of energy efficiency improvements.	2
Washington	DC	The District's Clean Affordable Energy Act of 2008 requires the energy performance of public and private buildings to be rated using ENERGY STAR software and disclosed annually. Public buildings have been benchmarked since 2010 and disclosed	2

City	State	Energy Management Strategies Including Benchmarking Requirements and Retrofit and Retrocommissioning Strategies	Score (2 pts.)
		thereafter via an online database. The city is pursuing retrocommissioning based on audits completed in 2011 that indicated more than 2,000 specific energy conservation measures that would significantly reduce consumption. The District is currently exploring energy service performance contracts. The city is a DOE Better Buildings Challenge Community Partner, with 90 million square feet committed, including municipal buildings.	
Chicago	IL	The majority of city buildings are benchmarked. The city has three contracts with energy services companies currently underway, as a starting point for Retrofit Chicago's municipal projects. The city is a DOE Better Buildings Challenge Community Partner, with 24 million square feet committed including municipal buildings.	1.5
Columbus	OH	All 183 of the city's buildings are benchmarked in ENERGY STAR Portfolio Manager, although information is not up to date on all buildings due to lack of data. There is no retrofit policy in place, although the city is exploring options to reduce energy consumption systematically. The city is in final negotiations with the energy services company AMERESCO for upgrades to several buildings.	1.5
Denver	CO	The city is a DOE Better Buildings Challenge Community Partner, with 6.6 million square feet committed, including municipal buildings. In conjunction with the Better Buildings Challenge, the city will be benchmarking approximately 70% of the total city government–owned square footage on a monthly basis throughout the year. At this time there is not a policy in place for retrofits. The city has audited and retro-commissioned 65 city buildings. A formalized process that incorporates retro- and ongoing commissioning and facility condition assessments is expected to be finalized and in place in 2013.	1.5
Fort Worth	TX	To meet city management goals, the city hired a conservation specialist to manage the selection of an energy services company to implement energy savings performance contracts. The city's conservation program acts to regularly retrocommission and retrofit buildings to improve energy efficiency when submitted projects are deemed cost-effective. The city is a DOE Better Buildings Challenge Community Partner, with 5.7 million square feet committed, including municipal buildings.	1.5
Indianapolis	IN	The city has implemented energy-efficient major renovations, but does not have a specific policy in place for building or procurement.	1.5
Philadelphia	PA	The city is using Portfolio Manager to benchmark all facilities of more than 10,000 square feet. The city's utility bill management system tracks energy use in all facilities on a monthly basis. Greenworks aims to raise the portion of the city's infrastructure in a state of good repair to 80% by 2015. Greenworks calls for energy savings performance contracts at more than 50 buildings, including city hall.	1.5
San Francisco	CA	The city's 2011 Existing Commercial Buildings Energy Performance Ordinance requires the benchmarking of public and private (non-residential) buildings of more than 10,000 square feet, using ENERGY STAR Portfolio Manager. The ordinance requires disclosure of the ENERGY STAR score or the energy usage intensity if a score is not available. According to the 2011 Energy Benchmark Report for Municipal Buildings, the city benchmarks 69% of its energy use. Retrofitting is accounted for annually through budgeting for energy efficiency. Currently, the San Francisco Housing Authority is engaged in several energy performance contracts.	1.5
Seattle	WA	Council Bill 116731, enacted in 2010, requires the benchmarking of public buildings of more than 10,000 square feet. The city benchmarks about 62% of public building square footage on an annual basis. In 2013, the city released an energy performance report on municipal buildings. Seattle is a DOE Better Buildings Challenge Community Partner, with 23 million square feet committed, including municipal buildings. The city	1.5

City	State	Energy Management Strategies Including Benchmarking Requirements and Retrofit and Retrocommissioning Strategies	Score (2 pts.)
		expects to complete a resource conservation management plan in mid-2013 to implement its target of a 20% reduction in energy use across the city's building portfolio by 2020. The city completed retrofits with contract with an energy services company in 2011 and 2012.	
St. Louis	MO	The city enters data in Portfolio Manager and pursues ENERGY STAR certification for all eligible properties, although no guiding policy is in place.	1.5
Atlanta	GA	The city is a DOE Better Buildings Challenge Community Partner, with 33 million square feet committed, including municipal buildings.	1
Austin	TX	In November 2008, the city council approved the Energy Conservation Audit and Disclosure Ordinance (#20081106-047). It requires building energy rating and disclosure for nonresidential facilities and applies to municipal buildings. In 2011, the 25 largest city-owned buildings complied with the ordinance by rating the buildings in EPA Portfolio Manager. These buildings totaled 3.8 million square feet of real estate, which is 73% of the total square footage owned by the city. In 2013, 15 more buildings will be benchmarked with portfolio manager, adding 700,000 square feet and bringing the total to 87%. Commissioning has been completed recently at the city's 14 largest buildings. The city does not use energy savings performance contracts, but Austin Energy distributed energy services staff act as energy efficiency project managers.	1
Baltimore	MD	The city has recently begun inputting buildings into Portfolio Manager, although no benchmarking requirements are in place. The city's sustainability plan calls for retrofitting school buildings. The city has an energy savings performance contract with Johnson Controls.	1
Dallas	TX	Under the city's environmental management system, city departments commit to reducing energy usage relative to previous years. Performance contracting is being used to retrofit some buildings.	1
Los Angeles	CA	The city is a DOE Better Buildings Challenge Community Partner, with 30 million square feet committed, including municipal buildings. EnvironmentLA includes a goal that energy-efficient retrofits be performed on 500 city buildings in order to continually reduce energy consumption and that energy efficiency retrofits of all city-owned buildings be completed in order to achieve at least a 20% reduction in energy consumption.	1
Memphis	TN	The city tracks energy use in 52 city facilities and 38 county facilities using Portfolio Manager. There is no specific benchmarking or retrofitting policy in place. The city has not had an energy performance contract for many years, but is currently considering one.	1
Pittsburgh	PA	The city has committed 1.9 million square feet to the DOE Better Buildings Challenge as Municipal Partner. It has no comprehensive retrofit policy, but it is currently pursuing retrofits to city-county buildings.	1
Sacramento	CA	The city is a DOE Better Buildings Challenge Community Partner, with 12 million square feet committed, including municipal buildings. The city has outlined retrocommissioning plans in its energy-efficient retrofit program for city buildings.	1
San Diego	CA	Energy use is monitored and benchmarked using a Smart Energy Management and Monitoring System. In addition, the city is beginning to compile city assets into Portfolio Manager. Retrocommissioning plans are included in the 2012 Climate Mitigation and Adaptation Plan, although due to funding shortages, such programs have not yet been implemented.	1

City	State	Energy Management Strategies Including Benchmarking Requirements and Retrofit and Retrocommissioning Strategies	Score (2 pts.)
Detroit	MI	Detroit has invested $10 million in efficiency improvements in 16 city buildings.	0.5
Minneapolis	MN	Minneapolis Ordinance Ch. 47-190 requires benchmarking of city buildings of 25,000 square feet or more.	0.5
Riverside	CA	The city conducts regular building retrofits.	0.5
Charlotte	NC	No benchmarking policy is in place, although the city tracks energy usage. The city has two buildings that participate in Envision Charlotte's Smart Energy program, which provides up-to-the-minute usage to building managers and the public.	0
Jacksonville	FL	Executive Order 2008-3 mandates that all applicable new city buildings and major renovations be built and certified to the appropriate LEED standards and achieve ENERGY STAR status. Existing buildings must incorporate all appropriate LEED-EB principles into facility operation and maintenance. The city uses an environmentally preferable purchasing policy.	0
Miami	FL	No data found.	0
San Jose	CA	The city is currently refining a plan or targeting retrofit projects. Benchmarking is being adopted on a regional level through the Silicon Valley Energy Watch, although no municipal policies are in place.	0
Tampa	FL	City Policy 40.1.5 requires the city to conserve energy by auditing all departments and tracking energy use, although no formal benchmarking program is in place.	0

Sources: Data request responses as noted in Appendix A, or independent research.

Table B-8. Sustainable Infrastructure Policies

City	State	Fix-It-First Policies, Life-cycle Cost Policies, and Capital Budget Maintenance Expenditures	Score (2 pts.)
San Francisco	CA	Approximately 5% of capital funds from 2014–2023 are dedicated to new assets and infrastructure, while 95% is dedicated to renewal and enhancement of existing assets and infrastructure. (However, "enhancement" includes renovation or replacement of existing facilities.) There is not an omnibus cost consideration policy, but sustainability factors into capital planning in a variety of ways. The San Francisco Public Utility Commission General Fund program policies state that cost-effectiveness be based on “all-in” costs and a 15-year payback. Longer payback periods will be considered for longer-lived equipment.	2
Houston	TX	The city uses life-cycle cost considerations in specific instances, including water main replacement. In fiscal year 2013, the city is spending approximately 35% of its capital improvement budget on maintenance and upgrades of existing infrastructure.	1.25
Portland	OR	The city is improving asset management practices, but continued improvement in processing, data management, monitoring, and evaluation is needed to ensure that asset management practices accurately inform strategic decision making and effective infrastructure management. Portland has seven independent bureaus and divisions that manage facilities, making it difficult to calculate the proportion of funds spent on existing assets. The Office of Management and Finance (Facilities) budgeted 25% for operations and maintenance.	1.25
Baltimore	MD	As a built-out city, the vast majority of Baltimore's capital budget is for renovation, replacement, or right-sizing of existing assets or infrastructure.	1
Chicago	IL	The city is currently drafting sustainable urban infrastructure guidelines, a formal policy on capital improvements that would take a life-cycle cost analysis approach to	1

City	State	Fix-It-First Policies, Life-cycle Cost Policies, and Capital Budget Maintenance Expenditures	Score (2 pts.)
		capital budgeting. This document will be in effect in 2013. The city prioritizes capital investments in a way that minimizes future maintenance and replacement costs.	
Fort Worth	TX	The city's primary tool to implement sustainable infrastructure improvements is the energy savings performance contracting model, mainly because of its neutral effect on the city's annual budget. Typically, net benefits to energy, water, and maintenance budgets are accounted for against principle, interest, and service costs. Individual measures implemented under the city's energy conservation program must also pay for themselves within their useful life.	1
Phoenix	AZ	The city utilizes development impact fees and life-cycle costing analysis.	1
Sacramento	CA	The city's green building policy calls for building analysis using life-cycle costing to determine the best selection of features and components.	1
Seattle	WA	The city has a diversity of sustainable infrastructure policies in its comprehensive plan including policies about life-cycle cost analysis, fix-it-first policies, a focus on transit-rich areas, and others.	1
Boston	MA	The city is planning to implement administrative processes to introduce life-cycle cost analysis for construction and renovation. The city spends 42% of its capital budget on upkeep (asset maintenance) and 31% on upgrades (asset improvements).	0.5
Columbus	OH	The city cannot use capital resources to maintain infrastructure. The city replaces an asset when its maintenance cost exceeds the value to the asset. Columbus has an asset management team that looks at life-cycle costs.	0.5
Denver	CO	In June 2010, the public works manager signed a memorandum entitled "Our Commitment to Total Cost of Ownership Project Management," reminding employees to take a life-cycle approach that rewards strategies that reduce energy use, waste, and water use. However, this is not formal policy. The city has devoted 69% of the capital budget to maintenance. In 2007, the citizens of Denver voted to dedicate an additional $2.5 million in increased property taxes to repair deteriorating infrastructure. As a result, the capital budget process supports a commitment to yearly, life-cycle maintenance of basic infrastructure—by prioritizing annual capital funding allocations for maintenance ahead of new, discretionary projects.	0.5
Tampa	FL	No data found.	0.5
Atlanta	GA	No data found.	0
Austin	TX	The city is incorporating sustainability into its capital planning process, but this is new and has not been formalized across all city operations.	0
Charlotte	NC	The city does not use life-cycle cost analysis or have a fix-it-first policy.	0
Dallas	TX	The city has several long-range strategic plans that provide for sustainability when infrastructure investments take place, but does not have formalized fix-it-first policies or requirements for life-cycle cost analysis.	0
Detroit	MI	No data found.	0
El Paso	TX	The city does not use life-cycle cost analysis or have a fix-it-first policy.	0
Indianapolis	IN	No data found.	0
Jacksonville	FL	No data found.	0
Los Angeles	CA	No data found.	0
Memphis	TN	A life-cycle cost consideration policy has been formalized Shelby County, but not for	0

City	State	Fix-It-First Policies, Life-cycle Cost Policies, and Capital Budget Maintenance Expenditures	Score (2 pts.)
		the city of Memphis.	
Miami	FL	Although the city has no life-cycle costing procedures in place, the county's Life Cycle Costing Procedure (AO 11-3) requires life-cycle analysis that considers maintenance, repair, energy costs, and other expenditures associated with day-to-day operations for certain commodities.	0
Minneapolis	MN	No data found.	0
New York City	NY	No data found.	0
Philadelphia	PA	No data found.	0
Pittsburgh	PA	The city does not use life-cycle cost analysis or have a fix-it-first policy.	0
Riverside	CA	No data found.	0
San Antonio	TX	The city does not use life-cycle cost analysis or have a fix-it-first policy.	0
San Diego	CA	With the exception of the LEED requirements outlined in council policies (900-02, 900-14) and building codes, life-cycle cost considerations are not yet a requirement. The city budgets 0–10% for existing assets depending on the type.	0
San Jose	CA	No data found.	0
St. Louis	MO	The city has no cost consideration policies at present, but it is in the process of developing a requirement for sustainability impact assessments.	0
Washington	DC	No data found.	0

Sources: Data request responses as noted in Appendix A or independent research.

Table B-9. Public Employees

City	State	Transit Benefits, Teleworking, and Flex Schedules for Public Employees	Score (1 pt.)
Atlanta	GA	The city subsidizes public transit fares for its employees and conducts various outreach events such as "Walk Day" and "Give Your Car the Day Off."	1
Austin	TX	The city has an internal human resources policy on teleworking that has been in place since 2000. Any employee can telework if he or she is approved by the supervisor. The city offers its employees free bus passes.	1
Charlotte	NC	Flex schedules and teleworking allowed if mutually agreeable to employer and employee. The city subsidized transit passes for FY13.	1
Chicago	IL	Flexible staffing is utilized in libraries, the Department of Streets and Sanitation, and other areas. Employees can purchase transit passes pre-tax.	1
Columbus	OH	The city has a policy allowing for telecommuting. In addition, on air quality alert days, the city encourages employees to reduce travel. The city has a bike-sharing program for city employees to travel to lunch or meetings, and makes bus passes available for employees	1
Dallas	TX	The city allows telecommuting and flexible schedules. To reduce the number of city employees who commute to work alone, the city uses GreenRide, a web-based commuter matching system, to help people find carpools and other alternative forms of transportation.	1
Denver	CO	The city allows both telecommuting and flexible schedules. Both options are discretionary with the individual agency and require	1

City	State	Transit Benefits, Teleworking, and Flex Schedules for Public Employees	Score (1 pt.)
		application. The city participates in and subsidizes the costs of the Eco Pass and ValuPass programs with the Regional Transportation District. Payment is through payroll deduction.	
El Paso	TX	The city uses a "4-10" schedule for most city employees, with some employees working Mondays and others working Fridays. City employees can ride the bus for free with their employee IDs. The sustainability office recently launched an iCarpool program for city employees to encourage carsharing.	1
Houston	TX	The city participates in Flex in the City, a program implemented by the city to encourage employers to try alternative scheduling options such as compressed work weeks, allowing telecommuting, and using flexible start and end times, eliminating their employees' rush-hour commutes. The city's employee transit program offers Metropolitan Transit Authority Q Cards to city employees working in downtown Houston, at no cost to the employee.	1
Indianapolis	IN	Flex schedules are neither encouraged nor discouraged. Each department sets its own policies as permitted by its work and schedule demands. The city has a program to promote alternative transportation, including providing bus passes to employees who elect not to commute via car. The city also plans to offer a membership/pass to the Indy Bike Hub for bicycle commuting employees.	1
Minneapolis	MN	The city's telework policy authorizes departments to consider alternative work schedules. The city offers a transportation benefit for vanpool and MetroPass, as well as a discounted membership fee for its bikeshare program to its employees.	1
New York City	NY	PlaNYC calls for an assessment of car sharing for city fleets. A transit benefit is available for public employees.	1
Phoenix	AZ	The city utilizes flexible schedules. The city's travel reduction program includes carpool parking subsidies, free bus/light rail passes for employees, emergency-ride-home cab vouchers, bicycle facilities, the option to telecommute, , and other incentives.	1
Portland	OR	The city's telework policy was adopted to increase productivity, reduce employees' commute trips, and accommodate employees' special needs. Trip reduction incentive program is available for employees using mass transit or walking/biking. The incentive program pays $41 per month to any employee who takes public transit, carpools, bicycles, or walks to work. The city also offers an emergency-ride-home program that provides a free cab ride to an employee who did not drive to work but faces an emergency situation that requires a car.	1
Riverside	CA	The city's flex schedule policy recommends modified or flexible work schedules in order to increase organizational efficiency and encourages ride sharing and trip reduction. The Clean Commute Rideshare Program allows any city employee to ride free on any fixed route bus by showing his or her photo ID badge. The city also offers incentives such as quarterly raffles for participating commuters, clean car rebate opportunities, and regional discounts.	1
San Antonio	TX	The city allows for teleworking or flex schedules at the discretion of each city department. The city provides free bus passes for employees.	1
San Diego	CA	The city has a flexible work schedule and telecommute policy in place. The city provides discounted public transportation passes, as well as promotes carpooling, ridesharing, vanpools, and bicycling to work.	1
San Francisco	CA	The city has a telecommuting program and is studying the results of a commuter survey to determine its success in reducing city employees'	1

City	State	Transit Benefits, Teleworking, and Flex Schedules for Public Employees	Score (1 pt.)
		commuter trips. SF Environment organizes a carpooling program and offers discounts for carsharing services.	
Seattle	WA	The city has a telecommuting policy in place. All employees receive free transit passes. The city has also established a pilot vanpool program.	1
Washington	DC	The District has policies for telecommuting and alternative work schedules	1
Baltimore	MD	The city is conducting a pilot telecommuting program at the Department of General Services through the Energy Office and has a carpooling program.	0.5
Fort Worth	TX	The city does not have a formal telework policy. The city has a multi-part commuter benefits program that includes free transit passes, allowing employees to earn compensatory time for using mass transit, and offers prizes for employees that act to reduce air pollution.	0.5
Miami	FL	City employees can purchase discounted transit passes.	0.5
Philadelphia	PA	The city does not allow teleworking or flex schedules. TransitCheck is available to all city employees through WageWorks. Pre-tax dollars can be spent on public transit.	0.5
San Jose	CA	The city's telework policy authorizes departments to consider offering employees the option of alternative work schedules.	0.5
St. Louis	MO	Teleworking is neither encouraged nor prohibited. The city waives the fee for its bicycle commuter station for city employees.	0.5
Tampa	FL	The city allows flexible schedules.	0.5
Boston	MA	There is no teleworking or flexible commuting for city employees. Employees transit passes are pre-tax, but in general there are no transit programs.	0
Detroit	MI	No data found.	0
Jacksonville	FL	No data found.	0
Los Angeles	CA	No data found.	0
Memphis	TN	The city informally promotes the county's van pool program and encourages carpooling among employees.	0
Pittsburgh	PA	Employees can purchase bus passes with pretax dollars, but no formal incentive programs are in place.	0
Sacramento	CA	No data found.	0

Sources: Data request responses as noted in Appendix A, or independent research.

Appendix C: Detailed Policy Information on Community-Wide Initiatives

Table C-1. City Scoring on Community-Wide Energy Targets

City	State	Community-Wide Energy Efficiency Goals or Related Targets	Sustainability Plan or Other Target Documentation	Score (2 pts.)
Minneapolis	MN	The city has set goals to reduce emissions by 15% by 2015 and 30% by 2025. Energy efficiency and climate programs have been incorporated into the city's comprehensive plan, Plan for Sustainable Growth.	Minneapolis Greenprint Minneapolis Plan for Sustainable Growth	2
New York City	NY	New York's general plan, PlaNYC, incorporates the city's goal to reduce greenhouse gas emissions by more than 30% by 2030 compared to 2005 levels. Energy efficiency programs are also included in the plan although targets are not explicitly stated.	PlaNYC	2
Philadelphia	PA	Energy and greenhouse gas goals are integrated into the city's comprehensive plan, including a goal to reduce city-wide energy consumption in buildings by 10%below 2006 levels by 2015, and a goal to reduce greenhouse gas emissions by 20% below 1990 levels by 2015.	Greenworks Philadelphia Philadelphia 2035	2
Portland	OR	The 2009 city of Portland/Multnomah County Climate Action Plan was adopted by Resolution No. 36748. The plan sets a goal of reducing emissions to 80% below 1990 levels by 2050.	Portland Climate Action Plan; Resolution 36748; Comprehensive Plan	2
Sacramento	CA	In 2012, the city council adopted the Sacramento Climate Action Plan to reduce greenhouse gas emissions by 15% below 2005 levels by 2020, 38% by 2030, and 83% by 2050. Climate and energy goals are included in the city's general plan. The city is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	Climate Action Plan 2030 General Plan	2
San Antonio	TX	SA2020, the city's comprehensive plan, includes a goal to reduce electricity usage by 1% per year per household through 2020.	SA2020	2
San Jose	CA	The San José Green Vision, a 15-year plan adopted in 2007, calls for reducing per-capita energy consumption to 50% below 2007 levels by 2022. The goal has been integrated into the city's general plan.	Green Vision 2012 Annual Report Envision San Jose 2040	2

City	State	Community-Wide Energy Efficiency Goals or Related Targets	Sustainability Plan or Other Target Documentation	Score (2 pts.)
Seattle	WA	City goals have been incorporated into its comprehensive plan and include targets for greenhouse gas emissions and energy consumption. Seattle aims to reduce residential energy use by 20% and commercial energy use by 10% by 2030. Its downtown is a 2030 District with a target to reduce energy use to 10% below the national average by 2015. The city is a DOE Better Buildings Challenge Community Partner committed to 20% reduction in community-wide building energy intensity by 2020.	Seattle Climate Action Plan Ordinance 123845	2
Atlanta	GA	The city has a goal to reduce greenhouse gas emissions within the city's jurisdiction by 25% by 2020, 40% by 2030, and 80% by 2050. Atlanta is also a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	Office of Sustainability Stated Targets	1.5
Austin	TX	Community targets have been discussed and accepted by stakeholder groups. The city strives for an 80% reduction in greenhouse gas emissions below 2005 levels by 2050.	Climate Action Report Resolution 20070215-023	1.5
Baltimore	MD	The goal of reducing city-wide energy consumption by 15% by 2015 has been integrated into the Baltimore City Sustainability Plan.	Baltimore Sustainability Plan Council Bill 09-0272	1.5
Boston	MA	Boston set reduction goals for greenhouse gas emissions of 25% by the year 2020 and 80% by the year 2050. The city also has a goal of reducing city-wide electricity demand by 200 MW through energy efficiency and alternative energy installations by 2017. The city is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	A Climate of Progress Executive Order 3-3890	1.5
Chicago	IL	The city has a greenhouse gas emissions reduction goal of 20% by 2025, 80% by 2050 below 1990 levels. Chicago also has an efficiency target to improve city-wide energy efficiency by 5% by 2015. The city is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	Chicago Climate Action Plan Sustainable Chicago 2015	1.5

City	State	Community-Wide Energy Efficiency Goals or Related Targets	Sustainability Plan or Other Target Documentation	Score (2 pts.)
Denver	CO	The city has goals to reduce total CO_2-e emissions to below 1990 levels and to hold total energy consumed in Denver for buildings, transportation[?], and industrial processes below 2011 levels while supplying at least half of that total from renewable sources. The city is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	GreenPrint Denver Executive Order 123	1.5
Miami	FL	MiPlan, the city of Miami's Climate Action Plan, outlines how the city will reduce greenhouse gas emissions to 25% below 2006 levels city-wide by 2020. The plan was formally adopted by the city commission in 2008.	MiPlan Climate Action Plan Resolution 08-01096	1.5
Pittsburgh	PA	The city has a goal to reduce greenhouse gas emissions to 20% below 2003 levels by 2023. This goal applies at the municipal and city-wide level.	Pittsburgh Climate Action Plan v2.0	1.5
Riverside	CA	Riverside Public Utilities set a goal for the community to reduce its annual consumption by 1% using a 2004 baseline, and to reduce the city's peak electricity demand by 10%.	Green Riverside Green Action Plan 2012	1.5
San Francisco	CA	City Ordinance 81-08 calls for a reduction in emissions to 20% below 1990 levels for 2012, 25% by 2017, 40% by 2025, and 80% by 2050. Energy efficiency is integrated into the general plan, but quantitative goals are not explicitly stated.	Strategies to Address Greenhouse Gas Emissions; Climate Action Plan; San Francisco General Plan	1.5
Washington	DC	Several energy-related goals are included in the city's sustainability plan, Sustainable DC. These include cutting city-wide energy use by 50%, increasing the use of renewables to 50%, and cutting greenhouse gas emissions by 50%, all by 2032. The District is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	Sustainable DC	1.5
Dallas	TX	In 2006, the mayor signed the U.S. Mayors Climate Change Agreement, a commitment to reduce greenhouse gas emissions to 7% below 1990 levels by 2012. The city has identified energy efficiency as a strategy in its comprehensive plan.	Green Dallas Fact Sheet Forward Dallas! Comprehensive Plan	1
El Paso	TX	The city has a goal to reduce energy consumption by 30% by 2014 and to transition 20% of the city's energy supply and 10% of community supply to renewable sources by 2020. The city has identified energy efficiency as a strategy in its comprehensive plan.	Livable City Sustainability Plan Plan El Paso	1

City	State	Community-Wide Energy Efficiency Goals or Related Targets	Sustainability Plan or Other Target Documentation	Score (2 pts.)
Fort Worth	TX	The city has entered into a Better Buildings Challenge Community Partner Agreement with the DOE that includes a commitment to encourage local entities to commit resources to improve energy efficiency at specific facilities by 20% by the year 2020. The city has a sustainability task force and a sustainable energy roundtable.	Better Buildings Commitment	1
Los Angeles	CA	The city has identified a greenhouse gas emissions reduction goal of 35% below 1990 levels by 2030. Downtown Los Angeles is also a 2030 District with a goal to reduce energy use to 10% below the national average by 2015. The city is a DOE Better Buildings Challenge Community Partner committed to a 20% reduction in community-wide building energy intensity by 2020.	GreenLA Climate Action Plan	1
San Diego	CA	The city has drafted a climate action plan that includes goals to reduce greenhouse gas emissions by 15% by 2020, 49% by 2035, and 83% by 2050 from baseline, as well as additional energy efficiency targets for existing and new residential and commercial buildings.	Draft Climate Mitigation and Adaptation Plan	1
St. Louis	MO	The city has identified a greenhouse gas emissions reduction target of 25% by 2020 and 80% by 2050 compared to current levels.	City of St. Louis Sustainability Plan	1
Tampa	FL	Following the state's adopted greenhouse gas reduction target, the city set a goal to reduce emissions to 1990 levels by 2025.	Annual Sustainability Report	1
Charlotte	NC	No specific community-wide target for a reduction in energy use has been identified, although the city's sustainability plan calls for targets to be considered. The privately run initiative Envision Charlotte has set energy efficiency targets for the downtown area.	Charlotte's Energy Future	0.5
Columbus	OH	The city is currently gathering data with a plan to set community-wide energy efficiency targets. Community members are engaged in the process through GreenSpot.	NA	0.5
Detroit	MI	No target has been identified, but the city's Green Task Force has developed broad stakeholder working groups.	NA	0.5
Houston	TX	The city has not formally adopted a long-term community-wide energy efficiency target but has joined the DOE's Better Buildings Challenge, which has an energy reduction goal of 20% by 2020. The city also has a stakeholder sustainability coordinating committee.	NA	0.5

City	State	Community-Wide Energy Efficiency Goals or Related Targets	Sustainability Plan or Other Target Documentation	Score (2 pts.)
Memphis	TN	The city and county endorsed a community-driven goal of creating 800 MW of renewable energy and energy savings through energy efficiency by 2020; however, the administration has not endorsed the target and is currently in the process of developing a lower target.	Sustainable Shelby Implementation Plan	0.5
Phoenix	AZ	The city works with the Environmental Quality Commission, an appointed citizen's group composed of 15 members. No community-wide energy efficiency goals have been established.	NA	0.5
Indianapolis	IN	No community-wide energy efficiency target has been identified.	NA	0
Jacksonville	FL	No community-wide energy efficiency target has been identified.	NA	0

Table C-2. Performance Management Strategies

City	State	Implementation, Monitoring, and Reporting Details
Atlanta	GA	Community-wide initiatives are overseen by the Office of Sustainability. The city has allocated $500 million to help meet the community goals set forth in Power to Change.
Austin	TX	The city reports annually on community-wide efficiency targets, many of which are included in its comprehensive plan Imagine Austin. Greenhouse gas goals are independently evaluated. Programs to meet efficiency targets are run through Austin Energy's Distributed Energy Services. The city has more than 60 staff members dedicated to sustainability initiatives.
Baltimore	MD	Annual sustainability reports track greenhouse gas emissions and energy use. In 2011, the city saw progress in all sectors except industrial and commercial. Data are provided by Baltimore Gas and Electric but are not independently verified. The city has six FTEs (full-time equivalents) in the sustainability office and lobbied for dedicated funding from the Maryland Public Service Commission to implement efficiency programs.
Boston	MA	Boston tracks its progress (although mostly with regard to greenhouse gas emissions) and reports on progress annually on its website. The Renew Boston Energy Efficiency program has been reviewed by third parties. Several departments have dedicated funding for energy efficiency initiatives, including Environmental and Energy Services, the transportation department, and Boston Redevelopment Authority. An estimated 30 FTE are dedicated to implementation of efficiency and sustainability goals.
Charlotte	NC	The city posts key indicator updates regularly on websites. Sustainability programs are funded using Energy Efficiency and Conservation Block Grants and coordinated by the energy and sustainability manager.
Chicago	IL	Updates to Sustainable Chicago are released every six months. The city is making progress toward efficiency goals through Retrofit Chicago. Progress is tracked by C40, the Natural Resources Defense Council, and technical advisors. Dedicated staff in Department of Environment oversee initiatives using state and federal funding as well as funds from energy savings.

City	State	Implementation, Monitoring, and Reporting Details
Columbus	OH	Annual reports include city-wide progress. The city studied its baseline greenhouse gas emissions in 2005. Three FTEs are dedicated in the Mayor's Office of Environmental Stewardship with 22 staff assigned representing their departments and divisions.
Dallas	TX	Reporting is not annual, although the city did release a progress report in 2012. The city is on track to meet its emissions goal due to the purchase of renewable energy. A portion of sustainability program data is compiled/verified by third-parties. There are currently 22 positions in the Office of Environmental Quality, with program funding dedicated in the city budget.
Denver	CO	A community-wide energy efficiency target was adopted in March 2013; therefore, it is too early to assess progress. The Denver Energy Challenge tracks and releases an internal report on its outcomes on a monthly basis. Periodic community updates are released when milestones are reached. The 2012 greenhouse gas target was achieved, and the city anticipates achieving the 2020 energy reduction goal. EMS ISO14001 allows third parties to audit data and reports. Currently, approximately eight FTE work on achieving greenhouse gas and energy efficiency goals using dedicated funding. The Department of Environmental Health also has ongoing enterprise funding for greenhouse gas reduction programs.
Detroit	MI	No data found.
El Paso	TX	The city is on track to reduce energy consumption by 30% by 2014 and reports annually. Progress is evaluated, monitored, and verified primarily by the sustainability department, but Johnson Controls and General Services monitor the data through performance contracts. The sustainability department has a budget for small projects and outreach programs, along with additional grant funding. Three full-time employees in the sustainability department are dedicated to the implementation of the city's energy goals.
Fort Worth	TX	The city plans to report biannually as part of the Better Building Challenge, but has not yet done so. Performance is monitored by the DOE. The city has dedicated incentive revenues to efficiency projects. The city employs a conservation specialist to oversee efficiency programs.
Houston	TX	Though the city has no specific energy goals, sustainability initiatives are overseen by the Mayor's Office of Sustainability.
Indianapolis	IN	The city has seven FTEs dedicated to the implementation of sustainability goals, although it does not have any energy-specific goals.
Jacksonville	FL	Although the city has no energy-specific goals, sustainability initiatives are overseen by the Office of Sustainability Initiatives.
Los Angeles	CA	Although the city has no specific energy goals, sustainability initiatives are overseen by the Environmental Affairs Department.
Memphis	TN	Although the city has no specific energy goals, sustainability initiatives are overseen by the Office of Sustainability, which has three full-time staff.
Miami	FL	Although the county reports annually, there is no reporting on energy goals at the city level. Two FTEs oversee sustainability efforts.
Minneapolis	MN	The city reports annually through GreenPrint progress reports. The 2012 report indicated that the city was on track to meet energy goals. Two staff members are dedicated to sustainability initiatives, and many others across departments work on related initiatives.
New York City	NY	The city releases annual greenhouse gas inventories and progress reports. City-wide emissions were 16.1% lower in 2011 than 2005, surpassing the half-way point of the PlaNYC goal of a 30% reduction in greenhouse gas emissions by 2030. Funding is allocated annually through city capital and operating budgets, and several lead agencies coordinate sustainability initiatives, overseen by the Office of Long-Term Planning and Sustainability.

City	State	Implementation, Monitoring, and Reporting Details
Philadelphia	PA	The city reports annually in Greenworks progress reports, but is not on track to meet energy goals since building energy usage increased between 2006 and 2010. City-wide data are supplied by utilities, but are not independently verified. Community-wide initiatives are overseen by the Office of Sustainability.
Phoenix	AZ	Sustainability reports are released annually. The city is on track to reduce building energy usage per its Energize Phoenix goals. Retrofit project data are reviewed by the city's local utility partner Arizona Public Service Company (APS) and research partner (Arizona State University) then submitted to DOE for review. Five full-time staff are dedicated to Energize Phoenix initiatives, although most project funding comes from the American Recovery and Reinvestment Act (ARRA).
Pittsburgh	PA	Sustainability initiatives are overseen by the city sustainability coordinator. The city has completed greenhouse gas inventories, but does not report annually.
Portland	OR	The city releases annual climate action reports and is on track to meet many of its energy goals. Individual efficiency programs are typically evaluated by third parties. Climate and energy work is funded on an on-going basis through solid waste management fees, with additional energy efficiency work funded by grants. The city has 7.5 FTEs for climate, building, and energy work.
Riverside	CA	The city's sustainability initiatives are administered by Riverside Public Utilities. The city does not publish formal reports, but does publish the minutes of Green Accountability Performance Committee meetings on its website.
Sacramento	CA	No data found.
San Antonio	TX	The city requires CPS energy to provide annual reports, prepared by a third party, which quantify savings from the Save for Tomorrow Energy Plan (STEP). CPS Energy is on track to meet energy goals laid out by the city. Seven FTEs are dedicated to these initiatives. The total cost of the STEP Program from 2009 to 2020 is estimated at $849 million.
San Diego	CA	Currently, the city does not report regularly, but once its Climate Action Plan is finalized, it will be monitored annually. Funding shortfalls have prevented implementation of community-wide programs.
San Francisco	CA	Annual reporting is done by the city's Department of Environment. As of 2010, the city had achieved city-wide emission reductions of 14.5% below 1990 levels. Data are verified by ICF International. Programs have dedicated funding through San Francisco Public Utilities Commission and ratepayers. The Department of Environment has four FTEs dedicated to climate goals. Seventeen additional staff work on green building and energy efficiency programs and policies including financing and marketing. In addition, climate liaisons are in each of the city's 50+ departments.
San Jose	CA	The city reports annually. Sustainability initiatives are led by a steering committee of executive staff with dedicated staff in charge of specific goals. Funding sources include more than $85 million in grants and a community benefit funding program through PG&E. The city has experienced some difficulty in reinvesting savings from energy efficiency projects.
Seattle	WA	The city releases annual progress reports for energy initiatives and is on track to reaching its greenhouse gas targets. The city follows Climate Registry protocols in conducting inventories, but does not pay for independent verification. Programs are supported through a road pricing system, commercial parking tax, and the Neighborhood Matching Fund, in addition to general funds.
St. Louis	MO	Annual updates for climate and energy initiatives began in 2010. The city is on track to meet some, but not all, of its energy goals. Sustainability initiatives are overseen by the sustainability director in the mayor's office, and programs are funded through departmental budgets and grant funding.
Tampa	FL	The city releases annual reports on energy and climate initiatives. Initiatives are led by the city's Green Officer using Energy Efficiency and Conservation Block Grants funding and TECO programming funds.

City	State	Implementation, Monitoring, and Reporting Details
Washington	DC	The Sustainable DC targets were released in February 2013, and work on the tracking system is currently underway; quarterly updates with an annual full progress report are likely. The city hosts a green dashboard with publicly available data and a report card, and has $4.5 million currently available for implementation. Sustainable DC calls for dedicated city government staff and funding to implement the plan, track progress, and make results publicly available.

Sources and Notes: Data for this table were gathered from city sustainability plans or through correspondence with city sustainability managers as noted in Appendix A.

Table C-3. City Scores for Efficient Distributed Energy—District Energy and Combined Heat and Power

City	State	District Energy (DE) Systems	DE Systems with CHP Integrated	District Energy Score (1 pt.)	Total CHP Capacity in City (kW)	CHP capacity per 100,000 in population (MW)	CHP Score (2 pts.)	Total Score (3 pts.)
Houston	TX	16	1	1	638,600	29.8	2	3
St. Louis	MO	4	1	1	71,850	22.6	2	3
San Diego	CA	12	1	1	238,542	18.0	2	3
New York City	NY	19	2	1	1,469,083	17.8	2	3
Boston	MA	5	1	1	109,917	17.6	2	3
Denver	CO	3	1	1	107,000	17.3	2	3
Philadelphia	PA	9	1	1	192,600	12.5	2	3
Sacramento	CA	2	0	0.5	263,715	55.9	2	2.5
Pittsburgh	PA	7	0	0.5	131,270	42.7	2	2.5
Jacksonville	FL	3	0	0.5	262,400	31.7	2	2.5
Atlanta	GA	4	0	0.5	105,100	24.3	2	2.5
Baltimore	MD	5	0	0.5	113,502	18.3	2	2.5
Miami	FL	5	0	0.5	73,845	18.1	2	2.5
Detroit	MI	2	1	1	85,255	12.1	1.5	2.5
Austin	TX	7	2	1	95,100	11.6	1.5	2.5
San Francisco	CA	5	0	0.5	77,089	9.5	1	1.5
San Jose	CA	3	0	0.5	54,322	5.6	1	1.5
Memphis	TN	4	0	0.5	35,513	5.4	1	1.5
Chicago	IL	14	0	0.5	146,630	5.4	1	1.5
Indianapolis	IN	3	0	0.5	42,000	5.1	1	1.5
Minneapolis	MN	1	1	1	18,528	4.8	0.5	1.5
Los Angeles	CA	4	1	1	99,546	2.6	0.5	1.5
El Paso	TX	3	0	0.5	24,200	3.6	0.5	1
Tampa	FL	2	0	0.5	9,500	2.7	0.5	1
Fort Worth	TX	1	0	0.5	18,650	2.5	0.5	1
Riverside	CA	2	1	1	3,492	1.1	0	1
Washington	DC	8	0	0.5	14,475	2.3	0	0.5
Seattle	WA	4	0	0.5	8,900	1.4	0	0.5
Dallas	TX	5	0	0.5	13,800	1.1	0	0.5

City	State	District Energy (DE) Systems	DE Systems with CHP Integrated	District Energy Score (1 pt.)	Total CHP Capacity in City (kW)	CHP capacity per 100,000 in population (MW)	CHP Score (2 pts.)	Total Score (3 pts.)
San Antonio	TX	6	0	0.5	13,900	1.0	0	0.5
Portland	OR	7	0	0.5	2,065	0.3	0	0.5
Phoenix	AZ	6	0	0.5	460	0.0	0	0.5
Columbus	OH	1	0	0.5	0	0.0	0	0.5
Charlotte	NC	0	0	0	0	0.0	0	0

Sources and Notes: IDEA (2013); ICF International (2012a)

Table C-4. Heat Island Mitigation Strategies

City	State	Urban Heat Island Mitigation Programs	Urban Heat Island Mitigation Policies	State-wide Cool-Roof Policy[1]	Score (2 pts.)
Austin	TX	Tree planting programs run through the Parks Urban Forestry Group and primarily funded by Austin Energy.	Cool roof requirement is based on the Austin Energy Green Building Ratings and/or LEED certification; varies by zoning, location, and building type.		2
Boston	MA	The city has Grow Boston Greener, an initiative with the goal of planting 100,000 new trees in Boston by 2020 and increasing the number of trees by 20%. The city promotes cool roofs.	Article 37 is the city's LEED requirement for buildings, which has a heat island credit.		2
Chicago	IL	The city has a goal to increase rooftop gardens to a total of 6,000 buildings city-wide and to plant an estimated 1 million trees.	Chicago Energy Conservation Code includes cool roof policy.	•	2
Dallas	TX	More than 700 acres of natural and wildflower areas were added through October 2012 as part of the Parks Environmental Sustainability Plan.	A cool roof policy is included in Green Building Ordinance.		2
Fort Worth	TX	The Street Tree program gives residents free trees in right-of-way easements. The Tree Grant program awards bonus points if trees are planted within 25 feet of nonpermeable surfaces.	The city has an ordinance that requires trees in parking lots.		2

City	State	Urban Heat Island Mitigation Programs	Urban Heat Island Mitigation Policies	State-wide Cool-Roof Policy[1]	Score (2 pts.)
Houston	TX	Million Trees + Houston set a three- to five-year goal to plant one million trees.	A cool roof policy is included in the city's Commercial Energy Conservation Code.		2
Miami	FL	None	The City of Miami Code has cool roof and cool hardscape policies for new construction and major renovations.	●	2
New York City	NY	MillionTreesNYC is a city-wide public-private program with a goal to plant and care for one million new trees across the city's five boroughs over the next decade.	Cool roofs are mandatory city-wide for all new buildings.		2
Philadelphia	PA	Greenworks has a goal to plant 300,000 trees by 2015. Retrofit Philly cool roof competition in 2010 also helped to educate residents about the benefits of cool roofs.	Cool roof policies require that low-slope roofs be highly reflective.		2
Portland	OR	The city has tree planting programs.	The city's Ecoroof Program offers $5 per square foot to property owners and developers for ecoroof projects.		2
San Diego	CA	The city has a goal to implement heat island mitigation strategies is included in draft Climate Mitigation Action Plan.	The city adopted the California Green Buildings Code, which includes a performance credit for cool roofs.	●	2
San Francisco	CA	The Department of Public Health is currently working to identify neighborhoods at high risk from heat waves. The planning department plans to launch an Urban Forest Master Plan.	The city adopted the California Green Buildings Code, which includes a performance credit for cool roofs.	●	2
St. Louis	MO	City is conducting tree planting and has pilot programs for park greenspaces and white roofs in process.	Tree Ordinance 68607 (2010) requires that the city have no net loss in the population and canopy of its urban forest.		2

City	State	Urban Heat Island Mitigation Programs	Urban Heat Island Mitigation Policies	State-wide Cool-Roof Policy[1]	Score (2 pts.)
Baltimore	MD	The Tree Baltimore program is working on a goal to double the tree canopy by 2037. It is targeting its tree plantings based on heat islands in the city.	None		1
Indianapolis	IN	NeighborWoods is Keep Indianapolis Beautiful's urban forestry effort to strategically plant trees throughout the city.	None		1
Los Angeles	CA	The Green LA plan includes a goal to plant one million trees.	None	●	1
Memphis	TN	The city's goal is to develop an urban forestry program, hire a full-time urban forester to audit the current system, develop a "tree master plan," and create an initiative to plant 5,000 street trees per year.	None		1
Minneapolis	MN	The city's goal is to maintain the tree canopy at 26% of the city through 2015 and increase it to 30% of the city by 2030.	None		1
Phoenix	AZ	An Urban Heat Island Task Force established in 2005. Cool pavement was installed at a 90,000 square foot temporary parking lot in downtown Phoenix.	None		1
Pittsburgh	PA	The city has a cool roof program and a goal to double the number of shade trees within the city.	None		1

City	State	Urban Heat Island Mitigation Programs	Urban Heat Island Mitigation Policies	State-wide Cool-Roof Policy[1]	Score (2 pts.)
Riverside	CA	The city has a goal to increase the city's urban forest and will plant at least 1,000 trees in city parks and right-of-ways annually and encourage the planting of at least 3,000 shade trees on private property annually.	None	●	1
San Antonio	TX	The city's target is to have 40% overall tree canopy in the city's extraterritorial jurisdiction.	Cool roof rebate through CPS Energy		1
San Jose	CA	The city is participating in the Lawrence Berkeley National Laboratory Cool Cities pilot program. The city is implementing a program called 100,000 Trees and Zero Emission Lights.	None	●	1
Seattle	WA	Seattle currently has 23% canopy cover and a goal to reach 30% by 2037.	None		1
Tampa	FL	The city is striving for "Tree City USA" designation.	None	●	1
Washington	DC	As a heat island mitigation strategy, the city has a goal to cover over 40% of the District with a healthy tree canopy by 2032.	None		1
Atlanta	GA	None	None	●	1
Charlotte	NC	None	None	●	1
Columbus	OH	None	None		0
Denver	CO	No policy is in place, although it is the practice to utilize white TPO for new and replacement roofs wherever practical.	None		0
Detroit	MI	None	None		0
El Paso	TX	None	None		0

City	State	Urban Heat Island Mitigation Programs	Urban Heat Island Mitigation Policies	State-wide Cool-Roof Policy[1]	Score (2 pts.)
Jacksonville	FL	None	None	●	0
Sacramento	CA	None	None	●	0

Sources and Notes: [1]Cool roof policies collected from the Cool Roof Rating Council. For all other policies, see city sustainability reports as noted in Appendix A.

Appendix D: Detailed Information on Buildings Policies

Table D-1: Scores and Policy Details for Requirements, Incentives and Goals for Efficient Buildings

City	State	Green Building Requirements (2 pts.)	Type of Above-Code Green Building Requirement	Building Energy Savings Goal (1 pt.)	Retrofit Req. (2 pts.)	Audit Req. (1 pt.)	Incentives or Financing Programs (3 pts.)	Incentive Type and Applicable Sector (Commercial, Residential, and/or Public, or not specified if not listed)	Total Score (9 pts.)
New York City	NY	2	Public	0	1	1	3	Loans; financing; energy service agreements (comm)	7
Boston	MA	2	Residential, Commercial, Public	1	2	1	1	Expedited permitting; height bonus	7
San Francisco	CA	2	Commercial, Residential, Public	0	1	0.5	3	Expedited permitting (res, comm); property assessed clean energy (PACE) financing (res, comm)	6.5
Washington	DC	2	Commercial, Residential, Public	1	0	0	2	PACE financing (comm); rebates (res); free energy audit program (res); weatherization assistance program (res)	5
Seattle	WA	0.5	Public	1	0	0	3	Expedited permitting; density bonuses; land use departures (res, comm)	4.5
Austin	TX	2	Residential, Commercial, Public	0	1	0.5	1	Density bonus (res, comm)	4.5
Portland	OR	0.5	Public	0	0	0	2.5	Plan review assistance (comm); PACE financing (comm); reduced permit fees; loans and grants; on-bill financing (res)	3
Houston	TX	0.5	Public	1	0	0	1.5	Tax abatements; incentives; free weatherization measures	3
Chicago	IL	1	Commercial, Public	1	0	0	1	Streamlined permitting process	3
Dallas	TX	2	Residential, Commercial, Public	0	0	0	1	Expedited permitting (res, comm)	3
Miami	FL	2	Commercial, Residential, Public	0	0	0	0.5	PACE financing (comm)	2.5
Sacramento	CA	0.5	Public	1	0	0	1	Financing (through a PACE-like program for res and comm)	2.5
Columbus	OH	1	Residential, Public	0	0	0	1.5	Grants for LEED certification (comm, res); fund matching for specific multifamily projects building ENERGY STAR-certified buildings with utility incentives	2.5
Denver	CO	0.5	Public	1	0	0	1	Loan program (res, comm)	2.5
San Diego	CA	0.5	Public	1	0	0	1	Expedited permitting (res, comm)	2.5

San Antonio	TX	0.5	Public	1	0	0	0.5	Rebate	2
Tampa	FL	0.5	Public	0	0	0	1.5	Expedited plan review (comm), rebate (res, comm)	2
Baltimore	MD	2	Residential, Commercial, Public	0	0	0	0	None	2
Pittsburgh	PA	0.5	Public	1	0	0	0.5	Density bonus (comm)	2
Philadelphia	PA	0.5	Public	1	0	0	0.5	Density bonus	2
San Jose	CA	2	Commercial, Residential, Public	0	0	0	0	None	2
Riverside	CA	0.5	Public	0	0	0	1.5	Rebate (comm); PACE financing (res, comm)	2
El Paso	TX	0.5	Public	0	0	0	1.5	Grants (comm); expedited permitting (res, comm)	2
Phoenix	AZ	0.5	Public	0	0	0	1	Rebate (comm); incentive (res)	1.5
Fort Worth	TX	0.5	Public	1	0	0	0	None	1.5
St. Louis	MO	0.5	Public	0	0	0	1	PACE financing (res, comm)	1.5
Minneapolis	MN	0.5	Public	0	0	0	1	Density bonus (res, comm)	1.5
Los Angeles	CA	0.5	Public	1	0	0	0	None	1.5
Atlanta	GA	0.5	Public	1	0	0	0	None	1.5
Memphis	TN	0	None	0	0	0	1	Tax abatements (res, comm)	1
Detroit	MI	0	None	0	0	0	0.5	Grants (comm, public)	0.5
Indianapolis	IN	0	None	0	0	0	0.5	Reduced permitting fees	0.5
Jacksonville	FL	0.5	Public	0	0	0	0	None	0.5
Charlotte	NC	0.5	Public	0	0	0	0	None	0.5

Sources: Data obtained through surveys to city sustainability officials and the DSIRE database.

Table D-1a: Scoring and Policy Details on Requirements and Incentives for Building Energy Retrofits and Audits

City	State	Retrofit (2 pts.)	Audit (1 pt.)	Requirement Type (Energy Audit or Retrofit)
Boston	MA	2	1	Energy audit (commercial and multifamily residential); retro-commissioning (commercial and multifamily residential)
New York City	NY	1	1	Energy audit (commercial and residential); retro-commissioning (commercial)
San Francisco	CA	1	0.5	Energy audit (commercial); residential energy conservation ordinance (RECO)—retrofit requirement (residential)

Austin	TX	1	0.5	Energy audit (residential); energy efficiency measures required for high energy consuming multifamily buildings (residential)

Sources: Data obtained through surveys to city sustainability officials and the DSIRE database.
Note: Cities that are not listed above received no points in this category.

Table D-2: Scoring and Policy Details on Commercial Building Benchmarking and Disclosure

City	State	Commercial Benchmarking Score (3 pts.)	Policy Details
San Francisco	CA	3	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); data reporting (0.5); public disclosure of data (0.5)
New York City	NY	3	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); data reporting (0.5); public disclosure of data (0.5)
Washington	DC	3	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); data reporting (0.5); public disclosure of data (0.5)
Philadelphia	PA	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0); enforcement (0.5); data reporting (0.5); public disclosure of data (0.5)
Seattle	WA	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); data reporting (0.5); quality data inputs (0)
Austin	TX	2	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); data reporting (0); public disclosure of data (0)
Boston	MA	2	Policy adopted (0.5); Policy implemented (0); training and guidance (0); enforcement (0.5); data reporting (0.5); public disclosure of data (0.5)
Minneapolis	MN	2	Policy adopted (0.5); Policy implemented (0); training and guidance (0.5); enforcement (0); data reporting (0.5); public disclosure of data (0.5)

Sources: Data obtained through surveys to city sustainability officials, and city benchmarking and disclosure ordinance documents.
Note: Cities that are not listed above received no points in this category.

Table D-3: Scoring and Policy Details on Residential/Multifamily Rating, Benchmarking and Disclosure

City	State	Residential Benchmarking Score (3 pts.)	Policy Details
Austin	TX	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0); Green MLS features (0.5); availability of reported data (0.5)
Seattle	WA	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); Green MLS features (0.5); availability of reported data (0)
New York City	NY	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); Green MLS features (0); availability of reported data (0.5)
Washington	DC	2.5	Policy adopted (0.5); Policy implemented (0.5); training and guidance (0.5); enforcement (0.5); Green MLS features (0); availability of reported data (0.5)
Chicago	IL	2	Policy adopted (0.5); Policy implemented (0.5); training

			and guidance (0); enforcement (0.5); Green MLS features (0.5); availability of reported data (0)
Boston	MA	2	Policy adopted (0.5); Policy implemented (0); training and guidance (0); enforcement (0.5); Green MLS features (0.5); availability of reported data (0.5)
San Francisco	CA	0.5	Green MLS (0.5)
Minneapolis	MN	0.5	Green MLS (0.5)
Charlotte	NC	0.5	Green MLS (0.5)
Denver	CO	0.5	Green MLS (0.5)
Houston	TX	0.5	Green MLS (0.5)
Los Angeles	CA	0.5	Green MLS (0.5)
Memphis	TN	0.5	Green MLS (0.5)
Phoenix	AZ	0.5	Green MLS (0.5)
Portland	OR	0.5	Green MLS (0.5)
Riverside	CA	0.5	Green MLS (0.5)
Sacramento	CA	0.5	Green MLS (0.5)
San Antonio	TX	0.5	Green MLS (0.5)
San Diego	CA	0.5	Green MLS (0.5)
San Jose	CA	0.5	Green MLS (0.5)
Seattle	WA	0.5	Green MLS (0.5)

Sources: Data obtained through surveys to city sustainability officials, and city benchmarking and disclosure ordinance documents.
Note: Cities that are not listed above received no points in this category.

Table D-4: Comprehensive Efficiency Services Scores

City	State	Home Performance with ENERGY STAR Program (2 pts.)
Atlanta	GA	2
Austin	TX	2
Baltimore	MD	2
Boston	MA	2
Chicago	IL	2
Denver	CO	2
Detroit	MI	2
Houston	TX	2
Los Angeles	CA	2
Minneapolis	MN	2
New York City	NY	2
Philadelphia	PA	2
Phoenix	AZ	2
Pittsburgh	PA	2
Portland	OR	2
Riverside	CA	2
Sacramento	CA	2

San Diego	CA	2
San Francisco	CA	2
San Jose	CA	2
Seattle	WA	2
St. Louis	MO	2
Washington	DC	2

Sources: ENERGY STAR program data obtained through independent research and Home Performance with ENERGY STAR online database.

Note: Cities that are not listed above received no points in this category.

Appendix E: Detailed Information on Energy Utility Policies and Public Benefits Programs

Table E-1: Cities with Investor-Owned Utilities: Partnerships and Advocacy

City	Utilities	Utility Partnerships	Advocacy Efforts
Baltimore	Baltimore Gas and Electric(BGE)	The city promotes Baltimore Gas and Electric's Smart Energy Savers programs through the Baltimore Energy Challenge. Using peer-to-peer education and networking, "energy captains" share information on the free and subsidized programs offered by BGE.	Baltimore successfully advocated for the Maryland Public Service Commission to allocate $52 million to the city for its CREATES program from the fund created by the merger of BGE and Excelon.
Boston	Nstar, National Grid	The Renew Boston program partners with the Boston-area utilities to promote their energy efficiency programs to residents and small businesses. As part of this partnership, Renew Boston has a utility manager whose position is funded by the utilities to coordinate energy efficiency promotion to large energy users.	The city successfully advocated for the state-wide Energy Efficiency Advisory Committee, which approves utility energy efficiency program plans, to include a seat for a city or town representative. Boston is the current committee member.
Chicago	Commonwealth Edison, People's Gas	The city actively promotes utility energy efficiency programs and other rebates and incentives through its commercial and residential programs in Retrofit Chicago.	
Columbus	AEP Ohio, Columbia Gas	The city partners with its utilities to co-promote energy efficiency programs for residents and small businesses through its Green Spot outreach program. The city is also working with American Electric Power (AEP) Ohio to assist local manufacturers in becoming more sustainable through expanding the E3 program (Economy, Energy, and Environment), a partnership at the federal, state, and local levels.	The mayor of Columbus, Michael Coleman, has advocated for the state's Energy Efficiency Resource Standard (SB 221 Ohio's Advanced Energy Portfolio Standard) to remain in place.
Dallas	Oncor Electric, Atmos Gas	The city promotes energy efficiency and rebate programs offered by Oncor through its Green Dallas website.	
Denver	Xcel Energy	The Denver Energy Challenge, which is funded by the DOE Better Buildings Program and provides free energy efficiency services and loans to residents and businesses, partners with Xcel Energy to cross-promote programs. Energy advisors in the Denver Energy Challenge are trained to promote the Xcel product portfolio and answer questions for residents and businesses on their programs.	Denver regularly intervenes in Colorado Public Utility Commission proceedings regarding Xcel's energy efficiency portfolio plans and to advocate for policies that more easily allow utility customers to share their own data with a third party for analysis.

El Paso	El Paso Electric, Texas Gas	El Paso Electric has partnered with the city's Green Business Challenge to provide workshops to educate businesses on strategies for saving energy. The city also promotes the utility's incentive and rebate offers.	
Houston	CenterPoint Energy	CenterPoint was a sponsor of the Houston Green Office Challenge and presented its energy efficiency programs to participants during educational meetings. The city is also working with CenterPoint to use its funding to continue the city's Residential Energy Efficiency Program (REEP), an income-qualified weatherization program. CenterPoint has committed $3 million for the city's REEP program and $2 million to offset the costs of the city's municipal energy efficiency program to retrofit the city's libraries.	The city regularly intervenes in Texas Public Utility Commission proceedings regarding CenterPoint's energy efficiency programs.
Indianapolis	Indianapolis Power and Light (IPL), Citizens Gas	The city partners with Indianapolis Power and Light in the promotion and implementation of its income-qualified weatherization program, administered by the state-wide third-party administrator. The city has leveraged its Better Buildings Neighborhood Program grant funding with the utility funding to increase benefits to customers while reducing the administrative costs associated with customer recruitment and the delivery of energy assessments. The city also partners with Citizens Gas in administering a portion of the city's weatherization funds.	The city has advocated for its utilities to offer on-bill financing for both utility- and city-sponsored energy efficiency programs. To date, Citizens Gas has implemented on-bill financing and makes this service available to customers participating in the city's EcoHouse loan program for medium- and low-income homeowners.
Minneapolis	Xcel Energy, CenterPoint Energy	The city promotes its utilities' rebate programs. The city funds, along with Xcel, CenterPoint and several other cities, the Home Energy Squad program, a low-cost residential installation program.	The city's current state legislative agenda includes advocating for the state to pass legislation that would allow the city to use franchise agreements with the local utilities to achieve local goals for energy efficiency and renewable energy.
New York City	Consolidated Edison, National Grid	The city administers several programs in partnership with its utilities. NYC Clean Heat is a partnership between the Environmental Defense Fund, National Grid, and Consolidated Edison. The program provides technical assistance to property owners and encourages them to convert from low-quality fuel oil to cleaner heating fuels and more efficient boilers at a faster pace than required by local regulations. Other programs that partner with the utilities include GreeNYC, the public education initiative of PlaNYC, and the mayor's Climate Challenge.	The city regularly provides comments and testimony to the New York Public Service Commission advocating for improvements to utility energy efficiency programs and the state's energy efficiency portfolio standard, and for improved access to energy usage data to support the implementation of city's benchmarking and disclosure policy.
Phoenix	Arizona Public Service, Southwest Gas	The Energize Phoenix Program, which is funded by the DOE Better Buildings Neighborhood Program, is a partnership	The city supports Arizona Public Service in gaining approval from the Arizona Corporation Commission for its annual

		between the city and Arizona Public Service (APS). It markets and leverages APS funding for energy efficiency incentives in targeted Phoenix neighborhoods.	energy efficiency incentive program.
Portland	Portland General Electric, Northwest Natural Gas	Portland partners with its utilities on numerous programs, including Sustainability at Work, a program partially funded by the utilities that offers free assistance to organizations to create sustainable workplaces; Clean Energy Works Portland/Oregon, a whole-home retrofit financing program that offers utility on-bill repayment; and Bucks for Buildings, an American Reinvestment and Recovery Act–funded rebate program for small commercial buildings.	Portland is a founding member of the Fair and Clean Energy Coalition that advocates for energy efficiency targets and dedicated public purpose funds. The city also routinely participates in Public Utility Commission proceedings.
San Francisco	Pacific Gas, and Electric (PG&E)	San Francisco partners with Pacific Gas, and Electric to administer the SF Energy Watch program targeting multifamily and commercial and property owners to offer incentives, technical services, and quality control for energy efficiency upgrades for both electricity and gas. The city is also partnering with the utility customer–funded Bay Area Regional Energy Network program that serves single and multifamily buildings, improve building code compliance, and provide financing for energy efficiency projects.	The city frequently participates in regulatory proceedings to advocate for additional energy efficiency spending and higher energy efficiency targets for utilities.
San Jose	Pacific Gas and Electric	San Jose partners with Pacific Gas and Electric to administer the Silicon Valley Energy Watch, a program funded by utility customers which serves all of Santa Clara County with energy efficiency service coordination, outreach, and training.	
Charlotte	Duke Energy	The city has worked with Duke Energy to develop energy efficiency programs to benefit Charlotte residents and businesses. Smart Energy Now is a Duke Energy program developed with Envision Charlotte, a public-private partnership designed/aiming to improve the sustainability of Charlotte's Uptown area. The goal of Smart Energy Now is to reduce energy consumption in Uptown office buildings by 5% from current levels. Duke Energy has also partnered with the city on projects funded by the federal Energy Efficiency and Conservation Block Grants.	
Atlanta	Atlanta Gas Light (AGL), Georgia Power	Atlanta has promoted Georgia Power's and Atlanta Gas Light's energy efficiency programs. The city and AGL partnered to complete an energy retrofit of the Atlanta Civic Center as part of the DOE Better Buildings Challenge, and the SHINE home weatherization program funded by the Better Buildings Neighborhood Program is designed to build on and leverage	

		existing utility rebate programs.
Fort Worth	Oncor Electric, Atmos Gas	The city partners with Oncor Electric and Atmos Energy in its DOE Better Buildings Challenge effort, including providing Portfolio Manager training and sponsoring a DOE Better Buildings Case Competition. Oncor is also a partner in the city's weatherization program run through the city's housing and economic development department.

Sources: Data request responses as noted in Appendix A or independent research.

Table E-2. Water Utilities

City	Drinking Water Utility	Wastewater Treatment	Stormwater Utility
Atlanta	Atlanta Watershed Management Division (municipal)	Atlanta Watershed Management Division (municipal)	Atlanta Watershed Management Division (municipal)
Austin	Austin Water (municipal)	Austin Water (municipal)	Austin Water (municipal)
Baltimore	Bureau of Water and Wastewater (municipal)	Bureau of Water and Wastewater (municipal)	Bureau of Water and Wastewater (municipal)
Boston	Boston Water and Sewer Commission (municipal)	Massachusetts Water Resources Authority (state)	Boston Water and Sewer Commission (municipal)
Charlotte	Charlotte-Mecklenberg Utilities (municipal-county)	Charlotte-Mecklenberg Utilities (municipal-county)	Charlotte-Mecklenberg Utilities (municipal-county)
Chicago	Water Management (municipal)	Metropolitan Water Reclamation District of Greater Chicago (region)	Water Management (municipal)
Columbus	Department of Public Utilities (municipal)	Department of Public Utilities (municipal)	Department of Public Utilities (municipal)
Dallas	Dallas Water Utilities (municipal)	Dallas Water Utilities (municipal)	Dallas Water Utilities (municipal)
Denver	Denver Water (municipal)	Metro Wastewater Reclamation District (regional)	Denver Waste Management (municipal)
Detroit	Detroit Water and Sewerage Department (municipal)	Detroit Water and Sewerage Department (municipal)	Detroit Water and Sewerage Department (municipal)
El Paso	EL Paso Water Utility (municipal)	EL Paso Water Utility (municipal)	EL Paso Water Utility (municipal)
Fort Worth	Water Department (municipal)	Water Department (municipal)	Water Department (municipal)
Houston	Public Works and Engineering Department (municipal)	Public Works and Engineering Department (municipal)	Public Works and Engineering Department (municipal)
Indianapolis	Citizens Water (investor-owned)	Citizens Water (investor-owned)	Citizens Water (private Utility) and Department of Public Works (municipal)
Jacksonville	JEA (municipal)	JEA (municipal)	Jacksonville Stormwater Utility (municipal)
Los Angeles	Los Angeles Department of Water and Power (municipal)	Los Angeles Department of Water and Power (municipal)	Los Angeles Bureau of Sanitation (municipal)

Memphis	Memphis Light, Gas and Water (municipal)	Department of Public Works (municipal)	Department of Public Works (municipal)
Miami	Miami-Dade Water and Sewer Department (municipal-county)	Miami-Dade Water and Sewer Department (municipal-county)	Miami-Dade Stormwater Utility (municipal-county)
Minneapolis	Department of Public Works, Water Treatment and Distribution Services (municipal)	Metropolitan Council, Environmental Services (regional)	Department of Public Works, Surface Water and Sewers (municipal)
New York City	Department of Environmental Protection (municipal)	Department of Environmental Protection (municipal)	Department of Environmental Protection (municipal)
Philadelphia	Water Department (municipal)	Water Department (municipal)	Water Department (municipal)
Phoenix	Water Services Department (municipal)	Water Services Department (municipal)	Environmental Services Division, Stormwater Program (municipal)
Pittsburgh	Pittsburgh Water and Sewer Authority (regional)	Allegheny County Sanitary Authority—ALCOSAN (regional)	Pittsburgh Water and Sewer Authority (regional)
Portland	Water Bureau (municipal)	Environmental Services Bureau, Wastewater Group (municipal)	Environmental Services Bureau, Stormwater Management (municipal)
Riverside	Riverside Public Utilities—Blue Riverside (municipal)	Public Works Department (municipal)	Public Works Department (municipal)
Sacramento	Department of Utilities (municipal)	Sacramento Regional County Sanitation District (regional)	Department of Utilities, Stormwater Quality Improvement Partnership (municipal)
San Antonio	San Antonio Water System (municipal)	San Antonio Water System (municipal)	Department of Public Works (municipal)
San Diego	Public Utilities, Water Branch (municipal)	Public Utilities, Wastewater Branch (municipal)	Transportation and Storm Water Department, Storm Water Division (municipal)
San Francisco	San Francisco Public Utilities Commission (municipal)	San Francisco Public Utilities Commission (municipal)	San Francisco Public Utilities Commission (municipal)
San Jose	San Jose Municipal Water System (municipal), Santa Clara Valley Water District (regional), San Jose Water Company (investor-owned), Great Oaks Water Company (investor-owned)	San Jose-Santa Clara Regional Wastewater Facility (regional)	Water and Sewer Utilities, Stormwater (municipal)
Seattle	Seattle Public Utilities, Water (municipal)	King County Wastewater Treatment Division (municipal-county)	Seattle Public Utilities, Green Stormwater Infrastructure (municipal)
St. Louis	Water Division (municipal)	Metropolitan St. Louis Sewer District (regional)	Metropolitan St. Louis Sewer District (regional)
Tampa	City of Tampa Water Department (municipal)	City of Tampa Wastewater Department (municipal)	City of Tampa Stormwater Division (municipal)
Washington	DC Water (regional)	DC Water (regional)	District Department of the Environment, Stormwater Management (municipal)

Table E-3. Water Efficiency

City	State	Water Efficiency Programs and Targets
Atlanta	GA	The Office of Water Efficiency makes Water Saver Kits available to its water customers. Each kit contains a 1.5-gallon-per-minute low-flow showerhead, a 1.5-gallon-per-minute kitchen faucet aerator, two 1 gallon-per-minute bathroom sink aerators, and toilet-leak-detection tablets. The city also offers rebates for high-efficiency toilets for residential and multifamily units.
Austin	TX	In May 2010, the city council adopted a goal of reducing total water use to 140 gallons per capita per day by the year 2020. The city offers rebates for WaterWise landscaping, rainwater harvesting, free shower heads, and other products and actions.
Baltimore	MD	The city has set a general goal to reduce the city's water use and support system maintenance.
Boston	MA	The Boston Water & Sewer Authority and Massachusetts Water Resources Authority provide free water-efficiency kits that include kitchen and bathroom faucet aerators, a low-flow replacement showerhead, a water-efficiency gauge to test showerheads and sinks, and dye tablets to check for toilet leaks.
Charlotte	NC	The city's WaterSmart program encourages the efficient use of water for indoor and outdoor purposes and offers consumer low-flow plumbing devices, smart irrigation controls, and other products.
Chicago	IL	The city has a goal decrease water use by 2% annually. The city provides incentives for the installation of water meters in homes that are not currently metered through its MeterSave program, and offers rain barrels, indoor, and outdoor conservation kits to homeowners.
Columbus	OH	The city funds a cost share program for rain barrels.
Dallas	TX	The city's 2010 Water Conservation Strategic Plan Update calls for reductions in gallons used per capita by an average of 1.5% per year through 2015. The city has watering restrictions and offers programs including the New Throne for your Home program, irrigation system checks, rebate programs, and support for minor plumbing repairs.
Denver	CO	As part of the city's 2020 goals, city buildings must reduce water use by 15% from 2011 levels by 2020. City parks must reduce water use to an average of 18 gallons per square foot. Denver Water's conservation plan aims to accelerate the pace of water conservation in its service area and reduce overall water use from pre-drought usage (2001) by 22% per capita by 2016. Denver Water provides rebates for water-efficient toilets and appliances, and has incentive programs for indoor and outdoor water-savings projects. .
Detroit	MI	No data found.
El Paso	TX	The city has a goal of reducing per-capita daily consumption to 130 gallons per person per day by 2020. The city uses reclaimed water for its operations and gives away water-efficient shower heads.
Fort Worth	TX	The city's goals are based on the recommendations of the Texas Water Conservation Implementation Task Force, which suggested a 1% reduction in gallons of water used per capita per day per year. The city has a SmartFlush program to replace residential toilets with high-efficiency toilets and has time-of-day watering restrictions.
Houston	TX	The city has a water conservation target of reducing unaccounted water use (often lost due to leaks) by 10% by 2020. The city has committed both labor and resources (with a budget close to $500,000 in 2013) in support of its Waterworks Education Center, which currently serves as an education center for water-related efforts in the community. The city recently established a water conservation task force to develop conservation goals and best practices for the city.
Indianapolis	IN	The city does not have water savings targets or water efficiency programs.
Jacksonville	FL	The municipal utility, JEA runs the LawnSmart program to help homeowners to program their irrigation controllers.

City	State	Water Efficiency Programs and Targets
Los Angeles	CA	The city has a goal to reduce per-capita water consumption by 20%. The Los Angeles Department of Water & Power offers a number of free water conservation devices to consumers. Its Landscape Incentive Program was launched in 2009 and pays consumers to replace turf grass with drought-tolerant plants or mulch.
Memphis	TN	The city does not have water-savings targets or water-efficiency programs.
Miami	FL	In 2006, the Miami-Dade County Board of County Commissioners adopted the Miami-Dade Water-Use Efficiency Plan through resolution r-468-06. Their goal is to reduce water consumption by 1.5 million gallons per day by 2015 from a 2007 baseline. As a part of the implementation, the county administers a variety of customer programs that provide rebates and free water-saving devices including shower heads, toilets, and landscape irrigation.
Minneapolis	MN	Water use is included in city-run energy programs. For example, the Home Energy Squad Program which is jointly funded by several Minneapolis area cities and the energy utilities, Xcel Energy and CenterPoint Energy, includes a water conservation component (replacing shower and sink aerators).
New York City	NY	The city funds the installation of automatic meter reading for all customers to help detect leaks and the replacement of old and inefficient toilets in government buildings. The New York City Water Board offers rate reductions for buildings that recycle a large portion of their water supply.
Philadelphia	PA	The Water Department runs the Water Conservation Assistance Program, which is designed to help low-income water customers reduce water waste through repairs to plumbing and installation of water conservation devices.
Phoenix	AZ	No programs.
Pittsburgh	PA	Pittsburgh Water & Sewer Authority supports two full-time leak detection crews to pinpoint leaks on both utility- and customer-owned water lines.
Portland	OR	The Portland Water Bureau's current annual budget for water efficiency programs is $800,000. They offer free water efficiency kits to customers; run a multifamily building toilet replacement program. The Bureau's Business Industry and Government program offers incentives and technical assistance for water efficiency projects.
Riverside	CA	The city has a goal to reduce its per-capita potable water usage by 20% by 2020. In 2008, the city approved the Riverside Recycle Water Project, which will use highly treated wastewater rather than high-quality potable water to serve the agricultural and irrigation needs throughout the city. The city offers rebates for water-efficient appliances (clothes washers, toilets), artificial turf, and free sprinkler nozzles.
Sacramento	CA	The city provides rebates for water-efficient toilets and clothes washers, and employs Water Wise conservation specialists to identify home and business water savings opportunities.
San Antonio	TX	The city has a goal to reduce water usage to 116 gallons per person per day by 2020 (from 124 gallons per person in 2009) and to use 16,500 acre-feet of water system-wide per year by 2020. The city offers WaterSaver rebates, free high-efficiency toilets and fixtures, incentives for large-scale water system upgrades, irrigation design rebates. The city also issues drought restrictions on water use.
San Diego	CA	A water savings target was proposed in the update to the city's 2012 Climate Mitigation and Adaptation Plan but was not included in the final version. The city's budget for water efficiency programs is $780 million for 2013.
San Francisco	CA	The city has a goal of saving 4 million gallons of water per day (1,500 million gallons per year) through conservation, by 2018. The city has updated codes requiring water-efficient fixtures/systems such as toilets, irrigation systems, and shower heads. The city offers rebates for high-efficiency clothes washers and low-flow toilets. The city's water conservation program was expanded to offer custom rebates based on projected savings as well as fixed rebates for common measures, similar to its energy efficiency programs.

City	State	Water Efficiency Programs and Targets
San Jose	CA	The city implements water conservation through a cost-sharing agreement with the Santa Clara Valley Water District, which has a target to save 70,500 acre-feet of water from 1992 levels by 2030 for programs such as incentives for water-efficient retrofits and by conducting outreach. The San Jose Municipal Water System offers free water fixtures for its San Jose customers, including showerheads and kitchen and bathroom faucet aerators.
Seattle	WA	Seattle Public Utilities offers, through the Saving Water Partnership, educational resources, leak-detection kits, and rebates for high-efficiency toilets and irrigation systems. The city's 2013 Water System Plan sets a goal to reduce total average annual retail water use to less than 105 million gallons per day by 2018 from around 119 mgd in 2013. Rebates are provided to residential, commercial, and industrial customers, including for toilets, appliances, and irrigation systems.
St. Louis	MO	The city has a goal to reduce water usage by 10% by 2018.
Tampa	FL	The city has a year-round restriction on water use for all water sources except reclaimed water (including but not limited to public, private, well, pond, and lake water, and captured rainwater) inside the city limits under Tampa Code Sec. 26-97 and Chapter 40D-22, F.A.C. The city also offers plumbing retrofits, rain barrel workshops, and rebate programs.
Washington	DC	The city has a goal to decrease total water use by 40% from current levels (2013) by 2032.

Sources: Data request responses as noted in Appendix A or independent research.

Table E-4. Energy Efficiency in Water Services

City	State	Energy Efficiency Programs and Self-Generation
Atlanta	GA	Under the 2010 Power to Change initiative, all city facilities, including the Department of Watershed Management facilities are striving to meet a 15% energy reduction by 2020. The RM Clayton wastewater treatment facility's combined heat and power system converts waste biogas into nearly 13 million kilowatt-hours of useful energy annually.
Austin	TX	There are no formal energy efficiency targets at Austin Water, but it is incorporating renewable energy and energy efficiency initiatives into its new water treatment facility, which it plans to be LEED Silver–certified. The Hornsby Biosolids Management Plant receives waste undigested solids from the various wastewater treatment facilities in Austin, anaerobically digests the solids, and produces biogas. The data suggest that the biogas production following the current digester modification activities will average 640,000 cubic feet per day or 26,600 cubic feet per hour.
Baltimore	MD	The city's Back River wastewater treatment facilities generate 3 MW of renewable energy at a methane gas-to-energy power plant.
Boston	MA	Massachusetts Water Resources Authority, Boston's regional water authority has completed energy audits at 28 of its 36 major facilities. Implementation of audit recommendations and other process optimization efforts is estimated to save almost $2 million annually. The system produces approximately 33 million kWh/yr from methane capture at the Deer Island wastewater treatment plant.
Charlotte	NC	The city's utility department is in the process of developing a combined heat and power project at the wastewater treatment plant.
Chicago city	IL	The Metropolitan Water Reclamation District of Greater Chicago has implemented a sewer thermal heat and cooling system to save energy at its water reclamation plant, where methane is also collected for electricity generation.
Columbus	OH	In 2012, biogas accounted for 47% of the energy used in wastewater treatment plants in Columbus.
Dallas	TX	The city council's strategic plan calls for identifying energy recapture opportunities in the water and wastewater systems. The Southside wastewater treatment plant has installed a bio-digester that

City	State	Energy Efficiency Programs and Self-Generation
		generates approximately 30,000 MW of electricity for the facility, reducing its energy use by 60%.
Denver	CO	Denver Water, the regional water supply authority has implemented several energy efficiency initiatives at its pumping stations. The Metro Wastewater District captures methane gas to provide electricity generation that would power almost 5,000 homes.
Detroit	MI	No self-generation, but solar panels at the central service facility for the Detroit Water and Sewage have a generating capacity of 20 kW and produce an estimated 21,500 kWh per year.
El Paso	TX	El Paso Water Utilities will start up three wastewater biogas recovery systems in 2012. The utility is implementing energy management initiatives that reduce energy costs and is investing in equipment that protects critical operations from interruptions in the energy supply.
Fort Worth	TX	The Fort Worth Water Department participates in the city's energy conservation programs and is currently completing three phases of the city's energy savings performance contracts (ESPCs). The ESPC-financed improvements to the city's water reclamation facility are projected to improve the facility's self-generation from 50 to 70%.
Houston	TX	The city does not use methane capture at its wastewater treatment plant or have specific energy management initiatives.
Indianapolis	IN	As of August 2011, the Citizens Energy Group assumed responsibility for the water and wastewater utilities. Citizens Energy Group pledged to operate the utilities for community benefit and to create operating efficiencies that would lower costs. Combining the city's water and wastewater systems with Citizens' natural gas, steam, and chilled water utilities will help to reduce future utility rate increases by 25% from the increases currently projected.
Jacksonville	FL	No data found.
Los Angeles	CA	The city has a goal to improve energy efficiency at drinking water treatment and distribution facilities, although no specific targets were available. The Los Angeles Bureau of Sanitation operates four treatment and water reclamation plants, two of which generate electricity from captured biogas.
Memphis	TN	Both of the city's wastewater treatment facilities supply biogas to the water utility and use it for self-generation.
Miami	FL	The Miami-Dade Water and Sewer Department, which provides water and wastewater treatment to the city, does not have any energy efficiency initiatives.
Minneapolis	MN	The city's Water Works are included in the 1.5% annual goal to reduce energy use in city facilities. The regional wastewater utility, Metropolitan Council Environmental Services, has reduced its purchase of energy from fossil fuels by 19% since 2006 through a wide range of energy efficiency projects in the wastewater treatment system, with the bulk of the improvements at the metro plant. MCES is 76% of the way toward meeting its 2015 energy goal of reducing energy purchases by 25% from 2006 levels.
New York City	NY	The city's Department of Environmental Protection has a goal to reduce greenhouse gas emissions by 30% from 2006 levels by 2030. The department has completed greenhouse gas and energy efficiency audits at four wastewater treatment plants and is in the process of auditing four additional plants to identify where energy use and emissions can be reduced. Modifications have been made at the Newtown Creek wastewater treatment plant, increasing energy efficiency and reliability.
Philadelphia	PA	The Philadelphia Water Department has a five-year strategic energy plan and is piloting solar, biogas, and sewer-thermal energy technologies. In February 2012, the water department announced an agreement with AMERESCO to design, build, and maintain an innovative wastewater biogas-to-energy facility at the Northeast water pollution control plant. The project will use biogas from the wastewater digesters to generate thermal energy and 5.6 MW of electricity for on-site use.
Phoenix	AZ	Energy efficiency is incorporated into all new construction and upgrades at Water Services Department facilities. The department's goal is to reduce energy consumption by a minimum of 5%. The city is currently evaluating digester gas resources for waste-to-energy opportunities.

City	State	Energy Efficiency Programs and Self-Generation
Pittsburgh	PA	Pittsburgh Water & Sewer Authority has a goal to reduce greenhouse gas emissions to 20% below 2003 levels by 2023. It is upgrading old pump motors to more efficient equipment (and rehabilitating some motors) and installing some new, more efficient pumps. The Allegheny County Sewer Authority uses steam generated from incineration of the sludge to heat buildings and to generate electricity.
Portland	OR	The Water Bureau had an energy goal to reduce total energy use by 5% by July 2012. A new goal is now in development. The Columbia Boulevard wastewater treatment facility uses a 1.7 MW biogas generator that in 2012 produced 12,818 MWh, representing 63% of the electricity used on site.
Riverside	CA	The city is developing a water resource and pumping plan strategy to reduce energy use by its water and wastewater utilities.
Sacramento	CA	The Sacramento Regional County Sanitation District, in partnership with Carson Energy, operates an on-site cogeneration plant at the Sacramento regional wastewater treatment plant in Elk Grove. The cogeneration plant is partly fueled by the biogas produced by the treatment plant's digesters.
San Antonio	TX	San Antonio Water System has a 20-year contract with AMERESCO to sell biogas, although it does not use the gas for self-generation. The water system tracks the energy savings from its efficiency initiatives, which include using high-efficiency pumps and motors to distribute water, generating biogas at its treatment facility, and performing lighting upgrades.
San Diego	CA	The wastewater branch has an energy efficiency program that consists primarily of on-site power generation. Its goal is to be capturing 98% of wastewater treatment gas by 2020. The city currently has a 15.9 MW cogeneration facility.
San Francisco	CA	The San Francisco Public Utility Commission has installed large electric cogeneration plants that utilize digester gas, a by-product of wastewater treatment operations, at two of its wastewater treatment plants, Southeast and Oceanside. These generate 2 MW and 1 MW at peak, respectively.
San Jose	CA	The regional wastewater facility self-generates up to 75% of its energy needs, up to 8 MW daily, from a blend of digester gas, landfill gas, and natural gas.
Seattle	WA	The Wastewater Treatment utility, operated by King County, has an energy conservation goal of 2% per year from a 2007 baseline. The county works with local energy utilities to reduce energy consumption at its facilities, including through equipment upgrades and optimization of air handling and other system operations. Several of the water treatment plants generate energy on site from digester gas, and the West Point treatment plant has a combined heat and power system.
St. Louis	MO	The Metropolitan Sewer District provides wastewater services to the city, but does not have any energy efficiency or self-generation initiatives.
Tampa	FL	The city has a goal to reduce energy used for water services and wastewater treatment by 20% below business as usual levels in 2025. On average, the city of Tampa Wastewater Department produces approximately 1.18 million kWh per month by burning the methane gas from the digesters in the cogeneration engines. This supplies 25% of the electricity consumed at the treatment plant.
Washington	DC	DC Water is building a new anaerobic digestion system at its Blue Plains treatment plant. Once completed, digester gas is expected to be the primary fuel, supplemented as necessary with natural gas.

Sources: Data request responses as noted in Appendix A, or independent research.

Table E-5. Efficient Stormwater Management

City	State	Stormwater Policies and Green Infrastructure Funding
Atlanta	GA	The city's Green Infrastructure Ordinance promotes green infrastructure and runoff reduction practices and complies with the Metropolitan North Georgia Water Planning District's model Post-Development Stormwater Management Ordinance.

City	State	Stormwater Policies and Green Infrastructure Funding
Austin	TX	One of the focus areas of the city's newly adopted comprehensive plan is green infrastructure. This includes the development of green infrastructure targets and calculating indirect and direct savings of green versus "grey" infrastructure projects. The city is currently installing rain gardens throughout Austin.
Baltimore	MD	There is legislation before the city council to create a stormwater fee that would be charged to property owners. The fee would fund green stormwater infrastructure, as well as system maintenance and repair.
Boston	MA	Under Boston Water and Sewer Commission's site plan requirements, developers designing new development and re-development projects must fully investigate methods for retaining or infiltrating stormwater on-site before the commission will consider a plan to discharge stormwater to its system. The commission's 2013–2015 capital improvement program includes $1,643,000 to install stormwater best management practices and green infrastructure components in three areas.
Charlotte	NC	The city's escalating water rate structure is designed to discourage excessive water usage.
Chicago city	IL	The city runs the Sustainable Backyards program, offering incentives for rain barrels, native plantings, tree planting, and compost bins. The city provides free rain barrels as part of the MeterSave program as an incentive to install water meters and conserve water. The city's stormwater management ordinance requires private development to provide onsite water infiltration as a percentage of developed space. The city is currently drafting a comprehensive green infrastructure plan embedded in its capital budget.
Columbus	OH	The city's stormwater drainage manual establishes stormwater control requirements for all new public and private development and redevelopment. It requires post-construction stormwater controls for both water quality and water quantity. The stormwater credit rule includes a Green Infrastructure Credit (Article 6), a Clean River Fee Credit (articles 3 and 8.3), and funding for the Residential Backyard Conservation Program (Article 7). Funding is allocated to projects that reduce impervious surfaces in the city.
Dallas	TX	The city has adopted the integrated Storm Water Management Manual from the North Central Texas Council of Governments. The guidelines presented in the document are currently voluntary for developers.
Denver	CO	Executive Order 123 lays the foundation for low impact development in the planning, design, and construction of public stormwater infrastructure. The city allocates about $1.5 million per year for green stormwater infrastructure.
Detroit	MI	The Detroit Water Agenda 2012, authored by the city council's Green Taskforce, includes several recommendations to reduce stormwater runoff by 25%, including green infrastructure and stormwater retention.
El Paso	TX	The ordinance that created the stormwater utility requires that 10% of the revenue from the stormwater fee be used for projects that combine stormwater management with the preservation of open spaces, wilderness areas, and park ponds. The city is purchasing arroyos with the intent to keep them in their natural state.
Fort Worth	TX	The city's stormwater management division has a credit policy that provides reduced stormwater utility fees for properties that have water quality features or practices. Funding for green infrastructure and water quality projects is made available through the stormwater utility.
Houston	TX	The city's Infrastructure Design Manual provides guidance to developers for preventing storm water pollution and controls to minimize impacts for new development and decrease impacts for redevelopment. In addition, there is a drainage fee on properties within the city limits that is based on the amount of impervious surface within each parcel. The fee is reduced if the owner increases the amount of pervious cover, adds additional water retention, or uses approved low-impact development best practices (e.g., green roofs, bio-retention, or porous pavement). The city is also leads the $205 million Bayou Greenways 2020 initiative, which includes improvement to stormwater

City	State	Stormwater Policies and Green Infrastructure Funding
		management through green infrastructure as one of its objectives.
Indianapolis	IN	The Sustainable Infrastructure Initiative's Green Supplemental Document provides design guidance to the design community for stormwater conveyance and treatment and to the office of code enforcement to approve site and building plans that incorporate sustainable infrastructure. Each year, the city's Office of Sustainability and United Water collaborate on the Green Infrastructure Grant Program to promote the construction of green infrastructure, such as green roofs, porous pavement, and rain gardens.
Jacksonville	FL	No data found.
Los Angeles	CA	No data found.
Memphis	TN	Currently, no public funding for green infrastructure is in place.
Miami	FL	Stormwater utility fees are assigned to all developed residential and non-residential properties and are determined as a function of equivalent residential units for residential properties and by determining the impervious area for non-residential properties.
Minneapolis	MN	Since 2005, the costs of providing stormwater management have been listed as a separate line item on the city's utility bills. In the past, those costs were included as part of customers' sewer charges. The city has a stormwater utility credit that can be applied for if a project demonstrates the ability to handle a ten-year or 100-year rain event on-site.
New York City	NY	The city has a sustainable stormwater management plan that includes 30 pilot projects to test promising source control technologies. Changes to city building codes and zoning since the launch of PlaNYC include zoning amendments initiated by the Department of City Planning, requiring new commercial parking lots to include perimeter and interior green infrastructure, prohibiting buildings in lower-density districts from having paved yards, and requiring new developments city-wide to include street trees and, in lower-density areas, include sidewalk planting strips. The city has allocated $1.5 billion for green infrastructure over the next 20 years.
Philadelphia	PA	In addition to encouraging low-impact development through new zoning code and comprehensive plans, the Philadelphia Water Department has extensive incentives to encourage green infrastructure for stormwater management.
Phoenix	AZ	The city requires new developments to manage stormwater on-site for a 100-year, two-hour rain event, but does not specifically encourage green infrastructure.
Pittsburgh	PA	The city has budgeted $9.3 million over the next four years to fund the green infrastructure program within the Pittsburgh Water & Sewer Authority service area. The city has amended its stormwater management requirements to provide standards for stormwater volume reduction and low-impact development strategies for planning and construction of publicly funded development and redevelopment projects.
Portland	OR	The city's Grey to Green initiative is a five-year, $55 million commitment to support Portland's green infrastructure efforts. The city also has a stormwater manual that requires all new construction to manage all stormwater on site. New parking lots must also manage stormwater on site, typically through the use of bioswales which reduce the paved area.
Riverside	CA	No data found.
Sacramento	CA	No data found.
San Antonio	TX	The city has allocated to funding to several green infrastructure projects including detention ponds and rainwater harvesting systems.
San Diego	CA	Private projects are required to develop and implement storm water best management practices as part of the permitting process. The city's stormwater division has developed a low-impact development design manual. The city has funding available for green infrastructure as required by the state. The city has integrated low-impact development stormwater best management practices

City	State	Stormwater Policies and Green Infrastructure Funding
		into some capital improvement projects.
San Francisco	CA	The city's stormwater management ordinance requires low-impact development. The San Francisco Public Utility Commission has committed funding $57 million for early implementation green infrastructure projects and is budgeting a total of $400 million over the next 20 years. The city also offers urban watershed stewardship grants.
San Jose	CA	The city's urban runoff management policy requires developers to demonstrate compliance with performance standards early in the planning process. The policy allows new trees planted within 30 feet of impervious surfaces to receive credit as post-construction treatment control measures.
Seattle	WA	The Green Stormwater Infrastructure Executive Order established a city-wide goal of 700 million gallons of stormwater managed annually with green infrastructure by 2025. The executive order also calls for stricter siting criteria and development codes. The city has dedicated staff for its green infrastructure initiative.
St. Louis	MO	The Metropolitan St. Louis Sewer District established a new green infrastructure program to fund $100 million of green infrastructure improvements in the next 23 years
Tampa	FL	In 2003, the Tampa city council approved a stormwater utility charge that provides a dedicated funding for stormwater management. Stormwater charges are based on equivalent square feet of impervious area. Assessments are collected through the Non-Ad Valorem tax bills. The stormwater charges help to offset the cost of maintaining the city's stormwater system.
Washington	DC	The District charges each property a stormwater utility fee that is based on the area of impervious surface. The revenue from this fee is used only for compliance with the District's MS4 Permit, which includes the installation of green infrastructure. Currently, the stormwater fee generates approximately $13 million in yearly revenue. Additionally, the District has proposed rules that will reduce the impervious surface charge for properties that install green infrastructure. The District also provides subsidies to properties that install green infrastructure through the "RiverSmart Program".

Sources: Data request responses as noted in Appendix A, or independent research.

Appendix F: Detailed Information on Transportation Policies

Table F-1. Location-Efficient Zoning Codes by City

City	Location-Efficient Zoning Codes	Parking Requirements [2]
Atlanta, GA	Atlanta has mandatory neighborhood form-based codes in addition to city-wide floating zones that have been in place since 1999. The city also has transit-oriented development–specific codes for the Doraville and Edgewood neighborhoods (2 points). [1]	No policy
Austin, TX	Subchapter E of Austin's zoning code adopted in 2009 includes form-based code elements to ensure street connectivity and mixed-use development in certain neighborhoods (1 point). [1]	No policy
Baltimore, MD	Transform Baltimore is a city-wide transect-based code with a mixed-use overlay to encourage the development of mixed-use neighborhoods (2 points). [1]	Baltimore requires one parking space per residential dwelling (0.5 point).
Boston, MA	Articles 87 and 87a of Boston's zoning code includes smart growth overlays to promote compact, mixed-use communities (1 point). [2]	Boston has been using maximum parking ratios for over a decade to suppress growth in parking supply and enforces a "parking freeze" in downtown districts (2 points).
Charlotte, NC	Charlotte's zoning code includes both pedestrian and transit-supported overlay districts in an effort to create transit-oriented communities (1 point). [2]	
Chicago, IL	No policy	The Chicago zoning ordinance includes parking reductions for development around transit stations (1.5 point).
Columbus, OH	The Columbus municipal planning code includes city-wide commercial zoning overlays to encourage pedestrian- and transit-friendly development in existing corridors while traditional neighborhood development zoning encourages a mix of residential types and commercial properties (1 point). [2]	Columbus requires at least 0.75 to 2 parking spaces per residential unit depending on the number of dwelling units per abode (0.75 point).
Dallas, TX	Dallas's Chapter 51A Article XIII uses mixed use districts on the neighborhood scale to implement transit-oriented communities and mixed-use development in area plans (1 point). [1]	No policy
Denver, CO	The city of Denver has a form-based/context-sensitive zoning code to encourage mixed uses in urban centers and	No policy

	around transit-oriented development. Form-based elements regulate all building types (2 points). [2]	
El Paso, TX	Plan El Paso implements a smart code for the city with a focus on walkable development around the city's transit stations (2 points). [2]	No policy
Fort Worth, TX	Fort Worth has implemented form-based codes to govern development in the Near Southside and Trinity Uptown neighborhoods (1 point). [1]	No policy
Houston, TX	No policy	Reduced parking requirements are provided and shared use parking agreements are allowed in areas around transit stations and other mixed-use projects where reduced parking requirements are most appropriate for further encouraging the accommodation of other non-vehicular modes of transportation. In addition, Houston's parking rules allow the creation of special parking areas for the purposes of increasing distance of parking to businesses, reducing parking ratios, and sharing parking (1.5 points).
Jacksonville, FL	Jacksonville's traditional neighborhood development ordinance is a city-wide form-based ordinance that has been in place since 1987 (2 points). [1]	No policy
Memphis, TN	Memphis adopted a Unified Development Code in 2010 that incorporates form-based elements and overlays to encourage mixed-use development (2 points). [1]	No policy
Miami, FL	Miami 21 is the city's mandatory, city-wide smart code that was adopted in 2009 and uses form-based zoning to encourage smart growth tenets (2 points). [1]	No policy
Minneapolis, MN	Minneapolis' Title 20 zoning code includes a series of pedestrian and downtown development overlays to encourage the creation of walkable neighborhoods (1 point). [2]	Minneapolis requires one parking space per dwelling on average (1 point)
New York City, NY	PLANYC, New York City's zoning code, designates a number of special purpose districts for the creation of mixed-use development in the city (1 point). [2]	Developers are required to provide, on average, 43 new off-street parking spaces for every 100 new housing units constructed in New York City (1 point).
Philadelphia, PA	Philadelphia adopted a new zoning code in 2012 that encourages development patterns that reinforce walkability and transit use through the use of a transit-oriented development overlay and mixed-	Philadelphia's parking code eradicates parking minimums for multifamily developments in the city center. Row house districts are also not subject to parking minimums (1.5 points).

	use zoning (1 point). [2]	
Phoenix, AZ	Phoenix city zoning include a transit-oriented development overlay district as well as form-based zoning for downtown development (1 point). [2]	No policy
Pittsburgh, PA	No policy	The city of Pittsburgh requires one parking space per residential dwelling (0.5 point).
Portland, OR	Portland's zoning code encourages mixed-use and infill development along nearly all portions of the city's main commercial streets and throughout most of the central city. The zoning map also identifies specific mixed-use centers, consistent with the regional growth plan, Metro 2040 (2 points).[2]	Portland has no parking minimums for residential dwellings with zero to 30 units in many zones across the city. Elsewhere, a minimum of one space per unit is implemented (1.5 points).
Sacramento, CA	No policy	Sacramento's parking code removes parking requirements for residential purposes in the central business and arts and entertainment districts (1.5 points).
San Antonio, TX	The city's Unified Development Code was adopted in 2006. This Unified Development Code includes use patterns for various forms of smart growth development such as traditional neighborhood development, transit-oriented development, neighborhood centers and conservation subdivisions, new infill development zones, parking caps, and street design and infrastructure options (1 point). [2]	No policy
San Diego, CA	San Diego's municipal code includes a transit overlay and urban village overlay for the development of walkable, mixed-use communities (1 point). [2]	No policy
San Francisco, CA	No policy	San Francisco has successfully eliminated city-wide parking requirements for residential purposes (2 points).
Seattle, WA	No policy	Seattle requires one parking space to be built for each residential dwelling (0.5 point)
St Louis, MO	Ordinance 69199 was adopted in 2012 and creates a new form-based overlay district to be incorporated into the St. Louis zoning code (1 point). [2]	No policy
Tampa, FL	Tampa has neighborhood form-based codes for the Greater Seminole Heights Planning Area, 40th Street, and Tampa Heights neighborhoods (1 point). [1]	No policy
Washington, DC	DC's zoning code encourages mixed-use, transit-oriented, and infill development (1	No policy

point). [2]

Source: 1. Placemakers 2013, 2. Independent research or city data requests.

Table F-2. Location Efficiency Incentives by City

City	Location Efficiency Incentives [1]
Atlanta, GA	Atlanta provides density bonuses to developers who build in the Buckhead neighborhood in an effort to create a denser, more compact neighborhood. [1]
Austin, TX	Austin's Safe, Mixed Income, Accessible, Reasonably Priced, Transit Oriented (SMART) Housing Program provides fee waivers, expedited review, and support to projects that provide certain levels of affordable housing and are transit-accessible. [2]
Boston, MA	Projects that are more than 50% residential are eligible for a bonus of 30 feet in height and an increase in floor-to-area ratio of 1.0 in the Fenway neighborhood district. [1]
Columbus, OH	The Columbus zoning code includes the use of tax incentives in the downtown zoning district to attract high-density development (both residential and commercial) to the downtown area of the city.
Houston, TX	The city of Houston passed Ordinance No. 2012-739 in 2012, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the program is to promote economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for new multifamily residential mixed-use developments.
Los Angeles, CA	The city of Los Angeles provides density bonuses for affordable housing projects that are located within 1,500 feet of a transit stop. [2]
Minneapolis, MN	Chapters 548 and 549 of the Minneapolis zoning code includes floor-to-area ratio premiums for development projects in downtown zoning districts and density bonuses for commercial districts. [1]
New York City, NY	New York City's R-10 program provides density bonuses to developments in medium- to high-density commercial neighborhoods that provide a certain number of affordable housing units. [1]
Phoenix, AZ	As part of its infill program, the city of Phoenix waives a number of development-related fees for developments on infill sites. Additionally, the Government Property Lease Excise Tax (GPLET) provides developers with potentially reduced property taxes over a lease period if the redevelopment area is in the central business district.
Portland, OR	The Portland Development Commission runs a transit-oriented development (TOD) property tax abatement program that reduces operating costs of high-density TOD projects by offering a ten-year maximum property tax exemption.[2] Portland also has removed the floor area ratio limitation on residential development within commercial (mixed-use) zones and provides density bonuses in the central city plan district, the most location-efficient part of the region. [1]
Riverside, CA	Riverside's Residential Infill Incentive Program provides fee adjustments and cost avoidance incentives for developers using the designated infill sites.

City	Location Efficiency Incentives [1]
Sacramento, CA	The city of Sacramento has an infill program that provides developers with flexibility in floor area ratios, height restrictions, and density. Expedited review of development plans is included in the incentive package.
San Antonio, TX	San Antonio's municipal code allows for the creation of transit-oriented development districts where flexibility in development codes is provided for new construction. The city also has an infill program that provides incentives in the form of fee waivers and other financial benefits.
San Diego, CA	The Affordable/In-fill Housing and Sustainable Buildings Expedite Program allows expedited permit processing for affordable infill housing developments that have ten or more proposed units and are located within designated urbanized areas.
San Francisco, CA	San Francisco's zoning code and General Plan allow greater height and floor area ratios in transit-rich areas of the city.

Source: 1. Independent research unless otherwise stated, 2. RA 2009