

Carbon Disclosure Project Cities Pilot Project 2008



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Executive Summary

The CDP U.S. Cities Pilot Project was launched by the Carbon Disclosure Project (CDP) and ICLEI – Local Governments for Sustainability in 2008 to encourage cities to voluntarily report their greenhouse gas emissions and disclose other information related to climate change. Local governments own and operate a considerable portfolio of buildings, fleets, and other infrastructure and through their progressive actions to reduce emissions have a great potential to lead by example. CDP's standardized and proven process has enabled the 18 participating cities to publicly disclose information in a form recognized around the world, providing a snapshot of engagement in the issues.



For this pilot project CDP and ICLEI partnered together. ICLEI supports progress towards sustainable development and has more than 550 members in the United States. CDP encourages organizations to use the Greenhouse Gas (GHG) Protocol for calculating emissions and ICLEI has provided a compatible methodology for local governments.

The participating cities include both recognized leaders and cities undertaking an emissions inventory for the first time. The results show that some cities have well established reporting procedures and strategies, are publishing plans and engaging with their communities. Others are making rapid progress. The results also suggest that while many cities are well-placed to begin to address the challenges of climate change, in most cases action is at an early stage and the opportunities ahead to reduce emissions will therefore be considerable.

All 18 cities identify risks associated with climate change. These risks arise directly from physical effects such as more severe weather, a rise in sea level and reduced water supply and hydropower as a result of drought. There are also risks for local economies if agriculture, tourism, and other sectors are impacted, and for public health.

Each of these risks is perceived to have implications for local government operations and revenues. However, regulations at state or federal level are considered to offer potential opportunities. For example, the wider introduction of Renewable Portfolio Standards is perceived to have the potential to improve the viability of renewable energy projects.

All responding cities report plans or actions to manage the risks associated with climate change. Some cities are already working on both mitigation and adaptation. Many cities have established investment processes to address risks or develop cost savings.

Sixteen cities provide emissions data in line with the GHG Protocol categories of Scope 1 (direct emissions) and Scope 2 (emissions associated with purchased electricity). This enables comparisons with other organizations in both the public and private sectors. However, it is important to recognize that the operational emissions of a local government are based on what that local government has operational control over, but this can differ from one jurisdiction to the next. For example, a small city may not operate its own wastewater treatment plant whereas a larger city likely would. This can have a dramatic difference on emissions totals, even if the methodology used is consistent.

The aggregated Scope 1 and Scope 2 emissions for the 18 responding cities amount to nearly 6.5 million metric tons CO₂-e, equivalent in scale to the emissions of a large multi-site corporation.

Although most cities have reduction plans or at least an overall emission reduction target in place, most of these are only recently established and emissions intensity measures have not been utilized. The targets reported tend to equate to annualized reductions of one or two percent. While this is not out of step with some government and corporate commitments, there is a vast gap between the total of all such targets and the scale and urgency of the climate challenge being revealed by the most recent scientific findings. In most responding cities, the mayor's office or high level committees have responsibility for reviewing policies and committing to plans and performance measures. It remains to be seen what role, if any, cities will play in bridging that gap.

The scope for cities to influence progress is not limited to those emissions for which they are most directly responsible. Some cities are engaged in contributing to the development of state level responses to climate change and many report the

local involvement of communities and stakeholder groups. CDP encourages the reporting of Scope 3 emissions and specifically invites the disclosure of emissions associated with business travel, logistics, use of the organization's products and services, and the supply chain. However, while many cities have calculated community emissions, most have yet to calculate Scope 3 emissions. Only six disclose figures. Of these, most are for employee commuting and solid waste. Only one city reports business travel and none explicitly reports supply chain emissions.

The U.S. is directly responsible for more of the accumulated greenhouse gases in the atmosphere than any other nation. By achieving emissions reductions, engaging with businesses and residents, implementing policies and programs, demonstrating commitment and leading by example, U.S. public authorities can encourage and inspire others to take action too.

Although there are important differences between city governments and companies, there are also many shared interests - in working towards a common language, tools and techniques, benchmarks and standards, and in developing compatible approaches that will help all organizations to work towards the common aim of minimizing climate change and planning adaptation.

The 18 participating cities have embarked on a climate change journey that needs to be taken by other cities and organizations around the world. This pilot project marks a significant step forward in advancing public disclosure and demonstrates a way forward from which many can learn.

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1

Background

The Carbon Disclosure Project (CDP) and ICLEI – Local Governments for Sustainability (ICLEI) have partnered together to encourage cities in the United States to voluntarily report their greenhouse gas emissions (GHG) and other information related to climate change.



For cities already publishing emissions data and climate change action plans, the CDP Cities Pilot Project provides another opportunity to publicly disclose and share climate change information. It also enables the progress of cities and businesses to be compared.

Local government operations typically account for only a small percentage of emissions within their communities. However, they have the potential to engage with businesses and residents, implement policies and programs, demonstrate commitment and lead by example. Local governments can encourage and inspire others to take action and, as a consequence, their influence can be considerable.

The Carbon Disclosure Project

CDP's mission is to collect and distribute high quality information that motivates investors, corporations and governments to take action to prevent dangerous climate change. By providing a framework for reporting and discussing the development of climate change strategies, CDP plays a vital role in encouraging organizations to measure, manage and reduce emissions.

Each year, on behalf of institutional investors, CDP asks the world's largest publicly traded companies to disclose details about their operations. In 2008, the CDP Information Request was endorsed by 385 international institutional investors with \$57 trillion in assets under management. It was sent to over 3,000 companies worldwide and the responses received make CDP the world's largest repository of corporate emissions data.

CDP also launched a Public Procurement program in the UK. The eight founding public sector members received responses to the Information Request from 238 suppliers. The responses, together with the data from previous requests, make CDP the world's largest registry of corporate GHG emissions information. CDP's data and reports are available to policymakers and their advisers, academics and the general public.

ICLEI – Local Governments for Sustainability

The mission of ICLEI is to build, serve, and drive a movement of local governments to advance deep reductions in greenhouse gas emissions and achieve tangible improvements in local sustainability. ICLEI, incorporated as a 501(c)(3) non-profit membership association in 1991, started with just a handful of local government members and has grown to a vibrant network of more than 550 local governments in the U.S. and over 1000 worldwide, taking significant action to quantify and reduce energy use and greenhouse gas emissions while improving overall community liveability.

ICLEI guides its members through a Five Milestone performance-based methodology for reducing greenhouse gas emissions and enhancing community sustainability. These milestones are supported by dynamic emissions analysis, action planning, and implementation tools and resources. The Five Milestones for Climate Mitigation are:

Milestone 1

Conduct an Emissions Analysis

Milestone 2

Set an Emissions Reduction Target

Milestone 3

Develop a Local Climate Action Plan

Milestone 4

Implement the Local Climate Action Plan

Milestone 5

Monitor and Report on Results

In support of its members' climate protection and energy goals, ICLEI provides guidance and resources to local governments to enable actions that encourage sustainable growth, protect open space, create more energy efficient buildings, and educate community members on the economic and social values of such initiatives. ICLEI provides direct technical expertise and guidance to its members as they progress through the Five Milestone process in addition to software, greenhouse gas inventory protocols, and emissions reductions quantification tools. ICLEI also facilitates the exchange of best practices amongst its members and is creating a network of local governments committed to climate protection and sustainability.

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CDP Cities Pilot Project





Participating cities

In 2008, thirty local governments volunteered to participate in the CDP Cities Pilot Project. Of these, 18 completed the online questionnaire and submitted responses. The participating cities are:

Annapolis, Maryland
 Las Vegas, Nevada
 Arlington, Virginia
 New Orleans, Louisiana
 Atlanta, Georgia
 New York City, New York State
 Burlington, Vermont
 North Little Rock, Arkansas
 Chicago, Illinois
 Park City, Utah
 Denver, Colorado
 Portland, Oregon
 Edina, Minnesota
 Rohnert Park, California
 Fairfield, Iowa
 Washougal, Washington
 Haverford, Pennsylvania
 West Palm Beach, Florida

Over 70% of total global emissions are generated from cities and if you don't measure these emissions, you can't manage them. This is a vital step for cities who wish to gain a better understanding of their own impact and by improving their understanding of risks and opportunities associated with climate change, best prepare their cities for a carbon constrained world.

Paul Dickinson,
CEO, CDP

ICLEI's partnership with the Carbon Disclosure Project underscores how crucial standards, quantification methods and voluntary reporting are to local climate action. This project provides the opportunity for transparency, and is essential in the emerging national and global policy dialogue as the priorities of local governments to achieve swift and deep reductions are identified and advanced by local government leaders.

Michelle Wyman,
Executive Director,
ICLEI USA

The 18 participating cities are a self-selected sample and not formally representative of the United States. However, they do demonstrate many diverse aspects of the history, geography and development of cities and each is located in a different state (Fig. 1). For example, New York City has a population of more than eight million, with a further 12 million living within the greater metropolitan area. Haverford is a suburban community of about 50,000 people. Sitting in the great plains of the agricultural Midwest, Fairfield is a city of just a few square miles with a population of about 10,000.

Around 70 percent of Nevada's population reside in the metropolitan area of Las Vegas, situated on the arid Mojave Desert floor. A thousand miles to the north, Washougal's southern boundary is defined by the Columbia River, the largest river in the Pacific Northwest and one of the largest salmon stocks in the United States. On Florida's Gold Coast, nearly half of the total area of West Palm Beach comprises reservoirs and the Everglades marsh ecosystem.

Located 7,000 feet above sea level, Park City's economic decline with the shutdown of local mining has been reversed by growth as a ski resort. Annapolis is located on the Atlantic coastal plain with the highest point barely 50 feet above sea level. Much of New Orleans, as evidenced during Hurricane Katrina in 2005, is below sea level.

The City of New York joins the world's leading corporations in providing a complete, accurate accounting of its carbon emissions, the strategies it is employing to mitigate those emissions, and the results of its efforts through the Carbon Disclosure Project and ICLEI. This partnership between the world's major corporations and, increasingly, its cities, highlights the importance of the cooperative action needed to successfully counter climate change.

Michael Bloomberg,
Mayor, New York City

Aims

The purpose of the pilot project is to apply the proven process developed by the Carbon Disclosure Project – as used by thousands of companies around the world – to enable U.S. cities to disclose GHG emissions and other climate change information.

The goal of the project for the participating cities was to

- understand the issues
- learn from peers
- manage risks
- improve readiness for a carbon constrained future
- demonstrate leadership
- educate stakeholders.

Project process

CDP has established an annual cycle of requesting and analyzing corporate information on climate change and GHG emissions. The Information Request at the heart of the process was originally designed to elicit corporate information of interest to investors. For this pilot project with U.S. cities, the core sections of the existing online questionnaire and accompanying guidance were adapted for use by public sector respondents. This ensured compatibility with proven methods and results from other organizations.

There are four core sections of the questionnaire:

- Risks and opportunities – associated with climate change
- Emissions - summary GHG emissions data
- Performance – strategies and achievements
- Governance – internal accountability.

Standardization by CDP ensures comparability between responses in both the private and public sectors. This standardization also, in effect, suggests key areas that investors and other requesting parties expect all organizations to address.

The questionnaire is included as Appendix 3.

The City of Washougal is excited to be part of the important discussion mediated by Carbon Disclosure Project and ICLEI. Efficiency of consumption and the effective reduction of emissions are processes initiated by the transparency and responsibility encouraged by the CDP and ICLEI. The effort to move cities into a leadership position in guiding sustainable development throughout the country will ultimately benefit the health of future generations.

**Stacey Sellers,
Mayor, Washougal**

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Context



Global context

The United Nations Framework Convention on Climate Change established principles of common but differentiated responsibilities, inter-generational equity, and 'the polluter pays'. Since then, intergovernmental policy development has been based on the assumption that a rise in average global temperature of two degrees Celsius represents a safe limit. In an attempt to avoid exceeding this, policies have subsequently been related to the concentration of GHGs in the atmosphere.

Negotiations have largely avoided the most direct ways of mitigating climate change, such as controlling fossil fuel extraction and outlawing the direct destruction of carbon sinks such as forests. Instead, efforts have been directed towards emissions management - exerting control over the emissions arising from human use of fossil fuels, waste disposal, the leakage of refrigerants and other sources.

Targets for emissions reductions have been defined in relation to 'baseline' years for which emissions have been assessed. The relationship between these targets and the accumulation of GHGs in the atmosphere has not been clear. The market-based approach of the Kyoto Protocol has failed to deliver significant emission reductions and while there have been some successful reduction efforts, these have been very small on a global scale. Emissions are increasing more rapidly than ever before.

About 80 million tons of carbon dioxide enter the atmosphere every day as a result of fossil fuel combustion alone. The concentration of GHGs in the atmosphere continues to grow at an unprecedented rate. Temperature changes have triggered many reinforcing feedback processes. These in turn have accelerated changes that continue to add to the rate of temperature increase.

Work is underway to negotiate a new international climate policy framework to succeed the Kyoto Protocol. This will culminate in a UN conference in Copenhagen in December 2009. It is not yet clear whether the disparity between previous policy goals and the most recent scientific findings can be reconciled but it would appear that the positive work towards solutions by U.S. cities could encourage and support a positive approach from the federal government and other nations.

U.S. context

The U.S. federal government signed the Kyoto Protocol but failed to ratify it. The Bush Administration did not pass any national climate change legislation, claiming it would have a negative impact on economic growth. In the absence of federal action, mayors, governors, and county executives have taken action locally. Seattle Mayor Greg Nickels launched the U.S. Conference of Mayors Climate Protection Agreement in February 2005. By November 2008, more than 900 mayors had signed the Agreement, thereby committing to meet reduction targets in line with the Kyoto Protocol. These include reducing global warming pollution levels to 7 percent below 1990 levels by 2012.

Local governments have proven to be excellent laboratories for implementing emissions reductions policies and programs and through their early action and leadership, they are being recognized for their knowledge and expertise of climate change related issues.

Local governments and the ICLEI Network

Many of the signatories of the U.S. Conference of Mayors Climate Protection Agreement are ICLEI members and 17 of the 18 cities participating in the pilot project are ICLEI members. While some of these are longstanding ICLEI members, others are new members taking the first steps towards developing an emissions inventory. ICLEI members are encouraged to follow ICLEI's Five Milestones for Climate Protection methodology (Fig. 2).

The 18 participating cities were encouraged to follow ICLEI's recently released Local Government Operations Protocol (LGOP) for quantifying and reporting emissions resulting from government operations. Based on the GHG Protocol, the LGOP was released in September 2008, shortly before the CDP questionnaire was issued. ICLEI expects a period of transition as its members adopt the LGOP and many of the responding cities did not complete inventories that were entirely compliant with it.

Although local governments are working on reducing greenhouse gas emissions resulting from both their own operations and their communities, the focus of this Cities Pilot Project 2008 is on government operations. Some cities also provided the results of a community-wide assessment, setting their own actions in the context of a wider sphere of influence.

In December 2008, ICLEI and Climate Communities - a national coalition of cities and counties - sought the endorsement of local elected leaders to promote a Climate Action Blueprint to the new federal administration, calling for a national climate policy to set mandatory limits on GHG emissions, establish market-based trading and allow regulated emitters to invest in carbon offsets.

Current context

Since the closing date for cities' disclosures, the Obama Administration has made significant advances towards creating policies and programs to support emissions reductions. The American Reinvestment and Recovery Act of 2009 set aside funds to invest in rebuilding the economy. This 'stimulus package' includes \$3.2 billion for the Energy Efficiency and Conservation Block Grant (EECBG) Program that will be directed towards local government energy efficiency projects. This could dramatically accelerate local governments' plans to reduce energy use through their government operations. Also, in April 2009 the U.S. Environmental Protection Agency formally declared that carbon dioxide and the five other gases that are included in the Kyoto Protocol are to be classified as pollutants, creating a key platform for future legislation.



Fig. 2. The ICLEI Five Milestones for Climate Mitigation

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Results

Cities' responses were submitted to CDP by 31 October 2008. Through their participation in this project, the 18 responding cities provide an indication of the progress being made by U.S. cities to address climate change. They also demonstrate leadership and a willingness to contribute to developing pathways towards global responses to climate change.

The 18 participating cities include large cities such as New York and Chicago, state capitals such as Annapolis, Atlanta and Denver, suburban cities such as Edina and Haverford and small cities such as Fairfield, Park City and Washougal. While Arlington is considered to be a Central City of the Washington Metropolitan Area, it is across the Potomac, and the state boundary, and politically it is organized as a county. Similarly, North Little Rock is across the Arkansas River from a larger neighbor.

Although there are important differences between city governments and companies, there are also many shared interests - in working towards a common language, tools and techniques, benchmarks and standards, and in developing compatible approaches that will help all organizations to work towards the common aim of minimizing climate change.

Many of the participating cities have responded very fully to the CDP Information Request and in addition have appended substantial reports, municipal resolutions, analyses by consultants and other documents including, in some cases, details of efforts to develop adaptation strategies. While some cities have already directed considerable resources towards addressing climate change, others are working through the issues and compiling a GHG inventory for the first time.



Risks and opportunities

All responding cities identify risks associated with climate change. Risks from physical impacts and their consequences include sea level rise for coastal cities such as Annapolis, New Orleans, New York and West Palm Beach. Perceived risks are not limited to direct impacts on cities but also relate to agriculture, water systems, fires, loss of hydropower and a range of direct and indirect public health issues.

A wide range of potential economic impacts are recorded. For example, the destruction of habitats and species migration could have economic consequences for Washougal if climate changes interfere with salmon stocks. Economies dependent on tourism such as Park City and Las Vegas could be impacted by loss of snow and water shortages respectively.

Regulation at the state or federal level could create opportunities as well as risks. For instance, the wider introduction of Renewable Portfolio Standards, carbon taxes or cap-and-trade systems could penalize cities that are heavily dependent on fossil fuels. On the other hand, cities including Denver and Rohnert Park anticipate that regulation could render renewable energy projects more viable, with benefits to local economies. In other cities, wind developers, photovoltaic manufacturers, biodiesel producers and energy efficiency consultants have already created thousands of new jobs.

Chicago and New York City anticipate that emission regulations and mandatory energy efficiency standards could help them meet their emissions reduction targets. Fairfield notes that, when seeking to engage the community, “regulation from higher up is another argument in favor of action”.

Other perceived opportunities associated with climate change include longer growing seasons, reduced heating or air conditioning costs and longer tourist seasons if spring and fall temperatures increase. However, a comment from Park City sums up the overall balance of risks and opportunities: “All of these potential benefits considered, Park City would still be better off without the predicted impacts of climate change”.

All responding cities report plans or actions to manage the risks associated with climate change, including both mitigation and adaptation. Many cities report policies and the implementation of practical programs, providing detailed examples. Some cities have established investment processes to address risks or develop cost savings or other local opportunities. For example, Park City has “developed regulations that allow for a 4% increase in total building costs to implement higher-cost green features into municipal facility new construction and remodels” and has also “invested \$1.4 million in a municipal facility energy and water efficiency project that will reduce municipal emissions by 13.5%”. Denver has “modernized its general motor pool fleet with over 130 hybrid electric vehicles” and also “implemented a green concrete policy in 2008 to require 20% of fly ash in city funded transportation infrastructure projects”.

Emissions

Sixteen cities provided summary government emissions data according to the GHG Protocol categories of Scope 1 (direct emissions) and Scope 2 (emissions associated with purchased electricity). This demonstrates that these cities are accounting for emissions and are able to organize the data in ways that support comparisons with other organizations in both the public and private sectors.

It is important to recognize that the operating emissions of local governments are a consequence - directly or indirectly - of a wide range of influences. These include climate and weather, and historical and geographical factors such as the availability of fossil fuel resources, the make-up of the local economy, the availability of renewable energy resources and the carbon intensity of available electric supplies. Until these influences are fully understood, comparisons on the basis of emissions alone (Appendix 1, Table 1) are of very limited value. ICLEI has identified several indicators and, on the basis of an examination of the responses of participating cities, the authors have derived a more extensive range of factors that may in future become useful when assessing the relative performance of cities (Appendix 1, Table 2). This is an area that requires further development.

Together, the aggregated Scope 1 and Scope 2 emissions for the responding cities amount to more than six million metric tons of carbon dioxide equivalent (CO₂-e - see Glossary). This total is of a similar order to the equivalent figures for some large corporations such as Coca Cola (five million metric tons CO₂-e), Procter & Gamble (six million metric tons CO₂-e) and Toyota (eight million metric tons CO₂-e) [Figures from CDP6 (2008) Global 500 Report].

The scope for cities to influence the reduction of emissions is not limited to those for which they are directly responsible. For example, while the direct (Scope 1) emissions accounted for by the government of Chicago amount to about 350,000 metric tons CO₂-e, the community of the city of Chicago and its six neighboring counties are together the source of over 100 million tons of GHGs annually. This is equivalent to five times the Scope 1 and 2 emissions of Wal-Mart or more than one day's worth of carbon dioxide emissions from all fossil fuel combustion globally.

Goods and services are bought from other U.S. states and cities or imported. Once the emissions in these supply chains have been accounted for, the full sphere of influence will be seen to be considerably larger. The CDP questionnaire invites respondents to disclose supply chain emissions and also emissions from employee business travel, external distribution and logistics and the use and disposal of an organization's products and services. The GHG Protocol refers to these, and any other emissions accounted for, as Scope 3.

New York City followed the LGOP when identifying and measuring Scope 3 emissions from government operations. These included school buses (a contracted service), taxis, livery cabs, and limousines (government regulated), employee commuting, and city government employee solid waste.

Five other cities calculated separate figures for some Scope 3 emissions including employee commuting. Edina and North Little Rock included a figure for emissions associated with the disposal by other parties of city waste. In total, the Scope 3 emissions reported by the 18 participating cities were in the order of two million metric tons CO₂-e.

It should be noted that some well known corporations such as Nokia and Microsoft are reporting Scope 3 emissions that far outweigh their Scope 1 and Scope 2 emissions. In the United Kingdom, the results of CDP Public Procurement 2008 suggested that local government Scope 3 emissions could be significant. This program demonstrated a previously unrecognized level of leverage available to the public sector through procurement policies. In the U.S., this is an area that also warrants further examination.

The factors used by cities to calculate their Scope 2 emissions vary because the energy mix and associated emissions vary considerably between locations. While some cities are heavily dependent on coal, Washougal is one of five cities reporting energy use from renewable sources. Two-thirds of the city's energy is hydropower. Cities' direct expenditure on energy ranged from around 1% to about one eighth of operating costs.

Cities have contracted out services and also purchase quantities of goods and materials. Suppliers are using energy from fossil fuels to manufacture, transport and supply these goods and services. If the price of energy rises because of Energy Portfolio Standards or a carbon market or tax, the suppliers are likely to pass that increase on to the city. If a significant proportion of a city's budget is spent on purchased goods and services, the cost implications could also be significant.

It has become the norm for both corporations and governments to set targets with reference to a combination of past performance in a 'baseline' year and projections of 'business as usual' emissions. Most cities have reduction plans, or at least an overall reduction target in place or under development, although most of these are only recently established and only one city reports reductions achieved directly as a result of reduction plans. While some

cities have set ambitious targets (e.g. Rohnert Park is aiming for a 35% reduction against a 2000 baseline by the end of 2012), others have more modest aims or no target.

Although reduction plans may not be based on uniform annual progress, it is noticeable that when annualized, even the most ambitious overall targets equate to minor incremental adjustments of less than three percent per annum (Appendix 1, Table 11). While this is not out of step with large corporations such as GE, Boeing, DuPont and IBM, there is a vast gap between the total of all such targets and the scale and urgency of the climate challenge being described in the recent findings of scientists. It remains to be seen what role, if any, city administrations will play in bridging that gap.

In the absence of a lead by the federal government under the previous administration, a more visionary approach, or the formulation of more ambitious targets, may have exposed local governments to challenge. Nevertheless, some cities have developed sustainability plans that address a broader range of issues. New York City's PlaNYC has a wide range of goals for 2030 while two cities report approaches that target unequivocal sustainability goals. Fairfield is aiming to become a model sustainable community and to achieve energy independence as a county. Sonoma Mountain Village, in Rohnert Park, plans to become North America's first "One Planet Living" community with goals of net zero energy and water use and net zero waste.

Most cities do not currently define emissions intensity targets - such as emissions per resident or per \$ budget. Five cities did provide figures for intensity measures, and the authors have supplemented these (Appendix 1, Table 7) but it would appear that further work is required to understand the factors that influence such measures.

Governance

In most responding cities, the city council, mayor's office or high level committees have responsibility for reviewing policies and committing to plans and performance measures. In some cases oversight is provided by a committee set up for that purpose.

Some cities have also instituted new organizational structures to respond to climate change such as the Mayor's Office of Long Term Planning in New York.

Looking ahead

Local governments, like corporations, have a tendency to report on all of the good things being done and the positive aims and aspirations. Certainly, encouragement is needed and success should be celebrated. However, it is also important to conduct a clear analysis of the extent to which actions are actually making a difference.

About half of the total world population lives in towns and cities. Through their actions, the 18 cities will not only make progress themselves - they will also serve as leaders and guides for others that will follow. Although, from the information disclosed, it appears possible that the dictum "what gets measured gets managed" could be true, that has yet to be proven. As the findings of scientists and the impacts of climate change are felt more sharply, questions about the need for more rapid change are likely to increase.

If historical responsibility for climate change were proportional to cumulative CO₂ emissions, the U.S., responsible for over a quarter of cumulative fossil fuel CO₂ emissions since 1750, would carry more than three times the burden of any other nation. In this context, U.S. cities have an important part to play in taking positive actions that can make a difference.

The 18 participating cities have demonstrated how to get started on the broad journey that needs to be taken by cities and other organizations around the world. This pilot project marks a significant step forward in advancing public disclosure and reporting on climate change related issues.

5

Appendix 1 Responses

1. Introduction

Eighteen cities completed the online questionnaire and submitted their response to CDP. While a couple of cities provided minimal information, most cities answered fully and many supplemented their answers with a considerable volume of material, including resolutions, community reports, climate actions plans and other documents.

The approach taken below is therefore to present key data that fits most closely with the questions asked, examples of responses, and explanatory notes.

Of the 18 responding cities, all but two have chosen to allow public access to their disclosures via the CDP website: www.cdproject.net. Further information can also be found on cities' own websites.



2. Completion levels

Following preliminary questions concerned with population and turnover, the cities were invited to disclose information under four broad headings:

- Risks and opportunities – cities' views on the risks and opportunities associated with climate change
- Emissions – summary annual greenhouse gas emissions data
- Performance – strategies to reduce emissions, minimize risk and capitalize on opportunities, including targets and reductions achieved
- Governance – internal accountability with regard to climate change and emissions.

These core sections of the CDP online questionnaire are included in all CDP programs, ensuring comparability between responses across the private and public sectors.

In CDP's corporate programs, an indication of progress in the development of climate change strategies is given by the extent to which respondents are able to complete successive sections of the questionnaire. This also appears to be the case for cities with the exception that, for cities, policy decisions and procedures to establish governance tend to precede rather than follow action (Fig. 3).

All responding cities identified risks associated with climate change and most (15 out of 18) identified at least one or two potential opportunities. For any organization, the completion of an emissions inventory and the implementation of internal reporting procedures are prerequisites for setting goals and planning performance improvements.

Nearly all (14 out of 16) of the cities that reported GHG emissions figures reported one or more emissions reduction targets and half (8 out of 16) report having an emissions reduction plan.

Some participating cities are calculating emissions for the first time and are at an early stage in examining the potential for reducing emissions. While about three-quarters of the cities (14 out of 18) have reduction targets in place, some of these targets may best be interpreted as a call to action rather than being based on a thorough analysis.

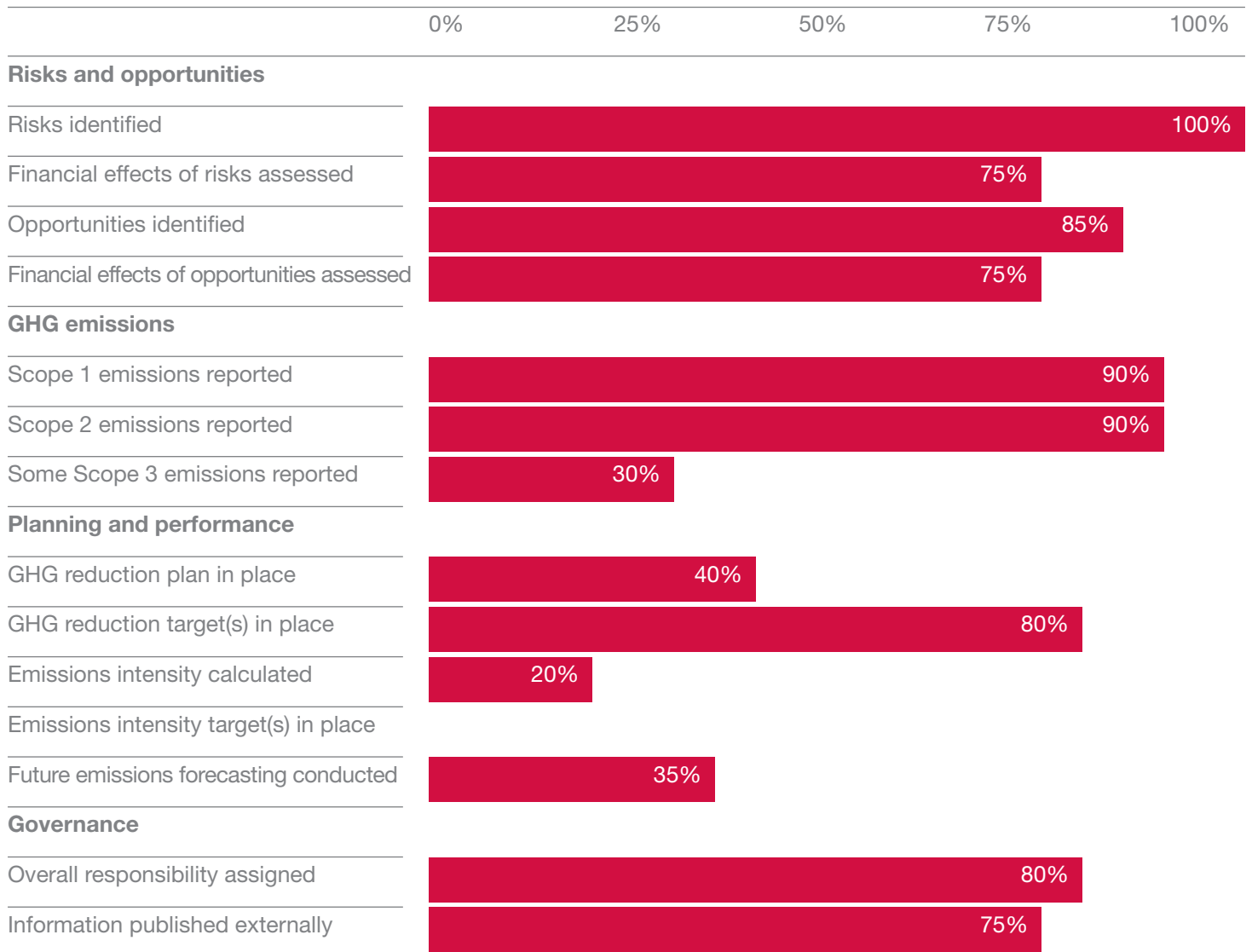


Fig. 3. Percentage of cities that answered each section of the questionnaire

3. Risk and opportunities

Many risks are becoming commonly associated with climate change. While corporations often consider risks to business, cities are also considering risks to the physical environment and the adaptation that may be needed if they are to become resilient to the effects of climate change.

Respondents are asked to identify strategic risks and opportunities and their implications. The questions are couched in terms of regulatory risks, physical risks and other “general” risks; and similarly for opportunities (Fig. 4). Further questions concern the financial implications of risks and investments associated with opportunities. Cities’ responses identify many interrelated issues and overlaps between these categories.



Fig. 4. Cities identifying risks and opportunities

Regulatory risks

Thirteen cities identify regulatory risks with the most frequently cited being associated with the introduction of a cap-and-trade system and shifting the energy mix from coal towards more renewable generation. The effects of climate change on water resources are also a critical concern for some cities. Some examples from responding cities are included below.

Electricity

A majority of states have mandatory Renewable Portfolio Standards (RPS) that require retail electricity providers to supply a minimum percentage of their electricity from renewable sources. Regulation by other states, or a federal RPS, could accelerate the deployment of renewable generation. Park City reports that in Utah “84% of our electricity production comes from coal” while Atlanta notes that Georgia’s energy mix consists of over 60% coal and that any higher costs of renewable generation could be passed on to customers including the city and its constituents.

Cap-and-trade or carbon tax

Washougal observes that if mandatory emissions reporting and reductions are introduced, the city may be forced to either reduce emissions or buy emissions rights. Las Vegas notes that if a cap is too low, business and industry may locate elsewhere. Chicago has completed a comprehensive Economic Impact Analysis of Climate Change and participates in the Chicago Climate Exchange, but the risks related to regulation of emissions have not yet been evaluated.

Water

Las Vegas reports a risk of further water quality and conservation regulations as a consequence of climate change: “Nevada’s surface waters are fully appropriated, so any change in the availability of water would complicate the complex water rights and interstate compacts that govern water allocation regionally and in Southern Nevada”. West Palm Beach reports that current state level

Consumptive Water Use regulations are designed to protect natural wetland areas, minimize overdraft of freshwater well fields and prevent salt water intrusion into aquifers. A combination of droughts and population increase is likely to require further restrictions on consumption in the city.

Physical risks

Recognition of the potential physical impacts of climate change and interrelated consequences is widespread. All 18 cities consider that they are exposed to physical risks from climate change, many of them interlinked.

Sea level rise

Annapolis is surrounded by six bodies of water (Weems Creek, Back Creek, Spa Creek, College Creek, Severn River, and the Chesapeake Bay) and was subjected to the destructive effects of a higher sea level on the downtown area during a hurricane in 2003. West Palm Beach is situated along a shoreline rising no more than a few feet above present high tides. New York City is especially vulnerable to sea level rises and coastal storms while the City of New Orleans is below sea level and has already suffered catastrophic effects.

Storms, hurricanes and extreme weather

Recognition of a tendency towards more extreme weather shows up in several ways. An Impacts Analysis conducted for Chicago found that the city “will receive more precipitation when we do not need it and less when we do.” Other cities observe that rivers will flow higher in spring when water is abundant but lower in summer when water is needed and the urban heat island effect will exacerbate rising temperatures.

Hurricanes and an increased incidence of storms were mentioned by several cities. Flooding with consequent damage to property and infrastructure and interruptions to energy systems, transport and other operations were highlighted by several cities including

Atlanta, Haverford, Las Vegas, North Little Rock and Rohnert Park.

Impacts on agriculture

Edina and Fairfield note the risk of soil erosion and the potentially damaging effects of severe run off on agriculture and infrastructure. Washougal noted that “Land use and agricultural production in Washougal’s ‘foodshed’ will be altered by increased temperatures. The most likely changes will be regional shifts in production, crop variety, and decreased irrigation water as urban consumption increases and natural water sources are depleted. A longer summer could initially affect productivity, time of harvest, and eventually the variety of crop that can be grown”. Burlington anticipates the arrival of new pests which could negate the benefits of longer growing periods.

Water and fire

Several cities, including Atlanta, Edina, North Little Rock and Park City, anticipate the risk of drought and the consequences for water supplies. For example, “Most of Edina’s residents use groundwater sources that draw water from aquifers located up to 80 miles from the city. Diminishing summer water supplies and increased risk from pollutants in the city wells will require implementation of additional water restriction measures.”

Several cities, including Haverford, Denver and North Little Rock, report that air quality issues could be exacerbated by, for example air-borne particulates due to a falling water table in agricultural areas, heat-related increases in ground level ozone and smoke from large wild fires as a result of increased frequency of droughts.

Increased fire risk is also mentioned by Las Vegas, Rohnert Park and other cities with Park City observing that “close proximity to wild land fire zones and significant forest lands increases this danger”.

Public health

Several cities, including Denver, Fairfield, Las Vegas, North Little Rock and Washougal, mention consequences for public health from more extreme temperatures and severe weather events. Respiratory disorders could be exacerbated by deteriorating air quality while Edina considers that summer temperature increases may lead to the spread of insect and water-borne diseases that have recently appeared in Minnesota, such as West Nile encephalitis from mosquitoes.

General risks

Sixteen cities report general risks. These include economic risks arising from the effects of climate change on ecosystems, consequences for the import and transport of food and other goods, and demographic changes. Washougal notes that community support will be required for action.

Ecosystems

Some cities consider that habitats and whole ecosystems could be affected with multiple consequences. For example, Haverford notes the potential threat to flora and fauna, while West Palm Beach reports the risk of habitat destruction and species extinction on a regional level. Washougal reports that stream flows and temperatures could be altered in the Columbia River basin and that “a diminished salmon stock would disrupt ecosystem dynamics” and affect other species. Fairfield notes that warmer winters could lead to an increase in invasive plant species and pests. Denver mentions risks associated with pine beetle infestations. Annapolis observes the potential for economic consequences as climate change warms the water of Chesapeake Bay, creating more eutrophication and increasing dead zones.

Economic consequences

Many cities report the risk of adverse economic consequences. For example, Las Vegas reports that “As of October 2007, both Lakes Mead and Powell stood at 49 percent capacity. One study suggests that unless water

consumption is drastically reduced, Lake Mead will dry up by 2021 leaving 12 to 36 million people without a secure water supply.” Reduced flow in the Colorado River could also end the hydroelectric power generated by the Hoover Dam (which supplies four percent of Nevada’s energy and a larger percentage to neighboring states). This could lead to higher energy prices. North Little Rock also notes that destabilization of river flow could lead to reductions in hydro-generation and river-related commerce.

There could also be consequences for economies dependent on tourism. For example, flooding in the Las Vegas Valley could deter tourists. Leisure and hospitality is the largest economic sector in Nevada. In 2006, metropolitan Las Vegas had more than 39 million tourists. Local golf courses, which are used by 3 out of every 10 tourists, are major consumers of water and may lose viability due to water shortage and aridity.

Park City has an economy that is dependent on the ski industry. It reports the results of a scientific analysis showing that, by 2075, it may not be possible to maintain persistent snow levels. If the ski industry experiences a significant downturn “there will be a corresponding reduction in tax revenue”.

Rohnert Park indicates there could be a risk to the wine production that contributes significantly to the region’s economy.

West Palm Beach notes risks to its financial services sector. “Increased frequency of severe climatic events has the potential to further stress insurers, reinsurers, and banks to the point of impaired viability or ensuing higher insurance premiums”. The consequences “could ultimately hurt the real estate market” and the local economy.

Demographic changes

Edina forecasts that the percentage of residents over the age of 65 (37 percent in 2000) will double by 2030. The majority of the housing stock in Edina currently consists of single homes in residential zones without pedestrian access or public transportation. More extreme weather conditions will pose health risks to the elderly and increase their isolation. Chicago reports the possibility of migrations from flooded and drought-stricken areas. Burlington considers that in future “environmental refugees” could be attracted to the area because of its abundant natural resources.

Food and goods

Climate change could disrupt the production and supply chains of food and other goods. Fairfield reports that Iowa imports about 80 percent of its food with the percentage of food imported to Fairfield believed to be of a similar order. “With an ever growing world population, decreasing arable land, decreasing soil fertility, decreasing productivity of current agriculture practices”, there is a risk of food shortages.

North Little Rock forecasts that “the impact of resource scarcity could increase the price we pay for purchases and the subsequent abilities of our residents to pay for the essentials of life. As they are unable to pay, they often turn to the City for assistance”.

Washougal notes that “Climate change presents a general risk to supply chains that serve consumers and businesses” and that the city “may be required to adjust and regionalize supply chains in order to minimize disruption.”

General and regulatory risks management

All responding cities report that they have taken action or are planning to manage general and regulatory risks. Many cities report policy plans and the implementation of practical programs. These include both long term planning and emergency preparedness. They reflect cities’ concerns with adaptation as well as mitigation. For example:

- Atlanta Mayor Shirley Franklin signed the US Conference of Mayors Climate Protection Agreement and the city is establishing an Office of Sustainability.
- Denver has developed a Climate Action Plan with several strategies being implemented.
- New York has launched the New York City Climate Change Adaptation Task Force to develop strategies to protect the city’s critical infrastructure systems.
- Chicago has undertaken a comprehensive adaptation planning and implementation process addressing extreme heat; extreme precipitation; building, infrastructure and equipment stress; ecosystem changes; and leadership, planning and communication

Financial effects of risks

Thirteen cities assess the financial effects of risks (Fig. 5). For example, the City of Chicago engaged consultants to help the Chicago Climate Task Force to model the potential economic impacts of climate change on the city over the period 2010 - 2100.

North Little Rock uses traditional cost benefit analysis to assess climate change risks and operational solutions and notes that the value of carbon emissions reductions is a consideration in financial reviews of departmental expenditures. West Palm Beach has begun a comprehensive evaluation of trends which have triggered increased expenditures linked to climatic alterations, increased material costs or energy and fuel costs.

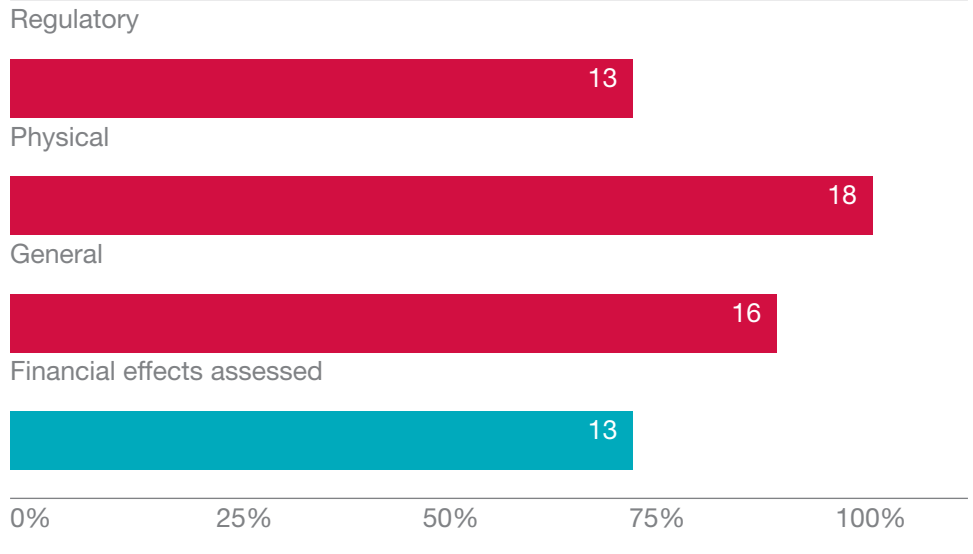


Fig. 5. Cities assessing the financial effects of risks

Regulatory opportunities

Seventeen cities consider that current or anticipated regulatory requirements offer opportunities (Fig. 6). For example, the City of Washougal recognizes that progressive climate change policy will provide a framework for improved resource management, regionalized and sustainable economic development, and a higher quality of life for citizens. Other cities proactively anticipating state regulation or eager to capitalize on opportunities for affirmative action on greenhouse gas emissions include Annapolis and Fairfield. Chicago and New York City anticipate that emissions regulations and mandatory energy efficiency standards could help them meet their own emissions reduction targets.

Several cities including Burlington, Denver and Rohnert Park anticipate the development of new renewable energy technologies, or that regulation could render renewable energy projects more viable. One city notes that firms like wind developers, photovoltaic manufacturers, biodiesel producers and energy efficiency consultants already employ thousands of local workers. New Orleans reports that a recent extension of renewable energy tax credits will allow the city and residents to finance solar and other renewable energy projects. North Little Rock also notes that there may be opportunities in the near future to monetize carbon emission reductions through the trading of carbon credits in a cap-and-trade environment.

Fairfield notes that “When it comes to communicating the need for climate change and local community independence, regulation from higher up is another argument in favor of action.”

Other cities note that addressing climate change creates opportunities to improve the wellbeing of residents: “When residents are able to...walk and ride bicycles, instead of relying on cars, their actions not only reduce fuel use, and therefore greenhouse gas emissions, but the individuals also may benefit from the improved health that accompanies a more active lifestyle.”

Physical opportunities

Ten cities anticipate opportunities arising from the physical impacts of climate change (Fig. 6). Potential opportunities concern cost savings, longer growing seasons, benefits for tourism and leisure facilities, and potential health benefits of milder winters.

For example, Washougal observes that warmer weather is generally linked to lower death rates and lower medical bills. Some cities mentioned opportunities to save heating costs as a result of milder winters (Chicago, Denver, Fairfield) although this may be offset by increased air conditioning costs in warmer months (Edina, New York). Other examples of potential cost savings mentioned include reduced use of snowplows and salt for the de-icing of roads and a reduction in road repairs and cold weather-related emergencies (Edina).

Longer growing seasons are identified by Fairfield, North Little Rock, Park City and Washougal, increasing the range and growing months for fruit and vegetables in particular. However, as noted above, cities also perceive risks associated with changing seasons.

Both Las Vegas and Park City highlight potential opportunities to increase tourism. While the Las Vegas Valley may benefit from a longer tourist season in the fall and spring as temperatures increase, Park City may benefit from tourists, and an influx of residents, escaping from the heat of Salt Lake City. Park City also mentions increased opportunities for summer recreation as it is increasingly becoming a destination for high-altitude training for athletes.

General opportunities

Fourteen cities report general opportunities arising from climate change (Fig. 6). In addition to opportunities mentioned in response to earlier questions, examples include energy efficiencies and a strengthening of communities.

For example, New York anticipates that “efforts to mitigate greenhouse gas emissions from government operations will save the city hundreds of millions of dollars in energy costs in the coming decade” while Fairfield aims to become a model sustainable community.

Annapolis reports: “We can all come together as a community to not only combat climate change but also to improve and strengthen our neighborhoods.” A similar view is expressed by Washougal: “Climate change provides the community of Washougal with the unique opportunity to unite all stakeholders behind a common banner. A proactive approach to adaptation and mitigation will reward business and residential consumers with lower energy bills, a cleaner environment, and a regional, localized economy that will offer additional jobs to many of its residents.”

Opportunities

Regulatory



Physical



General



Financial effects of opportunities assessed



Investing to maximize opportunities



Considering investment to maximize opportunities



0% 25% 50% 75% 100%

Fig. 6. Cities considering the financial effects of climate change opportunities and investing to maximize them

Investments

Eleven cities report investment to maximize climate change opportunities (Fig. 6). A further four cities mention plans or potential areas of investment that are under consideration. Examples include:

- Energy efficiencies: Edina “has invested in energy saving measures using a case by case approach.” Park City has developed regulations that allow for a 4% increase in total building costs to implement higher-cost green features into municipal facility new construction and remodels” and has also “invested \$1.4 million in a municipal facility energy and water efficiency project that will reduce municipal emissions by 13.5%.”
- Transport: Las Vegas was “one of the first cities in the world to have a hydrogen fueling station” while Denver “has modernized its general motor pool fleet with over 130 hybrid electric vehicles” and also “implemented a green concrete policy in 2008 to require 20% of fly ash in city funded transportation infrastructure projects.”
- Climate Action Plan: The “Chicago Climate Action Plan development has resulted from the investment in over \$1.3 million in grant and foundation funds.”
- Grant investment: Washougal “was rewarded with a \$75,000 grant in 2007 to identify ways in which the community could protect the environment while continuing to encourage economic development. The grant, also known as a Competitive GMA Planning Grant, will be used to further pursue the intentions established in the Sustainability Resolution adopted in 2007.”

Assessing the financial effects of opportunities

Most (13 out of 18) cities have considered how to assess the financial effects of the opportunities they have identified (Fig. 6). Some provide responses in terms of general principles or intentions although few have adopted an approach that explicitly puts a price on carbon.

North Little Rock comments that “Life cycle cost analysis to assess the long-term benefits of a project in conjunction with up-front costs is paramount to the proper assessment of the economic benefits of climate change-related opportunities.” Atlanta uses “discounted cash flow analysis” and notes that “financial effects will be limited to carbon dioxide offsets or renewable energy credits.”

Las Vegas mentions the value of investments that “teach the community, and offer a payback period or educational component.” Denver notes that in cases “where the city is leading by example, even though there may not be a payback period associated with some actions, the need to be seen as a leader sometimes trumps the added incremental costs.”

City	Period reported	Scope 1	Scope 2	Scope 3
Atlanta	2007	48,954	379,460	
Burlington	Jul07-Jun08	17,635	2,978	
Chicago	2007	348,014	729,759	
Denver	2005	51,406	68,552	49,244
Edina	2007	1,487	22,521	1,170
Fairfield	2006	3,444	7,357	
Haverford	Jun07-Jul08	5,034	10,279	
Las Vegas	2006	11,671	150,962	9,429
New Orleans	2007	106,725	103,921	
New York City	Jul06-Jun07	2,262,298	2,030,771	1,813,205
North Little Rock	2008	5,501	17,056	818
Park City	2007	4,041	7,098	1,934
Rohnert Park	2000	961	1,533	
Washougal	2007	727	1,635	
West Palm Beach	Average of 2.8 yrs	9,285	14,617	

Table 1. GHG emissions categorized by Scope (in metric tons CO₂-e)

4. Greenhouse gas emissions

One of the underlying objectives of this pilot program is to help towards the development of standards and benchmarks - so that local governments are able to compare their performance with each other and with businesses and other organizations. To do this requires consideration of both emissions data reported by the cities and the emissions accounting methodologies used.

It is also important to recognize that the operating emissions of governments are a consequence - directly or indirectly - of a wide range of influences. These include climate and weather, historical and geographical factors such as the availability of fossil fuel resources, the make-up of the local economy, the availability of renewable energy resources and, consequently, the carbon intensity of electricity.

ICLEI has identified several key indicators:

- Size – total area within jurisdictional boundaries
- Population – number of (year round) residents
- Annual Budget
- Employees (full-time equivalent)
- Climate Zone (as defined by the U.S. Department of Energy)
- Heating and Cooling Degree Days – annual heating and cooling degree days.

Some of these are considered under 'Emissions intensity' (below).

ICLEI also encourages local governments to report optional indicators for each sector of their operations, such as quantities of wastewater treated and solid waste accepted for disposal, vehicle miles travelled and total electricity generated at government facilities.

Until these indicators and influences are better understood, comparisons on the basis of emissions alone (Table 1) are of very limited value. It may be possible to develop indicators that will enable more meaningful benchmarking and comparisons of cities' performance.

On the basis of an examination of the responses of participating cities, the authors have derived a more extensive range of factors that may be relevant when assessing relative performance (Table 2). While governments can influence some of these factors, others are outside local control.

Factor	Likely to increase emissions	Likely to decrease emissions
Area	large	small
Population	large	small
Land use	urban, industrial, intensely farmed	wilderness
Transportation	private, heavy road use	public, pedestrian, bicycle
State regulatory context	not regulated	more regulated
When emissions reduction efforts started	not started	longstanding
Climate zone	extremes	temperate
Heating and cooling degree days	more	less
Local energy resources	fossil fuels: coal, oil, gas	sun, hydro, wind
Power generation	carbon intensive grid supply	carbon light grid supply
Energy costs	low	high
Local fresh water	scarce	plentiful
Housing	energy efficiency not considered	energy efficient design or refurbishment
Tourism / visitors	high	low
Wealth	high disposable income	low disposable income
Local economy	industrial	services
Cultural predisposition	urban, divorced from nature	in touch with nature
Government resources	poor	rich
Employees	more	less
Government supply chains	long	short
Leadership	focus on other priorities	focus on climate change
Relationship with community	no influence	strong influence

Table 2. Some factors that can influence local government emissions

	Likely to increase emissions	Likely to decrease emissions
Risk and opportunity management	not considered	well managed
GHG emissions reporting	no carbon accounting	established reporting cycle
Planning and performance	reactive	forward planning
Climate change governance	no coordination	responsibilities assigned at all levels

In addition to GHG emissions accounting, the scope of the CDP questionnaire itself covers a range of aspects of climate change and GHG management (Table 3). On the basis of an examination of cities' responses, it is the authors' view that these aspects do indeed give a broad indication of the state of development of responses to climate change and GHG issues and serve as an effective starting point for addressing the further challenges ahead.

Other factors that can be significant in accounting for emissions, and that are included in the CDP questionnaire (Table 3), concern:

- Reporting boundary
- Period reported
- Accounting methodology
- Factors (coefficients used to calculate emissions).

Cities' responses to these, and more information about the emissions data provided, are set out below.

Table 3. Aspects of management responses to climate change and GHG issues

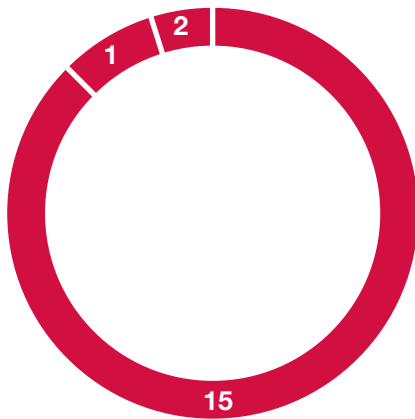


Fig. 7. Boundary selected for GHG emissions reporting

1. Financial control including companies in which an equity share is held

2. Financial control

15. Operational control

Reporting boundary

ICLEI strongly encourages local governments to define their organizational boundary by operational control when accounting for carbon. ICLEI reports that stakeholders involved in the development of the LGOP believe that operational control most accurately represents the emission sources that local government can influence.

Fifteen cities set the scope of their operational control as their carbon accounting boundary. Annapolis and Chicago defined the boundary for their inventory by financial control while North Little Rock included companies in which an equity share is held (Fig. 7).

Period reported

While CDP reporting guidance states: “You may select any start or end dates for your reporting year,” LGOP advises use of a calendar year rather than a fiscal year, and also that it is good practice to aim for a base year that is likely to be representative in terms of emissions.

Cities chose various periods for their emissions reporting (Table 4). Nine cities chose their financial accounting year while eight chose the calendar year (although it was not their fiscal year). A total of seven cities reported on the calendar year 2007 and the most recent year chosen, by North Little Rock, was 2008 (Fig. 8).

West Palm Beach utilized a 2.8 year (January 2006 to October 2008) period to calculate an average annual baseline. This approach was taken in an attempt to normalize data from three differing years with 2006 a post-hurricane year, 2007 a post regional drought year, and 2008 – during which the calculations were made – a normal climate year.

The majority of businesses that respond to the CDP Information Request go on to establish carbon accounting procedures that enable them to continue to report on an annual basis. ICLEI considers annual reporting to also be the best practice for local governments. However, from the cities’ responses it would appear that most have not yet established carbon accounting processes to provide annual carbon accounts on an ongoing basis. Chicago reports being able to provide data for more than one year while New York has made a commitment to conduct a comprehensive annual emissions inventory and published its second one in September 2008.

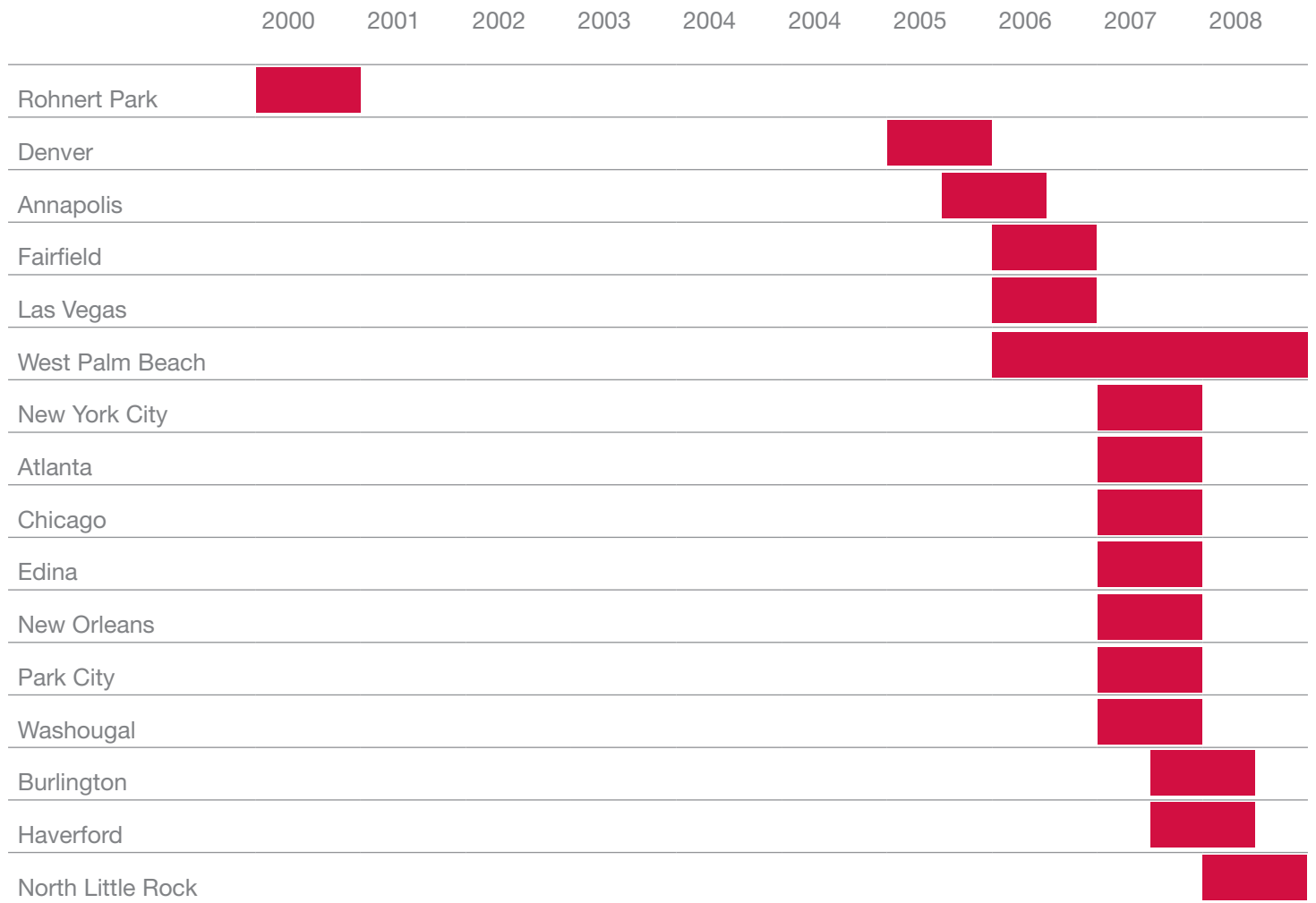


Table 4. GHG emissions reporting year chosen by responding cities

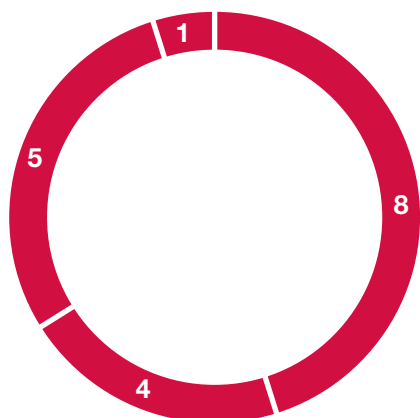


Fig. 8. Basis of period chosen for GHG emissions reporting

1. Other

5. Fiscal year

4. Fiscal year (that coincides with calendar year)

8. Calendar year

Methodology

CDP encourages and supports the use of the Greenhouse Gas Reporting Protocol (GHG Protocol) developed by the World Resources Institute and the World Business Council for Sustainable Development. The GHG Protocol defines a high level framework for a greenhouse gas emissions inventory by setting out:

- principles of greenhouse gas accounting
- organizational boundaries
- operational boundaries
- framework of scopes.

Scopes

In short, the GHG Protocol Scope 1 refers to emissions caused by the combustion of fossil fuels by an organization and other direct emissions into the atmosphere; Scope 2 refers to emissions arising in the generation of electricity that is purchased by the organization; and Scope 3 refers to emissions that fall outside Scope 1 and Scope 2.

Scope 2 emissions are therefore the Scope 1 emissions of the power generator. Similarly, one entity's Scope 3 emissions can be another entity's Scope 1 or 2 emissions. An aim of the categorization of emissions by scopes is to ensure that double counting is either avoided or clearly identifiable.

Gases to be reported

The CDP questionnaire is concerned with the reporting of the six greenhouse gases that are included within the Kyoto Protocol:

Carbon dioxide (CO₂)
 Methane (CH₄)
 Nitrous oxide (N₂O)
 Hydrofluorocarbons (HFCs)
 Perfluorocarbons (PFCs)
 Sulfur hexafluoride (SF₆)

All figures are to be reported in terms of CO₂-e i.e. the equivalent weight in carbon dioxide where equivalence is defined by global warming potential (GWP) over a period of 100 years. Respondents are asked to explain any circumstances in which any of these gases are excluded from reported figures.

ICLEI guidance

ICLEI has encouraged local governments to categorize emissions by operational 'sectors' such as:

- Buildings and other facilities
- Streetlights and traffic signals
- Water delivery facilities
- Port facilities
- Airport facilities
- Vehicle fleet
- Transit fleet
- Power generation facilities
- Solid waste facilities
- Wastewater facilities
- Other process and fugitive emissions.

More recently, ICLEI has also adopted use of the GHG Protocol's scopes, enabling reporting by these as well as in the terms of local government operational 'sectors' that are more widely recognized both internally and by citizens and other stakeholders. Some participating cities reported emissions calculated and categorized by using earlier versions of guidance provided by ICLEI, rather than revising and updating their reporting format within the timeframe of the current project.

All but two of the participating cities used either the LGOP and/or associated Clean Air & Climate Protection (CACP) software released by ICLEI, or the GHG Protocol.

Emission factors

Direct measurement of GHG emissions normally only takes place in facilities with continuous emissions monitoring systems, such as power plants. In other circumstances it has become accepted practice to calculate emissions by applying documented emission factors to activity data. For example, the distance travelled in a given type of vehicle (activity) x emission factor = emissions.

A balance between accuracy and standardization is generally sought when determining how to employ emissions factors. For example, the type of fuel and the type of combustion technology used can influence emissions. Emissions associated with electricity can vary considerably depending on the generating mix. Power is transmitted via the grid and subject to transmission losses and other fluctuations. To establish comparability, "grid average" emission factors for electricity are used, normally based on the regional generating mix. For example, the 2004 emission factor for Denver (in eGRID 2006 Subregion 19 - WECC Rockies) is 2,035.81 lbs CO₂/MWh whereas for Washougal (in eGRID 2006 Subregion 21 WECC Northwest) the 2004 emission factor is 921.10 lbs CO₂/MWh. The Local Government Operations Protocol calls for local governments to utilize the eGRID numbers. However, if the emissions factor for their local utility has been independently verified, then the local government may use that more locally accurate number.

	Scope 1	Scope 2	Scope 1 + Scope 2	Scope 2/ Scope 1	Scope 2 as a percentage of Scopes 1 + 2
Burlington	17,635	2,978	20,613	0.17	14%
New York City	2,262,298	2,030,771	4,293,069	0.90	47%
New Orleans	106,725	103,921	210,646	0.97	49%
Denver	51,406	68,552	119,958	1.33	57%
West Palm Beach	9,285	14,617	23,902	1.57	61%
Rohnert Park	961	1,533	2,494	1.60	61%
Park City	4,041	7,098	11,139	1.76	64%
Haverford	5,034	10,279	15,313	2.04	67%
Chicago	348,014	729,759	1,077,773	2.10	68%
Fairfield	3,444	7,357	10,801	2.14	68%
Washougal	727	1,635	2,362	2.25	69%
North Little Rock	5,501	17,056	22,557	3.10	76%
Arlington	14,718	48,172	62,890	3.27	77%
Atlanta	48,954	379,460	428,414	7.75	89%
Las Vegas	11,671	150,962	162,633	12.93	93%
Edina	1,487	22,521	24,008	15.15	94%

Table 5. Emissions from purchased electricity (Scope 2) compared to direct (Scope 1) emissions

Emissions reported under Scope 1 and Scope 2

Most (16 out of 18) cities were able to provide emissions figures for both Scope 1 and Scope 2, including Edina that was calculating GHG emissions for the first time. Scope 1 emissions reported range from 727 metric tons CO2-e (Washougal) to 2,262,298 (New York). Scope 2 emissions range from less than 1,533 (Rohnert Park included commute emissions in the figure reported) to 2,030,771 (New York). See Table 1 and Table 5 for further details.

There is a considerable range in the proportion of emissions from purchased electricity (Scope 2) compared to direct (Scope 1) emissions. Whereas for Burlington, Scope 2 emissions are less than one fifth of Scope 1 emissions or 14% of the total, for Edina they are 15 times greater than Scope 1 emissions and represent 94% of the total.

Energy costs and energy from renewable sources

Cities were invited to disclose their energy costs from fossil fuels and electric power, and the percentage of total operating cost that this represents. Seventeen cities provided a total energy cost figure and most of these (14) provided a percentage figure (Table 6). In addition, cities were asked to state the percentage of energy spend on energy from renewable sources (Table 7).

Washougal had the smallest energy bill of the 17 responding cities that provided a figure (\$461,670) but the highest percentage from renewable sources with 67% generated by hydropower in 2007, representing 48% of energy costs. New York had the largest energy spend - in the order of \$800 million. As a percentage of operating costs, energy ranged from around 1% (e.g. Denver) to 12.5% (West Palm Beach). Five cities reported energy from renewable sources while seven reported no energy from renewable sources. Six cities did not answer this question (Table 7).

Some cities reported plans to increase the percentage of energy purchased from renewable sources. For example, Annapolis plans to buy “20% of the city’s total energy needs from renewable sources by the year 2020.”

Many cities report risks associated with energy costs and the figures (Table 6 and Table 7) give an indication of cities’ direct exposure to fossil fuel and energy prices. However, completing the CDP questionnaire did not require responding cities to assess their indirect exposure, arising from energy used in their supply chains. This indirect exposure appears to be an unknown, but possibly important, factor as local governments consider how to bolster resilience.

Emissions intensity

While absolute emissions are an essential measure, some organizations have sought to identify additional measures that might assist the management of reduction efforts and comparisons with other organizations. Five cities provided emissions intensity figures.

Denver reported a figure for city government emissions per resident of 0.37 metric tons CO2-e per capita. North Little Rock reported emissions of 0.38 metric tons CO2-e per resident. Rohnert Park reported 137 pounds CO2-e generated from city government operations per capita for the city’s population, equivalent to 0.062 metric tons CO2-e per capita.

Las Vegas reported 61.25 tons CO2-e per full-time city employee and 0.3 tons per resident for city operations. Las Vegas also calculated that for every \$450 spent (city budget), one ton of CO2-e is generated. Las Vegas is not planning to introduce emissions intensity targets while North Little Rock noted: “Because North Little Rock is a municipal electric provider, plans call for intensity measures for emissions per MWh .”

	Energy costs (fossil fuels and electricity) as a percentage of total operating costs %
West Palm Beach	13
Haverford	11
Edina	8
North Little Rock	6
Washougal	5
Rohnert Park	4
Atlanta	3
Park City	2
Annapolis	2
Las Vegas	2
New York City	1
Denver	1

Table 6. Energy costs (fossil fuels and electricity) as a percentage of operating costs

NB. Some of the figures supplied have been rounded to the nearest 1%

	Percentage of energy costs incurred on energy from renewable sources %
Washougal	48
Las Vegas	8
New York City	7
Park City	1
Atlanta	0
Haverford	0
New Orleans	0
North Little Rock	0
Rohnert Park	0
West Palm Beach	0

Table 7. Renewable energy costs as a percentage of all energy costs (including fossil fuels and electricity)

NB. Some of the figures supplied have been rounded to the nearest 1%

Scope 3

Under Scope 3, CDP asks respondents to provide details of:

- Employee business travel
- External distribution/logistics
- Use/disposal of company's products and services
- Company supply chain.

Whereas businesses are often reluctant to consider the emissions associated with employee commuting, it is more common for public authorities to do so and ICLEI guidance includes this source as well as, for example, upstream and downstream transportation of materials and fuels and emissions from contracted services.

While the range of contracted services can vary widely among local governments (e.g. waste hauling, water treatment, bus systems, fire services) and the scale of other procurement can also vary considerably, contracts can enable a local government to exert an influence over associated GHG emissions. With just eight participating member organizations, CDP's recent Public Procurement 2008 program in the UK demonstrated the huge and previously unrecognized scale of leverage available to local governments seeking to reduce emissions. The suppliers to these eight organizations disclosed emissions equal to 0.6% of global output, a figure that exceeded the emissions of the local governments by many hundreds of times.

Six cities provided figures for some Scope 3 emissions (Table 9). Edina, New York City and North Little Rock included a figure for emissions associated with the disposal by other parties of city waste. Denver, Edina, Las Vegas, North Little Rock and Park City calculated figures for employee commutes. (Rohnert Park also calculated a commute emissions figure but this was included in the city's Scope 2 figure.) Edina, Park City and Las Vegas conducted employee surveys and extrapolated full commute emissions figures from the results.

Verification

Although participation in CDP programs is voluntary, a standing question in the questionnaire concerns the external auditing or verification of emissions data. Local government participation in ICLEI’s programs is also voluntary and ICLEI is not currently proposing a verification mechanism to demonstrate compliance with the LGOP. Only Atlanta and Chicago report some form of external verification.

	Employee commute	Solid waste	Business travel	School buses, taxis, livery cabs, limousines	Fleet fuel production
Park City	√	√	√		
Edina	√	√			
North Little Rock	√	√			
New York City		√		√	
Denver	√				√
Las Vegas	√				

Table 9. Sources of Scope 3 emissions reported

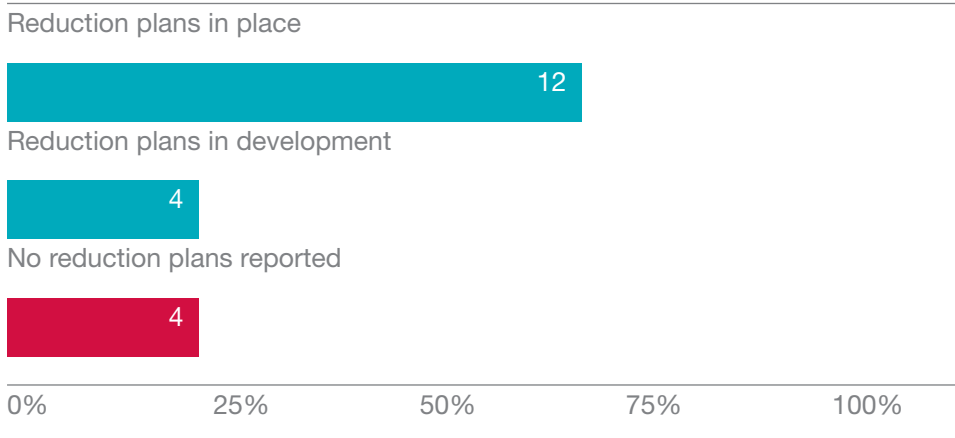


Fig. 9. Cities reporting reduction plans for municipal GHG emissions

5. Planning and performance

Twelve cities reported GHG emissions reduction plans and four reported plans in development (Fig. 9). Fourteen reported one or more reduction targets (Fig 10).

Reduction plans varied considerably and some related to community emissions rather than operational, which was the primary focus of the program. For example, some cities have identified a simple overall emission reduction goal e.g. Haverford: “A voluntary community emissions reduction of 10% is being promoted.” Others provide more detailed plans. For example, Chicago has set overall reduction targets for the community in relation to a 1990 baseline of 25% by 2020, and 80% by 2050. A comprehensive mitigation strategy has been developed to achieve the 25% community reduction by 2020 (15.57 million metric tons CO₂-e) including details set out under the following headings:

- Efficient Buildings (4.6 million metric tons CO₂-e)
- Clean and Renewable Energy Sources (5.33 million metric tons CO₂-e)
- Improved Transportation Options (3.61 million metric tons CO₂-e)
- Reduced Waste and Industrial Pollution (2.03 million metric tons CO₂-e)

The level of ambition expressed in emission reduction targets varies. For example, Rohnert Park’s emission reduction plans include a “35% target by the end of 2012”. Burlington has an overall target of 80% reduction below 2007 levels by 2050. 2020 “is set as a shorter term goal, with a 20% reduction below 2007 levels or 1.5% annually. Between 2020 and 2050, the annual reduction target rate would be 2%.”

Other cities have set more modest targets or not reported any target at all. Although the reduction plans of cities are not all based on uniform or 'straight line' annual progress, it is noticeable that even the most ambitious overall targets equate to less than 3% per annum (Table 11).

As noted above, some of the reported targets may best be interpreted as an expression of intent or a call to action. The practice of making reference to past performance in a 'baseline' year, and/or the projection of 'business as usual' emissions, has become the norm for both corporations and governments. Where such targets are chosen following an analysis of the potential for reductions, this is usually conducted on the basis of continuing and largely unchanged operations. At the present time, there is a vast gap between the total of all such targets and the scale and urgency of the challenge described by science. It remains to be seen what role, if any, city administrations will play in bridging that gap.

Reduction targets in place



No reduction targets reported



0% 25% 50% 75%

Fig. 10. Cities reporting one or more GHG emission reduction target

City	Target dates					Annualized
	2012	2017	2020	2050		
Rohnert Park	2000	35%				2.9%
New York City	2006		30%			2.7%
Annapolis	2006	25%				2.3%
Haverford	2005		30%			2.0%
Burlington	2007			80%		1.9%
West Palm Beach	2006-8			70%		1.7%

Table 11. Examples of overall GHG emission reduction targets including annualized figures

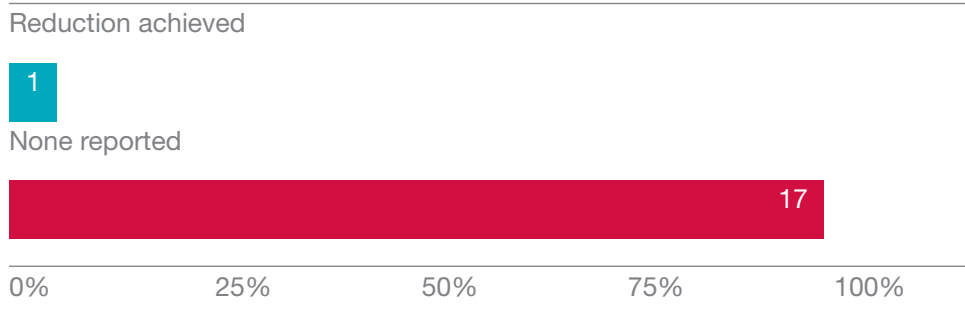


Fig. 11. Cities that have achieved municipal GHG emission reductions specifically attributed to reduction plans

Achieving reductions

Cities provided varying levels of detail about their plans to achieve reductions in emissions. For example, Las Vegas has taken steps towards integrating consideration of sustainability into all significant investment decisions and reports: “By 2009, 100 percent of decisions on major capital projects and new City programs will be made after considering life cycle financial, environmental and social costs and benefits using the Sustainability Action Map.”

New York City government’s reduction plan includes targets by category, such as:

- Equipment efficiency and operation and maintenance improvements to existing buildings, including audits and retrofits (937,000 metric tons per year by 2017);
- Street lighting improvements (50,000 metric tons per year by 2017);
- Clean distributed generation (65,000 metric tons per year by 2017);
- Energy efficiency improvements and methane capture at wastewater treatment plants (286,000 metric tons per year by 2017).

The city government has allocated 10% of its total energy budget each year to fund energy efficiency measures - a commitment of \$900 million over the next nine years. The total cost to achieve the target reduction of 30% in city government GHG emissions is estimated at \$2.3 billion.

Washougal reports that: “Regionally, the State of Washington along with seven other US states and three Canadian provinces, collectively signed the Western Climate Initiative in 2007 with aims of establishing a regional cap-and-trade market and cooperative approach to emissions reductions.”

Only Rohnert Park reported an achieved emissions reduction (271 metric tons CO₂-e) attributed directly to operational emission reduction plans (Fig. 11).

Forecast future emissions and/or energy use

Although ICLEI members are advised to forecast their emissions when setting their emissions reduction target as part of the Five Milestone Process, most cities do not appear to have established the practice of forecasting quantified future government emissions. North Little Rock provided figures for forecast use of purchased electricity, electricity from renewable sources and emissions. Some other cities also project energy costs for budgetary purposes e.g. Atlanta and Rohnert Park, or have established 'business as usual' projections of government emissions e.g. Haverford and New York City.

Capital expenditure planning

Cities are mostly at an early stage or have yet to begin to factor the costs of future emissions into capital expenditure decisions. North Little Rock reports considering carbon costs in purchasing decisions: "Purchases are evaluated to determine an estimated rate of return that includes projected future CO₂ price signals and anticipated CO₂ emission impacts or benefits, such as vehicle MPG. Market risks from various CO₂ price sensitivities will be evaluated within our integrated risk management control process."

6. Governance

An essential aspect of any climate change strategy concerns the ways in which decisions get made, how organizational procedures are established and in whom authority for decisions is vested. In the corporate sector, issues associated with climate change are sometimes tackled by specialists in particular areas such as Real Estate, Energy Management or Logistics before a coherent overall management overview is established. It can then take a long time for carbon and climate considerations to be integrated into decision-making throughout the organization.

In most responding cities the mayor's office or high level committees have responsibility for reviewing policies and committing to plans and performance measures. In some cases oversight is provided by a committee set up for that purpose. For example, the Chicago Climate Action Plan implementation is being overseen by the Green Ribbon Committee of corporate, civic and foundation leaders participating at the invitation of the Mayor. For the City of Denver, while overall responsibility rests in the Mayor's Office, implementation is managed by Greenprint, the Mayor's Sustainable Development Initiative.

Communications

A standing question in the online questionnaire asks responding organizations about their publication of information about risks and opportunities associated with climate change, details of GHG emissions and reduction plans. As government entities, cities have an obligation to

be transparent and accountable to their residents and 13 cities confirm that they are already engaged in such communication (Fig. 12). Some cities refer to their websites (for example www.SustainableAnnapolis.com <http://www.cedo.ci.burlington.vt.us/legacy/cap.html> and www.greenprintdenver.org) or attach their publications (including emissions inventories, climate action plans etc.) while others are at an earlier stage in developing their response to climate change. Some cities report extensive use of other channels of communication. For example:

Edina reports that: "The City website is the major vehicle of communication between the City, the Energy and Environment Commission and the residents. It posts educational activities, minutes of meetings, openings for working group and commissioner positions, etc. Other communication tools are programs on the local cable TV channel 16, publication on the local Sun Current newsletter and the 'About Town' Edina magazine."

Las Vegas "promotes sustainable topics and information in broadcasts on the city's television station, KCLV. Staff conduct a wide variety of public outreach at events and meetings: the U.S. Green Building Council (USGBC), Kiwanis Breakfast, Las Vegas Chapter of the American Planning Association (APA), the Ward 6 Energy Fair, Southern Nevada Home Builders Association (SNHBA) Home Builders Show, UNLV Earth Day Celebration and the Solar Home Tour at the Las Vegas Springs Preserve."

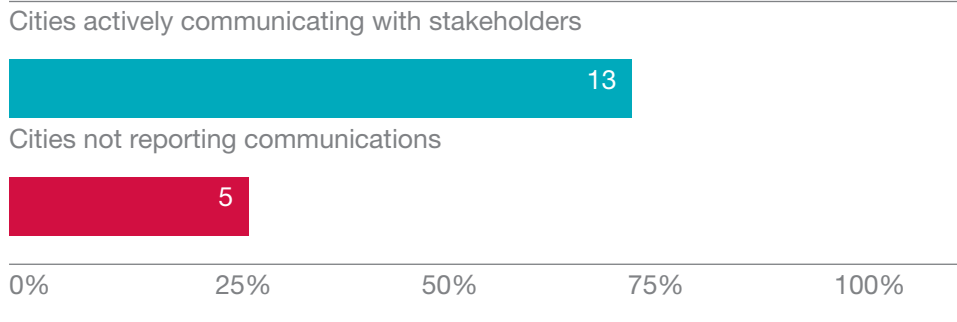


Fig. 12. Cities communicating information about risks and opportunities, emissions and reduction plans

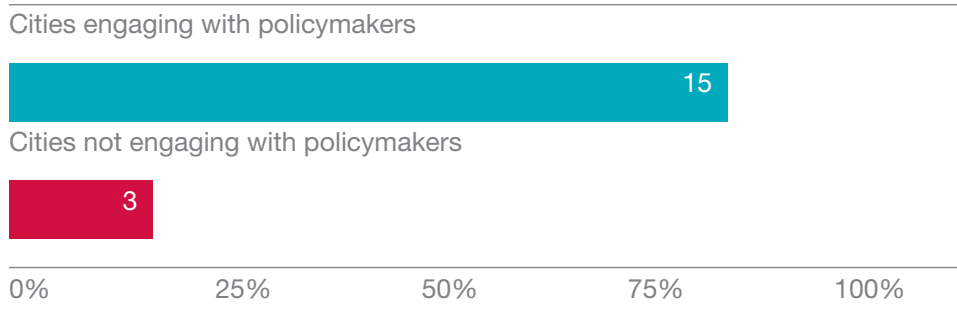


Fig. 13. Cities engaging with policymakers

Engaging with policymakers

Another standing question in the questionnaire asks: “Do you engage with policymakers on possible responses to climate change including taxation, regulation and carbon trading? If so, please provide details.” Fifteen cities answered “Yes” and three answered “No” (Fig. 13). Like other questions in the questionnaire, this was originally drafted to be answered by a business receiving the Information Request on behalf of investors. Cities are themselves policymaking bodies and in their responses some cities refer to their own processes for policy development. Some cities also refer to external engagement in policymaking.

For example, Chicago mentions that the city coordinates frequently with the US Conference of Mayors and supports many of its initiatives, including the Energy Efficiency and Conservation Block Grant Authorization and Appropriation. Burlington reports engagement with state and federal-level legislative delegation, community advocacy groups and non-profits with a climate change mission. Denver reports that city staff participated in a 2007 blue ribbon commission on climate change convened by the Governor of Colorado evaluating state-wide GHG mitigation strategies.

New Orleans is: “Working with State Public Service Commission to enact a Renewable Portfolio Standard (RPS) for utilities to meet to reduce GHG emissions.” New York City reports regular engagement “with policymakers in state and federal government on various possible responses to climate change, including convening the New York City Energy Planning Board, the New York City Climate Change Adaptation Task Force, and the Green Codes Task Force (with the U.S. Green Building Council) and serving a members of the New York State Sea Level Rise Task Force and the NYSERDA Adaptation Assessment.”

The City of Las Vegas “engages with policymakers at the local, regional, state, and national levels. City liaisons and lobbyists actively discuss climate change with its Congressional delegation. At the state level, public policy is discussed with members of the Nevada Legislature.” The city also notes that it “is participating in this project with the Carbon Disclosure Project to share information and resources in an attempt to educate the general public, policymakers and anyone else interested in climate change.”

Report writer

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CarbonSense is a leading independent think tank and innovator in the field of carbon strategy and climate change communication. CarbonSense also provides research, consultancy and training for business and public sector clients.

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