

Module: Introduction**Page: Introduction**

0.1

Please give a general description and introduction to your city including your city's boundary in the text box below.

Houston is the fourth largest city in the United States, with an estimated population of 2.1 million, according to the 2010 U.S. Census. Houston's population is among the youngest and most diverse in the U.S., as well as one of the nation's fastest-growing cities. Houston's economy has a broad industrial base in the energy, aeronautics, and technology industries, and ranks third among areas in Fortune 500 headquarters. The Port of Houston ranks first in the United States in international waterborne tonnage and second in total cargo tonnage. In 2006, the regional Gross Area Product was \$325.5 billion, slightly larger than the Gross Domestic Product of Austria, Poland, or Saudi Arabia. Houston is also home of the Texas Medical Center, the world's largest concentration of healthcare and research institutions, and NASA's Johnson Space Center.

0.2**Emissions Accounting Choice**

By checking the boxes below you are indicating that you have fuel and/or greenhouse gas (GHG) emissions data to report at this time.

Select 'Government' to report emissions from your local government operations (sometimes referred to as 'corporate' or 'municipal' emissions).

Select 'Community' to report emissions from the entire city area over which the city government can exercise a degree of influence through the policies and regulations they implement (sometimes referred to as 'geographic' or 'city-wide' emissions).

Select both boxes to report fuel and/or emissions for both inventories.

IF YOU HAVE NO FUEL AND/OR GREENHOUSE GAS EMISSIONS TO REPORT DO NOT CHECK EITHER BOX.

Government
Community

Module: Governance

Page: City Details

0.3

Please provide information about your city's Mayor in the table below.

Leader title	Leader name	Leader term start	Leader term end
Mayor	Annise D. Parker	2010	2015

0.4

Please provide details of your city's annual operating budget.

Annual operating budget (\$USD)	Budget year start	Budget year end
5200000000	Tue 01 Jul 2014	Tue 30 Jun 2015

0.5

Please provide details of your city's current and projected population.

Current population	Current population year	Projected population	Projected population year
2195914	2013	3370900	2040

0.6

Please provide details of your city's GDP.

GDP (\$USD)	Year of GDP	Source
48870000000	2014	http://www.usmayors.org/metroeconomies/2013/201311-report.pdf

0.7

Please provide further details about the geography of your city.

Average annual temperature (in Celsius)	Land area (in square km)	Average altitude (m)	Longitude (e.g. -120.9762)	Latitude (e.g. 41.25)
21	1625	13	-95.3698	29.7604

Page: Governance

1.0

Please describe the process by which the city reviews its progress and manages overall responsibility for climate change.

Emissions reduction	Adaptation
Overall municipal emissions reductions are reported annually. Estimated emissions reduction calculation for individual mitigation projects are made on a case-by-case basis. During the feasibility study of a mitigation project, estimated savings and emissions reduced are calculated. For certain projects, ongoing monitoring of emissions reduced are calculated. This would include building energy efficiency projects.	Progress on adaptation projects, in relation to infrastructure upgrades, are reported annually with a list of completed projects. Future changes are built into the capital improvement plan.

1.1

Has the Mayor or local government committed to adapting to climate change across the geographical area of the city, town or settlement?

In progress

1.1a

Please select the type of commitment(s) and attach evidence.

Type of commitment	Attach	Comments
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1.2

Does your local government have a plan that addresses climate change adaptation?

Yes

1.2a

Please indicate the title of your plan, the year it was published and attach the document in the space provided.

Publication title	Year of publication	Attach the document
Emissions Reduction Plan (Updated)	2009	https://www.cdp.net/sites/2015/08/31108/CDP_Cities_2015/Shared Documents/Attachments/Cities-TC-Adaptation-Upload/emissionreduction20091217.pdf

1.2b

Please explain why not and/or any future arrangements you have to create a plan.

1.3

Please describe the impact of national and/or regional climate change activities on your city's own climate change activities.

On a regional level, the Great Region 2040 is a high-level plan that offers six “Big Ideas” in the areas of economic development, environment, health, housing, transportation, and resiliency. The plan also contains 15 priority goals related to people, places and prosperity and more than 75 voluntary strategies that communities, local governments and individuals can consider to make their communities great places to live and work. The Our Great Region 2040 plan spotlights six case studies from local cities and counties that highlight real-life examples of how the ideas, goals and strategies could be implemented in the Houston-Galveston region. Our Great Region 2040 is the result of the efforts of hundreds of organizations and thousands of people from across the Houston-Galveston Area Council's 13-county service area over the past three years. Next steps are for the municipalities to consider adopting the plan or portions of the plan. (http://www.ourregion.org/OurRegion2040Supporting_Documents/OurGreatRegion2040-FINAL.pdf)

On a national level, Mayor Parker was selected in November 2013 as a member of President Obama's Task Force on Climate Preparedness and Resilience to advise the administration on how the federal government can respond to the needs of communities nationwide that are dealing with extreme weather and other climate impacts.

President Obama established the task force as part of his Climate Action Plan to cut carbon pollution, prepare communities for the impacts of climate change that cannot be avoided, and lead international efforts to address this global challenge. Mayor Parker played an integral role in ensuring the Task Force's recommendations to the President were responsive to the needs of all stakeholders in the Houston area.

“I am honored to have been chosen for this prestigious position and eager to be able to represent Houston's pragmatic and diverse points of view on this issue,” said Mayor Parker. “We are a city that is forward thinking when it comes to sustainability and the environment. We have a wealth of technological expertise in our existing energy sector. In fact, those companies are becoming the leaders in development of the new technologies that will support our nation's future environmental policies.”

The State, Local, and Tribal Leaders Task Force on Climate Preparedness and Resilience developed recommendations for the President on how the Federal Government can best support state, local and tribal leaders in their efforts to prepare for the impacts of climate change. These recommendations included removing Federal barriers to resilient investments, modernizing Federal grant and loan programs to better support local priorities, developing the information and tools that are needed to prepare communities, and other relevant measures. The report can be found here: https://www.whitehouse.gov/sites/default/files/docs/task_force_report_0.pdf

With acknowledgment that cities are responsible for 70 percent of all greenhouse gas emissions and therefore on the front lines of climate change, Mayor Annise Parker, Los Angeles Mayor Eric Garcetti and Philadelphia Mayor Michael Nutter launched the Mayors National Climate Action Agenda in September 2014. The mayors recognized the urgency for action while serving on President Obama's Climate Preparedness and Resiliency Task Force. All three cities and many others have dealt with extreme weather in recent years, including record droughts, flooding and storm surges.

By calling for national and international binding emission reductions agreements, establishing stronger inventory standards and reporting, committing to a set of local actions to reduce greenhouse gas emissions, and growing the carbon offset market by removing barriers to municipal offset projects, the Mayors' National Climate

Action Agenda is intended to demonstrate that emission reduction projects are not only viable, but essential initiatives that must be embraced and scaled across the country. The full Climate Action Agenda can be found here: http://www.houstontx.gov/mayor/press/Climate_Action_Agenda.pdf

Other national level climate-related activities include the City of Houston's participation in the U.S. Department of Energy's Better Buildings Challenge and Better Buildings Accelerator programs. The Better Buildings Challenge is a nationwide public-private partnership that seeks to improve energy efficiency 20 percent by 2020 in commercial, government and school buildings across the country. The Better Buildings Accelerators are part of President Obama's Climate Action Plan to engage leaders in state and local governments, utilities, and industry to demonstrate innovative policies and programs that will transform the energy efficiency market and cut building energy waste.

1.4

Does your city incorporate desired sustainability goals and targets (e.g. GHG reductions) into the master planning for the city?

Yes

1.4a

Please describe the ways that the master plan is designed to meet sustainability goals and targets (including GHG reductions).

As the fourth largest city in the US, and an array of new residents moving to Houston every day, the development of a Framework which promotes a more sustainable and targeted approach to Houston's current development practices is vital to the greater success of the region as a whole. Neighborhoods that promote "live, work, and play" amenities are desirable ways to encourage economic development, promote housing choices/styles, reduce the need for a car all while creating pedestrian-friendly corridors and providing renewed sense of interest in a community's identity. As such, the purpose of the Urban Houston Framework study was to develop a comprehensive Toolbox of policy and regulatory incentives that Houston can use to strategically encourage dense, sustainable Urban Centers in appropriate locations, while maintaining the character of existing neighborhoods.

The intent of the Framework is to help integrate land use and transportation planning by coordinating land development standards with new transit investments, and by providing affordable housing in dense areas around new transit lines.

The result of this study is a 4-part framework that will help guide the City in the development of responsible, policies, tools, and incentives that may be used by developers, citizens and the community at large for responsible, sustainable development throughout Houston.

The result is an Urban Center Framework that consists of four general categories:

- Urban Center Characteristics and defined criteria
- Tools provided to help developed desired Urban Center Vision
- Expectations associated with accessing those tools
- Process for becoming and acquiring access to provided tools

1.5

Does your city have a climate change action plan for reducing GHG emissions?

No

1.5a

Please attach your city's climate change action plan below.

Publication title	Year of publication	Attach
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1.5b

Please describe any future plans to create a city climate change action plan.

The City has completed the STAR Communities Rating assessment and has achieved a 3-STAR rating. Using this as a baseline assessment of community-wide sustainability, the findings have helped demonstrate where the strengths and gaps are in the community and will help inform a future city climate change action plan. The Mayor's Office of Sustainability is working on updating a sustainability plan for municipal operations. Currently, the Planning Department is working on a general plan for the city that will include sustainability strategies.

Module: Risks & Adaptation C40

Page: Risks C40

2.0

Do the current and/or anticipated effects of climate change present a significant risk to your city?

Yes

2.0a

Please list and describe the effects of climate change which you expect to experience in your city, together with their impacts, magnitudes and anticipated timescales.

Effects of climate change	Impact description	Magnitude	Anticipated timescale in years
Hotter summers	Hotter summers increase energy use in buildings, contribute to higher ozone levels, can be potential causes for brownouts which can lead to increased levels of PM 2.5 and PM 10, and can lead to heat-related illnesses/death.	Serious	Current
More frequent droughts	More frequent droughts deplete water resources for people and wildlife and cause infrastructure problems. It also leads to drought-stressed trees and vegetation which reduces the urban forest that would normally provide cooling and improve air quality.	Serious	Current
More frequent heat waves	More frequent heatwaves increase energy use in buildings, contribute to higher ozone levels, and can lead to heat-related illnesses/death.	Serious	Current
More hot days	More hot days will increase energy use in buildings and put more stress on the grid, which can be potential causes for brownouts.	Serious	Current
More intense rainfall	More intense rainfall can increase disrupt mobility infrastructure and damage buildings and assets in the community and increase risk of a storm surge.	Serious	Current

2.0b

Please explain why the anticipated effects of climate change present no significant risk to your city.

2.1

Please describe any compounding factors that may worsen the effects of climate change in your city.

As the City of Houston experiences more extreme weather events, this will likely change the landscape of many of the city's open spaces. The most recent example is the loss of millions of trees in the Houston area due to the worst drought in the city's history in 2011. An article published in the Houston Chronicle listed the compounding factors of losing so many of the city's urban trees (<http://www.chron.com/news/houston-texas/article/Millions-of-trees-likely-to-die-due-to-drought-2153585.php>). Some consequences include increased ground-level ozone and carbon dioxide release from dying trees, insect outbreaks on drought-stressed trees, reduced capacity to cool the air, increased urban heat island areas, loss of habitat and food for wildlife, loss of tourism due to the loss of wildlife habitat.

In 2011, Texas lost 301 million trees due to the drought, and an estimated 19 million was in Harris County: (<http://www.chron.com/news/article/2011-Texas-drought-slaughtered-301-million-trees-3893965.php>)

As sea level is expected to rise, the Port of Houston could be more susceptible to hurricanes and storm surges which would easily inundate factories, businesses and homes near the water. As the water reaches closer into the city, ocean-borne illnesses are more likely to occur in the population. The natural flora and fauna that have been in the region and support the many ecosystems locally could be devastated by the expected change in ocean chemistry. This could not only harm the individual ecosystems in the area but also could harm the entire regional ecosystem. Those individuals who live near, and depend on, these ecosystems and waterways for their livelihood would be adversely affected.

Texas is already prone to drought. Higher temperatures cause higher evaporation rates in the streams and reservoirs, which can affect the water supply. With higher evaporation rates there could be a decrease in the freshwater flow into the Gulf of Mexico which would endanger coastal health.

2.2

Do you consider that the effects of climate change could threaten the ability of businesses to operate successfully in your city?

Yes

2.2a

Please explain the reasoning behind your response.

The physical impacts behind extreme weather vary greatly in Houston. The most devastating consequences often result from tropical hurricanes, storm surges, and flooding. As seen with Tropical Storm Allison, the region had 22 fatalities, 95,000 damaged automobiles and trucks, 73,000 damaged residences, 30,000 stranded residents in shelters, and over \$5 billion in property damage.

Hurricane Ike damaged or destroyed over 200,000 homes in the Houston-Galveston region, washed away roads, and rendered drinking water, waste water and electrical utilities inoperable. Power outages reached an estimated 2.8 to 4.5 million customers, shutting down some office operations for weeks. Thousands of businesses suffered physical damage, economic distress, displaced workforce, reduced customer base and extended periods of business interruption. Damage estimates top \$15 billion statewide.

Not only has Houston experienced extreme flooding/hurricanes, but also it must contend with extreme droughts, never before seen in recent history. Effects of the extreme drought that hit Houston in 2011 included reservoir depletion, bursting pipes, damaged streets and loss of millions of trees. At the peak of the record-shattering heat wave and drought, Houston lost 18 billion gallons of water because of countless burst pipes, costing the city tens of millions of dollars in lost revenue. Along the 7,000 miles of pipes across the city, over 700 water main breaks were occurring each day due to weakened and corroded pipes and soil that was too dry to handle the expansion in the pipes.

2.3

Has a climate change risk or vulnerability assessment been undertaken for your local government area?

In progress

2.3a

Please attach your climate change risk or vulnerability assessment.

2.3b

Please select the primary process or methodology used to undertake the risk or vulnerability assessment of your city.

Primary methodology	Description
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Page: Cities-C40-ClimateHazards

2.4

Please list the climate hazards you are currently experiencing within your local government area.

Effects of climate change	City climate hazard
Hotter summers	Extreme hot weather
More frequent droughts	Drought
More frequent heat waves	Heat wave
More hot days	Heat wave
More intense rainfall	Flash/surface flood

2.5

Please list the future climate hazards you are expecting within your local government area. Tick all that apply.

Rain storm
 Tropical storm
 Heat wave
 Extreme hot weather
 Drought
 Storm surge
 Salt water intrusion

Page: Adaptation C40

3.0.

Please describe the actions you are taking to reduce the risk to, or vulnerability of, your city’s infrastructure, citizens, and businesses from climate change as identified on the previous page.

Effects of climate change	Hazard	Action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Hotter summers	Extreme temperature – hot	Cooling centers, pools, water parks/plazas	Programme/Project	Currently in effect (city-wide)	Yes	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service centers, and park and recreation centers) to citizens without access to air conditioning during heat waves. The Beat the Heat Program was funded by Reliant Energy for the past six years and evolved with the Houston Department of Health and Human Services to be increasingly responsive to the need for relief from Houston’s extremely hot summers. Between June and October 2014, there were 21,563 visitors

Effects of climate change	Hazard	Action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						in the five Centers. Around 50% of those service encounters were with citizens over the age of 60, many of whom were also participants in our senior congregate meal program or fitness activities. The program also provides funding to provide air conditioners for individuals who were primarily home bound. These individuals were most at risk for heat related illness and often closed themselves up at home, gradually unaware of climbing temperatures. In 2014, 233 portable or window air conditioning units were provided through Reliant support. The service is accompanied by installation of window units and education of recipient and care givers on use. The Beat the Heat Community Education has also provided information on healthy and economical ways to manage Houston's hot summers. Public information on heat precautions, energy bill review, participation in community events to promote heat safety and distribution of weatherization kits have all contributed to making sure we Beat the Heat together.
More frequent heat waves	Extreme temperature – hot	Projects and policies targeted at those most vulnerable	Programme/Project	Currently in effect (city-wide)	Yes	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service centers, and park and recreation centers) to citizens without access to air conditioning during heat waves. The Beat the Heat Program was funded by Reliant Energy for the past six years and evolved with the Houston Department of Health and Human Services to be increasingly responsive to the need for relief from Houston's extremely hot summers. Between June and October 2014, there were 21,563 visitors in the five Centers. Around 50% of those service encounters were with citizens over the age of 60, many of whom were also participants in our senior congregate meal program or fitness activities. The program also provides funding to provide air conditioners for individuals who were primarily

Effects of climate change	Hazard	Action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						<p>home bound. These individuals were most at risk for heat related illness and often closed themselves up at home, gradually unaware of climbing temperatures. In 2014, 233 portable or window air conditioning units were provided through Reliant support. The service is accompanied by installation of window units and education of recipient and care givers on use. The Beat the Heat Community Education has also provided information on healthy and economical ways to manage Houston's hot summers. Public information on heat precautions, energy bill review, participation in community events to promote heat safety and distribution of weatherization kits have all contributed to making sure we Beat the Heat together.</p>
More frequent droughts	Water scarcity	Maintenance/repair – leaking infrastructure	Policy	Currently in effect (city-wide)	Yes	<p>The City of Houston Water Conservation Plan 2014 highlights water conservation goals and continuous progress that will preserve long-term water supplies for the City of Houston and the greater Houston region. Water supply planning is important to the City of Houston in order to meet long term growth in demand and to comply with 30 TAC Chapter 288 that requires the City to prepare and implement a water conservation plan that meets certain requirements. This plan includes information to fulfill these requirements in addition to information specific to the City of Houston's water supply and treatment system. The current plan includes measures to be taken internally at the City of Houston as well as programs for water customers. These include current programs such as an in-house public education program, continued enforcement of water-wise building and plumbing codes and the Consumption Awareness Program designed to allow water customers to determine the most effective methods to maximize water-use efficiency inside and outside the home through communicating real-time meter data to household</p>

Effects of climate change	Hazard	Action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						users. This document also summarizes plans to develop an internal Water Loss Program, pilot a Mainline Leak Detection Program and expand the Consumption Awareness Program.
More hot days	Extreme temperature – hot	Cooling centers, pools, water parks/plazas	Programme/Project	Currently in effect (city-wide)	Yes	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service centers, and park and recreation centers) to citizens without access to air conditioning during heat waves. The Beat the Heat Program was funded by Reliant Energy for the past six years and evolved with the Houston Department of Health and Human Services to be increasingly responsive to the need for relief from Houston’s extremely hot summers. Between June and October 2014, there were 21,563 visitors in the five Centers. Around 50% of those service encounters were with citizens over the age of 60, many of whom were also participants in our senior congregate meal program or fitness activities. The program also provides funding to provide air conditioners for individuals who were primarily home bound. These individuals were most at risk for heat related illness and often closed themselves up at home, gradually unaware of climbing temperatures. In 2014, 233 portable or window air conditioning units were provided through Reliant support. The service is accompanied by installation of window units and education of recipient and care givers on use. The Beat the Heat Community Education has also provided information on healthy and economical ways to manage Houston’s hot summers. Public information on heat precautions, energy bill review, participation in community events to promote heat safety and distribution of weatherization kits have all contributed to making sure we Beat the Heat together.
More intense	Flood	Storm water capture systems	Programme/Project	Currently in effect	Yes	ReBuild Houston is the City of Houston’s initiative to improve the quality of life and mobility for residents of the city by

Effects of climate change	Hazard	Action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
rainfall				(city-wide)		rebuilding its drainage and street infrastructure. To support the initiative, the city has established a dedicated, pay-as-you-go fund to maintain the infrastructure and to plan upgrades to meet future needs as the city grows. From 2012 to 2014, ReBuild Houston has completed over 380 miles of local street asphalt overlays, cleaned over 170 miles of storm sewer lines, and re-graded over 710 roadside ditches. http://www.rebuildhouston.org/

Please note.

If you did not select 'Yes' in the dropdown list for Q2.0 on the Water Supply Risks page, nothing will be displayed on this page.

Please go back to the Risks page to confirm your choice or continue to the next section.

Page: Adaptation II

3.1

Please provide some additional information on the adaptation actions you are taking.

Actions to reduce vulnerability	Which exchange most helped to deliver this action?	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Cooling centers, pools, water parks/plazas	None of the above	Grants / subsidies	City's own funds / savings	0 - 100.000	06/14	10/14
Projects and policies targeted at those most vulnerable	None of the above	Grants / subsidies	City's own funds / savings	0 - 100.000	06/14	10/14
Maintenance/repair – leaking infrastructure	Working with non-C40 cities	City's own funds / savings	Tolls / user charges	10.000.001+	09/14	05/19
Cooling centers, pools, water parks/plazas	None of the above	Grants / subsidies	City's own funds / savings	0 - 100.000	06/14	10/14
Storm water capture systems	None of the above	Tolls / user charges	City's own funds / savings	10.000.001+	11/10	12/50

Page: Social Risks C40

4.0

Does your city face any social risks as a result of climate change?

Yes

4.0a

Please complete the table

Social risks	Anticipated timescale in years	Impact description
Fluctuating socio-economic conditions	Short-term	With longer heat events, at-risk populations that have limited access to cooling centers or do not have air-conditioning units within their place of residence are more susceptible to facing heat-related illnesses or death.
Increased conflict and/or crime	Medium-term	Loss of power after extreme weather events, such as hurricanes, can mean higher incidence of crime (e.g. looting and theft), as seen in the aftermath of Hurricane Ike.
Increased incidence and prevalence of disease	Short-term	During times of heavy rain events, flooding can occur, and if the ground is oversaturated, pools of water can attract mosquitoes, which can increase the prevalence of mosquito-borne diseases.
Increased demand for public services (including health)	Current	The Beat the Heat Program was funded by Reliant Energy for the past six years and evolved with the Houston Department of Health and Human Services to be increasingly responsive to the need for relief from Houston's extremely hot summers. Between June and October 2014, there were 21,563 visitors in the five Centers. Around 50% of those service encounters were with citizens over the age of 60, many of whom were also participants in our senior congregate meal program or fitness activities. The program also provides funding to provide air conditioners for individuals who were primarily home bound. These individuals were most at risk for heat related illness and often closed themselves up at home, gradually unaware of climbing temperatures. In 2014, 233 portable or window air conditioning units were provided through Reliant support. The service is accompanied by installation of window units and education of recipient and care givers on use. The Beat the Heat Community Education has also provided information on healthy and economical ways to manage Houston's hot summers. Public information on heat precautions, energy bill review, participation in community events to promote heat safety and distribution of weatherization kits have all contributed to making sure we Beat the Heat together.
Increased resource demand	Short-term	According to a local newspaper, the demand for power on the grid that serves most of Texas hit the third highest level in its history on Wednesday, August 7, 2013. This was the highest demand so far in 2013, which has included a mild summer compared to 2012 and the record-breaking 2011, Texas' hottest summer on record.

4.0b

Please explain why not.

Module: Opportunities

Page: Opportunities

5.0

Does climate change present any economic opportunities for your city?

Yes

5.0a

Please indicate the opportunities and describe how the city is positioning itself to take advantage of them.

Economic opportunity	Describe how the city is maximizing this opportunity
Development of new business industries (e.g. clean tech)	Houston is often regarded as a hub for the world's leading energy companies, but it is also gaining momentum on growing a clean energy job market. According to Clean Edge, Inc., Houston jumped from 22nd to 16th in their Metro Index from 2012 to 2013. The Metro Index tracks and analyzes clean-tech activities of the 50 largest U.S. metro regions through nearly two dozen indicators within the categories of Green Buildings, Advanced Transportation, Clean Electricity & Carbon Management, and Clean Tech Investment, Innovation, & Workforce. Also, more than 17.8 percent of the nation's total biodiesel production capacity resides in the Houston region. According to the U.S. Energy Information Administration, Texas' annual biodiesel production capacity of 431.0 million gallons is the highest in the nation. With 14 biodiesel plants, Texas has more biodiesel plants than Iowa (10) or California (9). The Houston area represents more than 92.8 percent of all biodiesel production capacity in the state of Texas. From bioenergy companies to biotechnology firms, the city encourages and welcomes new economic development in the clean energy sector. In a Brookings Institution study, Houston ranked 9th in the nation for top local clean economies. It was reported that there were 39,986 green jobs in the region in 2011. As reported in a local news source, "To develop the rankings, Brookings analyzed the sector of the economy that produces goods and services with an environmental benefit. In the report, 'the clean economy is divided into 39 distinct segments, reflecting economic activity involved in producing a broad spectrum of clean products, from goods such as wind turbines and solar photovoltaics to services such as mass transit and regulation.' The widest growth has taken place in the realms of professional environmental services and recycling and reuse. Between 2003 and 2010, the green economy grew by 5.3 percent annually in Houston. That leads to more money in green workers' pockets — the estimated median wage in Houston's clean economy is \$42,779 compared to \$38,608 for all jobs in the city." http://houston.culturemap.com/news/city-life/07-13-11-a-clean-green-job-growing-machine-houston-tops-texas-in-green-jobs-ranks-ninth-in-country/
Increased attention to other environmental concerns	As more people notice extreme weather events occurring in Houston, there is more attention placed on how the community needs to be more resilient. For instance, after the major drought in 2011, residents were increasingly inquiring about installing rainwater harvesting and the City's annual half-price rain barrel sale.
Increased infrastructure	ReBuild Houston is the City of Houston's initiative to improve the quality of life and mobility for residents of the city by rebuilding its

Economic opportunity	Describe how the city is maximizing this opportunity
investment	drainage and street infrastructure. To support the initiative, the city has established a dedicated, pay-as-you-go fund to maintain the infrastructure and to plan upgrades to meet future needs as the city grows. From 2012 to 2014, ReBuild Houston has completed over 380 miles of local street asphalt overlays, cleaned over 170 miles of storm sewer lines, and re-graded over 710 roadside ditches. http://www.rebuildhouston.org/
Improved efficiency of operations	In the City's municipal energy efficiency program, 6 million square feet of municipally-owned buildings are achieving guaranteed energy use reductions approaching 30% with paybacks of, on average, less than ten years. Currently, 18 libraries are using Qualified Energy Conservation Bonds to fund additional municipal energy efficiency work.

5.0b

Why not?

5.1

List any climate change-related projects for which you hope to attract private sector involvement.

The City of Houston constantly strives to keep solar at the forefront of its sustainability vision, striking a balance between increasing market growth and decreasing regulatory barriers. With existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center, the City is a test bed for solar technologies.

The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes.

The Houston Green Office Challenge invites commercial office owners/managers and tenants in Houston to increase their environmental and economic performance in cleaner transportation choices, energy conservation, property management/tenant engagement, water efficiency and waste reduction. The City is a community partner in the DOE's Better Buildings Challenge. Houston has committed 30 million square feet with a 20% energy reduction goal by 2020.

The DOE has recently described the City of Houston as a leader in weatherization through the Residential Energy Efficiency Program (REEP). The City received \$23 million from the DOE to help thousands of Houston residents. Centerpoint and the City of Houston have partnered to continue the program in 2014.

The City has launched Houston Drives Electric, the City's comprehensive municipal and public electric vehicle readiness initiative. The City of Houston now has 27 Nissan Leafs in the city vehicle fleet, bringing the total to 42 electric and plug-in hybrid fleet vehicles. The City has completed an EV deployment plan, installed numerous charging stations in public locations, offers 24 hour permitting for residential charging stations and is working on additional incentives to spur adoption of EV technology.

In April, 2013, the City expanded Houston Bike Share to encourage biking in Houston. Houston now has nearly 225 bikes and 29 stations throughout downtown and adjacent neighborhoods (Montrose, Midtown, East End and the Museum District). Phase III expansion plans include bike share kiosks at the city's universities, the Texas Medical Center and additional neighborhoods.

The City passed a Safe Passage ordinance in 2013 to keep bicyclists and pedestrians safer on city streets, and encourage more outdoor activity. On-street bike lanes and cycle-tracks are also being worked on as part of the City's commitment to Complete Streets.

Over the next ten years, the Bayou Greenways Initiative will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation.

The City of Houston won a Bloomberg Philanthropies Mayors Challenge grant award to implement One Bin for All, a program which will allow residents to discard all materials in one bin, treating trash as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. This first-of-its-kind innovation uses technology in a way that has never been done before.

The City Gardens and Farmers Market Initiative supports urban gardens and markets that inspire and empower people of diverse backgrounds to grow, eat and buy local and organic food. The initiative improves health and nutrition, creates community and supports valuable local businesses that together sustain and improve the environment.

Module: Emissions - Local Government Operations

Page: Local Government - Methodology

LGO1.0

Please state the dates of the accounting year or 12-month period for which you are reporting a GHG measurement inventory for your local government operations.

Wed 01 Jan 2014 - Wed 31 Dec 2014

LGO1.1

Please indicate the category that best describes the boundary of your municipal GHG emissions inventory.

Departments, entities or companies over which operational control is exercised

LGO1.2

Please indicate which of the following major sources of emissions are included in your municipal GHG emissions inventory.

Source of emissions	Status
Airport(s)	Included
Buildings	Included
Buses	Not applicable
Electricity generation	Included
Electricity transmission and distribution	Not applicable
Employee commuting	Not included
Incineration of waste	Not applicable
Landfills	Not applicable
Local trains	Not applicable
Maritime port	Not included
Municipal vehicle fleet	Included
Regional trains	Not applicable
Roads / highways	Not applicable
Street lighting and traffic signals	Included
Subway / underground	Not applicable
Thermal energy	Not applicable

Source of emissions	Status
Waste collection	Included
Wastewater treatment	Included
Water supply	Included

LGO1.3

Please give the name of the primary protocol, standard or methodology you have used to calculate GHG emissions.

Primary protocol	Comment
Local Government Operations Protocol (ICLEI/The Climate Registry/California Climate Action Registry/California Air Resources Board)	The Local Government Operations Protocol (LGOP) has been widely used for other municipal GHG emissions inventories in the U.S. and was the most applicable for our reporting. This was the primary protocol that the City utilized.

LGO1.4

Which gases are included in your emissions inventory? Tick all that apply.

CO2
CH4
N2O

Further Information

Page: Local Government - Energy Data

LGO1.5

Please give the total amount of fuel (refers to Scope 1 emissions) that your local government has consumed this year.

Source	Fuel	Amount	Units
Airport(s)	Natural gas	244670	Therms
Buildings	Natural gas	2512820	Therms
Wastewater treatment	Natural gas	6450560	Therms
Water supply	Natural gas	46720	Therms
Municipal vehicle fleet	Diesel/Gas oil	13029444	L
Municipal vehicle fleet	Motor gasoline (petrol)	26180741	L

LGO1.6

How much electricity, heat, steam, and cooling (refers to Scope 2 emissions) has your local government purchased for its own consumption during the reporting year?

Source	Type	Amount	Units
Airport(s)	Electricity	101817503	kWh
Buildings	Electricity	136471399	kWh
Street lighting and traffic signals	Electricity	66848479	kWh
Wastewater treatment	Electricity	176766997	kWh
Water supply	Electricity	137825700	kWh

LGO1.7

Please provide total (Scope 1 +Scope 2) GHG emissions for your local government's operations, in metric tonnes CO2e.

500510

LGO1.8

If applicable, please provide the following GHG emissions.

Scope 1: All direct GHG emissions

Scope 2: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.

Total Scope 1 activity in metric tonnes CO2e emitted	Total Scope 2 activity in metric tonnes CO2e emitted
156751	343759

LGO1.9

Do you measure Scope 3 emissions?

Yes

LGO1.9a

Please complete the table.

Source of Scope 3 emissions	Emissions (metric tonnes CO2e)	Comment
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Source of Scope 3 emissions	Emissions (metric tonnes CO2e)	Comment
Waste Related Scope 3 Emission Sources	107442	

LGO1.9b

Please explain why not and detail your plans to do so in the future, if any.

LGO1.11

Where it will facilitate a greater understanding of your government emissions, please provide a breakdown of these emissions by department, facility, source, or by any other classification system used in your city.

Department / Facility / Source / Other	Scope	Emissions (metric tonnes CO2e)
Convention & Entertainment: Buildings and Facilities	Total figure	17665
General Services: Buildings and Facilities	Total figure	42511
Municipal Courts: Buildings and Facilities	Total figure	1313
Park & Recreation: Buildings and Facilities	Total figure	14810
Public Works: Buildings and Facilities	Total figure	11594
Houston Airport System: Buildings and Facilities	Total figure	69467
Solid Waste: Buildings and Facilities	Total figure	1164
Vehicle Fleet	Scope 1	95867
Street Lights	Scope 2	34511
Traffic Lights	Scope 2	2569
Water Delivery Facilities	Total figure	76699
Wastewater Facilities	Total figure	132340

LGO1.12

Please indicate if your emissions have increased, decreased, or stayed the same from the previous year, and please describe why.

Change in emissions	Reason for change
Decreased	Using a baseline of 2007, the City of Houston's municipal GHG emissions have decreased 38% in 2014. This is attributable to decreased electricity usage and increased green power purchasing.

Page: Local Government - External Verification

LGO1.13

Has the GHG emissions data you are currently reporting been externally verified or audited in part or in whole?

No

LGO1.13a

Please provide the following information about the emissions verification process.

Name of verifier	Year of verification	Attach verification certificate	Comments
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LGO1.13b

Please describe your plans to verify your emissions in the future.

With additional funding, the City will consider third party verification for future community GHG emissions inventories.

Module: Emissions - Community

Page: Community - Date and Boundary

C1.0

Please state the dates of the accounting year or 12-month period for which you are reporting a GHG measurement inventory for your community.

Wed 01 Jan 2014 - Wed 31 Dec 2014

C1.1

Please indicate the category that best describes the boundary of your community GHG emissions inventory.

Administrative boundary of a local government

Page: Community - GHG Emissions Data

C1.2

Please give the name of the primary protocol, standard or methodology you have used to calculate GHG emissions.

Primary protocol	Comment
U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI)	

C1.3

Which gases are included in your emissions inventory? Tick all that apply.

CO2
CH4
N2O

C1.4

Please detail total (Scope 1 + Scope 2) emissions for your community, in metric tonnes CO2e.

33428301

C1.5

If applicable, please provide a breakdown of your GHG emissions by scope.

Scope	Metric tonnes CO2e
Scope 1 emissions excluding emissions from grid-supplied energy generation	16075539
Scope 1 emissions from grid-supplied energy generation within the city boundary	2841500
Total Scope 1 emissions (Row 1 + Row 2)	18917039
Total Scope 2 emissions	14511262

C1.6

Where it will facilitate a greater understanding of your community's emissions, please provide a breakdown of these emissions by end user (buildings, water, waste, transport), economic sector (residential, commercial, industrial, institutional), IPCC sector (stationary combustion, mobile combustion, industrial processes, waste) or any other classification system used in your city.

End user / Economic sector / IPCC sector / Other	Scope	Emissions (metric tonnes CO2e)
Buildings	Total figure	17352760
Transport	Scope 1	16075539

C1.7

Please give the total amount of fuel (referring to Scope 1 emissions) consumed in your city during the reporting year.

Fuel	Amount	Units	Source
Natural gas	520460869	Therms	Buildings
Diesel/Gas oil	35251388.3	L	Freight Rail: Line-Haul
Diesel/Gas oil	115921119.3	L	Freight Rail; Switchyard
Diesel/Gas oil	137396938.8	L	Freight Trucks
Diesel/Gas oil	666750314.5	L	Passenger Vehicles
Motor gasoline (petrol)	4685388469.2	L	Passenger Vehicles
Diesel/Gas oil	55962263.5	L	Transit
Motor gasoline (petrol)	5405462	L	Transit

C1.8

How much electricity, heat, steam, and cooling (referring to Scope 2) has been consumed by your city during the reporting year?

Type	Amount	Units	Source
Electricity	26095.7	GWh	Buildings

C1.9a

Please provide a summary of emissions by sector and scope as defined in the Global Protocol for Community Greenhouse Gas Emissions Inventories (GPC), (WRI, C40 and ICLEI). Please complete the corresponding emissions for each row in the table below.

Sector and scope (GPC reference number)	Emissions (metric tonnes CO2e)
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C1.9b

Please provide a breakdown of fuel use and emissions by subsector and scope as defined in the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), (WRI, C40 and ICLEI) and attach GHG emissions report.

C1.11

Do you measure Scope 3 emissions?

Yes

C1.11a

Please complete the table

Source of Scope 3 emissions	Emissions (metric tonnes CO2e)	Comment
Waste	842488	

C1.11b

Please explain why not and detail your plans to do so in the future, if any.

C1.12

Please indicate if your emissions have increased, decreased, or stayed the same since your last emissions inventory, and please describe why.

Reason for change	Please describe why
This is our first year of calculation	This is our first year conducting a community-wide GHG inventory using the ICLEI Community Protocol.

Further Information

Page: Community - External Verification

C1.13

Has the GHG emissions data you are currently reporting been externally verified or audited in part or in whole?

No

C1.13a

Please provide the following information about the emissions verification process.

Name of verifier	Year of verification	Attach verification certificate	Comments
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C1.13b

Please describe your plans to verify your emissions in the future.

With additional funding, the City will consider third party verification for future community GHG emissions inventories.

Module: Strategy C40

6.0

Do you have a GHG emissions reduction target in place for your local government operations?

Yes

6.0a

Please provide details of your local government operations emissions reduction target.

Baseline year	Baseline emissions (metric tonnes CO2e)	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
2007	985043	42%	Energy usage, Fuel consumption, and municipal and residential solid waste	Other: 2016	

6.0b

Please explain why you do not have a local government operations emissions reduction target.

6.1.

What actions are you undertaking to reduce your emissions in your local government operations?

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Buildings	Building performance rating and reporting	Institutional (municipal) buildings and facilities: Audits and advice	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Through performance contracting, a total of 6 million square feet of city facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years.
Buildings	Building performance rating and reporting	Institutional (municipal) buildings and facilities: Benchmarking	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The City of Houston has voluntary benchmarking programs, like the Houston Green Office Challenge and the DOE's Better Buildings Challenge, where commercial buildings can opt into disclosing their energy ratings to the City. The City is exploring energy efficiency policies for commercial buildings. The City is currently working on benchmarking over 300 City buildings in hopes of achieving Energy Star certification on as many as possible.
Buildings	Building performance rating and reporting	Institutional (municipal) buildings and	Policy	Currently in effect (city-wide)	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		facilities: Energy performance certification				
Buildings	Building performance rating and reporting	Institutional (municipal) buildings and facilities: Net metering	Programme/Project	Currently in effect and being piloted	Yes	The City of Houston constantly strives to keep solar at the forefront of its sustainability vision, striking a balance between increasing market growth and decreasing regulatory barriers. With existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center, the City is a test bed for solar technologies. The Green Building Resource Center provides leadership and education and shows real-time energy production of its rooftop solar panels. The center provides valuable resources to better inform the public when they are ready for solar, and citizens are able to learn what system works best in Houston's climate and location. The City is working on a program to build 30 MW of solar power to add to the City's renewable energy mix.
Buildings	Building performance rating and reporting	Institutional (municipal) buildings and facilities: Smart meters	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Building	Building	Institution	Programme/	Curre	Yes	With the assistance of the EECBG funding the City is able to implement a high-tech energy

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
s	performance rating and reporting	al (municipal) buildings and facilities: Sub metering	Project	ntly in effect and being piloted		management solution at City Hall, the City Hall Annex and the City Administration Building. The Smarte Building system will measure and analyze real-time energy consumption throughout each of the buildings. The system is designed to measure energy use for specific equipment and in many cases at an individual user level. The system will allow plant managers to tune their building automation system, as well as allow individual building occupants to more energy efficiently use their computers, peripherals and other office equipment.
Buildings	Energy efficiency/retrofit measures	Institutional (municipal) buildings and facilities: Building energy management system	Programme/Project	Currently in effect and being piloted	Yes	Schneider Electric's Resource Advisor is being used to track usage a number of facilities that are part of energy savings performance contracts (ESPCs).
Buildings	Energy efficiency/retrofit measures	Institutional (municipal) buildings and facilities: Energy performance	Programme/Project	Currently in effect (city-wide)	Yes	Through performance contracting, a total of 6 million square feet of City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years. Both Siemens and Schneider Electric worked on the performance contracting.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		contracting				
Buildings	Building codes and standards	Institutional (municipal) buildings and facilities: Energy performance rating for new construction	Programme/Project	Currently in effect (city-wide)	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 23 LEED Certified projects with 9 projects under review or in the pipeline. In the City's municipal energy efficiency program, 6 million square feet of municipal buildings are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.
Buildings	Energy efficiency/retrofit measures	Institutional (municipal) buildings and facilities: Installation of CFL or other efficient lighting mechanisms	Programme/Project	Currently in effect (city-wide)	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 23 LEED Certified projects with 9 projects under review or in the pipeline. In the City's municipal energy efficiency program, 6 million square feet of municipal buildings are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.

Emission reduction sector	Emission reduction activity	Emission reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Buildings	Energy efficiency/retrofit measures	Institutional (municipal) buildings and facilities: Insulation	Programme/Project	Currently in effect (city-wide)	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 23 LEED Certified projects with 9 projects under review or in the pipeline. In the City's municipal energy efficiency program, 6 million square feet of municipal buildings are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.
Buildings	Switching to low-carbon fuels	Institutional (municipal) buildings and facilities: Purchasing 'green' electricity from the grid	Programme/Project	Currently in effect (city-wide)	Yes	The City is a leader in purchasing renewable energy credits. It is the largest purchaser of renewable energy in the U.S. Currently, green power accounts for 50% of the City's electricity usage. The City's commitment to green power is setting an example for homeowners and businesses in Houston.
Community-Scale Development	Brownfield redevelopment programs	Brownfield redevelopment, clean up or rehabilitation	Programme/Project	Currently in effect (city-wide)	Yes	The Houston Brownfield Program seeks to help redevelop and revitalize properties that are abandoned or underutilized due to real or perceived contamination. Brownfield Properties can include sites such as old gas stations and auto body shops, abandoned industrial facilities, and many more. http://www.houstontx.gov/brownfields/

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		on initiatives				
Community-Scale Development	Eco-district development strategy	District heating/cooling	Programme/Project	Currently in effect and being piloted	Yes	Houston-based Thermal Energy Corporation (TECO) has provided reliable, cost-effective and energy-efficient cooling and heating to institutions in the Texas Medical Center since 1969. TECO uses district energy and CHP technology to produce chilled water and steam, which we pipe underground to more than 19 million square feet of customer buildings at 18 institutions. With a solid track record of performance, TECO is well-positioned to provide the energy behind what's next for the buildings and pace-setting services and research at the world-renown Texas Medical Center.. http://tecothermalenergy.com/about-teco/
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Opening schoolyards for public use	Programme/Project	Currently in effect (city-wide)	Yes	The SPARK School Program works with schools and neighborhoods to develop community parks on public school grounds. In the past 30 years, SPARK has built over 200+ community parks throughout the Houston/Harris County area. Each park is unique, with its design based on ideas and needs of the school and surrounding neighborhoods. While all of the parks are different, a typical park consists of modular playground equipment, a walking trail, benches, picnic tables, trees, an outdoor classroom, and a public art component. http://www.sparkpark.org/
Community-Scale Development	Transit oriented development	Integrating low carbon transportation solutions into development	Programme/Project	Currently in effect at a significant scale across most	Yes	The Complete Streets and Transportation Plan recognizes that all streets are different. The function of the road, current and projected adjacent land use and travel demands, availability of right-of-way, community input and the level of vehicular, pedestrian and bicycle traffic must all be considered in decisions regarding enhancements. The ultimate goal, where appropriate, is walkable and bike-friendly neighborhoods. In 2014, nearly 60 miles of bike lanes as well as 70 miles of sidewalks were created. In 2013, the City passed a Safe Passing ordinance to keep bicyclists and pedestrians safer on city streets. In 2014, the City and BikeHouston joined forces to launch a major bike safety campaign, Goal Zero, to enforce and educate motorists and cyclists about the Safe Passing ordinance, as well as create a Houston Bike Plan for the

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		(walkability/ bikeability)		of the city		City. The Houston Bike Plan will help make Houston a safer, healthier, more bike-friendly city. The Plan will clarify a vision and goals for biking in Houston and identify future projects to create a citywide bicycle network. This improved citywide network will serve a broader spectrum of people who bike at all skill levels, providing more transportation choices, with both on-street and off-street facilities and building on current efforts to create a well-connected citywide bicycle system. The Plan will identify supporting programs like motorist and bicyclist safety education, expansion of end of trip facilities like bike racks and bike share, and improved integration with transit.(http://houstonbikeplan.org/) The City helped pass a law, working with CenterPoint, to allow hike and bike trails along utility rights of way. The rights of way provide a clear path of open space in Houston's urban setting, and new trails will help create a complete network of off-street bicycle paths for Houston. In October 2013, the City unveiled Texas' first certified GreenRoads complete streets project in Midtown. In March 2015, the City completed the construction of the first two-way cycle track. The Downtown Park Connector provides connections to Discovery Green and Columbia Tap, as well as Sam Houston Park and Buffalo Bayou. Finally, the City has launched Cigna Sunday Streets HTx. Streets are opened to bicyclists, pedestrians, families, etc. and closed to car traffic. (http://www.gohealthyhouston.org/sundaystreetshtx/)
Energy Supply	Low or zero carbon energy supply generation	Entering into long-term contracts with renewable energy generators	Programme/Project	Currently in effect and being piloted	Yes	The City of Houston has signed an agreement with Reliant Energy, an NRG Energy company, to purchase over 140 MW of renewable power for the next two years. From July 1, 2013 through June 30, 2015, the City's purchase of green power will account for half of its annual electricity demand. The City will be using almost 623,000 mWh of green power per year, which is equivalent to the amount of kilowatt-hours needed to power over 55,000 homes each year. The City is the top municipal purchaser of green power. http://www.greenhoustontx.gov/pressrelease20130620.html
Energy	Optimize	District	Programme/	Curre	Yes	Houston-based Thermal Energy Corporation (TECO) has provided reliable, cost-effective and

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Supply	traditional power/energy production	heating/cooling	Project	Currently in effect and being piloted		energy-efficient cooling and heating to institutions in the Texas Medical Center since 1969. TECO uses district energy and CHP technology to produce chilled water and steam, which we pipe underground to more than 19 million square feet of customer buildings at 18 institutions. With a solid track record of performance, TECO is well-positioned to provide the energy behind what's next for the buildings and pace-setting services and research at the world-renown Texas Medical Center. http://tecothermalenergy.com/about-teco/
Energy Supply	Smart grid	Smart meters/controls	Programme/Project	Currently in effect (city-wide)	Yes	CenterPoint Energy has completed the installation of more than 2.2 million Itron smart meters. Smart meters are part of CenterPoint Energy's smart grid initiative, designed to give consumers more control over their energy consumption while improving electric reliability and power restoration. http://www.centerpointenergy.com/services/electricity/competitiveretailers/smartmeters/a3d58d69ef0fe110VgnVCM1000005a1a0d0aRCRD/
Food and Agriculture	Encourage sustainable food production and consumption	Municipal food purchasing/procurement guidelines	Programme/Project	Currently in effect and being piloted	Yes	At the City Hall Farmers Market, the public can enjoy a variety of locally prepared ready-to-eat or packaged to-go foods, pick up farm-fresh weekly groceries and at the same time support sustainable food, all amidst Houston's dramatic downtown urban setting every Wednesday during the spring and fall season. The City Hall Farmers Market features more than 30 vendors (located along both sides of City Hall's reflection pool), including local fresh produce grown by local farmers, cheeses, breads, roasted coffees, and a variety of prepared meals, as well as food trucks. http://www.greenhoustontx.gov/farmersmarket.html Go Healthy Houston Go Healthy Houston is improving the health of all Houstonians by increasing access to healthy foods, physical activity, and tobacco-free places. The initiative was launched by Mayor Annise Parker in 2012 and is led by a coalition of public and private partners. http://www.gohealthyhouston.org/
Outdoor Lighting	LED / CFL / other luminaire	More efficient luminaires (e.g. LED)	Programme/Project	Currently in effect at a	Yes	In May 2014, Mayor Annise Parker announced that CenterPoint Energy, in partnership with the City of Houston, will convert approximately 165,000 streetlights from high pressure sodium, mercury vapor and metal halide to light-emitting diode (LED) technology. This replacement project, the largest in the nation, will reduce the City's streetlight energy usage by

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	technologies			significant scale across most of the city		approximately 50 percent, reduce the City's municipal greenhouse gas emissions (GHG) by five percent and save the City over \$28 million over the life of the project. http://www.houstontx.gov/mayor/press/20140530.html
Private Transport	Infrastructure for non motorized transport	Cycle hire/ share programs	Programme/ Project	Currently in effect at a significant scale across most of the city	Yes	Houston B-cycle is a "bike sharing" program that works as an additional transportation alternative for people living and visiting Houston. At its core, a public bike sharing system is intended to be used for short trips in and around downtown Houston and surrounding urban areas. There are currently 29 stations and 225 bikes in operation. Since the launch over, there have been over 165,000 checkouts and over 784,000 miles ridden.
Waste	Recycling or composting collections and/or facilities	Residential organic waste: Municipal recycling points or centers	Programme/ Project	Currently in effect (city-wide)	Yes	Residents may dispose of their Tree Waste and Junk Waste at their curbside. Tree Waste is collected during ODD numbered months and Junk Waste is collected during EVEN numbered months. This method of collecting large waste comes with the benefits of diverting materials that can be recycled from landfills, saving landfill space and valuable tax dollars.
Waste	Recycling or	Residential non-	Programme/ Project	Currently in	Yes	In February 2015, Mayor Annise Parker personally delivered 96-gal recycling carts to residents in the Southeast community of Pecan Park, fulfilling the goal of city-wide automated curbside

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	composting collection and/or facilities	organic waste: Municipal recycling points or centers		effect (city-wide)		recycling for all residents with City of Houston solid waste collection. Council Member Robert Gallegos and City officials were also on hand to celebrate the final expansion and success of the Automated Recycling Program (ARP). In addition to the Automated Recycling Program, Mayor Parker implemented several other recycling initiatives during her terms in office including opening two new Neighborhood Depository & Recycling Centers, opening the Reuse Warehouse which diverts building material from the landfill, implementing the Business Recycling Program, implementing the Compostable Bag Program, installing Big Belly Solar Compactors and building partnerships with the private sector, such as Living Earth to recycle yard and tree waste, Cherry Companies to recycle concrete, the Houston Furniture Bank to recycle mattresses, CompuCycle to recycle electronics, the Carton Council to recycle shelf-stable & refrigerated cartons and American Textile Recycling Services to recycle textiles, clothes and shoes. http://houstontx.gov/solidwaste/press/mayor-annise-parker-delivers-promise-goal-met-city-wide-automated-curbside-recycling
Water	Water recycling and reclamation	Automatic leak detection	Programme/ Project	Currently in effect at a significant scale across most of the city	Yes	Consumption Awareness Program To make sure customers get timely and accurate bills, the city measures consumption efficiently through an automated system that transmits water usage data with radio waves, also referred to as an Automated Meter Infrastructure (AMI) network. An attachment on the water meter sends a wireless signal that is picked up by one of the collecting devices located throughout the city, usually on utility poles and in some city buildings like fire stations. Ultimately, the information is transmitted to a central computer where the data can be accessed by account owners, used to generate alerts and used to create water bills. So this information can be utilized by retail customers, the City of Houston has developed a Consumption Awareness Program (CAP) which affords customers with access to their real-time usage information and crosses multiple communication mediums. For more information and examples of the information available in the dashboard or visit www.houstonwater.org . The City of Houston has completed the implementation of the first phase of the CAP which included: <ul style="list-style-type: none"> o Converting 75 percent of retail customers to the AMI network o Web-based portal for single-family residential customers to access real-time

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						<p>water usage o Smart phone based application for iPhone and Android users As of the beginning of 2014, approximately 75 percent of retail customer accounts are on the AMI network and 10 percent of single- family retail customers have signed up for the CAP. Mainline Detection Leak program Using the AMI network previously described, the City of Houston is currently in the process of developing a more proactive leak detection program to determine effective next steps for increasing the efficiency of leak detection and repair efforts. Future applications under the network are currently being developed and conceived with manufacturers. These functionalities include pressure sensing, hydrant flow monitoring, water quality sensing, et al. The key to long term viability of this vision is to ensure interoperable end point functionality and open architecture protocols.</p>
Water	Water recycling and reclamation	Education or campaigns to promote water efficiency	Programme/ Project	Currently in effect at a significant scale across most of the city	Yes	<p>Housed in the administrative building of the Northeast Purification Plant campus, WaterWorks is a learning tool both on the outside and interior. Adjacent to the entry, large metal cisterns collect rainwater runoff for future use and inside, guests are guided through an immersing corridor, where they take on the role of a water molecule—venturing from water source to purification to consumption. The public can learn about Houston’s drinking water supply, the science behind it and wise consumption practices at the Water Works Education Center. The center opened in October 2010, just west of Lake Houston, in northeast Harris County.</p>

Please provide some additional information on the local government activities you are taking.

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Building performance rating and reporting	Institutional (municipal) buildings and facilities: Audits and advice	Working with cities in a specific C40 Network			Grants / subsidies		10.000.001+	01/04	12/50
Building performance rating and reporting	Institutional (municipal) buildings and facilities: Benchmarking	Working with cities in a specific C40 Network			Grants / subsidies		0 - 100.000	12/11	12/50
Building performance rating and reporting	Institutional (municipal) buildings and facilities: Energy performance certification	Working with cities in a specific C40 Network			Grants / subsidies		10.000.001+	01/04	12/50
Building performance rating and reporting	Institutional (municipal) buildings and facilities: Net metering	Working with cities in a specific C40 Network			Grants / subsidies		2.000.001 - 5.000.000	01/04	12/50
Building performance rating and reporting	Institutional (municipal) buildings and facilities: Smart meters	Working with cities in a specific C40 Network			Grants / subsidies		2.000.001 - 5.000.000	01/04	12/50
Building	Institutional	Working			Grants /		2.000.001 -	01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
performance rating and reporting	(municipal) buildings and facilities: Sub metering	with cities in a specific C40 Network			subsidies		5.000.000		
Energy efficiency/ retrofit measures	Institutional (municipal) buildings and facilities: Building energy management system	Working with cities in a specific C40 Network			Grants / subsidies		250.001 - 500.000	01/04	12/50
Energy efficiency/ retrofit measures	Institutional (municipal) buildings and facilities: Energy performance contracting	Working with cities in a specific C40 Network			Bond issuance (municipal bonds, green bonds, infrastructure bonds)		10.000.001+	01/04	12/50
Building codes and standards	Institutional (municipal) buildings and facilities: Energy performance rating for new construction	Working with cities in a specific C40 Network			City's own funds / savings		10.000.001+	01/04	12/50
Energy efficiency/ retrofit measures	Institutional (municipal) buildings and facilities: Installation of CFL or other efficient lighting mechanisms	Working with cities in a specific C40 Network			Grants / subsidies		1.000.001 - 2.000.000	01/04	12/50
Energy efficiency/ retrofit measures	Institutional (municipal) buildings and facilities:	Working with cities in a specific			Grants / subsidies		1.000.001 - 2.000.000	01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
	Insulation	C40 Network							
Switching to low-carbon fuels	Institutional (municipal) buildings and facilities: Purchasing 'green' electricity from the grid	Working with cities in a specific C40 Network			City's own funds / savings		2.000.001 - 5.000.000	07/13	06/15
Brownfield redevelopment programs	Brownfield redevelopment, clean up or rehabilitation initiatives	None of the above			Grants / subsidies		2.000.001 - 5.000.000	01/04	12/50
Eco-district development strategy	District heating/cooling	None of the above			Grants / subsidies		2.000.001 - 5.000.000	1/10	12/50
Green space and/ or biodiversity preservation and expansion	Opening schoolyards for public use	None of the above			Grants / subsidies		2.000.001 - 5.000.000		12/50
Transit oriented development	Integrating low carbon transportation solutions into development (walkability/ bikeability)	Working with cities in a specific C40 Network			Tolls / user charges		10.000.001+	10/13	12/50
Low or zero	Entering into long-	Working			Emissions		2.000.001 -	07/13	06/15

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
carbon energy supply generation	term contracts with renewable energy generators	with cities in a specific C40 Network			trading credits		5.000.000		
Optimize traditional power/energy production	District heating/cooling	None of the above			Grants / subsidies		10.000.001+	1/10	12/50
Smart grid	Smart meters/controls	None of the above			Developer contributions		10.000.001+	01/83	12/50
Encourage sustainable food production and consumption	Municipal food purchasing/procurement guidelines	None of the above			Grants / subsidies		250.001 - 500.000	09/12	12/50
LED / CFL / other luminaire technologies	More efficient luminaires (e.g. LED)	Working with non-C40 cities			Developer contributions		10.000.001+	1/15	12/20
Infrastructure for non motorized transport	Cycle hire/ share programs	Working with non-C40 cities			Grants / subsidies		2.000.001 - 5.000.000	05/12	12/50
Recycling or composting collections and/or facilities	Residential organic waste: Municipal recycling points or centers	Working with cities in a specific C40 Network			City's own funds / savings		2.000.001 - 5.000.000	01/04	12/50
Recycling or composting collections and/or facilities	Residential non-organic waste: Municipal recycling points or centers	Working with cities in a specific C40					2.000.001 - 5.000.000	01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
		Network							
Water recycling and reclamation	Automatic leak detection	None of the above			Tolls / user charges		10.000.001+	09/14	12/50
Water recycling and reclamation	Education or campaigns to promote water efficiency	None of the above			Tolls / user charges		1.000.001 - 2.000.000	10/10	12/50

Page: GHG Emissions Reduction - Community C40

7.0

Do you have a GHG emissions reduction target in place for your community?

No

7.0a

Please provide details of your city-wide reduction target.

Baseline year	Baseline emissions (metric tonnes CO2e)	Percentage reduction target	GHG sources to which the target applies	Target date	Comment

7.0b

Please explain why you do not have a city-wide emissions reduction target.

The City of Houston does not have a community-wide climate action plan.

7.1.

What actions are you undertaking to reduce emissions city-wide?

Emission reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Buildings	Building performance rating and reporting	Commercial buildings and facilities: Audits and advice	Policy	Still under consideration or awaiting final authorisation	Yes	The City is considering energy efficiency programs and policies for commercial buildings.
Buildings	Building performance rating and reporting	Commercial buildings and facilities: Benchmarking	Policy	Still under consideration or awaiting	Yes	The City of Houston has voluntary benchmarking programs, like the Houston Green Office Challenge and the DOE's Better Buildings Challenge, where commercial buildings can opt into disclosing their energy ratings to the City. The City is considering an energy benchmarking, audit, and disclosure policy for commercial buildings.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
				final authorisation		
Buildings	Building performance rating and reporting	Commercial buildings and facilities: Energy performance certification	Policy	Still under consideration or awaiting final authorisation	Yes	The City is considering energy efficiency programs and policies for commercial buildings.
Buildings	Building performance rating and reporting	Commercial buildings and facilities: Smart meters	Programme/Project	Currently in effect (city-wide)	Yes	Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Buildings	Building performance rating and reporting	Residential - Private housing: Audits and advice	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at no charge. The efficiency upgrades were based on a custom assessment of each home that determined the measures needed to make the home more energy efficient. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with over \$5 million committed through 2014.
Buildings	Building performance	Residential - Private	Policy	Currently in effect	Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	ce rating and reporting	housing: Benchmarking		(city-wide)		no charge. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with over \$5 million committed through 2014.
Buildings	Building performance rating and reporting	Residential - Private housing: Energy performance certification	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at no charge. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with over \$5 million committed through 2014.
Buildings	Building performance rating and reporting	Residential - Private housing: Net metering	Programme/Project	Currently in effect and being piloted	Yes	Some retail electric providers, like Green Mountain Energy, offer credits to customers for any excess energy that their qualifying distributed renewable generation facility exports to the electricity grid.
Buildings	Building performance rating and reporting	Residential - Private housing: Smart meters	Policy	Currently in effect (city-wide)	Yes	Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: Building energy management	Policy	Currently in effect at a significant scale	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		system		across most of the city		
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: CFL or other efficient lighting mechanisms	Policy	Currently in effect (city-wide)	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: Daylighting	Policy	Currently in effect (city-wide)	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: Energy performance contracting	Incentive /Disincentive	Currently in effect and being piloted	No	The Energy Efficiency Incentive Program (EEIP) provides a financial incentive to help office building owners, property managers and tenants located in the City of Houston to reduce energy consumption and increase the economic performance of their building. The Houston Green Office Challenge provided education on energy performance contracting and helping building owners/property managers find resources to help fund energy efficiency retrofits.
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: Heating and cooling efficiency	Policy	Currently in effect (city-wide)	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Buildings	Energy efficiency/retrofit measures	Commercial buildings and facilities: Heating and cooling efficiency	Policy	Currently in effect (city-wide)	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	retrofit measures	facilities: Insulation		(city-wide)		passed a mandatory cool roof requirement for new construction and roof replacements.
Buildings	Energy efficiency/retrofit measures	Residential - Private housing: HVAC operations & maintenance	Policy	Currently in effect (city-wide)	Yes	In January 2014, Houston City Council approved another five percent increase in the Houston Residential Energy Conservation Code. With this increase the local minimum energy efficiency requirements for new construction of one and two family homes, townhouses and apartments up to three stories in height is 15 percent above what is mandated by state law. This is the third year in a row the local code has been increased by five percent. Beginning February 1, 2014, the City of Houston Energy Code for residential structures requires that new buildings achieve 15% efficiency above the currently adopted Houston Energy Code (i.e. 15% above IECC 2009). The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Buildings	Energy efficiency/retrofit measures	Residential - Private housing: Installation of efficient lighting systems	Policy	Currently in effect (city-wide)	Yes	In January 2014, Houston City Council approved another five percent increase in the Houston Residential Energy Conservation Code. With this increase the local minimum energy efficiency requirements for new construction of one and two family homes, townhouses and apartments up to three stories in height is 15 percent above what is mandated by state law. This is the third year in a row the local code has been increased by five percent. Beginning February 1, 2014, the City of Houston Energy Code for residential structures requires that new buildings achieve 15% efficiency above the currently adopted Houston Energy Code (i.e. 15% above IECC 2009). The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Buildings	Energy efficiency/retrofit measures	Residential - Private housing: Insulation	Policy	Currently in effect (city-wide)	Yes	In January 2014, Houston City Council approved another five percent increase in the Houston Residential Energy Conservation Code. With this increase the local minimum energy efficiency requirements for new construction of one and two family homes, townhouses and apartments up to three stories in height is 15 percent above what is mandated by state law. This is the third year in a row the

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						<p>local code has been increased by five percent. Beginning February 1, 2014, the City of Houston Energy Code for residential structures requires that new buildings achieve 15% efficiency above the currently adopted Houston Energy Code (i.e. 15% above IECC 2009). The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code. Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.</p>
Buildings	On-site renewable energy generation	Residential - Private housing: Combined heat and power	Programme/Project	Currently in effect and being piloted	Yes	<p>HOUZE® Advanced Building Science Inc., along with the City of Houston, debuted the first-of-its-kind zero-energy homes in the United States, in the community of Independence Heights, just north of downtown Houston. These homes introduce a new, affordable option for buyers by producing more energy than they consume, redefining the American Dream with homes that cost less to own, operate and maintain. HOUZE® (the "ZE" stands for Zero Energy) Advanced Building Science Inc. is an innovative, technology commercialization company integrating disruptive technologies into real estate development and building. The company's mission is to empower the building industry with next generation building systems, materials and technologies to create affordable net-zero energy homes and buildings. It is 100% powered by natural gas and power cell. http://thezeroenergyhome.com/</p>
Buildings	On-site renewable energy generation	Residential - Private housing: Solar electricity	Policy	Currently in effect and being piloted	Yes	<p>The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes. On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with the Houston Advanced</p>

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						Research Center on streamlining and refining the solar permitting process. The City is also now working on a PACE (Property Assessed Clean Energy) commercial district for Houston, which will create financing that can help property owners break down the financial barriers to installing renewable energy projects. NRG Energy has a Residential Solar Solutions-Solar Leasing program: http://www.nrgsolar.com/#welcome
Buildings	Switching to low-carbon fuels	Residential - Private housing: Purchasing of 'green' electricity from the grid	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Retail electric providers that offer green power include: Reliant (NRG), Green Mountain (NRG), TXU, Gexa, and Stream.
Community-Scale Development	Brownfield redevelopment programs	Brownfield redevelopment, clean up or rehabilitation initiatives	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The Houston Brownfield Program seeks to help redevelop and revitalize properties that are abandoned or underutilized due to real or perceived contamination. Brownfield Properties can include sites such as old gas stations and auto body shops, abandoned industrial facilities, and many more. Our program offers comprehensive services to help with these problem properties. http://www.houstontx.gov/brownfields/
Community-Scale Development	Building standards	Green community rating system LEED-ND, GreenStar,	Programme/Project	Currently in effect at a significant scale	Yes	One of the goals for the Houston Green Office Challenge was to help participants achieve Energy Star or LEED certifications for their buildings. The City had 400 participants in this voluntary program. Houston is #5 in the nation for the number of LEED certified buildings and was ranked #8 in Energy STAR buildings in 2015.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
		Enterprise Communities, etc.		across most of the city		
Community-Scale Development			Incentive /Disincentive	Currently in effect (city-wide)	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Major's Office. The City of Houston passed Ordinance No. 2012-739, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the Downtown Living Initiative Chapter 380 Program (Program) is to promote economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for certain new multifamily residential mixed-use developments. The target area comprising the east side of downtown offers exciting attractions and amenities including Discovery Green Park, Phoenicia Market, churches and schools (including the planned HISD High School for the Performing and Visual Arts), major hotels, three of the region's four major sports venues and the George R. Brown Convention Center, ranked in the nation's top twenty.
Community-Scale Development	Compact cities	Minimum density requirements	Policy	Currently in effect (city-wide)	Yes	Under Chapter 42 (Subdivisions, Developments and Platting Ordinance) • General development structure allows for mixed land use development. The "unrestricted reserve" designations allows parcels to be platted without any restriction to the land use. • Created optional performance standards that allow transit oriented developments to receive reduced building setbacks along the existing and proposed Metro Rail/BRT corridors. • Propose to remove the "urban area" and "suburban area" designations as defined by boundary created by Loop 610. Create a core set of rules that apply to the City and the Extra Territorial Jurisdiction (ETJ).

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						<p>Establish optional, city-wide performance standards for single-family residential developments and reduced building lines for commercial, retail, and multi-family developments along major thoroughfares with a planned right-of-way of 80-feet or less. • Propose to establish a minimum lot size of 3,500 SF in the city. The minimum lot size of the ETJ will remain 5,000 SF. • Propose to allow lot size averaging within the city. Lots may be less than 1,400 SF if the average lot area in the subdivision or block face is a minimum of 1,400 SF. • Propose to allow lot width averaging within the city. Lots may have an average lot width of 18-feet within a subdivision or block face as long as no lots are less than 15-feet in width. • Propose to require lots immediately adjacent to the public street and opting into a reduced building setback performance standard to have a front door and pedestrian access to the public street.</p>
Community-Scale Development	Compact cities	Strategic refurbishment/re-use of unused buildings for new purposes	Policy	Currently in effect (city-wide)	Yes	<p>Since its inception in the early 1830s, Houston has encountered many transformations. The development of Houston from a tiny village to a substantial metropolitan city is recognized and interpreted through its remaining historic structures. In 1995, City Council adopted Houston's Historic Preservation Ordinance in effort to help preserve the significant reminders of the city's collective past as represented through the built environment. Through this ordinance, the City of Houston offers a process and methods to maintain Houston's architectural history. Landmark and Protected Landmark designations allow for both recognition and protection of individual historic structures, while Historic District designations encourage the recognition and protection of neighborhoods with distinct historic character by classifying a specific bounded area historically significant.</p>
Community-Scale Development	Eco-district development	District heating/cooling	Programme/Project	Currently in effect and being	Yes	<p>There are 16 district energy systems in the city. Downtown Houston houses the Union Station District Energy Center, which has an underground piping network in downtown, totaling about 4 miles in length. The piping grid connects the district energy center with other customers, including Minute Park and the Alley Theatre.</p>

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	strategy			piloted		This system serves 24 buildings, which is approximately 6.5 million SF in downtown Houston. Overall, Energy Solutions District Cooling provides service to approximately 7.2 million SF of space with an efficiency of 0.88 kwh/ton-hour. Also, the Thermal Energy Corporation (TECO) has the largest district cooling system in the country and owns and operates a CHP-based district energy system in the Texas Medical Center.
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Conservation or restoration of ecological corridors/connectivity	Policy	Currently in effect (city-wide)	Yes	The Tree Protection Ordinance as contained in sections V and VI of Chapter 33 of the City of Houston Code of Ordinances pertains to the protection and preservation of trees and shrubs on city property. Under this ordinance, City Council has been given the power to designate a green corridor to consist of right-of-ways of a major thoroughfare and building setback areas of abutting and adjacent properties in order to enhance the beauty of our city. Within the corridor, existing trees are given enhanced protection and the varieties of acceptable new trees are listed. The ordinance requires any tree removal in the corridor to be authorized by city permit, and the tree must be replaced by a specifically stated formula. This applies to trees affected by new construction or renovation of existing structures or parking lots.
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Conservation or restoration of natural/semi-natural areas	Policy	Currently in effect (city-wide)	Yes	The Tree Protection Ordinance as contained in sections V and VI of Chapter 33 of the City of Houston Code of Ordinances pertains to the protection and preservation of trees and shrubs on city property. This includes trees on right-of-ways, medians, parks and other city property. A permit is required to remove any tree on city property or on a setback.
Community-Scale	Green space	Home gardens/gardens	Policy	Currently in effect	Yes	Many citizens are interested in creating Natural Areas as part of their home landscaping to reduce maintenance, attract wildlife, and create garden diversity.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Development	and/ or biodiversity preservation and expansion	n plots		(city-wide)		However, going the natural area route within the city does not mean simply allowing an area to go unmanaged. The City of Houston Ordinance 32-10 defines a “natural area” as an area of native vegetation within planned and managed landscape. The ordinance gives the Houston Parks and Recreation Department, under the authority of the Director of the Department, the authority to create Rules and Regulations for Natural Areas. Permitting authority for Natural Areas is also given to the department by city ordinance. In addition, the ordinance stipulates what is considered native vegetation and the parameters for use of such plants in the creation, preservation, or restoration of natural plant communities. http://www.houstontx.gov/parks/naturalareaspermit.html
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Opening schoolyards for public use	Programme/P roject	Currently in effect at a significant scale across most of the city	Yes	The SPARK School Park Program is a non-profit organization operating out of the City of Houston Mayor's office. Developed in 1983 as a way to increase park space in Houston, Texas, Former City Council Member, Eleanor Tinsley, created SPARK to develop public school grounds into neighborhood parks. An inter-local agreement, one of the first in Houston, between the city, the Houston Parks Board and the school district, formally established the SPARK program. SPARK combines the resources of the Department of Housing and Community Development, seven local school districts, Harris County, the private sector, neighborhood group, PTA/PTO groups and concerned citizens. http://www.sparkpark.org/
Community-Scale Development	Green space and/ or biodiversity preservation and	Protection of large green and open spaces within the City	Programme/P roject	Currently in effect at a significant scale across most of	Yes	In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	expansion			the city		resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation: • Reduced doctor visits due to increased access to recreation opportunities; • Increase in use of alternative transportation for commuting along the hike and bike trails; • Increase in property values along the corridor resulting in increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston's image to attract the best and brightest to our city.
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Reforestation	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Memorial Park Conservancy (MPC) and the Houston Parks and Recreation Department (HPARD) have started planting new trees in Memorial Park, which suffered massive tree loss after a severe drought in 2011. The Memorial Park Forestry Conservation & Management Plan will work on replanting thousands of trees.
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Stewardship of open spaces	Programme/Project	Currently in effect at a significant scale across most of	Yes	In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	expansion			the city		resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation: • Reduced doctor visits due to increased access to recreation opportunities; • Increase in use of alternative transportation for commuting along the hike and bike trails; • Increase in property values along the corridor resulting in increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston's image to attract the best and brightest to our city.
Community-Scale Development	Green space and/ or biodiversity preservation and expansion	Tree planting/Afforestation	Programme/Project	Currently in effect (city-wide)	Yes	The Million Trees + Houston program is adding to the city's Urban Forest by planting more than a million new trees in a three to five year period. The program is coordinated by the Houston Parks and Recreation Department in partnership with Trees for Houston. Other partners include Harris County, the Texas Department of Transportation, and the Quality of Life Coalition. In the interest of creating a greener, more livable city, many private corporations are joining the effort through a special "Gift of Trees" program. http://www.houstontx.gov/parks/forestry/milliontrees.html
Community-Scale Development	Transit oriented development	Expanding transit to connect existing development	Incentive /Disincentive	Currently in effect at a significant scale across most of	Yes	In addition to the existing 7.5-mile Main Street line, METRO opened the North Line open in December, 2013, and the East End and Southeast Lines opened in May 2015. The North Line extends the existing Red Line by 5.3 miles and runs through the heart of the historic Northside, a neighborhood rooted in rail that came into being with the expansion of the Hardy Rail Lines in the 1880s. The 3.3 mile East End Line (Green Line) travels along Harrisburg from the Magnolia Park Transit Center through the historic East End to a variety of downtown entertainment and

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
				the city		business destinations. The Southeast Line (Purple Line) begins downtown and travels southeast along Capitol and Rusk to the Palm Center near MLK and Griggs. The 6.6 mile line travels through one of Houston's oldest African-American communities and connects to Texas Southern University and University of Houston.
Community-Scale Development	Transit oriented development	Prioritising development in areas well connected by transit	Incentive /Disincentive	Currently in effect at a significant scale across most of the city	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Mayor's Office.
Community-Scale Development	Transit oriented development	Restricting parking spaces in new development	Policy	Currently in effect (city-wide)	Yes	In the City of Houston Ordinance No. 2013-208 regarding parking requirements, if a development adds bicycle spaces, is a transit-oriented development, or a historic building, it can reduce its parking space requirement. Under Chapter 26 (The Off-Street Parking Ordinance) • Require bicycle parking for new commercial, retail, and office. Provide incentives that allow for reduced automobile parking up to 10% if additional bicycle parking is provided. • Expand options within the Shared Parking table to allow more uses to participate in shared parking and expand the time periods, thereby reducing the overall number of parking spaces. Director is given discretion to waive up to 10% of the total number of spaces based upon detailed parking study. • Establish procedures and criteria to allow areas to create different parking standards, such as reduced parking requirements, expanded distance for off-site parking, or even the removal of parking requirements. These areas are called Special Parking Areas and are the next generation of Parking Management Areas. • Per requests from the community, the "Warehouse District" on the north

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						side of Downtown has now been included in the Central Business District (CBD) – a district exempt from off-street parking requirements. • Allow a 40% reduction in the parking requirements for a protected landmarked or contributing structure within a historic district that receives an approved Certificate of Appropriateness • Allow grandfathered uses to redevelop into a less intense use without providing additional parking provided, however, they maintain existing parking spaces. • Allow a 20% reduction in the parking requirements for transit-orientated developments that opt-in to the pedestrian/transit focused performance standards found in Chapter 42. http://www.houstontx.gov/planning/DevelopRegs/offstreet/docs_pdfs/Chapter26_Ordinance_march_2013.pdf
Community-Scale Development	Transit oriented development	Using current transportation infrastructure projects as focus for new neighbourhood development	Incentive /Disincentive	Currently in effect at a significant scale across most of the city	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Mayor's Office.
Community-Scale Development	Urban agriculture	Rooftop and vertical farming	Programme/Project	Currently in effect and being piloted	Yes	The City has demonstration green roof using native plants at the Houston Permitting Center.
Energy Supply	Low or zero carbon	Advanced thermal treatment of	Programme/Project	Still under consideration	Yes	One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	energy supply generation	biomass		tion or awaiting final authorisation		paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Houston's innovation will: • Provide every residence with curbside One Bin for All services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Allowing technology and new process systems to sort household materials and derive an initial 55% diversion rate, and upwards of 75% with composting, anaerobic digestion and catalytic conversion (biomass-to-fuel) is more efficient and effective. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues.
Energy Supply	Low or zero carbon energy supply generation	Anaerobic digestion	Programme/Project	Still under consideration or awaiting final authorisation	Yes	One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce

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						greenhouse gas emissions, save money and create high value materials. Houston's innovation will: • Provide every residence with curbside One Bin for All services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Allowing technology and new process systems to sort household materials and derive an initial 55% diversion rate, and upwards of 75% with composting, anaerobic digestion and catalytic conversion (biomass-to-fuel) is more efficient and effective. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues.
Energy Supply	Low or zero carbon energy supply generation	Property tax rebate	Incentive /Disincentive	Currently in effect (city-wide)	Yes	In September 2009, Houston enacted Ordinance No. 2009-858, the City of Houston Tax Abatement Program, which establishes a partial tax abatement for commercial buildings that meet LEED standards. In order to qualify for the abatement, applicants must register with the US Green Building Council and then submit an application for the abatement prior to beginning any construction on the project. The tax abatement benefit will not become affective until construction of the project has completed and LEED certification is obtained. In addition, projects must meet a minimum investment level for the incremental cost of obtaining the LEED certification.
Energy Supply	Low or zero carbon energy supply generation	Solar electricity (photovoltaic, concentrating solar)	Programme/P roject	Currently in effect and being piloted	Yes	The City has existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center. The Green Building Resource Center housed within the Houston Permitting Center provides education and shows real-time energy production of its rooftop solar panels. The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably"

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						<p>reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes. On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with HARC on streamlining and refining the solar permitting process. With the support of some federal grant funding, the City will be working on promoting market readiness of solar technologies. Grant funding will be used to make installing rooftop solar photovoltaic easier, faster, and cheaper for homeowners and businesses by implementing streamlined and standardized processes that will dramatically improve local market conditions. The City is also now working on a PACE (Property Assessed Clean Energy) commercial district for Houston, which will create financing that can help property owners break down the financial barriers to installing renewable energy projects. Using grant funding, 17 mobile solar-powered shipping containers/generators (SPACE units) were acquired through a partnership with the University of Houston Green Building Components Program and placed at fire stations, parks, neighborhood centers and schools. The generators are designed for emergency relief efforts or cooling centers during times of extreme heat. When not being used in an emergency, they are used year-round for services, outdoor classrooms or to educate the public and bring awareness to solar projects. The City is also working on a program to build 30 MW of solar power to add to the City's renewable energy mix.</p>
Energy Supply	Optimize traditional power/energy production	Heat generation asset replacement	Programme/P roject	Currently in effect (city-wide)	Yes	Many buildings have replaced boilers.
Energy	Optimize	Increased	Programme/P	Currently	Yes	Houston-based Thermal Energy Corporation (TECO) has provided reliable, cost-

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Supply	traditional power/energy production	capture of waste heat	project	in effect (city-wide)		effective and energy-efficient heating and cooling to institutions in the Texas Medical Center since 1969. TECO uses district energy and CHP technology to produce chilled water and steam, which we pipe underground to more than 18 million square feet of customer buildings at 18 institutions. With a solid track record of performance, TECO is well-positioned to provide the energy behind what's next for the buildings and pace-setting services and research at the world-renown Texas Medical Center. The Houston airport systems utilizes waste heat recovery as well.
Energy Supply	Smart grid	Development of smart grids	Programme/Project	Currently in effect (city-wide)	Yes	CenterPoint Energy Houston Electric's (CPE) Smart Grid project involves deployment of a fully integrated advanced metering system and Web portal access to over 2.2 million customers, along with installation of advanced monitoring and distribution automation equipment. The project aims to reduce peak loads, overall electricity use, and operations and maintenance costs while increasing distribution system reliability. The project implements secure communications to: (1) allow smart meter customers to view their electricity consumption data whenever they want through the Smart Meter Texas (SMT) data exchange, and (2) allow CPE to effectively visualize and operate the distribution system. As a transmission and distribution service provider, CPE provides metering data to retail energy providers (REPs) through the SMT data exchange. The billing data and customer systems enable REPs to offer information feedback, new pricing programs, and other electric service options to customers. The project also deploys a more advanced distribution management system and automated feeder switching, that reduces operational costs and improves service reliability.
Energy Supply	Smart grid	Smart meters/controls	Programme/Project	Currently in effect (city-wide)	Yes	CenterPoint Energy Houston Electric's (CPE) Smart Grid project involves deployment of a fully integrated advanced metering system and Web portal access to over 2.2 million customers, along with installation of advanced monitoring and distribution automation equipment. The project aims to reduce peak loads, overall electricity use, and operations and maintenance costs while increasing distribution

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						system reliability. The project implements secure communications to: (1) allow smart meter customers to view their electricity consumption data whenever they want through the Smart Meter Texas (SMT) data exchange, and (2) allow CPE to effectively visualize and operate the distribution system. As a transmission and distribution service provider, CPE provides metering data to retail energy providers (REPs) through the SMT data exchange. The billing data and customer systems enable REPs to offer information feedback, new pricing programs, and other electric service options to customers. The project also deploys a more advanced distribution management system and automated feeder switching, that reduces operational costs and improves service reliability.
Energy Supply	Smart grid	Smart street lighting	Procurement	Currently in effect (city-wide)	Yes	All streetlights are retrofitted with photocell technology in order to deliver lighting based on need instead of being set on a timer.
Food and Agriculture	Encourage sustainable food production and consumption	Community gardens or allotments	Programme/Project	Currently in effect and being piloted	Yes	In November 2012, the City launched the Urban Grows initiative. Urban Grows, part of the City of Houston's Healthy Houston initiative, aims to help communities build vegetable gardens, farms and orchards on vacant land in areas with poor access to healthy fresh foods, often referred to as food deserts. The City of Houston will provide lots through its LARA program (Land Assemblage Redevelopment Authority), which works to redevelop tax-delinquent and abandoned properties. Community members, partnering with local non-profits, foundations or churches, will then work to transform these vacant lots into usable, productive and attractive green spaces. Urban Grows is the first initiative launched as part of Mayor Parker's new program, Healthy Houston, which is designed to reduce obesity and increase healthy eating and exercise. Healthy Houston will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage the development of sustainable

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						<p>food systems and promote recreational opportunities. Urban Grows will:</p> <ul style="list-style-type: none"> • Encourage urban agriculture in neighborhoods, utilizing vacant City property • Improve access to healthy, affordable and locally produced food for all neighborhoods • Support education regarding the benefits of sustainable agriculture <p>Urban Grows will complement the City's existing efforts, including the launch of the City Hall Farmers Market and farmers markets at the City's multi-service centers; new vegetable container gardens downtown and throughout the City; and a Grocery Access Task Force that works with grocers on providing economic tools and incentives to help spur more supermarket and grocery development in areas where they are needed.</p>
Food and Agriculture	Encourage sustainable food production and consumption	Rooftop farming	Programme/Project	Still under consideration or awaiting final authorization	Yes	The City is considering having a demonstration rooftop garden.
Mass Transit	Improve bus infrastructure, services, and operations	Bus priority at traffic lights	Programme/Project	Still under consideration or awaiting final authorization	Yes	The new 402 Quickline Bellaire operates with the efficiency of METRORail by offering limited stops to popular business centers all along the line. The new Quickline features eight state-of-the-art bus stations complete with digital "next bus" signage to inform riders when the bus will arrive. In addition, a bright blue road stripe has been painted along the entire route for easy identification. The Quickline bus also has priority at traffic lights.
Mass	Improve	Bus rapid	Programme/Project	Still	Yes	METRO launched the System Re-imagining project in 2013. This 12 month project

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Transit	bus infrastructure, services, and operations	transit	project	under consideration or awaiting final authorisation		involved "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, looked to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components. The newly designed bus system will launch in August 2015. An important component of METRO's regional mobility plan, Signature Service is based on the successful Bus Rapid Transit model. The result: METRO's 402 Quickline Bellaire route provides faster travel and fewer stops aboard high-end hybrid vehicles, plus greater reliability and increased customer convenience through the use of integrated technology, infrastructure and operational investments. http://www.ridemetro.org/Services/Bus/Quickline_SignatureService.aspx Uptown/Galleria is considering a bus rapid transit system to service the district.
Mass Transit	Improve bus infrastructure, services, and operations	Increase routes, frequency and night services	Programme/Project	Still under consideration or awaiting final authorisation	Yes	METRO launched the System Re-imagining project in 2013. This 12 month project involved "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, looked to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components. The newly designed bus system will launch in August 2015.
Mass Transit	Improve bus infrastructure, services,	Increase the number of bus stops	Programme/Project	Still under consideration or awaiting	Yes	METRO launched the System Re-imagining project in 2013. This 12 month project involved "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, looked to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then

Emission reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	and operations			final authorisation		develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components. The newly designed bus system will launch in August 2015.
Mass Transit	Improve bus infrastructure, services, and operations	Priority lanes	Programme/Project	Currently in effect (city-wide)	Yes	Priority lanes for buses include the HOV lane, HOT Lanes, and diamond lanes downtown that give priority to buses during peak hours. http://www.ridemetro.org/Services/HOTLanes.aspx
Mass Transit	Improve bus infrastructure, services, and operations	Provide more bus shelters	Programme/Project	Currently in effect (city-wide)	Yes	The Passenger Bus Shelter Program is an initiative to install bus shelters throughout the METRO service area. The program consists of the design and construction of new shelter foundations, as well as the fabrication and installation of standard passenger bus shelters. This program reinforces METRO's commitment to reinvesting in the agency's bus system backbone. Public response has been very positive. Installation of shelters has been shown to increase ridership at a given bus stop by an average of 20 additional riders per day. Bus shelters provide patrons both safety and protection from the elements. The Board is funding 100 new bus shelters per year. http://www.ridemetro.org/CurrentProjects/BusShelterProgram.aspx
Mass Transit	Improve bus infrastructure, services, and operations	Upgrade buses to increase accessibility	Programme/Project	Currently in effect at a significant scale across most of	Yes	Shaded paths to bus stops are available at numerous bus stops across the city. Also, in the Houston-Galveston Area Council Livable Centers studies, there are recommendations for improved sidewalk connectivity and more street trees, which will increase accessibility of bus services. http://videos.h-gac.com/CE/livablecenters/Downtown-EaDo_Livable_Centers_Study.pdf

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Mass Transit	Improve fuel economy and reduce CO2 from bus and/or light rail	Improve rail, metro and tram fuel economy and reduce CO2	Procurement	the city Still under consideration or awaiting final authorization	Yes	The new North, East End and Southeast lines dramatically increase light rail's reach across Houston. To handle the increased capacity, METRO is quadrupling the number of light-rail vehicles in their fleet. Now three different types of vehicles – the H1, which has been operating since 2004; the H2, which is now in service; and the H3 – will carry passengers all around Houston.
Mass Transit	Improve fuel economy and reduce CO2 from bus and/or light rail	Promote fuel-efficient bus driving and reduce idling	Policy	Currently in effect (city-wide)	Yes	All METRO buses are programmed to automatically shut down after 20 minutes of idling.
Mass Transit	Improve fuel economy and reduce CO2 from bus and/or light rail	Switch buses to Compressed Natural Gas	Programme/Project	Currently in effect and being piloted	Yes	Free and convenient transportation has returned to downtown with Greenlink. Through a partnership between the Downtown District, BG Group and Houston First Corporation, the downtown community can utilize the environmentally-friendly buses to get to popular downtown locations quickly. The buses run on Compressed Natural Gas (CNG), making them a cleaner transportation alternative. Greenlink is operated by METRO through an interlocal agreement with the Downtown District. This is a pilot program utilizing a CNG bus, and METRO is looking to expand its fleet with more CNG buses.
Mass Transit	Improve fuel	Switch buses to hybrid	Programme/Project	Currently in effect	Yes	METRO has 1,230 buses. With an extensive network of bus routes and convenient Park & Ride facilities helping to ease rush-hour commutes, the METRO Bus

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	economy and reduce CO2 from bus and/or light rail	engines		(city-wide)		System keeps the Houston region moving. METRO is paving the way for a cleaner Houston with 443 transit diesel-hybrid buses in operation. Since 2003, METRO has been actively working to improve the air we breathe with state-of-the-art technology that reduces nitrogen oxide emissions by more than 50 percent and offers substantial savings in fuel. Hybrid technology is METRO's current choice for vehicles and each year, as part of its fleet replacement plan, METRO purchases 100 buses.
Mass Transit	Improve fuel economy and reduce CO2 from trucks	Introduce low carbon waste collection vehicles	Procurement	Currently in effect at a significant scale across most of the city	Yes	Solid waste has 10 hybrid trucks in its fleet.
Mass Transit	Improve rail, metro, and tram infrastructure, services and operations	Improve rail transit times	Programme/Project	Currently in effect (city-wide)	Yes	Lightrail offers more reliability and is an improvement over bus transit times. METRO will also be celebrating its 100 millionth light rail rider in 2013.
Mass Transit	Improve rail, metro, and tram infrastructure	Improve station facilities	Programme/Project	Currently in effect at a significant	Yes	Houston is expanding its light-rail infrastructure with three new light-rail lines currently under construction and two more in the works, going from 7.5 miles to 23 miles, spending over \$4 billion to improve the system. The expanded light-rail system is an essential element of the city's plans to meet the transportation and

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	ure, services and operations			t scale across most of the city		environmental challenges of today and tomorrow, easing the growing traffic congestion, improving air quality and changing the way Houston moves. Upgrades of existing station facilities will match the new facilities. Facility upgrades include security upgrades (HD camera), updated fare equipment on the platform, and new communication equipment.
Mass Transit	Improve rail, metro, and tram infrastructure, services and operations	Increase number of carriages	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with three new light-rail lines currently under construction and two more in the works, going from 7.5 miles to 23 miles, spending over \$4 billion to improve the system. METRO will be adding 19 new Siemens H2 S70 trains to its light rail fleet.
Mass Transit	Improve rail, metro, and tram infrastructure, services and operations	Increase routes, frequency and night services	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with a \$4 billion investment. Three new light-rail lines are currently under construction, and two more are in the works, going from 7.5 miles to 23 miles. Night services will match existing schedules, and frequency will remain at 6 minute intervals. METRO has a 1 percent sales and use tax imposed within METRO's service area for transit activities. By voter mandate, METRO dedicates 25 percent of its sales tax for the General Mobility Program. Most of this funding is passed on to the city of Houston, Harris County and 14 multi-cities for general mobility projects.
Mass Transit	Improve rail, metro, and tram infrastructure, services	Increase the number of rail stations	Programme/Project	Currently in effect at a significant scale across	Yes	Houston is expanding its light-rail infrastructure with a \$4 billion investment. Three new light-rail lines are currently under construction, and two are more in the works, going from 7.5 miles to 23 miles. There are a total of 24 new stations under construction, 10 on the Southeast Line, 5 on the East End Line, 8 on the North line, and 1 on the existing Main Street Line. METRO has a 1 percent sales and use tax imposed within METRO's service area for transit activities. By voter mandate,

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	and operations			most of the city		METRO dedicates 25 percent of its sales tax for the General Mobility Program. Most of this funding is passed on to the city of Houston, Harris County and 14 multi-cities for general mobility projects.
Mass Transit	Improve rail, metro, and tram infrastructure, services and operations	Reduce fares	Incentive /Disincentive	Currently in effect at a significant scale across most of the city	Yes	The City of Houston offers an incentive for downtown municipal employees. The Downtown Employee Parking/Transit policy (AP: 3-6) states that each employee working in downtown is offered a parking space or METRO transit pass.
Mass Transit	Smart public transport	Bike scheme systems that track availability of bikes and locations for drop off	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The City launched its bike share program, Houston Bike Share, in May 2012, which is an active transportation alternative for the City. Houston's initial phase has been successful and, received funding support from Blue Cross Blue Shield TX and the US Department of Energy, totaling nearly \$2 million. On April 3, 2013, Houston B-cycle, expanded from 3 to 29 stations and from 18 to 225 bicycles. This Phase II expansion creates a presence not only in Downtown, but also in the East End, Midtown, Montrose and the Museum District/Hermann Park with four of the stations located at key METRORail stops. Phase III expansion discussions and planning include the Texas Medical Center and local universities, as well as additional neighborhoods. Pollution, traffic, and rising oil costs are just a few of the reasons why Houstonians need options for getting around. www.houston.bcycle.com The bike share system tracks availability of bikes and where the bikes can be docked via a mobile app or the website. There are currently 29 stations and 225 bikes in operation.
Mass Transit	Smart public	Electric vehicle charging	Programme/Project	Currently in effect	Yes	The Houston Drives Electric website updates its charging station map periodically to show where public EV charging is available. The City is a partner in the Center

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	transport	station mapping and real-time booking system		at a significant scale across most of the city		for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October 2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outline the number of existing PEVs and equipment in the Houston region. http://www.greenhoustontx.gov/ev/
Mass Transit	Smart public transport	Matching systems for carpooling/ car sharing	Programme/P roject	Currently in effect at a significant scale across most of the city	Yes	NuRide is the nation's largest rewards program for individuals who utilize commute alternatives by carpooling, vanpooling, biking, walking, telecommuting and taking public transportation. NuRide is a free service that can match carpoolers who live and work near each other as well as provide rewards and special offers to all NuRide members who track trips. NuRide is supported by the Houston-Galveston Area Council and local and national sponsors.
Mass Transit	Smart public transport	Road pricing that is responsive to real-time information	Incentive /Disincentive	Currently in effect at a significant scale across most of the city	Yes	METRO HOT (High Occupancy Toll) Lanes allow drivers without passengers (single-occupant vehicles or SOVs) to use the HOV (High Occupancy Vehicle) Lane – for a toll. Traffic monitoring systems help METRO maintain traffic speeds to ensure optimal travel times for existing HOV Lane users, as well those using the METRO HOT Lanes. If speeds slow, single-occupant vehicles are not allowed in the HOV Lane. The lane is also be closed during peak traffic periods – specific to each METRO HOT Lane corridor - to single-occupant vehicles. METRO HOT Lanes benefits: -Provides new options for commuters -Increases safety and promotes quick response to accidents and issues in the lanes, thanks to additional camera monitoring -Improves air quality by reducing traffic congestion -Better utilizes existing HOV Lanes -Offers increased enforcement of the HOV Lane system -Revenue generated from tolls will contribute to the operation, maintenance and enforcement costs for METRO HOT Lanes Tolls are based on time of day and

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						the congestion level of each METRO HOT Lane. METRO will publish the toll rate for specific corridors prior to opening, and tolls will be prominently displayed along each corridor. http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx
Mass Transit	Smart public transport	Smart card ticketing	Programme/Project	Currently in effect (city-wide)	Yes	The METRO Q® Fare Card is an electronic wallet for METRO riders. This unique card contains a computer chip that stores riders' cash balance directly onto the card. Fares are automatically deducted from the card each time a person rides, just like a debit card. The METRO Q®, which stands for "quick," also provides free transfers and tracks progress toward earning five free trips for every 50 paid trips.
Mass Transit	Smart public transport	Smart phone apps for real-time bike and pedestrian routes	Programme/Project	Still under consideration or awaiting final authorization	Yes	An app for bike and ped routes has been discussed and is under consideration.
Mass Transit	Smart public transport	Tele-commuting/flexible work schedules	Programme/Project	Currently in effect and being piloted	Yes	For City of Houston departments, opportunities for teleworking, flexible schedules, and compressed work weeks differ by department. The Houston-Galveston Area Council oversees the Regional Telework Program and offers free consulting services through the Commute Solutions Program to help start companies with their telework program or expand their existing telework program. They have also developed an Employer Telework Kit and offer grants to businesses wanting to begin or expand their teleworking program. http://www.mysolutionis.com/hr-management/telework/default.aspx
Outdoor Lighting	LED / CFL / other luminaire	More efficient luminaires (e.g. LED)	Programme/Project	Currently in effect (city-	Yes	Mayor Annise Parker announced in May 2014 that CenterPoint Energy, in partnership with the City of Houston, will convert approximately 165,000 streetlights from high pressure sodium, mercury vapor and metal halide to light-emitting diode

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	technologies			wide)		(LED) technology. This replacement project, the largest in the nation, will reduce the City's streetlight energy usage by approximately 50 percent, reduce the City's municipal greenhouse gas emissions (GHG) by five percent and save the City over \$28 million over the life of the project.
Outdoor Lighting	Smart lighting	Sensor-based lighting	Programme/Project	Currently in effect (city-wide)	Yes	All streetlights are retrofitted with photocell technology in order to deliver lighting based on need.
Private Transport	Awareness and education for non motorized transport	Cycle training	Programme/Project	Currently in effect (city-wide)	Yes	The City of Houston is proud to be a partner with the League of American Bicyclists (LAB) in the development of this online course to represent the classroom portion of the League's Traffic Skills 101 course. The BikeEd program is designed to develop the craft and science of bicycling, the ability to use a bicycle with confidence and competence for pleasure, utility and sport under various roadway, climate and traffic conditions. It is the nation's first free online bicyclist education course. http://www.bikeed.org/ Bike Texas, a statewide non-profit organization, has developed a comprehensive bicycle and pedestrian safety education curriculum designed for four and fifth grade elementary schools. The SafeCyclist Certification Training provides teachers, public safety and youth professionals with bicycle and pedestrian safety interactive lessons and the curriculum needed to teach these life-saving skills to their students. A training session was held in July 2012 at the Houston Permitting Center. There are also programs like the Ready2Roll Cycling series, where participants learn proper riding techniques, safety etiquette, riding in groups, and basic bicycle maintenance.
Private Transport	Awareness and education for non	School and workplace travel plans	Programme/Project	Currently in effect (city-wide)	Yes	The City of Houston offers over 300 miles interconnected bikeway network spanning across 500 square miles. The network includes bike lanes, bike routes, signed-shared lanes and shared-use paths, commonly referred to as 'hike and bike' trails, which includes rails to trails, and other urban multi-use paths. In

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	motorized transport					addition to these bicyclist transportation facilities, there are over 80 miles of hike and bike and nature trails found in City of Houston parks. In addition, Harris County and many municipal utility districts have constructed over 160 miles of bikeways within the City limits.
Private Transport	Improve fuel economy and reduce CO2 from motorized vehicles	Electric vehicle charging infrastructure	Programme/P roject	Currently in effect at a significant scale across most of the city	Yes	Participation in the DOE's EV Project added around 100 more Ecotality's Blink charging stations in Houston, including 39 at the airports and 29 in downtown Houston. Through this program, participants, including the City of Houston and other businesses, received charging stations at no cost and an additional credit to install the charging station. The EV Project goal is to collect and analyze data to characterize vehicle use in diverse topographic and climatic conditions, evaluate the effectiveness of charge infrastructure, and conduct trials of various revenue systems for commercial and public charge infrastructures. The Houston Drives Electric website updates its charging station map periodically to show where public EV charging is available. The City is a partner in the Center for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October 2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outline the number of existing PEVs and equipment in the Houston region. Links to Volume 1-3 of the plan are included. The City also released guidelines and long range plans to guide electric vehicle charging station deployment. (Link to attachments included) - Electric Vehicle Deployment Guidelines -Long Range Electric Vehicle plan -Micro-Climate plan The City has also streamlined the EVSE permitting process for residential installations. http://www.greenhoustontx.gov/ev/
Private Transport	Improve fuel economy and	Incentives/ rebates to switch personal vehicles to	Programme/P roject	Currently in effect (city-wide)	Yes	The city uses its Houston Drives Electric initiative to educate the public about electric vehicles. http://www.greenhoustontx.gov/ev/ The City is a partner in the Center for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	reduce CO2 from motorized vehicles	electric vehicles				2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outlines the number of existing PEVs and equipment in the Houston region. http://www.electrictechologycenter.com/pdf/Volume%201%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf http://www.electrictechologycenter.com/pdf/Volume%202%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf http://www.electrictechologycenter.com/pdf/Volume%203%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf The City has also streamlined the EVSE permitting process for residential installations.
Private Transport	Improve fuel economy and reduce CO2 from motorized vehicles	Incentives/ rebates to switch personal vehicles to hybrid engines	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	The City has the 4th largest municipal hybrid fleet in the nation. Approximately 50 percent of the City's nonspecialty, light-duty fleet have been replaced with hybrid vehicles. The City also has 27 Nissan Leafs in its fleet and 15 plug-in hybrids.
Private Transport	Improve fuel economy and reduce CO2 from motorized vehicles	Incentives/ rebates to switch personal vehicles to other lower-carbon fuel	Programme/Project	Currently in effect and being piloted	Yes	Houston Biodiesel educates about and promotes the use of clean, renewable, non-toxic, non-flammable, and domestically produced biodiesel.
Private Transport	Improve the	Fuel switching	Policy	Currently in effect	Yes	Emission controls are regulated by the Environmental Protection Agency. All ships have to fuel switch within 200 nautical miles of the coast of the US per federal

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	operations of shipping ports			(city-wide)		regulations. On March 26, 2010, the International Maritime Organization (IMO) officially designated waters off North American coasts as an area in which stringent international emission standards will apply to ships. For this area, the effective date of the first-phase fuel sulfur standard is 2012, and the second phase begins in 2015. Beginning in 2016, NOx aftertreatment requirements become applicable. http://www.epa.gov/otaq/regs/nonroad/marine/ci/420f10015.pdf
Private Transport	Improve the operations of shipping ports	Hotelling/ port electrification	Programme/Project	Currently in effect and being piloted	Yes	The infrastructure is available for port electrification at the Bayport Terminal.
Private Transport	Improve the operations of shipping ports	Labelling programs	Policy	Currently in effect (city-wide)	Yes	Any product or good that crosses the docks of the Port of Houston must be labeled. Gaseous or liquids must be labeled, and Material Safety Data Sheets must be on the container or drum. At the Port of Houston Authority, anti-idling is currently an incentive/disincentive that will turn into a policy by the end of 2013. Developed by the Regional Air Quality Planning Committee, there is a 5-minute idling limit currently in place; however, enforcement is being developed. Signage is in place to inform port users of the idling limit.
Private Transport	Improve the operations of shipping ports	More efficient vehicles	Incentive /Disincentive	Currently in effect (city-wide)	Yes	The Port of Houston Authority has specific programs being developed to enhance the turnover of vehicles to be more efficient.
Private Transport	Infrastructure for non motorized transport	Cycle hire/ share programs	Programme/Project	Currently in effect at a significant	Yes	The City launched its bike share program, Houston Bike Share, in May 2012, which is an active transportation alternative for the City. Houston's initial phase has been successful and, received funding support from Blue Cross Blue Shield TX and the US Department of Energy, totaling nearly \$2 million. On April 3, 2013, Houston

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
				t scale across most of the city		B-cycle, expanded from 3 to 29 stations and from 18 to 225 bicycles. This Phase II expansion creates a presence not only in Downtown, but also in the East End, Midtown, Montrose and the Museum District/Hermann Park with four of the stations located at key METRORail stops. Phase III expansion discussions and planning include the Texas Medical Center and local universities, as well as additional neighborhoods. Pollution, traffic, and rising oil costs are just a few of the reasons why Houstonians need options for getting around. There are currently 29 stations and 225 bikes in operation. www.houston.bcycle.com
Private Transport	Infrastructure for non motorized transport	Cycle parking	Policy	Currently in effect and being piloted	Yes	There is no existing data, but the Planning Department will be tracking new bike parking going forward as new projects get permitted. The department will work with GIS staff to consider ways to present the data. Also, the City and cycling advocacy group, Bike Houston, are evaluating how to document existing bicycle parking locations.
Private Transport	Infrastructure for non motorized transport	Cycle priority at traffic lights	Programme/Project	Currently in effect and being piloted	Yes	There is a pilot project at the intersection of Sawyer and Spring. When a cyclist activates the signal, the cyclist gets a 7-second advanced signal before vehicle traffic.
Private Transport	Infrastructure for non motorized transport	Cycle signage	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	There are 164 miles of signed bike routes.
Private	Infrastructure	Dedicated	Programme/Project	Currently	Yes	In November 2012, city voters passed a bond referendum for the Bayou

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Transport	ure for non motorized transport	cycle lane	roject	in effect at a significant scale across most of the city		<p>Greenways Initiative. Over the next ten years, the Bayou Greenways will add new and equitably distributed green spaces and will also complete 150 miles of continuous all-weather hike and bike trails that will meander through those greenways. The Complete Streets and Transportation Plan recognizes that all streets are different. The function of the road, current and projected adjacent land use and travel demands, availability of right-of-way, community input and the level of vehicular, pedestrian and bicycle traffic must all be considered in decisions regarding enhancements. The ultimate goal is walkable and bike-friendly neighborhoods. In 2014 nearly 60 miles of bike lanes as well as 70 miles of sidewalks were created. In 2013 the City passed a Safe Passing ordinance to keep bicyclists and pedestrians safer on city streets. In 2014 the City and BikeHouston joined forces to launch a major bike safety campaign, Goal Zero, to enforce and educate motorists and cyclists about the Safe Passing ordinance, as well as create a Houston Bike Plan for the City. The Houston Bike Plan will help make Houston a safer, healthier, more bike-friendly city. The Plan will clarify a vision and goals for biking in Houston and identify future projects to create a citywide bicycle network. This improved citywide network will serve a broader spectrum of people who bike at all skill levels, providing more transportation choices, with both on-street and off-street facilities and building on current efforts to create a well-connected citywide bicycle system. (http://houstonbikeplan.org/) The City helped pass a law, working with CenterPoint, to allow hike and bike trails along utility rights of way, which will provide a clear path of open space in Houston's urban setting. New trails will help create a complete network of off-street bicycle paths for Houston. In October 2013 the City unveiled Texas' first certified GreenRoads complete streets project in Midtown. In March 2015, the City completed the construction of the first two-way cycle track (Downtown Park Connector) that provides connections to nearby parks and trails. The City has launched Cigna Sunday Streets HTx. Streets are opened to bicyclists, pedestrians, families, etc and closed to car traffic.</p>

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						(http://www.gohealthyhouston.org/sundaystreetshtx/)
Private Transport	Infrastructure for non motorized transport	Improve pedestrian crossings	Policy	Currently in effect (city-wide)	Yes	Chapter 42 relating to the City's land development ordinance provides guidelines on appropriate sidewalk widths and encourages connectivity. http://www.houstontx.gov/planning/DevelopRegs/dev_regs_links.html In the City's Infrastructure Design Manual, Appendix 2 presents a "Street Design Menu" with examples of optional roadway corridor sections that are a result of the 2009 City of Houston Mobility Planning Study. The recommended street cross sections show a multi-modal approach to street design and offer improved pedestrian crossings. http://documents.publicworks.houstontx.gov/documents/design_manuals/idm.pdf
Private Transport	Infrastructure for non motorized transport	Create pedestrian plazas	Programme/Project	Currently in effect and being piloted	Yes	In the 2008-2011 TIP, the Transportation Policy Council committed \$1.5 million to fund Livable Center studies in the region. The goal of the Houston-Galveston Area Council's Livable Centers Program is to help create walkable, mixed-use places that provide multi-modal transportation options, improve environmental quality, and promote economic development. Many of the studies include proposals for pedestrian plazas and other pedestrian recommendations. http://www.h-gac.com/community/livablecenters/planningstudies/current/default.aspx
Private Transport	Infrastructure for non motorized transport	Shared cycle lane	Programme/Project	Currently in effect at a significant scale across most of the city	Yes	There are 16 miles of shared lane markings on Washington Avenue and Navigation Blvd, Antoine, Britmore, and West Dallas.
Private Transport	Infrastructure for non motorized	Walking maps and signage	Programme/Project	Still under consideration	Yes	City Mobility Planning is a joint initiative between the departments of Planning & Development and Public Works & Engineering (PWE) in partnership with the Houston-Galveston Area Council the regions Metropolitan Planning Organization

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	transport			tion or awaiting final authorisation		<p>(MPO). The City of Houston is trying to get ahead of transportation challenges. The Houston Planning Commission has established several committees to examine a range of development and growth issues. One of the committees, the General Plan committee, established mobility and drainage as top priorities and recommended a programmatic framework to address these issues. City Mobility Planning (CMP) will be the framework for evaluating transportation issues in the city and extra-territorial Jurisdiction (ETJ). Part of the study looked at ways to improve intersections and access to trail networks.</p> <p>http://www.houstontx.gov/planning/DevelopRegs/mobility/CMP.html In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. This project will incorporate pedestrian signage.</p>
Private Transport	Transportation demand management	Congestion/pollution charging			Yes	<p>METRO HOT (High Occupancy Toll) Lanes allow drivers without passengers (single-occupant vehicles or SOVs) to use the HOV (High Occupancy Vehicle) Lane – for a toll. Traffic monitoring systems help METRO maintain traffic speeds to ensure optimal travel times for existing HOV Lane users, as well those using the METRO HOT Lanes. If speeds slow, single-occupant vehicles are not allowed in the HOV Lane. The lane is also be closed during peak traffic periods – specific to each METRO HOT Lane corridor - to single-occupant vehicles. METRO HOT Lanes benefits: -Provides new options for commuters -Increases safety and promotes quick response to accidents and issues in the lanes, thanks to additional</p>

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						camera monitoring -Improves air quality by reducing traffic congestion -Better utilizes existing HOV Lanes -Offers increased enforcement of the HOV Lane system -Revenue generated from tolls will contribute to the operation, maintenance and enforcement costs for METRO HOT Lanes Tolls are based on time of day and the congestion level of each METRO HOT Lane. METRO will publish the toll rate for specific corridors prior to opening, and tolls will be prominently displayed along each corridor. http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx
Private Transport	Transportation demand management	Increase vehicle registration fees	Policy	Still under consideration or awaiting final authorization	No	The Houston-Galveston Area Council have made efforts at increasing fuel tax and insurance.
Private Transport	Transportation demand management	Personalized walking travel planning	Programme/Project	Currently in effect (city-wide)	Yes	The Houston-Galveston Area Council Pedestrian-Bicyclist Program coordinates programs and projects that improve mobility and safety for pedestrians and bicyclists throughout the region. The Regional Bikeway Viewer is an interactive map of existing and planned bikeways in the Houston-Galveston region. Users can see the regional bikeway network in its entirety, or zoom in for a closer look at specific areas of interest. The City of Houston's Bikeway Program designs, constructs, and maintains a citywide network of bicycle routes integrated into an overall transportation network for the Houston area. The program offers more than 300 miles of interconnected bikeway network spanning across 500 square miles. The bikeway network consists of off-road hike and bike trails, on-street bike lanes and on-street bike routes. The Houston Bikeway Network Map includes more than 300 miles of the most current on-street and off-street facilities as well as trails.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx
Private Transport	Transportation demand management	Restrict parking	Programme/Project	Still under consideration or awaiting final authorisation	Yes	Public Works & Engineering restricts parking based on times and location. Where expected traffic volumes are greatest, permanent parking is not allowed; however, some on-street parking is allowed where non-peak hour volumes allow for it. The City's Administration & Regulatory Affairs is in charge of providing fees and managing meters.
Private Transport	Transportation demand management	Road tolls	Programme/Project	Currently in effect (city-wide)	Yes	The Harris County Toll Road Authority system consists of approximately 120 miles of roadway in the Houston / Harris County area and 12 miles in Ft. Bend County, for a total of 132 miles. The Westpark Tollway, Katy Managed Lanes and the Northeast section of the Sam Houston Tollway are all-electronic tolling. All-electronic tolling means there are no toll booths, and no cash payment is accepted. An EZ TAG or other interoperable Texas toll payment tag is required. "Managed lanes" refers to a mixed-use facility dedicated to mass transit, high occupancy vehicles (HOV), and also allows for tolling. In this case, METRO vehicles are granted free usage 24-hours a day, and HOVs are granted free usage in both directions of travel during peak times-Monday through Friday, 5am - 11am and 2pm - 8pm. Single occupancy vehicles (SOV) are allowed to use the lanes 24 hours a day for a toll, which will be charged electronically via an EZ TAG or other interoperable Texas toll payment tag. During HOV hours, drivers will need to choose their designated lane based on the occupancy of their vehicle. Rates are posted on message boards at all entrances. The lanes serve as an all-electronic tollway for all vehicles (except mass transit) during all other times. In order to maintain an optimum level of service on the facility at all times, toll rates for the managed lanes are based on time of day, vehicle occupancy and axle count.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
						https://www.hctra.org/tollroads/
Private Transport	Transportation demand management	School and workplace walking travel plans	Programme/Project	Currently in effect (city-wide)	Yes	Biking and walking are fun, healthy commute alternatives that energize individuals and employees while reducing traffic congestion and air pollution. Houston-Galveston Area Council Commute Solutions encourages these two alternatives by providing rewards for bicycle and pedestrian commuting trips (www.nuride.com), trail maps. http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx
Waste	Recycling or composting collections and/or facilities	Residential non-organic waste: Reuse schemes	Programme/Project	Currently in effect (city-wide)	Yes	The Building Materials Reuse Warehouse, a component of the City of Houston Solid Waste Management Department, benefits the community by providing space for excess building materials that would otherwise be dumped in local landfills. The Reuse Warehouse only accepts building material that is in suitable condition for reuse. http://www.houstontx.gov/solidwaste/reuse.html
Waste	Recycling or composting collections and/or facilities	Residential non-organic waste: Municipal recycling points or centers	Programme/Project	Currently in effect (city-wide)	Yes	The City currently operates multiple drop-off locations for residents to bring recyclable materials.
Waste	Recycling or composting collections and/or	Residential waste: Electronic waste recycling	Programme/Project	Currently in effect (city-wide)	Yes	The City currently collects ewaste at three permanent locations, and also hosts drop-off events for different areas through out the year. The City also responsibly e-cycles all of its municipal waste.

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Waste	Recycling or composting collections and/or facilities	Residential waste: Incentives for recycling	Programme/Project	Currently in effect and being piloted	No	The City has also participated in an incentive program called Recycle Bank that offers rewards in the form of coupons to residents for recycling.
Waste	Recycling or composting collections and/or facilities	Collection for dry recyclables (glass, plastic, paper)	Programme/Project	Currently in effect (city-wide)	Yes	In February 2015, Mayor Annise Parker personally delivered 96-gal recycling carts to residents in the Southeast community of Pecan Park, fulfilling the goal of city-wide automated curbside recycling for all residents with City of Houston solid waste collection. Council Member Robert Gallegos and City officials were also on hand to celebrate the final expansion and success of the Automated Recycling Program (ARP). In addition to the Automated Recycling Program, Mayor Parker implemented several other recycling initiatives during her terms in office including opening two new Neighborhood Depository & Recycling Centers, opening the Reuse Warehouse which diverts building material from the landfill, implementing the Business Recycling Program, implementing the Compostable Bag Program, installing Big Belly Solar Compactors and building partnerships with the private sector, such as Living Earth to recycle yard and tree waste, Cherry Companies to recycle concrete, the Houston Furniture Bank to recycle mattresses, CompuCycle to recycle electronics, the Carton Council to recycle shelf-stable & refrigerated cartons and American Textile Recycling Services to recycle textiles, clothes and shoes. http://houstontx.gov/solidwaste/press/mayor-annise-parker-delivers-promise-goal-met-city-wide-automated-curbside-recycling
Waste	Recycling or	Collection for organic	Programme/Project	Currently in effect	Yes	Residents may dispose of their Tree Waste at their curbside. Tree Waste is collected during ODD numbered months. This method of collecting large waste

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	composting collections and/or facilities	compostable waste		(city-wide)		comes with the benefits of diverting materials that can be recycled from landfills, saving landfill space and valuable tax dollars. "Tree Waste" is defined as "clean" wood waste such as tree limbs, branches, and stumps.
Waste	Recycling or composting collections and/or facilities	Composting agricultural waste	Incentive /Disincentive	Still under consideration or awaiting final authorization	Yes	Anearobic organic waste treatment plan has capacity for treatment of agricultural and commercial organic waste.
Waste	Recycling or composting collections and/or facilities	Construction and demolition waste: Promoting reuse	Programme/Project	Currently in effect (city-wide)	Yes	The Building Materials Reuse Warehouse, a component of the City of Houston Solid Waste Management Department, benefits the community by providing space for excess building materials that would otherwise be dumped in local landfills. The Reuse Warehouse only accepts building material that is in suitable condition for reuse. The city currently operates one location for the collection of gently used building materials that are then made freely available to non-profit organizations for reuse. http://www.houstontx.gov/solidwaste/reuse.html
Waste	Recyclables and organics separation from other waste	Residential organic waste: Source separation policies	Policy	Currently in effect (city-wide)	No	Residents are required to place yard trimmings in city approved compostable bags for separate collection. In addition, every other month residents are provided collection of tree waste only on their heavy trash (bulky item) collection day. These materials are composted and mulched using a contracted private firm.
Waste	Recyclables	Residential	Programme/Project	Still	Yes	The City is working on a new innovation that would do the opposite of source

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	es and organics separation from other waste	non-organic waste: Source separation policies	roject	under consideration or awaiting final authorisation		separation, minimizing all separation, while achieving high recycling rates and diversion. One Bin for All would allow residents to discard all materials in one bin, treating trash as valuable assets, dramatically increasing recycling using game changing technologies. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues. In the meantime, while One Bin for All is receiving approvals, etc., the City will continue to expand its single-stream recycling program (the bins can be used as the One Bin for the program in the future, so there will be no sunk costs). The program should expand to 30k households in 2013.
Waste	Waste prevention policies and programs	Residential waste: Outreach/informative programs	Programme/P roject	Currently in effect at a significant scale across most of the city	Yes	Community outreach programs include presentations to schools, neighborhood associations, business groups and more. The Solid Waste Department has mascots to represent recycling and encourage kids to get involved. The City has also participated in an incentive program called Recycle Bank that offers rewards in the form of coupons to residents for recycling.
Waste	Waste prevention	Commercial waste: Waste	Programme/P roject	Currently in effect	Yes	For a fee, the city currently offers collection of recycling to small businesses near residential collection routes. This is a new program currently being piloted in a few

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	policies and programs	collection fees		and being piloted		areas with the intent to grow the program to more areas over time. http://www.houstontx.gov/solidwaste/business_recycling.html
Waste	Waste prevention policies and programs	Commercial organic waste: Incentives for organics treatment	Incentive /Disincentive	Still under consideration or awaiting final authorisation	Yes	Anearobic organic waste treatment plan has capacity for treatment of agricultural and commercial organic waste.
Waste	Waste prevention policies and programs	Construction and demolition waste: Reduce dumping of waste	Programme/P roject	Still under consideration or awaiting final authorisation	Yes	The City convened an Illegal Dumping Task Force to strategize ways to combat illegal dumping and to make recommendations as to how to improve this issue. Currently, residents may place up to 4 tires at the curb for collection during Junk Waste months. Collection crews will separate the tires from the Junk Waste. It may take up to a week before crews return and retrieve the tires. Separating the tires from the rest of the Junk Waste allows the SWMD to properly process tires.
Waste	Waste prevention policies and programs	Construction and demolition waste: Waste management plans on construction sites	Policy	Currently in effect at a significant scale across most of the city	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. In the LEED Rating System, there are two credits that relate to construction waste management. Many projects in the community have achieved this credit.

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
Waste	Improve the efficiency of waste collection	Sectoral consolidated waste collection	Programme/P roject	Currently in effect (city-wide)	Yes	In 2009, the Houston-Galveston Area Council held a workshop on the best management practices for transfer stations. The material presented was directed at both existing transfer station operators and those interested in developing a new transfer station.
Waste	Improve the efficiency of waste collection	Single waste stream collection	Programme/P roject	Currently in effect at a significant scale across most of the city	Yes	In February 2015, Mayor Annise Parker personally delivered 96-gal recycling carts to residents in the Southeast community of Pecan Park, fulfilling the goal of city-wide automated curbside recycling for all residents with City of Houston solid waste collection. Council Member Robert Gallegos and City officials were also on hand to celebrate the final expansion and success of the Automated Recycling Program (ARP). In addition to the Automated Recycling Program, Mayor Parker implemented several other recycling initiatives during her terms in office including opening two new Neighborhood Depository & Recycling Centers, opening the Reuse Warehouse which diverts building material from the landfill, implementing the Business Recycling Program, implementing the Compostable Bag Program, installing Big Belly Solar Compactors and building partnerships with the private sector, such as Living Earth to recycle yard and tree waste, Cherry Companies to recycle concrete, the Houston Furniture Bank to recycle mattresses, CompuCycle to recycle electronics, the Carton Council to recycle shelf-stable & refrigerated cartons and American Textile Recycling Services to recycle textiles, clothes and shoes. http://houstontx.gov/solidwaste/press/mayor-annise-parker-delivers-promise-goal-met-city-wide-automated-curbside-recycling
Water	Water metering and billing	Connection fees for new buildings	Policy	Currently in effect (city-wide)	Yes	Code enforcement has impact fees for connecting buildings to the City's water and sewer sytem.
Water	Water	Standards for	Policy	Currently	Yes	Standards to use reclaimed water have been included in the Houston Amendments

Emissions reduction sector	Emissions reduction activity	Emissions reduction action	Lever	Scale and status	Do you plan to expand this action in the future?	Action description
	recycling and reclamation	connection to recycled water network		in effect (city-wide)		to the adopted 2006 Uniform Plumbing Code Ch. 16. Sec 1601.1.2. 1601.1.2 Allowable Use of Alternate Water. Where approved by the Authority Having Jurisdiction, alternate water sources (reclaimed (recycled) water, rainwater, gray water and onsite treated nonpotable water) shall be permitted to be used in lieu of potable water for the applications identified in this chapter. http://documents.publicworks.houstontx.gov/documents/divisions/planning/enforcement/06_upc_amendments.pdf
Water	Water recycling and reclamation	Water recycling or reclamation	Programme/Project	Currently in effect and being piloted	Yes	Two golf courses take water from water treatment plants and use it for irrigation. Also, there are commercial/industrial treated water users who make great efforts to be water efficient.
Finance and Economic Development	Developing the green economy	Run competitions to promote the establishment of new green businesses	Programme/Project	Currently in effect (city-wide)	Yes	The Houston Green Office Challenge is a friendly competition for commercial office tenants that acknowledges participants for their achievements in greening their operations through Mayoral and media recognition. The Green Office Challenge helps participants move down the path towards environmental sustainability and, in some cases, towards third-party green building certification through the ENERGY STAR and LEED™ rating systems.

Please provide some additional information on the city-wide actions you are taking.

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Building performance rating and reporting	Commercial buildings and facilities: Audits and advice	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Building performance rating and reporting	Commercial buildings and facilities: Benchmarking	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Building performance rating and reporting	Commercial buildings and facilities: Energy performance certification	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Building performance rating and reporting	Commercial buildings and facilities: Smart meters	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Building performance rating and reporting	Residential - Private housing: Audits and advice	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Building performance rating and	Residential - Private housing: Benchmarking	Working with cities in a specific			Grants / subsidies			01/06	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
reporting		C40 Network							
Building performance rating and reporting	Residential - Private housing: Energy performance certification	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Building performance rating and reporting	Residential - Private housing: Net metering	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Building performance rating and reporting	Residential - Private housing: Smart meters	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Energy efficiency/ retrofit measures	Commercial buildings and facilities: Building energy management system	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Energy efficiency/ retrofit measures	Commercial buildings and facilities: CFL or other efficient lighting mechanisms	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Energy efficiency/ retrofit measures	Commercial buildings and facilities: Daylighting	Working with cities in			Grants / subsidies			10/11	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
		a specific C40 Network							
Energy efficiency/ retrofit measures	Commercial buildings and facilities: Energy performance contracting	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Energy efficiency/ retrofit measures	Commercial buildings and facilities: Heating and cooling efficiency	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Energy efficiency/ retrofit measures	Commercial buildings and facilities: Insulation	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Energy efficiency/ retrofit measures	Residential - Private housing: HVAC operations & maintenance	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Energy efficiency/ retrofit measures	Residential - Private housing: Installation of efficient lighting systems	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Energy efficiency/ retrofit measures	Residential - Private	Working			Grants /			01/06	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
retrofit measures	housing: Insulation	with cities in a specific C40 Network			subsidies				
On-site renewable energy generation	Residential - Private housing: Combined heat and power	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
On-site renewable energy generation	Residential - Private housing: Solar electricity	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Switching to low-carbon fuels	Residential - Private housing: Purchasing of 'green' electricity from the grid	Working with cities in a specific C40 Network			Grants / subsidies			01/06	12/50
Brownfield redevelopment programs	Brownfield redevelopment, clean up or rehabilitation initiatives	None of the above			Grants / subsidies			01/05	12/50
Building standards	Green community rating system LEED-ND, GreenStar, Enterprise Communities, etc.	Working with cities in a specific C40 Network			City's own funds / savings			06/04	12/50
		None of the above			Grants / subsidies			01/12	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Compact cities	Minimum density requirements	None of the above			Developer contributions			01/10	12/50
Compact cities	Strategic refurbishment/re-use of unused buildings for new purposes	None of the above			Developer contributions			01/95	12/50
Eco-district development strategy	District heating/cooling	None of the above			Grants / subsidies			05/11	12/50
Green space and/or biodiversity preservation and expansion	Conservation or restoration of ecological corridors/connectivity	None of the above			Bond issuance (municipal bonds, green bonds, infrastructure bonds)			11/12	12/50
Green space and/or biodiversity preservation and expansion	Conservation or restoration of natural/semi-natural areas	None of the above			Grants / subsidies			01/10	12/50
Green space and/or biodiversity preservation and expansion	Home gardens/garden plots	None of the above			Grants / subsidies			01/10	12/50
Green space and/or biodiversity preservation and expansion	Opening schoolyards for public use	None of the above			Grants / subsidies			01/83	12/50
Green space and/or biodiversity	Protection of large green and open spaces within	None of the above			Grants / subsidies			01/10	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
preservation and expansion	the City								
Green space and/or biodiversity preservation and expansion	Reforestation	None of the above			Developer contributions			01/10	12/50
Green space and/or biodiversity preservation and expansion	Stewardship of open spaces	None of the above			Developer contributions			11/12	12/50
Green space and/or biodiversity preservation and expansion	Tree planting/Afforestation	None of the above			Developer contributions			01/10	12/50
Transit oriented development	Expanding transit to connect existing development	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Transit oriented development	Prioritising development in areas well connected by transit	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Transit oriented development	Restricting parking spaces in new development	Working with cities in a specific C40 Network			City's own funds / savings			01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Transit oriented development	Using current transportation infrastructure projects as focus for new neighbourhood development	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Urban agriculture	Rooftop and vertical farming	None of the above			Grants / subsidies			01/10	12/50
Low or zero carbon energy supply generation	Advanced thermal treatment of biomass	Working with non-C40 cities			Grants / subsidies			N/A	N/A
Low or zero carbon energy supply generation	Anaerobic digestion	Working with non-C40 cities			Grants / subsidies			N/A	N/A
Low or zero carbon energy supply generation	Property tax rebate	Working with non-C40 cities			Grants / subsidies			09/09	12/50
Low or zero carbon energy supply generation	Solar electricity (photovoltaic, concentrating solar)	None of the above			Grants / subsidies			06/09	12/50
Optimize traditional power/ energy production	Heat generation asset replacement	None of the above			Grants / subsidies			01/10	12/50
Optimize traditional power/ energy production	Increased capture of waste heat	None of the above			Grants / subsidies			05/11	12/50
Smart grid	Development of smart grids	None of the above			Developer contributions			02/11	12/50
Smart grid	Smart meters/ controls	None of the			Developer			02/11	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
		above			contributions				
Smart grid	Smart street lighting	None of the above			Developer contributions			01/15	12/50
Encourage sustainable food production and consumption	Community gardens or allotments	None of the above			Grants / subsidies			01/10	12/50
Encourage sustainable food production and consumption	Rooftop farming	None of the above			Grants / subsidies			N/A	N/A
Improve bus infrastructure, services, and operations	Bus priority at traffic lights	Working with cities in a specific C40 Network			Grants / subsidies			06/09	12/50
Improve bus infrastructure, services, and operations	Bus rapid transit	Working with cities in a specific C40 Network			Grants / subsidies			06/09	12/50
Improve bus infrastructure, services, and operations	Increase routes, frequency and night services	Working with cities in a specific C40 Network			Grants / subsidies			08/15	12/50
Improve bus infrastructure, services, and	Increase the number of bus stops	Working with cities in a specific			Grants / subsidies			08/15	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
operations		C40 Network							
Improve bus infrastructure, services, and operations	Priority lanes	Working with cities in a specific C40 Network			Grants / subsidies			08/15	12/50
Improve bus infrastructure, services, and operations	Provide more bus shelters	Working with cities in a specific C40 Network			Grants / subsidies			08/15	12/50
Improve bus infrastructure, services, and operations	Upgrade buses to increase accessibility	Working with cities in a specific C40 Network			Grants / subsidies			08/15	12/50
Improve fuel economy and reduce CO2 from bus and/or light rail	Improve rail, metro and tram fuel economy and reduce CO2	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Improve fuel economy and reduce CO2 from bus and/or light rail	Promote fuel-efficient bus driving and reduce idling	Working with cities in a specific C40 Network			Grants / subsidies			09/06	12/50
Improve fuel economy and	Switch buses to Compressed Natural Gas	Working with cities in			Grants / subsidies			06/12	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
reduce CO2 from bus and/or light rail		a specific C40 Network							
Improve fuel economy and reduce CO2 from bus and/or light rail	Switch buses to hybrid engines	Working with cities in a specific C40 Network			Grants / subsidies			06/10	12/50
Improve fuel economy and reduce CO2 from trucks	Introduce low carbon waste collection vehicles	Working with cities in a specific C40 Network			Grants / subsidies			03/08	12/50
Improve rail, metro, and tram infrastructure, services and operations	Improve rail transit times	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Improve rail, metro, and tram infrastructure, services and operations	Improve station facilities	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Improve rail, metro, and tram infrastructure, services and operations	Increase number of carriages	Working with cities in a specific C40 Network			Grants / subsidies			12/13	12/50
Improve rail,	Increase routes,	Working			Grants /			05/15	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
metro, and tram infrastructure, services and operations	frequency and night services	with cities in a specific C40 Network			subsidies				
Improve rail, metro, and tram infrastructure, services and operations	Increase the number of rail stations	Working with cities in a specific C40 Network			Grants / subsidies			05/15	12/50
Improve rail, metro, and tram infrastructure, services and operations	Reduce fares	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Smart public transport	Bike scheme systems that track availability of bikes and locations for drop off	Working with cities in a specific C40 Network			Grants / subsidies			05/12	12/50
Smart public transport	Electric vehicle charging station mapping and real-time booking system	Working with cities in a specific C40 Network			Grants / subsidies			10/11	12/50
Smart public transport	Matching systems for carpooling/ car sharing	Working with cities in a specific C40 Network			Grants / subsidies			11/05	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Smart public transport	Road pricing that is responsive to real-time information	Working with cities in a specific C40 Network			Grants / subsidies			01/14	12/50
Smart public transport	Smart card ticketing	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
Smart public transport	Smart phone apps for real-time bike and pedestrian routes	Working with cities in a specific C40 Network			Grants / subsidies			N/A	N/A
Smart public transport	Tele-commuting/ flexible work schedules	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50
LED / CFL / other luminaire technologies	More efficient luminaires (e.g. LED)	Working with non-C40 cities			Developer contributions			01/15	12/50
Smart lighting	Sensor-based lighting	None of the above			Grants / subsidies			01/04	12/50
Awareness and education for non motorized transport	Cycle training	Working with non-C40 cities			Grants / subsidies			01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Awareness and education for non motorized transport	School and workplace travel plans	None of the above			Grants / subsidies			01/04	12/50
Improve fuel economy and reduce CO2 from motorized vehicles	Electric vehicle charging infrastructure	Working with cities in a specific C40 Network			Grants / subsidies			01/10	12/50
Improve fuel economy and reduce CO2 from motorized vehicles	Incentives/ rebates to switch personal vehicles to electric vehicles	Working with cities in a specific C40 Network			Grants / subsidies			01/10	12/50
Improve fuel economy and reduce CO2 from motorized vehicles	Incentives/ rebates to switch personal vehicles to hybrid engines	Working with cities in a specific C40 Network			Grants / subsidies			01/10	12/50
Improve fuel economy and reduce CO2 from motorized vehicles	Incentives/ rebates to switch personal vehicles to other lower-carbon fuel vehicles	Working with cities in a specific C40 Network			Grants / subsidies			01/10	12/50
Improve the operations of shipping ports	Fuel switching	None of the above			Grants / subsidies			04/10	12/50
Improve the operations of	Hotelling/ port electrification	None of the above			Grants / subsidies			03/08	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
shipping ports									
Improve the operations of shipping ports	Labelling programs	None of the above			Grants / subsidies			01/94	12/50
Improve the operations of shipping ports	More efficient vehicles	None of the above			Grants / subsidies			01/09	12/50
Infrastructure for non motorized transport	Cycle hire/ share programs	Working with non-C40 cities			Grants / subsidies			05/12	12/50
Infrastructure for non motorized transport	Cycle parking	None of the above			Grants / subsidies			01/04	12/50
Infrastructure for non motorized transport	Cycle priority at traffic lights	None of the above			Grants / subsidies			03/15	12/50
Infrastructure for non motorized transport	Cycle signage	None of the above			Grants / subsidies			03/15	12/50
Infrastructure for non motorized transport	Dedicated cycle lane	Working with non-C40 cities			Grants / subsidies			03/15	12/50
Infrastructure for non motorized transport	Improve pedestrian crossings	Working with non-C40 cities			City's own funds / savings			01/04	12/50
Infrastructure for non motorized transport	Create pedestrian plazas	Working with non-C40 cities			Grants / subsidies			01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Infrastructure for non motorized transport	Shared cycle lane	Working with non-C40 cities			Grants / subsidies			01/04	12/50
Infrastructure for non motorized transport	Walking maps and signage	Working with non-C40 cities			Grants / subsidies			01/04	12/50
Transportation demand management	Congestion/ pollution charging	None of the above			Grants / subsidies			01/14	12/50
Transportation demand management	Increase vehicle registration fees	None of the above			Grants / subsidies			01/14	12/50
Transportation demand management	Personalized walking travel planning	None of the above			Grants / subsidies			01/15	12/50
Transportation demand management	Restrict parking	None of the above			Grants / subsidies			01/15	12/50
Transportation demand management	Road tolls	None of the above			Grants / subsidies			07/90	12/50
Transportation demand management	School and workplace walking travel plans	None of the above			Grants / subsidies			01/15	12/50
Recycling or composting collections and/or facilities	Residential non-organic waste: Reuse schemes	Working with cities in a specific C40 Network			Grants / subsidies			01/04	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Recycling or composting collections and/or facilities	Residential non-organic waste: Municipal recycling points or centers	Working with cities in a specific C40 Network			City's own funds / savings			01/04	12/50
Recycling or composting collections and/or facilities	Residential waste: Electronic waste recycling	Working with cities in a specific C40 Network			City's own funds / savings			01/04	12/50
Recycling or composting collections and/or facilities	Residential waste: Incentives for recycling	Working with cities in a specific C40 Network			City's own funds / savings			11/09	03/13
Recycling or composting collections and/or facilities	Collection for dry recyclables (glass, plastic, paper)	Working with cities in a specific C40 Network			City's own funds / savings			01/90	12/50
Recycling or composting collections and/or facilities	Collection for organic compostable waste	Working with cities in a specific C40 Network			City's own funds / savings			03/09	12/50
Recycling or composting collections and/or facilities	Composting agricultural waste	Working with cities in a specific C40 Network			City's own funds / savings			N/A	N/A

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Recycling or composting collections and/or facilities	Construction and demolition waste: Promoting re-use	Working with cities in a specific C40 Network			Grants / subsidies			04/09	12/50
Recyclables and organics separation from other waste	Residential organic waste: Source separation policies	Working with cities in a specific C40 Network			City's own funds / savings			01/09	12/50
Recyclables and organics separation from other waste	Residential non-organic waste: Source separation policies	Working with cities in a specific C40 Network			City's own funds / savings			01/90	12/50
Waste prevention policies and programs	Residential waste: Outreach/ informative programs	Working with cities in a specific C40 Network			City's own funds / savings			01/90	12/50
Waste prevention policies and programs	Commercial waste: Waste collection fees	Working with cities in a specific C40 Network			Grants / subsidies			01/12	12/50
Waste prevention policies and programs	Commercial organic waste: Incentives for organics treatment	Working with cities in a specific C40 Network			Grants / subsidies			01/12	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
Waste prevention policies and programs	Construction and demolition waste: Reduce dumping of waste	Working with cities in a specific C40 Network			Grants / subsidies			04/09	12/50
Waste prevention policies and programs	Construction and demolition waste: Waste management plans on construction sites	Working with cities in a specific C40 Network			Grants / subsidies			04/09	12/50
Improve the efficiency of waste collection	Sectoral consolidated waste collection	Working with cities in a specific C40 Network			City's own funds / savings			01/90	12/50
Improve the efficiency of waste collection	Single waste stream collection	Working with cities in a specific C40 Network			City's own funds / savings			03/09	12/50
Water metering and billing	Connection fees for new buildings	None of the above			Tolls / user charges			01/95	12/50
Water recycling and reclamation	Standards for connection to recycled water network	None of the above			Developer contributions			12/10	12/50
Water recycling and reclamation	Water recycling or reclamation	None of the above			Grants / subsidies			12/10	12/50
Developing the green economy	Run competitions to promote the establishment of new	Working with cities in a specific			Grants / subsidies			10/11	12/50

Emissions reduction activity	Emissions reduction action	Which exchange most helped to deliver this action?	Anticipated emissions reduction – per annum at action end date (metric tonnes CO2e)	Anticipated emissions reduction – cumulative over the lifetime of the action (metric tonnes CO2e)	Primary (major) financial mechanism	Secondary financial mechanism	Total capital cost (\$USD)	Action start date (mm/yy)	Action end date (mm/yy)
	green businesses	C40 Network							

Page: Renewable Energy C40

8.0

Please indicate the energy mix of your electricity at the city-wide scale.

Energy source	Percent
Coal	36.10%
Gas	41.20%
Oil	
Nuclear	11.60%
Hydro	0.10%
Biomass	0.20%
Wind	10.70%
Geothermal	
Solar	0.10%

8.1

Does your city have a renewable energy or electricity target?

Yes - my city has a renewable energy target

8.1a

Please provide details of your renewable electricity targets and how the city plans to meet those targets.

Scale	Total installed capacity of renewable electricity (in MW)	Proportion of total electricity from renewable energy sources	Target Date	Plans to meet target (include details on types of energy)
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8.1b

Please provide details of your renewable energy targets and how the city plans to meet those targets.

Scale	Total installed capacity of renewable energy (in MW)	Proportion of total energy from renewable energy sources	Target Date	Plans to meet target (include details on types of energy)
Municipal	140	50%	2015	The City of Houston has signed an agreement with Reliant Energy, an NRG Energy company, to purchase over 140 MW of renewable power for the next two years. From July 1, 2013 through June 30, 2015, the City's purchase of green power will account for half of its annual electricity demand. The City will be using almost 623,000 mWh of green power per year, which is equivalent to the amount of kilowatt-hours needed to power over 55,000 homes each year. This purchase puts Houston as the largest municipal purchaser of renewable power in the U.S., and in the top 10 overall in the nation, according to EPA estimates. The City has purchased renewable energy credits (RECs) that are Green-E certified. Taking advantage of more cost effective and cost competitive REC prices, the City has maintained a relatively flat power price while also increasing its percentage of renewable energy in its portfolio. The City has committed \$2 million for this 2-year agreement.

8.1c

Please explain why you do not have a renewable energy target or a renewable electricity target and any plans to introduce one in the future.

Page: Water Supply Risks C40

9.0.

Do you foresee substantive risks to your city's water supply in the short or long term?

Yes

9.0.a

Please identify the risks to your city's water supply as well as the timescale and level of risk.

Risks	Timescale	Level of risk	Risk description
Inadequate or aging infrastructure	Medium-term	Less serious	During the extreme drought in 2011, a combination of hot weather and aging water pipes caused 700 breaks a day along 7,000 miles of pipes in Houston. The pipes were breaking due to being weakened and corroded with age and soil too dry to handle the expansion of the pipes. Without the soil against the pipes to help contain the pressure, the pipes broke.
Flooding	Short-term	Less serious	Every part of the country must deal with the threat of natural disasters. For Harris County, an area that is prone to severe rainfall, is generally topographically flat and has impermeable clay soils, the No. 1 threat is flooding. This area has flooded long before the Allen brothers founded the city of Houston in 1836. Written excerpts from early settlers have helped document this area's flooding history: Jacob de Cordova, one of the early encyclopedists of Texas, wrote in 1858, "The principle objection to these lands is that in consequence of their extreme flatness they are often in the wet season covered with water."

9.0.b

Please explain why you do not consider your city to be exposed to any substantive water-related risk

Page: Water Supply Management C40

9.1.

Please describe the actions you are taking to reduce the risks to your city's water supply.

Risks	Adaptation Action	Action Description
Inadequate or aging infrastructure	Investment in existing water supply infrastructure	Utility Customer Service is authorized to charge rates and fees as set by Chapter 47 of the City of Houston Code of Ordinances. Per state law, the City of Houston must charge fairly for water and sewer services. This means that water and sewer billing must cover the costs of: -Acquisition, treatment, and delivery of water to the tap -Removal and treatment of sewage -Maintenance and improvements to the water and sewer systems To cover increasing costs, water and sewer rates are adjusted each year in April to reflect the previous year's percentage change to the Producer Price Index (PPI). In 2014, the rate change equaled the PPI of 1.2% over the 2013 rates. City of Houston Ordinance 2010-305 requires the Combined Utility System (CUS) to implement an annual rate adjustment to be effective April 1st of each year. The required water and wastewater rate adjustment under this ordinance for April 1, 2013 is 3.6%. This rate adjustment is based on the regional Consumer Price Index increase plus population percentage growth for Houston. The 2010 ordinance also deferred half of the total increase in single family residential rates, to be implemented across 2011 through 2013. This year, in addition to the 3.6% annual rate adjustment, water and wastewater rates will have a final cost of service adjustment of 5.3% for a total of 8.9%. This increase will bring single family residential water and wastewater rates in line with actual cost of service. This annual rate adjustment is intended to help cover cost increases that impact the provision of safe, clean drinking water and the collection and treatment of wastewater. This includes operational costs as well as the costs involved in the repair and replacement of portions of the System's aging infrastructure.
Flooding	Stormwater management (natural or man-made)	The Harris County Flood Control District oversees 22 watersheds and approximately 1,500 bayous and creeks in Harris County. The way the local drainage system works is: stormwater travels through storm sewers and

Risks	Adaptation Action	Action Description
	infrastructure)	roadside ditches and flows into small tributaries and large tributaries, ultimately emptying into bayous, which carry the water to the Houston Ship Channel and then to Galveston Bay. The mission of the Flood Control District is to build flood damage reduction projects that work, with appropriate regard for community and natural values, building projects that reduce people's flooding risks.

Module: C40

Page: Overview

O1.0

Does the Mayor have a statutory duty (legal responsibility) to reduce greenhouse gases?

Yes

Page: Climate Adaptation

A1.0

Has your City invested its own budget in climate adaptation measures, or projects/programs that incorporate climate adaptation objectives, during the past two years?

Yes

A2.0

Has your City secured overseas assistance (donor support, loans, grants, etc. from multilateral institutions) to invest in climate adaptation measures, or projects/programs that incorporate climate adaptation objectives, during the past two years?

No

A3.0

Are there staff members within your City government with a specific responsibility for climate change adaptation?

Yes

A3.1

How many City staff work full-time on climate change adaptation?

1

A4.0

Describe the stability/ resilience of your City's water supply/ management system

Stability/resilience	Number of events
Number of individual water shortage events occurring within your City during the past 12 months	0
Number of individual flood events occurring within your City during the past 12 months	0

A5.0

What percentage of your City's water utility customers were affected by water shortage or flood events during the past 12 months?

0%

A6.0

Does your City have a strategy for food security?

No

A6.1

Please provide a link.

A7.0

Does your City have any targets in relation to climate change adaptation?

Yes

A8.0

Does your City consider climate change adaptation within any long-term planning documents (e.g. land-use planning)?

Yes

A8.1

Please list those documents.

Over two million people reside in Houston now and one million more are expected to move here in the next 20 years. A general plan will enable the City to take a fresh look at enhancing services to current residents and will help the City prepare for the anticipated growth. The plan, called Plan Houston, will be based on existing visions, goals, and strategies already created by the City and organizations representing all aspects of the community. Plan Houston will define successful outcomes for the City and develop strategies to enhance neighborhoods and support growth and development. This effort will improve coordination between government agencies and ensure efforts of the City and its partners are as effective as possible. The plan is determining strategies to be implemented.

A9.0

Does your City have an asset registry and maintenance schedule?

Yes

A10.0

Does your City have city-scale climate change projection data?

Yes

A10.1

On which climate change scenario(s) are the climate change projections of your City based? (Select all that apply)

AR5 IPCC RCP 6.0 (Representative Concentration Pathway 6.0.)
IPCC IS92 (Published in the 1992 Supplementary Report to the IPCC Third Assessment)

A11.0

Has your City revised its emergency management procedures to include climate change hazards?

Yes

A12.0

Does your City have a monitoring and evaluation plan to assess the effectiveness of your planned adaptation actions?

No

A13.0

What year was your climate change risk and/or vulnerability assessment completed?

A13.1

Which hazards were covered by your climate change risk and/or vulnerability assessment?

Hazard	Status
--------	--------

A13.2

Which sectors were considered in your climate change risk and/or vulnerability assessment?

Sector	Status
--------	--------

Page: Buildings

B1.0

What is the average breakdown of energy use in buildings across your City? Please indicate the percentage by end use.

End use	Percentage energy use
Space heating (e.g. air conditioning systems)	22%
Space cooling (e.g. refrigeration of food, medical goods etc.)	18%
Refrigerating	15%
Lighting	8%
Hot water	19%
Plug loads (Electrical loads from appliances plugged into buildings, these will generally be recorded as the remaining electricity consumption that is not used for any of the other demand categories indicated.)	18%
Others	

B2.0

Please provide additional details about your City's building emissions reduction targets and energy usage reporting in the following building types:

Building type	Status of emissions reduction target	Energy usage reporting platform available?	Is disclosure mandatory?	Is the data public?
Residential - Public housing	No	No	No	No
Residential - Private housing	No	No	No	No
Commercial buildings and facilities	No	No	No	No
Institutional (municipal) buildings and facilities	Yes	Yes	No	Yes
Industrial buildings and facilities	No	No	No	No

B3.0

What percentage of housing is multi-unit buildings?

21%

B4.0

What percentage of housing is single-unit buildings?

35%

Page: Community Scale Development

CD1.0

What percentage of the total area of the City is classified as agricultural land?

7%

CD2.0

What percentage of your City's area is green space (e.g. parks and gardens)?

9%

CD3.0

Compared to two years ago, has the green space in your City grown or reduced in size, or stayed the same?

Grown

CD4.0

Have major regeneration sites been identified in your City?

Yes

CD4.1

If yes, are there emissions reduction requirements/per capita emissions targets for the sites?

No

CD4.2

If yes, are climate change impacts considered in the identification and development of these sites?

No

CD4.3

If yes, are there climate change adaptation requirements for the sites?

No

CD4.4

If yes, how many square meters (m2) of your City's area are designated as regeneration sites?

CD5.0

Does your City have a masterplan to guide future development and regeneration?

Yes

CD5.1

If yes, please provide a link.

Over two million people reside in Houston now and one million more are expected to move here in the next 20 years. A general plan will enable the City to take a fresh look at enhancing services to current residents and will help the City prepare for the anticipated growth. The plan, called Plan Houston, will be based on existing visions, goals, and strategies already created by the City and organizations representing all aspects of the community. Plan Houston will define successful outcomes for the City and develop strategies to enhance neighborhoods and support growth and development. This effort will improve coordination between government agencies and ensure efforts of the City and its partners are as effective as possible. The plan is determining strategies to be implemented.

CD6.0

Does your City have a transit-oriented development strategy?

Yes

Page: Energy Supply

E1.0

What percentage of your City's population has access to electricity?

100%

E2.0

What are your City's main sources of energy for space heating of buildings (TWh)?

Energy source	Energy demand (tWh)
Electricity	44
Gas	43
Oil	
Biomass	
Other solid fuels	
Other	14

E3.0

Does your City government purchase energy (electricity/gas/heat/oil products, etc.) for use in public buildings?

Yes

E4.0

Does your City have district energy systems?

Yes

E4.1

What proportion of your City's buildings are connected to district energy systems?

1%

E4.2

What percentage of district energy uses combined heat and power?

100%

E4.3

What is the percentage breakdown by source fuel of total district energy output?

Energy source	Percentage
Gas	100%
Oil	
Biomass	
Waste	
Other	

E4.4

What is the total district energy output in TWh for:

Energy source	Energy output (TWh)
Heating	2.75
Cooling	.42

E5.0

What is the average carbon intensity of grid electricity in your City (kg/kWh)?

.6

E6.0

What is the TWh energy demand by:

End user	Energy demand (TWh)
Residential - Public housing	3
Residential - Private housing	5.3

End user	Energy demand (TWh)
Institutional (municipal) buildings and facilities (excluding outdoor lighting)	
Commercial buildings and facilities	7.3
Industrial buildings and facilities	10.5
Outdoor lighting	
Road and rail transportation	

E7.0

Does your City have a long-term energy procurement contract for municipal energy usage?

Yes

E7.1

What percentage of energy supply is centrally procured?

100%

E7.2

Does your contract expire in less than four years?

Yes

Page: Finance and Economic Development

F1.0

Has your city sought funding from the Clean Development Mechanism (CDM) for low carbon initiatives?

No

F2.0

Has your City sought funding for any energy efficiency/low carbon/renewable energy project(s) from a multi-lateral funding donor (e.g. World Bank, Asian Development Bank, etc.)?

No

F3.0

Has your City established a fund to invest in energy efficiency, renewable energy or carbon reduction projects?

No

F4.0

Does your City calculate its own GDP?

Yes

F5.0

Does your City have its own credit rating (international or domestic)?

Credit rating type	Does your City have a credit rating?	Rating agency	Rating
International	Yes	Moody's	Aa2
Domestic	Yes	Standard & Poor	AA

F6.0

Does your City publicly report on economic development metrics?

Yes

F7.0

Has your City prepared a strategy for green growth?

No

F8.0

How many people within your City are employed in green jobs/ industries?

40000

FA1.0

How many tonnes of food are produced within your City's boundaries each year?

51

FA2.0

Does your City have a target for encouraging local food production?

Yes

FA3.0

Does your City have a strategy for urban agriculture?

Yes

FA3.1

Please provide a link.

<http://www.gohealthyhouston.org/aboutus/>

<http://www.houstoniamag.com/eat-and-drink/gastronaut/articles/planned-houston-has-big-plans-for-urban-farming-august-2014>

<http://www.houstontx.gov/lara/>

<http://www.houstontomorrow.org/initiatives/story/houston-food-policy-workgroup/>

<http://www.houstontx.gov/mayor/press/20121103.html>

I1.0

What proportion of people have access to the internet at home or at work?

75%

I2.0

Has your City government assessed the economic case for the use of ICT in your City?

Yes

I3.0

Are there staff members within your City government with a specific responsibility for city-wide ICT services?

Yes

I4.0

Is there someone who is responsible for information communication technology strategy across the whole city?

Yes

I5.0

Does your City have an emissions reduction target for the ICT sector?

No

I6.0

Does your City have a target for increasing the rate of broadband internet connectivity for citizens?

Yes

I7.0

Does your City have a target for increasing the availability of public wireless internet hotspots?

Yes

I8.0

How many public wireless hotspots are there in your City?

150000

I9.0

How many people are registered to use public wireless hotspots?

1000000

I10.0

Does your City government have a website?

Yes

I11.0

Does the Mayor have a Twitter account, Facebook page, or some online communications forum to the public?

Yes

I12.0

Can the public connect to the Mayor or city officials online (i.e. email address)?

Yes

I13.0

Does your City have a masterplan for ICT service design/ delivery?

Yes

I13.1

Please provide a link.

<http://www.houstontx.gov/hits/strategicplan/itstrategicplan.pdf>

I14.0

Does your City share any online data sets with the public?

Yes

I15.0

Is there a system architecture for development and implementation of "smart city" solutions?

Yes

I16.0

In which areas does your City intend to utilize ICT to help reduce carbon emissions?

Municipal building operations and building energy efficiency

I17.0

What is your City's budget for ICT-related policies and programs (\$USD)?

24000000

I18.0

What percentage of citizens own a mobile phone?

91%

I19.0

What percentage of citizens own a smart phone?

56%

I20.0

What types of sensors are installed for monitoring:

Sensors	Description
Air and noise contamination	<p>The bureau, funded through grants from the U. S. Environmental Protection Agency (U.S. EPA) and the TCEQ, operates and maintains an ambient air monitoring network for Houston that follows the U.S. EPA protocols and quality assurance/control procedures. This network is part of a broader and more comprehensive system that includes facilities operated by the TCEQ, area counties, nearby cities and private entities. The bureau is responsible for monitoring up to 20 different parameters at 10 stationary air monitoring sites throughout Houston.</p> <p>Equipment used: Meteorological (weather) station - Wind speed and direction - Global Positioning System (GPS) location data - Relative humidity - Atmospheric pressure - Temperature Ozone monitor Particulate matter (PM) analyzer - PM 10 - PM 2.5 - Particle size distribution graphs (0.3 – 20 microns) Infrared (IR) and video cameras Gas Chromatograph (GC)/Flame Ionization Detector (FID)/Mass Selective Detector (MSD) analytical platform (Field and Fixed-Base) - Analysis of calibrated VOCs o Near real-time ambient air analyses o SUMMA canister sampling and analysis o Tedlar bag sampling and analysis o Software library for identification of unknown volatile organic compounds (VOCs) Software support - Forward and backward trajectories - Real-time concentration vs. time series plots for multiple pollutants of interest - Atmospheric modeling</p>
Waste	
Transit	<p>Houston TranStar, a national leader in freeway incident management, uses state-of-the-art technologies to reduce congestion on major roadways. Monitoring traffic incidents with more than 730 regional Closed Circuit Television Cameras (CCTVs), staff at the TranStar center dispatch vehicles to remove debris or hazardous materials, communicate with emergency vehicles about the most direct routes to an accident scene, and send tow trucks to stalled vehicles. Dynamic Message Signs (DMS), deployed from Houston TranStar, inform travelers about expected travel times and traffic issues ahead. Synchronized traffic signals, speed sensors, Highway Advisory Radio, ramp meters and other devices also help keep the region's traffic moving.</p>
Emergency	<p>When emergency conditions arise such as hurricanes, floods, industrial explosions or terrorist attacks, the Emergency Operations Center (EOC) at Houston TranStar is activated. Representatives from all four collaborating agencies—as well as such diverse entities as the U.S. Army, Salvation Army, Harris County Toll Road Authority, Amateur Radio Operator volunteers, the American Red Cross, and area local governments—come together to coordinate a quick, effective response. The Automated Flood Warning System, Doppler Radar Imagery, Satellite Weather Maps, Road Flood Warning Systems and the Regional Incident Management System (RIMS) comprise some of the tools used to address the emergency.</p>
Other	

I21.0

Are you increasing access to internet connection in your City?

Yes

I22.0

Are you increasing mobile phone coverage in your City?

Yes

I23.0

Are you increasing public access to computers in your City?

Yes

I24.0

Are you increasing wireless hotspots in your City?

Yes

Page: Outdoor Lighting

L1.0

How much of your City's area is covered by street lighting (m2)?

999999999

L2.0

What is the proportion of each type of luminaires (lightbulbs) used in street lighting across the city?

Type	Percentage
Incandescent	0%
Sodium discharge	96%
LED	1%
Other	2%

Page: Mass Transit

T1.0

What is the modal split for transport in your City, i.e. the proportion of trips made by each mode (%)?

Transport mode	Percentage
Private motorized transport	94%
Rail/Metro/Tram	1%
Buses	1%
Ferries/ River boats	0%
Walking	0%
Taxi	1%
Cycling	1%
Other	2%

T2.0

What are your City's total daily passenger kilometers for the following transport modes?

Transport mode	Total passenger kilometers
Private motorized transport	142928689
Rail/Metro/Tram	93738.9
Buses	1798907
Ferries/ River boats	
Walking	44240
Taxi	
Cycling	261600
Other	2517129

T3.0

What is the size of the low-emission bus fleet in your City?

Type	Number of buses
Electric	0
Hybrid	438
Hydrogen	0

T4.0

What is the size of the low-emission light duty passenger fleet in your City?

Type	Number of vehicles
Electric	553
Hybrid	16275
Hydrogen	0

T5.0

What is the size of the low-emission municipal fleet (excluding buses) in your City?

Type	Number of vehicles
Electric	27
Hybrid	801
Hydrogen	0

Page: Private Transport

PT1.0

How many kilometers of cycle lanes does the City have?

730

PT2.0

What proportion of cycle lanes are fully separated from motor transport?

41%

PT3.0

What is the total number of private motorized vehicles owned by residents within your City?

1298000

PT4.0

What is the total number of bicycles owned by residents within your City?

1500000

PT5.0

What is the total number of taxis registered in your City?

2480

PT6.0

What is the number of non-stop commercial air destinations served by City airports?

151

WT1.0

What percentage of your City's population has potable water supply service?

100%

WT2.0

What percentage of your City's population is served by wastewater collection?

100%

WT3.0

How is wastewater collected and treated in your City?

The first area, WASTEWATER FACILITIES OPERATIONS AND MAINTENANCE is charged with protecting public health and the environment by providing wastewater services through treatment of wastewater generated by residential, commercial and industrial customers. To insure routine daily activities can be carried out by our citizens, the branch operates and maintains 40 wastewater treatment plants treating an average of 277 million gallons per day, and 420 lift stations over a 650 square mile region. The system is closely managed through our Supervisory Control and Data Acquisition (SCADA) central monitoring system in order to meet all federal and state regulatory requirements and most important to provide 24-hour per day wastewater service to our customers. The second area, WASTEWATER COLLECTION SYSTEMS OPERATIONS is charged with the operation and maintenance of over 6,250 miles of sewer pipelines ranging in size from 6 inches to 144 inches in diameter, with over 130,000 manholes. Sewer depths range from 2 feet to 80 feet. This section is also responsible for implementing the Agreed Order (AO) requirements that were approved by the TCEQ. Implementation involves planning, analyzing, and designing sewer rehabilitation projects totaling over \$65 million each fiscal year, managing construction of these projects, and implementing the fats, oils, and grease reduction program.

WT4.0

How is stormwater collected and treated in your City?

The Storm Water Management Program (SWMP) supports the City of Houston in its implementation of citywide storm water drainage improvements and management practices. Specific work efforts within the SWMP include:

- The implementation of storm drainage improvements to the Texas Medical Center (TMC) and various neighborhood storm drainage improvement projects
- Floodplain Management
- Support of the City's participation in the National Flood Insurance Program (NFIP)
- The City of Houston Comprehensive Drainage Plan (CDP)

The SWMP designs and constructs Capital Improvement Projects (CIP) in order to provide increased levels of flood protection for Houston and its citizens.
<http://www.swmp.org/>

The storm sewer maintenance section handles the operation and maintenance of the City's storm sewer system, including tasks such as cleaning manholes, inlets, and storm sewer lines and leads. The storm sewer system is very different from the sanitary sewer system that carries waste from your home. These sewers are designed only for storm water and empty directly into major ditches and bayous. This Section is also responsible for entering large-diameter storm sewers to remove debris and objects that can block the storm sewer. These tasks are performed by "Confined Space Entry" teams that ensure safe maintenance in these conditions. In order to limit environmental concerns and maintenance needs, citizens are reminded to never dispose of grass clippings, motor oil, or any other items in the storm sewer. The Section also conducts inspections of new and rehabilitated storm water systems.

The storm water quality enforcement section monitors and inspects runoff from manufacturers and industrial businesses to prevent pollutants from entering our streams and bayous. Also, in support of the City's Texas Pollutant Discharge Elimination System (TPDES) Storm Water Permit, the City will conduct various tasks including monitoring outfalls within the City's limits, investigations of illegal discharges to the storm sewer system, and disposal of household hazardous waste through the Solid Waste Department's Environmental Service Centers.

WT5.0

What are the sources of your City's water supply?

Source	Percentage
Surface water	89%
Ground water	10%
Desalinated seawater	0%
Recycled / reclaimed water	1%
Rainwater	0%
Other source	0%

WT6.0

How much water is used within your City per day (for all uses) in millions of liters per day?

927

WT7.0

How is water used? Please indicate percentage of each end user.

End user	Percentage
Residential - Public housing	26%
Residential - Private housing	26%
Commercial buildings and facilities	34%
Institutional (municipal) buildings and facilities	0%
Industrial buildings and facilities	0%
Agriculture	0%
Loss	14%
Other	0%

WT8.0

What volume of wastewater is collected and treated per day (on average) in millions of litres per day?

1050

WT9.0

Is water metering mandatory for:

End user	Status
Residential - Public housing	Yes
Residential - Private housing	Yes
Commercial buildings and facilities	Yes
Institutional (municipal) buildings and facilities	Yes
Industrial buildings and facilities	Yes

WT10.0

What percentage of users have a metered supply?

End user	Percentage
Residential - Public housing	84%
Residential - Private housing	3%
Commercial buildings and facilities	13%
Institutional (municipal) buildings and facilities	0%
Industrial buildings and facilities	0%

Page: Waste

W1.0

Does your City have organic waste collection for:

Building type	Status
---------------	--------

Building type	Status
Multi-unit buildings	No
Single-unit buildings	Yes
Commercial establishments	No

W2.0

Does your City have waste collection fees for:

Building type	Status
Multi-unit buildings	No
Single-unit buildings	No
Commercial establishments	No

W3.0

Does your City have recyclables collection for:

Building type	Status
Multi-unit buildings	No
Single-unit buildings	Yes
Commercial establishments	No

W4.0

Does your City have a Solid Waste Management Master Plan?

No

W4.1

Please provide a link.

W5.0

What proportion of municipal waste is treated via:

Waste treatment	Percentage
Re-use	0.5%
Recycling	8.0%
Composting	10%
Anaerobic digestion	0.0%
Waste to energy: Incineration	0.0%
Waste to energy: Other	0.0%
Incineration without energy recovery	0.0%
Open burning	0.0%
Sanitary landfill	81.5%
Non-sanitary landfill	0.0%
Other	0.0%

W6.0

What proportion of municipal waste is made up of:

Waste type	Percentage
Organics	36%
Metals	4%
Wood	0%
Glass	4%
Textiles	5%
Plastics	15%
Paper and cardboard	27%
Fine particulate waste (soil, dust, etc.)	4%
Hazardous	1%
Electronic waste	0%
Other	0%

W7.0

What percentage of your City's total waste is collected (either formally or informally)?

98%

W8.0

Does your City have special programs to handle waste from large events (stadium, festivals, demonstrations, etc.)?

Yes

W9.0

How much waste does your City generate (tonnes/person/year)?

Sector	Amount of waste generated (tonnes/person/year)
Total	1.48
Residential	.55
Commercial	.45
Industrial	
Construction and demolition waste	.25
Other	.22

W10.0

What is the amount of waste collected by formal waste collection systems (tonnes/yr)?

580598

W11.0

What is the average distance travelled to the waste treatment facility from your City (km)?

24

W12.0

What is your City's annual waste budget in \$USD (collection, transfer, disposal)?

75000000

WST1.17a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Connection fees for new buildings				
Increase quantity of sewage treated				

Module: Compact of Mayors

Page: COM Overview

M0.1

If registering intent of compliance with the Compact of Mayors, please attach your letter.

M0.2

Please provide details of your city's current population.

Current population	Current population year
2233310	2014

M0.3

Please provide details of your city's GDP.

GDP (\$USD)	Year of GDP
488700000000	2014

M0.4

Please provide the land area (in km2) of your city.

1748

Page: COM GHG Emissions Inventory

M1.0

Please state the dates of the accounting year or 12-month period for which you are reporting a GHG emissions inventory for your community.

M1.1

Please indicate the category that best describes the boundary of your community GHG emissions inventory.

M1.2

Please give the name of the primary protocol, standard, or methodology you have used to calculate GHG emissions.

M1.3

Which gases are included in your emissions inventory? Tick all that apply.

M1.4

Does your city commit to reporting a compact-compliant GPC inventory?

M1.4a

When does your city commit to reporting a compact-compliant GPC inventory?

M1.5

Please provide a summary of emissions by sector and scope as defined in the Global Protocol for Community Greenhouse Gas Emissions Inventories. Please complete the corresponding emissions for each row in the table below.

Sector and scope (GPC reference number)	Emissions (metric tonnes CO2e)
---	--------------------------------

M1.5a

Please provide a breakdown of fuel use and emissions by subsector and scope as defined in the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), (WRI, C40 and ICLEI) and attach GHG emissions report.

Page: COM GHG Emissions Reduction

M1.6

Does your city have a climate changes action plan for reducing GHG emissions?

M1.6a

Please attach your city's climate change action plan below.

Publication title	Year of publication	Attach
-------------------	---------------------	--------

M1.7

Please provide details of your city-wide emissions reduction target.

Baseline year	Baseline emissions (metric tonnes CO2e)	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
---------------	---	-----------------------------	---	-------------	---------

Page: COM Risks

M2.0

Has a climate change risk or vulnerability assessment been undertaken for your local government area?

In progress

M2.0a

Please attach your climate change risk or vulnerability assessment.

M2.1

Please list the climate hazards you are currently experiencing within your local government area.

Effects of climate change	City climate hazard
Hotter summers	Extreme hot weather
More frequent droughts	Drought
More frequent heat waves	Heat wave
More hot days	Heat wave
More intense rainfall	Flash/surface flood

M2.2

Please list the future climate hazards you are expecting within your local government area. Tick all that apply.

Rain storm
Cyclone (Hurricane/Typhoon)
Tropical storm
Heat wave
Extreme hot weather
Drought
Flash/surface flood
Storm surge
Salt water intrusion

Page: COM Adaptation

M2.3

Has the Mayor or local government committed to adapting to climate change across the geographical area of the city, town or settlement?

In progress

M2.3a

Please select the type of commitment(s) and attach evidence.

Type of commitment	Attach	Comments
--------------------	--------	----------

M2.4

Does your local government have a plan that addresses climate change adaption?

In progress

M2.4a

Please indicate the title of your plan, the year it was published and attach the document in the space provided.

Publication title	Year of publication	Attach the document
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