

Module: Introduction

Page: Introduction

0.1

Introduction

Please give a general description and introduction to your city.

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

Please indicate which GHG measurement inventories you are disclosing.

Government
Community

Module: Governance

Page: Governance

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

When the inventory was conducted under the previous administration, the Mayor's Office of Environmental Planning measured, monitored, and managed climate-related programs and oversaw reporting for these initiatives. The Multi-Pollutant Emissions Reduction Plan (MERP) from August 2008 calculated GHG emissions for local government operations using 2005 data and outlined a plan to reduce emissions in the city by 2010. Data was gathered from the local utility, city contractors, and other city departments. An update to the MERP was released in December 2009 to document measures that had been completed, were ongoing, or would be completed at a certain future date.

Under the current administration, the Mayor's Office of Sustainability oversees the progress of environmental initiatives and manages climate-related reporting for the city. An updated GHG inventory will be conducted in 2012 using 2010 data. A similar approach for gathering information and involving key stakeholders to collect data will be followed when conducting the new GHG inventory.

1.1**Do you provide incentives for individual (or departmental) management of climate change issues, including the attainment of GHG reduction targets?**

No

1.1a

Please complete the table.

Who is entitled to benefit from these incentives?	The type of incentives	Comment
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2.0

Do current and/or anticipated effects of climate change present significant physical risks 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 anticipated timescales.

Effects of climate change	Level of risk	Anticipated timescale in years	Comment (please comment with particular reference to the impact on the following sectors: Buildings, Water, Waste, Transport, Energy, Communications / Telecommunications, Human Health, Other)
Hotter summers	Serious	Current	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.
More frequent heatwaves	Serious	Current	More frequent heatwaves increase energy use in buildings, contribute to higher ozone levels, and can lead to heat-related illnesses/death.
Increased urban heat island effect	Serious	Current	Increased urban heat island effect increases energy use in buildings, does not provide relief for people and animals in the evening, contributes to air pollution, and can lead to heat-related illnesses/death.
More frequent droughts	Serious	Current	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.
Increased risk of storm surges	Serious	Short-term	Increased risk of storm surges cause flooding, property damage, and power outages. It also interferes with communications/telecommunication, destroys habitats and vegetation, and can be adversely affect human health.

2.0b

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

2.1

Please describe any compounding factors that may worsen the physical 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 our 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.

2.2

Do you consider that the physical impacts 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.

2.3

Please describe the process or methodology you used to evaluate the physical risks to your city.

No methodology used currently. Economic times preclude staffing this or contracting it out for a study.

Page: Regulatory, Social and Other Risks

2.4

Does your city face any regulatory, social, or other risks that you wish to detail? If so, please use the text box provided.

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. In addition, 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.

Module: Opportunities

Page: Opportunities

3.0

Does climate change present any economic opportunities for your city?

Yes

3.0a

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

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 15th to 8th for Top Cities for Clean Tech jobs in 2009. Also, more than 13.5 percent of the nation's total biodiesel production capacity resides in the Houston region. The National Biodiesel Board reports that the Gulf Coast region is home to both the nation's largest and 3rd largest biodiesel plants. From bioenergy companies to biotechnology firms, the city encourages and welcomes new economic development in the clean energy sector.
Green jobs	According to the U.S. Conference of Mayors, Houston ranked 3rd in the nation for current and potential green jobs. The report identified 21,250 green jobs in the Houston metro area during 2006, with an expected new green job growth of 168,136 through 2038.

3.0b

Why not?

3.1

Please describe any other opportunities (e.g. social or physical) that climate change presents for your city.

With a warmer winter season, possible opportunities include longer growing season for regional farmers and increased outdoor activity/enjoyment of public spaces.

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.

Sat 01 Jan 2005 - Sat 31 Dec 2005

LGO1.1

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

Companies, entities or departments over which operational control is exercised

LGO1.2

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

Source of emissions	Status
Airport(s)	Included
Buildings	Included
Buses	Not applicable
Electricity generation	Not applicable
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 applicable
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.

Local Government Operations Protocol (ICLEI/The Climate Registry/California Climate Action Registry/California Air Resources Board)

LGO1.3a

Please explain your methodology, including protocols used and methods of calculation.

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. Only this methodology was used.

Page: Local Government - Energy Data

LGO1.4

Please give the total amount of fuel (in energy units) that your local government has consumed this year.

Fuel	Amount	Energy units
Gas/Diesel oil	413000	MWh

LGO1.5

How much electricity, heat, steam, and cooling (in energy units) has your local government purchased for its own consumption during the reporting year?

Type	Amount	Energy units
Electricity	1200000000	kWh

Page: Local Government - GHG Emissions Data

LGO1.6

Please provide total GHG emissions for your local government's operations, in metric tonnes CO2e.

1786109

LGO1.7

If applicable, please provide the following GHG emissions.

Total Scope 1 activity in metric tonnes CO2e emitted	Total Scope 2 activity in metric tonnes CO2e emitted
80306	928973

LGO1.8

Do you measure Scope 3 emissions?

Yes

LGO1.9

Please provide more detail about how you measure Scope 3 emissions, including total Scope 3 emissions in metric tonnes CO2e. If you do not measure Scope 3 emissions, please explain why not and detail your plans to do so in the future, if any.

Scope 3: 776830 metric tonnes CO2e

Scope 3 emissions in the 2005 GHG inventory accounted for city-generated waste and waste from residents that was collected by the city. The emissions were determined by the character and volume of the waste that was deposited into landfills, which are not city-owned. The EPA and the California Integrated Waste Management Board's standardized categories were used for waste characterization and to calculate emissions. Categories include food/sludge, plant/yard, wood/textile, and other (inert or non-organic materials). Allied Waste, Gulf Coast Recycling, and the City's Solid Waste Department provided waste generated in tons.

LGO1.11

Where it will facilitate a greater understanding of your government emissions, please provide a breakdown of these emissions by department, facility, greenhouse gas (CO2, CH4, N2O etc) or by any other classification system used in your city.

Department / Facility / GHG / Other	Type	Emissions (Metric Tonnes CO2e)
Convention & Entertainment: Buildings and Facilities	Scope 2	37113
Finance & Administration: Buildings	Scope 2	155
General Services: Buildings and Facilities	Scope 2	76180
Health & Human Services: Buildings	Scope 2	7253
Houston Airport System: Buildings and Facilities	Scope 2	179989
Library: Buildings	Scope 2	6834
Municipal Courts: Buildings	Scope 2	2754
Park & Recreation: Buildings	Scope 2	30523
Public Works: Buildings	Scope 2	24481
Solid Waste: Buildings	Scope 2	2828
Park Lights	Scope 2	182
Street Lights	Scope 2	82138
Traffic Lights	Scope 2	15690
Water Production and Wastewater Treatment	Scope 2	462852

LGO1.12

Please provide any further details about your process for collecting and managing GHG emissions data.

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 any other relevant information about the emissions verification process.

Due to budget constraints, no external auditor verified the inventory. However, inventory experts did look at the process and results and agreed with the outcome of the MERP. Future plans to seek third party verification of updated emissions inventory is under consideration.

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.

Mon 01 Jan 2007 - Mon 31 Dec 2007

C1.1

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

Geopolitical Boundary - physical areas over which local government has jurisdictional control

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.

2006 IPCC Guidelines for National Greenhouse Gas Inventories

C1.3

Please explain your methodology, including use of additional protocol, and methods of calculation.

Since an ICLEI – Local Governments for Sustainability community inventory protocol is still in the process of being produced, the City of Houston is utilizing the 2008 Local Government Operations Protocol (LGOP) and the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for the community inventory. However, it is noted that according to ICLEI, the community inventory protocol will mirror the LGOP, which also incorporates the 2006 IPCC Guidelines (Yienger, 2009, personal communication). Also, it must be noted that the two existing documents that specifically address the Project 2 Degrees (P2D) software were heavily utilized and frequently cited the 2006 IPCC Guidelines.

C1.4

Please detail total emissions for your community, in metric tonnes CO2e.

37031473

C1.5

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

Total Scope 1 activity in metric tonnes CO2e emitted	Total Scope 2 activity in metric tonnes CO2e emitted
13064488	18585870

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), greenhouse gas (CO2, CH4, N2O etc.) or any other classification system used in your city.

End user / Economic sector / IPCC sector / GHG / Other	Emissions (metric tonnes CO2e)
Energy: Electricity & Natural Gas	22295307
Transportation: On-Road, Plane, Boat, Non-Road, Train	11126942
Waste: Landfills & Wastewater Treatment Plants	3609224

C1.7

Please give the total amount of fuel (in energy units) consumed in your city during the reporting year.

Fuel	Amount	Energy Units

C1.8

How much electricity, heat, steam, and cooling (in energy units) has been consumed by your city during the reporting year?

Type	Amount	Energy Units
Electricity	28768616	MWh

C1.9

Please provide a breakdown of fuel use and emissions by source as defined in the Global Protocol for Community GHG Inventories.

Emissions Source	Energy/Activity Fuel Type	Fuel consumed/Electricity used/Other energy activity measure	Energy Units	Emissions Metric Tonnes CO2e	Type
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C1.11

Do you measure Scope 3 emissions?

Yes

C1.12

Please provide more detail about how you measure Scope 3 emissions, including total Scope 3 emissions in metric tonnes CO2e. If you do not measure Scope 3 emissions, please explain why not and detail your plans to do so in the future, if any.

5381116 metric tonnes CO2e

Scope 3 emissions are all other indirect and embodied emissions that occur as a result of activity within city limits. 15% of total emissions (or all scope 3 emissions) are beyond the geopolitical jurisdiction of Houston, but the City may have creative policy options available to influence or reduce these emissions.

Due to data availability, GHG emissions from planes and boats were direct entry. The diagram to the right presents the 2007 GHG emissions from planes, which are all scope 3. It is important to note that these are only emissions up to the mixing height (3000 feet) and do not include en route emissions or non- aircraft sources. As such, emissions from planes up to the mixing height comprise only 7% of transportation emissions.

C1.13

Please provide the following measures of emissions intensity for your community, as appropriate.

Annual emissions per person (emissions per capita)	Annual emissions per sq. kilometer	Other measures of emissions intensity
16		

C1.14

Please provide any further details about your process for collecting and managing GHG emissions data.

Briefly, this 2007 community inventory utilized data gathered from CenterPoint Energy (CNP) and several public agencies, including the City of Houston (COH), Houston- Galveston Area Council (H- GAC), Texas Commission on Environmental Quality (TCEQ), and the U.S. Environmental Protection Agency (EPA). As a beta- tester city, the City of Houston utilized a new software program called Project 2 Degrees (P2D) to compute and record the inventory. P2D is a secure, password- protected, web- based emissions tracker program jointly created by Microsoft Corporation, ICLEI – Local Governments for Sustainability, and the Clinton Climate Initiative with the help of Ascentium Corporation and the Center for Neighborhood Technology (CNT).

To develop the 2007 GHG emissions baseline inventory, a three- step process was employed:

Data Collection → Data Entry → Data Analysis

During the data collection phase, the scope of the project was delineated. The inventory comprises the geopolitical boundaries of Houston city limits. Data was collected for calendar year 2007 for three main sectors: energy use, transportation, and waste from CenterPoint Energy, the TCEQ and HGAC, and COH, TCEQ, and EPA, respectively. The subsectors (and units of measurement) included electricity and natural gas use by rate class (kWh and MMBtu), vehicle miles traveled (VMT), fuel use (gallons), and volume of waste by location (tons or gallons).

Once collected, the next step was to organize the data for entry into the Project 2 Degrees (P2D) software. The most recent emission factors from the 2008 Local Government Operations Protocol (LGOP) were used. P2D calculates GHG emissions in carbon dioxide equivalent (CO₂E), but this includes carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

In addition, the software categorizes GHG emissions by “scope”. Scope 1 emissions are all direct emissions from sources located within city limits. Scope 2 emissions are indirect emissions that result as a consequence of activity within city limits; limited to electricity generation, district heating, steam and cooling consumption. In contrast, scope 3 emissions are all other indirect and embodied emissions that occur as a result of activity within city limits.

Once input, the final phase was data analysis. The table below presents the 2007 community GHG emissions inventory by scope in tons per year (tpy). The emissions have been converted to metric tonnes for CDP reporting.

Page: Community - External Verification

C1.15

Has the GHG data you reported been externally verified or audited in part or in whole?

No

C1.15a

Please provide any other relevant information about the emissions verification process.

Due to budget constraints, no external auditor verified the inventory. However, inventory experts did look at the process and results and agreed with the outcome of the MERP. Future plans to seek third party verification of updated emissions inventory is under consideration.

Module: Strategy

Page: GHG Emissions Reduction - Local Government Operations

4.0

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

Yes

4.0a

Please provide details of your reduction target.

Baseline year	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
2005	5%	Energy	Other: 2007	HB 3693 2007 requires a 5% electrical use reduction for 6 years starting September 1, 2007.

4.0b

Please explain why you do not have an emissions reduction target.

4.1

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

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
Energy Demand in Buildings > Building codes and standards	Currently in-effect at a significant scale across most of the city	Mostly mandate, regulatory, or policy-driven	Not calculated	Not Applicable	The City adopted a Green Building Resolution, which set a target of LEED Silver certification for new construction, replacement facilities and major renovations of City of Houston-owned buildings. 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.
Energy Demand in Buildings > Energy efficiency/retrofit measures	Currently in-effect at a significant scale across most of the city	Mostly project or program based	9200	Project specific financing was obtained for this initiative	The energy reduction measures originally identified by the Houston Airport System (such as installing motion detectors for lighting specific interior areas, installing control measures such as photo cells, clocks and/or timers on all outside lighting, cutting the energy supply to unoccupied retail space, and requiring lights in electrical closets be turned off when not in use) mostly have been implemented. Additional measures targeted HVAC systems of the HAS Administration Building and the Technical Services Buildings. HVAC systems are now shut off when the buildings are not in use. It is important to note that the Houston Airport System is experiencing a period of accelerated growth. This needs to be monitored to ensure that the progress achieved to date is not negated by expected growth. The General Services Department instituted a supply- side energy management program in 2006. Over 5 million square feet of municipal buildings have been retrofitted since 2008. The City purchased 186 energy misers, energy saving devices, for cold beverage vending machines in City facilities.
Finance > ESCO financing	Currently in-effect at a significant	Mostly project or program based	24000	Project specific financing was	A total of 297 City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
	scale across most of the city			obtained for this initiative	million kWh of electricity every year, with paybacks of, on average, less than ten years. Final phase of ESCO-performed projects completed in 2011.
Energy Supply > Clean energy procurement strategies	Currently in-effect at a significant scale across most of the city	Mostly mandate, regulatory, or policy-driven	270000	Mostly funded through general municipal funds	Starting in 2010 and continuing into 2012, the City of Houston has been designated as the number one municipal purchaser of green power and the sixth largest overall purchaser in the nation, according to the U.S. Environmental Protection Agency (EPA). The City currently purchases 50 megawatts, or 35% of the total electricity load, from wind farms and has a goal to increase the city's usage of green power to 50% by 2015.
Transport > Improve fuel economy and reduce CO2 from motorized vehicles	Currently in-effect at a significant scale across most of the city	Mostly project or program based	1500	A grant or subsidy was received for this initiative	The City of Houston is replacing older, high mileage equipment in order to reduce current and future maintenance costs, increase vehicle reliability, and decrease emissions. Three specific measures have been planned to achieve this goal of Fleet Use and Replacement – Reduce fleet size, Rejuvenate the current fleet, and Better track/monitor fleet. The City has the 3rd largest municipal hybrid fleet in the nation. Approximately 50 percent of the City's nonspecialty, light-duty fleet have been replaced with hybrid vehicles. 25 Nissan Leafs are currently in the municipal fleet and more to be added in 2012. The City is consolidating its motor pool, resulting in a 34 percent decrease in the size of the City fleet, 35,000 gallons of fuel savings, and reduced emissions.
Outdoor Lighting > LED / CFL / other luminaire technologies	Currently in-effect at a transformative scale across the entire city	Mostly project or program based	7000	Project specific financing was obtained for this initiative	The City has almost completed replacing the incandescent bulbs at all of its 2,450 signalized intersections with LEDs, which are 75% more energy efficient. In addition, the City is now realizing over \$3.6 million a year in savings or around \$10,000 in savings per day.
Waste > Recycling or composting collections and/or facilities	Currently in-effect at a significant scale across most	Mostly project or program based	1000	Mostly funded through general municipal funds	This program will systematize recycling across all City facilities. This new recycling program expanded the recycling opportunities at City building and facilities to

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
	of the city				include plastics # 1- 7 (except Styrofoam and film bags); aluminum and bi- metal cans; glass and cardboard in addition to all types of paper. The City launched a mandatory yard waste composting program in April 2010 and has diverted 60,000 tons of yard waste in the last year, with disposal savings of \$2 million.
Urban Land Use > Urban agriculture	Currently in-effect and being piloted	Mostly project or program based	Not calculated	Project specific financing was obtained for this initiative	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. The City Gardens and Farmers Market initiative includes: <ul style="list-style-type: none"> • City Gardens at Bob Lanier Public Works Building: 25 vegetable container gardens on both sides of a 27-story skyscraper in downtown Houston. • City Hall Victory Garden: 20 vegetable container gardens, berry trestle and fruit trees in Tranquility Park, next to City Hall. • Houston Permitting Center: Five raised garden beds next to an adaptive reuse building that is going for LEED Gold Certification. • City Hall Farmers Market: supports local and organic farmers and assists over 40 “micro businesses” through a weekly Wednesday farmer’s market at City Hall. The public can enjoy lunch from vendors or pick up groceries while at the same time supporting local, fresh and sustainable food all amidst Houston’s dramatic downtown urban setting. Top chefs perform cooking demos and there are weekly musical guests. And non-profits often bring youth to the market.

Do you engage with city government suppliers on climate change?

No

4.2a

Please provide details of your engagement with the city government's supply chain.

Page: GHG Emissions Reduction - Community

4.3

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

No

4.3a

Please provide details of your reduction target.

Baseline year	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
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4.3b

Please explain why you do not have an emissions reduction target.

An emissions target for the community is being considered under the current administration.

4.4

What activities are you currently undertaking to reduce emissions city-wide?

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
Energy Demand in Buildings > Building codes and standards	Currently in-effect at a transformative scale across the entire city	Mostly mandate, regulatory, or policy-driven	Not calculated	Not Applicable	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.
Transport > Infrastructure for non-motorized transport	Currently in-effect at a significant scale across most of the city	Mostly project or program based	Not calculated		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 addition to these bicyclist transportation facilities, there are over 80 miles of hike and bike and nature trails found in City of Houston parks.
Transport > Improve the accessibility to public transit systems	Currently in-effect and being piloted	Mostly project or program based	Not calculated	Not Applicable	Houston METRO's comprehensive light rail plan plays a dynamic role in the city's life, providing smarter, more energy-efficient transportation options in the form of five new rail lines. The lines will connect citizens and visitors to every major activity center in our metropolitan area. They'll provide exceptional new opportunities for residents and businesses alike. METRO is the local transportation authority.
Waste > Recycling or composting collections and/or facilities	Currently in-effect and being piloted	Mostly project or program based	Not calculated	Mostly funded through general municipal	The City launched a mandatory yard waste composting program in April 2010 and has diverted 60,000 tons of yard waste in the last year, with disposal savings of \$2 million. The City has also deployed single stream recycling to one-third of

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
				funds	single-family households and is working on full deployment.
Energy Demand in Buildings > Financing mechanisms for retrofit	Currently in-effect and being piloted	Mostly project or program based	Not calculated	A grant or subsidy was received for this initiative	The City of Houston launched the Energy Efficiency Incentive Program allowing eligible commercial building owners to apply for funding to make energy efficiency improvements and reduce utility expenses and greenhouse gases. The City has committed approximately \$3 million for the program and will provide incentives to offset the up-front implementation costs. Over half the funds have been set aside for Class B and C buildings.
Other: Energy Efficiency and Behavior Change > Houston Green Office Challenge	Currently in-effect and being piloted			Project specific financing was obtained for this initiative	The Houston Green Office Challenge (www.houstongoc.org), launched in September 2010, 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. To date, the Houston Green Office Challenge has 371 businesses, representing more than 70 million square feet of office space, participating in the program. The City plans to continue the program for a second year to enable participants to fully implement their sustainability initiatives. The program also will be expanded to include other businesses, including NASA's Johnson Space Center and the Houston Independent school District. Of the initial group of cities that started a Green Office Challenge in 2011, Houston has the highest number of participants, over 370 participants, and has been the most successful with regard to sponsorships, programming and resources compared to other municipalities adopting the Green Business Challenge program. In 2011, Mayor Annise Parker was selected as the nation's top winner for large cities in the 2011 Mayors' Climate Protection Awards, an initiative sponsored by the U.S. Conference of Mayors. The annual awards program recognizes mayors for innovative practices in

Emissions reduction activity	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Which statement best describes how this initiative is funded or financed?	Comment
					their cities that increase energy efficiency and reduce greenhouse gas emissions.

4.5

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

Houston Green Office Challenge, public-private partnerships, Gulf Coast Green conference, annual rainwater harvesting/composting bin sales, urban gardens, City Hall Farmers Market

4.6

Does your city incorporate desired GHG reductions into the master planning for the city?

No

4.6a

Please describe the ways that the master plan is designed to reduce GHG emissions.

4.7

Please describe any renewable energy targets or goals and how the city plans to meet those targets.

The City of Houston has a goal to incrementally purchase more wind power and reach 50% renewable power by 2015.

Page: Adaptation

4.8

Do you have a plan for increasing your city's resilience to the expected physical effects of climate change?

No

4.8a

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

Individual measures have been implemented as climate-related events have occurred in the City, but no formal overarching adaptation plan has been developed due to limited staff, time, and resources. An adaptation plan is being discussed and considered in conjunction with the Clinton Climate Initiative.

4.9

Please describe the actions you are taking to reduce the risk to your city's infrastructure, citizens, and businesses from climate changes as identified in the Risks Module.

Effects of climate change	Actions to reduce vulnerability	What is the current status of this initiative as it relates to your city?	Which statement best characterizes the type of initiative?	Which statement best describes how this initiative is funded or financed?	Comment
Hotter summers	Projects or policies targeted at those most vulnerable	Currently in-effect at a significant scale across most of the city	Mostly project or program based	Not Applicable	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.
More frequent heatwaves	Projects or policies targeted at those most vulnerable	Currently in-effect at a significant scale across most of the city	Mostly project or program based	Not Applicable	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.
Increased urban heat island effect	White roofs	Currently in-effect at a transformative scale across the entire city	Mostly mandate, regulatory, or policy-driven	Not Applicable	Part of Houston's Commercial Energy Conservation Code is a mandate for cool roofs. Low slope roofs up to 2:12 shall be provided with a roof covering where the exterior surface has: (a) a minimum total solar reflectance of 0.70 when tested in accordance with one of the solar reflectance test methods listed below, and (b) a minimum thermal emittance of 0.75 when tested in accordance with one of the thermal emittance test methods listed below.
More frequent droughts	Awareness campaign/education to reduce water use	Once considered by your city and is now discontinued	Mostly mandate, regulatory, or policy-driven	Not Applicable	Mandatory water conservation measures were implemented to stabilize water levels in Lake Houston in the summer of 2011. While restrictions were mandatory, the measures started with warnings and an informational campaign to citizens. Those who did not comply after a warning were issued fines.
Increased risk of storm surges	Crisis planning and practice exercises	Currently in-effect and being piloted	Mostly project or program based	A grant or subsidy was received for this initiative	The City of Houston acquired 17 SPACE units, which are mobile solar generators made with shipping containers. The generators are designed for emergency relief efforts and were purchased to serve in the recovery efforts from future hurricanes. The units contain refrigerators and air conditioning to provide relief and also to allow emergency equipment to be hooked up when needed.

4.11

Please describe any other efforts you have undertaken or will undertake to ensure business and operational continuity - for both the city government and the businesses located in your city - in the event of a significant weather-related event.

The City of Houston Mayor's Office of Emergency Management (OEM) provides programs and activities to City residents and departments to help them prepare for, cope with and recover from the effects of natural and manmade disasters. The Emergency Operations Center (EOC) is a centralized facility responsible for coordinating emergency management and response functions citywide. The EOC, when activated, is staffed by representatives from various City, Regional and Federal agencies as well as not-for-profit and private-sector partners. It can be modified to meet the specific needs of the given emergency. The EOC serves primarily as a base of operations for City elected and appointed officials to coordinate activities which save lives and property, while leaving the direct command of resources to emergency services personnel on the scene of the incident.

Page: Water

4.12

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

Yes

4.12a

Please identify the risks to your city's water supply as well as the timescale.

Risks	Timescale	Comment
Predictions for drought continue into 2012, and water levels in Lake Houston may recede.	Short-term	Due to subsidence issues that resulted in major elevation losses in the early 1970s, Houston's water supply gradually moved from groundwater to surface water. Diminishing water levels primarily in Lake Houston, source of the City's water supply, prompted the mandatory water conservation ordinance in summer of 2011. As a result, the City started tapping into Lake Conroe for water. A more thorough explanation of Houston's water supply can be found at the City's Public Works website. http://www.publicworks.houstontx.gov/utilities/drinkingwater.htm

4.12b

Please describe the actions (on the supply and demand side) you are taking to reduce the risks to your city's water supply.

Supply side actions:

Plans to provide adequate water for growing population
Funds to perform operations and maintenance on aged infrastructure

Demand side actions:

Regulations to limit water use during water shortages/drought
Repairing infrastructure to minimize leaks
Increasing consumer awareness to water issues with programs like the City's annual rainbarrel sale
Allowing reuse of rainwater for potable and non-potable uses in the City's building code
Allowing waterless urinals in commercial buildings
Promoting tree canopy to reduce urban heat island effect

4.12c

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