

MEXICO CITY

**CLIMATE
ACTION**

Program **2008-2012**

SUMMARY

SECRETARÍA DEL MEDIO AMBIENTE
GOBIERNO DEL DISTRITO FEDERAL

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MEXICO CITY CLIMATE ACTION PROGRAM 2008-2012/SUMMARY

PROGRAMA DE ACCIÓN CLIMÁTICA DE LA CIUDAD DE MÉXICO 2008-2012/RESUMEN

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WRITING AND PRINTING OF THIS *MEXICO CITY CLIMATE ACTION PROGRAM*
WAS MADE POSSIBLE THANKS TO WORLD BANK SUPPORT

Introduction

Mexico City's efforts in the field of climate change are consistent with measures in favor of the environment and represent a commitment to the inhabitants of our city and, above all, a responsible course of action in relation to the future generations of the world.

Climate change is one of the major challenges facing humanity today; this is true for many reasons. The increasingly evident modification of the planet's climate takes the form of exceptional events such as drought, heavy rain, and the accelerated loss of ice at the poles and on the mountains. Climate change is the result of human activity, specifically of the intensive utilization of fossil fuels and the destruction and loss of huge tracts of jungle and forest land.

On a long and medium term basis, climate change can bring irreversible alterations in the biological balances that make life on earth possible. As of now, significant impacts of this change are on the rise in human communities throughout the planet, as reflected in loss of lives and staggering economic costs. A number of outstanding scientific groups have already gathered enough evidence to prove that climate change has consequences at all levels of human activity and on all natural systems.

Due to its size in terms of population and economic activity, its role in the world, and its status as Mexico's seat of government power, Mexico City is a major contributor to the problem; at the same time, it is an actor whose symbolic value cannot be underrated and a space in which the city's vulnerability to the effects of climate change has become a national security issue. As a result, whatever we do in Mexico City to reduce greenhouse gas (GHG) emissions and to decrease our vulnerability through adaptation actions that mitigate climate-change impacts is highly significant for the city's inhabitants, the country, and humanity itself.

Around 88 per cent of all GHG emissions in Mexico City are attributed to energy consumption in the form of fossil fuels and electricity used in transportation, industry, trade, housing, or services. Actions that make it possible for citizens to live and for the economy to function with a lower output of GHGs cut across a broad spectrum of issues: the growth and improvement of public transportation and the transformation

of vehicle technology; the efficient use of energy in buildings, industrial facilities, public lighting systems, water pumping systems, and homes; the exploitation of renewable energy sources; the rational use of water in the broadest sense --including water saving and reuse and the recharging of aquifers--, as well as the reduction of waste generation and the promotion of adequate waste management.

Likewise, in the framework of the capital city's General Development Program 2007-2012, the Mexico City Green Plan, and a set of public policies and programs designed to improve the quality of life for city residents, the Mexico City Climate Action Program lends continuity to these existing city government programs aimed at mitigating greenhouse gas (GHG) emissions. It also proposes new initiatives for deepening these endeavors, starting with a wide variety of actions that are viable for citizens, communities, businesses and government.

Mexico City Government Statement on Climate Change

The Mexico City government recognizes that climate change is now the most serious threat to the ecosystems of this city, the country, and the world, with unquestionable socioeconomic consequences for the population.

The effects of the climate change have already been felt in Mexico City with the modification of the intensity and seasonal nature of the rains, the elevation of average annual temperatures, and the increased frequency of widespread, high-impact weather phenomena. The failure to take steps to mitigate the climate-change-related GHGs and to adapt to their effects, will heighten the risk of severe damage to physical, chemical, and biological systems, with negative consequences for the society, the environment, and the economy of Mexico City.

The Mexico City government shares the vision emerging from the most recent conclusions of the Intergovernmental Panel on Climate Change (IPCC), which establishes that, beyond a shadow of a doubt, global warming is a reality.

According to the Panel's conclusions, climate system warming is unmistakable, as shown by observations of rising average air and ocean temperatures, widespread melting of snow and ice, and the rising sea level worldwide. Eleven of the last twelve years (1995-2006) are among the twelve warmest years since 1850.

According to the views of the Mexico City government, urgent actions are necessary to reduce greenhouse gas emissions.

Measures should be adopted for the rational use of energy, as well as for avoiding carbon intensive energy solutions. There should also be a reduction in consumption of material goods, an increase in recycling, and more efficient use of resources. This has implications for social justice, given that certain sectors of the society waste energy and resources, while others have limited access to them.

The Mexico City government believes that it is necessary to adopt adaptation measures in the face of climate change.

The inertia of the climate system and the current rhythm of greenhouse gas generation imply that, given the possibility of reaching a bal-

ance between these emissions and the capacity of the ecosystems to neutralize their effects, it will be necessary to live with the ongoing reality of climate change throughout this century. The most vulnerable groups in Mexico City will feel the effects more harshly and will have higher exposure to climate change risks. They are more likely to be affected by heavy rains and to have a wider radius of damage; furthermore, they have fewer resources with which to cope with the catastrophes and require a longer recuperation time in dire circumstances. In view of this, it is critical to take steps to prevent and reduce the impact of climate change in the years and decades to come. The acknowledgement of this situation has resulted in the prominence of vulnerability analysis and climate change adaptation measures in the Mexico City Climate Action Program.

The Mexico City government has drawn up the Mexico City Climate Action Program.

This program identifies and presents the basic elements required for the implementation of a series of lines of action and specific activities to be carried out with the aim of reducing the risks and effects of climate change. These actions include those that promote the reduction of GHGs in Mexico City government activities or in activities controlled and regulated by the government. Other measures are aimed at adaptation to the conditions and effects of climate change, both at present and in the future, thereby prompting Mexico City to be ready to face climate change and to influence different actors in the society to take the necessary mitigation and adaptation steps.

The Mexico City government states that in view of the scarce resources for putting programs into operation, there is an urgent need for resources generated by the sale of greenhouse gas emission reduction.

The measures for reducing emissions may not adequately meet emission reduction goals if there is a lack of sufficient resources; therefore it is critical to obtain additional resources from the sale of greenhouse gas emission reduction credits on international markets. A similar problem also occurs with respect to the development of adaptation measures.

Background

Climate change is a tremendous challenge and, at the same time, a tremendous opportunity. The challenge lies in significantly reducing greenhouse gas emissions and confronting the risks implicit in our vulnerability to the effects of global warming, redefining our development processes with an environmental focus and availing ourselves of additional resources necessary to deal with the situation. It is important to realize that Mexico is in a position to receive resources from other countries obliged to reduce their emissions. The societies as a whole, and the governments and inhabitants of the cities in particular, faced with the challenges and opportunities presented by climate change, must reconsider the economic development styles that have given rise to production and daily living patterns, and in so doing, strongly affected the ecosystems.

This review of what we're now doing and of what we can do in the short, medium, and long term to improve our quality of life and assure the sustainability of our development is presented in the framework of the responsibility we have assumed to enact the city's environmental policy with justice and equality.

This Mexico City Climate Action Program is one of the priorities of the Mexico City government in the environmental sphere; in it, coordinated efforts, commitment, consciousness raising, cooperation, participation, and verification are proposed in the framework of the Mexico City Environmental Agenda and the Green Plan. The Program deals with a set of local actions that have global repercussions and a set of joint public policies that will be a reference point in both the national and international spheres.

Climate change is, in summary, a horizontal issue that cuts across and brings together the main components of Mexico City's environmental and development policies, including those related to energy, water, mobility, soil conservation, economic development, waste generation and management, vulnerability, and environmental education.

Transportation is considered in the context of the mobility, expansion, and improvement of public transportation. The expansion of infrastructure for more sustainable transportation forms and the change in transportation use habits towards non-motorized mobility constitute a group of actions and public policies that, at the same time, propose to guarantee the mobility of goods and people and reduce GHG emissions in the atmosphere.

Water is a cross-sectional element and central part of any vulnerability analysis dealing with climate change; it should also be considered in subsequent adaptation plans. Associated with drought and flood risk, water is also a challenge represented by the increasing scarcity of the liquid so essential for human life. In the framework of the Mexico City Climate Action Program, policies and actions regarding efficient water use and supply are linked to those dealing with risks.

On the question of energy, GHG emission mitigation actions in the capital city include energy saving and efficiency measures, the promotion of the use of solar energy, and, increasingly, the promotion of renewable energy sources.

With regards to solid waste, the measures taken to avoid waste generation and to recycle and utilize its energy content all have a broad, clear environmental and economic orientation.

Soil conservation actions, such as land restoration, care of the soil, and surface area expansion through zone recovery, contribute to mitigating GHGs by increasing carbon capture and reducing the city's vulnerability to extreme climate events.

The analysis of climate data gathered in recent decades shows that the Valley of Mexico is vulnerable to extreme conditions, whether they involve a rise in environmental temperatures, heavy rains, or drought.

Thus, it is urgent to design, refine, and implement strategies that strengthen the ability to adapt to the effects of climate change, thereby reducing vulnerability to the most probable scenarios of adverse impacts on the population.

Any strategy geared towards dealing with climate change should continually address the population's information and training needs and include educational activities so that the society can identify everyday practices contributing to GHG emissions and decide what we can do to reduce our vulnerability and to increase our ability to adapt.

To sum up, the aim of the Mexico City Climate Action Program is to contribute to the reduction of greenhouse gas emissions, reduce the vulnerability of the city to the effects of global warming, and heighten our adaptation. To this end, the Program considers related Mexico City government policies and investments that are already in effect; it also identifies and propitiates further complementary actions, and facilitates actions taken by the society, individuals, and businesses.

Aims and Objectives

The overall goal of the Mexico City Climate Action Program is to “Integrate, coordinate, and encourage public actions in the capital city to diminish environmental, social, and economic risks stemming from climate change and to promote the welfare of the population through the reduction and capture of greenhouse gas emissions.” There are five specific objectives:

To influence the behavioral patterns, habits, and attitudes of Mexico City’s population so that it will contribute to the mitigation of climate change and enact adaptation measures.

To attract investment and financing for greenhouse gas emission mitigation projects aimed at overcoming obstacles to the implementation of adopted measures.

To promote technological innovation related to combating climate change.

To position Mexico City and its government as leaders in national and international efforts to mitigate greenhouse gas emissions in the context of the commitments assumed by Mexico in the United Nations Framework Convention on Climate Change.

To set out guidelines for public policies in the mitigation of and adaptation to climate change in Mexico and to generate a multiplier effect in the country and the world.

The Mexico City Climate Action Program has two global aims, the first being the mitigation of GHG emissions and the second, adaptation to climate change:

Aim 1: To reduce carbon dioxide, (CO₂) equivalent emissions by seven million tons during the 2008-2012 period.

Aim 2. To initiate an integrated program for adaptation to climate change in Mexico City and have it fully functional by 2012.

In view of the fact that the Mexico City government has already instituted different programs related to waste management, transportation, water, etc. and that some of the planned actions have a high impact on the reduction of greenhouse gas emissions and adaptation to climate change, this Program identifies these actions but also proposes additional measures for the government to foster during the current administration; proposals include selections from existing programs, as well as several

other innovative, high-impact actions. In all cases it is clear that a critical factor in the adequate development of measures and successful compliance with greenhouse gas reduction goals is obtaining additional resources from the greenhouse gas emission markets.

Although the life of the Program is only five years, its effects are more far-reaching.

The Mexico City Climate Action Program contemplates actions in five key areas: energy, transportation, water, waste, and adaptation. At the same time, communications and environmental education take place along two lines of action: mitigation and adaptation. The first integrates actions geared toward the reduction of GHG emissions and CO₂ capture, both of which will reduce Mexico City's contribution to greenhouse gas concentrations in the earth's atmosphere. The second includes actions that will reduce climate change risks to the population and the local economy.

Greenhouse Gas Mitigation Actions

A total of 26 greenhouse gas mitigation actions have been proposed in the Mexico City Climate Action Program; if implemented, they will reduce the CO₂ equivalent emissions by 4.4 million tons a year, which represents 12% of the annual GHG emissions in Mexico City. The budget for the implementation of these actions during the next five years is \$56,152 million pesos. The actions are presented in the following tables:

Energy Actions		CO ₂ equivalent emission reductions (tons per year)	2008-2012 Investment or Budget (millions of pesos)
Action	Description		
Sustainable housing in Mexico City	— Funding for new housing in the Multifamily Housing Program, integrating sustainability criteria such as the installation of solar collectors, energy saving systems, water saving systems, systems for the utilization of rain-water and soapy water, waste-water treatment plants, and absorption wells	3,351	845
Sustainable buildings in Mexico City	— Establishing environmental certification systems for commercial and residential property in Mexico City	25,000	480
Renewable energy programs for Mexico City	— Promoting solar energy water heating in Mexico City government buildings — Promoting the exploitation of solar energy in businesses and services through existing relevant environmental norms	25,000	To be defined in future studies
Energy efficiency program in Mexico City government	— Efficient Lighting in Buildings (ESCO's) — Efficient Street Lighting — Efficient operation of Electrical Transportation System — Replacement of fluorescent lighting with energy-saving lighting in the subway	107,391	415
Efficient home lighting pro- gram in Mexico City	— Distribution of 10 million compact fluorescent lamps in Mexico City homes	270,000	308
TOTAL		430,742	2,048

Water Actions		CO ₂ equivalent emission reductions (tons per year)	2008-2012 Investment or Budget (millions of pesos)
Action	Description		
Improvement of MCWS* water pump control systems to avoid unnecessary equipment use during low demand hours	— Equipping, reconditioning and/or repair of the pump station control systems and unitary pumping equipment now used at different points of the Mexico City Water Systems (MCWS), with the aim of minimizing operation hours and thus reducing electrical energy consumption associated with these systems	5,000	321
Reduction of emissions from Mexico City septic systems	— Construction and provision of sewerage and water treatment services in areas where the best cost-benefit relation and reduction of methane gas is possible	15,000	To be defined in future studies
Energy improvement of MCWS water pump system equipment	— Infrastructure maintenance of potable water, sewerage, and water treatment and reuse systems of the Mexico City Water Systems (MCWS), with the aim of reducing electrical energy consumption associated with their operation	19,000	3,671
Electrical energy generation in hydroelectric plants installed at existing MCWS waterfalls	— Exploitation of hydroelectric potential in an electrical energy generation plant	40,700	To be defined in future studies
Infrastructure improvement through leak suppression and pipe rehabilitation and sectioning at water distribution facilities	— Reinforcement of leak and water loss detection, as well as reduction activities at different plants of the Mexico City Water Systems (MCWS), with the aim of reducing electrical energy consumption associated with their operation	45,500	2,970
Home water saving programs	— A permanent water culture campaign to encourage water savings and efficiency, geared towards reducing demand by at least 2.2 m ³ /s by 2010, promoting the installation of low-flow toilets and water saving accessories	47,777	200
Reduction of mud emissions from city biological treatment plant	— The inclusion of greenhouse gas reduction criteria in the reduction of mud emissions from biological treatment plants in Mexico City	380,000	1,205
TOTAL		552,977	8,367

* MCWS: Sistema de Aguas de la Ciudad de México, SACM

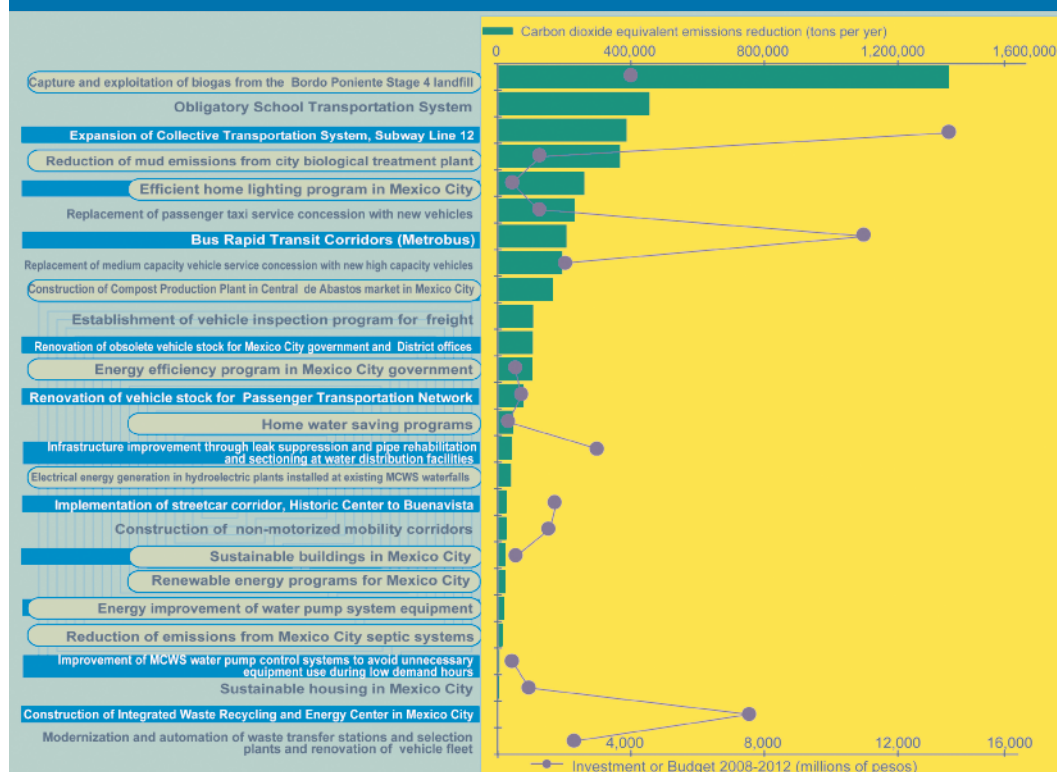
Transportation Actions		CO ₂ equivalent emission reductions (tons per year)	2008-2012 Investment or Budget (millions of pesos)
Action	Description		
Construction of non-motorized mobility corridors	— Strategic plan for the creation of a bike path network in Mexico City; construction of 300 km of bike paths and initiation of “Travel by Bike” project	27,479	1,500
Implementation of streetcar corridor, Historic Center to Buenavista	— An increase in electrical transportation in Mexico City through the implementation of a streetcar corridor from the Historic Center to Buenavista	28,000	1,692
Renovation of vehicle stock for Passenger Transportation Network	— Pilot project to test clean technologies and evaluate the best vehicle renovation technology — Renovation of 920 units; Acquisition of 200 units for new routes; Acquisition of 700 joint units for Metrobus use	80,000	600
Renovation of obsolete vehicle stock for Mexico City government and District offices	— 100% replacement of vehicle stock for the Mexico City government with energy efficient, low contamination units by 2012	109,000	To define in future studies
Establishment of vehicle inspection program for freight trucks	— Application of vehicle inspection program for freight transportation in Mexico City	110,000	To define in future studies
Replacement of medium capacity vehicle service concession with new high capacity vehicles	— Replacement of 20,000 medium capacity units with high capacity vehicles	200,000	2,000
Bus Rapid Transit Corridors (Metrobus)	— Implementation of 9 transportation corridors in Mexico City with 200 km of restricted lanes and 800 tandem buses to replace 3000 minibuses	214,000	11,300
Replacement of passenger taxi service concession with new vehicles	— Replacement of 75,000 2-door vehicles with 4-door vehicles, including in the former taxi fleet	240,000	1,125
Expansion of Collective Transportation System, Subway Line 12	— Construction of Subway Line 12	400,000	13,700
Obligatory School Transportation System	— Gradual change from the use of private transportation by students to obligatory public transportation	470,958	To be defined
TOTAL		1,879,437	31,917

Waste Actions		CO ₂ equivalent emission reductions (tons per year)	2008-2012 Investment or Budget (millions of pesos)
Action	Description		
Construction of Compost Production Plant in Central de Abastos market in Mexico City	– The creation of a Compost Center is proposed in the Central de Abastos market to exploit the 700 tons of organic waste generated on a daily basis	170,500	To be defined in future studies
Capture and exploitation of biogas from the Bordo Poniente Stage 4 landfill	– The capture and exploitation of the biogas emitted from the Bordo Poniente Stage 4 landfill and the eventual installation of an electrical power plant	1,400,000	3,880
Construction of Integrated Waste Recycling and Energy Center in Mexico City	– Construction and operation of an Integrated Recycling and Energy Center for appropriate solid waste management in Mexico City	To be defined in future studies	7,690
Modernization and automation of waste transfer stations and selection plants and renovation of vehicle fleet	– A modernization and automation program for the best management and operation of transfer centers, separation plants, compost plants, energy savings, and energy efficiency in these facilities – Renovation of the vehicular stock for the waste collection and transfer	To be defined in future studies	2,250
TOTAL		1,570,500	13,820

Of the projected 4.4 million ton annual carbon dioxide equivalent reduction, 12% will be reduced in the water sector through the seven actions proposed above; 10% will be reduced in the energy sector through five integrated actions; 35% in the waste sector through four specific actions; and 42% in the transportation sector through ten actions contemplated in the Program. Figure 1 shows the proposed mitigation actions, their contribution to greenhouse gas emission reduction, and the necessary investment for implementing each measure.

Among the actions proposed for the water sector (Figure 2), those that have the highest impact on GHG emission mitigation are mud emissions capture, accounting for 69% of all reductions in this sector, and the Home Water Savings Program, accounting for 9%. It is important to mention that some of the GHG emission mitigation actions proposed for the water sector are also climate change adaptation measures; this is the

FIGURE 1. GREENHOUSE GAS EMISSION REDUCTION ACTIONS



case with the Infrastructure Improvements, such as leak suppression, pipe rehabilitation, and pipe sectioning. These help in encouraging rational water use and protect the available water supply. The measures include the construction of drainage and sewerage systems that help to decrease flood risk.

In the energy sector, the project with the greatest potential impact among the proposed actions (Figure 3) is that of massive efficient lighting in Mexico City housing; this measure alone could reduce predicted GHG emissions in this sector by 62%.

With regards to the actions proposed in the waste sector (Figure 4), it is important to emphasize that biogas capture in the Bordo Poniente Stage 4 landfill represents 89% of the emissions to be reduced. In the case of the actions carried out in the Integrated Recycling and Energy Center and the modernization of transfer and renovation of vehicular

FIGURE 2. WATER SECTOR MITIGATION ACTIONS

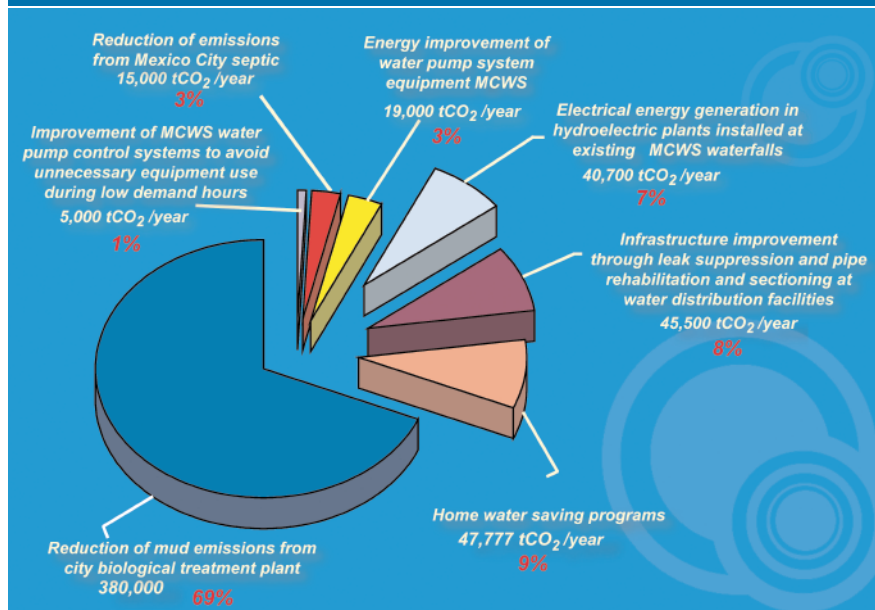


FIGURE 3. ENERGY SECTOR MITIGATION ACTIONS

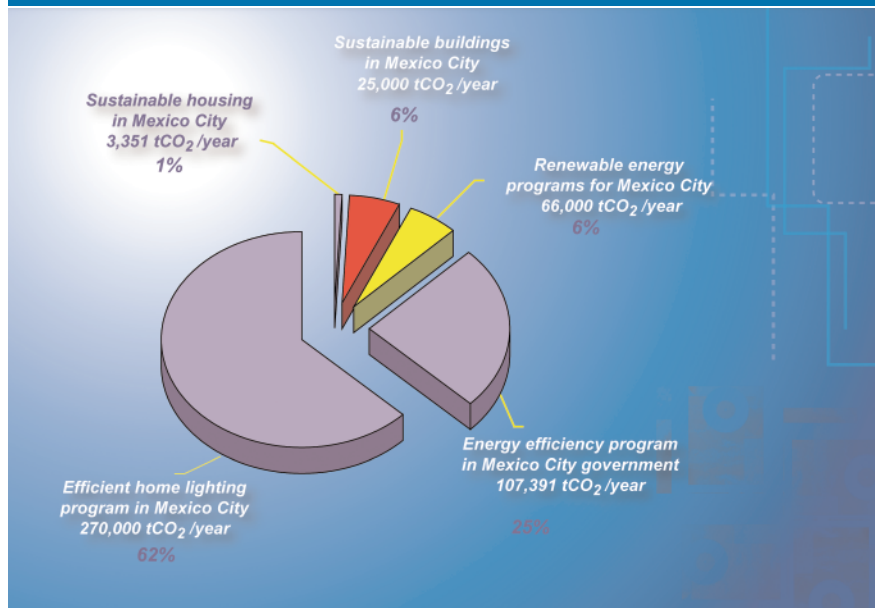


FIGURE 4. WASTE SECTOR MITIGATION ACTIONS

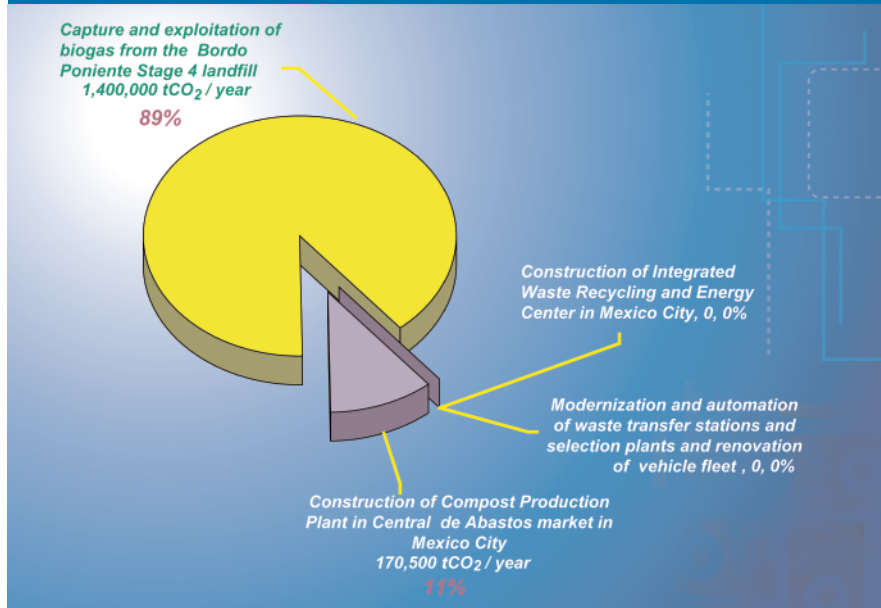
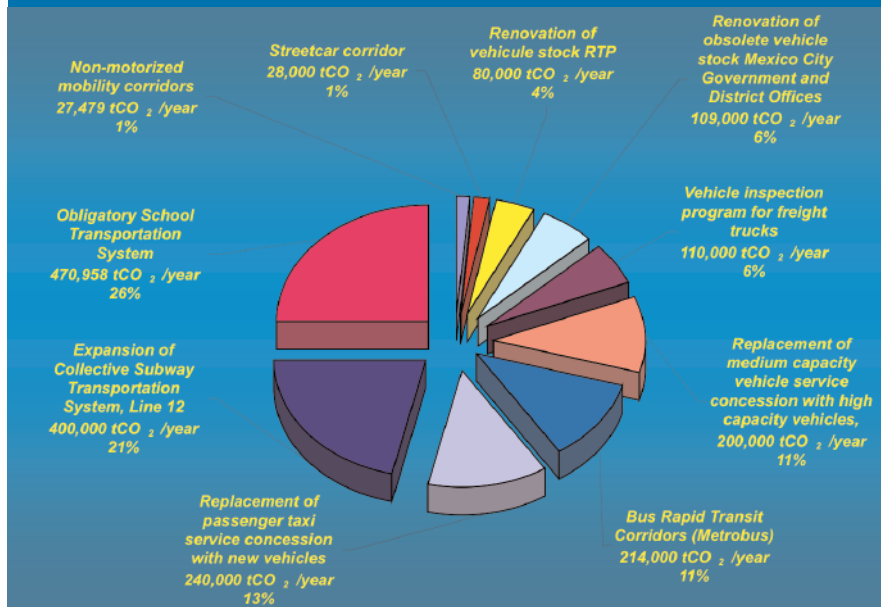


FIGURA 5. TRANSPORTATION SECTOR MITIGATION ACTIONS



stock, possible emission reductions have not yet been estimated due to the need for further studies.

Among the proposed transportation sector actions (Figure 5), the most important are the Obligatory School Transportation Program, the construction of Line 12 of the Subway, and the construction of new transportation corridors, which represent 58% of the GHG emission reductions proposed for this sector.

Climate Change Adaptation Actions

A Program of Climate Change Adaptation Measures has been integrated into the Mexico City Climate Action Program and consists of a set of both short and long range actions to reduce potential climate change risks to the Mexico City population and economy. Likewise, the program will promote the development of adaptation abilities aimed at reducing vulnerability and moderating possible damage, forecasting risks, and taking advantage of opportunities derived from the climate change in Mexico City and its outlying areas.

The primary lines of adaptation actions are: the identification of primary threats and a vulnerability analysis; the integration of an adaptation perspective in order to build on existing Mexico City government plans; and, lastly, the implementation of adaptation actions.

These three lines of action include twelve climate change adaptation actions requiring an investment of \$2,999 million pesos during the next five years. The adaptation actions are organized into two groups; the first integrates components associated with an early alert, and the second includes components related to a medium term response. In the first group there are six adaptation actions: the implementation of a Metropolitan Hydro-meteorological Monitoring and Forecasting System for the Valley of Mexico (Early Warning System) geared towards identifying risks and threats to the Mexico City population and taking immediate, medium term, and long term action; Micro-basin management of urban ravines in order to deal with the threat of heavy rains and to help reduce risks to the population inhabiting these areas; assistance to people who are vulnerable to extreme climate events such as heavy rains, or intense cold waves or heat waves; epidemiological monitoring in the context of climate change or to identify vectors presented as a result of

extreme climate events; protection and recuperation of native crops and herbs in order to maintain the diversity and resilience of agro-systems; and the remote detection and monitoring of forest fires during the dry season. These actions along with the budgeted amounts necessary for implementing them are presented below:

Adaptation actions, group one	Total 2008-2012 Budget (millions of pesos)
Metropolitan Hydro-meteorological Monitoring and Forecasting System for the Valley of Mexico: Early Warning System	111
Micro-basin management 1: Urban Ravines	694
Protection and recuperation of native crops and herbs: creole maize	150
Remote detection and monitoring of forest fires with cameras	279
Epidemiological monitoring in the context of climate change	5
Assistance to people who are vulnerable to extreme climate events	71
TOTAL	1312

The second group of adaptation actions includes six measures with a medium term impact; five of them have to do with Mexico City's rural zone and one is related to rooftop naturation in the urban area. The measures are as follows:

Adaptation actions, group two	Total 2008-2012 Budget (millions of pesos)
Micro-basin management 2: Soil and water conservation projects	450
Micro-basin management 3: Rural development and soil and water conservation on agricultural lands	210
Agricultural monitoring of genetically modified foods and fomentation of organic production	260
Land parcels pilot project 1: Soil recovery for rural development	460
Land parcels pilot project 2: Alternative reforestation with species resilient to climate change	103
Rooftop naturation	202
TOTAL	1686

Climate Change Communications and Educational Actions

The issues of education and communications have been incorporated into the Mexico City Climate Action Program in an effort to reinforce climate change adaptation actions and GHG emission mitigation measures. It is clear that in order to influence behavior patterns, habits, and attitudes of the Mexico City population regarding the issue of climate change, this kind of program is necessary. Needless to say, the more that is known about climate change and the more public reflection there is on the issue, the more understanding and social support there will be for the measures that are collectively adopted to face this challenge. That's why informational and educational efforts, as well as communications about the problem will make it easier to define common visions and make consensual decisions to deal with the phenomenon.

The proposed communications actions require a total budget of \$404 million pesos for the next five years. They are as follows:

Communications and Educational Actions	Total 2008-2012 Budget (millions of pesos)
Ongoing seminar on climate change	To be defined
Education for the efficient use of resource in Mexico City housing units	7
Reinforcement of a water culture in Mexico City	60
Educational communications to promote social awareness of the climate change phenomenon	100
Educational communications for the integrated management of solid wastes in Mexico City	63
Communication about the risks associated with climate change and the promotion of adaptation measures	174
TOTAL	404