



Secretaría del Medio Ambiente



# Green Plan

*Mexico City*

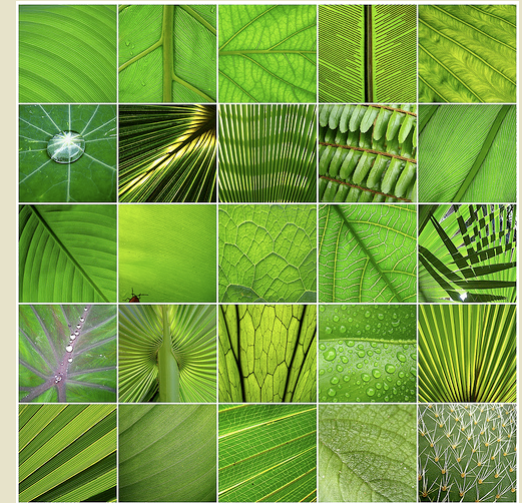


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C.P. 06068, Mexico City. Tel. + 52 (55) 5345 8187 / 88 [www.sma.df.gob.mx](http://www.sma.df.gob.mx)



## What is the Green Plan?

The Green Plan is Mexico City Government's medium-term (15-year) course of action and guideline comprising strategies and actions to lead the city towards its sustainable development.



**The Green Plan is a communication mechanism as well. A prompt and simple mechanism to provide society with information on how the government assesses environmentally relevant topics, related goals and the high-impact strategies and actions to accomplish them.**

**This plan is a live instrument which will be permanently subject to both enhancement and evaluation.**

## Mexico City's participating agencies

- Mexico City Major
  - Ministry of Environment
  - Chief of Staff Mexico City Government
  - Ministry of Transit and Transport
  - Ministry of Social Development
  - Ministry of Public Security Ministry of Finances
  - Ministry of Public Health Services
  - Ministry of Public Works and Services
  - Ministry of Culture
  - Ministry of Urban Development and Housing
  - Ministry of Tourism
  - Ministry of Education
- 
- Ministry of Rural Development and Equity for Communities
  - Ministry of Civil Protection
  - Mexico City General Attorney
  - Social Attorney
  - Environmental and Territorial Attorney
  - Mexico City Historic Center Authority
  - Science and Technology Institute

## Topics

- 1** Land and Conservation
- 2** Habitability and Public Space
- 3** Water
- 4** Transportation
- 5** Air
- 6** Waste
- 7** Climate Change and Energy

# 1 Land and Conservation

## Strategies to carry it out

*Purpose:*

To rescue conservation land as a key space for maintaining the ecological balance of Mexico City.

- E1** Zero human settlement growth in conservation lands
- E2** Restoration and preservation of ecosystems with high environmental value
- E3** Payment of environmental services as a mechanism to compensate for conservation costs
- E4** Promotion of agroecosystems and sustainable management of natural resources



# 1 Land and Conservation

## E1 Zero human settlement growth

- New socio-political pact aimed at safeguarding the conservation land
- Creation of a specialized surveillance corps for protection of conservation land, to be launched in 2008
- Strict reinforcement of the law and harsher penalties for those who harm the environmental heritage
- Recovery and restoration over a six-year period of 150 high-environmental value sites which have been occupied by irregular settlements, reducing the total figure from 834 to 684 such sites
- Permanent awareness campaign for protection and preservation of conservation land



## Strategies to carry it out



# 1 Land and Conservation

## Strategies to carry it out

### E2 Restoration and conservation of high-environmental value ecosystems

- Rescue of the Magdalena and Eslava rivers basin in order to achieve a 100 percent reversal of its environmental degradation over a six-year period
- Reforestation and restoration of 3,000 hectares with 2.5 million plants per year
- Productive reconversion of 10,200 hectares of cultivated land to plantation woodland by 2012
- Protection of 45 percent of natural ecosystems, including 35,000 hectares annexed as either Protected Natural Areas, Environmentally-Valued Areas, Community Areas, or Ecological Conservation Reserves
- Reinforcement of the Protected Natural Areas System of the Federal District, providing each area (anp) with a Management Plan by 2012



# 1 Land and Conservation

## Strategies to carry it out

### E3 Payment of environmental services as a mechanism to compensate for conservation costs

- Identification and assessment of the environmental goods and services provided to the city by conservation land, by 2009
- Protection of 24,000 hectares (27 percent) of conservation land by incorporating it into schemes of payment for environmental services, by 2012. The goal for 2020 is to protect 50 percent of the total surface.
- To assess the option of creating green taxes and compensation dues for environmental harm in order to pay for the services provided by conservation land.





# 1 Land and Conservation

## Strategies to carry it out

### E4 Promotion of agroecosystems and sustainable management of natural resources

- To preserve the germplasm of all Mexico's Central Plateau's native corn races
- To implement a monitoring system to detect transgenic corn by 2009
- To develop sustainable systems of land management and stone exploitation by 2010
- To develop environment-friendly agricultural practices to replace non sustainable practices in 8,000 hectares by 2012
- Reconversion of 3,200 free-grazing livestock units (animals) to stable systems by 2012



## 2 Habitability and Public Space

### Strategies to carry it out

*Purpose:*

To recover and create public spaces in order to transform Mexico City into a place suitable for social integration and capable of offering better habitability, confort, and equity.

- E1** To implement projects aimed at re-organizing and regulating large public spaces, designed according to sustainability and habitability criteria
- E2** To recover and reinforce existing public spaces in order to incorporate them into Integration and Development corridors for recreational and environmental purposes
- E3** To increase green areas and provide public spaces with urban furnishing and accessibility elements



## 2 Habitability and Public Space

**E1 To implement projects aimed at re-organizing and regulating large public spaces, designed according to sustainability and habitability criteria**



### Strategies to carry it out

- To implement projects involving public spaces in underutilized areas with a high potential for urban and environmental reconversion
- To design integral projects aimed at the physical and social recovery of public spaces, including sustainability, competitiveness and equity factors
- To verify local compliance with Norm 005 and land use regulations in order to keep noise emissions under 65 decibels in daytime and 62 decibels at nighttime
- Implementation of a new social housing model which brings together public spaces and green areas, and approaches sustainability, habitability and comfort as elements of design
- To implement the “Clean Building Seal” in every new services facilities and all of those located in main urban corridors; it will be mandatory starting in 2010

## 2 Habitability and Public Space

**E2 To recover and strengthen existing public spaces in order to incorporate them into Integration and Development corridors for recreational and environmental purposes**



### Strategies to carry it out

- Improvement of urban image, rescue and reinforcement of public spaces and urban areas will take place mainly in the Environmental and Recreational corridors, as well as in the Development and Transportation corridors
- “22 New Spaces for Our Coexistence” Program (to be held along the Inner Circuit artery) by 2020
- “Hands at Work” Program, which will seek to regain 1,000 public spaces
- Rescue of public spaces and green areas for proper use and enjoyment of the community
- Creation of neighborhood public squares in order to promote social cohesion
- Naturation (greening) of flatroofs and facades at a rate of 30,000 square meters per year
- Naturation (greening) of roundabouts, traffic islands and streets with suitable vegetation and diversified stratum
- Permanent awareness campaign to protect and preserve the public space

## 2 Habitability and Public Space

**E3 To increase green areas and to provide public spaces with urban furnishing and accessibility elements**

- To develop green corridors (lineal parks) seeking to reach the goal of 9 square meters of green areas per resident
- To build new infrastructure for public spaces and urban areas (treated water network, rainwater collectors; urban furnishing for children, elderly citizens and people with different capacities; organic and inorganic waste containers, public lightning, emergency phones, etc.)
- Bike lanes and pedestrian walks which will join the city's green areas and public spaces, by 2015
- To restore and create new parks and gardens all over town in order to transform the image of the city
- Creation of a 36,000-square meter urban park in the Iztapalapa Delegation (municipality) by 2010



## 3 Water

*Purpose:*

To achieve water self-sufficiency and improve water management in Mexico City

### Strategies to carry it out

- E1** To attain balance of the aquifer resources
- E2** To reduce residential water consumption
- E3** To reduce losses in the water mains
- E4** To increase re-use and treatment of water
- E5** To create lakeside water (lacustrine) parks in Tláhuac and Xochimilco



## 3 Water

### E1 To attain balance of the aquifer resources



### Strategies to carry it out

- Reassessment of current use of springs, starting 2009
- Protection of the conservation land in order to insure aquifer recharge
- A 90 percent decrease of barren land by 2015, and development of soil retaining structures in the basin to favor greater aquifer recharge and to avoid erosion and sewage obstruction
- Protection of the ravines and conservation land; issue of a decree declaring 12 urban ravines as environmentally-valued areas
- Extension of the absorption pits network; endorsement of actions aimed at increasing the aquifer recharge and filtration (in 2.5 cubic meters per second), starting in 2008

## 3 Water

### E2 To reduce residential water consumption



### Strategies to carry it out

- Endorsement of micromasurement of water starting in 2008 with the goal to reach a 100 percent coverage by 2010
- To enforce punitive actions against delinquent accountholders in order to increase payment of dues
- To promote use of low water consumption sanitary furniture as well as water-saving devices in households starting in 2008
- Endorsement of a permanent water culture campaign promoting its efficient use so that demand may decline at least one cubic meter per second by 2010



## 3 Water

### E3 To reduce losses in the water mains



### Strategies to carry it out

- To modernize the water supply network
- Replacement of 100 percent of obsolete or damaged network infrastructure by 2012
- Sectoring of 100 percent of the network, to ensure control over the efficiency of 330 hydrometric sectors, by 2009
- Reduction of losses in the water mains (3.3 cubic meter per second) by 2015
- Identification and regularization of clandestine water intakes, pressing major offense charges against those who install them and theft charges against those who use them
- Endorsement of a permanent campaign on control of leaks in households

## 3 Water

### E4 To increase re-use and treatment of water



### Strategies to carry it out

- To launch construction of Emisor Oriente (East Emissor) seeking to increase the capacity of the sewage system by 2012
- To increase treatment of residual waters from 2.5 to 7.2 cubic meters per second by 2012
- To accomplish tertiary treatment of water of at least 2.5 cubic meters per second for its reinjection into the aquifer by 2010
- To build residual waters treatment plants in rural communities to avoid discharges into river beds and ravines by 2010

## 3 Water

### E5 To create lakeside water (lacustrine) parks in Tláhuac and Xochimilco

### Strategies to carry it out

- To recover lacustrine landscape in 250 hectares of Tláhuac and Xochimilco, starting in 2008
- To build ecological corridors in lakeside water parks
- To strengthen the zone's lacustrine vocation and hydric regulation



## 4 Transportation

*Purpose:*

To regain streets and roads for efficient, non-polluting, qualified mass transportation, and to promote non-motorized transportation.



### Strategies to carry it out

- E1** To encourage efficient, non-polluting, qualified mass transportation; and to recover the streets and roads for the majority of the population
- E2** To reduce the number of vehicles in circulation
- E3** To offer incentives to those who use non-motorized transportation
- E4** To improve transit and traffic
- E5** To support a transit and pedestrian culture aimed at a more harmonious coexistence

## 4 Transportation

**E1 To encourage efficient, non-polluting, qualified mass transportation; and to recover the streets and roads for the majority of the population**

- To develop 250 kilometers for collective transportation
- Consolidation of the Metrobús System with the construction of ten corridors, two per year, by 2012.
- Increase of subway (Metro) coverage with the construction of Line 12 (Mixcoac-Iztapalapa-Tláhuac) by 2012
- Reorganization of exclusive bus stops for privately-owned collective transportation, starting in 2008



## 4 Transportation

### E2 To reduce the number of vehicles in circulation

To endorse a transit and traffic culture aimed at a more harmonious coexistence.



### Strategies to carry it out

- Mandatory school bus transportation for private schools (34 schools in troubled traffic areas will be targeted by 2008; 100 percent of private schools will be targeted 2012)
- Circulation constraint for taxis carrying no passengers
- Circulation of freight vehicles will be restricted to specific schedules and routes, depending on their cargo, dimensions and fuel technology, starting 2009

## 4 Transportation

### E3 To offer incentives to those who use non-motorized transportation

### Strategies to carry it out

- To endorse pedestrianization of historic downtowns, neighborhoods and villages in all of the 16 delegations (municipalities) of the Federal District by 2010
- To promote bicycle as alternate means of transportation
- Bicycles should account for at least 5 percent of all individual trips made in the city prior to 2012
- Full achievement of the Master Plan, including construction of 300 kilometers of bike lanes and green corridors prior to 2012
- To provide the city with urban furnishing and equipment, as well as services for safe access in 100 percent of the bike lanes included in the Master Plan, by 2012
- To guarantee intermodal trips (public transportation-bikes) in 5 percent of all individual trips prior to 2012
- Endorsement of a permanent cycling culture campaign, to promote its use both as a recreational activity and as means of transportation

## 4 Transportation

### Strategies to carry it out

#### E4 To improve transit and traffic

- To modernize the structure of streets and roads
- Streets and roads adaptations to improve transit and traffic in 350 troubled points over a 5-year period
- Intelligent traffic signalization covering all main arteries in the city over a 36-month period
- 15 reversible streets and roads by 2010
- To promote the construction of new parking lots and setting up parkimeters in suitable areas
- Suspended vehicle circulation on Saturdays, starting in 2008 (10 Saturdays per vehicle a year).





## 4 Transportation

**E5 To support a transit and pedestrian culture aimed at a more harmonious coexistence**

### Strategies to carry it out

Permanent transit awareness and education campaign to promote respect among drivers, passengers, pedestrians, and cyclists

Setting up 8,000 new cameras and 100 radar to inhibit the perpetration of violations

Incorporation of 2,000 new traffic officers over a 4-year period



## 5 Air

*Purpose:*

To control the most prevailing and health-affecting atmospheric pollutants (ozone and particulate matter), and to attain reduction of toxic contaminant emissions.

- E1** To reduce emissions of pollutants
- E2** To increase both passenger and freight transportation efficiency
- E3** To enforce the actions proposed by transportation and energy plans, and to measure the benefits yielded by the Green Plan in terms of air quality

## Strategies to carry it out



## 5 Air

### Strategies to carry it out

#### E1 To reduce emissions of pollutants



- Fifty percent reduction of nitrogen oxides and volatile organic compounds by 2012
- Reduction of at least 80 percent of suspended matter particles (10 microns or less) emissions by 2012
- Reduction of 10,000 tons of industry-generated pollutants generated per year by 2012
- Enforcement of mandatory emissions verification for freight vehicles by 2009
- Replacement of 100 percent of all Mexico City Government official vehicle fleet by fuel-efficient and low-polluting units by 2012

## 5 Air

### **E2 To increase both passenger and freight transportation efficiency**



### **Strategies to carry it out**

- Introduction of new technologies for the diesel fleet in order to replace 70 percent of the vehicles by 2012
- Incorporation of clean technologies such as euro-iv, in 100 per cent of the units of the Metrobús system and the Public Transportation Network (rtp), starting in 2007
- Replacement of 5,000 microbuses by new units equipped with low polluting technologies and with larger passenger capacity, by 2009
- Replacement of 4,500 microbuses by 850 units of the Metrobús System by 2012
- Replacement of 100 percent of all taxis by less polluting units, prior to 2012
- Introduction of ultra low sulphur diesel in public transportation starting in 2008-2009

## 5 Air

**E3 To enforce the actions proposed by transportation and energy plans, and to measure the benefits yielded by the Green Plan in terms of air quality**



## Strategies to carry it out

- To support the actions proposed for transportation, climate change and energy through specific projects
- Biannual inventory of urban, toxic pollutants and greenhouse gas emissions
- Biannual modelling of the effects of the Green Plan's actions and scenarios on air quality

## 6 Waste

*Purpose:*

To implement a comprehensive and sustainable management of solid waste.

- E1** Reinforcement of packing and packaging regulations in order to reduce waste production
- E2** Reinforcement of trash separation program in households, commercial and service businesses, and industrial facilities in order to increase recycling
- E3** Creation and endorsement of recyclable materials market opportunities in order to increase the use of such materials
- E4** Modernization of waste collection, concentration, transfer, treatment, and disposal methods



### Strategies to carry it out

## 6 Waste

### E1 Reinforcement of packing and packaging regulations in order to reduce waste production



### Strategies to carry it out

- To promote new designs of packing and packaging using biodegradable material and/or easily recyclable in order to diminish generation of waste
- To sponsor a law initiative to regulate packing and packaging of products commercialized in the Federal District
- To analyze over a period no longer than two years the possibility of establishing compensatory measures in the Financial Code to urge enterprises to diminish their final waste and uptaking recycling.

## 6 Waste

**E2 Reinforcement of trash separation program in households, commercial and service businesses, and industrial facilities in order to increase recycling**



### Strategies to carry it out

- Full coverage of a separate collection system in the city by 2008
- Increase of organic waste recycling (from 3 to 30 percent) by 2012
- Increase of inorganic waste recycling (from 12 to 20 percent) by 2012
- Permanent campaigns to promote reduction, separation, recycling and reuse of waste among population
- Permanent training program for personnel performing waste disposal tasks for the Mexico City Government



## 6 Waste

### Strategies to carry it out

**E3 Creation and endorsement of recyclable materials market opportunities in order to increase the use of such materials**

- To identify and promote the establishment of improved technologies and processes, originated in Mexico or elsewhere, for better use of recyclable materials
- To implement, along with the entrepreneurial sector, environmental markets in order to make appropriate disposal of discarded tires, electric and electronic waste, expired medication, oil-based painting containers, construction debris, batteries...
- Large-scale production and use of compost by 2008
- Building of three additional plants for recycling construction debris



## 6 Waste

### Strategies to carry it out

#### **E4 Modernization of waste collection, concentration, transfer, treatment, and disposal methods**



- To achieve efficiency in the waste management system
- Building of a new waste selection plant and modernization of all others (2010)
- Construction of an integral waste management center (2010)
- Use of waste for power generation (2009)
- Permanent and methodical updating of the vehicles, machine and service equipment used in waste tasks
- Integral use of the sludge produced by Mexico City's water treatment plants and of similar materials generated by dams, river beds and pipes (2010)

## 7 Climate change and Energy

### Strategies to carry it out

*Purpose:*

To reduce greenhouse gas emissions, to endorse and reinforce renewable energy markets, and to promote adaptations to climate change among the population.

- E1** To deliver the Climate Change Action Plan for Mexico City
- E2** To endorse all actions proposed by the transportation, water, air, public spaces, waste and energy plans aimed at the reduction of greenhouse gas emissions
- E3** To reduce Mexico City's vulnerability to climate change by implementing adaptation measures for all population in general



## 7 Climate change and Energy

### Strategies to carry it out

#### E1 To deliver the Climate Change Action Plan for Mexico City

Reduction of greenhouse gas emissions through measures such as:

- Energy saving and efficient use in public, social and industrial sectors
- Regulation of equipments and promotion of their efficient use
- Promotion of alternative fuels and replacement of conventional ones
- Use of new technologies and renewable sources of energy
- Development of actions by the forest sector aimed at carbon capture



## 7 Climate change and Energy

**E2 To endorse all actions proposed by the transportation, water, air, public spaces, waste and energy plans aimed at the reduction of greenhouse gas emissions**

**Strategies to carry it out**



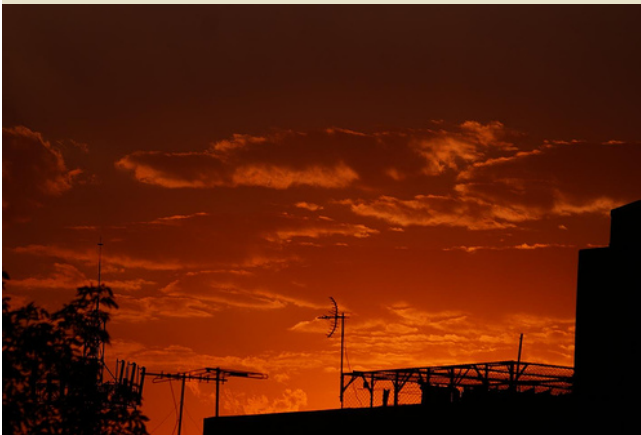
To reduce greenhouse gas emissions through specific actions funded by selling carbon bonds

## 7 Climate change and Energy

### Strategies to carry it out

**E3 To reduce Mexico City's vulnerability to climate change by implementing adaptation measures for all population in general**

- To identify vulnerable and risk zones and to warn the population about them
- To launch measures aimed at reducing the vulnerability of population in face of the climate changes and the natural phenomena generated by it
- To develop adaptation actions to avoid potential health and safety risks for the population



## Transversality

**The achievement of the Green Plan's goals requires to go beyond the technical and operational reach of government's responsibility and tasks.**

It requires to develop transversal strategies which longitudinally cross each proposed action.

Thus, we can count on gaining acceptance by society as well as supply of the means and resources necessary to fulfill the goals.

- **Funding**
- **Legal, regulative and institutional framework**
- **Environmental education and public communication**
- **Society participation**
- **Metropolization and regionalization**
- **Transparency and accountability**
- **Monitoring and evaluation**
- **Internationalization**

## Transversality

### •Funding

To guarantee that the Green Plan's actions obtain in due time and proper form enough resources for their execution, through a number of financing mechanisms.

### •Legal, regulative and institutional framework

Many of the actions proposed by the Green Plan require updating legal and regulation frameworks currently in force.

### •Environmental education and public communication

Most actions comprised in the plan will include an educational element in order to favour appropriation of them by the population and, consequently, an active social participation in their execution and fulfillment.



## Transversality

### •Society participation

The Green Plan is a live instrument which requires society's permanent participation in its monitoring, updating, and execution.

### •Metropolization and regionalization

Being part of a megalopolis, Mexico City needs to establish agreements with its neighbors so that the actions proposed by the Green Plan find a correspondance in the State of Mexico and the other states bordering the Federal District.

### •Transparency and accountability

In the new government practice and culture, transparency and accountability are imperative. They offer society certainty and confidence regarding the fact that the human, financial and material resources involved in the design and execution of the actions comprised in the Green Plan are handled with probity.

## Transversality

### •Monitoring and evaluation

A set of mechanisms for recording, monitoring and evaluation will be designed, based on fulfillment and alert indicators.

An Evaluation and Monitoring Board made up by outstanding actors of the public, social, entrepreneurial and academic fields will overlook the plan.

### •Internationalization

A metropolis of the dimensions and relevance of Mexico City must be fully integrated into the international context, both as a work of reference for other cities as well as a recipient of other global experiences.



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## The Green Plan is a live instrument which must be permanently evaluated and enhanced

### Mexico City's Green Plan Evaluation and Monitoring Board

It will acknowledge and feed-back the programs derived from the Green Plan.

It will reinforce the communication task of promoting the implementation of the Green Plan among the community.

It will evaluate and monitor the actions executed by the Mexico City Government and any other authorities in order to fulfill the Green Plan.

### The Green Plan's Evaluation and Monitoring Board

**Humberto Bravo Álvarez**, Ph. D., Atmospheric Sciences Center, unam

**Sergio Aguayo Quezada**, Ph. D., El Colegio de México

**Víctor Lichtinger**, B. A., environmental consultant

**Héctor Mayagoitia Domínguez**, Ph. D., ipn

**Marisa Mazari Hiriart**, Ph. D., Institute of Ecology, unam

**Alfonso Iracheta**, Ph. D., Colegio Mexiquense

**Rodolfo Lacy**, M. Sc., Centro Mario Molina

**Odón de Buen**, engineer, consultant

Representative

**Leonardo Álvarez**, Environment and Ecological Protection Commission, Legislative Assembly of the Federal District

Rep. **Bernardo Navarro**, uam, campus Xochimilco

Rep. **Ma. Eugenia Negrete Salas**, El Colegio de México

**Gabriel Quadri de la Torre**, engineer, environmental consultant

**Ana Romero Salcedo**, M.B.A., Presencia Ciudadana Mexicana, a.c.

**Isabelle Romieu Romero**, Ph. D., National Public Health Institute (insp)

**Jorge Sánchez Gómez**, engineer, femisca

**Carlos Sandoval Olvera**, conieco, a.c.

**Sylvie Turpin Marion**, Ph. D., uam, campus Azcapotzalco

**Eduardo Vega**, M.B.A, Faculty of Economy, unam

**Lorenzo Ysasi**, B.A., National Chamber of Commerce, Mexico City



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## Context and justification

### Land and conservation

#### The conservation land problem in Mexico City

Conservation land is a space whose natural conditions sustain a number of processes necessary to maintain the viability of the city such as aquifer recharge, local climate regulation, land sliding control, among others. It is a space closely intertwined with the city, bringing together natural, economic and social processes. Different actors converge in it, generating conditions that favor change of land use and, therefore, loss of important resourceful areas and natural processes which are essential for Mexico City and its metropolitan zone.

Undoubtedly, the conservation land problem is the result of a number of factors; however, two of them can be emphasized:

- 1.- The fast-growing urbanization of Mexico City. According to estimates made by the current General Urban Development Program of the Federal District, the urban area has advanced an hectare per day over the past sixty years. This urbanization is determined, among other factors, by the scarcity of land available for low-income housing and by the high cost of renting or buying a house.
2. The rent of land for agricultural and livestock use is lower than urban rent. This means that the owner of a parcel located in conservation land obtains a greater income by dividing it into lots and selling them. These lots will then enter an urbanization cycle, rather than being dedicated to agricultural, livestock or forest activities. According to 2005 data, the profit an hectare of crop land will yield in the best case scenario (fruit crops) adds up to 28,050 pesos per year. In contrast, the lowest selling price per hectare of urbanized land is 2.5 million pesos. This estimate does not take into consideration the environmental goods and services provided by this hectare to the city.

The evolution of land uses shows us that we are losing forest and crop land. Between 1970 and 1997, 23 hectares of forest vegetation and 173 hectares of agricultural land were lost every year. In contrast, the urban area expanded 289 hectares per year with an average growth rate of 6.1 percent. If this tendency continues, 30 percent of conservation land will be lost by 2030.

In addition to surface loss, deterioration of conservation land conditions may also be noted:

Over exploitation of aquifers and alteration of the basin's hydrologic cycle cause a loss of humidity, essential for ploughland productive processes. It is estimated that for every square meter of land being paved, around 2,000 or 2,500 liters of water are lost each year.

Change of forest land use to agricultural and residential uses.

Damage to vegetation cover, soil compaction and pollution, primarily due to presence of residual water, solid waste and chemical substances.

Deforestation and modification of microclimates produce soil erosion and excessive drainage, ultimately reducing the land's fertility.

Loss of areas providing native vegetation and biodiversity.

Loss of Protected Natural Areas (anp). Back in the 1980, a report denounced the loss of 79.8 percent of El Tepeyac, 83 percent of Molino de Belén, 84.4 percent of Fuentes Brotantes, and 92.7 percent of Cerro de la Estrella—all of them classified as anp.

Emergence of risk zones and formation of slopes and land slides during removal of soil while preparing the land for house-building or agricultural use in unsuitable locations.

## Context and justification

### Land and conservation

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## Justification

The term “conservation land” is a category already recognized by legislation and refers to zones with severe restrictions for land use. From the perspective of the city’s growth planification, the natural characteristics possessed by such zones make them ecosystems essential for the survival of Mexico City’s subsistence.

Conservation land comprises the rural area which is mainly located south and southwest of the Federal District. In the south and west, it includes Sierra del Chichinautzin, Sierra de las Cruces and Sierra del Ajusco; in the east, Cerro de la Estrella and Sierra de Santa Catarina, and the lakeside plains of Xochimilco, Tláhuac and Chalco; in the north, Sierra de Guadalupe and Cerro del Tepeyac.

In total, conservation land expands over 88,442 hectares, representing 59 percent of Federal District’s surface, distributed into 9 political delegations (municipalities): Tlalpan (29.4%), Milpa Alta (32.2%), Xochimilco (11.9%), Cuajimalpa (7.5%), Tláhuac (7.2%), Magdalena Contreras (5.9%), Álvaro Obregón (3.1%), Gustavo A. Madero (1.4%), and Iztapalapa (1.4%).

From an ecological perspective, conservation land is home to natural ecosystems with over 1,800 plant and animal species, accounting for about 2 percent of the world’s biological resources and 11% percent of Mexico’s. In this context, the Federal District ranks 23rd in Middle America’s endemic vertebrate species and 24th in endemic species per state.

In addition to this, a number of natural processes take place in conservation land, producing a variety of environmentally strategic goods and services which are essential to the Federal District’s sustainability. This means they embody the quality of life and even the survival of its population. Such processes are:

Climate regulation by means of carbon dioxide (CO<sub>2</sub>) capture. In average, conservation land zones have a carbon capture capacity of 90 tons per hectare.

Water supply derived from the conservation of hydrologic cycles, since conservation land provides 57 percent of the water consumed by the city, contributing of flow of over 19 cubic meters per second.

Declination of atmospheric pollution by retaining particulate matter.

Preservation of biological diversity

Recreational and panoramic value potential through ecotourism activities that may be developed with sustainability in conservation land.

All of the above show the importance of conservation land for the residents of the Federal District. The future of the urban zone undoubtedly depends on the preservation of conservation land.

## Context and justification

### The habitability and public space problem in Mexico City

Mexico City has 7,049 hectares worth of public spaces and green areas, which represents 10.8 percent of its urban surface. However, certain political delegations (municipalities) such as Benito Juárez, Iztacalco and Azcapotzalco devote only 1, 2 and 2.9%, respectively, of their surface to these purposes.

The city provides each resident with 5.4 square meters of green areas, which is under the international suggested standards of 9 to 16 square meters. The Benito Juárez, Magdalena Contreras and Cuauhtémoc delegations are the ones with less green areas (1.19, 1.81 and 1.82 square meters per resident, respectively).

It must be noted that public spaces and urban areas in good conditions allow the strengthening of social integration processes, and favors cultural, recreative and expressive manifestations. At the same time, they contribute to particulate matter retention, humidity conservation, noise absorption, and water filtration to the aquifer. On the other hand, the habitability conditions of such spaces improve the quality of life of a community, enhancing its urban structure and image.

It is obvious that the city faces a problem of public space and urban areas unequal distribution. Its northern, western and southern zones suffer a serious lack of these element while, at the same time, they host the largest population concentrations.

Today, public spaces display a generalized degree of neglect or invasive action. In such conditions, these spaces accelerate urban degradation in its immediate milieu, a process that brings about delinquency, drug addiction, and harmful fauna, as well as loss of environmental goods and services in the zone.

Public spaces no longer contribute to the Federal District's sustainability, since rainwater infiltration processes are incomplete and suspended matter capture actions sometimes favor the formation of heat isles.

On the other hand, the lack of resources for the maintenance of such places has advanced the degradation processes of the urban spaces and green areas.

The specific problems concerning public spaces and green areas are complex and numerous, due to several factors such as geographical and political location, characteristics of the social fabric of users and current managing mechanisms.

Neglect, environmental deterioration, isolation and lack of social participation in the management and maintenance of a public space are consequence of:

- Lack of resources
- Lack of emphasis on social integration in the current programs
- Lack of long-term vision in its planning
- Lack of models which take into consideration its maintenance
- Lack of an integral vision that considers public space as an articulating whole

It must be noted that in these public spaces we may find Mexican cypresses, willows, bondpland willows, ash trees, and cedars. All of them are classified by the Law of Defense of Urban Development and Architectural Heritage of the Federal District.

## The habitability and public space problem in Mexico City

The following are considered urban parks:

Chapultepec, Alameda Central, Alameda de Santa María, Felipe Xicoténcatl, Miguel Alemán, Revolución, San Lorenzo, Tlacoquemécatl, De los Venados, México, España, Hundido, Bosque de Tlalpan, Las Américas, Lira, María del Carmen Industrial, Parque Nacional del Tepeyac, Cerro de la Estrella National Park, De los Cocodrilos, and Ramón López Velarde.

On the other hand, under the classification of *paseo* or promenade, we may cite the following avenues:

Reforma, Bucareli, Horacio, Tlalpan, Tacuba, Mazatlán, Durango, Insurgentes, Oaxaca, Veracruz, Ámsterdam, Miguel Ángel de Quevedo, Los Misterios, Guadalupe, and Pedregal.

Public Space and Green Areas are identified as central elements in the task of physically and socially articulating the city. That is why the Federal District Government has set as a primary goal to transform Mexico City into a space of sustainable social integration by means of recovering the habitability of its public spaces and green areas.

## Justification

The plan is made up of four types of action aimed at promoting projects which involve creation and recovery of public spaces and green areas.

**1) Organizing Projects.** Their main design components are wide public spaces with social furniture, developed in observance of sustainability and habitability guidelines. They are located in large high-potential, underutilized areas. They promote social balance and protection of environment and natural resources.

**2) Integration and Development Corridors.** Urban image improvements will take place mainly in the Environmental and Recreational corridors as well as in the Development and Transportation corridors. Other actions to be taken are: rescue and consolidation of public spaces, creation of lineal parks, reforestation of green areas, endorsement of non polluting transportation systems, promotion of sports, artistic and cultural activities seeking society reconciliation through public spaces and green areas.

**3) Territorial Regulation Zones.** They refer to specific polygons of the city afflicted with a high degree of urban-environmental deterioration and targeted to be reconverted.

**4) Social Furnishing and Neighborhood Centers Projects.** They consist of specific urban intervention actions aimed at balancing the inequities between the western zone and the rest of the city, by providing new green areas and reforesting the existing ones, and creating high-quality public spaces, with an emphasis in design, urban image, furnishing and services. The general purpose is to improve the quality of life.



## Context and justification

### WATER

#### The water problem in Mexico City

The increasing demand for potable water supply—derived from the Federal District’s demographic growth—has led to the over exploitation of the Valley of Mexico’s aquifer, resulting in severe land sinkings (up to 35 cm per year on the Eastern zone of the city) and deterioration of water quality (particularly in the southeast). Additionally, the urban sprawl expansion and the associated loss of green land have reduced the natural aquifer recharge, thus increasing the hydric erosion vulnerability of the soils and overflowing the sewer lines, which must dispose of large volumes of water during rain season in order to prevent floods.

Despite the seriousness of this problem, irrational use of water is still a common issue, while residual water recycling is still low and water supply and sewer lines suffer losses by leaks that need to be fixed.

Furthermore, the large volume of water being imported is not enough to achieve balance while the administrative formalities to acquire it become increasingly complex. On the other hand, the water being discharged onto neighboring basins comes in contact with untreated, polluting waste produced by both industry and households.

Water distribution and costs in the Federal District are clearly unequal between high-end residential zones and low income areas, being the consumers in the latter the ones more deeply affected by it. The situation is worsened by the lack of an updated, centralized consumer census and by unregistered clandestine water intakes. The current generalized subsidy also contributes to the misuse of this resource.

All combined, these situations result in budgetary deficit and social unrest among afflicted sectors. It is important to point out that faulty collection of water supply dues have forced Mexico City Government to assume the cost of maintaining the existing infrastructure and building new ones in order to meet the public works deficit.

## WATER

### Justification

It is essential keep the use of hydric resources within an integral, sustainable management framework, since the current and future quality and availability of water for human consumption depend on it. The development of productive activities and the ecological balance of the Valley of Mexico basin and all neighboring basins count on it too.

Therefore, it is essential to rely on a strategy aimed at protecting conservation land through actions such as reforestation, prevention of irregular, invasive settlements, and construction of absorption pits to ensure filtration of water into the aquifer and to avoid sewage obstruction produced by barren soils being dragged into it.

On the other hand, given the fact that the city keeps growing, although not as fastly paced as a few decades ago, it is necessary to reduce both residential and non-residential consumption so pressure on the available hydric resources may decline. In order to achieve this, it is essential to create social awareness of the importance of rational water use, and installation of water saving devices at residential level.

Most importantly, under the premise that all water uses have an economic value and that water supply must be paid for, it has become perentory to establish a new policy for collecting water dues, setting up differentiated rates according to consumption volumen. It is also necessary to assess rates for non-residential consumption so that they reflect the true economic value of the resource.

The strategies previously mentioned, along with a reduction of main losses by replacing obsolete or damaged pipes, the sectoring of the network, and the regularization of clandestine water intakes, could result in savings of up to 4 cubic meters per second, an accomplishment that would allow us to reduce the current supply deficit.

Lastly, it is important to point out that re-use of treated water may partially liberate the demand of prime quality water and may also be infiltrated back into the aquifer to

help establish its balance.

## Context and justification

### Transportation

#### The air quality problem in Mexico City

Within the new urban order and sustainable development context, urban transportation acquires great relevance, since public policies have awarded it a substantial role, making it the current administration's hallmark.

Therefore, the subway system, backbone of non polluting transportation, joins the other modal systems, bringing about modernization and technological change, that is, an improved offer. The Metrobús, an essentially agile, non polluting system, is introduced as an alternative in the improvement of service quality and it will soon become the axis of urban transportation. The next 9 Metrobús lines will build up a 470-kilometer long network, served by 850 single and bi-articulated units, with zero contaminants emission.

The 28,000 minibuses currently in circulation are technologically and safety-wise obsolete. Most of them concluded their useful life four years ago, therefore its immediate replacement is imperative. In order to substitute most of the current fleet, several stages were set up. During the first stage, 20,000 units will be changed.

The Federal District Government is well aware of the necessity to preach by example. That is why the modernization of its own vehicle fleet with non polluting technologies is a priority. Two hundred gas-fueled vehicles have been replaced by electric ones and other actions will be taken to convert and/or acquire new low-emission units.

Vehicles transporting food and other sensible commodities require new options and mechanisms to lessen their impact in transit, traffic and contaminant emissions. That is why special routes will be designed for freight, seeking to reduce high traffic volumes and contamination levels.

Streets and roads re-organization actions will have an impact in traffic loads and, therefore, in contaminant emissions. The implementation of 15 reversible arteries will allow the organization of traffic flows at critical hours, in troubled points.

Street circulation is a key element of this plan. That is why the recovery of streets and roads include liberation of lanes, improvement of primary routes (such as closing of the Inner Circuit and conclusion of the Peripheral Ring's northern arc), optimization of secondary routes by means of correcting its layout and enhancing its use.

Endorsement of new non-motorized means of transportation as true alternatives will become concrete with the creation of 350-kilometer worth of cycle lanes and green areas. The fact that this network will link with other mass transportation systems guarantees safe and frequent use of bicycle.



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## Transportation

### Justification

Sustainable development actions in transportation, specially mass transportation, will lay the foundations on which the future of a sustainable city will be built, preventing with it the unfavorable tendency of environment degradation. The actions proposed in this plan seek to reverse polluting, scarce transportation, poor quality service, disarticulated systems tendencies. Furthermore, these actions pretend to promote other non polluting transportation means such as the non motorized options. A city with a safe, efficient and qualified collective transportation is what we aim for.

## Context and justification

### AIR

#### The air quality problema in Mexico City

Despite all efforts made to improve air quality in the Valley of Mexico's Metropolitan Zone (zmvm) in recent years, we are yet to accomplish the standards established by Mexican Official Norms for air quality concerning ozone and particle matter.

By the end of 2006, 59 percent of the days of the year showed ozone levels above the norm (an average of 2.2 hours per day, 130 imeca points). In contrast, the figure for 1991 was 98 percent of the days (an average of 6.6 hours per day, 200 imeca points).

Regarding matter particles of size less than 10 microns (PM10), 80 percent of the PM10 samples collected with a manual sampler had concentrations under the limit established by the last modified Environmental Health Norm, which is 120 $\mu\text{g}/\text{m}^3$  over a 24-hour period. However, the values for protecting health in events of chronic exposure to PM10 (50 $\mu\text{g}/\text{m}^3$  over a 24-hour period) are still beyond limits.

The annual limit established for PM2.5, (15 $\mu\text{g}/\text{m}^3$ ) was exceeded in 2006. Nonetheless, the average standard value for a 24-hour period (65  $\mu\text{g}/\text{m}^3$ ) was not surpassed.

Handling the zmvm's environmental problem remains a delicate issue, due to diverse, constant factor of pressure. The population has increased approximately 25 percent from 1992 to date, forcing the urban sprawl to extend over neighboring municipalities belonging to the State of Mexico. The vehicle fleet rose from around two million to almost four milllion units. As for industry, there are more than 50 000 facilities of the most diverse fields and sizes. Consequently, fuel consumption is very high: it has been estimated to be equivalent to 44 million-liters of gasoline each day.

## Justification

### Air

There are specific factors for the zmvm that should be accounted for in order to design and implement programs that continue to improve air quality, thus reducing damage to the population's health.

According to health studies concerning ozone, if the current average concentrations were reduced to comply with the Norm of Health Protection, the following could be avoided: around 20,500 hospital admissions and 132,500 emergency room visits both due to respiratory diseases, productivity and wellbeing losses adding up to 15 million-days of adult restricted activity, over 200,500 asthma attacks and more than 2,500 children with symptoms.

Regarding the PM10, the benefits that could be obtained as a result of reducing the current concentrations to meet the Health Protection Norm, is the avoidance of over 2,000 hospital admissions due to respiratory, heart and cardiovascular diseases; over 26,000 visits to the emergency room for respiratory problems and loss of productivity and wellbeing resulting in 9 million-days of adult restricted activity and over 940,000 working days destined by women to take care of their sick children; approximately 3,600 asthma cases in children, around 6,700 new cases of chronic bronchitis, and over 1,000 chronic cough cases in children. On top of all of this, we should also consider the declining impact in crops and ecosystems.

The purpose of reducing the emission by each transported passenger is challenged by the fact that the scarcity of employment and services near new housing developments, force zmvm residents to travel long distances daily, with the consequent transit saturation, high fuel consumption and long commuting hours. Serious decisions must be taken to address this problem in order to offer a mass transportation which is safe, efficient, modern, equipped with clean-technology. At the same time other transportation alternatives should be explored by other social actors; some of them could be school buses, industry personnel transportation, and use of non-motorized means.

Furthermore, it is necessary to consider the needs of infrastructure on the peripheral zones of the Federal District, where most streets are not paved pavement, while land previously devoted to agricultural, use is now deprived of its vegetation cover and, once is commercialized in an irregular manner, it will become the site of a new building. These areas have become generators of particulate matter and in order to reduce such emissions, reforestation and paving programs should be designed and implemented.

In order to keep a permanent monitoring of the pollution levels is necessary to strengthen the tools of air quality management, a measure that could contribute to reduce contamination by merely keeping an efficient and effective operation that will yield better emission inventories. This would also allow the continuance of research projects on air quality and its impact on the health of the zmvm population.

## Context and justification

### Waste

#### The waste management problem in Mexico City

Mexico City's 8,720,916 residents produce approximately 12,500 tons of solid waste each day. The daily solid waste generation is 1.4 kilograms per capita.

The pursued goal is to achieve a Sustainable Solid Waste System with a profit-earning management as well.

The Federal District has undergone certain changes in its environmental policy regarding its solid waste management: from a simple waste collection has gone to a integral management of solid waste, affecting the service-providing infrastructure and establishing obligations for every solid waste generator.

The obligations for the users must focus on the separation of solid waste. High-volume generators, special-handling waste producers, reusers and recyclers, they all must have solid waste management plans.

As for delegations, their obligations deal mainly with the supply of separated collection services; previously they should inform and guide the users, and offer training to all of their waste management personnel.

In regard to the Central Government and the Ministry of Public Works and Services, their responsibility is to maintain the separation of waste during its passage through the infrastructure under their command. The Ministry of Environment is in charge of establishing an environmental policy of solid waste management.

Strategies, guidelines and goals for implementation of measures and actions aimed at the integral management of solid waste in Mexico City are part of the Integral Management of Solid Waste for the Federal District Program, 2004-2008, a document including a diagnosis of this subject, which sets up the criteria for developing actions tending to solve this problem.

It is necessary to make the current solid waste management efficient. This task should include aspects such as coverage and quality of collection service, controlled management of the disposal site, institutional strengthening, financial handling and collection of dues in order to achieve a Sustainable Solid Waste System.

Great waste generators should be made aware of their condition by charging them dues in accordance to the waste volumes produced, that is: "if you pollute, you pay for it".

In order to advance in this direction, society's cooperation and participation is required, as well as competitiveness, transparency and accountability in order to gain the confidence of consumers and to attract investments from the entrepreneurial sector.

## Waste

### Justification

A new waste disposal system should have as its goal an integral management so that it can reduce the quantity of solid waste sent to sanitary landfills. An example of this is the fact that by applying management plans since 2004, the Federal District currently receives accurate information from at least 1,290 establishments managing 2,300 tons of solid waste each day. This information offers information concerning origin and final destination, quantity and kind of waste. Its management allows better planning and operation of the system.

Furthermore, integral management plans for some wastes in the Federal District has allowed successful implementation of economic instruments generating markets and productive chains for waste such as: construction debris, toner cartridges, cardboard, batteries, lubricating oils and used tires. As a result of these plans, 50,000 tons of solid waste have been withdrawn, a quantity equivalent to five days of disposal in sanitary landfills.

However, despite being nationally renowned for its solid waste management and having a collection service coverage of over 90 percent, Mexico City still has a long way to go for diminishing generation and disposal of waste volumes. At the same time services, urban image, efficiency and effectiveness need to be

improved in order to make this a cleaner, more human city.



## Context and justification

### Climate Change and Energy

#### Background and problems faced by Mexico City because of climate change

Strong evidence points out the fact that developing countries and cities are highly vulnerable to the effects of climate change, and their environmentally sustainable economic and social development may be challenged by it. The capability to address these growing global concerns without obstructing the development process of those countries is perhaps one of the greatest challenges of our time.

Climate change as we experience it in the beginning of the twentieth-first century, has had differentiated impacts on countries and regions. For this reason, social and natural systems have had to spontaneously create processes of adaptation and accommodation to the new climate situation. These responses constitute a first but insufficient reaction for the survival of humankind.

Many communities and regions that are vulnerable to climate change are as well subject to forces such as population growth, natural resources exhaustion and poverty.

The policy to diminish the pressure exercised on the resources, to improve the situation concerning environmental risks and increase the well-being of the poorest members of society may simultaneously advance sustainable development and equity, improve adaptation capabilities and decrease vulnerability to climate tensions. If climate risks are included in the design and implementation of development initiatives, then sustainable equity and development may be promoted, thus diminishing vulnerability to climate change.

Climate and weather have been determining factors in the development of all societies. If we think on the impact hurricanes or droughts have, we could realize that those regions afflicted by extreme meteorological conditions may suffer considerable damages, equivalent to backward stepping several years development-wise.

However, it is necessary to consider that disasters are not totally natural. It is true that meteorological threats are greater in certain regions, however, the experienced damage is greatly related to the capability to resist their impact. More precisely, it may be said that climate risk depends on the intensity and frequency of the threat (i.e. hurricanes or drought), but also on the vulnerability, that is, the extent in which several sectors (cities, countries, regions) may be affected.

This concept has gained great relevance due to the fact that the global warming tendency is expected to continue and, with it, the climate changes. Mitigation of greenhouse gas emissions do not seem to change such trend.

## Justification

### Climate Change and Energy

One of the central goals of the Federal District Government's climate change policy is to establish an institutional framework that promotes mitigation and capture of greenhouse gases by implementing specific measures concerning saving and efficient use of natural resources, regulation and efficient use of equipments, replacement and endorsement of alternative fuels, use of new technologies and renewable sources of energy, actions by the forest sector to capture carbon and preserve the reservoirs. At the same time, this goal should allow to establish basic guidelines for adaptation to be observed by Mexico City's residents in the face of the global warming's effects.

All of the above is the result of an environmentally committed policy of the Federal District Government, particularly in regard to reducing greenhouse gases emissions, in synergy with reduction of pollutant emissions local policies, as well as seizing opportunities in the context of the Kyoto Protocol, the Clean Development Mechanism and other instruments emerging all over the world, within the United Nations Framework Convention on Climate Change (unfccc)

In order to establish specific lines of action, we must start by producing diagnosis to define the main greenhouse gas emissors—such as a inventory of emissions— and to identify and evaluate the factors of vulnerability of Mexico City in the face of global warming. Finally, we should propose concrete measures for the reduction and capture of greenhouse gas emissions, as well as adaptation measures to climate change aimed at local population.

Available greenhouse gas inventories and tendencies for Mexico City include emissions generated according to each type of fuel and energy consumed by each industrial branch, for each kind of vehicle, by household end-use, by commercial and service sectors, for each type of use by the public sector, those originated in the sanitary landfills and in the forest and agricultural and livestock sectors. Because of this, those inventories have become an essential element to make decisions in climate change subject, since they provide judgment elements, with solid scientific foundations that allow to identify which sectors are the main emissors, and which forces guide their changes. At the same time, these elements help to evaluate the better options of mitigation and capture, as well as the effectiveness of the enforced measures.

On the other land, the climate data analysis for the recent decades in the Valley of Mexico show that this region is highly vulnerable to extreme climate conditions, whatever they are: higher temperatures, heavy rains or droughts.

Mexico City will have to consider strategies to address many of its problems, taking into account that it will have to adapt to new forms of climate variation.

The preventive adaptation measures that are currently being designed will have to be followed immediatly in order to prevent the effects of climate change, with an emphasis on those measures that generate local benefits, even if no significant climate changes take place. The implementation of such preventive measures will favor the future adoption of emergency actions, if this should ever be necessary.



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## Justification

### Climate Change and Energy

One of the common topics in the international debate on climate change is the design of mitigation measures, reinforced by specific projects that seek to reduce greenhouse gas emissions and to increase the fixation of carbon in earth deposits. The Mexico City Government is not obliged to reduce these gases, yet it has established actions to achieve this purpose.

Through its Ministry of Environment, the Federal District Government has assumed the responsibility to promote and enforce measures to reduce such emissions. These projects include saving and efficient use of natural resources; regulation and efficient use of equipments; fuel substitution and promotion of alternative fuels; use of new technologies and renewable energy sources; development of actions by the forest sector to capture carbon, and more efficient practices involving the most important emitters, according to the local inventory of greenhouse gases.

It is important to take into consideration that most of Mexico City's residents live in difficult economical conditions, with serious shortcomings in basic areas such as health, water supply, education, housing, safety, etc.

Facing this harsh reality, the limited resources of the city must be directed towards the most imperative and basic problems of the population, leaving projects such as the mitigation of greenhouse gas emissions in serious disadvantage. That is why this kind of actions are critically dependant of the resources obtained by selling emission reductions.

The programs and projects developed up to now demonstrate that only with great effort these measures have achieved certain success, but they have been suspended because of lack of the extra economic resources that could grant them financial viability. In the future, those resources should be generated by the sale of emission reduction.