GOBIERNO DE LA CIUDAD DE MÉXICO | SECRETARÍA DEL MEDIO AMBIENTE

PROGRESS REPORT

ENVIRONMENTAL AND CLIMATE CHANGE PROGRAM

FOR MEXICO CITY 2019-2024

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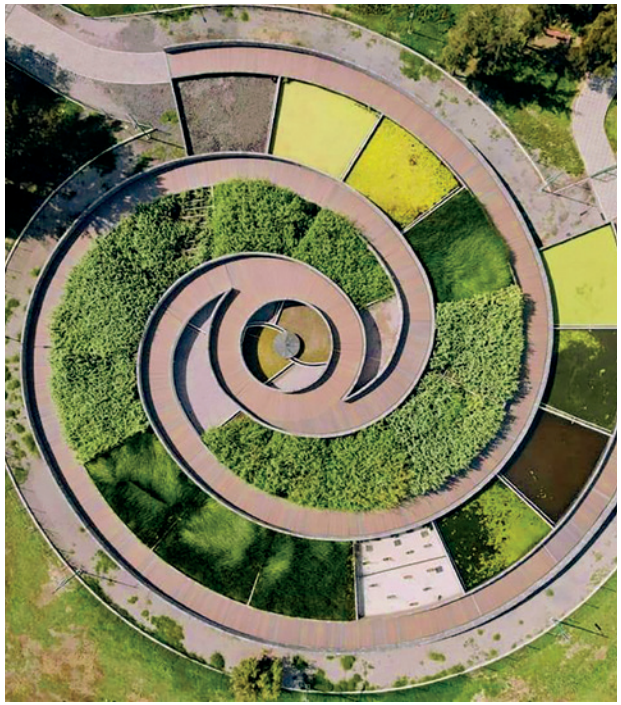

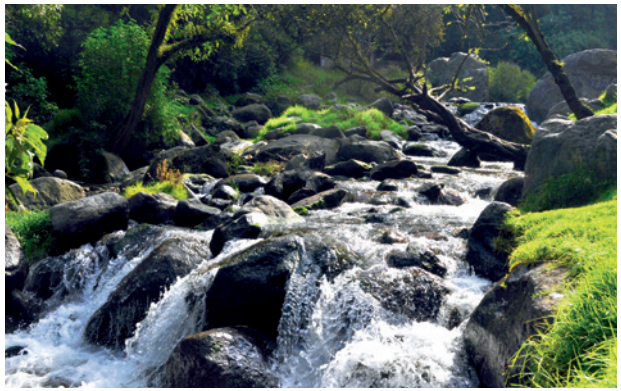

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OVERVIEW

In Mexico City we are implementing the Environmental and Climate Change Program as an integral part of our development policy. The objective is to improve environmental conditions in all aspects, build resilience and reduce carbon emissions through innovation, science and technology, all with the participation of our communities. We believe that society's well-being is only possible if we make an equitable and sustainable transition, which is why we adhere to seven strategic pillars:

First. We will make a greener city by planting 40 million trees and other plants, and bringing back more than 1,000 hectares of public parks.

Second. We will restore 85 kilometers of polluted rivers and waterways, converting them into clean water ecosystems that offer new public spaces.

Third. We will guarantee the basic right to water and improve the region's water situation. We are working on sustainable water management and doubling investment in infrastructure to improve distribution and prevent leaks. We also harvest and use rainwater, a very important resource.

Fourth. Our goal is to be a zero-waste city. By 2024 we will reduce the volume of waste going to landfills by 50 percent compared to 2018. In addition, we are increasing the level of recycling and composting, and we are fostering a circular economy.

Fifth. We will build sustainable mobility with the acquisition of 500 trolleybuses; we will expand the construction of our Cablebús system by 30 kilometers, renew our bus fleet with clean technologies, and renovate the Metro and Metrobús mass transit systems.

Sixth. We will improve air quality through tougher standards for motor vehicles and other actions to reduce emissions.

Seventh. We will create a solar city. In conjunction with the federal government we are building a solar park in the center of the city that will be the largest in any urban area in the world, with an extension of 25 hectares of roofs and the capacity to generate 20 megawatts.

- 1,129,805 tons of CO_2e during the year.
- Which is equivalent to removing 160,546 vehicles from circulation for one year.
- Equivalent to removing all vehicles from circulation in Mexico City for 25 days.
- Equivalent to the benefit of reforestation and care of 2,874,801 pine trees (Pinus ayacahuite) for 50 years.

We are convinced that to reduce the catastrophic effect of climate change, we need a new developmental model, education, health, access to water and a healthy environment. These are all rights, not privileges. That is why in Mexico City we are working to reduce inequalities, for the well-being of all. The government and the people will continue to fight together against climate change and for the construction of a sustainable city, with a future, for the joy and well-being of all its residents.

ANNUAL CO_2e MITIGATION by pillar

Urban and Rural Revegetation

74,249 tons
of CO_2e per year

The actions of this pillar help preserve the biocultural wealth of the city, reducing the impact of climate change and improving air quality. They also mitigate urban heat island effects and recover public spaces—all of this while creating green jobs and a fair economy for the producers of the Suelo de Conservación.

Rescue of Urban Rivers and Other Bodies of Water

2,818 tons
of CO_2e per year

The actions of this pillar seek to guarantee the basic right of water for everyone, reduce the exploitation of aquifers to obtain sustainable levels, reduce flooding and save energy. These actions also lower emissions that cause climate change, since less energy is needed to transport water to the city.

Sustainable Water Management

154 tons
of CO_2e per year

The actions of this pillar contribute to the recovery of the city's ecosystems, reducing flood risks, rising temperatures and other effects of climate change. They also help replenish aquifers to provide fresh water and create green spaces for everyone.

Zero Waste

403,468 tons
of CO_2e per year

The actions of this pillar allow us to implement circular economy initiatives and reduce exploitation of natural resources, protecting the biodiversity of our city. Here we promote innovation and green jobs, while reducing air, soil and water pollution caused by waste generation.

Integrated, Sustainable Mobility

59,420 tons
of CO_2e per year

The actions of this pillar expand access to clean, efficient, safe and integrated public transportation that improves air quality and public health. The goal is to recuperate the use of public space for more sustainable and non-motorized mobility, with a focus on improved technologies that reduce the emissions causing climate change.

Air Quality

556,549 tons
of CO_2e per year

The actions of this pillar contribute to reduce air pollution, which in turn reduces the negative impacts on public health and economic development.

Solar City

33,147 tons
of CO_2e per year

The actions of this pillar seek to provide clean energy for Mexico City, promoting efficient energy use practices and improving air quality—all of this while we generate savings for household economies and promote technological innovation.

PILLAR 1. URBAN AND RURAL REVEGETATION

Annual mitigation

74,249 tons of CO_2e per year

Reto Verde

As part of Reto Verde, a total of 15,802,063 trees, shrubs and other types of plants have been planted in Mexico City since 2019. Many of them are the result of increased production in Mexico City's plant nurseries.

The San Luis Tlaxialtemalco nursery went from producing 250,000 trees in 2018 to more than 5 million in 2020, with native seeds collected from local urban forests. Meanwhile, production at the Nezahualcóyotl and Yecapixtla nurseries quintupled between 2017 and 2020. Between January 2020 and March 2021, more than 42,000 plant species native to the Valley of Mexico were produced.

To reintroduce native plants from the Valley of Mexico Basin and expand the range of vegetation available in the city, seeds of native and pollinator plants from the Valley of Mexico are collected each year and processed in the city's nurseries. So far, 80 native species have been produced.

15,802,063 plants and trees have been planted

Benefitting more than **9 million people in Mexico City**
In the Nezahualcóyotl and Yecapixtla nurseries, 42,639 native plants from the Valley of Mexico have been produced.

In 2019 and 2020, 450 pollinator gardens were created.

In 2020, five courses were given to 93 women to generate job skills that contribute to recovering biodiversity in the city through the creation of pollinator gardens.

Starting in 2019, rehabilitation projects have been carried out in protected areas to improve ecological conditions and open spaces for public use.

92% of the goal established for 2024

32,130 in 2020

10,509 in 2021

In 2019, 112,595 Acacia, Agapanthus, Echeveria, Kalanchoe, Lagerstroemia, Lantana, Lavandula, Ligustrum, Psidium, Rossmarinus, Salvia and Sedum were planted along the median strip of the Calzada de Tlalpan roadway.

Altepetl Program

With a historic investment of 94,133,00 U.S. dollars per year, the Altepetl Program benefits 13,000 people yearly to carry out reforestation, cleaning, sanitation and management of forest ecosystems, protecting and ensuring the environmental benefits that the natural and rural areas of the city provide to its inhabitants.

2020

7,700 subsidies were granted in an area of roughly 7,700 hectares of conservation land.

The Altepetl Program provides employment to 25,000 inhabitants in rural areas with high levels of poverty. This has allowed the reactivation of the land and, in turn, the promotion of short supply chains, prioritizing direct contact between producer and consumer.

We also support the development of beekeeping units to restore the health of honeybee populations. This enabled 154 beekeepers, with 3,000 registered hives, to go from producing nine to 15 kilograms of honey per hive.

800 grants for livestock production

Approximately 1,600 direct grants for agricultural production

10 strategic initiatives for community strengthening

5,200 grants for the creation and/or strengthening of productive systems

Socio-environmental rehabilitation of natural protected areas

Nature tourism in the Suelo de Conservación, through agro-ecological reconnection and the consolidation of a network of tourist routes is a great economic and conservation opportunity for this area of the city. During 2019 and 2020:

- We improved Mexico City's rural bikeway and its eight bike stations.
- We developed the San Luis Tlaxialtemalco Agrotourism Route, which included the cleanup of 1,000 hectares of the chinampera area, as well as signage in the region to improve the marketing of local products.
- We supported the improvement of 24 trajineras and the rehabilitation of four others in San Pedro Tláhuac and San Andrés Mixquic; 18 through the Nelhuayotl component of the Altepetl program and six through the Centli component.
- We created environmentally friendly infrastructure that facilitates the use of and enjoyment by the population in the Xochimilco Ecological Park, the Mexico City Ecological Park, five sites in the Sierra de Guadalupe Natural Protected Area (NPA), four in the Sierra de Santa Catarina NPA, and five sites in Cerro de la Estrella.

Five NPAs were rehabilitated with comprehensive socio-environmental action:

1. Sierra de Guadalupe: revegetation of 16,651 m² with native plants and rehabilitation of 3.7 hectares between 2019 and 2020.

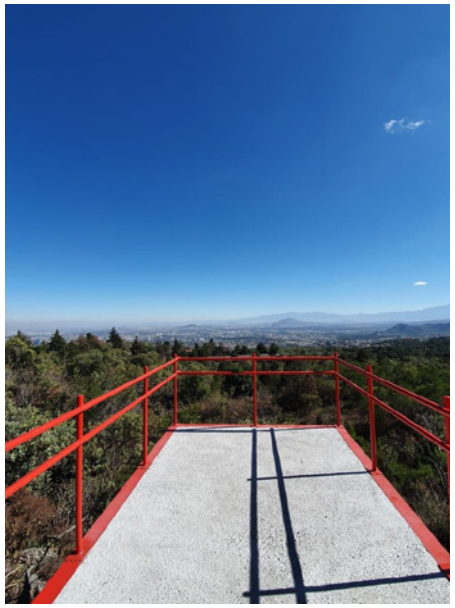
2. Sierra de Santa Catarina: revegetation of 19,776.39 m² and rehabilitation of 33.7 hectares between 2019 and 2020.

3. Cerro de la Estrella: revegetation of 144,277 m² and intervention of 27.9 hectares between 2019 and 2020. Construction of six gabion dams and six guard stations for research.

4. Parque Ecológico de la Ciudad de México: revegetation of 5,574 m² and rehabilitation of 2.07 hectares between 2019 and 2020.

5. Parque Ecológico de Xochimilco: Revegetation and rescue of existing species and development of construction and maintenance works.

Conservation and revegetation of other NPAs, with the planting of more than 25,000 native species plants in La Loma Ecological Conservation Area, Bosque de las Lomas Conservation Area, Parque Nacional Desierto de los Leones, and Parque Nacional Insurgente Miguel Hidalgo y Costilla. Conservation and management of Tarango, Mixcoac, La Loma section of Becerra Tepecuache, Tacubaya, and Magdalena-Eslava ravines



Forest fire prevention

In Mexico City, thousands of brigade members, both men and women, are committed to protecting the biocultural heritage of our forests, which is why they work to prevent and combat forest fires and are trained in fire management.

The area of conservation land affected by fires was reduced 49% from 2019 to 2020, from 4,352.04 hectares to 2,232.79 hectares.

From January 2019 to March 2021, numerous activities were carried out to **prevent forest fires on conservation land**

Creation of more than 100 firefighting brigades

Clearing of **20 hectares**

Clearing of **384 km of fire-breaking trails**

Opening of firebreaks along 8 km

Creation of **4 km of black lines**

Upkeep of **55 km of roads**

Pruning of 54 hectares

Management of 2,086 m³ of fuel

Planting of 5 million trees

Conservation and rehabilitation of urban forests and parks

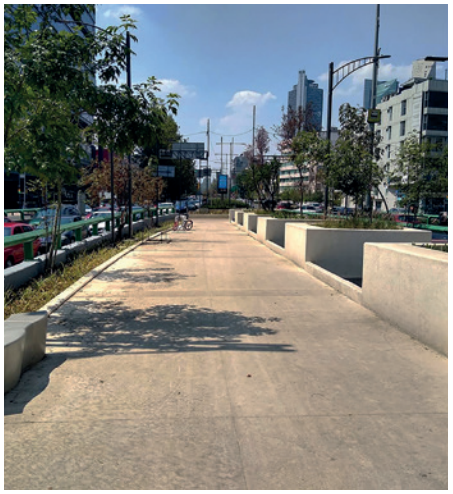
In order for people to enjoy and enjoy more and better public spaces with green areas, through the Sembrando Parques program, the following places have been rehabilitated, improved and opened to the public since 2019.

The recovery of these public spaces helps generate spaces for recreation and reconstruction of social activities as well as helping to improve air quality and mitigate climate change effects such as heat islands and flooding.

1. Parque Cuitláhuac
2. Gran Canal
3. Parque Cantera
4. Periférico Oriente
5. Parque Ecológico Xochimilco
6. Rehabilitación del Bosque de Aragón
7. Zoológico de Chapultepec
8. Zoológico San Juan de Aragón
9. Eje 6 Sur
10. Leona Vicario
11. Av. Chapultepec
12. Deportivo El Vivero
13. Bosque de ChapulTepec (Memorial Panteón Dolores, Bosque Clausell Y Paso del Conejo, Ermita Vasco de Quiroga, Parque de Cultura Urbana y Parque Cri Cri)

Revitalization of Chapultepec Avenue (Second Stage)

- **86,396 m²** rehabilitated
- **9,070 m²** of green areas
- **179** new trees
- **88,216** new plants, shrubs and ground covers



Parque Leona Vicario

- **7,307 m²** of surface area rehabilitated
- **900 m³** of improved substrate
- **Ecological pathway of 2,036 m²** of surface area

Construction of the Parque Gran Canal Linear (First Stage)

Completed section from Del Peñón Ave. to Eje 2 Norte

- **4.1 hectares** in 2019
- **17,120 m²** of rehabilitated green areas
- **22,282 m²** of central gardens rehabilitated

Bosque de Chapultepec

- **29,800 trees** and other plants
- **Soil restoration** in three areas of the forest
- **Maintenance** of green areas, canals and walkways
- Environmental restoration of **40 hectares of the 3rd Section**
- Rehabilitation of the Seed Library
- Urban and landscape rehabilitation with **20% progress of the Bosque de Chapultepec Master Plan**

Parque Ecológico Xochimilco

- Conditioning of **3 km of roads and 35 hectares** comprising Lake Huetzalin
- Maintenance of grass in **21.67 hectares**, planting of **3,500 m²** of grass and revegetation of **652 m²** with ornamental plants
- Conditioning of a greenhouse and nursery for the production and maintenance of plants
- Maintenance of **1,225 ahuehuete and ahuejote trees**
- Rehabilitation of museum space

Parque Cuitláhuac

- **Maintenance of 40 hectares**
- Expansion of the treatment plant
- **New wetlands area**
- Landscape architecture in each rehabilitated area

El Vivero Cuautepec Sports Complex

- **37,600 m²** of green areas
- **11,740 plants and trees**

Median Pathway of Periférico Oriente

- **15,700 m²** of green areas rehabilitated
- **48,000 m²** rehabilitated
- **465,068 plants**
- **491 trees**

Restoration of the Bosque de San Juan de Aragón (First Stage)

- **186,773 m²** rehabilitated
- **50,000** plants
- **2,500** trees
- **8,241.93 m²** of green areas rehabilitated
- **Urban Wetland 123,115 m²** of area of influence
- **11,056 plants** placed in the wetland
- Creation of the first refuge for biodiversity
- Creation of 5 pollinator gardens

PILLAR 2. RESCUE OF URBAN RIVERS AND OTHER BODIES OF WATER

Annual mitigation

2,818 tons of CO_2e per year

Integral recovery of bodies of water

Since 2019, numerous maintenance and cleanup actions have been carried out in canals, ditches, irrigation canals and wetlands of Xochimilco and Tláhuac, such as removal of water lilies, weeds, organic and inorganic waste, dredging and clearing. The rivers improved to date are: San Buenaventura River, Arroyo Santiago, Eslava River and Magdalena River. The work included the cleaning of 300,538 m² of riverbed, the removal of 2,585 m³ of organic and inorganic waste, the collection of 72 m³ of debris, the clearing of 107,616 m², and the care of 3,383 trees.

In the upper basin areas of these rivers, 233 soil and water conservation works were completed and rehabilitated to reduce erosion and sediment dragging, prevent slopes from collapsing and conserve soil, and prevent flooding in the lower parts of the basin.

Riverbed cleanup

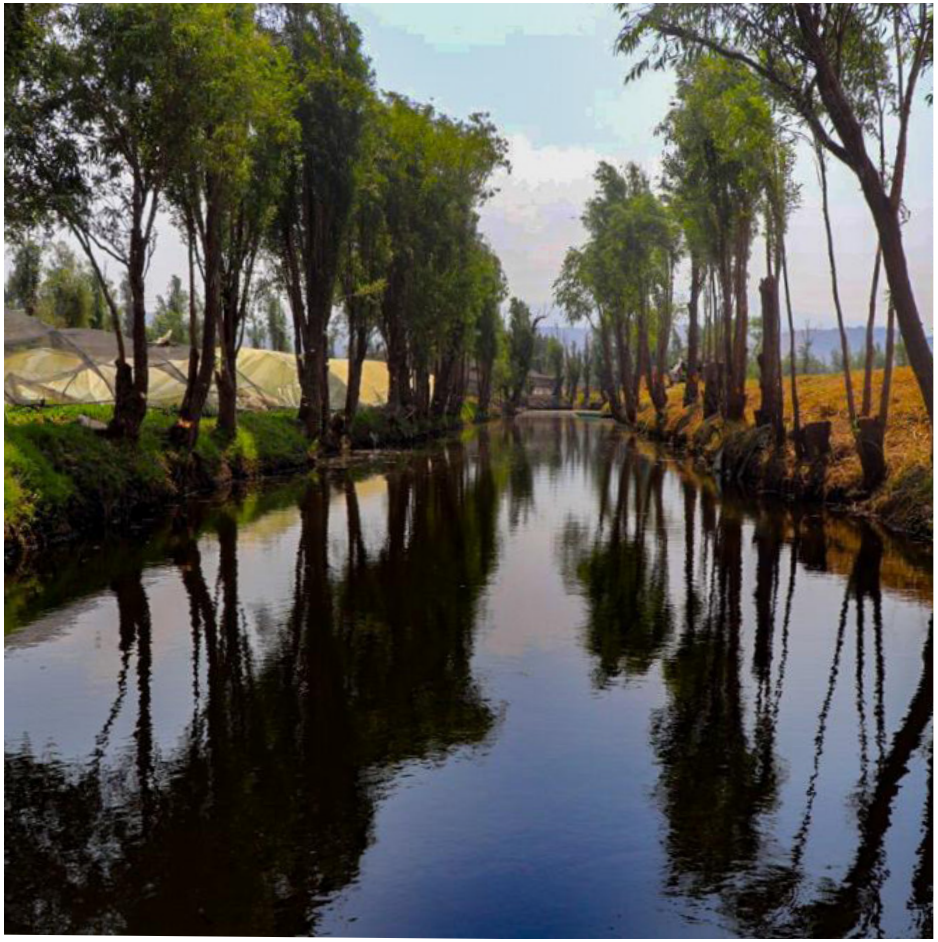
San Buenaventura River, Arroyo Santiago, Eslava River and Magdalena River

Cleaning of 300,538 m² of riverbed
Removal of 2,585 m³ of waste
Collection of 72 m³ of debris
Clearing of 107,616 m²

Pruning of 3,383 trees

This preserves riverbeds and ravines, avoids the dragging of waste, reducing the risk of flooding.

In February 2021, the Mayor de Iztapalapa, San Lorenzo and La Quebradora, as well as the Ciénegas Chica and Grande lagoons were cleaned. Between August 2020 and July 2021, 535,567 forest, fruit and pollinator species were planted, reaching a total of 717,060 plants throughout 2019-2021, achieving a carbon capture of 2,818 tons of co2e for the year.



Creation of wetlands

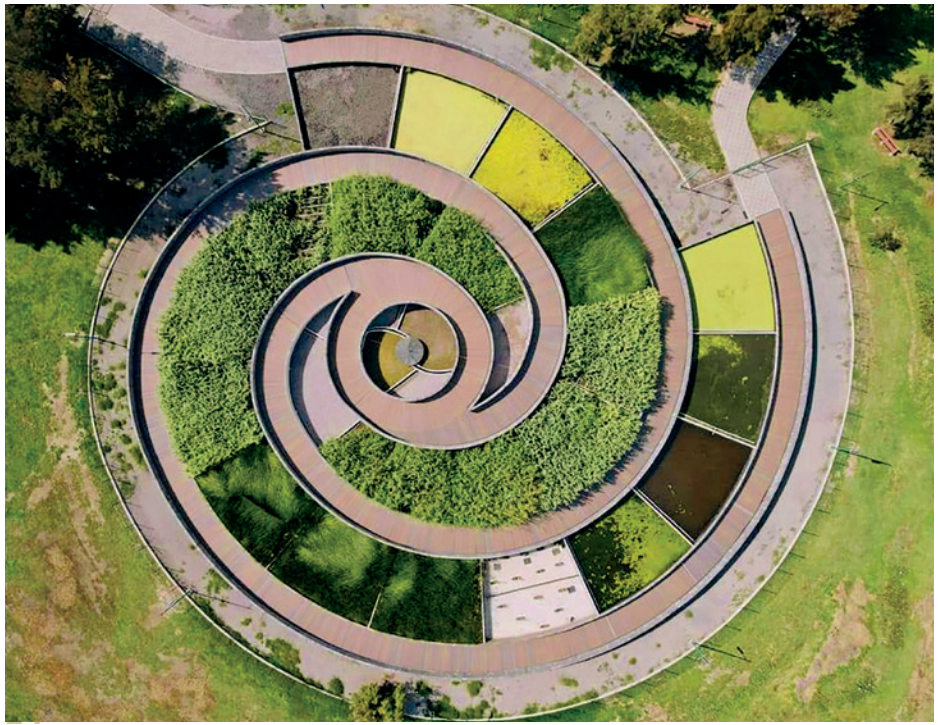
Wetlands represent a link to the city's past and also a commitment for a better future. These ecosystems are rich in biodiversity, provide water and food, and protect from floods and droughts. Taking advantage of the topography of the sites and the presence of rainwater, Mexico City made a commitment to build one wetland per year until 2024.

In the Sierra de Guadalupe Natural Protected Area, a wetland system consisting of three dams was built, while in the Santa Catarina Natural Protected Area, a shallow channel was created to capture and channel rainwater runoff from the highlands in the southeastern part of the park.

Wetlands are also being built in the Bosque de Aragón, in the Chapultepec Zoo, in the recently created Parque Cuitláhuac, and in the Cerro de la Estrella Wastewater Treatment Plant (WWTP). In the latter, in addition to the construction and initiation of a hydrobotanical pavilion, a wetland for advanced treatment of wastewater has been included.

On August 28, the second stage of the rehabilitation of the Bosque de San Juan de Aragón was completed, covering an area of 38.6 hectares and the recovery of 12,000 m² of permeable green areas for water filtration.

The wetland was restored and 1,000 m² were set aside for a bird beach to protect endemic resident and migratory birds.




Nuestra lluvia
COSECHA
DE LLUVIA
Ciudad de México
Nuestra casa

PILLAR 3. SUSTAINABLE WATER MANAGEMENT

Annual mitigation

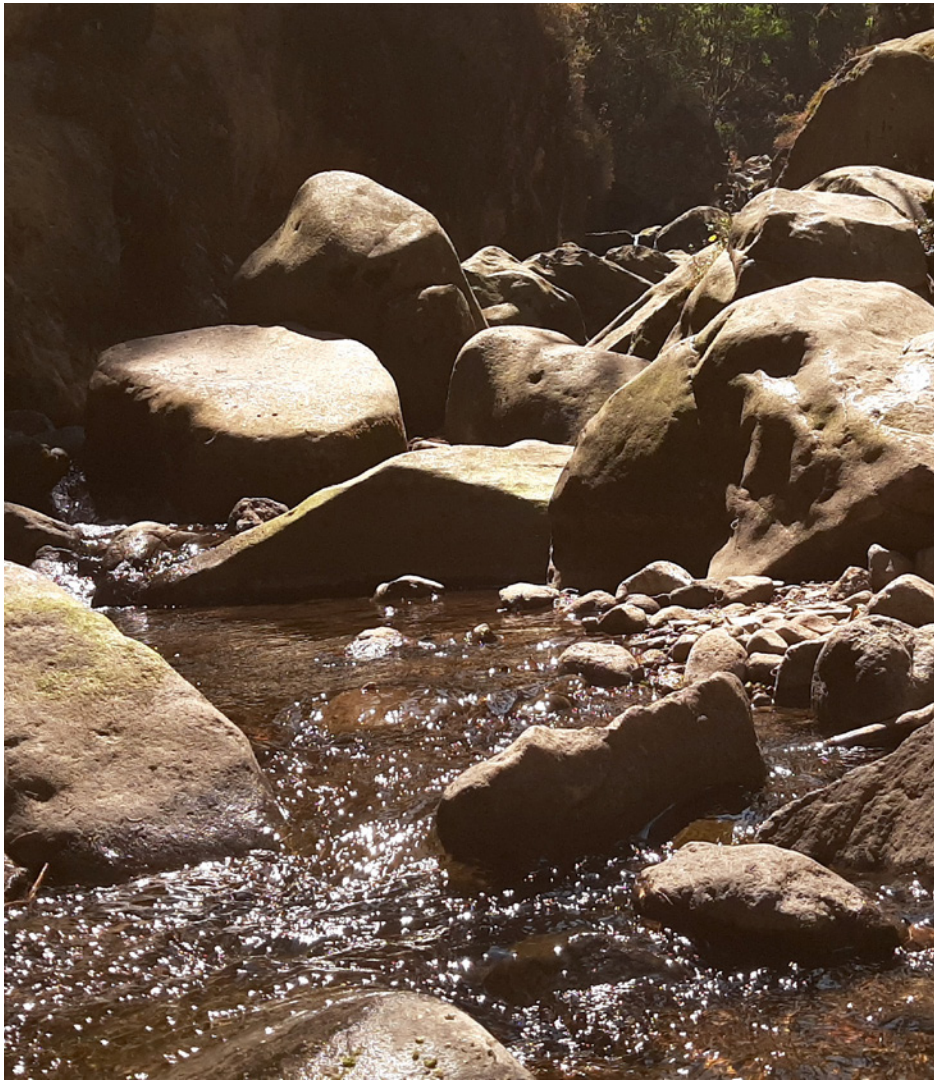
154 tons of CO_2e per year

Improvement of water supply

In addition to moving toward sustainable use of the aquifers and water sources that supply Mexico City, we are committed to guaranteeing access to drinking water for everyone.

This why we are improving the operation of the distribution network, allowing greater control of the water volume entering and leaving the system and, above all, regulating pipe pressure. Through this action and the deployment of 150 brigades, we reduced system leaks by 24 percent in 2021.

We are currently building, adapting and refurbishing the measurement and control sites in the distribution network. Sectorization of the network is one of the first steps to facilitate gradual control. This allows daily supply of water to all residents, as well as the recovery of water that was lost in leaks and the closure of wells that produce poor quality water and generate damage due to subsidence. So far, 169 programmed hydraulic sectors have been completed, and by the end of 2021 we expect to build nine more sectors.



Activities carried out:

Modernization of remote data transmission

Powering of instruments with alternative energies

Global server

New metering technologies

Modernization of backup and recording of measurements

Strengthening of SCADA systems at the control station

Open databases

Data security and protection

Comprehensive asset inventory, maintenance, procurement and replenishment program

Potabilization and wastewater treatment

We are currently studying the feasibility of increased use of treated water for Mexico City. To date, an experimental water treatment plant with a capacity of 20 liters per second has been developed for treated wastewater from the Cerro de la Estrella plant. Its flow will be used to artificially recharge the Zona Metropolitana aquifer.

We completed the construction and equipping of 24 deep wells that had reached the end of their useful life or no longer provided projected volume. And we are over halfway complete with another ten deep wells, benefiting approximately 218,000 inhabitants. We rehabilitated 18 potable wells to increase water supply, as well as rehabilitating 33 more wells in the Lerma System in the State of Mexico, benefiting 417,645 inhabitants. In addition, another 17 potable wells are in the process of being rehabilitated, which will benefit 660,000 inhabitants.

Eleven water treatment plants were rehabilitated, benefiting more than half a million inhabitants, and eight others were refurbished. By the end of 2021, we expect to complete the refurbishment of five more plants and the rehabilitation of another four.

Refilling and sustainable use of aquifers

In addition, we are working on the Master Plan for the Management of the Aquifers of the Mexico City Metropolitan Area, which will establish appropriate sites for artificial refilling of aquifers and define the wells that should be taken out of operation due to poor quality or soil subsidence.

Rainwater Harvesting

The Cosecha de Lluvia program is being implemented in neighborhoods with high poverty rates and water supply problems. From 2019 through the first half of 2021, 23,903 harvester systems were installed in the boroughs of: Iztapalapa, Xochimilco, Milpa Alta, Tlalpan, Tláhuac, Azcapotzalco, Gustavo A. Madero, Coyoacán and Magdalena Contreras. Of these, 135 were installed with resources from the Fondo Mixto de Cooperación Española. In two years, 20 percent progress has been made toward the 2024 installation goal.

Through this program, the flow of water into storm drains and the water distribution pressure of the network are reduced. This also reduces extraction of water from aquifers, as well as the energy required to pump and transport water to homes, thereby reducing pollution emissions.

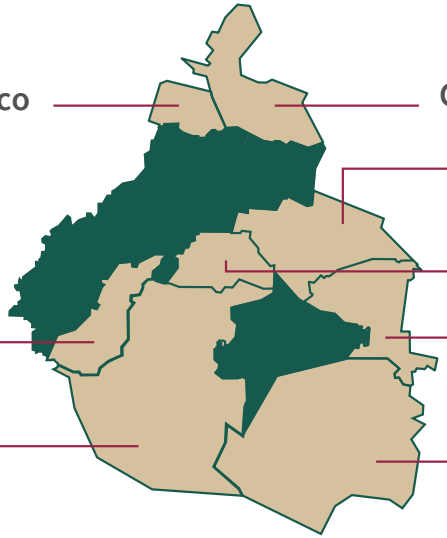
Rainwater harvesting guarantees water in homes for five to eight months of the year and frees up time allocated for unpaid domestic work, mainly for women, who have historically been assigned the task of supplying and carrying water in the family.

To date, the 25,377 installed systems have saved 312,137 kilowatt hours of electricity per year, which

represents 154,196 kilograms of carbon dioxide equivalent mitigated annually.

In this sense, each system represents a saving of 12.3 kilowatt hours per year of electricity and 6.1 kilograms of carbon dioxide mitigated per year.

From 2019 to the first half of 2021, we installed **25,377 harvester systems**



Of these, 135 were installed with resources from the Fondo Mixto de Cooperación Española.

It is estimated that 63,000 m³ of rainwater will be harvested annually, which represents an electricity savings of 77,490 kWh per year in pumping water to the homes, which is 39,132.5 kgCO2e per year of mitigation.

65 % of the beneficiaries of the program are women.

In two years we have advanced 20% of the six-year goal of installed harvesters.

These actions:

Reduce the flow of water to drains, which translates into less flooding

Allow self-sufficiency in water supply at least 5 to 8 months of the year.

Reduce overexploitation of aquifers and improve recovery by reducing demand.

97% of the beneficiaries have more water since they started harvesting rainwater.

98% of the beneficiaries who have harvested rain are satisfied with the quality of the harvested water.

Maintenance of dams and drainage network

During the dry season, we work to recover the storage, regulation and conveyance capacity of the flow of sewage and rainwater for the rainy season. In extreme cases, this can prevent floods, landslides and resulting losses for the city and its inhabitants. So far, 12 dams have been rehabilitated, and capacity recuperation work continues annually.

During 2019, work was carried out on nine dams, with 299,103 cubic meters of silt extracted. In 2020, work was done on 11 dams, with the removal of 169,253 m³ of silt.

We have made progress in maintaining the drainage network in optimal conditions for the removal of rainwater and wastewater from the entire metropolitan area. This has required rehabilitating the deep drainage system, clearing of bodies of water, and constructing and replacing collectors and sewers, as well as comprehensive rehabilitation to increase the capacity of the Interceptor Oriente Sur, the rehabilitation of the discharge box of the Gran Canal to Lumbrera 8 Interceptor Oriente, and the maintenance of a total of 32 km of deep drainage. Work was completed to recover the conveyance capacity of the Hondo River, as well as to recover the regulation capacity of six dams, five lagoons and one river, benefiting 680,000 people.

Se concluyeron los trabajos para recuperar la capacidad de conducción del Río Hondo, así como la recuperación de la capacidad de regulación de seis presas, cinco lagunas y un río, en beneficio de 680,000 personas.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PILLAR 4. ZERO WASTE

Annual mitigation

403,468 tons of CO_2e per year

Reduction of waste generation

Valorizing and using waste as raw material to manufacture new products reduces greenhouse gas emissions in production processes, prevents waste from reaching landfills and, therefore, reduces the risks associated with pollution.

In Mexico City, the sale, distribution and delivery of disposable plastic bags, forks, knives, spoons, mixing sticks, plates, straws, cotton swabs, balloons and balloon sticks, cups and their lids, food trays and tampon applicators is prohibited. This will help reduce the amount of waste generated and move towards a city free of single-use plastics by 2024.

The new Azcapotzalco Transfer Station and Sorting Plant has a daily reception capacity of 1,400 tons of solid waste and a daily processing capacity of 1,000 tons, including 60 tons per day of recyclable materials and 300 tons per day of inorganic waste with high calorific value. With an investment of 1,868,00 U.S. dollars, it is today the most modern plant in Latin America.

Sustainable management of municipal solid waste

The new Azcapotzalco Sorting Plant will allow sales of recyclables of almost 235,800 USD, while the savings from the transportation and final disposal of waste would be 1,999,700 USD, which translates into around 4,422,000 USD saved per year. In addition, the improvement in waste management has resulted in savings of 39,306,400 USD by reducing the amount sent to landfills.

Mexico City is moving toward sustainable production models for industry and commerce, with the application of shared and extended responsibility models, through the involvement of all sectors, the generation of jobs, the development of markets for second-use materials, recyclables and fuels derived from waste, as well as development and innovation in waste management and utilization processes to improve air, water and soil quality.

The new high-tech Azcapotzalco Sorting Plant will carry out two core activities: the reintegration of materials into the value chain through the recovery of recyclable by-products, and the selection of solid waste with high calorific value to be compacted and used as refuse-derived fuel (RDF) in cement plants.

The plant also ensures the proper disposal of inert and organic waste, which due to its composition or moisture content, is not suitable for energy recovery. By 2024, 72,720 tons of recyclable materials will have been recovered and 363,600 tons of waste will have been used for energy recovery. This will translate into the mitigation of 395,960 tons of carbon dioxide equivalent per year.

In the case of the city's organic waste, from 2019 to date, 1,100 tons per day have been composted, which represents 401,460 kilograms of carbon dioxide equivalent mitigated annually. The goal is to increase this to 4,400 tons per day by 2024, which would allow the mitigation of 1,120,185 tons of carbon dioxide equivalent per year.

Sustainable management of construction waste

A construction and demolition waste treatment plant with a capacity of 2,000 tons per day was installed in the borough of Miguel Hidalgo. There are plans to install two more treatment plants in the Bordo Poniente, which will begin operating in 2022, and one more in the Parque Cuitláhuac, which is in operation since this year. With the plant in operation, 4,015 tons of carbon dioxide equivalent are being mitigated per year.

We also worked on the project for the NACDMX-007-RNAT-2019 standard, which establishes the integration of recycled construction and demolition waste in both public and private sites.

The goal is to reach a total of 8,000 tons of recycled construction and demolition waste per day.

Monitoring of final disposal sites

Currently, the Santa Catarina, Bordo Poniente stages I, II, III and Prados de la Montaña landfills are being conserved and maintained through the conservation of the final or surface cover, through irrigation and pruning, as well as the control of gas and leachate emissions.

In the case of Santa Catarina, for safety reasons, gases are burned passively in 36 wells in the landfill. It is estimated that 608 cubic meters of gas are burned per hour. The Prados de la Montaña landfill has a biogas collection network that burns an estimated 463 cubic meters of biogas per hour.

Harnessing the energy potential of waste

The Bordo Poniente landfill closure project will prevent the dispersion of deposited waste and will extract and use the biogas produced to generate 14 megawatts of electricity per year.

It is estimated that the emission of 285,000 tons of carbon dioxide equivalent per year will be avoided, and by 2024, two years after the utilization plant has been in operation, the emission of 243,165 tons of carbon dioxide equivalent per year will be avoided.

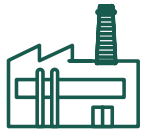
As part of the energy recovery, a modular hydrothermal carbonization plant is being built to transform organic waste into electrical energy and biomass. The biochar generation project at Bordo Poniente will process 75 tons of organic waste per day in its first phase, and will reach a total of 1,250 tons in its final stage (fourth phase).

Mexico City's hydrothermal carbonization plant will have an approximate productivity of 0.66 kilograms of hydrochar for every kilogram of municipal organic solid waste or biomass.

The charcoal generated will be used as fuel by the Petacalco thermoelectric plant in the state of Guerrero. Its use is equivalent to the mitigation of 75,281 tons of carbon dioxide equivalent per year, without considering the transfer of the material to Guerrero.

The Petacalco thermoelectric plant produces more than 5 percent of the electricity generated in the country and has six carboelectric generating units in operation, with a nominal capacity of 350 megawatts each and a total installed capacity of 2,100 megawatts.

Harnessing the energy potential of waste



We estimate that by the year of completion of the Bordo Poniente landfill closure project, the emission of 285,000 tons of CO2e will be avoided.

The biochar generation project at Bordo Poniente will process 75 tons of organic waste per day, in its first phase, and will reach a total of 1,250 tons upon completion.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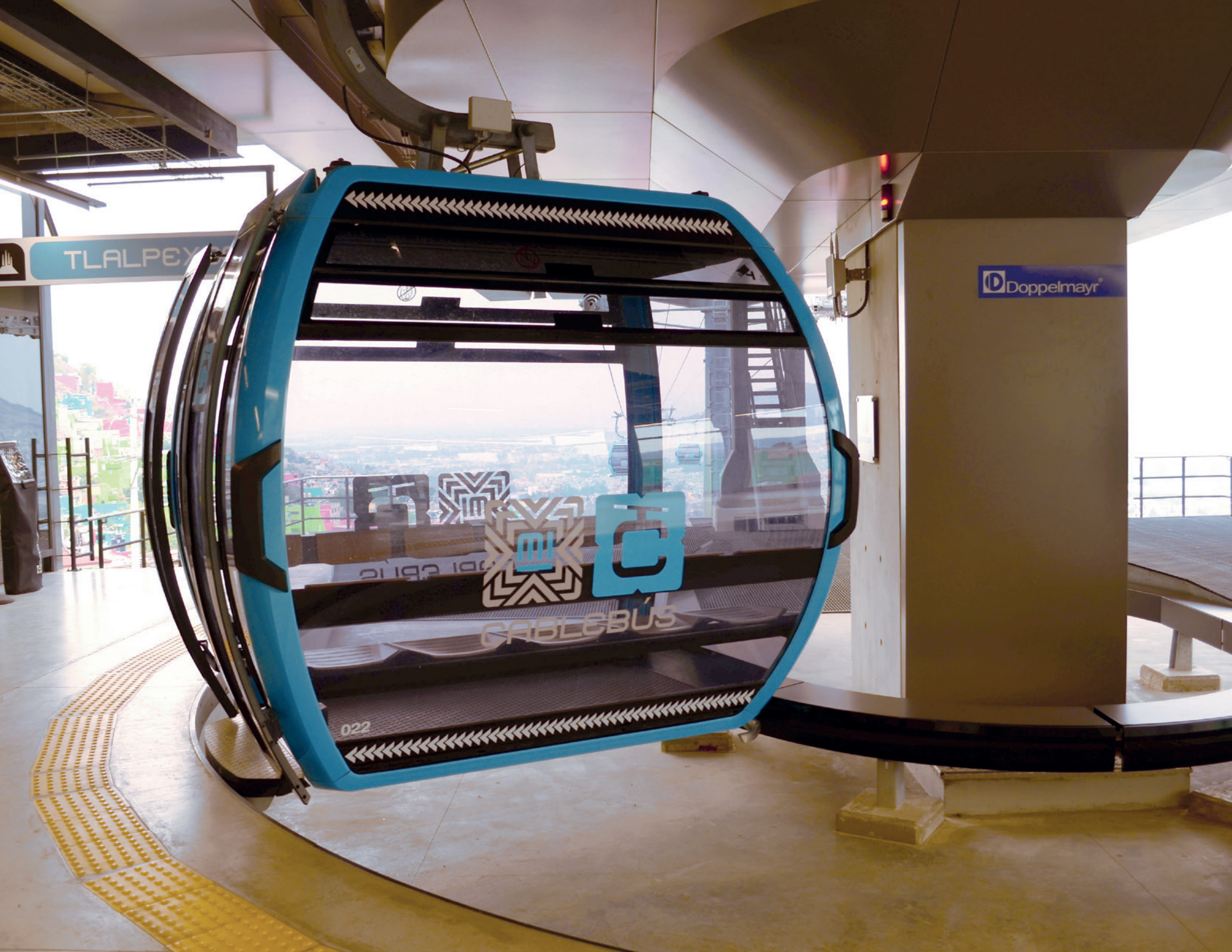
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PILLAR 5. INTEGRATED, SUSUSTAINABLE MOBILITY

Annual mitigation

59,420 tons of CO_2e per year

Expansion of the public transportation network

A total of 173 buses were acquired for Metrobús, ten of which are electric, thus avoiding the emission of local pollutants. The first of these ten units began operating in September 2020 on Metrobus Línea 3, which runs from Tenayuca to Etiopía. For 2021, we plan to replace 54 of the first units of Línea 3, of which nine will be electric.

Metrobús Líneas 3, 4 and 5 were extended; and the expansion of the La Joya, El Caminero and Colonia Del Valle stations of the Insurgentes Corridor of Metrobús Línea 1 was carried out. In order to offer greater accessibility to public transportation, two Cablebús lines were built: Línea 1 runs from Cuautepec to Indios Verdes and Línea 2 from Constitución de 1917 to Santa Marta.

Línea 1, inaugurated on July 11, 2021, is 9.2 kilometers long, with six stations and the capacity to transport 144,000 people per day. This reduces travel times from 90 to 33 minutes. Línea 2, inaugurated on August 8, 2021 in Iztapalapa, has a length of 10.6 kilometers and seven stations, making it the largest urban cable car line in the world.

It has the capacity to transport 108,000 people per day and reduces travel times from 1 hour and 15 minutes to 36 minutes. Línea 2 of the Cablebús mitigates 7,720 tons of carbon dioxide equivalent per year, which is equivalent to planting 20,000 pine trees and caring for them for 50 years or removing 1,097 vehicles from circulation for one year. Both Cablebús lines will mitigate 16,653 tons of carbon dioxide equivalent per year.

The elevated Trolebús, which is a great improvement to mobility for the east side of the city, is 50% complete and will run on the Ermita Iztapalapa roadway, on a 7.5 meter high structure for its exclusive use.

The Programa de Movilidad de Barrio includes the operation of golf-cart taxi, motorcycle cabs and bicycle cabs in the Historic Center and other parts of the capital. An ordinance plan has been prepared with guidelines for the operation of the units.

Maintenance and modernization of mass transit

To reduce the carbon footprint of concessioned public transportation, we promote the renovation and maintenance of vehicles, and we carry out document and physical-mechanical checks to ensure compliance.

Currently, 284 obsolete buses have been replaced through scrapping, which represents a mitigation of 470 tons of carbon dioxide equivalent per year. In addition, more than 15,000 vehicles from 100 of the 103 existing routes were inspected to improve the registration of concessioned transport operators. The renewal of microbuses allows the reduction of emissions that are causing climate change and the reduction of emissions that cause poor air quality and affect public health. This will generate greater road safety and greater accessibility for public transport users.

To reduce emissions and renew the vehicle fleet, we are promoting technology upgrades and electromobility for light vehicles. Through the replacement of 172 cabs, to date there has been a reduction of 2,063 tons of carbon dioxide equivalent per year. In addition, we plan to expand the RTP fleet to 800 units in order to meet demand and reduce the carbon footprint of public transportation. To date, around 300 new RTP units have been incorporated, which has allowed a reduction of approximately 87 tons of carbon dioxide equivalent each year.

To expand the trolleybus network, we are working on the opening of new corridors and the acquisition of 500 new units. During the last year, 193 new trolleybuses have been added to the Electric Transportation Service (STE), 50 of them articulated, achieving a mitigation of 384 tons of carbon dioxide equivalent per year.

Major maintenance work was carried out on the Tren Ligero track system:12.7 kilometers between the Tasqueña and Xochimilco terminals, benefiting 110,000 people who use this transport daily, which improves energy efficiency in the movement of trains.

Progress is being made in the comprehensive program to improve and modernize the Metro Collective Transportation System (STC), including the acquisition of trains on Línea 1, renovation of stations, lighting, improvement of infrastructure and equipment for train maintenance workshops, rain mitigation projects, and completion of the first stage of modernization of the Buen Tono Substation and Rectifier Substations on Línea 1.

Promotion of cycling as a mobility mode

To increase bicycle use, we are investing in infrastructure that includes expanding the network of bicycle lanes to new areas of the city, installing bike racks, and increasing the Ecobici service.

During the present administration, 139.15 km have been built and in 2021 we plan to build 28.5 km more, corresponding to the new Insurgentes bike lane, which was added during the COVID-19 pandemic to promote sustainable mobility and facilitate safe-distance travel. This achieves a mitigation of 8,224 tons of carbon dioxide equivalent each year.

Additionally, in March 2021, a smart bike lane was inaugurated in the second section of the Bosque de Chapultepec, made with recycled plastic, which allows for temporary water storage and prevents flooding during rainy seasons. This bicycle lane has the potential to capture 600 million cubic meters of water per year, which will reduce the water shortage in times of droughts.

To date, eight high-volume and medium-volume bicycle parking lots have been set up. By 2024, sixteen are expected to be in operation.

PILLAR 6. AIR QUALITY

Annual mitigation

556,549 tons of CO_2e per year

Proaire 2021-2030

The improvement of air quality is one of the most important challenges facing the Mexico City government.

We estimate that the implementation of ProAire will reduce emissions by between 20% and 35%, depending on the pollutant. We also expect an additional benefit in terms of climate change, estimated to be a 10% reduction of greenhouse gases.

To advance the goal of a transparent city with clean air, we are working with the authorities of the State of Mexico and the federal government to standardize and update regulations and carry out joint actions.

Cooperation areas

- Environmental monitoring
- Health and communication
- Research
- Institutional follow-up and sustainable urbanization

Priority sectors with potentia for emission reductions

Transportation
- Private
- Passenger
- Cargo

Domestic
- Use of VOC-emitting products
- Propane gas leaks

Commercial and Industr
- Propane gas use
- Industrial pollutants
- Electric power generati transmission and distribution

Fugitive particles
- Dust dispersion in roadways
- Tillage and harvesting
- Vegetation and soil was

Waste
- Open burning of garbag and waste
- Solid waste in landfills
- Wastewater

Improvements to the Vehicle Verification Program

The Mandatory Vehicle Verification Program makes it possible to inspect and control vehicles, specifically the level of emissions generated through an on-board diagnostic system; it also promotes proper vehicle maintenance, thereby achieving a 20 percent reduction in emissions.

Promotes the production and use of cars with lower environmental impact

Hologram “00” for vehicles with better environmental performance

Mechanical inspection of taxis

Prevents the emission of approximately 20% of pollutants from vehicles

Evaluates pollution emissions and greenhouse gases

Since 2020, the program has been improved to expand the review of automobiles and evaluate both emissions of different pollutants and greenhouse gases. Currently, the "00" hologram is granted to vehicles with the lowest emissions, which encourages the production and use of models with lower environmental impacts.

Vehicle verification centers are now also authorized to check braking systems, suspension and steering alignment. This service is voluntary and free of charge for personal vehicles.

The inspections allow the identification of vehicle malfunctions, promoting repair and maintenance, which, in addition to preventing accidents, produces an environmental benefit, since faulty tires and poor alignment increase fuel consumption by up to five percent, which translates into more pollution.

This measure contributes to reducing 556,549 tons of carbon dioxide equivalent per year.

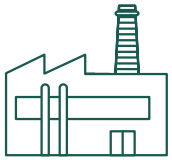
Reduction of volatile organic compounds

The environmental norm NADF-011-AMBT-2018 promotes the installation of equipment to control emissions of volatile organic compounds in stationary sources, as well as the exchange of raw materials for inputs with lower environmental impact and good operating practices. The application of the norm allows for a 30 percent reduction in emissions from businesses, services and industries that generate volatile organic compounds.

The Mexico City government is preparing two official Mexican norms that will regulate the content of volatile organic compounds in household cleaning products, cosmetics, paints and architectural coatings.

NADF-011-AMBT-2018 Reduction of volatile organic compounds (VOC) emitted by fixed sources under the jurisdiction of Mexico City.

The use of emission control technologies is promoted.



Potential for 20-30 % reduction of VOCs

Five SEDEMA projects with guidelines for the use of architectural coatings and machinery with lower environmental impact

Machinery with lower emissions

Low volatile organic compound coatings

Reduced emissions in the city's urban and natural environment

The acquisition and use of low volatile organic compound paints and cleaning products content is also promoted in the bidding processes of the Secretary of the Environment, in addition to the application of general guidelines for the use of low-emission construction machinery in construction projects. To date, five natural protected area projects have been tendered with guidelines that will promote lower environmental impacts.

Mexico City, in coordination with the federal government, worked to ensure that Petróleos Mexicanos - Transformación Industrial (PEMEX-TRI) distributes gasoline with lower volatility during the months of March to August in the metro area, since volatility is a characteristic that directly affects the emission of volatile organic compounds. With this action, vehicles entering the metropolitan area of the Valley of Mexico will generate lower emissions during the most problematic ozone season

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Technological innovation

The Mexico City government, through the Secretary of Education, Science, Technology and Innovation, supports technological innovation projects to reduce pollution, including the following:

- The Bioenergy Innovation Laboratory at the Central de Abasto
- System for hybridizing internal combustion vehicles
- Biofuel production plant
- Improved transportation (motorcycle and bicycle taxis)
- Vehicle technology evaluation laboratory
- Air purification using microalgae


7:30:44
LATINO SEGUROS

PILLAR 7. CIUDAD SOLAR

Annual mitigation

33,147 tons of CO_2e per year

Solar park in the Central de Abasto

In collaboration with the Government of Mexico, we are building a solar park on the roofs of the Central de Abasto (Ceda), the largest ever built inside a city, which will have an installed capacity of 18 megawatts and will generate electricity equivalent to the consumption of 15,240 homes.

With the initiation of this project, a reduction of emissions equivalent to 13,852 tons of carbon dioxide per year is estimated, as well as annual savings of up to 3,611,275 USD derived from the self-generation of energy consumed in the common areas of the Ceda, to which approximately 20 percent of the energy generated in the photovoltaic plant will be delivered, while the remaining 80 percent will be used to cover energy consumption in other activities carried out in the city.

The project began with a review process of the electrical and structural conditions of the Central de Abasto and will be completed by the end of 2022. Almost 20,144,500 USD will be allocated from the Fund for Energy Transition and Sustainable Use of Energy. The plant will generate co-benefits such as an improvement in air quality and a boost to the local economy through the associated works, particularly in terms of green jobs.

Biodiesel production

Another step that puts Mexico City on the road to energy transition is the use of the energy potential represented by used cooking oil waste, which is generated in various establishments in the food sector and in Mexico City homes.

Currently, the Central de Abasto has a biodiesel production plant, which has the capacity to transform two daily quantities of 1,550 liters, totaling 3,000 liters of used vegetable oil into this bioenergy source per day, and which, when used as a bioadditive, can be mixed with fossil diesel up to five percent.

This plant uses technology developed by the Instituto Politécnico Nacional (IPN-GBD-1000). The biodiesel production replaces an equal amount of fossil diesel and generates an estimated reduction of 10,796 tons of carbon dioxide equivalent per year. Working meetings were held with the IPN and the Red Transporte de Pasajeros (RTP) to agree to carry out biodiesel tests for their units and for those of the Metrobús network.

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Solar heaters in homes

During 2020 and the first half of 2021, as part of the promotion of the use of renewable energies, 1,548 solar water heaters were installed in new homes under the Mexico City Reconstruction program. The goal established for 2024 is to install 7,617 systems, which will strengthen the economy of families and consolidate this market in Mexico City.

With the completed goal, up to 3,208 tons of carbon dioxide will be mitigated annually, which is equivalent to the carbon dioxide captured by 164,564 Pinus ayacahuite trees over 20 years of useful life; this will help improve both the air quality of the city and the quality of life for its residents.

Photovoltaic systems in public buildings

Mexico City's economy is strongly focused on commerce and services, so promoting the decarbonization of the non-residential buildings requires the implementation of new strategies that lead to an increase in energy consumption efficiency and the use of renewable energy potential in these sectors, including in government buildings.

In order to identify actions that will enable the decarbonization of buildings, progress is being made in the design of the roadmap, which is expected to define a formal goal for buildings of each type of use, establish a comprehensive plan with intermediate goals by 2030, implement a system for monitoring, reporting and surveillance of building emissions, as well as mandatory design benchmarks for new buildings, mandatory standards and adjustments to existing ones to reduce energy consumption in buildings, and identify innovative financing structures and incentives.

To accelerate the energy transition, the Mexico City government has set a goal of installing photovoltaic systems (PVS) in 300 local government buildings.

In addition to combating climate change, these systems will allow for savings in electricity costs. Estimating an average of 50 kWp of installed capacity per building, it is expected to generate 23,270 MWh of energy per year. With the possibility of generating savings of around 3,734,100 USD per year while avoiding the emission of 12,000 tons of CO_2. If we consider the 25-year average life of the photovoltaic systems, the investment would lead to a reduction of 300,000 tons of CO_2 and a savings of 93,352,700 USD. The program is progressing and more than 100 technical visits have been made to public buildings, identifying 76 feasible sites for the installation of photovoltaic solar energy systems.

We are also working on the implementation of the Transición a Edificios Públicos Sustentables program in 50 city government buildings, which will allow greater energy efficiency and the use of technologies that take advantage of renewable energy sources.

To this end, since August 2020, the Inter-American Development Bank supported the energy audit of the 50 buildings and found a potential annual reduction of greenhouse gas emissions of up to 1,800 tons of carbon dioxide equivalent.

Energy efficiency and clean energy in private buildings

To encourage the implementation of energy efficiency measures in private buildings, Mexico City launched the Reto de Edificios Eficientes, which seeks to reduce the energy consumption of participating buildings by 10 percent during the first year.

To encourage the use of renewable energies in micro-, small- and medium-sized companies, incentives are provided for the installation of solar energy systems, solar water heaters and/or photovoltaic modules, with a percentage of support corresponding to 40 and 20 percent of the total cost of the systems, respectively. In three years of government, we have supported 130 MSMEs for the acquisition and installation of solar energy generation systems; during the last year we installed 21 photovoltaic systems and four solar water heaters.

In addition, technical and economic consultations are provided for the installation of these systems; mechanisms are established to control the quality of the systems and the installations carried out; and MSMEs are linked to sources of financing for the acquisition of the systems.

Through the operation of this program, a reduction of 122,871 tons of carbon dioxide equivalent is expected by 2024. The growth of the market for qualified suppliers of solar energy equipment and services is also encouraged.

Actions are carried out to guarantee the correct implementation and compliance with energy efficiency and renewable energy norms (NADF-008-AMBT-2017 and NOM-008-ENER-2001) by real estate developers.

Certifications for energy transition

Regarding NOM-008, which refers to non-residential building, the application of the Sustainable Building Certification Program (PCES) has both voluntary and mandatory compliance markers so that buildings with high environmental impacts comply with the thermal envelope standard, while at the same time, through environmental impact authorization procedures, the issuance of administrative resolutions to buildings is conditioned so that they register with the PCES and thus comply with NOM-008-ENER-2001.

In the case of NADF-008AMBT-2017, which establishes the technical specifications for the use of solar water heating in buildings, facilities and establishments, work is being done to update it to improve its understanding by construction companies and thus facilitate compliance.

By complying with NADF-008AMBT-2017, it is estimated that by 2024 a reduction in greenhouse gas emissions of up to 71,207 tons of carbon dioxide equivalent could be achieved.

With the intention of promoting technological change for the use of solar energy, strengthening the quality of installations and confidence in the technologies, as well as reducing barriers to entrepreneurship in the solar energy technology sector, the Secretary of Economic Development maintains a training and certification program for installer technicians of photovoltaic generation systems and solar water heating systems under CONOCER competency standards.

Likewise, training is provided in other sectors of the value chain, such as sales, design and sizing of solar energy systems. In the three years of government, more than 763 grants have been awarded to people interested in pursuing certification processes as solar installers under the Labor Competency Standard. Under this program, Mexico City expects to have 1,000 people trained and certified in labor competencies related to the installation of solar energy systems by 2024.

THE CITY WE WANT AND LOVE

The achievement of the goals of the Mexico City Environmental and Climate Change Program (2019-2024) depends on the effort, coordination and collaboration of the government and society as a whole. Our city is moving toward the aspirations of the future we dream of building.

Biodiversity will be recovered, natural protected areas and areas of environmental value will be restored, protected and conserved. Nature will be clearly incorporated into the urban landscape.

The conservation land will be fully protected and the sustainable use of productive land will be the engine for the rural economy and a dignified life for families of producers in Mexico City.

A better quality of life for those who live in rural communities will contribute to curb land use changes and deforestation. Irregular human settlements will be addressed and tackled from a joint perspective of environmental protection and

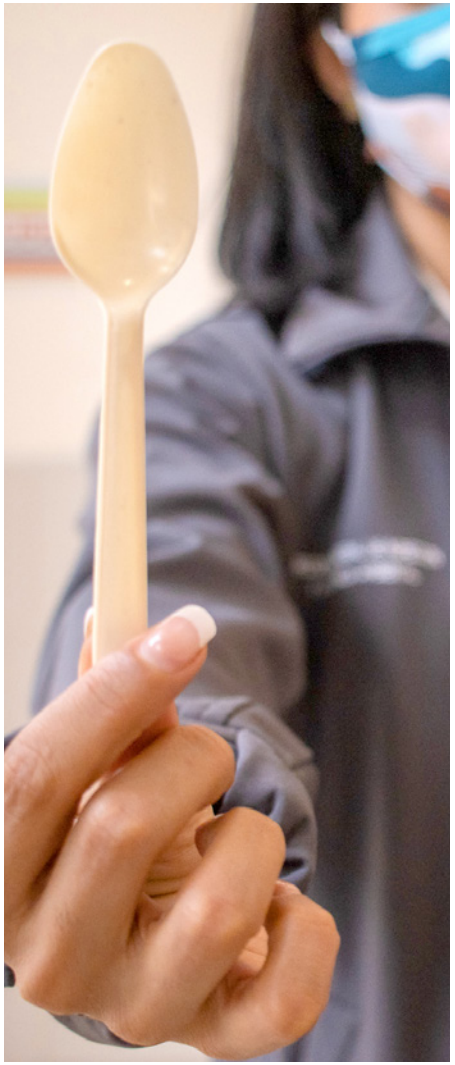
social development. Green areas will be expanded and protected, and residents will enjoy them close to their homes.

Rivers and bodies of water will be cleaned up and restored. The right to water will be a reality, with sufficient, affordable and continuous access to good quality water for everyone.

Overexploitation of Mexico City's aquifer will have stopped and current extraction will favor groundwater refilling. Watersheds will be restored, thereby reducing the negative effects of climate change.

Waste will be reused and our economic model will have shifted to a circular one, where the useful life of products will have been extended, and service and asset rental programs will be a reality. Mexico City will be a zero waste city.

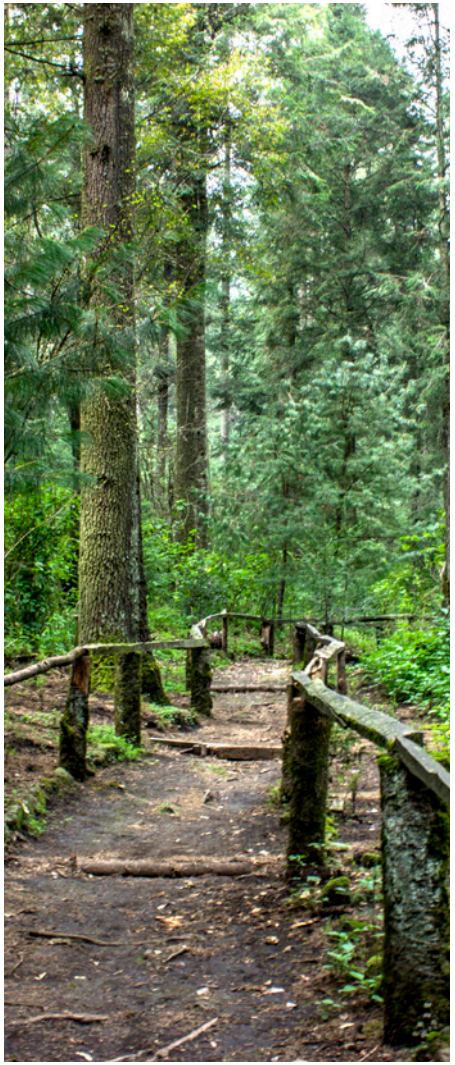
There will be integrated, inclusive, safe and clean mobility, with modern and efficient infrastructure that favors pedestrians' use of public



space and the use of bicycles and non-polluting means of mobility. All of this will accelerate the trend toward better air quality, which is necessary to protect our health.

Under this aspiration, Mexico City will fulfill its climate action commitments by drastically mitigating greenhouse gas emissions and strengthening the adaptive capacities of residents and ecosystems.

Mexico City's committed action builds a path to reconcile the conservation and protection of ecosystems and other forms of life, the reduction of social inequalities, the enjoyment of rights and the aspirations to improve the quality of life of current and future generations.



GOBIERNO DE LA
CIUDAD DE MÉXICO

SECRETARÍA DEL
MEDIO AMBIENTE