

## ADAPTATION AND MITIGATION TO CLIMATE CHANGE PLAN FOR BOGOTA (Bogota Climate Action Plan)

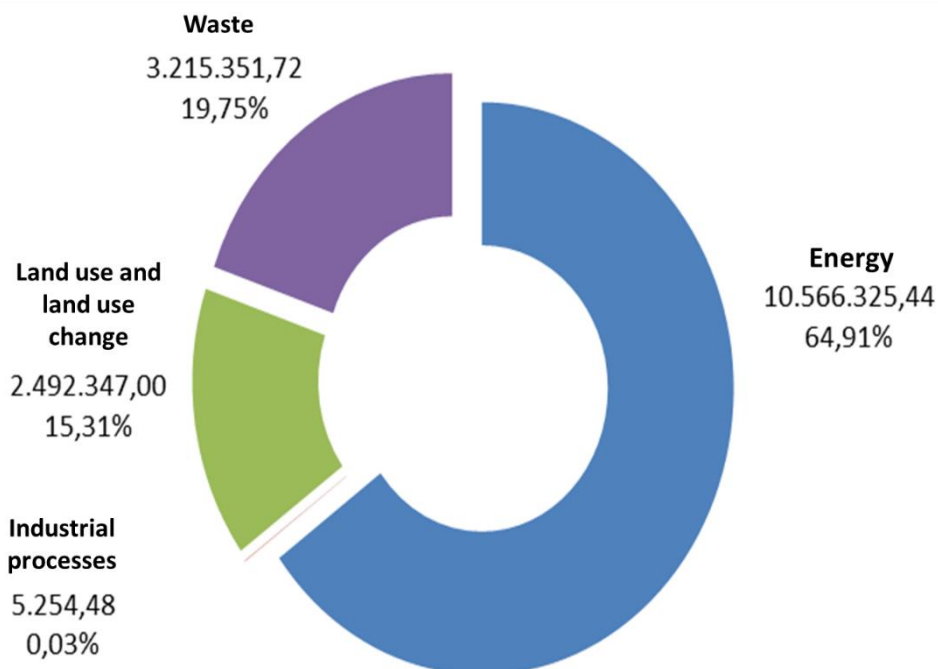
Scientists and world leaders recognize that climate change is a fact and the result of an economic model and a political vision based on the use of fossil fuels. Likewise, they identify that it is a real and disturbing manifestation: at different regions of the world there is a progressive increase of extreme weather events; heavy precipitation and storms, high temperatures and droughts that are detrimental to the infrastructure, the economy, and the right to development, culture, traditions and life itself.

Bogotá as the capital city of Colombia is located in a country that is responsible for 0.36% percent of *global CO2 emissions*. However, Bogota is committed to reduce emissions of greenhouse gases in order to improve local and regional air quality. These actions will contribute to diminish the effects of climate change on health, water, energy, but also food availability and in general on the humankind quality of life. Responding to these challenges, Bogota introduce **ADAPTATION AND MITIGATION TO CLIMATE CHANGE PLAN**, as a roadmap to build a city organized around the water and adapted culturally and environmentally to climate change impacts, keeping the greenhouse gases in a low-level emission.

### 1. Bogota's greenhouse gas emissions

Bogota released 16 million tons of carbon dioxide equivalent (CO<sub>2</sub>e) in 2008, and each citizen produced 2.28 tons per capita of CO<sub>2</sub>e. Energy sector were responsible for 64% of citywide greenhouse gas (GHG) emissions because of the use of fossil fuels (coal, oil, its derivatives, natural gas) for energy purposes. Moreover, waste sector accounted for 19.75% and the remaining emissions stem largely from emissions released at agriculture, forestry and land use changes (15.31%) and industrial processes sector (0.03%).

Fig 1. GHG Emissions by Sector



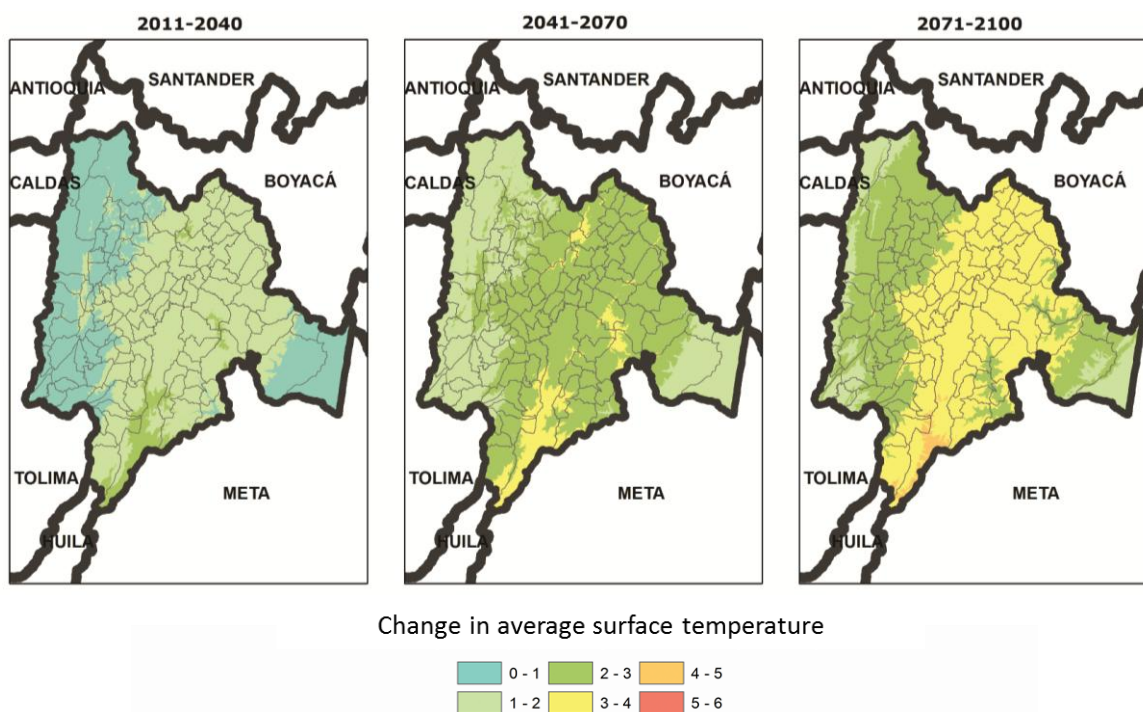
According to actual economic and technological trends, CO<sub>2</sub>e emissions are projected to rise up between 2008 and 2050.

	2025	2038	2050
<b>CO<sub>2</sub>e emissions (tones/year)</b>	33.688.468	46.896.802	59.089.110
<b>Projected emissions per capita (tones/year)</b>	3,79	4.59	5.16

## 2. Bogota climate projections

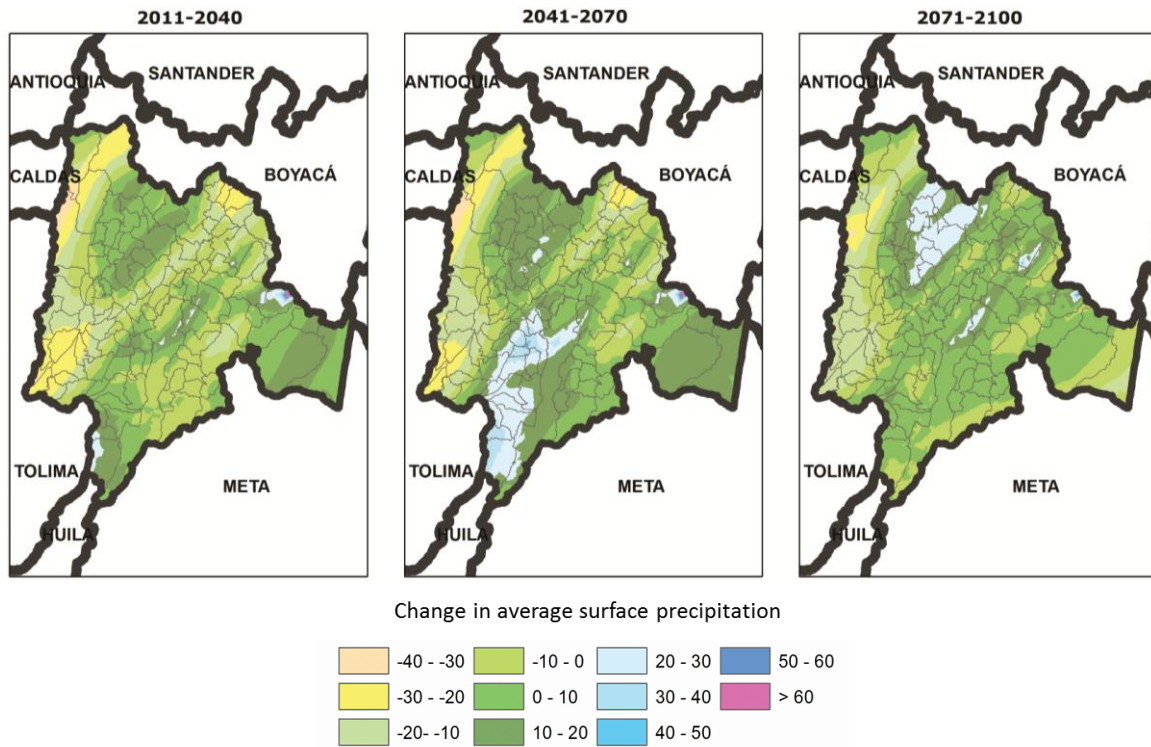
In order to satisfy population needs (water, food, energy, among others) Bogota has a strong bound and interdependence with the region and its ecosystems. Climate change may alter this dynamic. This section describes climate trends and projections related to temperature and precipitation for Bogota and the region as follows:

Fig. 2 Projected Changes in temperature from 2011 – 2100



For the next years there is a progressive increase in the monthly average temperature, with intervals projected around 1 – 2°C for 2011 – 2040, 2- 3 °C for 2040-2070 and 2 – 5°C for 2070 – 2100. Increasing temperature can lead to a reduction of 70.5% forests and 54.6% moorlands (*Paramo*) at the whole region. The main impact is on consumed water in Bogota that comes from regional ecosystems. This creates a water, energy and food vulnerability

Fig. 3 Projected Changes in temperature from 2011 – 2100



The climate change scenarios show decreases on rainfall (between 10% and 20%) at the East of the Department and in some areas of *Chingaza* moorland. These declines may have serious implications in wetlands and water springs of rivers and streams that supply aqueducts and reservoirs. On the other hand, the largest increases in precipitation (20% to 30%) will be at the South (Sumapaz) but also on central parts of Cundinamarca, Rionegro and Gualiva Provinces (especially for the period 2041-2070). Increasing precipitations could produce a frequent and intense flooding and landslides in Bogota.

### 3. Bogota's Plan of Adaptation and Mitigation to Climate Change

The **ADAPTATION AND MITIGATION TO CLIMATE CHANGE PLAN FOR BOGOTA** gives the roadmap to build a city organized around water and adapted culturally and environmentally to climate change impacts, keeping the greenhouse gases in a low-level emission.

#### Goal 1: To cut Bogota's carbon dioxide (CO<sub>2</sub>) emissions:

The aim is to cut emissions by 56% by 2038 and 62% by 2050, based on projected changes in CO<sub>2</sub>e emissions.

The goal for 2025 is to achieve stabilization of emissions of equivalent CO2 per capita, with 2 tonnes as a limit, with respect to the emissions projected in the trend-based scenario. This will be accomplished through the following programs:

*Sustainable mobility:*

- Transformation of conventional city taxi fleet to electric taxis
- Implementation of technologies of zero or low emissions in the integrated public transport system
- Implementation of four (4) Light rail –LRT- and heavy Metro lines
- Change of the particular vehicle to the use of non-motorized transport - bicycle

*Zero waste*

- Use of 100% of the potentially recyclable material in industrial processes.
- Reuse of construction and demolition waste.
- Implementation of thermolysis technology for 60% of the solid waste generated.

*Eco-efficiency in responsible consumption and production systems.*

- Increase the energy effectiveness in the public lighting system
- Reduce energy consumption (including the use of efficient electrical equipment, switching to LED bulbs in facilities and homes and more sustainable habits)
- Implement the photovoltaic solar energy in different sectors
- Replace the fuel in stationary sources that use coal for complementary energy efficiency measures (measurement of conversion of 160 industries today using coal and natural gas)

*Sustainable building*

- Sustainable building design and construction that integrates the use of alternative sources of energy and bioclimatic variables.
- Remold the stock of existing buildings to include criteria of sustainability, savings and efficiency in the use of energy and water.

Mitigation not only means reducing CO2 emissions, it helps to reduce the pollution of the air and improve the health conditions of the inhabitants of Bogotá, and their quality of life. At the same time, optimizes the urban structure and its network of mobility services.

Goal 2: Increase the adaptive capacity of the city to climate change: This will be accomplish through the following programs

*Ecourbanism and territorial planning for adaptation:* the goal is that 100% of the new and existing buildings will be sustainable

*Recovery the Ecological main structure of Bogota and the region*

- In 2025, 69 thousand hectares of Andean forest and moorelands will be in conservation
- In 2038 an active restoration will take place in 19 thousand hectares
- In 2050 more than 22 thousand hectares of moorelands and high Andean forest will be restored

*Scaling of green space coverage: 22 thousand trees planted by 2050 through ecological restoration*

*Research on health Impacts of Climate Change*

Goal 3: Save and manage integrally the water: This goal will be achieved by the following programs

- Sustainable drain system
- Reduce water losses
- Increase rainwater uses
- Aquifer protection
- Bogota river basin recovery

Goal 4: Consolidate a system of environmental governance to tackle climate change collectively.

The social capital will be strengthened, which means, the ability of organization, appropriation of knowledge, understanding of the environment and conflict resolution capacity. In addition to regain confidence in institutional management and achieve the shared responsibility of citizens in the construction of the public through formal and informal participation in the decision-making processes that impact the city.

Goal 5: Promote a transformative cultural change, according to new climate challenges that are imposed.

The challenge for the city, will be match, coordinate and achieve synergies that increase social and cultural appropriation for adaptation to climate change, allowing a clear message of reflection on our consumption habits, internalize and implement practices and habits by the inhabitants of the territory. This will lead to achieving climate change adaptation and mitigation measures defined for the city, but this split knowledge, clear information, education, participation, recovery of the sense of belonging and recognition and valuation of the diversities with their knowledge.