



Greenhouse Gas Emissions in Colombia

Colombia Numbers at a Glance (2013)

177.6 MtCO₂e*

Total GHG emissions
(0.37% of world total)

World: 48,257 MtCO₂e

47,342,363

Population

World: 7,176,092,192

3.75

tCO₂e per capita

World: 6.72 tCO₂e

US\$333,817 Million

GDP**

World: US\$55,261 Billion

532

tCO₂e/million US\$ GDP

World: 679 tCO₂e/million US\$ GDP

-88 MtCO₂e (-33%)

Change in GHG emissions
(1990–2013)

World: +14,434 MtCO₂e
(+43%)

Sources: WRI CAIT 2.0, 2017.

Emissions including Land-Use Change and Forestry

*Million metric tons of carbon dioxide equivalent. Global Warming Potentials are from the Intergovernmental Panel on Climate Change Second Assessment Report

**Gross Domestic Product (GDP) in constant 2010 US\$

This document is based on information available at the date of publication, and does not reflect official views of the U.S. government. Sources may be incomplete or contradictory. Judgment and knowledge of the national context should be used to interpret and supplement this information. USAID assumes no liability for the contents or use of the information in this document.

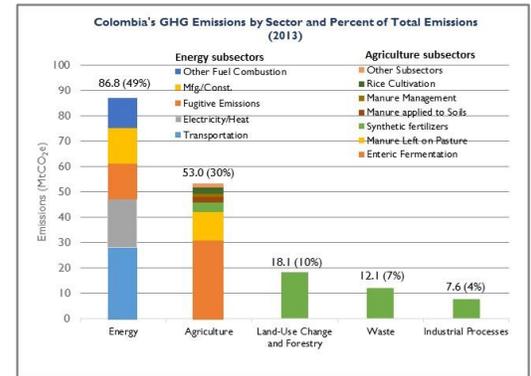
Greenhouse Gas (GHG) Emissions by Sector

According to the World Resources Institute Climate Analysis Indicators Tool (WRI CAIT), Colombia's GHG emissions in 2013 were dominated by the energy sector (49%), followed by agriculture (30%), and land-use change and forestry (LUCF) (10%). Waste and industrial processes (IP) contributed 7% and 4% of total emissions, respectively. Within the energy sector, transportation and electricity and heat production contributed over 50% of the sector's emissions.¹ Colombia's [Biennial Update Report \(BUR\)](#), submitted to the UNFCCC in 2015, includes a GHG inventory for years 2010 and 2012. It too shows energy as the largest emitting sector (44%) in 2012, followed by agriculture, forestry and other land use (AFOLU) (43%).

Change in GHG Emissions in Colombia (1990-2013)

According to WRI CAIT, Colombia's GHG emissions decreased by 88 MtCO₂e between 1990 and 2013. The average annual change in total emissions during this time was -1.1%, with sector-specific average annual changes as follows: energy (2.2%), agriculture (0.1%), LUCF (-3.4%), waste (1.8%), and IP (4.2%). The change in emissions in selected sectors is discussed below.

Energy: Energy sector emissions increased by 33 MtCO₂e from 1990 to 2013, with transportation (37%), fugitive emissions (28%), and electricity and heat production (20%) driving this increase.² Colombia struggled with managing transportation issues arising from a growing population and rising vehicle use.³ In particular, Bogota experienced significant growth in private car ownership in the past two decades, causing traffic congestion and long commuting hours.⁴ In 2000, Colombia launched Phase I of the TransMilenio Bus Rapid Transit (BRT)⁵ system in Bogota, followed by Phase II in 2006 and Phase III, which has been partially implemented.⁶ In 2006, TransMilenio became the world's first mass transit project registered under the UNFCCC Kyoto Protocol's Clean Development Mechanism (CDM).⁷ The latest CDM monitoring report shows GHG emission reduction of 80,128 tCO₂e in 2012.⁸ Nevertheless, Colombia's BUR shows an increase in energy sector GHG emissions between 2010 and 2012, due to growing fuel consumption from an increasing number of vehicles. The vehicle fleet increased 69%, from 1,011,008 to 1,710,318 vehicles from 2010 to 2012.⁹ Colombia is South America's largest coal producer and the region's third-largest oil producer.¹⁰ The BUR attributes the emissions increase from oil and gas activities to the increase in



Source: WRI CAIT 2.0, 2017, FAOSTAT, 2017.

¹ World Resources Institute Climate Analysis Indicators Tool (WRI CAIT 2.0, 2017). Global Warming Potentials (GWPs) are from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (SAR).

² WRI CAIT 2.0, 2017.

³ Center for Clean Air Policy (CCAP). [Case Study: Colombia's Bus Rapid Transit \(BRT\) Development And Expansion](#), 2012.

⁴ Library of Congress – Federal Research Division. [Country Profile: Colombia](#), 2007.

⁵ The Institute for Transportation & Development Policy defines [BRT](#) as a bus-based transit system that uses dedicated lanes and off-board fare collection to deliver fast and comfortable services similar to a light rail system.

⁶ CCAP, 2012.

⁷ Ibid.

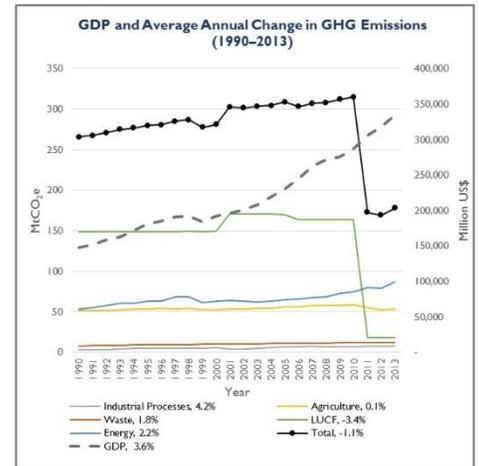
⁸ CDM, [Project 0672: BRT Bogotá, Colombia: TransMilenio Phase II to IV](#). See [Monitoring report](#). The GHG reductions were achieved from Phase II and the operational portion of Phase III, and covers the period January 2012 to December 2012.

⁹ Republic of Colombia. Colombia's BUR to the UNFCCC, 2015. The inventory uses GWPs from the IPCC SAR.

¹⁰ US Energy Information Administration. [Country Analysis Brief: Colombia](#), 2016.

hydrocarbon production. From 1996 to 2012, oil production increased 49%, from 635,000 to 944,000 barrels per day.¹¹ In power generation, total electricity generation almost doubled from 1990 to 2013.¹² As of 2013 71% of electricity was generated by hydro, followed by natural gas (17%), coal (9%), and biofuels (3%).¹³

Agriculture: According to WRI CAIT, agriculture emissions were slightly higher in 2013 than they had been in 1990. Emissions peaked in 2010 due to enteric fermentation and manure left on pasture, the leading sources of emissions from agriculture.¹⁴ During the same period, emissions from synthetic fertilizers, a smaller source of agriculture emissions, increased 82%.¹⁵ As for fertilizer use, data from the World Bank also show a significant increase in fertilizer consumption in Colombia, jumping from 309 kilograms per hectare (kg/ha) of arable land in 2002 to 649 kg/ha in 2013.¹⁶ This rate is more than double the average across South America.¹⁷ According to WRI CAIT, agriculture emissions started decreasing in 2010. The BUR attributes the GHG decrease from 2010 to 2012 to a decline in the number of livestock as a result of damage caused by La Niña. FAOSTAT data show a decline of 13% in the number of cattle in the same period.¹⁸



Source: WRI CAIT 2.0, 2017

LUCF: According to WRI CAIT, LUCF emissions decreased 131 MtCO₂e from 1990 to 2013, with much of the decrease due to a significant drop in emissions from forest land in the period 2010-2013.¹⁹ The Colombian government identifies seven main drivers of deforestation: (1) extension of agriculture and livestock, (2) illicit crops, (3) settlement / displacement of populations, (4) infrastructure, (5) mining, (6) removal of timber (both legal and illegal), and (7) wildfires.²⁰ Colombia reduced the deforestation rate from 265,441 hectares (ha) per year annually from 1990-2000 to 166,070 ha per year from 2010-2012.²¹ The BUR notes that many programs implemented between 2010 and 2012 may have contributed to decreasing emissions during this period. In particular, Colombia established the National Forest and Carbon Monitoring System, which provided reliable data on forest areas and changes in the country. As of 2012, Colombia's total forest area was 60,012,529 ha, 52.5% of the total land area.²² Colombia also participates in the [UN-REDD Programme](#) and the Forest Carbon Partnership Facility and is preparing its National REDD+ Strategy.

Carbon Intensity: GHG Emissions Relative to Gross Domestic Product (GDP)

According to WRI CAIT, Colombia's GHG emissions decreased 33% between 1990 and 2013, averaging -1.1% annually, while GDP grew 125%, averaging 3.6% annually. Despite this, and although Colombia's economy already emits fewer GHGs relative to GDP than the world average, Colombia launched in 2012 the Colombian Low Carbon Development Strategy, which seeks to promote efficient, low-carbon growth and low-carbon development plans in the energy, mining, agriculture, transportation, industry, waste, and construction sectors.²³

Climate Change Mitigation Targets and Plans

In its [Intended Nationally Determined Contribution \(INDC\)](#), Colombia commits to unconditionally reduce its GHG emissions by 20% from the 2030 business-as-usual scenario, in particular through the implementation of mitigation action plans in eight key sectors. The INDC notes that the 2030 target could be strengthened to 30% with international support. Colombia is also preparing Nationally Appropriate Mitigation Actions (NAMAs).²⁴ It is implementing or seeking support to implement its Transit Oriented Development, Public Lighting Energy Efficiency, and Domestic Refrigeration Sector NAMAs and is seeking recognition or support to prepare additional NAMAs. In 2016, through Decree, Colombia established the Institutional Strategy for the Articulation of Policies and Actions on Climate Change (SISCLIMA). It also developed the draft [National Climate Change Policy](#), which seeks to integrate climate change in public and private decisions and develop a climate resilient and low carbon path.

¹¹ BP. Statistical Review of World Energy, [June 2007](#) and [June 2016](#).

¹² International Energy Agency (IEA) Statistics: Colombia Electricity and Heat [1990](#) and [2013](#).

¹³ IEA Statistics: Colombia Electricity and Heat [2013](#).

¹⁴ Food and Agriculture Organization of the United Nations Statistics Division (FAOSTAT). Colombia [Emissions – Agriculture Total](#), viewed on March 09, 2017.

¹⁵ Ibid.

¹⁶ World Bank. Fertilizer consumption (kilograms per hectare of arable land), [Colombia](#), viewed on March 09, 2017.

¹⁷ Organisation for Economic Co-operation and Development (OECD). Review of Agricultural Policies - [Colombia](#), 2015.

¹⁸ FAOSTAT. Colombia [Live Animals, Cattle](#), viewed on March 09, 2017.

¹⁹ FAOSTAT. Colombia [Emissions – Land Use Total](#), viewed on March 09, 2017.

²⁰ Ministerio de Ambiente y Desarrollo Sostenible (MADS). [La Propuesta de Preparación para REDD+ \(R-PP, Versión 8.0, Bogotá, Colombia\)](#), 2013. Also cited in the REDD desk - [Colombia](#), viewed on March 9, 2017.

²¹ Colombia. Colombia's BUR, 2015. In the intervening years, annual national deforestation was 315,597 ha per year from 2000-2005 and 281,969 ha from 2005-2010.

²² Ibid.

²³ Grantham Research Institute on Climate Change and the Environment. The Global Climate Legislation Study – [Colombia, 2015](#).

²⁴ UNFCCC NAMA Registry – [Colombia](#), viewed March 9, 2017.