Colombia

Independent regional climate change assessment

Key opportunities for climate ambition and implementation

- The integration of an Adaptation Monitoring and Evaluation System, such as the Integrated Information System on Vulnerability, Risk and Adaptation (SIIVRA, Spanish acronym), will enable the country to provide information on vulnerability, risk and adaptation to climate change to monitor compliance with the targets adopted in the NDC.
- The NDC targets must be aligned with the Long-Term Climate Strategy (E2050), as it is crucial to ensure that there is a coherent trajectory for the country's emission reductions.
- The country has an MRV System for Climate Finance that can be enhanced to increase transparency in tracking financial flows and optimize resource investment.

It is crucial for all stakeholders in the country to actively collaborate on climate actions, leveraging the strong national political framework. These efforts should align with key cross-cutting issues such as food security, poverty eradication, just transition, human rights, intergenerational equity, territorial inclusion, gender equality, water protection, ecosystems and biodiversity, the circular economy, and sustainable production. By doing so, the country can achieve low-carbon development and enhance climate resilience.

Climate Justice

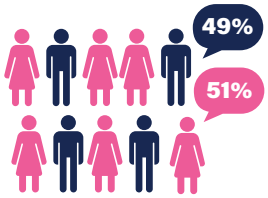
Climate policy instruments

In compliance with the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement, the countries parties have developed normative instruments, institutional and budgetary arrangements to address the effects of climate change at the national level. The following is a list of some of the instruments that frame climate action at the domestic level:

NDC	1st NDC, 2020
Target 2030 y 2050	Target 2030 not to exceed 169.44 MtCO2eq Target 2050 to achieve net zero emissions
BUR	3 BUR (2015, 2018, 2022)
LTS	E2050 COLOMBIA: Colombia's long-term climate strategy, 2021
NC	3 National Communications (2001, 20120, 2017).
PNA	PNACC. 2016, National Climate Change Adaptation Plan. ABC: Adaptation Conceptual Basis. Conceptual framework and guidelines.
Laws relevant to climate change	– Law 2294/2023 on Development Plan 2022-2026 – Law 2169/2021 on the promotion of low-carbon development – Law 1964/2019 on the promotion of the use of electric vehicles. – Law No. 1931 guidelines for climate change management – Law 1819/2016 on tax deductions for renewable energy and carbon tax. – Law 1715/2014, integration and promotion of non-conventional renewable energies (FNCER). – Law 1523, National Risk Management Policy and the National Risk Management System.

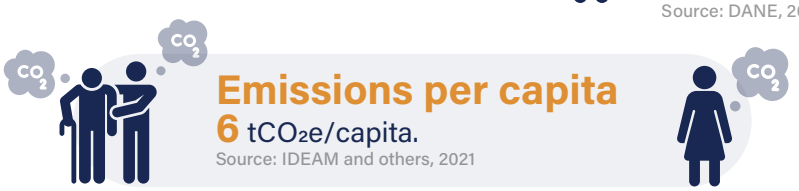
Colombia

Context



Population of
51.27 million
inhabitants (2021)
Source: World Bank, 2022

4% of the population recognized as belonging to or descending from **Indigenous People.**
Source: DANE, 2018

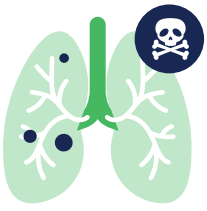


Emissions per capita
6 tCO_2e/capita.
Source: IDEAM and others, 2021

SOCIOECONOMIC

Colombia		Regional average
82.14%	**Inhabitants** in **urban areas** 2023 Source: World Bank, 2022	**81.2%**
0.75%	Index of **human development** 2021 Source: UNDP, 2022	**0.75%**
6,130 USD$	**GDP** per capita in 2021 Source: World Bank, 2022	**8,340USD$**
35.4%	**Poverty** 2021 Source: Cepal, 2022	**32%**
0.53	**Gini index** income inequality in 2021 Source: Cepal, 2022	**0.46**

HABITAT AND ENVIRONMENT



Deaths attributed to **air pollution**
25 **23**
per **100,000** inhabitants
Source: IHME, 2020

Surface of **native forests** **52%** of the total area of Colombia.
(**463,000 km²** en 2021)
Source: World Bank, 2022

Colombia

Adaptation and vulnerability

With the signing of the Paris Agreement, the parties committed to increase capacity to adapt to the adverse effects of climate change and build climate resilience, as well as to promote low-GHG development.

CONTEXT

The entire Colombian territory has some level of threat: 56% has a "high level" of vulnerability, 13% of the departments have a "very high" vulnerability. All the departments have some level of risk, three of them were categorized "high risk" and four as "very high risk".

KEY OPPORTUNITIES

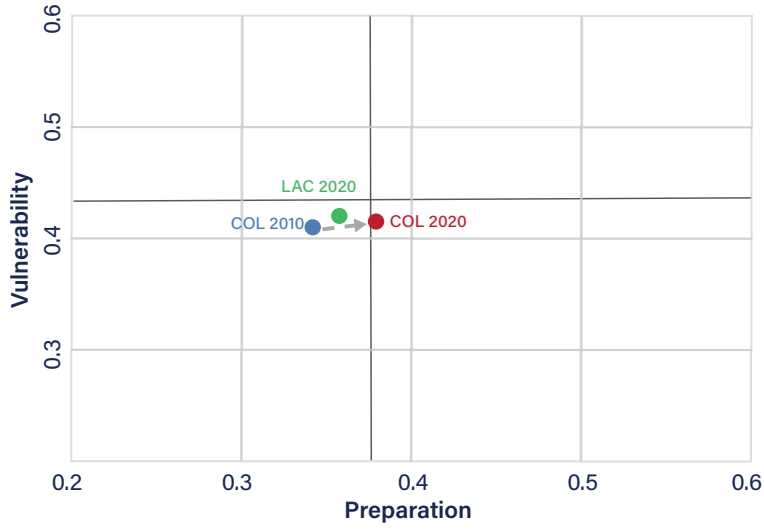
Current efforts are focused on planning and knowledge consolidation; however, it is urgent to start implementing measures that reflect transformation options. It is considered that at least 0.2 % of the national GDP should be invested annually in adaptation actions until 2030.

3.1 Vulnerability and preparedness

According to the methodology developed by the University of Notre Dame (ND-GAIN Country Index[1]) to establish the degree of vulnerability of countries in relation to their degree of preparedness, Colombia shows intermediate levels in both aspects, with no major advances in its level of vulnerability from 2010 to the present (Figure 1).

The dark blue dot represents the initial year 2010, the red dot the final year 2020 and the green dot represents the regional average for the year 2020. The vertical axis shows the vulnerability score, and the horizontal axis shows the comparison score for the country.

Figure 1. Comparative resilience 2010-2020.



Fuente: Own elaboration based on ND-GAIN, 2023.

1 The ND-GAIN country index summarizes a country's vulnerability to climate change and other global challenges combined with its preparedness to improve resilience. It aims to help governments, businesses and communities better prioritize investments for a more efficient response to the immediate global challenges ahead. According to this methodology, vulnerability measures a country's exposure, sensitivity, and adaptive capacity to the negative effects of climate change, considering six life-supporting sectors: food, water, health, ecosystem services, human habitat and infrastructure. On the other hand, preparedness measures a country's capacity to leverage investments and turn them into adaptation actions, considering three components: economic preparedness, governance preparedness and social preparedness. https://gain.nd.edu/our- work/country-index/

Figure 2. Examples of changes observed in Colombia.

TEMPERATURE

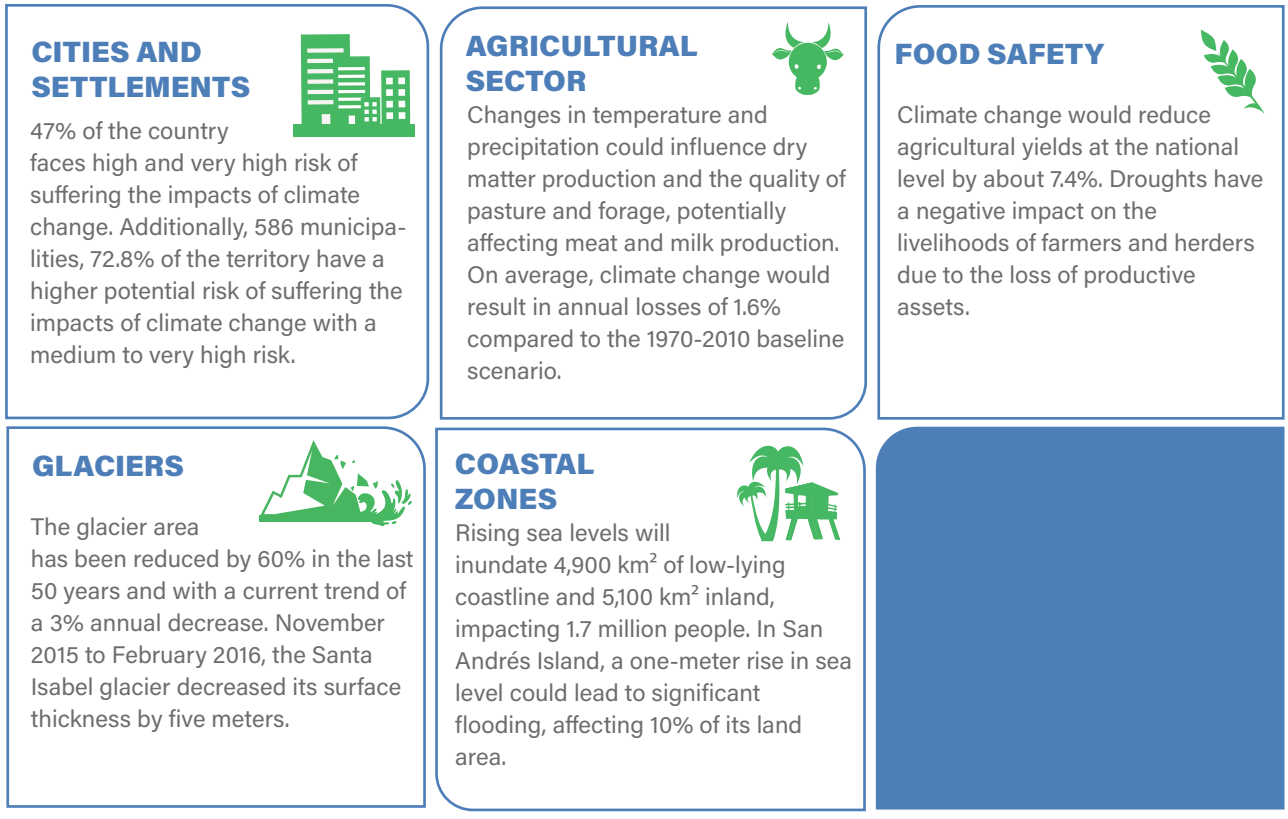
Between 1971 and 2015, the average annual temperature rose by 0.8ºC, bringing the average annual temperature to 22.4ºC. The number of very hot days (where temperatures are above 35°C), is of critical importance, and is expected to increase from approximately 16 to 131 days per year by the end of the century, mainly affecting the Caribbean coast.

RAINFALL

Precipitation patterns exhibit a high degree of interannual variability in Colombia, while ENSO brings droughts and warmer weather. Between 1950 and 2006 there was a statistically significant increase in rainfall between March and December.

Sources: WBG, 2021.

Figure 5. Projected impacts.



Sources: DNP, BID and CEPAL, 2014; FAO aqnd PNUD, 2022; WBG, 2021; TCNCC, 2017.

3.2 Adaptation policies and measures

Currently, there is no institutional means to analyze the level of implementation level of these measures. The research report Colombia's NDC and its Monitoring Systems[2] conducted an initial analysis of the Nationally Determined Contributions (NDC). Updated in 2020, the NDCs include monitoring and evaluation systems with various platforms, protocols, strategies, and developments used for data collection, analysis and interpretation to report progress to the United

Nations Framework Convention on Climate Change (UNFCCC), funders and the country. However, it was found that there is no systematic and centralized information to identify with certainty the degree of implementation of adaptation goals. While a desktop review using Google can yield useful information on a goal-by-goal basis, some relevant publications remain inaccessible.

The publications we identified as potential sources of information on adaptation goals include press releases from ministries, presidency and vice-presidency, press articles in national and regional media, management reports, and management reports. We found information on 16 of the 30 goals, indicating progress made in the implementation of the goals.

Table 1. Sectors with adaptation measures according to Colombia's Updated Nationally Determined Contribution 2020 and the Portfolio of Climate Change Adaptation Targets. Colombia 2020 NDC.

Sectors	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
Energy	Creation of sectoral planning instruments that have basic climate change guidelines and that consider the operational demands of the environmental sector, in addition to the promotion of strategic lines to 2025 to have a methodology for climate risk analysis.	No information on progress found.
Agriculture/ Food Security	Integration of climate change into agricultural planning, adaptation actions and capacity building in key subsectors.	No information on progress found.
Ecosystems/ Biodiversity/ Forests	A 15% increase in the percentage of ecosystems, underrepresented ecosystems or ecosystem analysis units included in the SINAP. Increase of 18,000 hectares in the process of restoration, rehabilitation, and ecological recovery in protected areas of the National Natural Park System and its areas of influence.	No information on progress found.
Production/ Industry/ Private sector / Circular economy	A 10% increase in the implementation of climate change adaptation strategies in companies of different sizes.	No information on progress found.
Transportation	Integration of risk management and climate change adaptation in transportation planning. Creation of two technical guideline documents for conducting risk studies on transportation infrastructure. Creation of a policy for disaster risk management and climate change adaptation formulated for the sector.	No information on progress found.
Water sanitation, and utilities	A 10% tax on domestic wastewater treated by public water service providers. Development of protection and conservation actions in 24 watersheds supplying aqueducts in municipalities susceptible to water shortages due to low rainfall and rainy seasons. Achieve 68% of urban domestic wastewater treatment.	No information on progress found.

2 Asociación Ambiente y Sociedad, 2023. Colombia's NDC and its Monitoring Systems, Ana Malagón Llano.

	Water resource	Protection and conservation of 24 watersheds in municipalities severely affected by climate change.	No information on progress found.
	Risk management	This is an issue that is being addressed across various sectoral goals but doesn't have a specific target of its own.	No information on progress found.
	Health	Formulation of adaptation actions in prevention and health promotion in 100% of the Territorial Entities category 1, 2 and 3. A 40% of public health care institutions implement adaptation actions in the face of climate-related events.	No information on progress found.
	Seas/oceans/ coastal zones	Adoption and implementation of 100% of the Plans for integrated management for the coastal environmental unit (POMIUACs) with adaptation actions based on mangrove ecosystems, seagrasses, and other coastal ecosystems, third to implement 6 climate change adaptation and risk management initiatives for the sustainable use of mangroves.	No information on progress found.
	Cities/ Human Settlements/ Housing	Develop structural and non-structural risk management actions for adaptation to climate change in 30% of the municipalities prioritized for susceptibility to water shortages due to dry and rainfall seasons.	No information on progress found.

Colombia

Mitigation

With the signing of the Paris Agreement, the parties committed to keep the global average temperature increase well below 2°C above pre-industrial levels and to continue efforts to limit it to 1.5°C.

CONTEXT

Of the 148 mitigation measures, 89 are subnational in nature, and are related to measures found in the Comprehensive Territorial Climate Change Management Plans (CTCCMP), territorial instruments whose progress is not easily traceable. There is no coordination between these instruments and the NDC update of 2020.

KEY OPPORTUNITIES

Strengthen the National Climate Change Information System (SNICC), its various subsystems and platforms, and ensure effective coordination with entities of the National Environmental System (SINA), in alignment with diverse sectoral and territorial planning instruments.

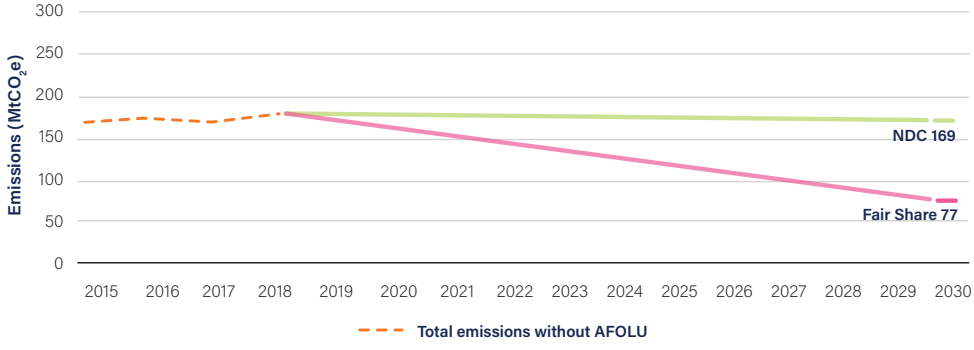
4.1 Country's emissions

Colombia's latest reported total annual emissions were 302.9 $MtCO_2e$ in 2018, and 180.7 $MtCO_2e$, if emissions from land uses (LULUCF) aren't considered (IDEAM et al., 2021).

In the latest update of its NDC, Colombia commits not to exceed 169 $MtCO_2e$ per year by 2030, which means a reduction by approximately 30% of total emissions compared to 2018 (Figure 4).

Whereas, considering the fair contribution for Colombia (Fair Share[3]), according to the Stockholm Environment Institute Calculator (SEI, 2023), Colombia should reduce its emissions by 77 $MtCO_2e$ by 2030 (without considering AFOLU). This implies a reduction of almost 57% compared to emissions in 2018 (Figure 4).

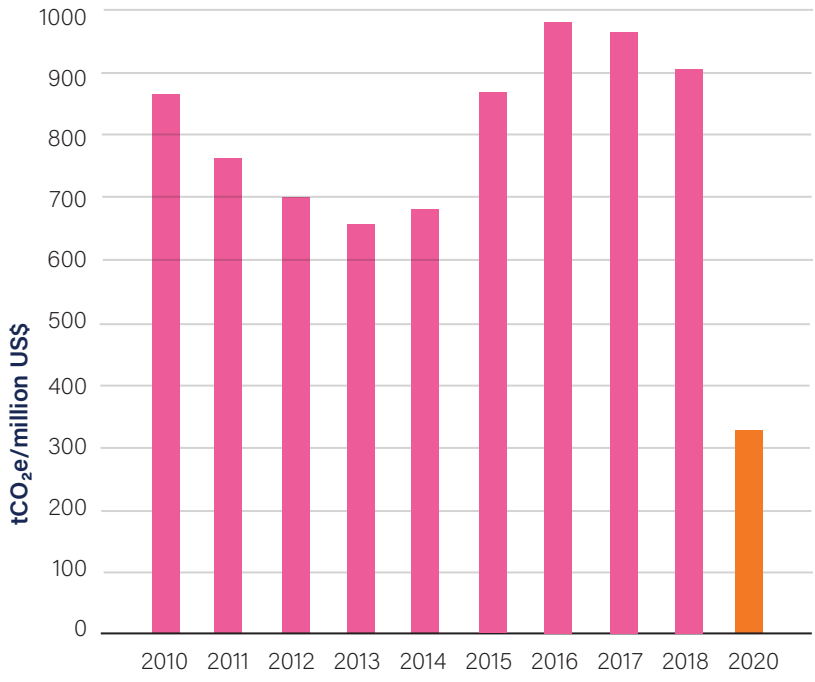
Figure 6. Colombia's NDC target and fair share without LULUCF.



Source: Own elaboration based on IDEAM et al., 2021; NDC, 2021; SEI, 2023.

The emissions intensity of the Colombian economy increased by 5% between 2010 and 2018 (IDEAM et al., 2021).

Figure 7. Carbon intensity of the economy (tCO_2 e / million US$).



Source: Own elaboration based on official country data: IDEAM and others, 2021.

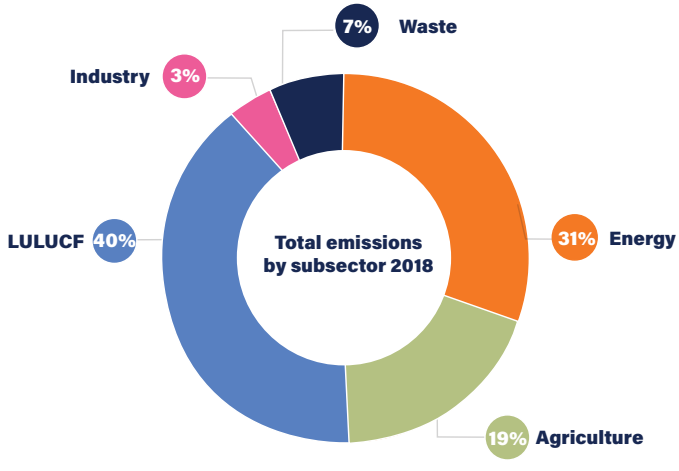
4.2 Emissions by sector

In 2018, 40% of the country's emissions came from the LULUCF sector, 31% from energy, 19% from the AFOLU sector, and to a lesser extent from industry and waste (IDEAM et al., 2021) (Figure 6).

Energía

Colombia's fossil fuel reserves (natural gas, oil and coal) represent 1% of the total reserves of Latin America and the Caribbean in terms of energy (OLADE, 2022; BP, 2022; Our World In Data, 2022).

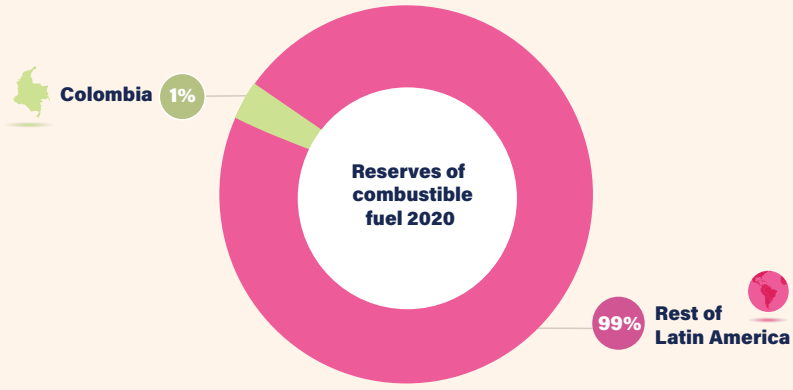
Figure 6. Total emissions by sector 2018.



Source: Own elaboration based on IDEAM and others,2021..

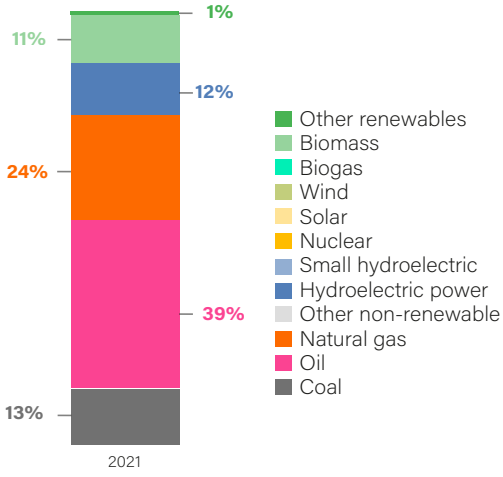
3 The Fair Share represents the fraction of emissions that each country should emit at most (in this case by 2030) to not exceed the 1.5°C average global temperature increase. There are various methodologies for calculating the fair share, the following is used here developed by the SEI, because it provides information for all Latin American and Caribbean countries. Considerations used for the calculation (SEI): Historical responsibility: since 1850, Mitigation pathway: 1.5°C standard (excl LULUCF), Capacity: $0 development threshold, 50% Responsibility - 50% Capacity.

Figure 7. Colombia's fossil fuel reserves and its share in total LAC reserves[4]



Source: Own elaboration based on OLADE, 2022; British Petroleum, 2022; Our World in Data, 2022.

Figure 8. Primary energy matrix 2021.

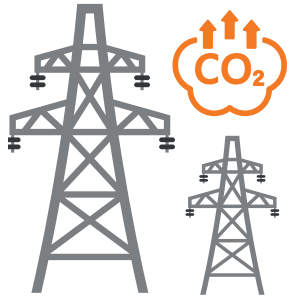


Historically, the primary energy matrix has a strong dependence on fossil fuels (76% in 2021), higher than the regional average of 66% for the same year (OLADE, 2022; IEA, 2022), although in recent years renewable energies have gradually begun to be incorporated, reaching a 12% share in 2021[5].

Source: Own elaboration based on (BECO, 2021). This matrix shows primary energy resources; in this sense, it should be considered that if the country imports secondary fuels, these will be reflected in the sector's emissions, but not in this primary energy matrix.

Figure 9. Carbon intensity of Colombia

Carbon intensity of primary matrix 1.7 tCO_2e/toe in 2021 (OLADE, 2022; EDGAR, 2022). This leaves in evidence the permanent high dependence on fossil fuels in the matrix.



Colombia issues

1.7

tCO_2e / toe

per unit of energy supply.

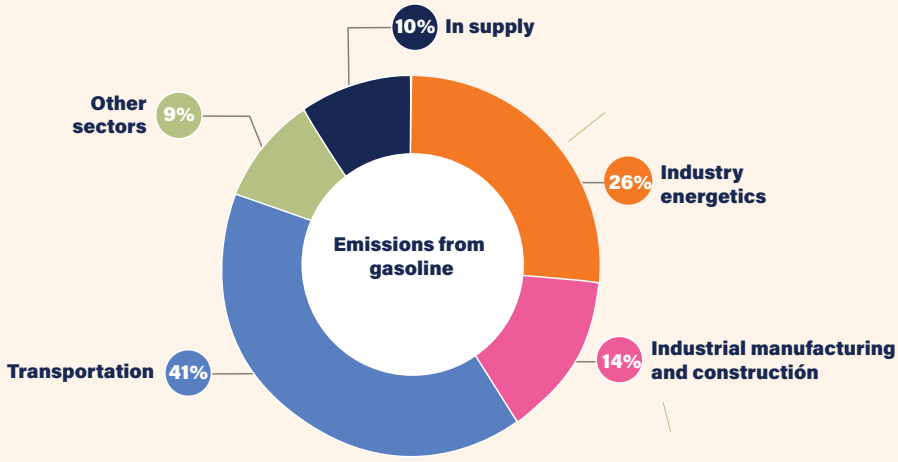
Source: OLADE, 2022; EDGAR, 2022.

4 For the conversion to energy units of fossil fuel reserves, the lower calorific values given by OLADE as a reference in its publication MANUAL DE ESTADÍSTICAS ENERGÉTICAS, OLADE 2011, were used.

5 Hydroelectric plants are not considered among the renewables.

Emissions from the energy sector have shown a slight increase since 2010. The transport subsector is the largest contributor to emissions in this sector with a 42% share in 2021, followed by the industry subsector with 22%.

Figure 10. Emissions of Energy by subsector.

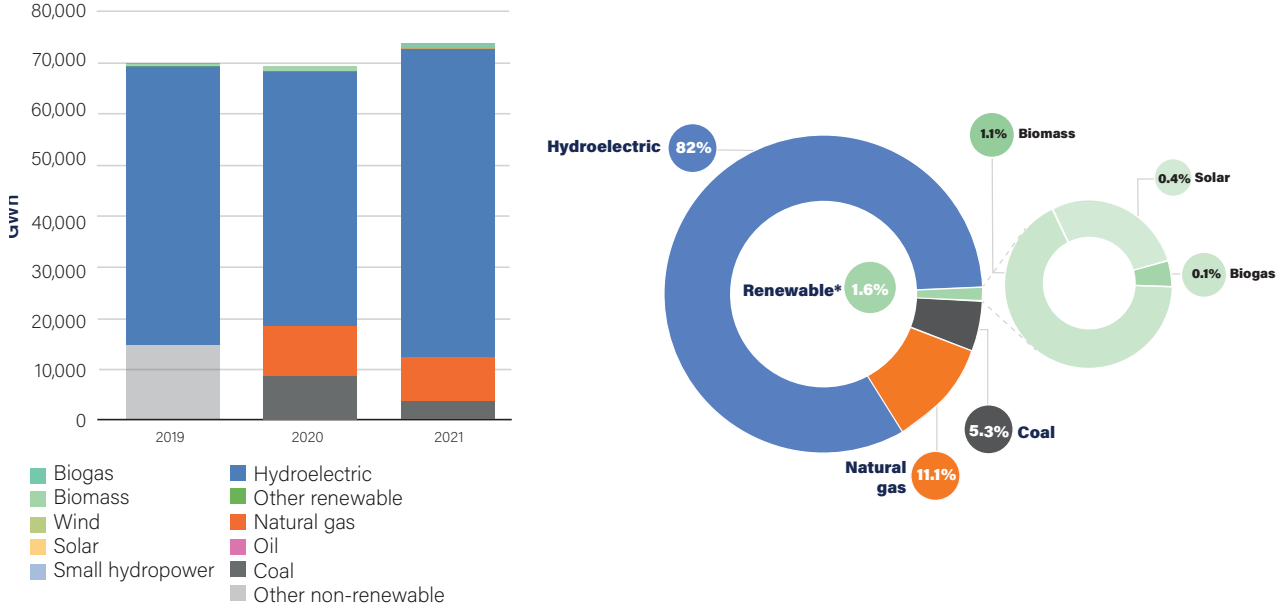


Source: Own elaboration based on IDEAM and others, 2021.

Power generation

The share of renewable energies has shown a minimal increase in the last decade from 1% in 2010 to almost 2% in 2020 (Figure 11). Within the 2% of electricity generation from renewable sources achieved in 2020, 90% was from biomass.

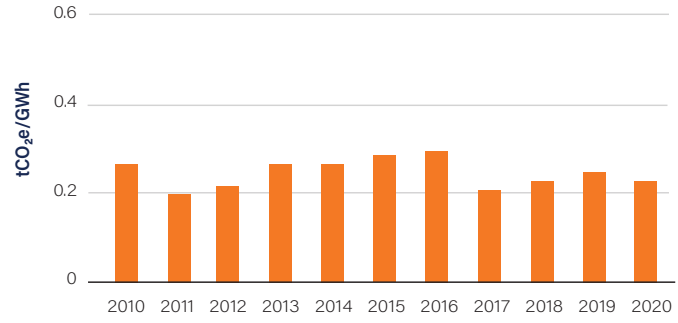
Figure 11. 2021 electricity generation matrix and percentage share of each technology in 2021.



Source: Own elaboration based on official data from Colombia: XM, 2022.

Figure 12. Carbon intensity of electric power generation ($ktCO_2e/GWh$).

The emissions intensity of electricity generation has decreased in recent years due to the gradual incorporation of renewable energies into the matrix (EDGAR, 2022; IRENA, 2022).

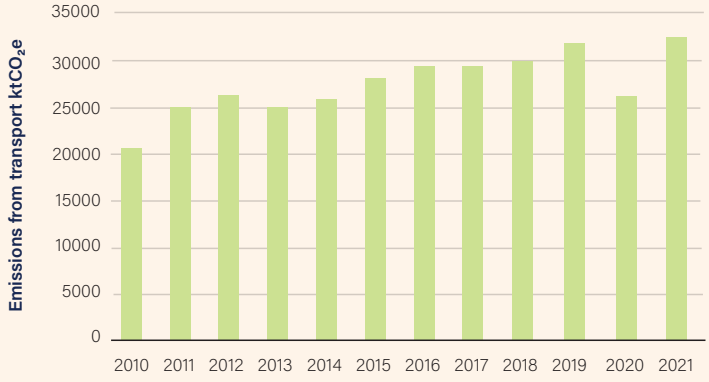


Source: Own elaboration based on EDGAR, 2022; IRENA, 2022.

Figure 13. Transportation Emissions 2010-2021.

Transportation

Emissions from the transportation sector show a continuous increase in the period 2010-2019, decreasing in 2020, coinciding with the COVID-19 pandemic, and then increasing in 2021.

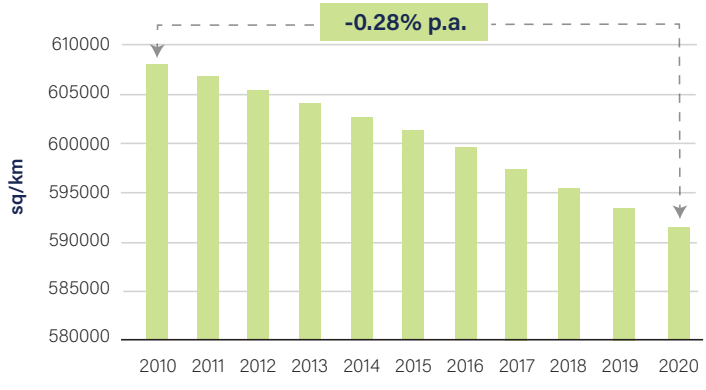


Source: Own elaboration based on EDGAR, 2022.

Figure 14. Area of native forests in Colombia and average annual loss rates.

Agriculture, forestry and other land use (AFOLU)

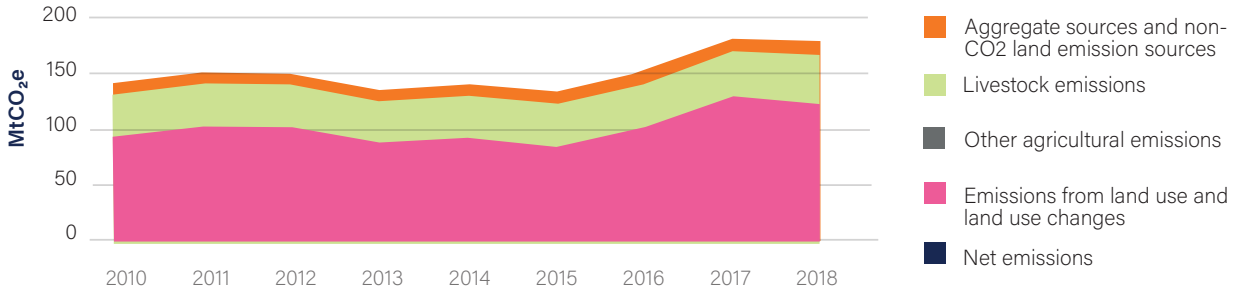
Forest land in Colombia has been experiencing a continuous loss in the last decade (2010-2020) at a rate of 0.28% per year, below the regional rate of 0.3% (World Bank, 2022), which is equivalent to the loss of more than 166 thousand hectares per year.



Source: Own elaboration based on World Bank, 2022.

Emissions from the Agriculture, Forestry and other land use sectors have increased from 2015 driven by the increase in emissions from the Land Use, Land Use Change and Forestry (LULUCF) sector (EDGAR, 2022; FAO, 2022).

Figure 15. LULUCF emissions by subsector.



Source: Own elaboration based on official data from Colombia IDEAM and others, 2022.

4.3 Mitigation policies and measures

Table 2. Energy and transportation sector mitigation measures (IDEAM et al., 2021).

Sector	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
Transport	Electric Mobility	- National Electric Mobility Strategy - Law 1964 of 2019 whereby "the use of electric vehicles is promoted in Colombia". - Decree 191 of 2021, which identifies preferential parking for electric vehicles. - Resolution 20213040039485 of Mintransporte, referring to the technical-mechanical review for electric vehicles. - Conpes document 3934 on green growth policy. - There is no report of GHG reduction results.
	Performance Based Navigation	- Implementation of infrastructure improvements for air navigation. - Implementation of the PBN system in the most frequent domestic commercial operations. No GHG reduction results reported.
	Motor Freight Modernization Program	- Conpes Document 3963 - Modernization of automotive cargo transportation. - Conpes Document 3982 - National Logistics Policy. - Resolution 5304 of 2019, which regulates the Motor Freight Modernization Program. - Constitution of Fund for the implementation of the program, pursuant to Article 307 of Law 1955 of 2019. - Since 2013, emissions reductions of approximately 1.2 million tons of CO_2eq, due to the disintegration of 24,040 vehicles and the entry of 8,928 vehicles with higher emission standards.
	Switching from road to river freight transport mode	The national government published in 2021 draft bidding terms and conditions for the bidding of the PPP for the Magdalena River in 2024 was declared void because no bidders were submitted. No further information on progress was found.
	Active Transportation and Demand Management	- Structuring of the National Strategy for Active Mobility -ENMA - Conpes Document 3991, National Urban and Regional Mobility Policy.
	Transportation-Oriented Development	- NAMA implementation pre-feasibility studies developed for Pasto and Cali and under development for Manizales, Medellin and Bogota. - Conpes Document 3991 - National Urban and Regional Mobility Policy. - No GHG reduction results reported.

Transport	Rehabilitation of the rail corridor	- Adoption of the Rail Master Plan. - Conpes Document 4047, Guidelines for contractual risk policy for rail transportation.
Energy	Energy Efficiency	Rational and Efficient Energy Use Program Update - Proure 2022-2030 No GHG reduction results reported.
	Fugitive emissions management	Generation of the document "Greenhouse gas emission mitigation scenarios to 2030 and carbon neutrality to 2050". Resolution 40066 of 2022: regulation of fugitive emissions No reporting of GHG reduction results.
	Demand management	No information on progress found.
	Diversifying the energy matrix	Projects to diversify the energy matrix are being supported, which has allowed an increase ranging from 28.8 MW in 2018, to about 250 MW, as of May 2021, in the country's installed capacity for power generation from non-conventional renewable sources.

Table 3. Mitigation measures for the Agriculture, Forestry and other land uses sector (IDEAM et al., 2021; NDC, 2020, BUR 2 and 3) NDC, 2020).

Sector	Measure	Degree of implementation (identified priorities / initiatives / flagship projects)
Agriculture	Emission reductions in the life cycle of cocoa production	Until 2019, 44,000 ha of the total planned in SAF were completed and 10,000 ha were renovated.
	Massive adoption of technology for rice production	By 2020, an average of approximately 168,000 ha/year of irrigated and rainfed rice have implemented AMTEC 2.0.
	Coffee production management	No information on progress found.
	Sugarcane production management	No information on progress found.
Livestock	Sustainable Cattle Raising	No information on progress found.
Forests and natural ecosystems	Intersectoral deforestation reduction	Integral Strategy for Deforestation Control and Forest Management, which promotes and establishes forest management in the territory. **Hectares deforested per year:** 2018, 197.159 2019, 158893 2020, 171.685 2021, 174.103 2022, 123.517 2023, 79.256
	Development and consolidation of the forest plantation production chain for commercial purposes.	No information on progress found.

Colombia

Financing

Under the Paris Agreement, the Parties committed to financial flows consistent with a scenario towards low GHG emissions and resilient climate development.

CONTEXT

By 2021 Colombia had received 24.69 billion pesos for climate action, of which 71% came from domestic public funding, 18.34% from international public funding, and 10.66% from private sources.

KEY OPPORTUNITIES

The platform should be improved and the data in the MRV System for Climate Finance should be updated, as there is a lack of information on the flow of economic resources in the country with respect to donations and credits received for the implementation of the NDC.

5.1 The role of the public sector

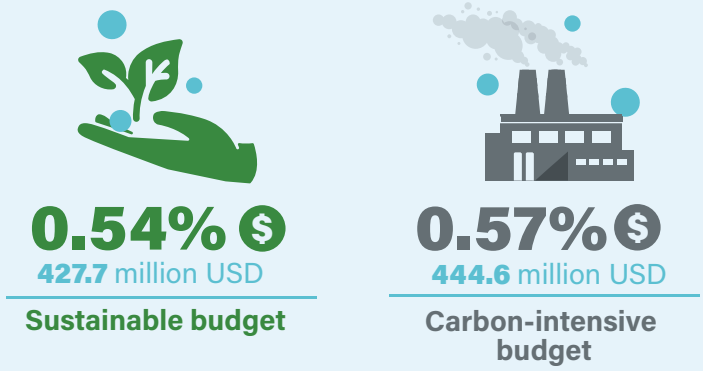
The distribution of the central budget makes it possible to identify government priorities in the development planning of Latin American and Caribbean countries.

Figure 16. Budget allocation for strategic sectors in Colombia.

Source: Own elaboration with information from GFLAC, 2021.

In 2019, the budget for hydrocarbons represented 0.57% of the General Budget of the Nation, a budget 1.1 times higher than the sustainability budget of the country, conformed by spending labeled for climate change, energy efficiency, renewable energy, and natural disasters.

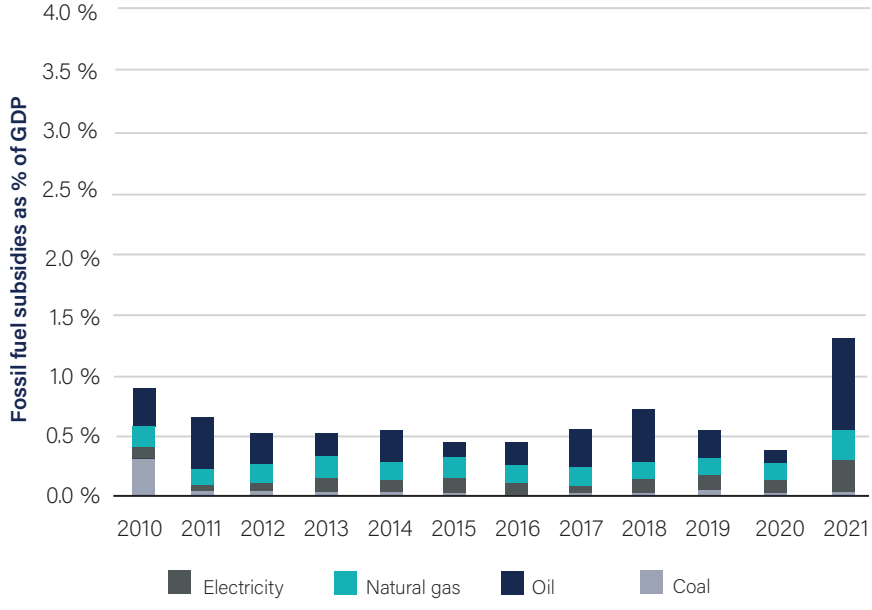
Figure 17. Comparison of sustainable budget versus carbon-intensive budget.



Source: Own elaboration with information from GFLAC, 2021

Colombia has had a carbon tax since 2017 (Our World in Data, 2022). The tax reaches 23% of the country's greenhouse gas emissions, with a price of US$5/tCO$_2$e. It reached revenues of 89 million $US in 2022 (World Bank, 2022). Despite this, in 2021 it will continue to maintain as a priority the extraction and exploitation of fossil fuels reaching a peak of almost 1.5% of GDP (FossilFuelSubsidyTracker.org, 2022) (Figure 18) which meant more than 4.7 million dollars considering the GDP reported by the World Bank for Colombia (World Bank, Open Data), in 2021

Figure 18. Fossil fuel subsidies as a percentage of GDP.



Source: Own elaboration based on FossilFuelSubsidyTracker.org, 2022

5.2 International cooperation

Table 4 shows a summary of the amount received by Colombia from different international cooperation agencies for climate action projects, both for Mitigation and Adaptation. In addition, a distinction is made between non-reimbursable amounts and loans.

Table 4. List of projects and amounts approved for Colombia from different cooperation agencies.

Agency / Institution	Scope of the project	Amount approved for the period 2016-2022 (Million US$)			Approved projects period 2016-2022			
		Non refundable	Loan	Co-financing	Mitigation	Adaptation	Others	Preparation
Green Climate Fund (GCF)	Only Colombia	137.37	53.21	207.52	--	2	2	12
	Multiple countries	57.91	49.83	161.81	1	2	3	3
Global Environment Facility (GEF)	Only Colombia	59.03	--	472.42	--	--	11	--
	Multiple countries	15.24	--	309.46	--	--	6	--
UN Climate Technology Centre and Network (CTCN)	Only Colombia	0.35	--	--	--	3	--	--
	Multiple countries	0.04	--	--	--	--	1	--
Inter-American Development Bank (IDB)	Only Colombia	--	3,956.97	--	--	69	35	--
	Multiple countries	--	--	--	--	--	--	--

Source: Own elaboration based on CTCN, 2022; IDB, 2022; GEF, 2022; GCF, 2022.

Colombia

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Colombia

Country profile
March 2024

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