

## Energy Efficiency for the Transition to Carbon Neutral Cities in Colombia

### Part I: Project Information

**GEF ID**

10917

**Project Type**

FSP

**Type of Trust Fund**

GET

**CBIT/NGI**

CBIT No

NGI No

**Project Title**

Energy Efficiency for the Transition to Carbon Neutral Cities in Colombia

**Countries**

Colombia

**Agency(ies)**

CAF, IADB

**Other Executing Partner(s)**

Ministry of Environment and Sustainable Development

**Executing Partner Type**

Government

**GEF Focal Area**

Climate Change

**Taxonomy**

Focal Areas, Climate Change, Climate Change Mitigation, Energy Efficiency, Influencing models, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Gender-sensitive indicators, Beneficiaries, Capacity, Knowledge and Research, Capacity Development, Learning, Indicators to measure change, Theory of change, Adaptive management, Innovation, Stakeholders, Indigenous Peoples, Communications, Public Campaigns, Education, Behavior change, Awareness Raising, Private Sector, Individuals/Entrepreneurs, SMEs, Financial intermediaries and market facilitators, Civil Society, Community Based Organization, Non-Governmental Organization, Trade Unions and Workers Unions, Academia, Type of Engagement, Consultation, Partnership, Participation, Information Dissemination, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Participation and leadership, Knowledge Generation, Workshop

**Sector**

Energy Efficiency

**Rio Markers****Climate Change Mitigation**

Climate Change Mitigation 2

**Climate Change Adaptation**

Climate Change Adaptation 0

**Duration**

60 In Months

**Agency Fee(\$)**

714,162.00

**Submission Date**

1/7/2022

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCM-1-1	GET	1,983,784.00	25,226,390.00
CCM-1-3	GET	5,951,351.00	75,679,170.00
Total Project Cost (\$)		7,935,135.00	100,905,560.00

## B. Indicative Project description summary

### Project Objective

Contribute to a reduction of CO2 emissions by increasing energy efficiency in the construction sector in Barranquilla, Montería and Pasto through the development of actions that involve the different stages of the life cycle of buildings and interventions in public space.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
Component 1: Governance for Energy Efficiency in Buildings and Public Spaces	Technical Assistance	<p><u>Outcome 1.1:</u> Capacity of local institutions strengthened with technical, normative, and methodological tools to implement strategies for enhanced energy efficiency in buildings and public spaces</p> <p><b>Indicators:</b></p> <p><i># And frequency of verification reports on implementation of standards and protocols for energy efficient buildings and public spaces</i></p> <p><b>Target:</b></p> <p><i>3 annually by government</i></p> <p><i>3 annually by the private sector</i></p> <p><i># Of public and private institutions that have institutionalized the national</i></p>	<p><u>Output 1.1.1:</u> National standard developed and adopted for energy efficiency in buildings and public spaces.</p> <p><u>Output 1.1.2:</u> Monitoring, reporting and verification mechanism to guarantee the implementation of the norms, standards and protocols for energy efficient buildings and public spaces.</p> <p><u>Output 1.1.3:</u> Plans for energy efficient buildings and public space in Barranquilla, Montería and Pasto formulated and under implementation.</p> <p><u>Output 1.1.4:</u> Capacity Building Program inclusive of technical assistance and training for the implementation of energy</p>	GET	1,294,647.00	16,871,409.00



*standard for energy efficiency* efficient buildings, public space and green infrastructure developed and implemented.

**Target:**

*At least 3 public*

*At least 3 private*

*# Of financing mechanisms for the replication of project results*

Output 1.1.5: Virtual platform for the evaluation of projects, works or activities of energy efficient buildings in public space designed and implemented.

**Target:**

*2 financing mechanisms*

Output 1.1.6: Financing strategy for energy efficiency projects with both public resources and financial mechanisms through a triple alliance between the National Government, the construction sector, and the financial sector.

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Component 2: Pilots of Energy Efficient Buildings and Public Spaces	Investment	<p><u>Outcome 2.1:</u> GHG emissions reduced, and improved energy efficiency associated with buildings and public spaces in the project intervention areas.</p> <p><b>Indicators:</b></p> <p><i>tCO2-e reduced or avoided in energy efficient buildings and public spaces by 2030</i></p> <p><b>Target:</b></p> <p><i>TBD</i></p> <p><i>% Reduction in GHG emissions by energy efficient buildings because of project interventions</i></p> <p><b>Target:</b></p> <p><i>40%</i></p>	<p><b>(TA) Output 2.1.1:</b> Design of (6) projects (in phase I Profile or in phase II Pre-feasibility), on new energy efficient buildings and renovations in public spaces in Barranquilla, Montería and Pasto.</p> <p><b>(INV) Output 2.1.2:</b> Three (3) co-financed pilot projects to demonstrate energy efficient buildings in Barranquilla, Montería and Pasto.</p> <p><b>(TA) Output 2.1.3:</b> Design of Five (5) pilot projects implemented to demonstrate sustainable energy intervention model in public spaces in Barranquilla, Montería and Pasto and in 11 additional cities in Colombia</p>	GET	5,498,575.00	69,211,124.00
Component 3: Project Management, Dissemination, and Knowledge Management	Technical Assistance	<p><u>Outcome 3.1:</u> Informed and adaptive project management</p> <p><i># Of PIRs that reflect project performance and lessons learned</i></p>	<p><u>Output 3.1.1:</u> Project M&amp;E plan implemented and PIRs developed and completed.</p> <p>-</p> <p><u>Output 3.1.2.:</u> Annual Project Performance Meeting with stakeholders to track progress against work plan and results framework for effective adaptive management.</p>	GET	764,049.00	9,777,749.00

*# Of annual reflection meetings to track progress against work plan and results framework*

Output 3.2.1: Cross-sectoral communication strategy and knowledge products developed.

**Target:**

*5 PIRs*

*4 Annual Performance Meetings*

Output 3.2.2: Exchange visits to promote upscaling of project results and lessons learned across other cities of Colombia, and internationally

Outcome 3.2: Knowledge Management communications and dissemination

*# Of Knowledge Management (KM) strategies developed and implemented.*

*# Of exchange programs*

**Target:**

*1 KM Strategy implemented*

*At least 4 exchange programs*

Sub Total (\$)	7,557,271.00	95,860,282.00
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**Project Management Cost (PMC)**

GET	377,864.00	5,045,278.00
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Sub Total(\$)	377,864.00	5,045,278.00
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Total Project Cost(\$)

7,935,135.00

100,905,560.00

Please provide justification

**C. Indicative sources of Co-financing for the Project by name and by type**

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Barranquilla City Council	Public Investment	Investment mobilized	61,619,846.00
Recipient Country Government	Ministry of Environment and Sustainable Development	Public Investment	Investment mobilized	2,857,143.00
Recipient Country Government	Pasto City Council	Public Investment	Investment mobilized	3,428,571.00
GEF Agency	CAF -Development Bank of Latin America	Loans	Investment mobilized	10,000,000.00
GEF Agency	IDB-Inter-American Development Bank	Loans	Investment mobilized	15,000,000.00
Other	Development Promotion Fund (FONPRODE) of the Spanish International Cooperation Agency for Development	Grant	Investment mobilized	8,000,000.00
<b>Total Project Cost(\$)</b>				<b>100,905,560.00</b>

**Describe how any "Investment Mobilized" was identified**

Projects under the BiodiverCiudades initiative will complement this GEF project and are considered counterpart by the local governments of the 3 beneficiary cities: Barranquilla, Montería and Pasto. The resources of these counterparts are public investment, except for the loan made by the IDB to the city of Barranquilla and the grant from FONPRODE for conservation efforts and recovery of the Ciénaga de Mallorquín. The CAF 10MM co-financing loan will be executed through energy efficiency credit lines from demand oriented to buildings and urban services in Colombia.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
CAF	GET	Colombia	Climate Change	CC STAR Allocation	6,122,786	551,051	6,673,837.00
IADB	GET	Colombia	Climate Change	CC STAR Allocation	1,812,349	163,111	1,975,460.00
Total GEF Resources(\$)					7,935,135.00	714,162.00	8,649,297.00

E. Project Preparation Grant (PPG)  
PPG Required **true**

PPG Amount (\$)				PPG Agency Fee (\$)			
137,614				12,386			
Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
CAF	GET	Colombia	Climate Change	CC STAR Allocation	137,614	12,386	150,000.00
Total Project Costs(\$)					137,614.00	12,386.00	150,000.00

Core Indicators

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	51998	0	0	0
Expected metric tons of CO <sub>2</sub> e (indirect)	1184355	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)				
Expected metric tons of CO <sub>2</sub> e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector



Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO <sub>2</sub> e (direct)	51,998			
Expected metric tons of CO <sub>2</sub> e (indirect)	1,184,355			
Anticipated start year of accounting	2023			
Duration of accounting	20			

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)
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Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	992,617			
Male	913,535			
Total	1906152	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The calculation of metric tons of CO<sub>2</sub>e was conducted based on the following mitigation actions: Energy efficiency and water use according to Resolution 0549/2015 and Renewable energy, energy efficiency, and transport electrification. In terms of calculations related to 'Renewable energy, energy efficiency, and transport electrification' as per the matrix below, the GHG emission factor of the Colombian grid calculated by UPME is used instead of a higher factor, such as the emission factor of the Colombian grid for CDM projects, also calculated by UPME, and this is explained by two main reasons: The first reason is to apply the precautionary and conservative principle to the calculations, since this calculations incorporate important assumptions at this early stage, if a higher emission factor is used, it could result in possible deviations from the real calculation. The second reason is that the CDM methodology is used for projects that intend to generate GHG reductions or CERs that can be certified by the CDM board, and thus participate in a regulated carbon market, these processes entail costs for the projects, but is not the case for the GEF project in which a first-party verification of said reductions would be made. Key assumptions of the calculations are summarized below. Assumptions regarding the general implementation dates:

- The project implementation period is 5 years between 2022 and 2026. During this period, it is assumed that the energy efficiency projects will be implemented in compliance with the national standard both in the cities supported by the project and in the other 11 cities.
- The capitalization period for the project activities is 15 years, to complete a total calculation time of 20 years. Regarding the date of the data:

**OUTPUT 2.1.2 ENERGY EFFICIENCY BUILDINGS IN BARRANQUILLA, MONTERÍA AND PASTO AND 11 ADDITIONAL CITIES IN COLOMBIA.** The main data to be used for these calculations are consumption by city and the number of households to be built in the cities. In the case of energy and water consumption by city, the data was obtained from official databases and calculated until 2020, which was the last year of data availability when the calculations were made. Regarding the number of households to be built, the data from the national construction association is used, which is updated until 2020. With these baseline data, projections must be made until 2041 to determine the baseline and mitigation scenario.

- **OUTPUT 2.1.3 – PROJECTS TO DEMONSTRATE THE SUSTAINABLE ENERGY INTERVENTION MODEL IN PUBLIC SPACES IN BARRANQUILLA, MONTERÍA, PASTO AND IN 11 ADDITIONAL CITIES IN COLOMBIA.** It is assumed that the infrastructure projects (Mallorquin, Ahuyama, Pasto River, and Botanical Garden) in the cities will finish their construction in the third year of implementation, thus reporting GHG reductions for 17 years until 2041. For the photovoltaic energy installed in cities (34 MW in total) it is assumed that, at the end of the implementation period (2026) it will be fully installed, so that as of the year 2027 there are 14 full years of reporting in reductions of GHG. A description of the methodologies used is presented in Annex F and the respective calculations in Excel are presented in Annex G as a separate file. The nature of this public project (public buildings and public spaces) will result in direct benefits to the general populace of the three (3) targeted cities with a total of 913,535 men and 992,617 women, consistent with the most recent population census. The project assumes that the general populace will benefit directly, since project interventions will target public buildings and public spaces.

## Part II. Project Justification

### 1a. Project Description

#### **National Context for Energy Efficiency in Colombia**

The residential, public, and commercial sectors can be considered as the sectors with the highest impact and relevance in terms of energy efficiency in Colombia. According to the Colombian Energy Balance (BECO), these sectors have a final energy consumption that represents approximately 25% of final energy consumption nationwide. 44% of this energy corresponds to electricity from the National Interconnected System, 28% to firewood, 21% to natural gas and 6% to liquefied petroleum gas. Building construction in Colombia is responsible for approximately 30% of global energy consumption and is one of the main generators of greenhouse gas (GHG) emissions.

The country for more than thirty years has been a leader in the development of bioclimatic projects with very significant achievements. Recently the awareness of both individuals and companies of the importance of minimizing the environmental impact of the sector and of contributing to the international environmental and sustainable development commitments acquired by the country has grown.

Energy is an essential resource for the construction of buildings and public spaces in Colombia. A general look at the energy sector reflects the productive and economic transformation that the country has undergone in the last fifty years. According to the National Energy Plan 2020-2050, the country has almost doubled its population from 1975 to 2019, from 24 million to almost 49 million inhabitants. In line with this trend and with the productive and economic transformation of the country, final energy consumption in this same period has also almost doubled, from 728 PJ (Petajoule) to 1,346 PJ. (UPME, 2020). The country has policies, norms, guidelines, and programs that help transform the energy matrix into a more sustainable, resilient, equitable and accessible one, in line with international commitments.

The construction of buildings has played a fundamental role in the final consumption of energy in the country for several years. It is important to highlight that between 1975 and 2019 the only sector that has a considerable decrease is the residential sector, going from being the most energy-intensive subsector to considerably reducing its energy consumption, mainly due to the substitution of traditional low-efficiency fuels such as bagasse and firewood, by fuels, that are more efficient such as electricity and natural gas. The above shows how consumer habits and technologies can be critical drivers for transformational change.

According to Strategy 2050, electricity is the main energy source with which carbon-neutrality can be achieved if it is supplied in a clean way. For this, the country must use its water resources for generation up to its technical capacity and the remaining energy must be obtained from renewable sources such as solar and wind, among others. Both residential and commercial buildings, as well as the industrial sector, will play a very important role in electricity consumption in 2050. It is urgent to implement strategies to have a clean energy matrix, in addition to implementing energy efficiency strategies in the sector (Government of Colombia, 2021).

According to the National Energy Plan 2020-2050, the residential sector for the year 2018 represented 20% of the final energy consumption in the country. For the residential sector, cooking has a weight of 68% and cooling 15%, followed by other activities such as the use of television, lighting, washing machines and water heating. The tertiary sector represents 5% of final energy consumption in the country, and its activities with the most intense uses are lighting, refrigeration, and the use of indirect heat (UPME, 2020). Although the large energy consumption associated with buildings occurs in the processes of extraction, manufacture, and transport of materials, and during their operation, there are significant consumption that occurs during the construction phase.

The main energy efficiency measures implemented in construction of buildings according to surveyed developers are the shutdown of equipment when there is no use and the awareness of construction employees to avoid wasting energy. There are important changes with respect to the expectation of implementation of efficiency measures in construction in five years. It is expected to increase the implementation of all measures, however, the main priorities of energy efficiency programs will focus on improving the efficiency of equipment and the use of LED lighting. On the other hand, about the use of alternative energies at the construction level, only 11% of the surveyed builders and developers currently use them in all their works and 15% in some of them. However, this percentage is expected to change significantly in five years with 41% of those surveyed who consider that renewable energies will be part of all the works and 30% that some of them will be part.

The main energy consumption that a building has during its operation largely depends on the decisions made during design and construction.

- At the residential level, the main efficiency measures that are being implemented are natural lighting, natural ventilation, the use of LED lights and the orientation of the project in relation to the sun. Which are mostly passive and depend on a good architectural design.
- In the case of commercial and institutional projects, the same measures stand out except for the orientation of the project in relation to the sun, however, the windows with adequate characteristics of thermal transmission, occupancy sensors for lighting and equipment for ventilation and air conditioning are added. efficient. In other words, passive measures are complemented by a greater number of active measures.
- Except for the use of efficient ventilation and air conditioning equipment, hotel projects have a very similar behavior to commercial and institutional projects.
- In industrial projects the use of LED luminaires stands out, however, the other efficiency measures are implemented to a lesser extent.
- An increase in the implementation of all efficiency measures is projected in five years, counting on the use of LED luminaires, natural lighting and ventilation and roofs with adequate characteristics of thermal transmission for the project, such as those of greater use.

The use of renewable energies is becoming increasingly important in the construction of buildings. Most builders, especially for the industrial and residential sectors, still implement renewable energy in less than 10% of their projects; 34% of those surveyed consider that more than 50% of their projects will implement renewable energy within five years. This allows us to see that the sector considers that it will progress gradually. Among building operators, 60% of them affirm that in more than 80% of the buildings they operate, energy savings are sought, while 20% report that between 50% and 80% of their buildings do so.

The main energy efficiency measures that building operators incorporate are natural lighting and the use of LED lights. The most popular measures after these are natural ventilation, use of variable speed drives for pumps, use of efficient ventilation and air conditioning equipment, and shading - vertical or fins. On the other hand, the least implemented measures are shading - horizontal or eaves, orientation of the project in relation to the sun and roofs with high solar

reflectance. Finally, less than 10% of the buildings that operate use alternative energies, which reaffirms that renewable energies still have a low use in the building sector.

### **Governance Context**

The governance context relevant for energy efficiency in Colombia contains elements of policies, laws, strategies, programs, and plans at both the national and regional levels, all of which collectively constitute the 'governance framework'. For the policy framework, the starting point is the Paris Agreement adopted on December 12, 2015, in Paris, France. In 2017 this Agreement was adopted as a national policy in Colombia through Law 1844. From this norm derives the National Policy on Climate Change approved in 2017 and Law 1931 on Climate Change of 2018, which establish the guidelines for the climate change management and where the National Plan for Adaptation to Climate Change (PNACC) and the Colombian Strategy for Low Carbon Development (ECDDB) are integrated, among others. These framework instruments, which integrate international and national climate change intentions, propose actions in the short, medium, and long term that the Colombian Government has established as a roadmap with goals at the national, sectoral, and territorial levels.

At the sectoral and territorial level, there are Comprehensive Plans for Sectoral and Territorial Climate Change Management (PIGCCS) and (PIGCCT). The latter were recently reviewed and updated to integrate them into the Nationally Determined Contributions (NDC), which are the country's main strategy to achieve the medium-term goals (2030). Likewise, the NDCs, updated in 2020, are articulated with the Long-Term Strategy, E2050, which seeks to define the roadmap towards carbon-neutral development. The construction industry plays a key role in achieving the objectives of these policies, especially considering that many developing countries, such as Colombia, are rapidly constructing new buildings as their populations and incomes increase.

The document CONPES 3919 of 2018 "National Policy for Sustainable Buildings", defines the sustainability criteria, such as efficiency in the use of water, energy, handling of materials and resources, as well as quality of the interior environment. There are seven CONPES documents, which are public policy instruments that generate a frame of reference for the different policies, initiatives and regulations that exist in the country. With special emphasis on CONPES 3919 "National Sustainable Building Policy", the following recommendations stand out:

- § Request the Ministry of Housing, City and Territory (MVCT) with the support of the Ministry of Environment and Sustainable Development (MADS) and the Mining and Energy Planning Unit (UPME), to establish sustainability criteria for buildings and issue the standard that allows their regulation.
- § Request Colombia Compra Eficiencia to develop a manual to incorporate sustainability criteria for the rental, sale, and construction of buildings for public use and their transitory application.
- § Request the Ministry of Mines and Energy (MinEnergía) and the UPME to formulate an energy label for buildings that guarantees reductions in energy consumption and GHG.

Additionally, in regulatory terms there is Resolution 549 of 2015 of the MVCT, which establishes the minimum percentages and measures for saving water and energy for new buildings. The issuance of this standard, which is currently in the process of being updated, is one of the most important steps that have been taken by the national government to advance the purpose of highly efficient buildings.

On the other hand, the energy sector has proposed important actions that impact the construction sector. Resolution 41286 of 2016 of the Ministry of Energy establishes the Program for the Rational and Efficient Use of Energy and Non-conventional Sources (PROURE), and develops the Indicative Action Plan (PAI), which establishes energy efficiency goals for all sectors, including that of construction and construction materials. The PROURE has identified some related

goals with energy efficiency in the residential and tertiary sectors. In the tertiary sector, with the implementation of the proposed energy efficiency measures, it is expected to achieve a percentage energy saving of 1.13% with respect to the total consumption of the country. For its part, with the measures of the residential sector, a saving of 0.74% would be achieved with respect to the country's total consumption. It is also important to highlight the National Energy Plan, which provides a long-term vision and different scenarios on energy consumption and production in the country.

At the level of interaction with the environment and the contribution to more sustainable cities, the sector is related to CONPES 3819 to consolidate the System of Cities in Colombia, CONPES 3718 of Public Space, Territorial Organization Plans and initiatives such as the NAMA Habitat of the MVCT, the NAMA DOT (Development Oriented to Transport), and the NAMA MoVE (Electric Mobility and Low Emissions) of the Ministry of Transport, which seek to generate sustainable and low-carbon environments, improve air quality, increase indexes of public space and harmonize the relationship of cities with the main ecological structure. Many of these actions are incorporated in both the Housing and Sanitation PIGCCS and the updated NDC.

Tax incentives currently exist within the context of Law 1715 of 2015, which have led to the implementation of actions such as VAT exemption on solar panels and other equipment used in the generation of photovoltaic solar energy. With respect to technical regulations, these refer to aspects of energy systems, and are currently implemented; the same happens with Resolution 030 of the CREG for distributed generation. The Energy Transition Law is recent and is in its initial phase of implementation.

A critical element of the governance framework is Resolution 549 of 2015. This resolution defines the parameters and guidelines by which sustainable construction are regulated in Colombia and the guide for saving water and energy in buildings is adopted". This resolution defined the percentages of water and energy savings that the new buildings that will be built in Colombia must comply with, and which entered implementation of all its content in 2016. This resolution makes provisions for its contents to be adjusted based on the review of new technological conditions available in the country that can adjust the savings minimum requirements for water and energy, a process that began its analysis in 2020 in the Ministry of Housing of Colombia. Consistent with the above, investments by this proposed GEF project in the updating of technologies that increase energy efficiency in buildings and reduce GHG emissions in target cities, will result in the definition of new energy efficiency parameters that the current resolution and associated guidelines do not contain, and will thus require updating as allowed and required by the same resolution.

Colombia has a regulatory framework related to sustainable construction defined in Decree 1077 of 2015 and Resolution 549 of 2015 and especially Decree 1077 of 2015, defines in its article 2.2.7.1.3. the follow-up that should be conducted, the procedure, and tools for monitoring the implementation of sustainable construction measures in buildings. This process, however, is currently weak and must be strengthened through a verification, monitoring, and follow-up mechanism, which can comply with what is indicated in the decree. Today the source of information available for public use related to data on sustainable construction is the observatory of the DNP system of cities, which does not contain information on all the buildings in Colombia. The monitoring and verification mechanism must rely on the information generated by the various urban projects that are being developed in Colombia, but it must first be applied at a local scale, in this case in three cities of different sizes and urban dynamics, to corroborate its effectiveness in the management of information, for later use at the national level in coordination with the Ministry of Housing, City and Territory. Having a system of this type at the national level will allow the regulatory updating process that the national government currently advances from resolution 549 of 2015 to require less investment in time and resources, by having the information available and updated, which can complement, update, and modify the criteria of sustainability in constructions.

Under the current regulatory framework in Colombia, relevant institutions have not been able to quantify the impact of energy efficiency in buildings. The most significant advances are the statistics generated by the observatory of the system of cities of the DNP of Colombia, which registers 268 building projects certified in sustainable construction, 18 certified facilities and in 49 municipalities, a small figure for the housing market that in 2021 registered the sale of 221 thousand homes sold throughout the country. Another source of information is that collected by the Mining-Energy Planning Unit (UPME) from energy consumption in buildings, which appears in third place with 22.04% of the national share of energy consumption above of mining and agricultural activities, this information was taken in 2018 and is updated annually, but its consultation is difficult at the time of disaggregating by cities or by projects. However, energy efficiency from the parameters defined in resolution 549 of 2015 is subject to the reduction of energy consumption in homes and equipment, a parameter that is adjusted depending on the climatic region where the project is located. That is why a monitoring, follow-up and verification system becomes a necessity to quantify the impact of the construction sector in reducing GHG from the projects that are being built in the country. A quantitative and informed assessment of the extent to which energy efficiency is being taken in Colombia will be facilitated by a fit-for-purpose monitoring, verification, and reporting system.

Another key element of the governance framework is the Long-Term Strategy of Colombia E2050. This strategy was announced at the recent COP26 in Glasgow in 2021, as the route to achieve carbon neutrality in the country in 2050 and the increase in the country's climate resilience, in response to the high vulnerability to climate change of the country. Among the nine goals of the E2050, there is a specific one for cities, in which the country's progress in the construction of a legal framework and technological advances related to energy efficiency in buildings are highlighted. This effort is validated by recognizing that Colombia must continue to advance in the consolidation of follow-up and monitoring mechanisms for sustainable construction in the country. E2050, in its commitment to cities-regions, in the transformation option 28 "Highly Efficient Buildings Adapted to Climate Change," also prioritizes the adjustment and updating of the regulations and technical construction regulations in Colombia to include more robust guidelines on buildings with zero net GHG emissions and adapted to climate change. Likewise, E2050 proposes to develop reporting and verification mechanisms to guarantee the implementation of norms, standards and protocols for sustainable energy efficient buildings and net zero emissions.

As a follow-up from Glasgow in late 2021, the country is now working on developing the E2050 Implementation Plan which must comprehensively address legal and institutional needs to ensure successful plan implementation, as further explained in 'Barrier 1'.

### **The Financial Sector and Energy Efficiency in Colombia**

In Colombia, banks such as Bancolombia, Banco de Bogotá, Davivienda, BBVA, among others, have generated lines of credit associated with the incentive for sustainable construction, doing important work in the implementation of sustainable projects in construction. In addition, there is the work carried out by Financiera de Desarrollo Territorial S.A., (FINDETER) with the Transportation Oriented Development NAMA to finance urban development projects in Colombian cities. For this reason, it will be essential that the updating of national regulations involve the financial sector in the creation of incentives for sustainable construction, to assist in defining in which phases of the construction of a building or public space project the greatest economic benefits are generated when an incentive is applied.

It is worth mentioning that the national standard includes tax benefits related to energy efficiency, but as indicated by the Observatory of the DNP System of Cities, only 96 projects related to buildings were reported as beneficiaries of these incentives in 2019, with which the work with banks to analyze together with builders the best financing measures for energy efficiency in construction, would improve the design of incentives, and increase the number of projects



reported both for being beneficiaries and for applying measures associated with energy efficiency in buildings. This alliance and strengthening of working relationships with the financial sector will be crucial to the upscaling of the results anticipated under this proposed GEF project.

#### Socio-economic Context of Project Sites

The city of **Barranquilla**, officially Barranquilla's Special, Industrial and Port District, is the capital of the department of Atlántico, located in the north of the country in the Caribbean region on the western bank of the Magdalena River, 7.5 km from its mouth in the sea. Caribbean. It is the fourth most populated city in the country. The population density is 8,274 inhabitants per square kilometer. About 5.1% of the population is of black, mulatto or Afro-American descent and only 0.1% is indigenous. Public services in Barranquilla (electricity connection, sanitary sewerage, aqueduct, gas, and telephone) exceed 90%. However, it does not have an adequate storm drainage system, which is why it is constantly affected by flooding of the roads because of streams overflowing due to the occurrence of rains. Likewise, in terms of vulnerability there are also erosive processes, soil instability, and risks of eventual hurricanes.

The city of **Montería** is the capital of the department of Córdoba, located in the northwest of the country in the Caribbean region in the valley of the Sinú River, whose main channel crosses the city to the west. The municipality and its surroundings are characterized by being geographically located in an alluvial plain, with a great wealth of wetlands and swamps that contribute to the richness of fauna and flora, and a wide availability of environmental services. In Montería, 78% of the territory is rural land and only 1.3% is urbanized. The predominant activities in rural land correspond to 24% of environmental conservation and 32% to agro-silvopastoral use. The main strategic ecosystems correspond to a series of wetlands that belong to the Sinú River basin. Other types of strategic ecosystems correspond to the protection rounds of water bodies such as rivers and streams, the aquifer recharge zones, and the protection rounds for water sources.

Montería has a population of approximately 505,334 inhabitants. (2020), of which 78% are in urban areas, which reflects a high concentration of population in this area. Montería has the fifth highest poverty rate in the country (34.8%), high levels of informality in settlements and economic activities, a high supply of unskilled labor, and high potential but ineffective demand due to the limited ability to pay, education and health services. Montería's economy is based mainly on the primary sector, where agriculture, extensive cattle ranching, and mining predominate. It has a high coverage of services (water, energy), however, in terms of sanitation there are deficiencies.

The city of **Pasto** is the capital of the department of Nariño, located in the western part of Colombia, in the middle of the Andes Mountain range, in the Atríz Valley at the foot of the Galeras volcano at 2,599 m.a.s.l. The city is located on the banks of the river that bears his name, which represents the main source of water supply and is a determining element for the structuring of urban life. With a population of 464,967 inhabitants that represents 25% of the total population of the department. The net density of the city is 15,401 inhabitants / km<sup>2</sup>. The region near the city of Pasto corresponds to the townships and rural areas that make up its natural and landscape heritage, in addition to the areas of source of its rivers, streams and lagoons, such as the Laguna de La Cocha, considered as an important wetland especially as Habitat of Aquatic Birds, with its cultural, tourist and productive character, being this the main environmental asset of the municipality.

The economic development of the municipality of Pasto has been based on the tertiary sector of the economy. The city has a very good coverage of public services. Pasto has a significant population with low incomes, with a poverty rate of 30.5%, extreme poverty of 4.5%. Likewise, the effects of the conflict, forced displacement and other factors affect the quality of life of the population, thus forming highly vulnerable population groups. Socio-culturally, the

municipality of Pasto is configured as a diverse, multi and pluri-cultural territory, made up of a population of migrant past generations and a diversity of communities with values, knowledge, customs, and social manifestations that have determined the coexistence of very human dynamics. typical of the region. Traditionally, indigenous communities have had a preponderant role around the development and configuration of the municipality. The Historic Center of Pasto was declared a National Site of Cultural Interest (BIC) (Law 163 of 1959) and has a close relationship with the Pasto River and with the development of the Carnival of Blacks and Whites as it is crossed by a section of the Carnival Path.

### **Long-term Solution and Barriers**

Although Colombia has made progress on the issue of energy efficiency in the construction of buildings and public spaces, there are still barriers that must be overcome. During the formulation of this project, the following barriers were identified:

***Barrier 1 – Governance of the construction sector.*** Implementation of the E2050<sup>[1]</sup> is key for creating the enabling framework for improved governance of the construction sector in Colombia. The E2050 initiated the development of its implementation plan in **February 2022**, where it will define in greater detail the times, managers and products required to comply with the 2050 strategy. Concurrently, the country is already advancing with the '*Net Zero Carbon Building for All Program*', which aims to achieve new net zero buildings by 2030 and existing net zero buildings by 2050, delivering in the coming months the roadmap to achieve this objective at the national level, being an advance in the implementation of the measures proposed in the E2050, and incidentally being a guiding process for the project presented for financing before GEF. Even though the country is making progress in the formulation of policies and regulations on sustainable and low-carbon buildings, there is much work to be done to upgrade existing regulations and guidelines to make them responsive to requirements for achieving carbon neutrality and energy efficiency, in line with the goals defined in the National Determined Contributions (NDC) and E2050. Current policies for energy-efficient building require a more robust and comprehensive regulatory development that involves the entire life cycle of buildings and there is a lack of appropriate monitoring and verification systems to ensure compliance by the construction sector. At present, there are still gaps in the sustainability criteria addressing energy efficiency in the design, construction, and operation of buildings and public spaces, which prevents builders from knowing in a practical way the recommendations and guidelines for optimizing their processes, promoting the carbon neutrality of the country. In addition, and as mandated in the resolution itself, new energy efficiency parameters for buildings will require updates to Resolution 549 of 2015, to allow for greater certainty about the contribution of the construction sector in the reduction of GHG emissions and leaving clarity in the norms and standards that must be met in new Colombian buildings. Governance of the construction sector requires reforms to and strengthening of the legal and institutional frameworks and monitoring mechanisms to effectively implement the E2050, and by extension, the achievement of carbon neutrality and energy efficiency in the construction sector.

***Barrier 2 – Lack of incentives for the application of energy efficiency in sustainability criteria in projects, works or activities associated with construction.*** According to the publication 'State of Sustainable Construction in Colombia 2021', carried out by the Colombian Council for Sustainable Construction, all members of the value chain, that is, suppliers, manufacturers, operators, designers, consultants, builders, and developers, identify the main barriers as lack of incentives from the government and additional investments in direct project costs, including those associated with energy efficiency.

***Barrier 3 - Lack of knowledge, skills, and capacities for energy-efficient construction at the local level.*** Builders and developers, for their part, consider the lack of advisory knowledge in the country in the use of advanced technologies as an additional barrier. Designers, consultants, manufacturers, and suppliers agree in their perception of the lack of demand in the market since there are different obstacles to the consolidation of a market for sustainable energy efficient buildings for decarbonization.

**Barrier 4 - Lack of evaluation and monitoring mechanisms.** Finally, institutional actors at the local level in the cities of Barranquilla, Montería and Pasto identified as a barrier the lack of tools that would allow the evaluation energy efficiency in sustainable construction projects, works or activities in public spaces or buildings, as well as obtaining data from variation in terms of emission reduction in accordance with the sustainability criteria applied. The lack of information does not allow the correct application of sustainable criteria during the construction life cycle, nor does it allow an adequate evaluation to be made for decision-making for the city in terms of mitigating GHG emissions and reducing environmental impacts.

## 2) The baseline scenario and any associated baseline projects

### BiodiverCiudades Projects

Since 2019 the National Government has been leading the BiodiverCiudades initiative, which seeks to transform Colombian cities into urban spaces where nature is part of sustainable urban development, and with which a solution is given to the main environmental, social, and economic problems. The national government has managed to form a network with the 14 cities that have ratified, through a memorandum of understanding, their commitment to incorporate biodiversity into the urban development of cities. This memorandum provides a framework of work and understanding with the cities, with which 94 urban development projects have been identified and leveraged with resources from the national government, 2 projects in Barranquilla for USD 50 million and 4 projects of national scale of technical assistance. This commitment of the cities to the initiative has managed to generate coordinated work that has allowed for the formulation of an energy efficiency project with resources from the GEF, which is why the government is committing to guarantee the identification of 6,024 housing pilot projects at the city level, complementary to the projects presented as counterpart to this project, as further outlined below.

It is necessary to clarify that these 6,024 pilot projects will be identified after the presentation of the project to the GEF, being supported in addition to the relationship and work with the cities and the figures provided by the National Department of Statistics (DANE), which between 2015 and 2019 show that Barranquilla, Montería and Pasto are among the 20 cities with the largest number of square meters of buildings built in the country. In the case of Barranquilla, a construction of more than 6 million m<sup>2</sup> of buildings is reported in the aforementioned period, Pasto reports more than 1 million m<sup>2</sup> and Montería more than 600 thousand m<sup>2</sup>, this, together with the statistics provided by the Ministry of Housing, which reported the sale of more than 221,000 homes throughout Colombia in 2021, makes it feasible to achieve these pilot projects complementary to those presented as counterpart, which would apply the energy efficiency proposals proposed in the GEF project.

To develop projects within the framework of BiodiverCiudades, five lines of action were established: 1) circular economy, 2) air quality, 3) environmental education, 4) bioeconomy and 5) sustainable infrastructures. The latter is expected to be promoted starting with this proposal, especially with the implementation of energy efficiency criteria that helps in the reduction of GHG emissions.

The cities of Barranquilla, Montería and Pasto have currently prioritized the following projects which may help to form part of this project's baseline.

### **Barranquilla:**

Eco Park Family District Ciénaga de Mallorquín. It is a response to climate change and the urgent need to develop a space for public recreation, an encounter with nature. It proposes a Master Plan where six projects will be executed around the perimeter of the swamp, seeking the landscape adaptation of the southeastern sector of the Cienaga de Mallorquín.

Recovery of the Caño de la Ahuyama. This project has contemplated the hydraulic and connectivity adaptation of the Caño de La Ahuyama. It will prevent the risk of flooding in the neighborhoods adjacent to the Caño de La Ahuyama within the framework of risk management.

#### **Montería:**

Construction of the Botanical Garden of Sinú. This project seeks to design, build, and put into operation the Sinú Botanical Garden in the municipality of Montería. It consists of an environmental and urban project, which aims to strengthen the socio-environmental component of the municipality, by promoting conservation, research, ecotourism, and education in the context of the biodiversity of native and exotic flora.

Adaptation of an interactive classroom and construction of an urban garden in the Ronda del Río Sinú. This project seeks to adapt an interactive classroom and build an urban garden, to create capacity and awareness around environmental issues, in formal and non-formal education in its coverage area. The facility is in the Ronda del Sinú Linear Park, on a property owned by the municipality and, in which there is currently an infrastructure that requires adjustments

#### **Pasto:**

Environmental, landscape and architectural recovery of the Pasto River as a structuring and connecting element of development and urban housing in the city of San Juan de Pasto. The project arises from the need to recover the Río Pasto as a true structuring of development and economic and social activity in the urban sector. The project includes the intervention and recovery of approximately 2 kilometers in length of the river in its urban section, which crosses the city of San Juan de Pasto from southeast to northwest. The project would add about 524 thousand square meters of effective public space, reducing the city's deficit in effective public space. It is made up of 13 sections.

Based on these projects already identified and prioritized in the framework of BiodiverCiudades for the cities of Barranquilla, Montería and Pasto, this GEF project will contribute to the incorporation and application of energy efficiency strategies such as the use of renewable energies, LED technology and saving measures energy, and the use of efficient construction materials at the level of bioclimatic comfort, as a way of implementing energy efficiency pilots in public spaces and in buildings destined for public use.

#### **Sustainably Constructed Buildings for All Project**

In 2019, within the framework of the United Nations Climate Action Summit, the Net Zero Carbon Building for All program was launched, which aims to achieve new net zero buildings by 2030 and existing net zero buildings by 2050. As part of this program two countries were selected to receive technical and financial assistance to develop a two-year project, in which they can advance in these goals, Colombia was one of these two countries.

The project began in April 2021 and is aligned with different public policies created in recent years in Colombia due to the multiple relationships they generate with their environment and with various sectors of the economy throughout their life cycle.

This project promotes the development of net zero buildings in Colombia, however, now the pilots will only be developed only in Cali and Bogotá; for this reason, it is necessary to replicate this initiative in other cities. This proposal seeks to bring net zero buildings to Barranquilla, Montería and Pasto, expanding the scope of the project "Net zero buildings for all" to continue advancing in the decarbonization of buildings and the reduction of emissions generated in the construction sector.

#### **Pre-feasibility study and design of an urban park, Montería**

This study implemented by CAF was recently conducted in October 2021 and constitutes an important part of this project's baseline. The project included:

- § Opportunity and feasibility analysis (environmental, urban, economic, legal, institutional, and social) for the development of an open public space in the current oxidation lagoon area and its area of influence.
- § The formulation of a plan to abandon the oxidation ponds and reconversion to the new proposed use, in accordance with the guidelines established for this purpose by the Regional Autonomous Corporation of the Sinú Valley –CVS.
- § The design and construction proposal of the park, including the construction and implementation stages of this public space and its non-motorized connectivity with the city.
- § The analysis of financing alternatives for the construction and maintenance of the park in the long term, specifying the management and financing instruments that can be implemented in each of them.

#### **Analysis for the definition of alternatives, studies, and preliminary designs for the environmental management of the Ciénaga de Mallorquín Ring Road, District of Barranquilla, Colombia (US\$253,575)**

This project implemented by CAF is ongoing until May 2022 and will provide critical baseline information for this project as indicated in its primary objectives listed below:

- § Characterize and contextualize the Ciénaga de Mallorquín to define the essential technical elements to structure alternative projects that can promote sustainable development.
- § Identify and formulate alternative interventions in accordance with the environmental, social, and urban environments.
- § Define evaluation criteria and monitor the prioritization of intervention alternatives based on a multi-criteria analysis that allows generating the instruments for selecting the most appropriate alternative.
- § Prepare at the pre-feasibility level the selected alternative for each neighborhood and structure a roadmap to advance in its final design and implementation.

The World Bank funded project "**Assessment of the Energy Demand Reduction Potential of Public Buildings in Colombia**" is currently underway in the country and has as its objective, identify the potential for reducing energy consumption in public sector education, health, and administrative buildings. For this, 29 energy audits were carried out where energy consumption, energy used, equipment, deficiencies in the comfort of the facilities and measures to reduce energy consumption were identified. Among the tangible results obtained in the audits, is the construction of a package of energy efficiency and renewable energy

measures, the assessment of their potential for energy, economic and financial savings and the identification of financing strategies considering the particularities of the public sector at the national and regional level. The results of this project will provide critical information for streamlining the specific activities to be considered for inclusion in the CEO Endorsement Request during the PPG phase.

In addition, and complementary to the above baseline, the UPME is advancing a proposal of a roadmap for labeling of buildings, including simulations and goals. The UPME has published the third version of the Indicative Action Plan of the Rational Use of Energy Program PAI-PROURE for the year 2021. This document proposes a long-term vision of energy efficiency as a fundamental resource in energy transformation, as well as indicative energy efficiency goals estimated from cost-efficient measures. This exercise projects the impact of energy efficiency on demand and emissions in the 2021-2030 period and a cost-benefit analysis of the measures studied is carried out. With the results of this exercise, the UPME identifies the measures that require tax incentives to be developed and thereby achieve potential energy efficiency goals. The measures proposed in the PAI-PROURE show a consumption reduction potential of 1,726 PJ in the 2021-2030 period. The foregoing corresponds to a 9.34% reduction compared to a trend scenario. If we consider that the energy consumption for 2020 was 1650 PJ, it can be said that with the implementation of the measures proposed in this plan, Colombia could save 1 year of energy consumption and its associated costs. The distribution of the 9.34% reduction in consumption in the analyzed sectors is as follows: transportation with 3.71%, residential 2.89%, industrial 1.41%, tertiary 0.72% and others with 0.61% remaining. On the side of CO<sub>2</sub> emissions, the PAI-PROURE simulation shows a potential of 87.22 MTonCO<sub>2</sub> avoided in the period analyzed. The foregoing is equivalent to an estimated reduction of 15.2% for the emissions estimated in 2030 for the final consumption sectors.

**Neto Zero Carbon Building Accelerator by WRI** - The Net Zero Carbon Building Accelerator project is financed by the Global Environment Facility (GEF) and is implemented by the World Resources Institute (WRI) and the Colombian Council for Sustainable Construction. The main objective is to accelerate the country's transition towards global goals of net zero carbon in construction. It has a national component that seeks to develop the national roadmap for net zero carbon buildings and begin its implementation process. Likewise, it has a local component that seeks to develop specific action plans for two pilot cities, Bogotá and Cali, and work on other necessary actions to achieve effective implementation.

In 2021, the project began with the launch at the national level, the advisory committee was formed in which Minambiente's vision was important to review the key actors and their role in the project, as well as the country's commitments to the climate change. With this committee, a consensus has been reached on what a net zero carbon building is for the country, and the key actors and organizations for discussion at the national and local levels have been identified and integrated. This group of experts is made up of nearly 300 people throughout the country, who represent the construction value chain from the private and public sectors, unions and associations, academia, and cooperation entities. In 2022, the project will publish the recommendations document that synthesizes the transformative actions for net zero carbon buildings in the country, because of the national dialogue with experts. This summarizes for each action: the gap with respect to the current state, the enabling policies for its implementation, actors involved, expected result, scalability recommendations, and relationship with the regional and local context. This document, in turn, integrates the prioritization exercise that was carried out in 2021 and will be a consultation document for public entities.

**Guide to Sustainability Criteria for Social Housing in Colombia** - In 2018, the Conpes 3919 - National Policy for Sustainable Buildings promoted by the MVCT, proposed the definition of sustainability criteria for all buildings, considering their life cycle. In this initiative, the MVCT has been leading the strategy to define the sustainability criteria proposed as the main commitment in Conpes 3919 of 2018. In this regard, since 2019 working sessions have been held with the sectors, unions, academia, among others, to consolidate a proposal of criteria by life cycle stage and environmental, social, and economic component, as well

as the structuring of a resume by criteria that allows understanding the scope and regulatory status of each one. Today there is a preliminary proposal of approximately 65 criteria identified for the entire life cycle of buildings, which is being strengthened through additional inputs obtained through the participation of the MVCTy in the Triangular Cooperation Project between Mexico, Germany, and Colombia. Within the framework of the project with Mexico, there are two key consultancies: 1. Consultancy on phase 2 sustainability criteria, which focuses on the materials component (in execution). 2. Consultancy on sustainability criteria for the environment (under contract). The information resulting from both consultancies will be used to advance in the fulfillment of commitment 1.1 of CONPES 3919 of 2018 on sustainability criteria for new and existing buildings, considering the life cycle.

**Policy and Regulatory Analysis by Universidad de los Andes and UK-PACT Colombia** - Low Carbon Cities in Colombia - An Integrated Urban Modeling Approach for Policy Analysis, was a project funded by UKPACT in 2019, with results delivered in 2020, and developed by the Universidad de los Andes and the Colombian Council of Sustainable construction. The objective of the project was to provide an approach, technical criteria, tools (set of indicators and models) and policy and regulatory recommendations for sustainable urban development in Colombia (climate change mitigation synergies between sectors, urban adaptation goals and SDGs)). The following products were generated for two urban projects in Colombia: Development of a vision to plan and operate a city or an urban project; Construction of inventories and base lines; Set of indicators (adaptable) to evaluate an urban project and its evolution towards an expected situation; Application of a set of models to evaluate options for mitigation, adaptation and improvement of habitability conditions; Development of a tool for integrating the recommended options; Analysis of mitigation scenarios, and options to increase resilience and improve habitability conditions for two case studies. The scale of the project was at the urban level, and it generated recommendations in the following dimensions: Urban Ecology, Water, Energy, Waste, Transportation, and Buildings and public space.

### 3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

#### Intervention Logic

The intervention logic of the project is guided by the 'drivers', 'assumptions', and 'logical pathways' needed to produce the project's objectives and ultimately the desired impact and global environmental benefits. The key drivers are those activities and processes that the project can potentially and directly sponsor (inputs), in support of project outputs and outcomes, while the assumptions are those conditions and circumstances that are necessary to achieve the desired project results, but are outside the control of the project, as highlighted in the Project Results Framework. The logical or impact pathways are the set of steps, consisting of activities, processes and assumptions that collectively will deliver the desired project objective.

The project's overall objective is 'Contribute to a reduction of CO<sub>2</sub> emissions by increasing decarbonization strategies in buildings and public spaces in Barranquilla, Montería and Pasto through the development of actions that involve the different stages of the life cycle of buildings and interventions in public space'. This project seeks to address the barriers identified above related to energy efficiency in buildings and public spaces in Colombia, consistent with the need to reduce the associated GHG emissions.

The project's intervention logic specifically supports the implementation of Resolution 549 of 2015 adopted by the Ministry of Housing, City, and Territory of Colombia. This resolution is contained in the NDC as a mitigation measure in the Colombian NDC and incidentally has supported the commitment of sustainable cities of the long-term strategy to 2050; in addition, this resolution has been the trigger for regulatory measures associated with energy efficient construction in cities such as Bogotá and Cali, and the 2019 National Sustainable Building Policy, being examples of how Colombia advances in reducing GHG emissions. Resolution 549 of 2015 seeks to establish the minimum percentages and measures for saving water and energy in new buildings as of January 1,

2016, for all of Colombia. Compliance with these measures is carried out by the construction union and reporting through the construction license. The resolution additionally adopted the sustainable construction guide for buildings; in this guide there are both active and passive measures to reduce water and energy consumption, and the technical support for adjusting the savings percentages by type of climate and building, based on the information available in 2015.

Five years after the adoption of the resolution in Colombia, the Ministry of Housing, City, and Territory began the process of updating this standard, considering two points, the technological advance in the energy efficiency of buildings, which should confirm whether it is feasible to increase or reduce the savings percentages and the need to create a system for monitoring compliance with this measure. This project presented to the GEF will allow Colombian cities and, incidentally, the national government to have more precise and detailed information on quantifiable measures that increase the energy efficiency of buildings and infrastructure and quantify the reduction of GHG emissions by energy efficient construction, which are implemented in cities and in construction projects in Colombia, being verified and promoted in the regions of the country. The primary drivers, assumptions, and the two key logical pathways of the project's Theory of Change (ToC) are presented below and the graphical illustration of the TOC is presented in Figure 1.

Primary drivers include:

- § resolution or administrative act on highly efficient buildings adapted to climate change, which in their life cycle and interaction with the environment generate a net balance of carbon emissions equal to zero.
- § reporting and verification mechanisms to guarantee the implementation of the norms, standards, and protocols for energy efficient building and public spaces.
- § roadmaps for Barranquilla, Montería and Pasto to advance in the decarbonization of buildings, which will include a monitoring system, and a business model that involves the financial sector.
- § technical guides and manuals for the design and implementation of projects in public spaces and energy efficient buildings.
- § 14 pilot projects that implement incremental changes in existing buildings that allow a tangible reduction in the carbon footprint associated with buildings and public spaces.

The project's key assumptions are:

- § **Outputs to Outcomes:** Drivers of change supported by the project are effective in delivering anticipated outcomes as indispensable inputs to reaching necessary intermediate states.
- § **Outcomes to Intermediate States:** Regulatory authorities embrace the new framework, and the private sector sees the benefit of energy efficient construction.
- § **Intermediate States to Impact/GEBS:** Project's sustainability strategy holds true to deliver Global Environmental Benefits (GEBS).

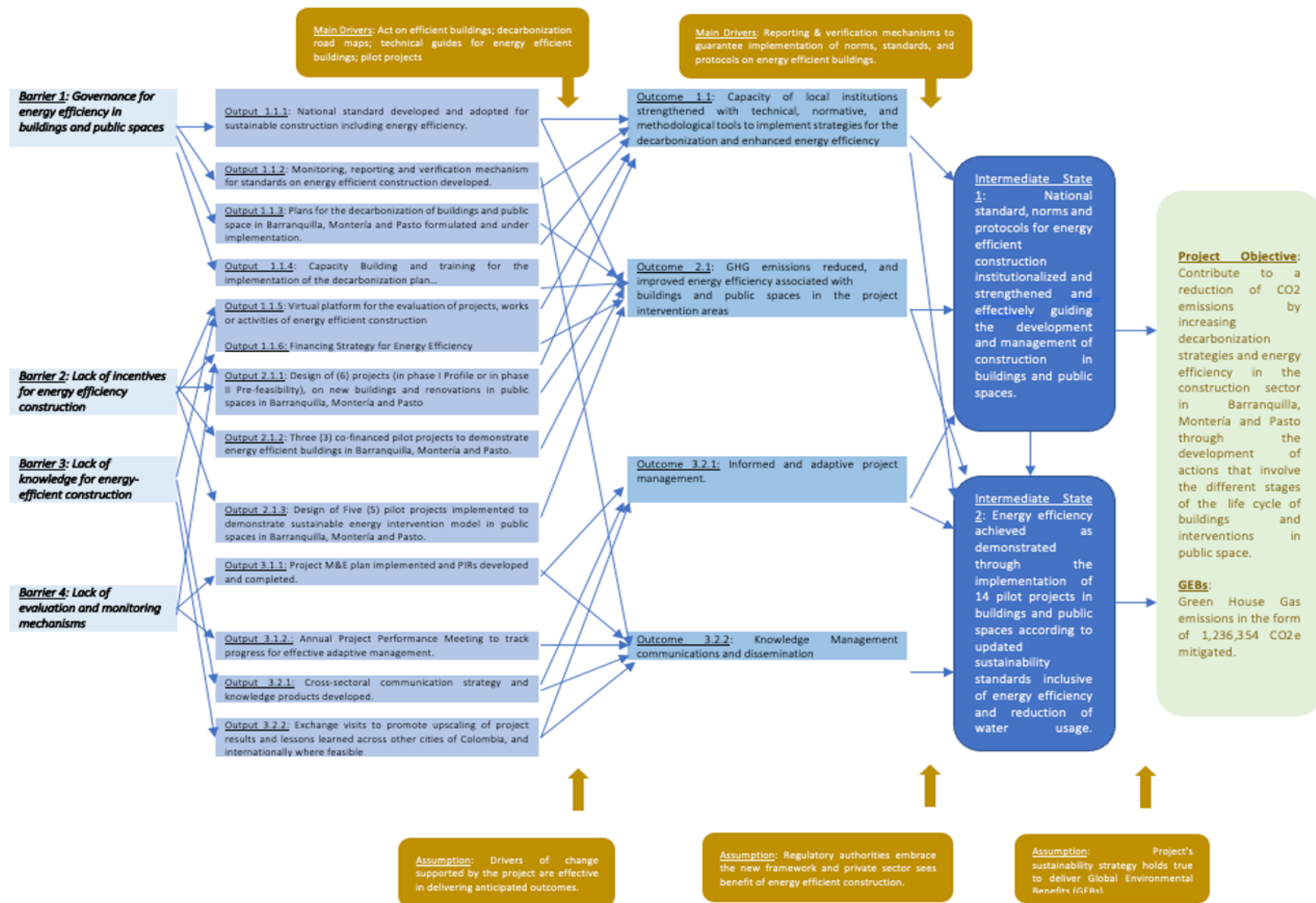
The project's *logical pathways* are summarized below:



**Logical Pathway 1:** This pathway proposes that **IF** a national standard is developed and adopted for energy efficient buildings, monitoring, reporting, and verification mechanisms are instituted, plans for the decarbonization of buildings and public space are implemented, and capacity building in energy efficient construction is provided, **THEN** the capacity of local institutions will be strengthened with technical, normative, and methodological tools to implement strategies for the decarbonization and enhanced energy efficiency in buildings and public spaces, **BECAUSE** the overall governance framework for energy efficient buildings and public spaces would have been revamped to create the enabling environment with guidelines that contain comprehensive sustainability parameters for the entire life cycle of buildings and public spaces that allow for meeting the challenges of efficiency and reducing impacts on the environment, by optimizing processes while promoting the carbon neutrality of the country.

**Logical Pathway 2:** This pathway advocates that **IF** pilot projects are designed and implemented to demonstrate energy efficient buildings and sustainable energy intervention models in public spaces in Barranquilla, Montería and Pasto, **THEN** GHG emissions will be reduced and energy efficiency will be improved associated with buildings and public spaces in the project intervention areas, **BECAUSE** incentives would lead to construction of buildings and public space adopting energy efficiency criteria as part of overall sustainable construction, and knowledge, skills, and capacities for energy-efficient construction at the local level would have been strengthened.

**Logical Pathway 3:** This pathway proposes that **IF** a project M&E plan is implemented and PIRs developed and completed, Annual Project Performance Meetings to track progress against the project's results framework are conducted; a cross-sectoral communication strategy and knowledge products are developed, exchange visits to promote upscaling of project results and lessons learned across other cities of Colombia and internationally are conducted, **THEN** informed and adaptive project management and Knowledge Management communications and dissemination will be achieved, **BECAUSE** the project would have invested in proper project management and KM systems that are necessary for reporting and accountability, and as part of a systematic construction of knowledge that is crucial for the upscaling of project results.



## Component 1: Governance for Sustainable Construction (GEFTF \$1,294,647; Co-financing: \$16,871,409)

The level of detail provided for each project component is reflective of the inputs received to date during consultations with stakeholders and project principals. Further details will require more extensive consultations during the PPG with municipal governments in the three cities, industry, civil society, academia, and the local community. Additionally, specifics of activities per output may also require targeted technical assessments on energy efficiency within the context of buildings and public spaces. These may be conducted during the PPG.

The objective of this component is to improve the regulatory and technical framework related to net zero carbon buildings and to accompany the cities of Barranquilla, Montería, and Pasto in their implementation. Its result will be to improve the capacities of local institutions with technical, normative, and methodological tools to implement strategies for the decarbonization of the construction sector.

**Outcome 1.1.: Capacity of local institutions strengthened with technical, normative, and methodological tools to implement strategies for the decarbonization of the construction sector**

While Resolution 2015 was meant to achieve substantial progress in energy efficient construction, this has not been fully implemented or at the pace desired due to challenges in institutional capacity at the municipal and local levels and budget shortages. This component will finance the preparation of a resolution or administrative act complementary to Resolution 2015, on highly efficient buildings adapted to climate change, which in their life cycle and interaction with the environment generate a net balance of carbon emissions equal to zero. Technical studies will be developed that define: (i) the reporting and verification mechanisms to guarantee the implementation of the norms, standards, and protocols for sustainable buildings inclusive of energy efficiency; and (ii) plans, also called, roadmaps for Barranquilla, Montería and Pasto to advance in the decarbonization of buildings, which will include a monitoring system, and a business model that involves the financial sector based on a Financial Strategy to be developed, as further described below.

This component will also support the development of three (3) technical guides and manuals for the design and implementation of projects in public spaces and energy efficient buildings to improve information on financial and tax incentives associated with sustainable construction inclusive of energy efficiency in Colombia, differentiated by regions, climatic zones, and ecosystems for the implementation of sustainability criteria in projects related to public space and buildings. These will include, but will not be limited to:

§ Guidance manual to access financial and tax incentives associated with sustainable construction inclusive of energy efficiency in Colombia.

§ National practical guide differentiated by regions, climatic zones, and ecosystems for the implementation of sustainability criteria in projects inclusive of energy efficiency, related to public spaces and buildings, involving the entire life cycle.

The design and implementation of a virtual platform for the evaluation of sustainable construction projects, works or activities in public space or buildings will also be financed, which will serve local governments, the construction union and other decision makers, to know if the Projects meet environmental sustainability criteria and are energy efficient and low in carbon. This platform will complement the EDGE (Excellence in Design for Greater Efficiencies), which is an online tool for determining cost-effective ways to build green, sustainable buildings, and has been shown to help planners to make energy efficiency savings of over 20% in new buildings<sup>[2]</sup>.

Additionally, technical assistance will be financed to support implementation of the decarbonization plans proposed for each city. Complementary to the above, the implementation of the tools developed by this component will be co-financed in the prioritized cities, with an emphasis on support with specialized personnel, equipment, virtual platforms, among others.

The project will support a triple alliance for the development of a Financing Strategy to be made up of the Ministry of the Environment, the Ministry of Housing, and the Ministry of Finance as representatives of the National Government; the Colombian Council of Sustainable Construction as technical representative of the construction sector; and Asobancaria, and Financiera de Desarrollo Territorial S.A (FINDETER) as representatives of the Colombian financial sector. The objective will be to create two financing mechanisms to guarantee the replicability and expansion of the scope of this proposed GEF 7 project. The first, through public resources to generate conditions and incentives that the government supports in terms of efficiency and sustainable construction; This mechanism would be supported by the regulations that are generated within the framework of this proposed GEF 7 project.. The second would be a financial mechanism that allows, for example, to increase credit lines, with better rates so that more income is generated for the financing of new projects at the national level. Further details on the proposed financial mechanism are presented in the Private Sector Engagement section of the PIF.

To complement the information provided above, Table 2 provides further details of the needs, objectives, scope and key actors to be involved in Component 1 by output.

**Table 2. Needs, Objectives and Scope of Component 1 Outputs**

Output	Need	Objective	Scope	Stakeholders/ Responsible Party
<u>Output 1.1.1:</u> National standard developed and adopted for energy efficiency in buildings and public spaces.	Regulation in place (Resolution 549, 2015) was a good starting point but it clearly lacks a comprehensive scope (for example low carbon materials are not considered), goals could be enhanced, M&E is not clearly defined, amongst other.	Support the Ministry of Housing to carry out technical studies to identify opportunities of improvement of the new regulation	<ul style="list-style-type: none"> <li>- Carry out technical studies to identify opportunities of improvement of the new regulation</li> <li>- Consultants to prepare regulation, technical guidelines, manuals, and standards</li> <li>- Conduct a participatory process with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>-Ministry of Housing</li> <li>-Ministry of Environment</li> <li>-National Planning Department</li> <li>-Construction Industry, Camacol</li> </ul> <p><u>Responsible Party:</u> IDB and CCCS</p>
<u>Output 1.1.2:</u> Monitoring, reporting and verification mechanism to guarantee the implementation of the norms, standards and protocols for energy efficient building	Policies in place lack an appropriate MRV system that provides transparent information about achievements or progress	Establish a comprehensive MRV system that tracks progress in the private sector, aligned with the country's climate change MRV system	<p>The MRV System will allow monitoring compliance with regulations related to energy efficiency and sustainable construction.</p> <p>Design, developm</p>	<ul style="list-style-type: none"> <li>-Ministry of Housing</li> <li>-Ministry of Environment</li> <li>-National Planning Department</li> <li>-</li> <li>-</li> </ul> <p><u>Responsible Party</u></p>

s and public space s.		Monitoring of the implementation of public policy	ent, testing, validation, and operation of the system.	y: IDB and CCCS
<u>Output 1.1.3:</u> Plans for energy efficient buildings and public space in Barranquilla, Monteria and Pasto formulated and under implementation.	Local governments do not count with a clear strategy with goals, actions, and indicators on the way forward to decarbonize the building sector	Provide technical assistance to support the preparation and implementation of plans for energy efficient buildings in Barranquilla, Monteria, and Pasto	-Preparation of a roadmap for each city jointly with local authorities	- Local authorities in Barranquilla, Monteria, and Pasto  -Local construction industry  - <u>Responsible Party:</u> IDB and CCCS
<u>Output 1.1.4:</u> Capacity Building Program inclusive of technical assistance and training for the implementation of energy efficient buildings, public space and green infrastructure developed and implemented.	Construction companies and authorities at the local level lack the human capital, knowledge, and experience to incorporate GHG mitigation and green infrastructure in buildings design and public space development	Enhance the capacities of construction companies, local authorities to promote energy efficient buildings, low carbon public space and green infrastructure	-Design the capacity building Program  -Implementation of the Program  -Assessment	- Local authorities in Barranquilla, Monteria, and Pasto  -Local construction industry  - <u>Responsible Party:</u> IDB and CCCS
<u>Output 1.1.5:</u> Virtual platform for the evaluation of projects, works or activities of energy efficient buildings in public space designed and implemented.	The National Government and Local Governments require a platform that allows their energy efficiency projects to be evaluated to guarantee the effectiveness of their low-carbon measures associated with this type of action	Develop and implement a platform for modeling and evaluating energy efficiency projects of public initiative or with public participation.	Conduct information gathering and existing monitoring and verification systems at the national and local levels related to energy efficiency and sustainable construction.  Build a baseline associated with lo	Ministry of the Environment, Ministry of Housing and Local Governments

			<p>associated with low-carbon energy efficiency and sustainable construction projects.</p> <p>Installation of the monitoring and follow-up platform aligned with the MVR purposes of the previous output.</p> <p>The Platform will allow an increase in the access of the actors involved to energy efficiency simulators, with which a framework of neutrality is maintained against the certifiers and the management of open data.</p>	
<p><u>Output 1.1.6:</u> Financing strategy for energy efficiency projects with both public resources and financial mechanisms through a triple alliance between the National Government, the construction sector, and the financial sector.</p>	<p>One of most prominent barriers for sustainable buildings is the required finance to implement energy efficient initiatives. There is a lack of economic incentives that help move forward projects</p>	<p>Elaborate a green finance strategy for sustainable construction, with the participation of the financial sector</p>	<ul style="list-style-type: none"> <li>- Studies to identify the finance gaps and review international experiences</li> <li>-Prepare and implement the finance strategy</li> </ul>	<ul style="list-style-type: none"> <li>- Ministry of Housing</li> <li>-Ministry of Environment</li> <li>-National Planning Department</li> <li>-Ministry of Finance</li> <li>- Asobancaria – Green Protocol</li> <li>-National development banks, commercial banks</li> <li>-Construction led</li> </ul>

				Construction industry, Camacol
				<u>Responsible Party:</u>

## **Component 2: Net Zero Carbon Buildings and Energy Efficiency in Public Spaces (GEFTF \$5,498,575; Co-financing \$69,211,124)**

The second component aims to implement effective and innovative solutions to promote energy efficient construction with an emphasis on buildings and public space. The result of this component is to: (i) reduce GHG emissions generated in the cities of Barranquilla, Montería, and Pasto, associated with construction and energy efficiency in buildings and public spaces; and (ii) increase sustainable construction in Barranquilla, Montería, and Pasto, which will generate 40% less GHG emissions.

### **Outcome 2.1: GHG emissions reduced and improved energy efficiency associated with buildings and public spaces in the project intervention areas.**

This component will finance studies, designs, and works in the cities of Barranquilla, Montería and Pasto. It will finance projects that implement incremental changes in existing buildings that allow a tangible reduction in the sector's carbon footprint.

Housing designs will be made according to the climates of the cities with the aim of improving efficiency in energy and water consumption. These designs and guidelines may be used by construction companies in their housing projects not only for the intervened cities but for the rest of the cities of the country, and even for cities in the region in Latin America. Additionally, designs of public spaces will be developed with criteria of energy efficiency, use of renewable energy and water use, so that they can be used by the municipality's governments in the interventions of public spaces. This component does not contribute directly to GHG reductions to the GEF project; however, it has the potential that its activities can serve as a reference point at the national and regional level for scaling up the results of the project.

Within the framework of the project activities, the activities under the output 2.1.2 are the only activities that will produce a direct effect on GHG emissions reductions, therefore, an important amount of the resources will cover these activities. The project will support the adoption of efficient central and decentralized systems for energy and water use in 6,024 new households (public and private) in Barranquilla, Montería and Pasto, or 3,044, 1,696 and 1,284 households correspondingly, under the guidelines of resolution 0549 of 2015, under the National Decree 1077 of 2015 where all the regulations of the Housing Sector, City, and Territory of Colombia fall. A decentralized energy system allows for more optimal use of renewable energy as well as combined heat and power, reduces fossil fuel use and increases eco-efficiency. In general, the project seeks to improve energy efficiency, associated with the consumption of Natural Gas and Electric Power and water, and therefore to promote the reduction in GHG emissions during the lifetime of the households. The number of households described above correspond to 20% of the projected households to be constructed, according to data from the NATIONAL DEPARTMENT OF STATISTICS (DANE) and the Colombian Chamber of Construction and is the maximum number of households that could be supported with project resources. It is assumed that after the project finishes its 5-year implementation period, the project will be able to influence indirectly a percentage as minimum the double (40%) in the rest of the future houses to be delivered in each of the cities for the next 15 years, therefore the replication factor will be around **6 times** (two times the number of houses X **three** times the initial period).

In general, it is intended that the project can provide direct support to the design and implementation of centralized systems for household's projects and direct or indirect financial support in conjunction with energy and water utilities for end users of homes so that they can purchase decentralized systems for the distribution of energy, gas, and water. This component assumes that the GEF project could finance the adaptation of public space projects in cities, under a model of efficient energy consumption and the use of renewable energies.

Therefore, the energy generated by the photovoltaic systems will serve to supply a part of the electricity demand in public spaces, but it will also have a small percentage of energy generation that could be used, for example, to supply energy to electric vehicle charging systems. Batteries are also considered to be used as backup to these systems; the use of batteries will support the power supply at night, when some of these spaces will need lighting, as is the case in parks and other public spaces that are open during nighttime. The intention is that this type of public spaces can become not only a place where citizens can get closer to the biodiversity of their cities, but also an example of the innovative and sustainable uses of electrical energy with the implementation of renewable energy systems, energy efficiency, storage, and electrification of transport. In this scenario, used solar PV panels will be disposed and/or recycled in accordance with national laws and regulations (Decree 4741 of 2005 - "By which the prevention and management of hazardous waste generated within the framework of comprehensive management is partially regulated"). With this type of infrastructure, it is expected that many other cities nationwide and in the Latin American and Caribbean region, can follow the same example in the implementation of comprehensive and sustainable solutions in public spaces. However, without having finalized designs for public space projects in many cases, a figure for the GHG reductions is just indicative and could be more detailed when the project enters and advance phase of design (PPG).

### **Component 3: Project Management, Dissemination, and Knowledge Management (*GEFTF \$764,049; Co-financing \$9,777,749*)**

Project monitoring and evaluation will be conducted in accordance with procedures established by CAF. This is guided by the CAF GEF Project Manual which ensures systematic planning, implementing, monitoring, and reporting of project activities, results, and outcomes. The monitoring plan will be designed to assist the project executing team to plan, execute, monitor, and report progress towards achieving objectives and outcomes in a consistent manner. Results indicators will be selected and clearly defined in project development to enable uniform data collection and analysis. The frequency and schedule of data collection will be defined for the project, as well as the roles and responsibilities of project team members. The project's M&E plan will be presented at the project inception workshop, including a review of indicators, means of verification, and the full definition of project staff M&E responsibilities.

#### **Outcome 3.1: Informed and adaptive project management**

- This outcome will ensure that the monitoring and evaluation plan is finalized with on-time data collection, reflection and reporting to aid in results-based decision making and adaptive management. The Project M&E plan will be fully implemented and PIRs developed and completed on time for review by CAF and onward submission to the GEF. An Annual Project Performance Meeting with stakeholders to track progress against work plan and results framework for effective adaptive management will be held to ensure full stakeholder participation and informed annual planning based on results and lessons learned from the previous year's implementation. The project's mid-term and final evaluations will also be ensured as part of overall project management activities, in addition to all auditing and fiduciary compliance responsibilities with the oversight of CAF.

#### **Outcome 3.2: Knowledge Management (KM), communications, and dissemination**



Under this outcome, the KM approach will be developed and implemented to ensure systemic documentation and uptake of results, experiences and lessons learnt is realized through-out project implementation, and not just because of periodic monitoring of time-bound project milestones. The development of this approach will be guided by the GEF approach to KM and by globally accepted elements affecting the successful implementation of Knowledge Management Systems: adoption, acceptance, and assimilation<sup>[3]</sup>. The institutionalization of knowledge management initiatives and processes developed by the project will be a specific objective of the Knowledge Management Approach and will be a critical element for the sustained storage, access and dissemination of project results and outcomes beyond the life of the project.

With the aim of expanding the impact of the project, the implementation of a "Network of pioneering cities in sustainable construction in Colombia" will be financed, which will serve as a strategy for the exchange of experiences and transfer of knowledge in the 14 cities that are part of the BiodiverCiudades initiative that the national government has been promoting.

Cross-sectoral communication strategy, knowledge products, and networking tools and communications products will be applied to facilitate the general public's awareness regarding sustainable construction to reduce and avoid CO2 emissions. The project will also distribute knowledge products to stakeholders, including making them accessible on project partners' websites.

#### **4) Alignment with GEF focal area and/or Impact Program strategies**

The project is aligned with the GEF-7 Climate Change Focal Area, Objective 1. Promote innovation and technology transfer for sustainable energy breakthroughs, and specifically CCM-1-3 - Promote innovation and technology transfer for sustainable energy breakthroughs for accelerating energy efficiency adoption.

Through the planned interventions of the project, capacity of local institutions will be strengthened with technical, normative, and methodological tools to implement strategies for the decarbonization of the construction sector, GHG emissions reduced, and improved energy efficiency associated with buildings and public spaces in the project intervention areas achieved.

#### **5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing**

##### **Additionality**

Resolution 549 of 2015, currently in the process of being updated, establishes the minimum percentages and measures for saving water and energy to be achieved in new buildings, and adopts the Sustainable Construction Guide for saving water and energy in buildings. However, although it has not been implemented throughout the country, "it is a benchmark for policy actions related to sustainable construction, and it has served as a basis for some of the country's main cities to implement their regulations and / or particular programs. This is the case of Bogotá, Cali and Medellín with the Aburrá Valley, cities in which there are programs to promote sustainable construction, codes, or guidelines for sustainable construction, and / or local policies for their implementation. Even so, it has been identified that the initiatives, regulations, or guides have not been particularly relevant due to the lack of economic

incentives that promote the development of sustainable construction projects. The projects with sustainability characteristics have been given more by the benefits identified by the private initiatives in the market, than by the existence of local or national norms or incentives". "(...) Likewise, the design of public policies does not have considerations regarding the resources required for their implementation, for which reason the action plans are not implemented.

Therefore, this GEF 7 project "Energy Efficiency for the Transition to Carbon Neutral Cities in Colombia", aims to minimize the gaps that currently exist in relation to energy efficiency in buildings and public spaces in the country, from governance issues, regulations and monitoring, up to the design and implementation of energy efficiency pilots, particularly in residential buildings, but also with the intention of opening the possibility of designing pilot projects for inclusion and energy efficiency in public spaces; contemplating, of course, the management of projects, dissemination and management of knowledge to expand results and transfer knowledge and good practices in more cities.

Regarding component 1, in relation to the monitoring and follow-up of the progress in sustainable construction in the country, although it can be said that it is monitored through voluntary certifications, there is no follow-up mechanism associated with the current resolution 549 of 2015. This GEF project seeks to strengthen current regulatory instruments in compliance with the measures of the NDC Colombia, the Long-term Climate Strategy of Colombia - E2050 and the Comprehensive Climate Change Management Plan of the Housing Sector PIGCC and, consequently, the inclusion sustainability criteria, without focusing solely on the voluntary intentions of the actors to implement this type of characteristics in projects.

Likewise, the National Government, through the Ministry of Environment and Sustainable Development, together with the World Resources Institute - WRI and the Colombian Construction Council - CCCS, are currently implementing the project "Neto Zero Carbon Buildings for all", the which seeks to achieve new buildings net zero carbon by 2030 and existing buildings net zero carbon by 2050, through the development of a roadmap for net buildings that articulate with the life cycle of the building and with specific plans for the cities of Bogotá and Cali; this GEF 7 will allow to contribute to the development of more local building plans for the cities of Barranquilla, Montería and Pasto; In addition, it will expand the scope for action on sustainable construction for public space as pilots, which, within Component 3, will be taken into account, along with actions associated with buildings, to promote the expansion of project results and lessons learned within the BiodiverCiudades Network of Cities.

Regarding component 2, this GEF project will allow to promote in cities and the construction sector designs and technologies that allow actively or passively the incorporation of energy efficiency measures in building and public space projects that contribute to the mitigation of emissions of GHG product of the construction sector.

If Colombia does not increase energy efficiency and carbon neutrality strategies in the construction sector through the development of actions that involve different stages of the life cycle of buildings, construction and adaptations of public space, then: i) The buildings will continue to generate the same amount CO2 emissions, waste, inefficient consumption of energy, water and materials; ii) The Sustainable Construction goals proposed in the NDC Colombia will not be met, and it will be difficult to meet the City-region commitment, with highly efficient buildings, contained in E2050 within the proposed deadlines; iii) Sustainable construction projects, such as housing, will not be mobilized in large numbers; iv) Colombian cities will hardly be consolidated as sustainable, energy efficient, resilient and carbon neutral cities; v) The governance of sustainable construction that guarantees energy efficiency and the application of sustainability criteria throughout the construction life cycle will not be strengthened; vi) Cities will not have energy efficiency pilots in their public spaces, where the use of renewable energy, LED technologies or energy saving measures is promoted; vii) The construction sector will lose its competitiveness

compared to other countries in the region and the global vanguard, suffering great delays in terms of the market, application of construction methods, use of advanced technologies and energy and materials efficiency; ix) Carbon neutrality will not be achieved throughout the construction sector value chain and the construction and operation of buildings will not be highly efficient.

In addition, if the different actors in the value chain, manufacturers, suppliers, operators, builders, developers, designers and consultants, do not have comprehensive knowledge that involves the different sustainability criteria and the existing incentives for the construction of this type of buildings, then, are unlikely to build spaces under sustainability criteria during the entire construction life cycle, or buildings in a more efficient way that helps reduce energy consumption, generate fewer CO<sub>2</sub> emissions. In numerical terms, the Global Environmental Benefit (additionality) of the project has been estimated at **1,236,354 CO<sub>2</sub>e avoided**.

### **Co-financing**

The project has secured US\$**100,905,560** in co-financing. All co-financing has been classified as 'Investment Mobilized' and represent a combination of cash public investments, two loans and one grant from a total of seven co-financing sources. Loans represent 25,000,000, grant 8,000,000 and the remainder cash public investments. The details of investments mobilized have been presented above below the Cofinancing Table.

### **6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)**

The project contributes directly to GEF 7 Core Indicator 6 **Greenhouse Gas Emissions Mitigated** (metric tons of CO<sub>2</sub>e). Estimates of CO<sub>2</sub>e to be delivered by the project in terms of Sub-Indicator 6.2 Emissions avoided (estimated at 20 years) is 1,236,354 CO<sub>2</sub>e, being direct 51,998 and indirect 1,184,355.

The project will achieve the above Global Environmental Benefits via the development and adoption of national standard for energy efficiency in buildings and public spaces; development and implementation of monitoring, reporting and verification mechanism to guarantee the implementation of the norms, standards, and protocols for sustainable construction; development of plans for the decarbonization of buildings and public space; implementation of a Capacity Building Program inclusive of technical assistance and training for the implementation of the decarbonization plans with emphasis on public space, green infrastructure, and energy efficiency in sustainable construction; and through the implementation of pilot projects to demonstrate reduced GHG emissions and improved energy efficiency associated with buildings and public spaces.

### **7) Innovation, sustainability, and potential for scaling up**

#### **Innovation**

The proposal is innovative in the Colombian context, and it will be particularly so for Barranquilla, Montería and Pasto, cities that, although through the BiodiverCiudades initiative, have been betting on projects that favor their sustainable regional urban development, they currently do not have routes and/or plans for the decarbonization of buildings. In addition, they will have the possibility of having energy efficiency pilots in buildings and public spaces that involve the use of renewable energies, LED technology and/or energy saving measures. Likewise, they will have local information on the reduction of emissions associated with construction, considering that currently this information is only available globally for the country.

Consistent with the project's strategy in Component 1, at the national level, the innovativeness of the project is highlighted in two key actions that will serve to respond to information gaps and a lack of tools for project evaluation. The first is the development of a guide with sustainability criteria for construction, which, although they already exist, the innovative thing is to include the entire life cycle, do it from a regional approach and consider the climatic zones and ecosystems present in area. The second is the operation of a virtual platform (tool) for the evaluation of projects, works or activities of energy efficient construction in public spaces or buildings, which allows obtaining variation data in terms of emission reduction in accordance with the applied sustainability criteria. Currently, this tool does not exist, which is why it is of great help in decision-making for both local authorities and the construction industry.

Consistent with the project's strategy in Component 2, it is intended that the public spaces supported by the project become centers for the innovative and efficient use of energy. On the one hand, distributed solar generation projects will be generated, which, although there are already some installations in the country, most of them have been concentrated in the private sector and not in the public sector as ordered by various current laws. There will also be space for various uses of batteries as a backup for energy solutions, in this case public lighting, electric mobility in the case of the Mallorquin project train or general uses in the case of the Montería Botanical Garden. Although the implementation of large-scale batteries has been promoted in the country through big projects on the north coast, a market dynamic has not been generated for batteries in minor low-voltage applications and with use in commercial or residential installations. Therefore, the intention is that these spaces serve as pilot projects to introduce batteries in this new market segment. Finally, with the generation of photovoltaic electricity not used directly in the spaces, there will be enough energy to install charging infrastructure for vehicles, motorcycles, and other electrical transports and to try to generate new business models for the energy commercialization that have been promoted by the law of electric mobility.

In conclusion, the innovation of this proposal is in the use of low carbon technologies, which have not reached cities like Pasto and Montería; energy efficiency pilots in public spaces that have not been developed locally and that can later become benchmarks for other cities; and the exploration of alternative, local and low-carbon materials that are not applied in Colombia.

### **Sustainability**

From the national perspective, the project will be tied to the implementation of the NDC, specifically to measure 7 - Sustainable Construction. It will also articulate the implementation of E2050, particularly its commitment 6 "Cities-regions with comprehensive urban development (...)". Likewise, sustainability will be achieved through regulatory development that will support the project in relation to low-carbon buildings.

Sustainability will occur with the implementation of the technical assistance strategy for cities in public space, infrastructure, sustainable buildings, and circular economy, present within the Urban Environmental Policy. This assistance will be led by the national government at the head of the Ministry of Environment and Sustainable Development, with the support of the Ministry of Housing, City and Territory.

Likewise, the plans for the decarbonization of the cities of Barranquilla, Montería and Pasto, will also be a way to give continuity to this project from the local level, since they will have the support of the mayors, the environmental authorities, and the local private sector (supported by CAMACOL and/or by the Colombian Council for Sustainable Construction), which will guarantee its appropriation and operation over time. In the case of used solar PV panels, these will be disposed or recycled in accordance with national laws and regulations.

### **Scaling-up**

This project is part of the BiodiverCiudades Strategy, currently led by the Ministry of Environment and Sustainable Development, which seeks to transform Colombian cities into urban spaces where nature is part of sustainable urban development, and with which, solutions are given to the main environmental, social, and economic problems. For this, 5 lines of action have been prioritized that seek to guide the development of projects: 1) Circular Economy; 2) Air quality; 3) Environmental Education; 4) Bioeconomy; 5) Sustainable constructions.

Under this strategy, the lessons and initiatives will be upscaled through the "Network of pioneering cities in sustainable construction", which allows the exchange of experiences and knowledge transfer on buildings and public space with energy efficiency and application of sustainability criteria. Within the Network, it is possible to replicate the roadmaps/plans for the decarbonization of buildings, energy efficiency pilots in public spaces and the construction of project portfolios on new buildings, infrastructure works and renovation in public spaces to serve as a reference in decision-making or for the integration of these into planning instruments. It is proposed that this network of cities work with the 14 cities<sup>[4]</sup> that make up the BiodiverCiudades initiative. Barranquilla, Montería and Pasto are part of this initiative of sustainable cities that the Colombian Government has been promoting since 2019. Cities will be encouraged and trained in the use of the guides and tools generated through this project, so that in the medium and long term, they can apply this knowledge and experience in other sustainable construction projects, both in buildings and in space. public.

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[1] E2050: Estrategia Climática de Largo Plazo de Colombia E2050. Fuente: <https://e2050colombia.com/>

[2] EDGE Tool. [https://www.c40knowledgehub.org/s/article/EDGE-tool?language=en\\_US](https://www.c40knowledgehub.org/s/article/EDGE-tool?language=en_US)

[3] Knowledge Management Tools. <https://www.knowledge-management-tools.net/knowledge-management-systems.html>

[4] Currently the 14 cities that are part of the BiodiverCiudades initiative are: Barranquilla, Montería, San Andrés, Bucaramanga, Barrancabermeja, Yopal, Villavicencio, Pasto, Quibdó, Leticia, Pereira, Armenia, Manizales and Medellín.

#### 1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

IMAGE 1. MAP OF PASTO SHOWING AREA, POPULATION AND COORDINATES

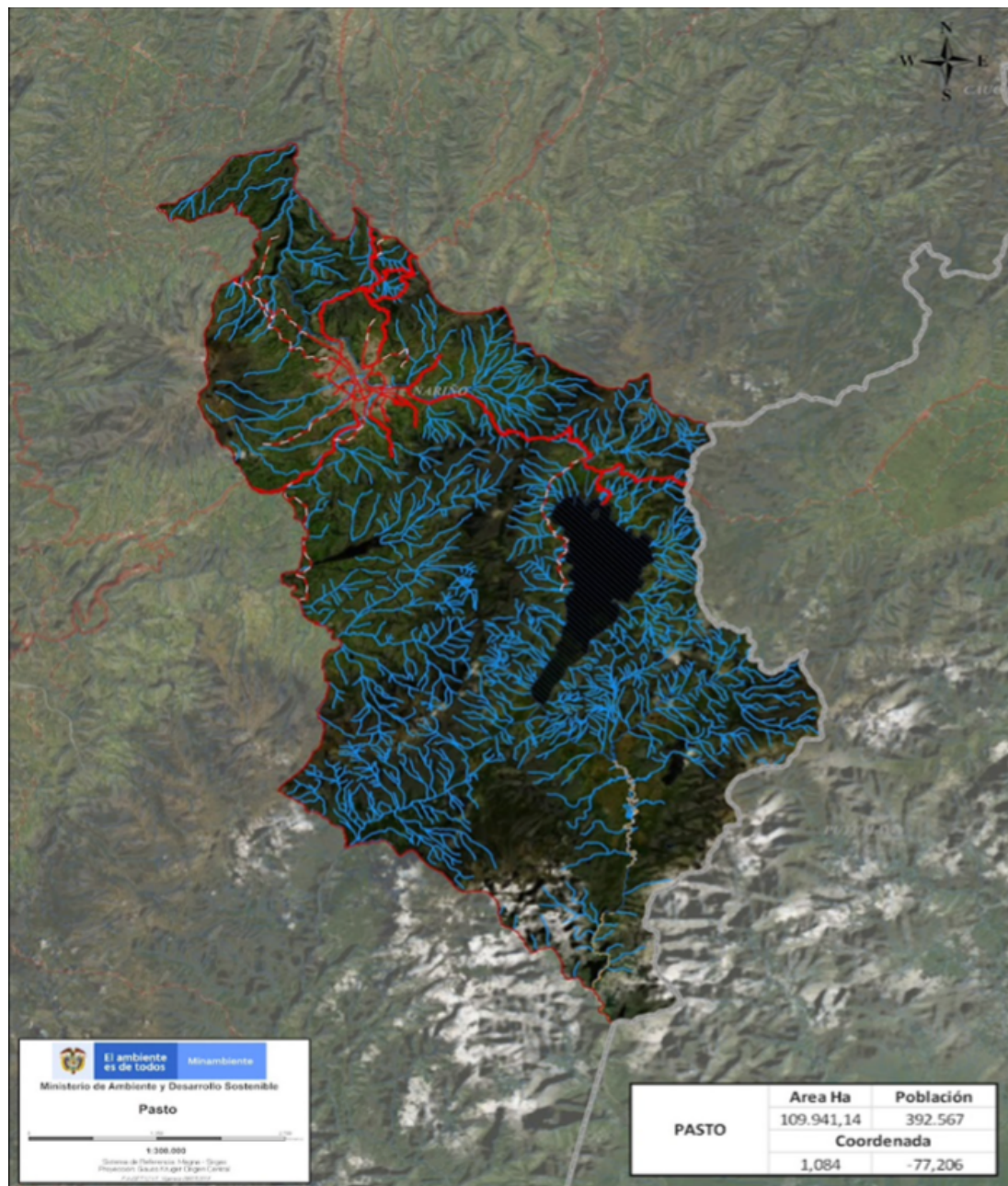


IMAGE 2. MAP OF MONTERIA SHOWING AREA, POPULATION AND COORDINATES



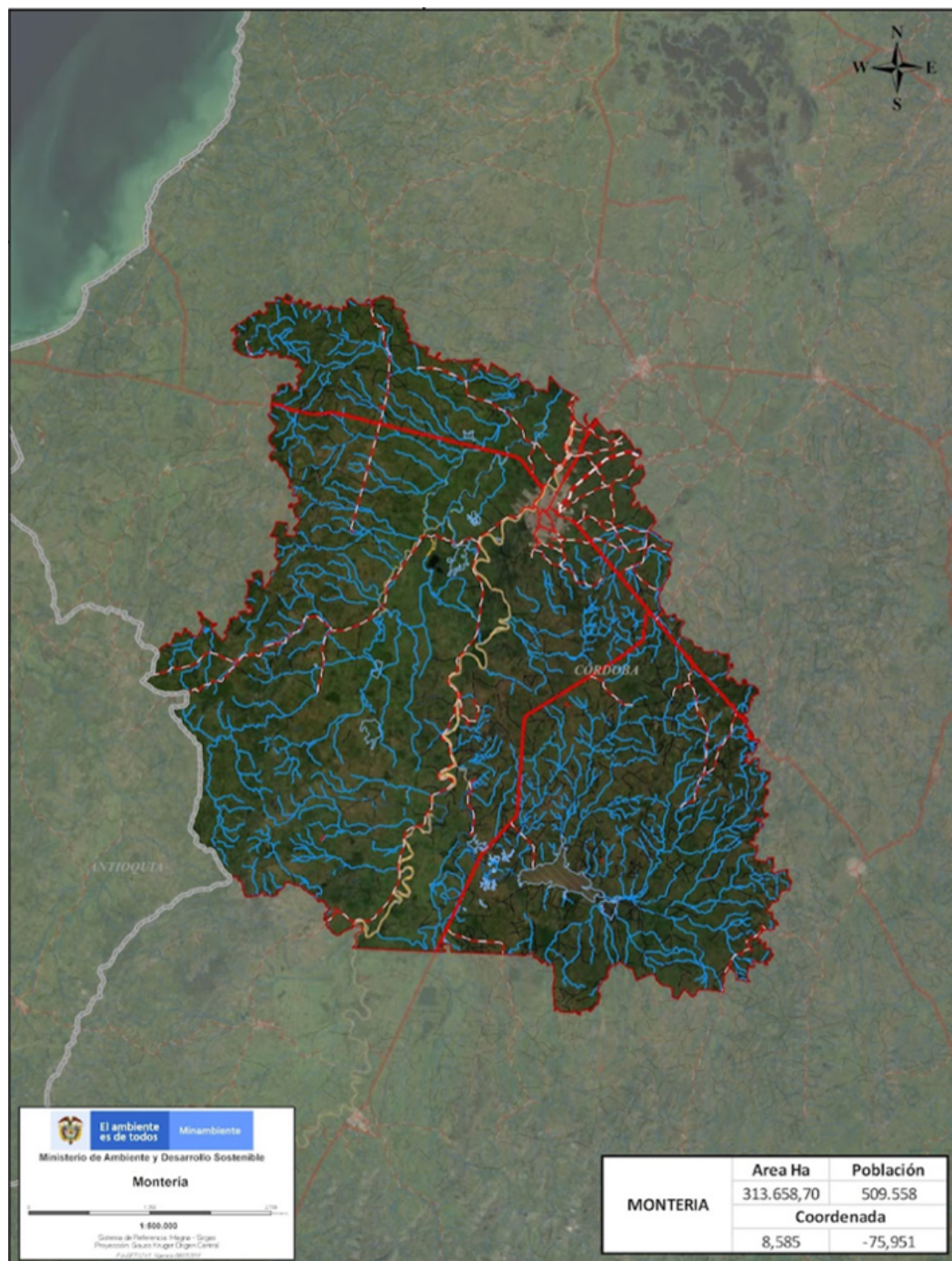




IMAGE 3. MAP OF BARRANQUILLA SHOWING AREA, POPULATION AND COORDINATES



## 2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities

Civil Society Organizations

Private Sector Entities Yes

If none of the above, please explain why:

Consultations in support of project design during the PIF stage occurred in three distinct moments.

First moment - An approach was made to assess the main problem the project would address within the context of the National Government initiative, BiodiverCiudades. The 3 beneficiary cities (Barranquilla, Montería and Pasto) were prioritized, and the relevant information was collected for the consolidation of information sources, technical, normative, and environmental references related to sustainable construction, public space, and highly efficient buildings. In this first stage, the representatives of the Vice Ministry of Environmental Planning of the Territory, the Office of International Affairs, the Directorate of Climate Change and Risk Management and the Directorate of Environmental, Sectorial and Urban Affairs of the Ministry of Environment and Sustainable Development participated (Anchor Team).

Second moment - The initial proposal was conceptualized, and certain parameters were defined to consider when defining the project's Theory of Change. In this second moment, the representatives of the Ministry of Environment and Sustainable Development (Anchor Team) and representatives of the IDB participated as the implementing agency of the intervention proposal.

Third moment - This moment drove the participatory approach of the proposal. The different stakeholders of the project participated. For this, 3 virtual workshops were carried out for the construction of the logical framework. Each session had a different purpose: Workshop 1. Objective: to identify the main problems associated with all elements of sustainability in buildings, it was held on September 9, 2021; Workshop 2. Objective: Identify the main causes of the problem, it was held on September 15, 2021; Workshop 3. Objective: Identify possible solutions, was held on September 21, 2021. During the workshops, representatives of the Ministry of Environment and Sustainable Development, Ministry of Housing, City and Territory, Colombian Council for Sustainable Construction, IDB, Mayor of Barranquilla, Mayor of Montería and Mayor of Pasto attended. After these workshops, a virtual meeting was held with the Colombian Chamber of Construction (CAMACOL), as a way of socialization and feedback on the intervention proposal resulting from the workshops. This session was held on September 30, 2021.

During the PPG, new workshops to socialize the PIF will be conducted, so that the same parties involved that were part of its formulation can know the result and feel involved from the beginning throughout the project cycle. Likewise, new actors to invited to these new sessions will include academia (universities), the local community, and civil society organizations.

**In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement**

Institution/organization	Role in PPG phase
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Ministry of Environment and Sustainable Development	<p>MinAmbiente is responsible for environmental policy, technical and regulatory instrumentation in the country.</p> <p>He will be part of the project's directive and technical committee and will have a fundamental role in providing sustainability criteria, linking the project with public policy, technical and environmental guidelines, and supervising the proper implementation of the project and the articulation of the different actors.</p> <p>He will oversee leading the preparation of the project and summoning the other stakeholders for this.</p>
Ministry of Housing, City and Territory	<p>Responsible for promoting the planned territorial and urban development of the country, reducing the deficit in urban housing, drinking water and basic sanitation. He will be part of the technical committee of the project. It will accompany the 2 components of the project, especially component 1 "Governance for sustainable construction".</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, particularly in component 1, in the formulation / development of the regulations on sustainable buildings and the reporting and verification mechanism for the implementation of regulations, standards and protocols of buildings.</p>
Barranquilla, Monteria, and Pasto City Council	<p>They will be part of the Steering and Technical Committee. They will also be key actors to coordinate, through their Secretaries of Environment and Planning, the implementation of the 2 components that make up the project.</p> <p>In relation to component 2 Buildings, net zero carbon and energy efficiency in public spaces", they will oversee defining the spaces in which the sustainable construction interventions will be carried out. They will also actively participate in the definition of plans for the decarbonization of the buildings present in their city, proposed in component 1 "Governance for sustainable construction."</p> <p>Likewise, they will be important to coordinate the activities that will maximize and complement the projects defined within the counterparts.</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, both in components 1 and 2, each time they are convened. Additionally, it will provide inputs such as information and documentation on the cities.</p>
Colombian Council for Sustainable Construction	<p>It is a private non-profit organization committed to raising the level of sustainability of all uses of new and existing buildings and of cities in general.</p> <p>He will be part of the technical committee of the project to ensure the participation of the private sector.</p>

	<p>He will be part of the technical committee of the project to ensure the participation of the private sector. It will be a key partner to provide technical advice on the development of the project, particularly the preparation and validation of the guides and the implementation of the pilots.</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, both in components 1 and 2, particularly those related to practical guides, virtual platform for project evaluation and the implementation of the net building pilots. zero carbon and public space.</p>
Colombian Chamber of Construction - CAMACOL	<p>National non-profit trade union association with the vision of leading responsible and sustainable urban development.</p> <p>He will be part of the technical committee of the project to ensure the participation of the private sector. It will be a key partner to provide technical advice on the development of the project, particularly the preparation and validation of the guides and the implementation of the pilots.</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, both in components 1 and 2, particularly those related to practical guides, virtual platform for project evaluation and the implementation of the net building pilots. zero carbon and public space.</p>
Financiera de Desarrollo Territorial S.A., FINDETER	Key player in the formulation and delivery of credit lines that will be structured in component 1 and crucial for the upscaling of project results.
Ministerio de Minas y Energía	Will be instrumental in the process of building the regulatory framework generated in component 1.
Unidad de Planeación Minero Energética (UPME)	Will be instrumental in the process of building the regulatory framework generated in component 1.
Departamento Nacional de Planeación (DNP)	Will be instrumental in the process of building the regulatory framework generated in component 1.
Barranquilla Verde, CVS y CORPONARIÑO	<p>Barranquilla Verde Environmental Public Establishment, as the Environmental Authority of the city of Barranquilla, the Regional Autonomous Corporation of the Valles del Sinú and San Jorge, as the Environmental Authority in the municipality of Montería and the Regional Autonomous Corporation of Nariño, as the Environmental Authority in the Municipality of Pasto, will be key actors in the implementation of the 2 components that make up the project. These environmental authorities will be part of the technical committee.</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, both in components 1 and 2, each time they are convened. Additionally, it will provide inputs such as information and documentation on the cities.</p>
La Asociación Bancaria y de Entidades Financieras de Colombia, Asobancaria	Representative union of the Colombian financial sector. Key partner from the financial sector in the replicating and upscaling of project results.
Consejo Colombiano de Eficiencia	Key consultation partner on specific activities to be supported by the project to optimize returns from

Energetica	m GEF investment.
<p>Academia</p> <ul style="list-style-type: none"> <li>-Universidad de los Andes</li> <li>-Universidad del Norte</li> <li>-Universidad de Cordoba</li> <li>-Universidad Javeriana</li> <li>-Universidad Nacional de Colombia</li> <li>-</li> </ul>	<p>The universities will be an important source of knowledge and technical advice to the different committees of the project.</p> <p>It will be part of the technical committee.</p> <p>It is proposed to link to the Faculty of Architecture and Design of the Universidad de los Andes.</p> <p>Through workshops, groups, or work sessions, it will support the preparation of the project, both in components 1 and 2, particularly those related to practical guides, the virtual platform for project evaluation and the implementation of building pilots. zero carbon net and public space. They will serve as technical validators.</p>
Chamber of Commerce of Barranquilla, Monteria, and Pasto	Key consultation in the construction sector in the three targeted cities of the project.
Palmayacu Refugio Amazonico	Civil Society Organization. Consultations on project objectives, impacts and beneficiaries
Red Nacional de Jovenes de Ambiente	Civil Society Organization. Consultations on project objectives, impacts and beneficiaries
Biomimesis Caribe	Civil Society Organization. Consultations on project objectives, impacts and beneficiaries
Monteria Ciudad Amable	Civil Society Organization. Consultations on project objectives, impacts and beneficiaries
Cemacol Nacional, Atlantico, Cordoba, y Narino	Private Sector organization involved in the construction industry. Key consultation partner.
Development Bank of Latin America - CAF	<p>GEF Implementing Agency</p> <p>Oversight for completeness and robustness of project design while ensuring quality control and compliance with GEF policies and procedures</p>
Inter-American Development Bank - IDB	<p>Donor and Co-GEF Implementing Agency</p> <p>Support to ensuring completeness and robustness of project design while ensuring quality control and compliance with GEF policies and procedures</p>

### 3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

#### *National Overview*

Colombia has ratified all current international treaties on human rights and women's rights and has made significant progress in developing laws to promote gender equality and guarantee women's rights. Some of the key ones are summarized in the Table 8 below, including a statement of their relevance for the project's design and implementation.

**Gender-Relevant Instruments**

Gender-Relevant Instrument	Year of Inception	Alignment/Relevance to Project
The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) 1979	1980	Establish tribunals and other public institutions to ensure the effective protection of women against discrimination; and to ensure elimination of all acts of discrimination against women by persons, organizations, or enterprises. Colombia having ratified the convention, CEDAW sets the overall international standard to be met by the project in Colombia for women's rights and is consistent with the WWF Standard and the GEF Policy on Gender Equality.
Inter-American Convention on the Prevention, Punishment and Eradication of Violence Against Women (Convention of 'Belem do Para') 1995	1996	Key objectives: to promote awareness and observance of women's rights; to modify, through educational programs, social and cultural patterns of conduct of men and women and prejudices, and customs and stereotypes based on the idea of the inferiority and superiority of the sexes; and to promote the education and training of all those involved in the administration of justice, police, and other law enforcement officers among others. The project is investing public awareness, technical trainings, as well as training to monitoring and surveillance entities. All these investments are opportunities for gender mainstreaming, and directly consistent with the objectives of the convention as outlined above.
National Policy on Gender Equality (CONPES 161)	2013	Co-ordinate efforts across the whole-of-government to guarantee women's equality and non-discrimination. All the government institutions involved in the implementation

		n of this project are mandated by this policy to guarantee women's equality and non-discrimination through-out all project interventions (MINAMBIENTE, CORALINA, MINCIT, DIMAR, IV EMAR, IDEAM, PNNC, etc.)
National Development Plan 2018-22, chapter on women's rights, "Pact for Women's Equality"	2018	Important provisions on gender equality based on three dimensions: the economic dimension (overcoming poverty, the care economy, inequality in the workplace); the political dimension (women in positions of power and decision making) and the physical integrity dimension (violence and sexual and reproductive rights).  This National Development Plan provides an enabling framework for the project's Gender Action Plan to align gender mainstreaming actions along the 3 nationally-mandated dimensions as listed above.
Law 1257 of 2008	2008	Provisions for regulations on awareness, prevention, and punishment of all forms of violence and discrimination against women.  This law is consistent with the national commitments acquired through the ratification of CEDAW, and its relevance to the project are those described above for CEDAW.
Law 581 - Quota Law	2000	Establishes that a minimum of 30 percent of appointed positions must be occupied by women in the three branches of public power: executive, legislative, and judiciary <sup>[1]</sup> .  This law creates an enabling environment for the project to demonstrate that it is doing its part by ensuring no less than 30% female representation on the project's governing bodies (Project Steering Committee and Technical Advisory Committee) and the Inter-Institutional Coordination Group to be formed through the project's intervention.

While the norms described above provide a solid framework for advancing women's rights, there are still challenges to be addressed. As of April 2017, the National Registry of Victims (RUV) estimates that there are over 8.1 million victims of armed conflict in Colombia, representing 18% of the Colombian population<sup>[2]</sup>. Most victims (4.5 million) were females affected by forced displacement and sexual and gender-based violence, and were mostly female adolescents, single mothers or widowed with children affected by the war. At least 40% of the victims were women below the age of 29; approximately 10% were girls and young women between 10–19 years old; about 40% were adult women between 30–59 years old; 13% were older women above the age of 65; and 4% were octogenarian women over 80 years old. Women belonging to indigenous and Afro-Colombian ethnic groups have been disproportionately

affected by conflict-derived violence; Of 3,445 cases of homicides of indigenous and Afro-Colombian people, 65.5% were women<sup>[1]</sup>. According to the report of the National Institute of Legal Medicine in Colombia (INMLCF) in 2014, 1,007 women were murdered and 37,881 cases of violence against women among couples were registered. In that same year, 16,088 cases of sexual violence against women were reported, with girls and adolescents being the main affected by this form of violence.

Following the fundamental principles of E2050, among which is Gender Equality, this proposal will integrate the gender approach in the project cycle following the Guide to Integrate a Gender Approach in Projects, Programs, Plans and Policies of Sustainable Urban Development, developed by the Ministry of Environment and Sustainable Development, which will support the mainstreaming of the gender approach throughout the proposed intervention, so that if it is defined, it can have objectives for gender equality, with their respective results and indicators.

This guide will guide the design, implementation, and evaluation of the project in a way that guarantees the participation of women in decision-making and ensures equal rights and opportunities for women and men in accessing potential goods and services that may build the project. In this way, it is expected that this intervention proposal will effectively contribute to the advancement of gender equality and the empowerment of participating and / or beneficiary women. This approach will have a special role during the implementation of Component 1 "Governance for sustainable construction", since it will guarantee the participation of women in decision-making and the same opportunities for women and men during training, exchange of experiences and technical assistance on public space, green infrastructure, circular economy and sustainable buildings within local governments, unions, and academia.

During the PPG phase, a detailed gender analysis and gender-sensitive consultations will be conducted for the project intervention areas, the results of which will be used to develop the project's Gender Action Plan, based on the principles established in the guide mentioned above, the GEF Gender Policy, and the Gender Policy of CAF.

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[1] Gender Equality and Women's Empowerment in Public Administration. Colombia Case Study. UNDP, 2012

[2] Juan Carlos Rivillas et al. 2018. How do we reach the girls and women who are the hardest to reach? Inequitable opportunities in reproductive and maternal health care services in armed conflict and forced displacement settings in Colombia.

[3] Mainstreaming gender equality in Colombia, Capacity4dev, Published 7<sup>th</sup> October 2019

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?** Yes

**closing gender gaps in access to and control over natural resources;**

**improving women's participation and decision-making; and/or** Yes

**generating socio-economic benefits or services for women.** Yes



Will the project’s results framework or logical framework include gender-sensitive indicators?

Yes

#### 4. Private sector engagement

**Will there be private sector engagement in the project?**

Yes

**Please briefly explain the rationale behind your answer.**

The joint efforts of the public and private sectors in the country have begun to pay off with an increase in the number of companies in the construction sector, which increasingly include sustainability as part of their business strategy.

For this reason, there will be the participation of the private sector represented by the Colombian Council of Sustainable Construction, the Colombian Chamber of Construction – CAMACOL and the Consejo Colombiano de Eficiencia Energetica, which will be consulted and taken into account, as technical advisers, when developing the activities that will help improve the capacities of local institutions with technical, normative and methodological tools; that is, they will be consulted for: 1) the formulation / development of a national regulation on sustainable low-carbon buildings; 2) the formulation of decarbonization plans for buildings and public spaces; 3) the virtual platform for the evaluation of sustainable construction projects, works or activities, and 4) the design and implementation of practical guides on sustainable construction.

On the other hand, the pilots on net zero buildings and on energy efficiency in public spaces will be developed with the support of the private sector, as well as the design of projects on new buildings and public infrastructure; For this, the support of the Colombian Sustainable Construction Council will be very important since it has the experience of currently supporting the implementation of the Net Zero Buildings Program for all in Bogotá and Cali.

The private sector will also have a key participation in the proposed financial mechanisms to be developed by the project. Regarding the financial mechanism, the Ministry of the Environment, and the National Government, based on the work carried out with the formulation and implementation of the NAMAs for Development Oriented towards Transportation and Electric Mobility, have built a series of financing mechanisms that increase the capacity of the impact of NAMA financing resources on more projects. This project hopes to generate a financial mechanism that contributes to financing energy efficiency projects in buildings, considering previous experiences. The first option proposed to be applied in this project is the creation of a fund, which serves to make available i) credit lines with concessional conditions from FINDETER through financial entities supervised by the SFC; ii) partial credit guarantees directly or through the National Guarantee Fund; iii) direct subsidies to compensate for the use of new technologies. The second proposal is the creation of a resource multiplier, which, based on initial resources, finances new projects through credits, with one or more of the following alternatives: longer term, longer grace period, lower interest rate, rediscount compared to traditional FINDETER lines, and inverted curve in the interest rate, to motivate the intermediary to place medium-term credit, among others.

## 5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Risk	Risk Level	Proposed mitigation measures
Impacts of the COVID-19 Pandemic	High	<p>A key risk of COVID-19 is prolonged social distancing measures and recurring national quarantine measures in project countries. To guarantee the continuation of the project despite prolonged social distancing requirements, project meetings and the engagement processes could transition on-line or a combination of in-person and virtual participants to minimize contagion risks. Remote technological infrastructure would be used to facilitate this type of engagement including easily accessible videoconferencing services. For those who cannot participate remotely, in-person meetings could be held with a reduced number of participants and holding social distancing and hygiene best.</p> <p>The development of the crisis will be closely monitored, and creative responses will be explored and implemented along the way focused on advancing project outcomes through alternative forms of engagement, and flexibility in case meetings and field visits must be rescheduled. Similarly, innovative ways of ensuring co-financing funds can be effectively deployed under a COVID-19 risk scenario may also have to be explored. The project will exercise extreme caution in ensuring that its activities do not increase the risk of transmission and spread.</p> <p>COVID-19 may affect the physical availability of technical expertise to provide in-situ support due to travel restrictions and limitations on physical gatherings imposed by the authorities. As suggested above, virtual means of delivery will be used in such cases and required adjustments to the timeline to accommodate the effects of the pandemic will be given due consideration during the project's annual planning processes.</p> <p>The project provides an opportunity for green recovery and buildi</p>

		<p>ng back better through the development of sustainable construction in three cities of Colombia, with business models that are climate-smart and take into consideration lessons learned in COVID 19 response strategies developed by the government and globally, thus contributing to levels of preparedness, reduction of risks, and increased resilience for future pandemics if they should arise and to the effects of climate change.</p> <p>The project will also develop a COVID 19 Prevention and Risk Mitigation Plan, the content of which shall be consistent with the GEF's latest requirement in this regard.</p>
Political corruption, scandals, turnover delay or disrupt project implementation.	Med	Account for corruption within institutional arrangements and controls.
Climate change risks to the 3 cities and the construction sector.	Med	The proposed project will help mitigate climate risks by making sure that the revised planning and regulatory framework for the construction sector includes provisions for climate change adaptation, consistent with the individual Climate Change Strategies of each city. The Climate Risk Assessment Form for the project is presented in Annex E of the PIF.
Change of city administrations and the national government.	Med	The mitigation measure will be supported by the natural continuation of the BiodiverCiudades program in the work plans of the cities, coupled with an assertive information and engagement campaign by the project to bring new administrations up to date on project progress and the role of the city administrations in its implementation.
Change in land use in cities	Med	Public and housing spaces are defined in the Territorial Regulation instrument of each city and can only be changed through a process that includes public administrations with the approval of the municipal legislative bodies.
Gender mainstreaming by the project may be undermined without a series of activities aimed at understanding women's challenges, and if the project does not take advantage of their capabilities and leadership roles within the family unit and the local community.	Low	The project will have to be genuinely gender mainstreamed, from the initial design phase, through the implementation, and impact evaluation. Particular attention must be paid to addressing all possible information gaps that may place women in an unfavorable position. The project will develop a Gender Mainstreaming Plan, inclusive of a Gender Action Plan, to ensure that the project is truly gender-sensitive and minimize any potential gender risks.
Disposal of used solar panels	Low	Consistent with Decree 4741 of 2005, the project will ensure that used solar panels are legally disposed of as per the law. This co

	LOW	Compliance by the project is not optional and is a legal requirement.
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## 6. Coordination

**Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.**

### Institutional arrangements

The project will be implemented by CAF and the IDB as GEF implementing agencies and will be executed by the Ministry of Environment and Sustainable Development and the Colombian Council for Sustainable Construction. CAF and the IDB will lend technical expertise and guidance to the project in annual planning of activities to delivery project outputs and outcomes and will identify opportunities for coordination and avoidance of duplication with CAF and IDB's investments in the country. Additionally, these agencies will ensure proper quality control and compliance required project management and fiduciary responsibilities.

The Ministry of Environment and Sustainable Development shall have overall responsibility for the project on behalf of the Government of Colombia and GEF Focal Point. Additionally, the Ministry of Environment and Sustainable Development shall lead the implementation and delivery of activities and outputs under Component 1, in addition to chairing the Project Steering Committee.

With fourteen years of experience, the Colombian Sustainable Construction Council (CCCS) is the leading organization in Colombia in promoting the transformation of the construction sector towards higher levels of sustainability, to achieve sustainable buildings, infrastructure, communities, and cities. This has been done through the generation of state-of-the-art knowledge around this topic, through collaborative work with its more than 180 members who represent the value chain of the construction industry, and by accompanying the public sector in progress of the country in this area. The organization has a highly competent and committed technical team that has specialized in different aspects of sustainable construction such as energy efficiency, climate change, sustainable materials, sustainable housing, water management, urban design, cities sustainability, sustainable infrastructure, health, and well-being in the built environment, among others.

The CCCS has successfully led, implemented, and participated in several technical projects with different sources of funding. It is currently the local implementing partner of the Neto Zero Carbon Building Accelerator, a project whose focal point is the Ministry of Environment and Sustainable Development, the global implementing partner is the WRI, and the financier is the GEF. This project has a time horizon of April 2023 and seeks the development of the national roadmap for net zero carbon buildings and the development of specific action plans for the cities of Bogotá and Cali.

The CCCS currently leads the development of a Measurement, Reporting and Verification system for the city of Bogotá in alliance with Fondo Acción and is the consultant for the project Guide to Sustainability Criteria for Social Housing in Colombia, which is being developed to MVCT and DNP with funding from GIZ. From 2016 to 2021, the CCCS was the local implementing partner of the Building Efficiency Accelerator (BEA) program for the cities of Bogotá, Cali and Montería, achieving the issuance of 3 resolutions to promote energy efficiency in cities, whose global implementing partner was the WRI and had resources from the GEF and P4G. Likewise, it participated as a partner in the project Systemic Perspectives on Low-carbon Cities in Colombia- An integrated Urban Modeling Approach for Policy and Regulatory Analysis, a project led by the Universidad de los Andes within the framework of the financing of UK-PACT Colombia to have an effective strategy for reducing the carbon footprint of cities and addressing the impacts and risks of climate change.

Additionally, the CCCS has developed a series of technical publications as tools for advancement and decision-making for the industry and the public sector, including the Protocol of Sustainable Urban Planning Guidelines (CCCS, 2016), the Protocol of Verification for Natural Ventilation Engineering Systems (CCCS, 2017), the Introduction to Sustainable Construction Guide (CCCS, Camacol Nacional and IFC, 2020), the Natural Ventilation Commissioning Guide (CCCS, 2020), the White Book of Cities Sustainable (CCCS and Uniandes, 2020), the Materials Primer (CCCS and Uniandes, 2021), the Sustainable Management Guide and Circular in Works (CCCS and Camacol, 2021), the State of Sustainable Construction in Colombia (CCCS, 2021 ) and the Sustainability Roadmap for Building Materials (CCCS, 2021).

The CCCS has also developed the CASA Colombia certification, a user-centered certification standard for sustainable housing. Finally, the CCCS is part of several international networks and working groups such as the Global ABC where it participates in the Finance Taskforce, the World GBC where it participates in the Better Places for People, Resources and Circularity, Advancing Net Zero and The Business Case for Affordable Housing, and the BEA network of cities.

Other key elements of the project's institutional arrangements are outlined below:

**Project Steering Committee:** Ministry of the Environment and Sustainable Development, CAF, IDB, Colombian Council for Sustainable Construction and mayors of Barranquilla, Montería and Pasto. In this committee investment decisions and monitoring of the GEF are made.

**Technical Advisory Committee:** Led by the Ministry of Environment and Sustainable Development and Colombian Council for Sustainable Construction, the Ministry of Housing, City and Territory, the Environmental Authorities, Mayors, Trade Unions (Colombian Council for Sustainable Construction and national and local CAMACOL) and the Academy will participate. Provides advice on the actions that are being carried out.

**Project Executing Unit (PEU):** This coordinating unit will act in a transversal manner and will be housed in the Colombian Council for Sustainable Construction. It will provide the technical secretariat to each one of the Committees, monitors the execution, delivers management reports to the Committees, and is also in charge of executing the project in coordination with and under the supervision of the Ministry of Environment and Sustainable Development. It is made up of a coordinator and thematic leaders. This unit will be important when identifying lessons learned for feedback on the project.

The above arrangements, including Terms of Reference for the different committees and key staff will be further developed during the PPG, as well as a diagram illustrating decision making flows, funding flows, coordination and KM flows, and visualizations of relationships with key project stakeholders. The details of this require further consultations with project principals and stakeholders.

#### **Coordination with GEF Projects**

The project will seek coordination and lessons learned with the following GEF-financed projects:

*GEF 5 - Implementing the Socio-Ecosystem Connectivity Approach to Conserve and Sustainable Use Biodiversity in the Caribbean Region of Colombia (GEF ID:5288).* The objective of this project was to reduce the degradation and fragmentation of strategic ecosystems in the Colombian Caribbean region by implementing a strategy of socio-ecosystem connectivity that includes inter-institutional articulation, territorial planning, social participation with an intercultural vision, effective management of existing protected areas, creation of new protected areas and promotion of sustainable production models. Execution ended in 2021, one of its main products is the Caribbean Connectivity Strategy, important for the case of Montería and Barranquilla.

*GEF 6 - Public Lighting Energy Efficiency Program: Public lighting replacement of low-efficiency VSAP bulbs with high-efficiency LEDs in Colombia (GEF ID:9354).* Substitution of public lighting from low-efficiency VSAP bulbs with high-efficiency LEDs in Colombia. The proposed project aims to support the design of a 4-axis strategy to reduce technical barriers and information gaps, as well as real or perceived risks that have impeded the success of energy efficiency public lighting projects.

*GEF 7 Paramos for life (GEF ID:10361),* the objective of which is to conserve páramo ecosystems by promoting sustainable systems for the conservation of biodiversity, ecosystems, agrobiodiversity services and the adequate management of socio-environmental conflicts in paramo complexes in accordance with the Law of Páramos approved in 2018. In formulation and relevant to the case of Pasto.

*GEF 7 Conservation and Sustainable Use of the Ciénaga Grande de Santa Marta (GEF ID:10567),* will focus on the implementation of the Action Plan for the Comprehensive Recovery of the Ciénaga Grande de Santa Marta that seeks to contribute to the recovery process of the environmental goods and services of the Ciénaga recovering mangrove ecosystems and fisheries with a participatory approach and strengthening environmental governance. The foregoing in compliance with the recommendations of the Ramsar assessment mission. In formulation and relevant to the case of Barranquilla.



## 7. Consistency with National Priorities

**Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions?**

Yes

**If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc**

- JAT- - NATIONAL ACTION PLAN FOR ADAPTATION (NAPA) UNDER LDCF/UNFCCC
- NATIONAL ACTION PROGRAM (NAP) UNDER UNCCD
  - ASGM NAP (ARTISANAL AND SMALL-SCALE GOLD MINING) UNDER MERCURY
  - MINAMATA INITIAL ASSESSMENT (MIA) UNDER MINAMATA CONVENTION
  - NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLAN (NBSAP) UNDER UNCBD
  - NATIONAL COMMUNICATIONS (NC) UNDER UNFCCC
  - TECHNOLOGY NEEDS ASSESSMENT (TNA) UNDER UNFCCC
  - NATIONAL CAPACITY SELF-ASSESSMENT (NCSA) UNDER UNCBD, UNFCCC, UNCCD
  - NATIONAL IMPLEMENTATION PLAN (NIP) UNDER POPs
  - POVERTY REDUCTION STRATEGY PAPER (PRSP)
  - NATIONAL PORTFOLIO FORMULATION EXERCISE (NPFE) UNDER GEFSEC
  - BIENNIAL UPDATE REPORT (BUR) UNDER UNFCCC
  - OTHERS

The Colombian Government established the goal of reducing the country's greenhouse gas emissions of 51% by the year 2030; commitment that is framed in the process of updating the Determined Contribution at the National Level of Colombia, known as NDC, which becomes the country's roadmap to establish ambitious actions to face the effects of climate change in the face of next 10 years.

In addition, within the framework of its commitment to achieving carbon neutrality in 2050, the year in which it must be emitted below 50 MtonCO<sub>2</sub>, the country intends with Colombia's Long-Term Climate Strategy to comply with the Agreement on Paris (E2050), transform its productive apparatus while advocating for reducing the risks associated with climate change. However, to achieve carbon neutrality by 2050 it is important to achieve the emissions goal of the NDC of Colombia.

### **NDC - Nationally Determined Contributions**

The NDC incorporates three components: i) Greenhouse Gas (GHG) mitigation, ii) adaptation to climate change, and iii) means of implementation as an instrumental component of policies and actions for low-carbon, adapted and climate-resilient development.

To meet the GHG mitigation goal, a portfolio of measures has been identified consisting of a list of 32 national measures (led by ministerial portfolios), 89 sub-national measures (led by territorial entities), 24 measures led by companies and 3 specific measures to reduce black carbon, for a total of 148 measures. Within the portfolio of sectoral GHG mitigation measures are, among others, Measure 7 of Sustainable Construction with a reduction potential of 93,800

tCO<sub>2</sub>eq.

Measure 7 NDC: Sustainable construction (Implementation of Resolution 549 of 2015). This measure is focused on defining guidelines for the design and construction of sustainable buildings, achieving reductions in energy consumption, which allows reducing GHGs linked to the development of housing and other buildings.

Consequently, this project is coherent and related to the NDC because it seeks to reduce the emissions generated in construction processes, as well as the reduction of energy consumption in buildings. This relationship is seen substantially in component 2 "Net zero carbon buildings and energy efficiency in public spaces", whose main result is the reduction of GHG emissions in the cities of Barranquilla, Montería and Pasto, associated with construction and energy efficiency in buildings and public space.

#### **E2050 - Colombia's Long-Term Climate Strategy to comply with the Paris Agreement (E2050)**

Through the implementation of E2050, it is expected that Colombia will have net annual emissions of Greenhouse Gases (Carbon equivalents) equal to zero, based on profound changes in production and consumption patterns, as well as an increase in the Carbon absorptions, resulting in the country achieving carbon neutrality by 2050. To achieve this, certain long-term bets have been defined. One of these is bet 6 "Cities-regions with integral urban development for their environmental sustainability (...)", which contains transformation options such as 28 of "Highly efficient buildings adapted to climate change that in their life cycle and the interaction with the environment generates a net balance of carbon emissions equal to zero".

This project seeks to contribute to this transformation option, which is why the recommendations given for the 2020-2030 period were included in the results, associated with: 1) the adjustment and updating of legal regulations to include guidelines for highly efficient buildings and adapted to climate change in their life cycle; 2) Development of reporting and verification mechanisms to guarantee the implementation of norms, standards and protocols for sustainable buildings and net zero buildings; 3) Usable construction and demolition waste (RCD), reincorporated in the life cycle of new buildings. The three recommendations are reflected in component 1 "Governance for sustainable construction" and component 2 "Net zero carbon buildings and energy efficiency in public spaces".

#### **ENEC - National Circular Economy Strategy**

Colombia intends to be a leader in Latin America in the implementation of the circular economy by 2030. This vision implies increasing efficiency in the use of materials, water, and energy, considering the resilience of ecosystems and the circular use of resources. material flows, maximizing their added value and their useful life. ENEC seeks to promote productive transformation to maximize the added value of industrial and agricultural systems and sustainable cities. Within this strategy, 6 material and resource flows have been prioritized, including demolition and construction material flows.

#### **CONPES 3919 - National Sustainable Building Policy**

This Policy seeks to promote the inclusion of sustainability criteria for all uses and within all stages of the life cycle of buildings through regulatory adjustments, the development of monitoring mechanisms and the promotion of economic incentives, which contribute to mitigating the negative effects of building activity on the environment, improving living conditions and generating employment and innovation opportunities.

Through this project, both in Component 1 and Component 2, the implementation of this policy will be promoted when developing decarbonization plans, guidelines, and construction pilots. Likewise, it will strengthen this instrument thanks to the proposal made to improve national regulations and implement a reporting and verification mechanism to guarantee compliance with the existing norms, standards, and protocols in Colombia regarding sustainable and low-carbon buildings.

## 8. Knowledge Management

**Outline the knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.**

During project implementation and before the end of each project year, knowledge produced by or available to the Project will be consolidated from project stakeholders and exchanged with other relevant projects, programs, initiatives, research institutions, academia, etc. by the Project Executing Unit (PEU). This collected knowledge will be analyzed alongside project monitoring and evaluation data at the annual Adaptive Management meeting. It is at this meeting that the theory of change will be reviewed, and modifications to the annual work plan and budget will be drafted. Adjusting based on what works and what does not work should improve project results.

Lessons learned and best practices from the Project will be captured from field staff, biannual Project Progress Reports, and annual Project Implementation Reports (PIR), and from stakeholders at the annual Adaptive Management meeting. External evaluations will also provide lessons and recommendations. These available lessons and best practices will then be documented in the semi-annual project progress reports (PPR) (with best practices annexed to the report).

The PUE Project Coordinator will ensure that relevant stakeholders, such as GEF Operational Focal Point, members of the Project Steering Committee (PSC) and Technical Advisory Committee (TAC), project partners, and other stakeholders are informed of and where applicable invited to the Adaptive Management meeting, formal evaluations, and any documentation on lessons and best practices. These partners will receive all related documents, such as Project Progress Reports, Evaluation Reports, and all Knowledge Management materials produced by the to ensure the sharing of important knowledge products.

All knowledge and communication products produced by the Project will be shared on a project-specific website to be updated frequently by the Ministry of Environment and Sustainable Development and the Colombian Council for Sustainable Construction. This will allow a wider audience to gain knowledge from the Project. In addition, the Project Coordinator will share these documents with stakeholders more directly through mail, presentations at workshops, and meetings of the Steering Committee and the Technical Committee.

## 9. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

**Overall Project/Program Risk Classification\***

PIF

CEO Endorsement/Approval MTR

TE

Medium/Moderate

#### Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

In the evaluation of the environmental and social impacts, it is foreseen that the Project will generate mainly positive environmental and social impacts, since it contemplates the reduction of CO2 emissions through the increase of decarbonization strategies in the construction sector in Barranquilla. Montería y Pasto through the development of actions that involve the different stages of the life cycle of buildings and interventions in public space. In this sense, the project is expected to generate mainly positive impacts since it is focused on reducing emissions, which will translate into environmental and social benefits for the populations of the cities in which the projects will be located. However, considering the activities to carry out the planned activities and the level of sensitivity of the environment, it is expected that the negative impacts will be mainly associated with the implementation and deployment activities of the Project. Impact from climate change may occur, but will be limited, transient or manageable. Financial, environmental, and social underperformance or failure is unlikely. The system has the capacity to manage volatility, shocks, stressors or changing climate trends.

On this basis and given the characteristics of the environment and the expected impacts, the operation is classified as **Moderate Environmental, Social and climate change Risk**.

#### Supporting Documents

Upload available ESS supporting documents.

Title

Submitted

Annex D&E

### Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
María Fernanda Vélez Ramírez	Head of International Affairs Office	MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	4/8/2022

## ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

IMAGE 1. MAP OF PASTO SHOWING AREA, POPULATION AND COORDINATES

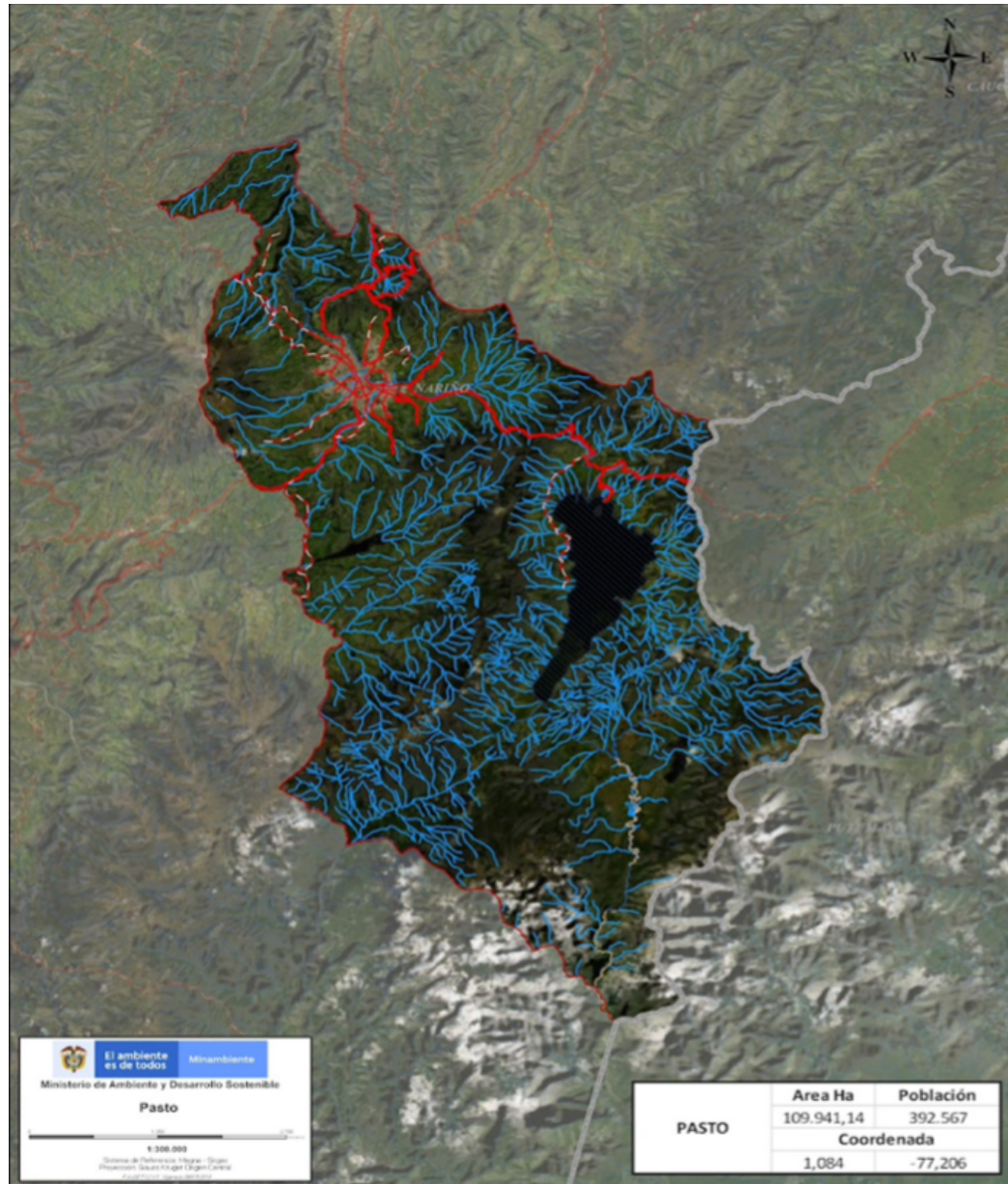




IMAGE 2. MAP OF MONTERIA SHOWING AREA, POPULATION AND COORDINATES

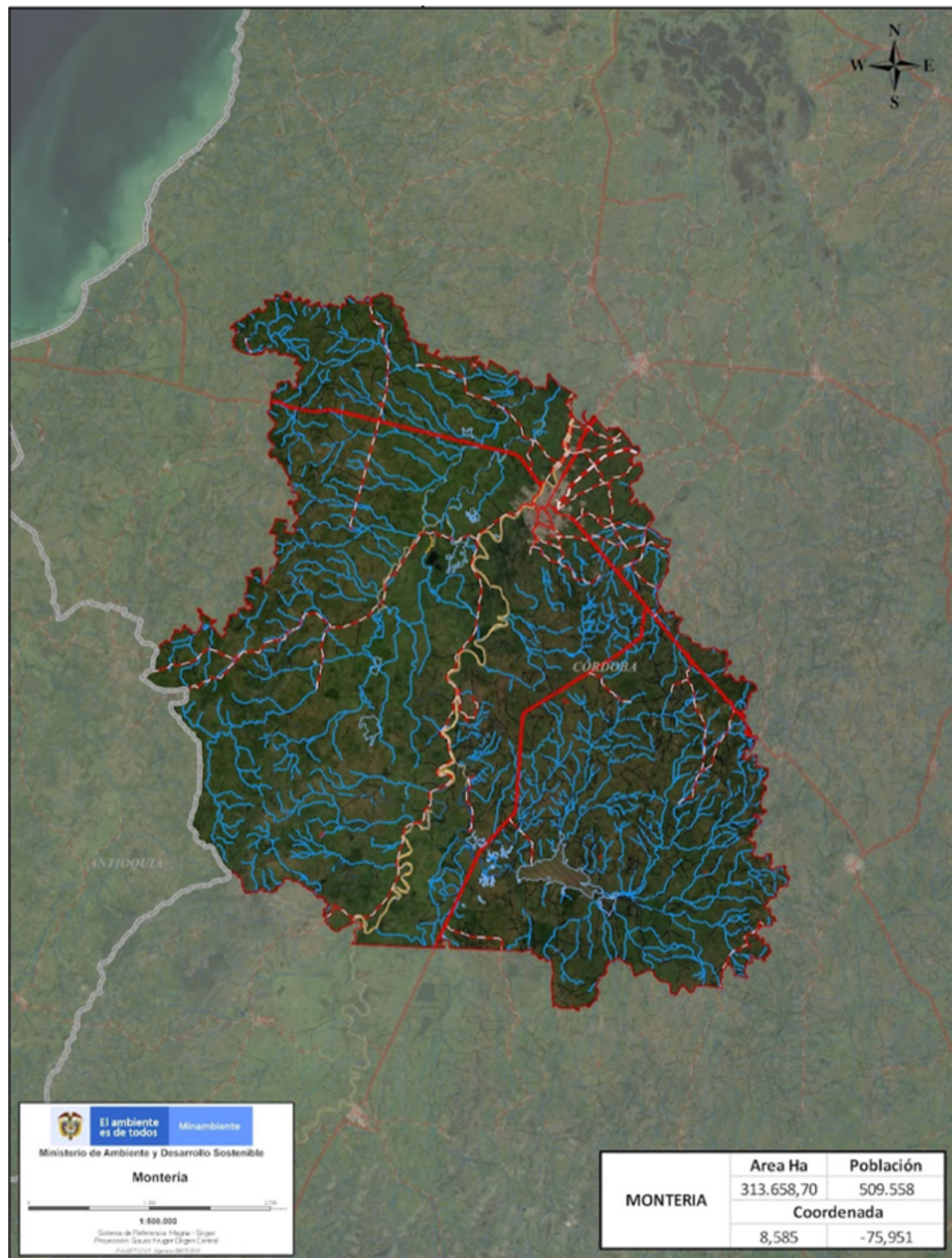




IMAGE 3. MAP OF BARRANQUILLA SHOWING AREA, POPULATION AND COORDINATES



