# Solid Waste NAMA in Colombia

## Transforming the Solid Waste sector while reducing GHG emissions

**Sponsoring Country:** **Colombia**

**Sponsoring Agency:** **Center for Clean Air Policy**

**Main Contacts:**


Javier Moreno
Director de Desarrollo Sectorial
Ministerio de Vivienda, Ciudad y Territorio
(57 1) 332 3434
Carrera 6 No. 8-77
jmoreno@minvivienda.gov.co

Rodrigo Suárez.
Director de Cambio Climático.
Ministerio de Ambiente y Desarrollo Sostenible
(57 1) 332 3400 / 332 3820 Ext: 2484/2411
Calle 37 No. 8-40
rsuarez@minambiente.gov.co

# Executive Summary

## 1.1. Introduction

The waste sector in Colombia contributes 5.7% of total greenhouse gas (GHG) emissions, totaling 10 MnTCO2e. As one of the fastest growing countries in the Latin American region, these emissions are expected to grow rapidly under the business-as-usual scenario. Most of the current emissions are generated through methane emissions from landfills in which Colombia disposes most of its solid waste. While this is good practice from a basic waste management perspective, Colombia is not optimizing the economic value that is present in solid waste streams through processes such as recycling, composting and conversion to fuel. Hence, Colombia is actively considering a Solid Waste Sector NAMA in order to maximize generation of economic value from waste streams and also achieve reduction of methane emissions by diverting solid waste away from landfills. The NAMA would transform the waste sector resulting in carbon neutrality shortly after implementation. Additionally, this NAMA is also expected to have several other social, economic and environmental benefits thereby making it consistent with Colombia's sustainable development objectives.

## 1.2. NAMA Description

The NAMA will support the Colombian government in transforming the solid waste sector by overcoming various existing policy, financial, market and social barriers. The cornerstones of the NAMA are regulatory changes, the promotion of alternative waste treatment technologies, creation of appropriate financial mechanisms, and the integration of informal recyclers into the formal sector.

The Colombian government (through the Ministry of Housing, City and Territory and the Ministry of Environment and Sustainable Development) is in the process of reforming solid waste management regulation that currently favors landfill disposal over alternative treatment technologies.

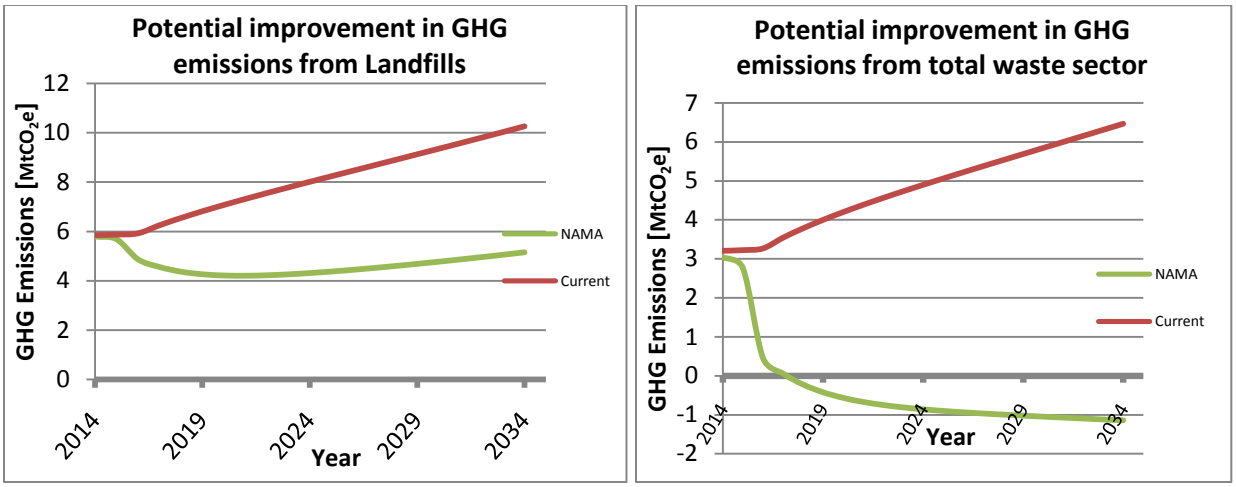
The most important of these changes concerns how the solid waste tariff is calculated. The tariff sets the price that solid waste operators can charge to collect, transport, and dispose of waste in landfills. Under the current tariff structure, it is much more profitable for waste operators to dispose of waste in landfills instead of diverting waste to recycling, composting, or waste-to-energy (WTE) plants. The NAMA feasibility studies have included assistance to the national regulatory agency to help them determine the true economic cost of alternative waste treatment methods in order to devise a new tariff structure. Apart from the above crucial steps, the government is also working on other regulatory changes such as removing unfair barriers to use non-hazardous waste as fuel in cement kilns and development of policies such as Extended Producer Responsibility (EPR).

As part of the NAMA, Colombia is proposing the promotion of new technologies such as mechanical-biological treatment (MBT) facilities that can process waste diverted away from landfills to produce commodities such as recyclables, compost, and refuse derived fuel (RDF). Compost made from mixed waste can be used in public parks or for land reclamation. From a mitigation perspective, composting of organic waste is paramount to achieving meaningful GHG reductions, since organic waste placed in landfills will create methane emissions once it begins decomposition. RDF can be sold to cement kilns or

other industrial consumers to replace fossil fuels which have a dual GHG benefit of reducing landfill emissions and those resulting from combustion of fossil fuels. Under the solid waste NAMA plan, such MBT facilities will be constructed in cities throughout Colombia and will be executed in three phases. The first phase will include construction of such a facility in Cali, the second phase will include the cities of Barranquilla, Medellín, and Bucaramanga and the third phase would be open to any other Colombian city interested in participating in the NAMA.

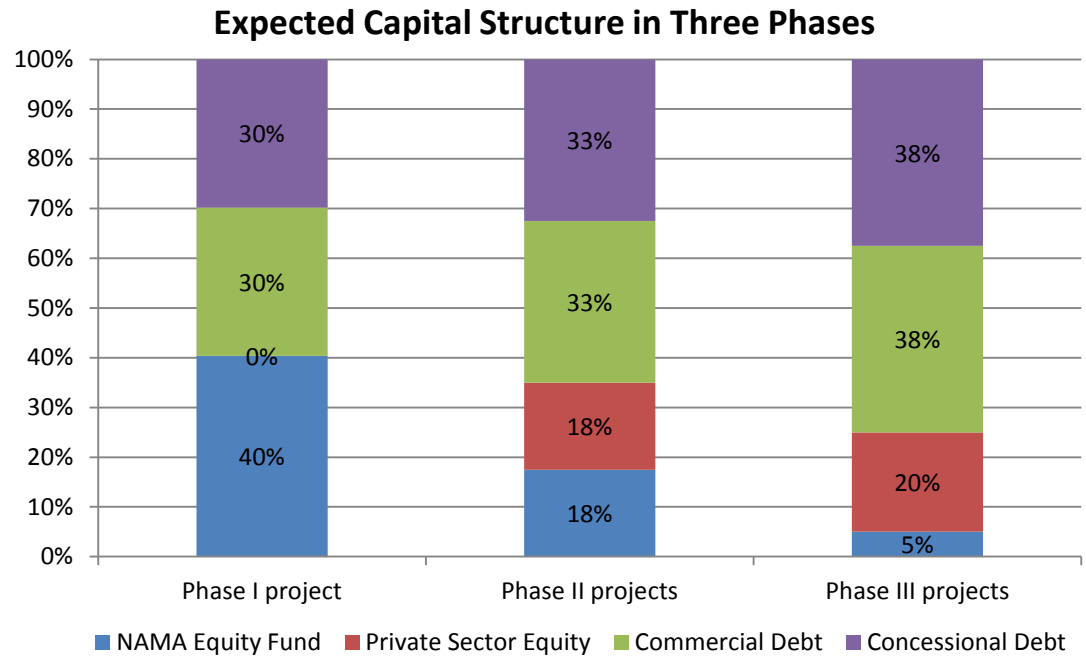
The above projects will assume that 50% of waste from all cities in Colombia will be diverted away from landfills to MBT facilities, which will lead to a significant reduction of GHG emissions from the sector. Diverting 50% of the waste would mean that over time, only half of the landfill emissions would be generated. If in addition to this we consider the environmental benefits of recycling (avoiding the production of virgin materials), composting (displacing chemical fertilizers) and use of RDF (displacing coal in cement kilns and other industrial boilers), the waste sector could be a carbon sink, with negative net emissions, as shown in Figure 1. This NAMA scenario is significantly better than a scenario where 50% of all nationally produced landfill gas is flared, as this would reduce the sector emissions by 78%, compared to a 115% reduction after implementing the NAMA.

**Figure 1. Comparison of current and proposed scenarios**




The conditions for financing MBT facilities in Colombia, while encouraging in an overall sense, present a significant barrier in terms of availability and affordability of private sector equity capital due to the lack of experience with such technologies. Hence, another important element of the solid waste NAMA is the creation of a NAMA Equity Fund, henceforth known as the "Fund", financed through public resources of Colombia and climate finance contributions from donor countries up to $40 Mn. The Fund will contribute equity capital to the MBT facilities that will be constructed in various cities as explained above. The contribution of the Fund to the total equity capital of each of these projects will reduce over time as the private sector becomes more comfortable with the MBT technology and the operational and financial risks associated with it (Figure 2).

**Figure 2. Financing structure over the different phases**




The Fund will be revolving in nature which is to say that the returns accruing to the Fund from its investments in various MBT facilities will remain within the Fund and will be available for deployment to other projects in the pipeline in future (

**Figure 3**).

**Figure 3. Fund use over time**

| In US$ Mn | Cities | | Total Investment Required | 2014 | 2015 | 2016 | 2017 - 2021 | 2022 - 2026 | 2027 - 2031 | 2032 - 2036 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Phase I** | **Cali** | | **28.5** | | | | | | | |
| | | Fund Investment | | (11.5) | | | | | | |
| | | Returns to fund | | | | | 2.6 | 5.4 | 9.1 | 5.5 |
| **Phase II** | **Barranquilla, Medellin, Bucaramanga** | | **100.0** | | | | | | | |
| | | Fund Investment | | | (17.5) | | | | | |
| | | Returns to fund | | | | | | 10.3 | 13.0 | 11.1 |
| **Phase III** | **Other cities** | | **160.0** | | | | | | | |
| | | Fund Investment | | | | (8.0) | | | | |
| | | Returns to fund | | | | | | 3.9 | 5.5 | 6.3 |
| **Consolidated Fund Balance** | | | | | | | | | | |
| | Opening Balance | | | 40.0 | 28.5 | 11.0 | 3.0 | 5.6 | 25.2 | 52.7 |
| | Investment | | | (11.5) | (17.5) | (8.0) | 0.0 | 0.0 | 0.0 | 0.0 |
| | Returns | | | 0.0 | 0.0 | 0.0 | 2.6 | 19.6 | 27.5 | 22.9 |
| | Closing Balance | | | 28.5 | 11.0 | 3.0 | 5.6 | 25.2 | 52.7 | 75.6 |

In order to further increase the returns and reduce the risk associated with these projects, cities will be encouraged to implement MBT facilities using the Public-Private Partnership (PPP) framework established under Colombian law in which private sector investors can receive up to 20% of the total construction and operation costs from the Colombian government as revenue support during the operating phase of the project.

Another crucial aspect of the solid waste NAMA is that policies and business models are being designed in order to include informal workers in the modernization of the sector, allowing them opportunities to work in the formal economy and increase the standard of their working and living conditions. Several international studies suggest that integrated solid waste management processes like the ones contemplated in the NAMA can create up to 6 - 10 times the number of jobs than those focused on disposal. Thus, additional jobs created through the Solid Waste NAMA could be used to employ a large number of existing informal workers, including many indirect jobs that will be created through increased recycling (transformation into new products) and the creation and sale of compost and RDF.

The Colombian government is also contributing to the success of the Solid Waste NAMA by proactively designing next generation waste management processes such as source separation and selective routes for waste collection that will enhance the efficiency of MBT facilities and also increase the quality of their outputs. Forward-looking policies such as these could be integrated with the larger NAMA whenever possible at a municipal level.

In addition to contributing to the Fund, NAMA Finance could include funding for capacity-building at the national and sub-national governments and for project pipeline development support for Phase I and Phase II projects.

*Capacity-building at the national and sub-national governments could include:*

1. Creation of NAMA specific posts in Colombian Government for three years
2. Consultants to support national government in policy & regulatory design, technical standards for alternative technologies and processes and MRV Systems
3. Consultants to support municipalities through studies on plans for source separation & selective routes, markets for recyclables, compost and RDF and integration of informal workers.

*Project pipeline development support could include funding for activities for each project such as:*

1. Detailed Engineering studies for MBT facilities
2. Detailed estimation of waste composition, GHG baseline and mitigation scenarios
3. Conducting RFP process for selection and contracting with private sector operator/owner
4. Financial closure expenses
5. Negotiating with existing contractors agreeing on service standards and incentives aligned with NAMA objectives

## 1.3. Support Requested

The Colombian government is highly committed to the success of the Solid Waste NAMA because it considers it to be:

- **Transformational** as it propels the solid waste sector into the next generation of technologies and revitalizes recyclable markets, thereby reducing GHG emissions from the sector significantly.
- **Catalytic** as 1 $ of climate finance can mobilize up to 10$ from Colombian public and private sources through innovative financial structuring.
- **Comprehensive** as it meets regulatory, economic, social and environmental objectives.
- **Integrated** as it is consistent with Colombia's sustainable development plans and will receive high-level support from relevant institutions and contributions through public resources.
- **Replicable** throughout Colombia

Colombia shall be contributing valuable institutional capacity and public resources to:

- Undertake regulatory overhaul and legislative reform
- Contribute to NAMA equity fund (up to 50%)
- Facilitate PPP process for MBT facilities in various cities
- Conduct national and sub-national awareness and education programs
- Undertake comprehensive legislative reform for Solid Waste Management sector

In order to ensure success of the Solid Waste NAMA, the Colombian government requests the following climate finance assistance:

1. Contribution to NAMA equity fund (at least $20 Mn)
2. Capacity-building Support ($2.5 Mn)
3. Project Pipeline Development Support ($ 2.5 Mn)

The Colombian government is confident that the combination of unilateral contributions and actions along with climate finance support will create the ideal enabling environment for the success of the ambitious Solid Waste NAMA.