

## Improved Cookstoves - Colombia

### INTRODUCTION

While Colombia's large bustling cities are well known for their innovative climate solutions, the rural parts of the country are not enjoying the same level of development; not least when it comes to cooking solutions. It is estimated that 1.4 million households are relying on 'traditional' methods which stretches from cooking over an open fire to different type of fire-fuelled stoves to portable LPG containers, depending on what is available, affordable and convenient at the moment.

The practice of relying primarily on the burning of wood and cooking over an open fire has significant negative health, economic and environmental effects. The smoke contains particles which are harmful for the respiratory system. As cooking usually befalls to women and children, these groups are hardest hit. Moreover, if the firewood is collected in the woods, this takes a considerable amount of time, which could have been dedicated to other uses. Additionally, the environmental effects of deforestation are well known - release of greenhouse gases, land and soil degradation and increased proneness to drought, to name a few.

Using improved cookstoves contribute to alleviate these issues, to a certain extent, as they require much less firewood. Moreover, as they have an inbuilt chimney, the indoor air pollution is drastically reduced. Efficient cookstoves do exist in Colombia, but at a limited scale. The local authorities in a few provinces provide them free of charge, but at slower rate than what is needed. Moreover, this assistance-based approach distorts the market, resulting in little competition and very low-quality standards and limited market growth. Furthermore, this approach discourages the willingness to pay for an improved cookstove which means that there is a very limited offering of repairs and spare parts. Combined with the low quality, many of the free improved cookstoves break, and are then discarded. The family reverts to its earlier practice, and the same issues reappear. This also affects the perception of the improved cookstove as a technology within the community, further discouraging the willingness to pay from those affected.

Fundación Natura, a Colombian NGO, approached UNEP DTU Partnership with the idea to switch to a market-based approach, where innovative financial solutions would ensure improved cookstoves' affordability, enabling scale up and mass distribution. This ADMIRE project has identified the barriers for this market based approach, and created partnerships to overcome them.

### PROJECT OBJECTIVE

The objective was to create the necessary partnerships to integrate elements from a market based approach into the current assistance-based practice for the dissemination of improved cookstoves. The partnerships were built on the analyses of the current system from both the supply and demand side.

### RESULTS & NEXT STEPS

The project set up three pilot projects between cookstove suppliers and financial institutions offering micro credits. These projects are pioneering the market approach in Colombia, providing a proof of concept. By establishing partnerships between different actors, the projects also provide valuable lessons learnt in creating and utilizing the partnerships for maximum impact. The pilots are designed so that if the partners find it valuable, they can continue their engagement. Thus, the project has established a market for improved cookstoves with the potential to grow organically. This represents a significant shift in mentality as it was previously seen as impossible to sell improved cookstoves directly to users.

The development above will continue to grow organically, but more actions are needed to scale it up. The project-initiated discussions with the Colombian government, whom have taken action to include improved cookstoves on a list of energy efficient products exempted to pay VAT. Furthermore, discussions were initiated to consider ending the current practice by local authorities of subsidising 100% of the cost of improved cookstoves for a small number of households, but instead allow a market to establish itself, with progressive subsidies according to income level.

These discussions are ongoing. Fundación Natura also continues its work on improved cookstoves in Colombia as an advocate for a transition towards a market-based approach.

**IMPACT HIGHLIGHTS**

	GHG mitigation	Investment	Actors
Currently	Not estimated	USD 127,000	8 integral partners, 11 total actors engaged
Total potential if up-scaled and replicated	4.5 Mt CO2e/year	USD 213 million	



Drastically reducing indoor pollution, thus reducing the adverse health effects on those cooking.

As women are harder hit by the indoor pollution, improving the situation improves women’s livelihood.

Increasing the level of energy efficiency for rural households.

The market-based approach strengthens the value chain, thus creating employment.

Decreased rate of deforestation means preservation of the natural habitats of several species of animals and plants.

**THE TECHNOLOGY - EFFICIENT COOKSTOVES**

Cooking food is a daily necessity, and the technologies humans have developed for it are numerous. In Colombia, a variety of cooking technologies are employed. Gas stoves are most common in the urban areas and liquid petroleum gas, which comes in cylinders, is common in semi-urban areas. However, in certain rural areas, cooking with wood fuel is a common practice. According to estimates by the national authorities, there are an estimated 1.4 million households which cook primarily with wood. This is the potential target group of this project.

The conventional practice for these households is to cook over an open fire. An improved cookstove allows for a more efficient combustion as it takes place in an enclosed space. It thus requires less firewood to get the same cooking effect. Another important improvement is the chimney, which leads the smoke out of the indoor space, limiting the indoor pollution considerably.

Through innovation, the use of improved cookstoves can also result in other substantial benefits. By placing a thermoelectric generator, it can convert the excess heat to electricity which can be stored in a battery. It is sufficient to light several LED lights for hours, or to charge a phone. Considering that many of the households of the potential target market are situated off the electricity grid, this option provides them with a source of electricity generated as a by-product from a daily activity.

**THE BUSINESS CASE FOR CLIMATE ACTION**

The business model conceived by this project would require improved cookstove suppliers to start selling to individual clients, and to enter into partnerships with financial institutions to offer a more accessible way to finance the purchase. It is clear that potential users need to be willing to pay to acquire the technology, instead of expecting to receive one for free from the local authorities. The public authorities would also need to support the development, or at least refrain from blocking it.

As mentioned before, the benefits of switching to improved cookstoves are numerous for all stakeholders:

For the **users**, switching to an improved cookstove has primarily non-monetizable benefits such as better health. Depending on how the firewood is acquired, there can also be economic benefits. If it is bought, there is a monetary saving as less wood is required. Some users also have transport costs associated with acquiring the wood. For the users collecting it themselves, there is a considerable time gain. However, despite the moderate economic gains, users do perceive it as desirable to have an improved cookstove, and are to a degree willing to pay for it. Their willingness to pay is naturally subject to the limitation imposed by their ability to pay. While a complete demand analysis has not been conducted, the project results point in the direction that a demand exists which is unmet by the current practice.

For the improved **cookstoves suppliers**, switching to a market-based model holds several promises. Currently, the only clients of the suppliers are the local authorities. While one contract can mean the production of several thousand units of improved cookstoves, they are rare and come far in-between. One improved cookstove provider partaking in the pilot project thus sees this new type of client as a good way to diversify the client base, and consequently, the cash flow.

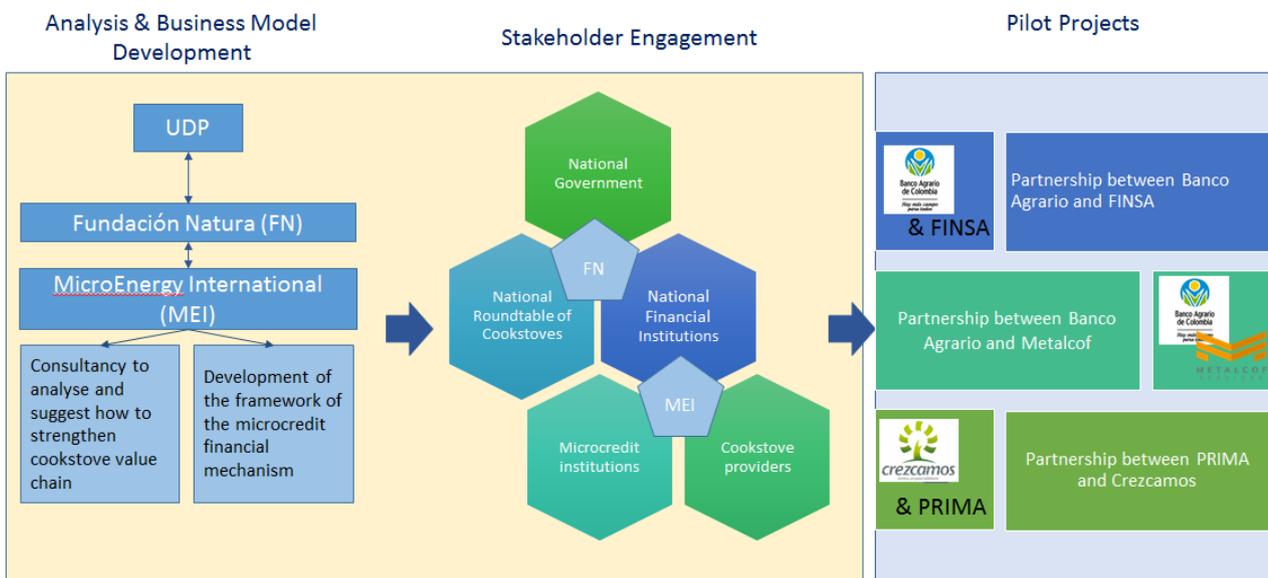
For the **financial institutions**, improved cookstoves represent a new market to offer financial services on. It has not been deemed as a potential market given the current assistance-based market approach, but the financial institutions have declared their interest in exploring the possibility.

In the case of commercial stakeholders, the market potential is large. An improved cookstove can cost up to 430 USD in Colombia. As mentioned before, there is an estimated 1.4m households which are currently using wood for cooking purposes. Thereby, if this number is considered as the potential market, this would mean potential revenues of 530m USD for improved cookstove suppliers. For microfinance institutions, expanding their portfolios to also finance improved cookstoves represents potential revenue of 213m USD.

For the **public institutions**, the switch to a market-based approach from an assistance-based approach could mean a better allocation and use of resources, as more people would benefit from an improved cookstove with the same amount of money.

It is clear that the relevant stakeholders have much to gain by shifting to a market-based approach in order to disseminate improved cookstoves in Colombia. However, a major problem was to convince them to act in sync with one another, and to create a partnership where this business model could flourish. This is what the project set out to do.

**PROJECT STAGES**



### Analysis & Business Model Development, and the Stakeholder Engagement:

Fundación Natura has a long history of engagement with improved cookstove projects in Colombia, and identified the benefits of integrating a market-based approach. However, for this to happen, several aspects needed to be analysed, especially those related to strengthening the value chain of improved cookstove suppliers and the current financial landscape, in order to enable the access of potential users to buy it. Given the expertise required to conduct these analyses, it was decided to utilise a consultancy to solve these tasks. MicroEnergy International (MEI), a consulting firm specialized in energy and financial inclusion was selected to perform these studies. Fundación Natura built on its own experience and on the results of the MEI's technical assistance, and socialised the findings with the actors on the national roundtable for improved cookstoves to gain their input and validate the results. Through these discussions and conscious engagement efforts with key stakeholders, steps were taken to realise the business model, including the creation the aforementioned partnerships which were operationalized through the pilot projects.

### Pilot Projects:

Based on the model developed, Fundación Natura facilitated the creation of three partnerships between improved cookstoves suppliers and financial institutions to test out the model. Essentially, improved cookstove suppliers have the option to offer a potential customer a financing solution through a micro credit loan. The partnership facilitates the access to these loans greatly, as the financial institution knows the potential of the technology, and that it upholds a certain level of quality. These three pilot projects are, at the time of writing, underway, and represent one of the first experiences where improved cookstoves are sold directly to end-users in Colombia.

The pilots function as a 'proof of concept' in that it illustrates that there is a demand and a willingness to pay. Moreover, valuable lessons learnt are extracted in regards to which arrangement works. An example of this is the success of Metalcof, an improved cookstove provider, who engaged with potential users when it was invited and attended its partner Banco Agrario's expositions. The fact that they were present at these occasions, combined with the hard work of the supplier, made a significant difference for the result of the pilot project, as they were able to sell many more improved cookstoves.

## RESOURCES

**Final Publication of the Project:** "Construyendo un Enfoque de Mercado para el Escalamiento de un Programa Nacional de Estufas de Cocción con Leña"

**Market Calculations Model** which extrapolates the revenue, interest, and GHG emissions of a full scale efficient cookstove market.

**Demand Projection Model** which includes three scenarios of demand growth, and their implications on accumulated sales and concessional funding needs.

## TEAM

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