

## Distribution of improved cooking stoves in Peru



### Programme summary

With the carbon offset programme “Qori Q’oncha – Distribution of improved cooking stoves in Peru”, myclimate and its local partner Microsol accomplish three objectives: they make a contribution towards climate protection, improve the long-term living conditions of indigenous people in rural regions and protect the local environment. The use of energy-efficient cooking stoves leads to a reduction in the amount of unsustainably harvested wood biomass (from local forests) required for cooking, thereby reducing the volume of greenhouse gas emissions produced. In addition, the project brings health benefits to low-income households by preventing the release of cooking smoke inside the kitchen.



### Programme benefits

The programme is helping to reduce CO<sub>2</sub> while making a significant contribution to sustainable development in the region:

- The use of improved cooking stoves reduces the demand for the use of non-renewable firewood. This leads to a reduction of CO<sub>2</sub> emissions and protects the local forest.
- The new ovens reduce smoke emissions and improve indoor air quality, thus having a positive effect on the respiratory health of women and children.
- As the improved ovens require less wood, the villagers spend less time on the tiresome task of gathering firewood and save money.
- Protecting the forest has positive effects on biodiversity and reduces soil erosion.
- Reduced particulate matter, methane and nitrogen oxide emissions.
- Capacity building on the construction of efficient stoves with local materials.

## Facts and figures on the carbon offset programme

Programme location	Peru, entire country
Regions of first two VPAs	Ancash, Cusco, La Libertad, Moquegua, Huancavelica, Piura, Cajamarca
Project standard	Gold Standard VER
Project type	 Energy efficiency
Emission reductions	331,754 t CO <sub>2</sub> e (over 7 years)
Situation without programme	Consumption of non-renewable firewood
Programme start	September 2008

## The programme country

Peru is located in the west of Latin America and is divided into 24 regions. Peru has had several years of good economic growth. However, its fast-developing urban economy has not led to environmental improvements in technology. Its rural areas are hard-hit by the degradation and deforestation of both tropical and mountainous forests. The country is considered to be the third most vulnerable country to climate change. Peru has numerous tropical glaciers that are currently melting rapidly and are expected to disappear within a century. Moreover, desertification will soon be putting the poorest inhabitants of the country in danger, including those in the mountainous Andes region. Deforestation is threatening the biomass reserves of the country. Aside from ecological problems, the poorest part of the Peruvian population has largely been marginalised by economic growth. Their wages as well as their access to basic needs (e.g. drinking water, electricity, balanced nutrition and medicine) are still very low.

## The situation in the programme region

The indigenous people of Peru mostly live in rural and often remote areas of the country. They usually work in agriculture. Families have traditionally cooked their meals on the ground in the house over an open flame. As a traditional house usually has only one room, the whole house is filled with smoke before and after meals. The smoke is thick and stays in the house as only a little hole in the roof allows for ventilation. As a result, acute respiratory and eye diseases are a significant problem for women and children. Additionally, this traditional form of cooking requires large amounts of firewood, which puts pressure on the local forests and is thus a major contributor to climate change.



Map of Peru: red circles show the project regions.



Traditional cooking situation (baseline): open fire fills room with thick smoke. Acute respiratory and eye diseases are a problem for women and children.

## How the programme is implemented

Mainly due to a lack of finance and knowledge, too little has been done in the past to combat the unsatisfactory health conditions in homes and to protect forests. However, some local non-governmental organisations (NGOs) as well as development cooperation organisations have been working successfully with efficient stoves for many years in Peru. Most of these efforts rely on donation schemes and are only implemented on a small scale without in-depth, long-term monitoring plans.

The Gold Standard cooking stove methodology for voluntary carbon markets is designed to amplify existing projects while strengthening monitoring and sustainability aspects. With the help of the “Qori Q’oncha” programme, already committed organisations can now scale up their work dramatically, while improving quality control.

Having already acquired part of this knowledge through their studies in international economics, the two young Frenchmen Pol Raguenes and Arthur Laurent completed an extended field trip in the Andean region seven years ago. After numerous interviews, volunteer activities and discussions with local families, NGOs and professionals, they came up with the decision to build their own social enterprise in 2008. As a first step, the introduction and promotion of efficient cooking stoves with chimneys funded by the voluntary carbon market turned out to be the best option for achieving their vision of improving both environmental and social development in the region. In their search for a competent, socially oriented partner, they contacted myclimate, which already had experience with stove projects under the Gold Standard.

### Organisation of the programme

The “Qori Q’oncha”-programme is the first voluntary Gold Standard “Programme of Activities” (PoA) worldwide. It coordinates different projects, so-called “Voluntary Programme Activities” (VPA). All activities aim to distribute efficient cooking stoves equipped with a chimney and are coordinated by Microsol.

The cooking stove distribution activities are implemented by various local partners (LPP – local project participant). So far, four NGOs and the regional government of Moquegua (Gobierno Regional Moquegua – GRM) are active in three regions: Sembrando in the La Libertad region, in Cajamarca, Huancavelica and in Piura; ProPeru in Cusco; CARE Peru in Huancavelica; the GRM in Moquegua. The LPPs are in charge of the installation of the stoves in the field, including trainings

on the construction and proper use of the stoves. In addition, these NGOs and the GRM are responsible for local stakeholder consultations and project monitoring through data collection. However, their work goes far beyond the cooking stove itself, and includes capacity building on health issues, hygiene in the household and environmental protection.

The programme is aimed at the poorest parts of the population and in that way contributes to social development. All activities respect the uniqueness of the beneficiaries. The LPPs are familiar with local habits and thus try to implement the projects in the least invasive manner possible. Gold Standard requires a “Do no harm” declaration form filled out by each LPP, which guarantees that aspects like human rights, labour standards, environmental protection and anti-corruption are respected.

In a PoA the long-term coordination of the different project activities is key for success. Only a local entity like Microsol can coordinate all the different activities required. These include an overall stakeholder consultation, analysis of the monitoring data, documentation of the programme and of each project activity, report-writing, capacity building with regard to the carbon market and the programme, as well as contracting and integrating further programme partners into the programme. For these reasons it makes sense to include this additional entity in the project development chain, as opposed to individual project activities,

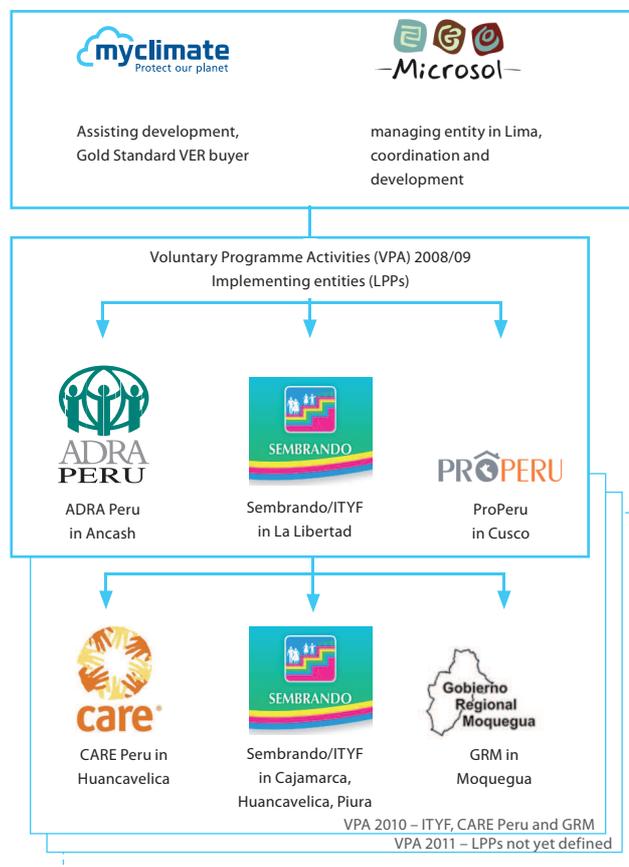


Chart illustrating the organisation of the programme

where myclimate usually communicates directly with the local project implementer.

With its knowledge of the carbon market, myclimate's role is to give advice to Microsol throughout the process by reviewing all project documents, communicating with the auditors (third party validation/verification) and the Gold Standard (registration), buying the offset credits generated and redeeming them for its customers.

### Improved efficient cooking stoves

The families are highly involved in the construction of the new cooking stoves. The LPPs conduct a capacity-building course and provide technical assistance. The specific models of stoves vary depending on two main factors: 1) the presence and nature of local materials, which are always given preference in the construction process, and 2) the specific needs of the local population. Yet some characteristics are the same for all improved cooking stoves under the Qori Q'oncha-programme:

- Insulating materials are used, in order to optimise the efficiency of the stove.
- The technology design respects the basic rules of physics in order to optimise internal combustion and practical use of the stove.
- The stoves are at least partially closed, with a chimney that draws the toxic smokes outside the house. This reduces smoke emissions and improves indoor air quality, thus improving the health of women and children.

The stoves are mainly built with adobe bricks. Adobe is a natural building material made of sand, clay, and water, with a fibrous or organic material providing structural support. The material is shaped into bricks using frames and dried in the sun. Adobe structures are durable and account not only for stoves but also for some of the oldest extant buildings. Adobe has been in use by indigenous peoples of the Andean region for many centuries.

The stoves also include metal parts for the cooking plates and the chimney. These parts are manufactured in Lima and transported to the rural areas by truck. The emissions generated through this transport are considered as leakage and are therefore subtracted from the emissions reduction calculation.

### Training and awareness building

Aside from the distribution of the cooking stoves, their proper use is a key factor for the success of the



The efficient ovens are built from local materials.



Local workers construct the efficient ovens after a capacity-building workshop



The newly installed chimney (blue pipe on the left) takes smoke out of the house.



The new ovens improve hygienic standards in houses and women and children's health. This woman has put tiles around her oven.



### The traditional cooking stove

2.4 billion users around the world.  
2.3 million users in Peru.

#### Environmental aspect

Deforestation rate of 0,4 per cent annually (Ministry of Environment of Peru, first official communication).

#### Health

An estimated 1 million people die every year around the world as a consequence of indoor smoke caused by traditional cooking stoves.

Studies show that in Peru 2,500 children below 14 years of age died as a result of acute respiratory infections in 2004.

According to the WHO, indoor smoke is the world's biggest health challenge.

Table: Traditional cooking stove in comparison with improved cooking stove (Sources: World Lung Foundation, The Acute Respiratory Infections Atlas, 2010; Global Alliance for Clean Cookstoves (<http://cleancookstoves.org>), February 2012; Energy Sector Management Assistance Programme (<http://www.esmap.org/esmap>), February 2012.

programme. The new cooking stoves are very similar to the families' traditions, wood is still used as a fuel and the combustion mode is very similar. A main part of the project is the training and sensitising of the beneficiaries, respecting their social and cultural needs. In order to comply with this objective, many concrete measures are implemented, such as the participation of the families in the planning and construction process, training of builders for knowledge transfer into the communities and training of families on the correct use and maintenance of their new cooking stove. All training and awareness-raising activities are carried out by the local project participants.

What's more, the project raises awareness of both the health and environmental impacts of the improved cooking stove. LPP supervisors plan group meetings according to the beneficiaries' schedules and use pedagogical tools such as small theatre pieces and drawings to transmit information. The sensitisation is reinforced each time supervisors go to visit the beneficiaries in their homes to ensure adequate integration.



### The new, improved cooking stove

Already implemented in parts of Africa, Asia, Central and South America.

Established and applied by a variety of actors.

#### Environmental aspect

82,099 stoves had been implemented by December 2011. 74,235 tonnes of wood are saved per year with a reduction of 331,754 tonnes of CO<sub>2</sub>e over 7 years.

#### Health

An efficient cooking stove from the myclimate project can eliminate up to 27 per cent of combustion gases.

## Non-renewable biomass and climate change

Forests play an integral role in mitigating climate change. Not only are they one of the most important carbon sinks, storing more carbon than both the atmosphere and the world's oil reserves, they also constantly remove carbon from the atmosphere through photosynthesis, which converts atmospheric carbon into organic matter.

If in a defined region the harvest rate of the forest exceeds the mean annual regrowth, the excess of logged compared to grown wood is considered non-renewable. Thus burning such wood leads to more CO<sub>2</sub> than the forest is able to capture. By reducing the amount of fuel wood required, the gap between harvest and growth rates can be minimised. In contrast, fuel wood from a well-managed forest, such as in Switzerland for example, is considered renewable and has no additional CO<sub>2</sub> emissions.

According to the Gold Standard Methodology used, the fraction of non-renewable wood has to be studied and defined precisely with the help of local forest departments, published studies, data from the Food and Agriculture Organisation of the United Nations and satellite images.

## Emission reduction calculation

The calculation of the emission reductions relies on conservative statistical analysis and measured parameters like wood consumption before and during the project.

Put simply, the calculated CO<sub>2</sub> emission reduction can be demonstrated as the wood savings thanks to the project activity times an approved emission factor multiplied by the fraction of non-renewable biomass.

In reality, many more parameters have to be considered to establish the correct amount of reduced emissions, including the emissions generated through the transport of the metal parts of the stoves.

This calculation has to be performed for each project cluster. A cluster is a group of stove users with equal conditions, e.g. region, climate, stove type, used fuel type, and non-renewable biomass situation.

## Monitoring

The monitoring plan is based on the “Gold Standard Methodology for Improved Cookstoves and Kitchen Regimes”. First, each LPP compiles a list of the families that have received an improved stove. Microsol compiles the lists. LPPs regularly update their lists and communicate changes to Microsol. This forms the basis for identifying stove owners to be surveyed and for the total emission reductions calculation.

Before the validation of each subproject, a baseline study using the old stoves and a study of the project scenario using the new stoves are conducted by performing qualitative kitchen surveys and quantitative kitchen tests, where the amount of used fuelwood is measured.

At least every two years, a general update of each subproject is carried out that compares predicted and actual total emission reductions based on the initial emissions reduction measurement. A monitoring report is then produced.

During the two-year period, the project is continuously monitored through kitchen surveys with a smaller sample size. Whenever major changes are identified, quantitative kitchen tests are performed in addition to the surveys.

Finally, other aspects such as leakage, sustainable development, non-renewable biomass and potential “do no harm” mitigation parameters analysis are monitored in the general biannual update so as to take into account the influence of its eventual evolution.

Quality control is carried out both by Microsol in Lima as well as by myclimate, which supervises the process. All data generated is centralised by Microsol in comprehensive databases to allow for accuracy and easy access and analysis.



A member of a local project participant performing a quantitative kitchen test.



Beneficiaries filling out their qualitative kitchen surveys.

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