

June 2017

# Amaray

Energy and development for rural areas



## Financing

An essential tool for achieving basic energy access

## Distribution chain

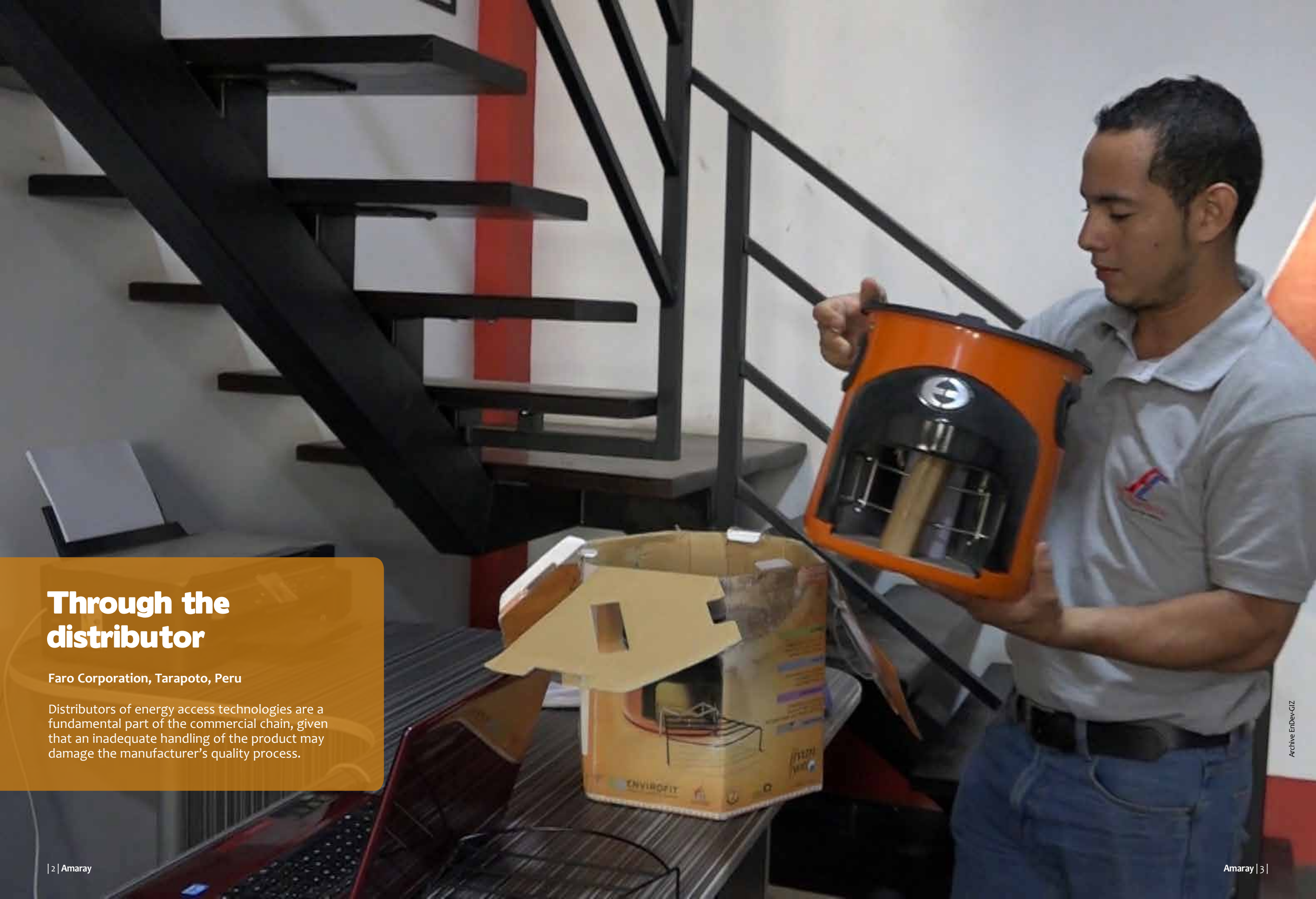
All actors involved in the market dynamics

## From the manufacturer

Envirofit International, Honduras

Like other companies that are focused on improving access to energy in low-income rural areas, Envirofit International is engaged in the industrial manufacturing of improved cookstoves, seeking to connect with distributors in different countries where it offers its products.





## Through the distributor

Faro Corporation, Tarapoto, Peru

Distributors of energy access technologies are a fundamental part of the commercial chain, given that an inadequate handling of the product may damage the manufacturer's quality process.





## To the point of sale

Local business, San Martin, Peru

Selling the product to the consumer represents the last challenge in the distribution chain, in which the point of sale has direct contact with the customer. It is also here where the change really begins towards an improvement in the quality of life.



In Peru, fighting isolation in rural areas is a challenge that requires financing and fostering the market.

Jesus Flores



Dear readers,

It is always a pleasure to present the new edition of Amaray magazine, this time, focused on two fundamental topics to promote energy access among low-income populations. On the one hand, access to financing by actors involved in the sector, so that they can continue expanding their work; and on the other hand, the visualization of the distribution chain of basic energy access technologies.

From the EnDev Peru Project approach, we are confident that knowledge opens doors and pushes us to break the poverty gap. Therefore, we seek to share our experiences and of other institutions committed to this task, thus generating better technologies and services that reach more and more to populations that need them most.

We want to present financing experiences, which include the payment of credit funds, result-based financing, and service compensation mechanisms and also show you how the Peruvian government is supporting a more citizen-centred investment.

In addition, we want to show you the faces of the main actor in the basic energy access market: the manufacturer, the importer, the distributor and the point of sale. Thus, as cooperation, we understand that it is important to understand the actor first and then being able to promote it, so that an efficient chain is jointly articulated, bringing quality products with an adequate after-sales service to rural households.

Finally, how not to present you a photographic portfolio displaying the fervor of the Lima purple tradition, enraged in the “Procesión del Señor de los Milagros”, in photos of multitudes by Jesus Flores. We believe that only with faith in our work and with the support of all of you, we will be able to generate the knowledge that we believe is valuable for strengthening the energy access market.

We hope you enjoy this new number and do not hesitate to send us your comments and suggestions.

My regards to you all,

**Ana Isabel Moreno Morales**  
General Manager of the Energising Development Project EnDev-GIZ Peru

[www.endevperu.org.pe](http://www.endevperu.org.pe)

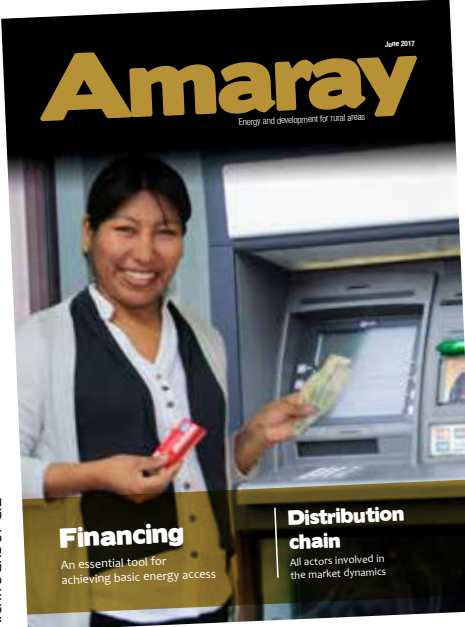




Archive EnDev-GIZ

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**Special. EnDev Peru**  
Visualising the chain of energy access



Archive EnDev-GIZ

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Jesus Flores

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**Portfolio. Spaces of faith**  
Photographs of Jesús Flores



# Rural energization policies



FASERT-IICA

The access to improved cookstoves generates an impact at the social level, which is decisive for state policies.

The Peruvian State, within the framework of a new national policy of modernization, is giving emphasis to an investment beyond technologies, which is focused on making possible for citizens to improve their life standards.

By the Access to Basic Energy Collective

In Peruvian rural areas, most households live in poverty and extreme poverty, indicator of the absence of an adequate energy access, essential element for lighting, cooking, heating and communicating.

Thus, although there is access, it is of poor quality, inaccessible and expensive, considering that a poor rural family, compared with an urban middle-class family, spends most of its income on energy; this, because it uses inefficient, second-hand devices or because the price paid is high.

Then, we are in front of a low-income family, which is located in a remote area, with little access due to the lack of paved roads, and whose energy or liquefied petroleum gas (LPG) consumption is almost absent. In this context, it is difficult to imagine that the private sector will be interested in investing in their energy consumption, action that seems unlikely.

### ENERGY ACCESS MECHANISMS

The Peruvian Government proposes solutions for energy access through the Universal Energy Access Plan 2013-2022 (Ministerial Resolution No2013-2013-MEM/DM), which seeks to implement projects with the financing of the Social Inclusion Energy Fund (FISE), widening like this universal access to energy supply through available energy sources. These projects shall be technical, social and geographical feasible, and implemented through the four Mechanisms of Universal Access to Energy and Rural Energization, which are: 1. Promotion for large-scale use of natural gas; 2. Promotion and compensation for LPG access; 3. New supplies development in the energy frontier; 4. Rural energy use improvement.

This article is especially interested in commenting on points 3 and 4, e. i., the development and promotion of mechanisms for energy access through the total or partial subsidy of costs; this, with regards to photovoltaic systems, biodigesters, solar heaters and other equivalent technologies.

Therefore, a look at universal access to energy based on a binary approach, considering whether the family has or not the technology, generates a framework in which the State investment tenders the technologies to deliver them to beneficiaries, without a maintenance and replacement programme. In this context, empirical experience indicates that this type of interventions is not sustainable, while in successful experiences local capacity building for

the operation, maintenance and repair of offered technologies is seen.

### PUBLIC MODERN MANAGEMENT

Access to energy, present in lighting, cooking, heating water, heating, cooling, communication and information and, under quality standards that meet the needs and expectations of users, involves the design of the offer of the energy service that covers the minimum standards and generates positive impacts in society (at an initial stage with the support of the State), in a way that generates a supply that incentives private investment and allows channelling more and new resources for the operation and maintenance of technologies.

This approach is aligned with the modern policies and public management promoted by the State, where the priority lies not only in public products, as proposed by the Universal Access Energy Plan, but in meeting the needs and expectations of the citizen, achieving results and impacting on their quality of life.

Within the framework of this national policy of modernization, the State is focusing its work on the citizen as it looks for better quality standards; for this purpose, it is proposed to create a “public value”, a concept that refers to providing services that benefit the citizen, generate confidence in the State, and achieve compliance of the results proposed by state agencies. In other words, it is expected to promote changes in the well-being of the person and in their behavior, thus generating a social impact.

We see then, how the investment and public management may be oriented to create results and public value. These are approaches that energization seeks to provide through sustainable energy services by using renewable energies. For that, generating a public policy of rural energization shall take into account poor technologies availability and lack of an operation and maintenance system, having in the agenda a possible incentive for private investment.

Likewise, the dialogue around this public policy of rural energization is open, considering that it is proposed not to focus on the technology, but on achieving social results and impacts. Thus, it is essential to reformulate budget programmes towards programmes, projects or activities that involve achieving results, or developing the insertion of a new budget proposal, in which results-based and person-centred rural energization is the issue on the agenda.

The Peruvian Government proposes solutions through the Universal Energy Access Plan 2013-2022.

## Access to Basic Energy Collective

The Access to Basic Energy Collective was created in 2016 with the interest of providing strategic proposals and actions aimed at reaching sustainable development in the regions of Peru. The Collective is promoted by the EnDev-GIZ Peru Project, Practical Action, PLESE, FASERT-IICA and the Institute of Nature Sciences, Territory and Renewable Energies of the PUCP.





# Lighting now to develop the future

The use of third-generation photovoltaic systems is presented as a key to achieve universal access to electricity. ACCIONA Microenergy has installed 7,500 of these systems in the State of Oaxaca, in Mexico, and in 2016, 61 families of the region of Loreto, in Peru have also started this experience under a public-private alliance scheme. The advantages are palpable and their technology and service acceptance has been extraordinary.

By **Julio Eisman**, Director of the ACCIONA Microenergy Foundation and **Jessica Olivares**, Manager for ACCIONA Microenergy Peru.

Access to basic lighting through photovoltaic systems is presented as an alternative that has an impact on education.

Although electrification rates in Latin American countries (above 95%) seem to indicate that it will be possible to reach universal access to energy before 2030, the reality is less optimistic, because while the electrification rate increases, the annual electrification growth decreases. The reason is that there are great technical and economic difficulties to reach remote and dispersed places, where the solution with conventional grids is inefficient. Even considering the use of second-generation solar home systems (SHS) with lead-acid batteries, low-power fluorescent lights and fixed installations does not seem to be the most appropriate way for these environments, due to their high maintenance cost.

In light of this reality, there is a solution based on the use of service technology and models, proven and tested in the field. Fortunately, it can be stated that it is possible to provide basic access to cover the electricity demand in most remote and dispersed places. This is done through so-called third-generation PV (3GPV). These systems have lithium-batteries, reduced size and weight, more cycling capacity, are environmentally friendly and use LED light bulbs (highly efficient, brighten more from a lower consumption). In addition, they are based on the concept of plug and play, factor that enables users with minimal training to install their own system. Therefore, the advantages of these systems are evident and their characteristics allow installing more efficient and economic service models.

Similarly, with 3GPV, the user takes the broken element to the supply and service centre (SSC) located in the head municipality, avoiding the movement of the supplier thereof, as happens with second-generation systems. Furthermore, it has also been proven that these systems present a reduced number of faults. Another advantage is the option of equipping them with prepaid technologies, having the possibility of combining them with money incorporated into the mobile phone service. Likewise, the SSC also becomes a payment centre, avoiding the displacement for making a cut or reconnection. It is worth mentioning that the SSC may become a driver of local energy activity, offering additional proximity services and compatible devices with 3GPV, which improve living conditions of users. Then, we see how the reduction in the equipment cost, operation and maintenance results into an attractive economic solution, far below the services associated to power supply with grids.

There is a solution based on the use of service technology and models, proven and tested in the field.



### A PROGRESSIVE SOLUTION

According to the five levels of electrification proposed by the Energy Sector Management Assistance Program – ESMAP of the World Bank, 3GPV are located in level 2, enabling lighting through three light bulbs for about four hours a day, and feeding low consumption devices (mobile phones, radios, TVs and fans). Although this may seem insufficient to boost the development, it is worth recalling some relevant aspects:

- Energy is an element that facilitates development. Having more energy does not necessarily imply greater development, because in these environments there are more determinant elements such as access roads, prices of produced elements, etc.
- Resources allocated to electrification are limited and when faced to the dilemma of having basic energy in the short term or having a greater level years later, settlers prefer to have basic energy as soon as possible.

Female settlers in off-grid isolated places find a solution in solar panels.



- Having basic energy immediately, generating a direct impact on the living conditions, is not an element incompatible with access to a greater level of electrification as it becomes necessary, if progressive solutions are sought.

Thus, given the arguments presented, we will continue betting for 3GPV, taking into account that these systems may be expanded by adding or replacing elements at a reduced cost (level 3); may be connected to each other to exchange energy and, in turn, allow connecting other storage and generation elements to the micro-grid itself (level 4); could even connect to the national grid, in case it reaches the area (level 5). In addition, we can see how the technological evolution enables these transformations to advance at a reduced cost.

### IMPLEMENTING THE EXPERIENCE

ACCIONA Microenergy has installed 7,500 3GPV between 2012 and 2016, under a public-private alliance scheme between the state of Oaxaca and the Spanish and Mexican international development cooperation agencies, establishing six SSC in that territory. Thus, we believe that this could be the greatest experience with 3GPV in the Latin American region, despite the fact that many more are already taking place in other countries of the region.

Likewise, in August 2017, the pilot project will end, co-funded by the National Fund for Science, Technology and Technological Innovation (FONCYTEC) of the Peruvian State, to evaluate the application of 3GPV in 61 families from four communities settled along the banks of the Napo River in the region of Loreto. It is worth highlighting that the application of these

systems under extreme conditions and with logistical difficulties, which are presented in the Peruvian Amazon, is a crucial test of the feasibility of this solution.

In conclusion, technology and service model acceptance in both experiences has been extraordinary. Therefore, we can confirm that we are not in front of promising ideas, but directly in front of real experiences.

### SHARED RESPONSIBILITY

Regarding the commitment made by the countries that ratified the United Nations agreement on the Sustainable Development Goals, Goal 7 is broken down to “ensure access to affordable, reliable, sustainable and modern energy for all”. Hence, the responsibility of achieving this goal involves different agents such as the State, private companies and civil society, each one with specific responsibilities and roles.

It is the State’s responsibility to prioritize universal access through energy policies and integrated planning, considering isolated electrification with renewable energies and developing and incentive regulatory framework. Then, looking to the future, we bet on joint and coordinated actions, where each actor may contribute with what it is best at. In that sense, instruments like public/private alliances have proven to be very effective.

Peru has especially made significant progress by developing the BT8 tariff for isolated photovoltaic systems. However, it is needed not to stay behind, but to expand said tariff to 3GPV, using a decided approach to urgently satisfy universal access to energy for all Peruvians.

Peru has especially made significant progress by developing the BT8 tariff for isolated photovoltaic systems.

## ACCIONA Microenergy

ACCIONA Microenergy is the social branch of the Spanish business group ACCIONA. The initiative seeks to provide access to isolated renewable energy in low-income rural communities, where electricity grids are not foreseen to arrive. At present, it provides electricity to about 50,000 people in Cajamarca (Peru) and Oaxaca (Mexico) through its program Luz in Casa.

[www.accioname.org](http://www.accioname.org)



# Visualising the chain of energy access

Promoting the retail market of basic energy access technologies means to multiply and foster distribution channels so that more people have access to them. For that, the EnDev Peru Project has been documenting a series of videos that seeks to highlight the different roles of each leading actor of the technological offer.

By Alicia Castro, Senior Technical Advisor for EnDev-GIZ Peru and Angel Verástegui, Main Advisor for same project

Firus Altamirano, entrepreneur from the province of Moyobamba, seeks to take his products to customers who need them most.



It is globally recognised that basic energy access enables social integration and economic development, and it is also a means to help eliminate poverty. This is translated as Goal 7, from the United Nations Sustainable Development Goals (SDGs), which is a commitment for the sustainability of the 2030 Agenda and a command for countries of the world.

In Peru, despite the economic progress of the last decade, there is still a gap and inequality of opportunities between urban and rural areas, with a significant proportion of the population without access to basic energy services: about 30 percent of the population still cooks with firewood or traditional open fire, and 10 percent lacks electricity in the household.

Given this scenario, the Energising Development EnDev Peru project, from a market approach, seeks to reach the unmet demand, promoting the development of distribution chains for basic energy access technologies (BEAT). For that, the project identifies and strengthens entrepreneurs who are active or interested in BEAT, encourages alliances between them and promotes the multiplication of distribution channels. All of this in order to contribute to the fostering of the retail market of BEAT and, therewith enabling energy access to depend mainly on the option to purchase of potential users.

In addition, EnDev Peru, in its task of collecting, sharing and disseminating information with the aim to increase knowledge on basic energy access, also considers important to highlight the concept and approach of the distribution chain of BEATs.

#### DISTRIBUTION CHAIN STRUCTURE

A distribution channel or chain is the path followed in the marketing process of a product, from the manufacturer to the final consumer or user. Hence, the starting point of this distribution channel is the producer, while the final point or destination is the consumer. Likewise, the group of people or organizations located in between are the intermediaries.

In this sense, a distribution chain is made of a series of companies or people that facilitate the circulation of the manufactured product. Thus, in a territory there are different distribution chains already established for different types of products and services, which represent an opportunity for BEATs market penetration.

At present, in Peru, manufacturers and importers of BEATs have little market penetration due to their scarce or short distribution channels. In view of this, the objective of boosting the distribution chains of BEATs implies developing various distribution channels in all regions with significant potential demand.



A warehouse or a local shop may also become part of the points of sale network.

## Actors in the distribution chain of basic energy access

BEAT: Basic energy access technology



#### INTERNATIONAL MANUFACTURER

- Acquires supplies to manufacture and export BEATs
- Their direct clients are mainly importers
- It positions as a stakeholder with initiatives at global level
- Does not sell directly to the final user because it sells great quantities
- Does not receive direct critics or comments about the product



#### IMPORTER

- It usually has the exclusive representation of the international manufacturer
- Their customers are mainly wholesalers and retailers
- Positions itself as a national stakeholder with local initiatives
- Does not sell directly to the final user in mature markets
- Does not focus only in retail or rural markets



#### NATIONAL MANUFACTURER

- Acquires supplies to manufacture and distribute a type of BEATs
- Their direct customers are wholesalers and retailers
- It positions as a national stakeholder with local initiatives
- It does not usually have commercial capacities or specific staff (unlike the international manufacturer)
- Does not have the financial support that the international manufacturer has



#### WHOLESALER

- Acquires one or more types of BEATs to diversify the supply
- Its customers are mainly local retailers (sub-distribution) and final users
- It is aware of the national initiatives around BEATs
- It is not interested in one product or brand, but only in the one that sells the most
- Does not tend to innovate because it has its working capital already distributed



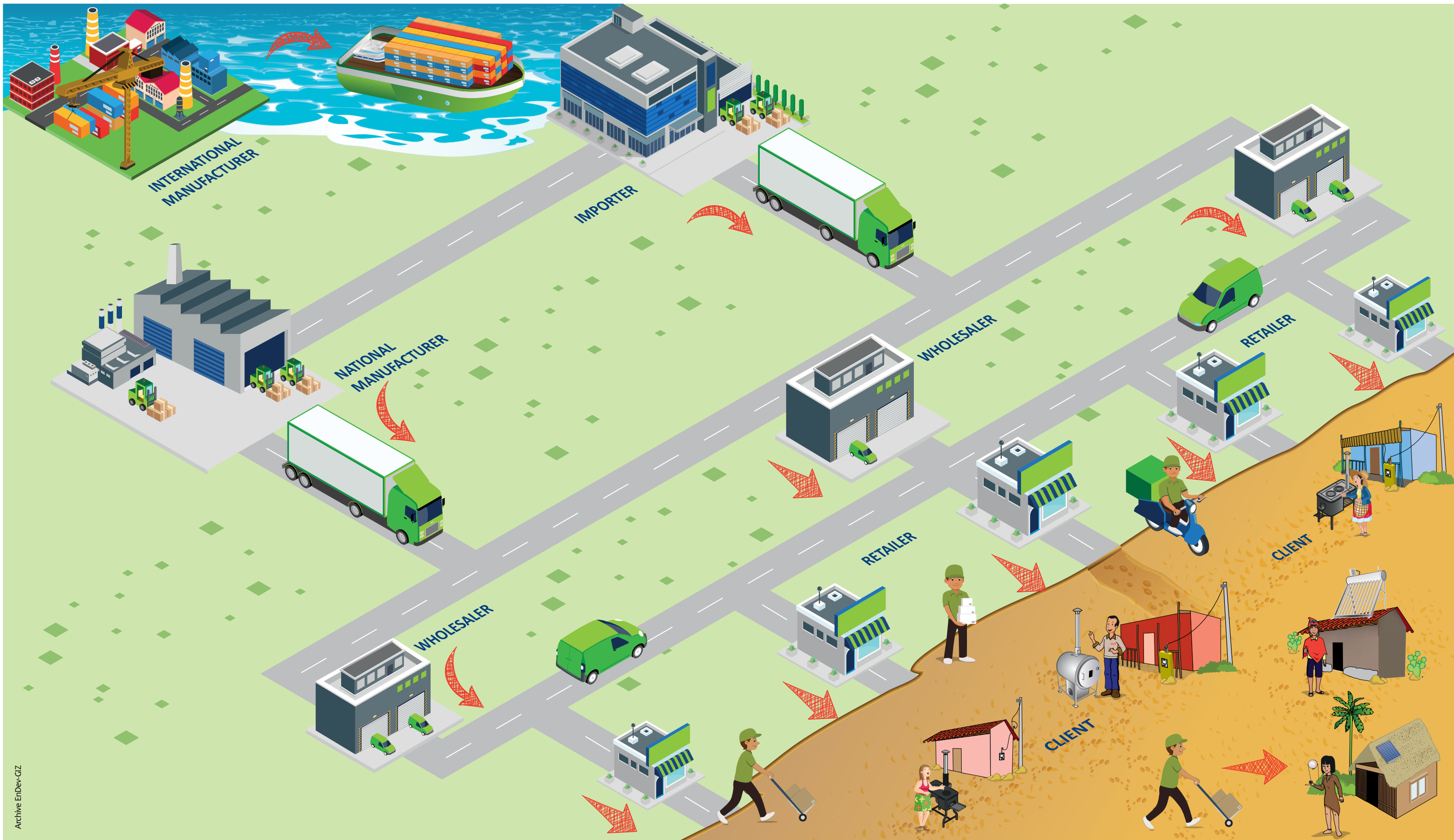
#### RETAILER

- Acquires one or more types of BEATs to diversify its supply
- Its final customers are BEATs final users
- It is aware of local initiatives around BEATs
- Does not shop from importers or manufacturers in mature markets due to the reduced size of the orders
- Does not need technical capacities to be successful in sales



# Dynamic of the distribution chain of basic energy access

A distribution chain is made of a series of companies or people that facilitate the circulation of the manufactured product. The starting point is the producer, while the final point or destination is the consumer. Likewise, the group of people or organizations located in between are the intermediaries. Thus, the operation of each element is vital to achieve an adequate flow of the trading system.





# The faces in the distribution chain

To address the topic of the distribution chain of BEATs, an audio-visual tool (videos) has been used as a didactic resource that shows the different actors operating along the chain. Thus, the objective has been to know the characteristics of each link from the perspective of each of the actors.

In that sense, the EnDev Peru Project has documented five testimonies of people who play different roles in the distribution chains of BEAT. It is worth mentioning that the common objective shared by these people is that all of them want to cover an unmet demand by offering for this purpose, improved cookstoves and ovens, photovoltaic systems or solar water heaters.

In the narration of the interviewees we can see coincidences. For example, from the manufacturer

to the point of sale, the main concern is the quality of the product in order to satisfy the final consumer. Moreover, it is emphasized that the product offered not only meets the basic energy needs, but also generates social and environmental impacts, highlighting its contribution in reducing environmental pollution and therefore fights against climate change.

In this line, on the following pages we present a synthesis of each role in the distribution chain. As well, the function and reality of each one of the roles in the distribution chain could be seen in detail, according to the individual experience of each interviewee, including: the national and international manufacturer, the importer, the wholesaler (or distributor) and the retailer (or point of sale).

The function and reality of each one of the roles could be seen in detail.



Miguel Granados visits regularly the Latin American countries where Envirofit works.



Envirofit

The manufacturing plant of Envirofit for Latin-America is located in Honduras.



## The international manufacturer

Miguel Granados, Representative for Latin America of Envirofit International, Guatemala

“My name is Miguel Granados, I studied Industrial Engineering and at present I work in Envirofit International. Our goal as a company is to get people to cook in a pleasant and happy way having a good product. For that reason, in Envirofit we try to design something pretty, pleasant for the user and that complies with the quality standards, for which we have our own production plants, but we also work with subcontractors.

To date, the company has managed to implement products in more than 40 countries around de world, working in the public and private sector, non-governmental organizations and small distribution chains.

We try to segment our market well in order to introduce our products into the channels that promote development. In this sense, bringing the message to the public that needs it is a daily challenge, because for many people it is quite difficult to have the availability of access to a credit in a segment with extreme poverty”.

[www.envirofit.org](http://www.envirofit.org)

“Our goal as a company is to get people to cook in a pleasant way”.





Paul Winkel carries out field visits to know closely the relationship of the user and the technologies.



### The importer

Paul Winkel, General Manager of PowerMundo, Lima

“My name is Paul Winkel and I am the General Manager of PowerMundo. I studied international development and just after that I met my partner and he told me there was work to do regarding energy access in Peru. So, I arrived into the country in 2012, and since then I have been here with PowerMundo supporting this process.

What motivates me the most is changing from a burner or a candle to modern energy, as when using solar energy. For that, we are looking for our products to be known in Peru and in all Latin American regions, by working with allies at local, national and international level. Apart from that, we have made alliances with manufacturers that cover all the quality certifications and expectations.

The products themselves are the ones generating the social impacts we are looking for, the most important being the savings issue. In that sense, we are replacing a daily spending, which could be used in changes that really can break the cycles of poverty.

The lack of funds is always a problem. For example, to increase the size of our distribution, we need the support of not only international organizations and cooperation, but also of allies and investors in the issue of distribution. We depend on them to keep growing”.

[www.powermundo.pe](http://www.powermundo.pe)

**“The products themselves are the ones generating the social impacts we are looking for”.**



Wilbert Pulcha has expanded his family business to manufacturing improved cookstoves and ovens.



### The national manufacturer

Wilbert Pulcha, General Manager of Centro Tecnológico Metalmecánico, Arequipa

“My name is Wilbert Pulcha and work in mass metal-mechanic production. This is a family business, my father was engaged into this activity and, my company’s name is Centro Tecnológico Metalmecánico.

One of the products that we offer are firewood improved ovens. Another product that we are also positioning in the market is firewood improved cookstoves, which use little firewood, using energy efficiently.

To reach our final customers we use distributors in several regions, since we are not in charge of the sales, but they are the ones responsible of reaching the customers. In that sense, our vision as company is to cover all the national territory and then export.

One of the main problems we have faced is in the distribution. For example, when sending 20 pieces to other region, half of them arrived damaged. Another problem is the lack of capital for restocking, because we have to wait until all shipments are paid and during that time a little fluidity is lost in the production”.

**“One of the products that we offer are firewood improved ovens”.**





Hans Vela (on the right) talks to his colleagues about the technologies he distributes.



Firus Altamirano sells energy access technologies in his business in Moyobamba.



### The wholesaler

Hans Vela, General Manager of Faro Corporation, Tarapoto



### The retailer

Firus Altamirano, Manager of Consultora & Constructora Firus, Moyobamba

“I am Hans Vela and live in Tarapoto, and I am founding partner of Faro Corporation, a company that commercializes and distributes clean technologies such as improved cookstoves and photovoltaic systems.

We started the business distributing solar lamps, building a small distribution network here in San Martin. Moreover, little by little we met more manufacturers and suppliers of clean technologies. At present, Faro markets throughout the north of the country, with salespeople and a distribution chain that is the largest in Peru at the moment.

What motivates me is that more people can stop being exposed to this contamination, and that our company can be the principal actor of this change. Often, the final public needs to acquire a renewable technology; however they do not have money at that time. This is a barrier that we are trying to solve by looking for financial institutions that may provide this financing without tedious evaluation systems”.

[www.facebook.com/farocorp.sac](http://www.facebook.com/farocorp.sac)

“What motivates me is that our company can be the principal actor of this change”.

“I am Firus Altamirano Vicente. I am an electrician and live in the province of Moyobamba in the department of San Martin. My Company is Consultora y Constructora Firus with almost a year of creation. One of the main areas is the distribution and sale of clean technologies such as improved cookstoves, solar panels, Pico Pv systems, improved ovens and solar heaters.

I distribute technologies directly to people, in urban areas or taking the products to rural and peri-urban areas, because there is people who are interested in acquiring these technologies. Mostly, I find difficulties in transportation and access to rural areas, even worse, there are increasingly remote locations, but in spite of that I continue carrying the technologies because people need them.

My expectations are to continue improving as professional and as company to know in depth all the technologies that I promote, and become a national distributor”.

[www.facebook.com/FIRUZEIRL](http://www.facebook.com/FIRUZEIRL)

“I distribute technologies directly to people”.

## EnDev Peru

The Energising Development Project (EnDev) is a program of access to energy financed mainly by the governments of the Netherlands and Germany, which aim is to provide access to energy to 14 million people around the world, being the German Cooperation, implemented by the GIZ, the executor in most of the cases.

EnDev intervenes in 21 countries, from which the majority are in Asia and Africa, while four are in Latin America. In Peru, EnDev has been working since 2007, trying to build public-private alliances that support markets creation that may benefit those populations that lack adequate energy services and technologies.

[www.endevperu.org.pe](http://www.endevperu.org.pe)



# Spaces of faith

## Photographs of Jesús Flores

By Carlos Bertello, editor of Amaray magazine

There are moments in life when we need to believe in something, it can be real, tangible and present, or go beyond what is seen, letting our feelings flow towards an idea, doctrine or promise. In both cases, we look for a motivation, a force that allows us to fight for a better present or future.

Jesús Flores, Peruvian photographer living in Germany, has tried to capture a space of faith of great fervour for the Peruvian people. The procession of “El Señor de los Milagros”, Cristo de Pachacamilla or Cristo Moreno (Dark Skinned Christ), goes through the streets of Lima, every year in October since 1687, bringing blessings of union, hope, Catholic fervor and tradition.

From EnDev Peru, we want to highlight that given the development challenges present in Peru, it is indispensable to have faith in our work. That is, confidence that we can contribute to better access to energy. Likewise, being close to the reality of so many families that lack electricity or other basic services: how not to recognize the faith for a better future day by day in their faces?

From the sharp eye of Jesus Flores, we share these faith photographs present in the Lima tradition, along with other taken in sparsely populated areas of Peru and the North Sea of Germany, showing like this an aesthetic of amplitude in contrast to the photographs of the purple procession.

After all, these isolated places are also spaces of faith for those seeking theirs in silence, going over less crowded places where the magnitude of nature reigns. Finally, we emphasize the evident remoteness shown in these Peruvian landscapes, evidencing the difficulty to bring modernity and access to energy to these localities.

Jesús Flores, Lima, Peru, 1980, studied graphic design and photography at the Peruvian Institute of Art and Design from 2002 to 2005. He has worked for public institutions and private companies in corporate photography and communications. In 2011, he was a finalist of the Hasselblad Latin American Competition; in 2012 participated in the First Biennial of Photography of the Centre of the Image; and had been semi-finalist of the Eugène Courret Competition in 2014. He has also collaborated in visual documentation projects on the work of urban artists and social institutions in Lima, Holland and France. “He’s Us” lives in Germany since 2013.

[www.hesusfloresphotography.com](http://www.hesusfloresphotography.com)







Procession of El Señor de los Milagros, Lima





Procession of El Señor de los Milagros, Lima



Optisch, Peru



Strand Norddeich, Germany



Optisch, Peru



Optisch, Peru



Strand Norddeich, Germany



# Credit funds as financing



FASERT/ICA

Taking a step forward in promoting green energies, FASERT not only continues financing producer organizations, but allows partners to access identified technologies. This is through the promotion of the benefits of the technology in improving living conditions, therefore motivating its acquisition among partners.

By Angélica Fort, National Technical Coordinator of the Fund for Sustainable Access to Renewable Thermal Energy FASERT-IICA

FASERT has developed credit funds to install solar dryers for coffee beans.

The Fund for Sustainable Access to Renewable Thermal Energy (FASERT), financed by the Energising Development Programme (EnDev), and implemented by the Inter-American Institute for Cooperation on Agriculture (IICA), was born in 2014 as a response to the commitments acquired by the Paris Agreement and the United Nations Sustainable Development Goals, to use renewable energies, mitigate the effects of climate change and fight poverty under a gender equity approach.

A new intervention modality was designed, aimed at producer organizations.

The main component of FASERT is a grant to co-finance projects that promote access and dissemination of thermal renewable energy technologies (TERT) among rural and peri-urban populations in Peru. Thus, these technologies promote an improvement in their quality of life, generating heat from a renewable source as biomass or the sun.

The fund has been implemented in two phases. The first was executed between 2015 and 2016 through nine projects to install firewood improved cookstoves, biodigesters and improved brick kiln ovens. The second, launched in mid-2016, has facilitated 22 projects to access the aforementioned TERT, as well as solar dryers, firewood improved cookstoves and solar heaters.

At the end of the first phase, it was possible to identify that the intervention model along with the active participation of producer organizations was sustainable and successful. In addition, FASERT received the demand for funds from producer organizations wishing to finance the acquisition of different TERTs among their partners.

This is how a new intervention modality was designed, aimed at producer organizations with financing mechanisms developed or associated to a financial institution that manages the credit funds. For this, it was established that the projects execution period would be less than 15 months; the amount to be co-financed with FASERT at 50/50 would be up to USD 50,000 per project; or otherwise, the counterpart would rotate the fund so that money given by FASERT would be placed, totally recovered and reinvested in new beneficiaries within the duration of the project.

Moreover, although the existence of an offer developed for the technologies to be financed



in the area was a requirement, the producer organization should have been aware of the benefits of the technology in order to improve the living conditions of their partners, so that the project will strengthen the market of clean energies at local level.

In this context, nine organizations presented to the call, and six were selected under the commitment of guaranteeing the installation of quality technologies. Hence, the payment was disbursed directly to the supplier chosen by the user and previously approved by FASERT, as for the training and models of certified TERT. In addition, each executing

organization shall safeguard the adequate recovery of the funds, so that once the intervention period has ended, the credit fund for the financing of renewable energy will continue to be allocated for up to five more years.

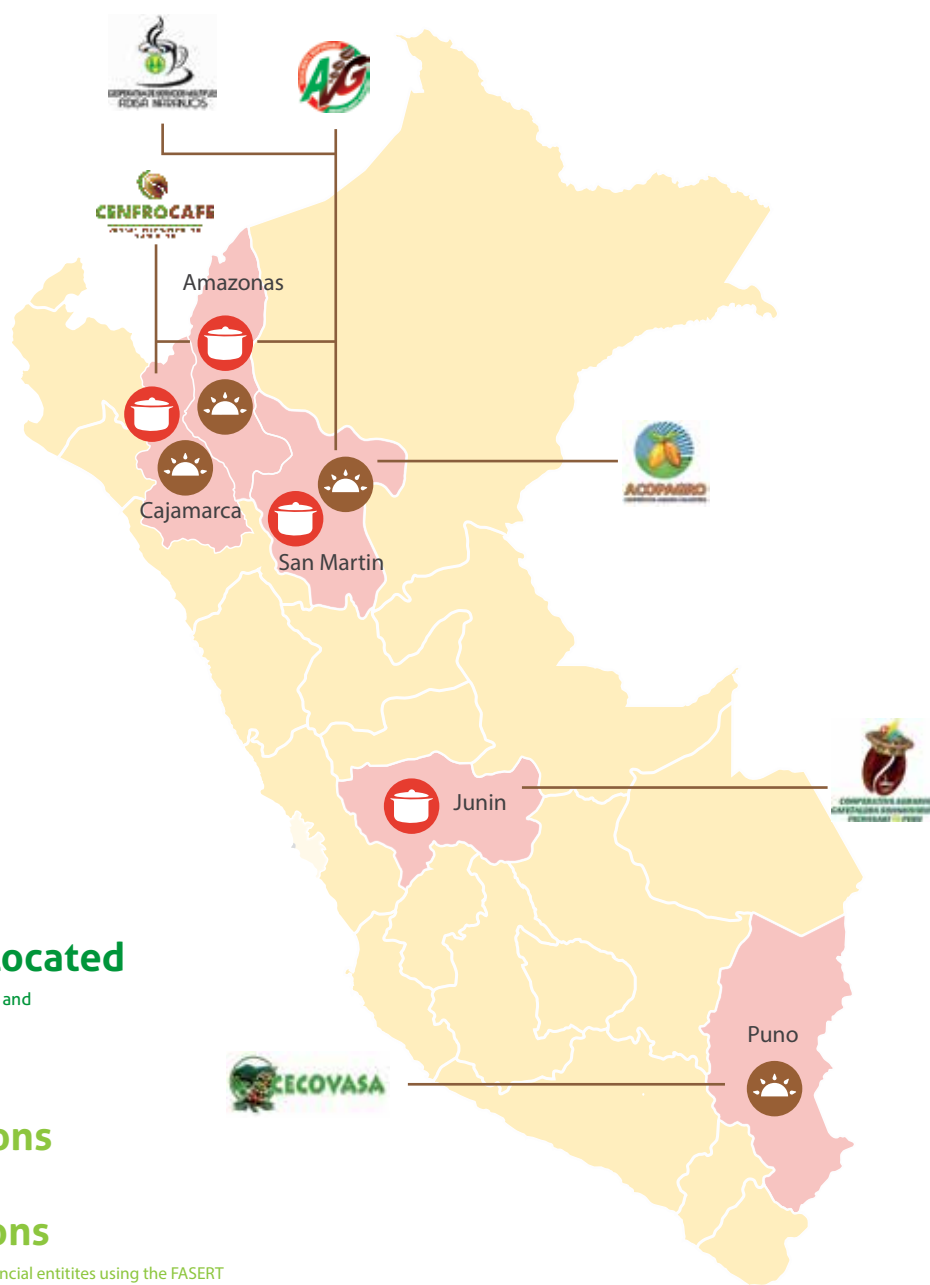
In this sense, the producer organization provides its logistics and technical equipment to raise awareness in their associates on the economic, social and environmental benefits of the technology, in order to motivate its acquisition. In parallel, the amount foreseen by FASERT will be used as capital for partners to access identified technologies.

The producer organization provides its logistics to raise awareness in their associates.

Cenfrocafe wants to enter the market of Premium Coffee with the required funding.

## CREDIT FUNDS GRANTED BY FASERT

Phase II - Call in June 2016



Type of thermal renewable technology

- Solar dryers
- Improved cookstoves

### The Cenfrocafe experience



Cenfrocafe, an association that groups more than 1900 families in the provinces of Jaen, San Ignacio and Bagua, which are located in the north of Peru, is a cooperative that participates in FASERT's credit funds to install solar dryers for coffee beans. Moreover, this group wants to continue financing the acquisition of improved cookstoves by their partners, expanding like this the experience it had with FASERT in its first phase, implemented by Practical Action. Furthermore, in order to install the technologies, it has the services of the youth association Cafe y Vida.

The impact of the project is directly related to an improvement in the quality of life. Alfredo Cruzado, coordinator of the Cenfrocafe Project Management and Development Unit, said: "A producer that installs a solar dryer will have the possibility of acquiring higher revenues, because markets recognize the quality of the bean, offering a better price due to its purity".

Traditionally, beans are dried on a plastic blanket (for example, on the side of the road) exposed to contamination and deterioration. On the contrary, solar dryers protect the coffee from outdoor elements, keeping their organoleptic properties, accelerating the drying process, saving on labour, among other great benefits. "With the solar dryer we are looking for an average rating of 80 points per cup from the Specialty Coffee Association of America (SCAA), which is a Premium coffee," added Cruzado.

The variety of models of solar dryers responds to the purchasing power of each producer, its productive capacity and the physical space available. Until May 2017, Cenfrocafé has already installed 70 solar dryers of metal structure or wood and mica, and 30 of translucent calamine. Likewise, 20 micas will be soon delivered to producers to build the structure with bamboo or wood from their own properties.

It is worth mentioning that this experience has awoken interest of the Canadian Company Kicking Horse Coffee (regular customer of Cenfrocafe), which has proposed to grant two dollars per each quintal of imported coffee, in order to increase the revolving fund to access TERTs in Cenfrocafe.

[www.cenfrocafe.com.pe](http://www.cenfrocafe.com.pe)



### The testimony of Doña Lidia

“I dreamt of having a house, even if it was of straw and modest, but neat and clean. I learnt it myself: before going out, I leave everything well swept. At the meetings my husband attended at the cooperative, we were informed about improved cookstoves; that is how we got it. I had a surgery two years ago and heat makes me sick. This cookstove is better than turpia (name given to open fire in the north of Cajamarca) because it produces less heat; I don't breathe smoke, the eyes don't hurt and my pots are like new. When I put firewood to the coffee tree it burns really fast. If not, I set the fire with a piece of candle”.

**Lidia Neyra Condeso**, El Huabo Town, San Ignacio, Cajamarca



FASERT/ICA

### The testimony of Alfredo Cruzado

“In Cenfrocafe we make an effort to have an organic and quality production. The organic culture includes taking care of the environment with benefits on people's health. This is the reason of this project, which also has an inclusive component. Now, we have a direct link with women, expanding the relationship we previously had only with the producer, who harvests the coffee”.

**Alfredo Cruzado**, Coordinator of the Cenfrocafe Project Management and Development Unit



Cenfrocafe

www.cenfrocafe.com



Solar dryers protect coffee from the environment, providing benefits to the product's final quality.

Acopagro

### The Acopagro experience

Acopagro, an organization of small cocoa producers located in the central Huallaga Valley in the Region of San Martin, with more than 2,000 associates, was the first cooperative to apply for FASERT funds to finance improved cookstoves. This requirement prompted the design of this modality of intervention. Herbert García, coordinator of the project, indicates that the initiative arose from an earlier experience that they wanted to continue and improve.

The project has granted 290 loans, which have already allowed the installation of 217 improved cookstoves. As well, it is considered an important component for the maintenance of installed technologies: “If we do not give maintenance, cookstoves got into disused, either because the chimney does not work or because of ignorance in the care. For that reason, we have dedicated efforts to train them for the good use of the cookstove”, states García.

The cooperative has also experience in granting loans based on an Inter-American Development Bank (IDB) project, being this a financing for increasing the productivity of cocoa. On the other hand, in the case of FASERT, the project has awakened interest of other people that are not associated, but that are part of the value chain, as well as municipal authorities, which foresee to implement similar projects in a near future.

[www.acopagro.com.pe](http://www.acopagro.com.pe)

### FASERT

The Fund for Sustainable Access to Renewable Thermal Energy (FASERT) is financed by EnDev-GIZ Peru and implemented by the Inter-American Institute for Cooperation on Agriculture (IICA), an organism of the Inter-American System (OAS) specialized in agriculture, which supports the efforts of its Member States to achieve agricultural development and rural welfare. Specifically, the aim of FASERT is to promote the value chain of renewable thermal energy technologies (TERT) in Peru.

[www.fasert.org](http://www.fasert.org)



# Mechanisms for paying services

In the region of San Martin, exemplary mechanisms for paying services allow fundraising and financing energy access technologies within a regulatory framework that stimulates environmental care. This has been a successful pilot experience that may be replicated throughout the country.

By Rafael Rengifo del Castillo, Manager of the ARA San Martin y Martha del Castillo Morey

Isolated localities may be benefited from this paying mechanisms.

In Peru, the region of San Martin remains at the forefront of establishing and defining the Payments for Ecosystem Services (PES), pioneer in establishing the first pilot experience in the micro-basins of Mishquiyacu, Rumiayacu and Almendra (Moyobamba), and facilitating the practical application of the regulatory framework before its regulatory entity, being this the Peruvian Water Regulator (SUNASS by its acronym in Spanish).

The Payment for Services (PS) states that water utilities in Peru, through a tariff resolution, generate reserves with the money collected to finance conservation projects in the sources that generate the water resource (upper basin). Similarly, money paid by users is allocated in an exclusive account where funds are saved to maintain water sources, where the regulatory body is responsible for guaranteeing and regulating that the amount collected is exclusively used for the objectives proposed.

A similar PS is being implemented in other projects, such as the case of Gera PES, which is the main source of the existing Gera Hydroelectric Power Plant in Moyobamba, San Martin. Hence, this PS is applicable to the electric sector, mainly to hydroelectric generation projects, which already have more complex tariff regulations. However, these efforts allow making the path to enable the enforcement of Law 30215 or PES and its respective regulations (Supreme Decree No 009-2016-MINAM).

## IMPLEMENTATION AND OPERATION

PES operates based on voluntary agreements and commitments between payers and contributors, which facilitates a good governance platform of the resource for local actors. Through this mechanism, the conservation, recovery and sustainable use of these ecosystem services sources are encouraged. As well, the following services may be part of PES: water regulation, biodiversity maintenance, carbon capture and storage, scenic beauty, soil erosion control, genetic resources provision, air

quality regulation, climate regulation, pollination, natural risks regulation, recreation and ecotourism, nutrients cycle and soil formation.

This is how the environmental regulatory framework allows and facilitates financing and access to basic energy for rural populations (contributors) of the high lands, specifically in the basins where water resources for human consumption and for electric generation are produced; thus compensating the benefit received by populations using these services (payers).

Other ongoing water PEs is applied to the micro-basin of Cumbaza, which includes an area of 57,120 hectares, serving 230,000 inhabitants. This mechanism comprehends two subsystems: voluntary payment carried out by organized rice producers in a board of users in four native communities located in the high lands; payment of domestic water users, through a collection made by the Municipal Company of Drinking Water and Sewage (EMAPA) of San Martin.

These funds are used in the implementation of forests and ecosystems conservation actions, restoration of critical areas, community forest monitoring, as well as sustainable environmental agro-productive activities. The operator of the mechanism or fund administrator, mainly carried out by the first subsystem, is the Management Committee of the micro-basin of Cumbaza, which associates public, private and civil society actors, linked to said basin.

Similarly, we can add that in the region of San Martin, PS are allowing access to energy for lighting with photovoltaic systems (PV), solar home systems, improved cookstoves and filters for purifying water; all these technologies are compatible with environmental conservation and allows increasing the quality of life of the populations participating in PES as pilot experiences, which will later be replicable within the country.

The environmental regulatory framework facilitates financing and access to basic energy for rural populations.

## ARA San Martin

The Regional Environmental Authority (ARA) of the Regional Government of San Martin is the direction of the regional public policy, in natural resources, environment and land management.

The implementation of ARA and its ecosystem intervention approach will allow to improve and strengthen the environmental management in the region, as well as to optimize and rationalize financial resources, which lead to the achievement of the objectives outlined and to the improvement of the quality of the service to the citizens.

[www.regionsanmartin.gob.pe](http://www.regionsanmartin.gob.pe)



EnDev wants to foster public lighting by using solar lamps, like in this rural area of Mali.

EnDev Mali - GIZ

# Driving energy access markets to scale through RBF

Results-Based Financing (RBF) initiatives, implemented by Energising Development in 14 countries around the world, have generated a valuable experience in three years of work. Therefore, this model is presented as an important tool for strengthening and expanding markets from the “base of the pyramid” that still need to offer adequate access to energy.

Por Elina Weber, RBF Coordinator for the Energising Development Programme

Energising Development (EnDev) is piloting a set of 17 results-based financing (RBF) projects across 14 countries worldwide. The aim is to incentivize provision of energy access by paying private sector service providers based on performance. By doing so, EnDev’s objective is to take energy access markets to the next level across a variety of contexts where private sector actors currently face certain market barriers. However, EnDev also aims to learn (and share) important lessons about the potential effectiveness of RBF schemes to support the development of energy access markets.

EnDev’s RBF projects back a wide variety of products and technologies including cookstoves, solar lanterns, appliances, streetlights, water pumps and water heaters, biogas, grid densification and mini grids. The key actors commonly involved in an EnDev RBF projects are the following:

- EnDev as the main project implementer and provider of incentives.
- A financial institution, supporting the management of the RBF mechanism and responsible for the administration of the incentive disbursement procedures.
- An independent verification agent, who will verify claimed results by the private sector to trigger disbursements.
- The private sector as provider of the clean energy product or service and recipient of the RBF incentives out of which RBF is built up.

The primary aim of including financial institutions is to provide an opportunity for these institutions to gain experience of, and become better acquainted with, the energy access sector. This helps to address a crucial need in the development of the sector at large which is the aspect of financing.

## LESSONS LEARNED

A number of lessons have already been drawn from the first three years of EnDev’s RBF facility. The first one is not to underestimate the complexity of energy access markets. Significant market research of the specific context is essential to see if the market is actually ready for an RBF approach and to design a successful RBF scheme. This requires time and resources. The approach is new, hence it is important to invest the required time to bring all stakeholders involved on

board in understanding how it operates. The inclusion of such comprehensive, and sometimes even repetitive loops through research, consultations and bringing financial institutions on board actually caused delays in implementing some of the schemes for EnDev. However, ensuring that all stakeholders understand the scope of the approach as well as the participation of the financial sector can be crucial to a successful outcome, and so such delays were worth the trouble.

Second learning is the importance of working closely with the private sector when designing and implementing RBF schemes. RBF puts the risk on the shoulders of the companies by only releasing funding for achieved results. This means high up-front investment costs for the private sector. Hence, in order to make RBF an attractive source of financing to companies, rules and expectations of the schemes should be straight forward for them to be able to assess the risk they are entering. Incentives must reflect what is seen as both achievable and attractive to these actors. Donors therefore need to adopt the perspective of the private sector in order to develop effective RBF schemes at the outset.

The incentive structure itself also deserves careful consideration: who gets it, when, how much and based on which results. Incentivizing the direct delivery of energy access products to consumers may seem like the most obvious way. But barriers to energy access are often down to market failures across the supply chain. An incentive structure that targets one or more points in the supply chain may in the end contribute more to the objective of developing the market. In this regard, it is also critical to understand how the incentives fit within a country’s broader technical assistance framework and ensure co-ordination between donors and policy actors operating in the same markets. For example, by the time the EnDev RBF scheme for pico-PV systems in Rwanda was launched, a World Bank incentive program that provided up-front funding was already in place, making the RBF a redundant double incentive (and was hence postponed until the WB program terminated).

Another crucial lesson has to do with the verification process. Before payment is made to the service providers, independent

EnDev’s RBF projects back a wide variety of products and technologies.



verifiers provide third-party monitoring of RBF results. This can be another time and resource-intensive measure, largely because of the dispersed and remote nature of the markets being served and especially if it comes to portable technologies like solar lanterns. Verification generally involves contacting individual customers by phone and through field visits to check if they received service as claimed. The process doesn't benefit from economies of scale, and puts an added burden on companies: they must collect the required personal information from all of their customers. The efficiency of the verification process is crucial to the success of RBF schemes because companies need to be confident that their claims will be processed quickly and payment for their services made. If that goes away too often, the incentive becomes less attractive and can fail to bring the private sector on board.

#### AN ASSET FOR MARKET DEVELOPMENT

Despite these challenges, the EnDev RBF facility has proved successful across a variety of contexts. One functioning strategy has been to build on a service provider's success and pushing them into underserved markets by the incentive offered. In Tanzania for example, a number of solar companies had already found a comfortable position serving urban and peri-urban customers. The surrounding rural areas, particularly in Tanzania's Lake Zone were not being served by these actors, however. The RBF scheme incentivized them to move into the rural Lake Zone, resulting in a significant shift into this area from Mobisol, Off-Grid Electric

and other major players already operating in Tanzania.

By providing companies with a 'guarantee of payment' contingent on performance, RBFs can also de-risk outside investments in service providers. This is especially reassuring to investments in BOP markets where customer payment reliability is in question. In Benin, for example, the RBF project that guaranteed future results-based revenues enabled a triad of pico-PV companies to attract up-front financing from banks.

After three years of trial and error, the EnDev RBF programme shows promising outlooks and has developed critical insights into the effectiveness of RBF as a means for spurring energy provision in underserved markets. The most important lesson learned so far, however, is that RBF can work, but it should be considered as one out of several tools to develop energy access markets.

In the majority of underserved energy markets in the developing world there are multiple barriers to entry. To unlock these requires that RBF schemes are implemented in concert with a larger set of technical assistance programmes. These include reforms of tariff and regulatory structures, local skills and supply chain development initiatives, consumer awareness campaigns, support for development of investment-worthy mini-grid business plans, certifications and product standard development, and others, depending on context.

**RBF can work, but it should be considered as one out of several tools to develop energy access markets.**

## EnDev

The Energising Development Project (EnDev) is a program of access to energy financed mainly by the governments of the Netherlands and Germany, which aim is to provide access to energy to 14 million people around the world, being the German Cooperation, implemented by the GIZ, the executor in most of the cases.

EnDev intervenes in 21 countries, from which the majority are in Asia and Africa, while four are in Latin America. In Peru, EnDev has been working since 2007 trying to build public-private alliances that support markets creation that may benefit those populations that lack adequate energy services and technologies.

[www.endev.info](http://www.endev.info)

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A RBF project aims to provide access to small photovoltaic systems in rural areas of Tanzania.



# ¿Do you know where to find the technologies?

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IMPERIO INKA

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