



**EXPERIENCE CAPITALIZATION OF THE FUND
FOR SUSTAINABLE ACCESS TO THERMAL
RENEWABLE ENERGY (FASERT)**



Experience Capitalization of the Fund for Sustainable Access to Thermal Renewable Energy (FASERT)

June 2019



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List of Acronyms

CO ₂ eq	Carbon Dioxide Equivalent
DE	Developer Entities
EnDev	Energising Development
FAO	Food and Agriculture Organization of the United Nations
FASERT	Fund for Sustainable Access to Thermal Renewable Energy
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IICA	Inter-American Institute for Cooperation on Agriculture
SDG	Sustainable Development Goals
NGO	Non-Governmental Organization
UN	United Nations
SEforAll	Sustainable Energy for All
tCO ₂ eq	Tons of Carbon Dioxide Equivalent
TRET	Thermal Renewable Energy Technologies

Dwelling on the Uros Floating Islands in Lake Titicaca, at almost 4000 meters altitude. The family—working in tourism—has a solar water heater and a photovoltaic system for lighting.





Executive Summary

Aiming for the revitalization of the market value chain for thermal renewable energy technologies in Peru, in 2013 was implemented the Fund for Sustainable Access to Thermal Renewable Energy (FASERT), through the Inter-American Institute for Cooperation on Agriculture (IICA) and by request of the Energising Development (EnDev) global program, implemented by the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) GmbH.

From its creation up to the closing of this document, FASERT has executed 46 projects, for a total amount of 2.6 million dollars, in two phases. The first phase had nine projects executed between 2015 and 2016 for an amount of 1,2 million dollars. During the second phase 37 projects were implemented, including a component of revolving fund, for an amount of 1,4 million dollars. The promoted technologies made possible to take advantage of the productive use of energy through technologies such as biodigesters, improved cookstoves, improved brick kilns, greenhouses, solar dryers, technified dryers and solar water heaters.

Based on the innumerable projects and activities developed, it was aimed to identify, analyze and register the lessons learned through the experiences of implementing projects for sustainable access to thermal renewable energy. For this purpose, a process of *experience capitalization* was driven, based on the guidelines established by the Food and Agriculture Organization of the United Nations (FAO). Findings from the experience of FASERT confirm that is possible to develop a market for Thermal Renewable Energy Technologies (TRET), especially if those are oriented toward productive uses. This is due to their great acceptance in the market as well as their positives effects in the creation of income and because of the improvement of the user's quality of life.

According to the experience of FASERT, market revitalization needs a favorable environment that promotes the circulation of TRET through the development and validation of certified technologies by the academia as well as other research centers. Likewise, the interest of the population should be addressed and the demand should be promoted by working on informative actions about the characteristics and benefits of these technologies. Also, it is crucial to know the characteristics that are more appreciated by the potential users, to articulate the market players by means of incentives, to promote the creation of enterprises networks that improve the commercial presence and to develop mechanisms that ensure client's satisfaction.

The development of financial incentives and mechanisms should be considered as the more representative element in market revitalization of TRET. In practice, the articulation of market players was promoted by means of monetary and financial incentives to final users. For that reason, credit funds were used in cooperative models, which at the same time promoted the development of innovative financial products oriented to the use of renewable energies by the rural demand, coming either from families or institutions or required for productive use.

Finally, it should be taken into account the close technical assistance of the implementing —team of FASERT— to the developing entities —project executors— to strengthen their revitalizing role and the appropriate implementation of technological innovation projects, considering the evaluation of the technical and sociocultural competences of the specialists.

Traditional production process of CRE cookstoves in the enterprise Koyllor.



1. Background

1.1 Program Context

Renewable energies have become a very important subject at international level. They represent a sustainable energetic and environmentally clean alternative, able to improve the access of population groups that face geographic and socioeconomic limitations (P. Gamio, 2017). In 2011, the United Nations (UN) and the World Bank (WB) launched the initiative Sustainable Energy for All (SEforALL) whose goals for 2030 are: to improve energetic efficiency; to increase the use of renewable energies; and to improve access to modern energy services by means of an integrated food and energy production. Furthermore, the 2014-2024 term was declared as the Decade of Sustainable Energy for All. Lastly, the UN included energy as a main subject of the Sustainable Development Goals (SDG) due to its relevance in the socioeconomic development of populations.

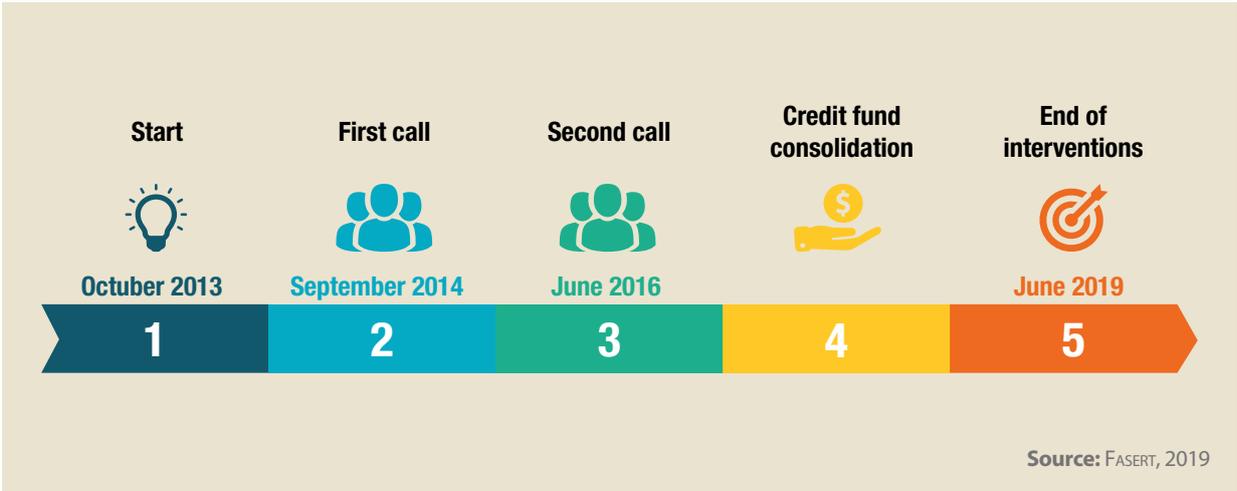
In 2013, EnDev, implemented by GIZ, put in charge of IICA the implementation of the **Fund for Sustainable Access to Thermal Renewable Energy (FASERT)**, with the goal of revitalize the TRET market value chain in Peru. Actions were organized around the international agenda on energy access, such as the ones related to the Nationally Determined Contributions (NDC) and the 2030 Agenda with its SDG. In regard of the SDG, it was highlighted the relation to Goal 7 -Affordable and Clean Energy-, since the idea is to create affordable and clean energetic markets.

1.2 Program Milestones¹

The first milestone of FASERT’s history is its implementation in 2013. One year after, the first calling for the financing of thermal renewable energy projects was done. In this competition, eight projects were selected, for a total amount of 2,26 million dollars. In 2016, it was launched a second call, which was different from the first one for having a component oriented to promote direct participation of the TRET value chain stakeholders, specially for those who provided the technologies and for the organized rural producers. During this second phase it was highlighted the installation of household technologies -mainly improved cookstoves- and for productive use -solar dryers- through credit funds promoted by producer organizations.

The dissemination mechanism for the use of technologies through credit funds made possible important achievements during 2018. Having in mind the appropriate culmination of FASERT, the deadline was extended until June 2019. Among the developed activities stands out the end of the interventions for component 1 “Set up the bases for giving continuity to the promotion actions in favor of renewables energies in Peru and the Andean region”, and the technical assistance for IICA Bolivia for the implementation of the FASERT program.

Graphic 1. FASERT Main Milestones

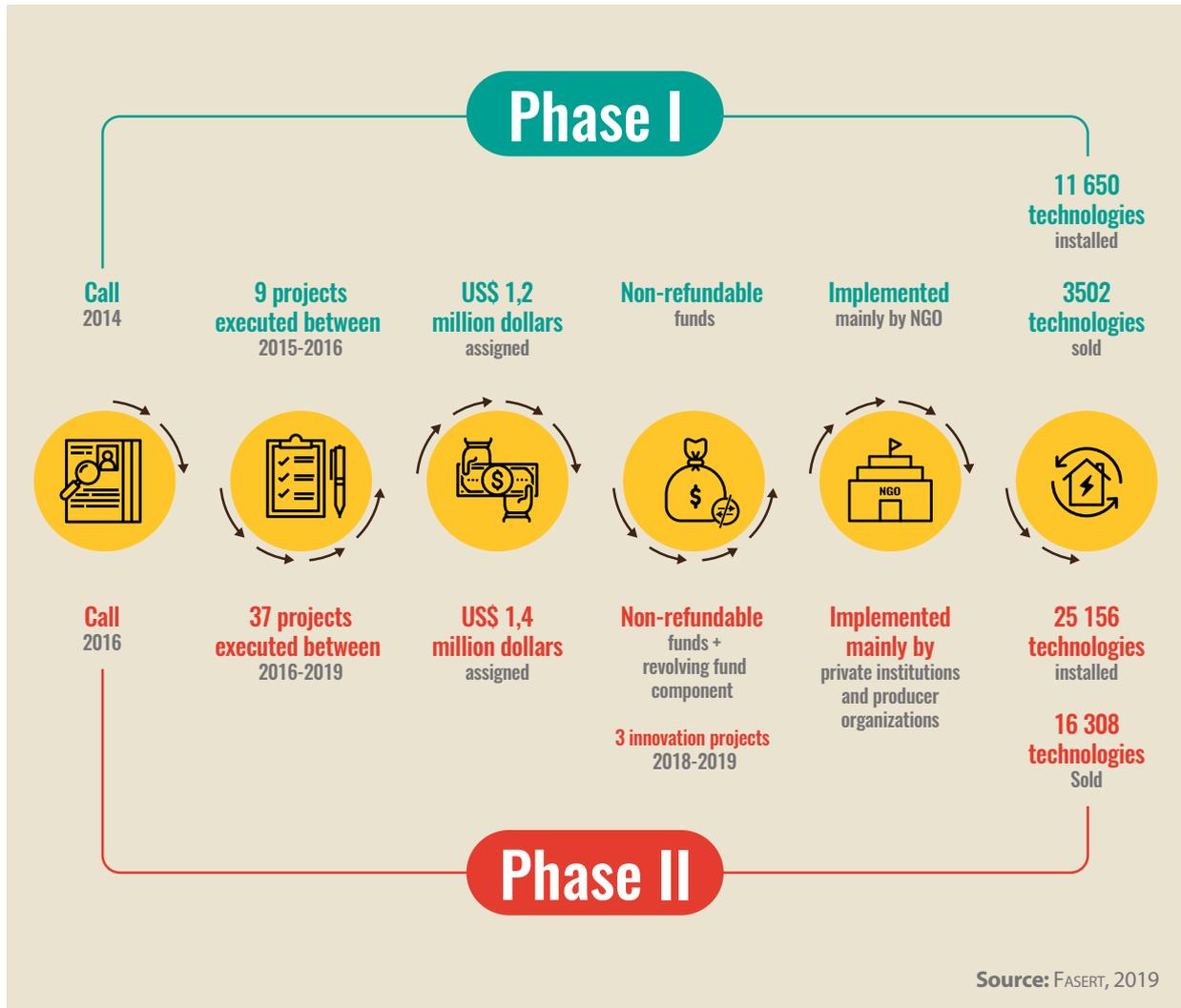


1. Set up milestones is a way to find out about the project progress without being familiar with it. Thus, milestones are tasks with zero duration because they represent an achievement, one point, and one specific moment in the project.

1.3 Program Results and Achievements

From its creation up to the date, el FASERT, has executed 46 projects for a total amount of 2.6 million dollars in two phases. During the first phase, whose call took pace in 2014, nine projects for 1,2 million dollars were implemented. During the second one, that started in 2016, 37 projects were implemented, basically through privates companies and producer organizations; this represented 1,4 million dollars, including a revolving fund component. The technologies promoted were improved cookstoves, improved brick kiln, biodigesters, solar water heaters and solar dryers.

Graphic 2. FASERT Program Results



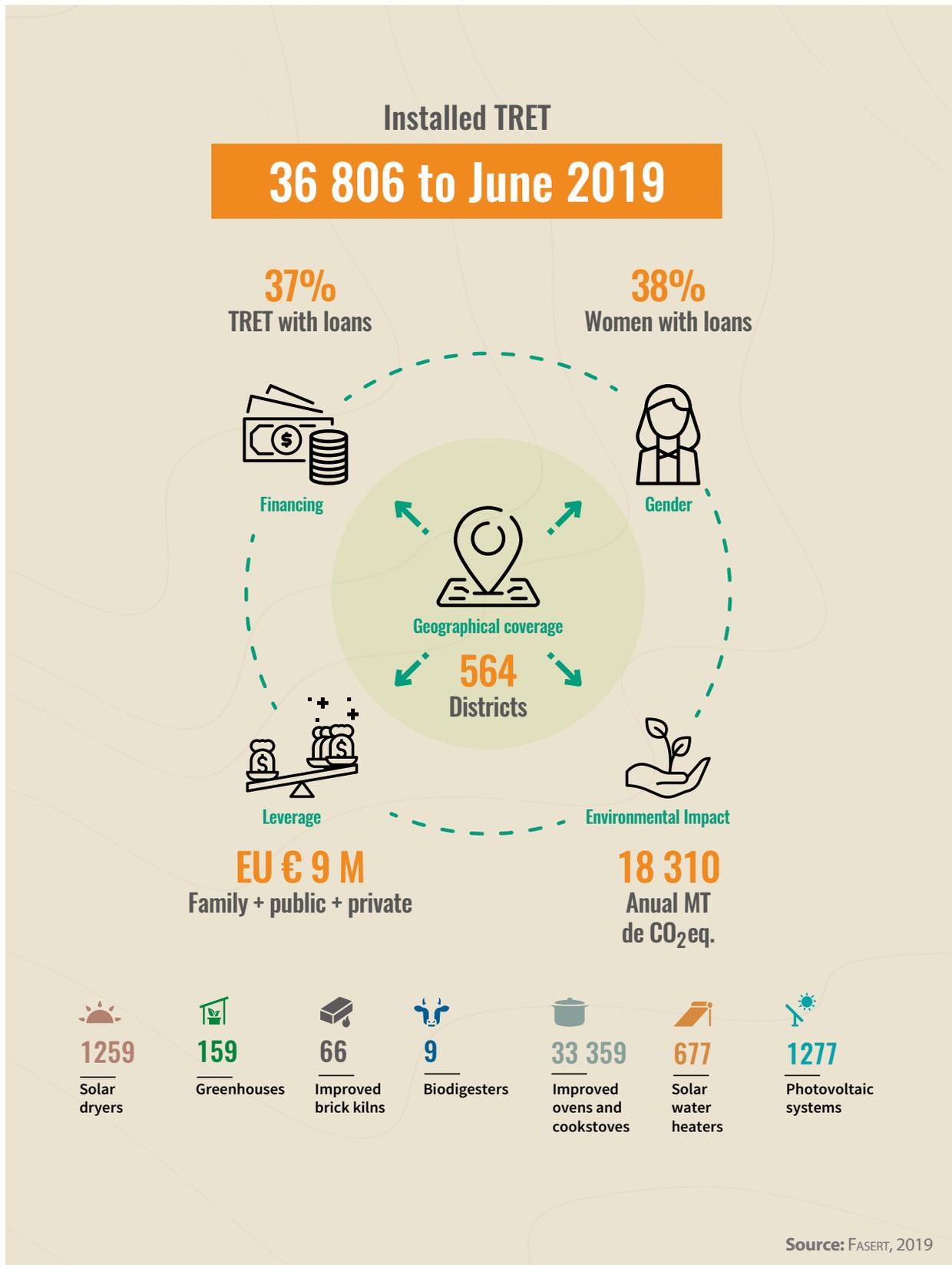
Source: FASERT, 2019

Until June 2019 del 2019, FASERT has supported the installation of more than 36 800 TRET in 564 districts -program coverage- and through producer organizations (6), private companies (12), government bodies (6) and NGO (10). From the total number of TRET, 37% were acquired by credit, which made possible to improve the access for families, from which 38% were women who qualified as individuals subject to credit.

This fund made possible the leverage of more than 9 million euros among the families, the private and public sector; and reduced 18310 MT of carbon dioxide equivalent (CO₂eq) per year, amount comparable to the volume contained in 2490 Olympic Pools (ECODES 2010).²

2. BBC Mundo. Río 2016: ¿Why Olympic pools are much faster than other pools? Extracted from <<https://www.bbc.com/mundo/noticias-america-latina-37059039>>. The regulated dimensions of the Olympic pool is 50 x 25 x 3 meters.

Graphic 3. FASERT Achievements, June 2019



Focus group with partners of the Shankivironi Cooperative and TRET users (solar dryers and improved cookstoves) in the village of Aladino, Perené District, Chanchamayo Province, Junin Región.



2. Process of Capitalization

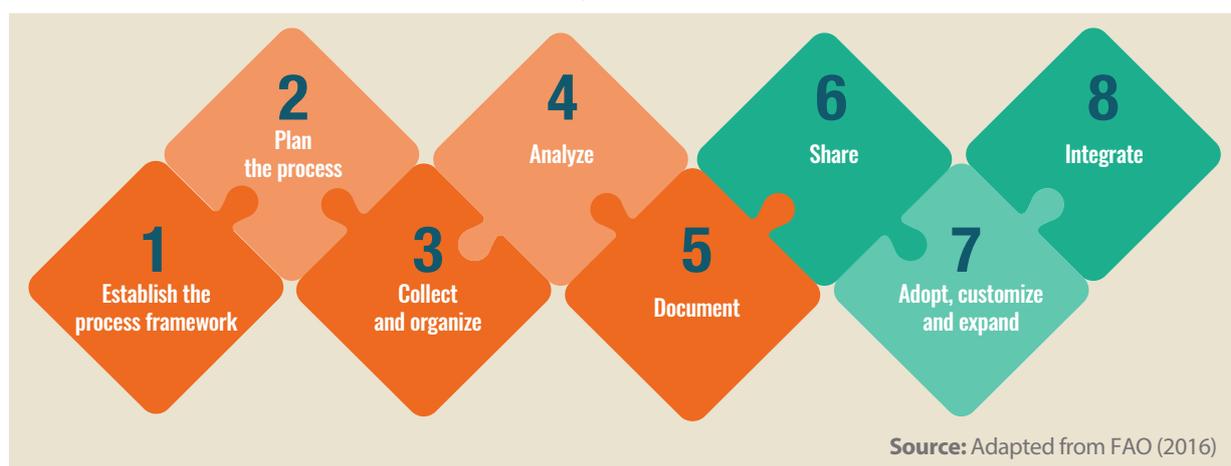
2.1 Reason

Working in development contexts makes evident that much of the knowledge generated from various initiatives doesn't get shared or gets lost, thereby limiting the benefits derived from actions or successful projects. In addition, it turns out that, on one hand, little time is generally devoted to reflect on the work done by a project, which would allow lessons to be drawn and shared. As a result, most of the knowledge created remains implicit or tacit (Villevall and Delville, 2004). On the other hand, the approaches for a conventional evaluation fail to overcome the linear models of cause-effect logic, thus they do not allow to capture or map the complex dynamics and interdependencies of an intervention (Tapella and Rodríguez Bilella, 2014).

In this context, the main purpose of this experience capitalization is to identify, analyze and document the lessons learned from the experiences in implementing projects of sustainable access to thermal renewable energy, in the form of credit funds and productive use of energy. Furthermore, the knowledge and results obtained within the framework of FASERT's operation are aimed at being disseminated and shared with stakeholders interested in participating in the subject of thermal renewable energies.

This experience capitalization has been carried out in accordance with the guidelines established by FAO, which conceives it as a systematic, iterative and participatory process, whereby an experience is analyzed and documented to generate new knowledge, lessons, innovations and specific good practices, which are shared and used to generate change. Although only the first five steps of capitalization were developed (graphic 4), in the scope of consultancy, in the methodological appendix —submitted as a separate document— there were proposed guidelines to let the FASERT team to complete three more steps (graphic 4).

Graphic 4. Capitalization Steps & Scope of Consultancy



2.2 Components to be capitalized

FASERT had three components: TRET direct market promotion, TRET innovation & quality, and TRET indirect market promotion. Although these components encompasses lines of action on use of energy in sectors such as household, production and social infrastructure, 99% of technology installations corresponded to productive and household uses. Taking into account the relevance of the lines of action on energy uses, this capitalization systematizes two components:

1. **TRET direct market promotion** in the form of provision of incentives to companies or the establishment of credit funds in cooperatives of farmers to promote the productive use of energy.
2. **TRET innovation & quality**, component aimed at improving or customizing energy-driven technologies, in order to contribute to improve the production processes.

These components converged around market revitalization, encouraging both the supply and demand stakeholders to perform their functions efficiently and effectively, so that the system can be able to offer greater opportunities and benefits to vulnerable population.

2.3 Presentation of findings

In order to objectively present the findings, overcoming circumstances posed by different views and multiple truths about what could be regarded as best practices or success-fail factors, the presentation of findings shall be made through *lessons learned*.³ They are drawn during the implementation of projects of sustainable access to thermal renewable energy, in the form of production technologies, credit funds, and TRET innovation & quality.

3. *Lessons learned* describes both constraints and key factors of success. These factors help to make evident the limitations found throughout the process and to learn from failures (FAO, 2013).

Entrepreneurs promoted by FASERT took part in the Expoamazónica Fair 2017.



EXPOSITOR
EDUARDO BARRERA
PROYECTO CHOEV
SOLU MEXICO

COCINA MEJORADA MÓVIL PRACTIFOGÓN - 3 HORNILLAS

- Menos humo, más salud.
- Menos leña, más ahorro.
- Cocina en menos tiempo varias comidas a la vez.
- Fácil de instalar y transportar.
- De calidad y gran duración.

→ Tecnología Limpia

3. Program Strategy

3.1 Market Approach

FASERT has promoted the development of a market of pro-poor renewable energy technologies (World Bank, 2012a), which can be used for improving the quality of life of families and communities. Such market development involved multiple offer-supply stakeholders, with different fields of knowledge and geographic coverage. The work with these stakeholders was formalized through agreements to implement the various components of the fund.

For the creation of an enabling environment, which promoted the TRET market, it was necessary to carry out activities for: mapping and developing linkages among stakeholders; identifying critical factors and trends which shaped the environment and the operating conditions; and mapping the services that supported the dynamics. On the supply side, monetary incentives were provided and extensive work has been done with the purpose of favoring the articulation of stakeholders in the commercial channel by developing distribution networks for the products and services offered, with a strong focus on customer satisfaction and after-sales services. As to demand, it was comprised of potential users who made household technology installations —improved cookstoves, solar water heaters and photovoltaic systems—, put them to productive use —solar dryers, greenhouses, improved brick kilns and biodigesters— or applied them to social infrastructure —solar water heaters and improved cooking stoves—.

During the program development, it was possible to characterize the demand and identify the attributes of greatest importance for potential users. This allowed appropriate commercial strategies to be established for various market segments. Among the major actions that encouraged an enabling environment for TRET market are those performed by developer entities: stakeholders who represented a key role for articulating supply and demand, providing assistance to users, and advising on commercial start-ups of TRET.

3.2 TRET Market Dynamics Evolution

Credit funds significantly invigorated the TRET market. Subsequent to the implementation of this line of action, an increase of 116% in number of TRET installed⁴ and 366% in technologies sold⁵ was reported. Such funds, managed by producer organizations, allowed to overcome a major constraint: so far, members of these organizations were not creditworthy subjects eligible for funding. In addition, these funds allowed TRET users to have access to financing in conditions according with their payment capacity and real productive circumstances, thus contributing to the development of a financial literacy. Graphic 5 shows the strategy used by FASERT.

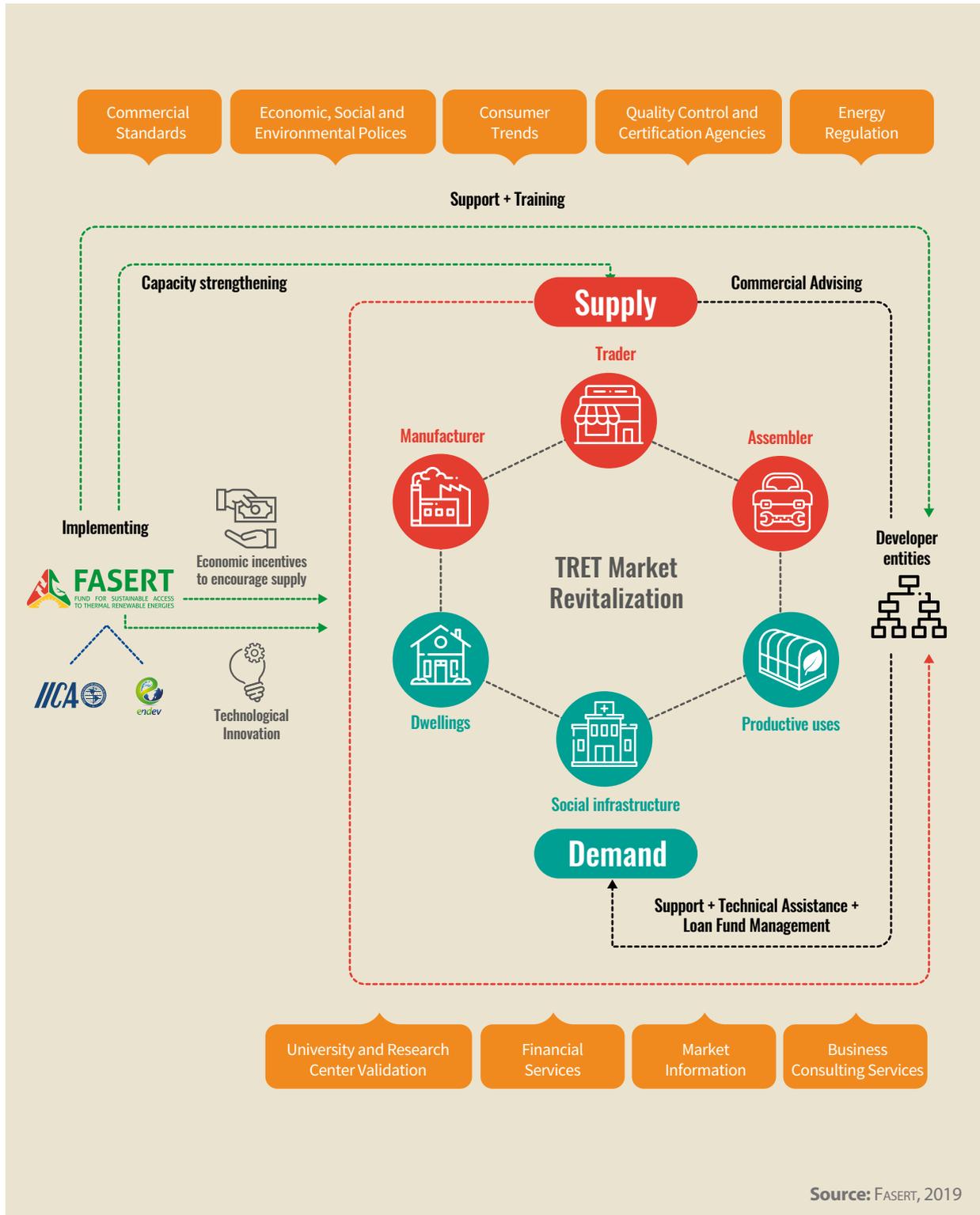


Client of the Rondesa Loans and Saving Cooperative in Cajamarca Region.

4. TERT sold —in cash or by credit—, intended for demonstration or donation.

5. TRET actually sold in cash or by credit.

Graphic 5. FASERT Strategy.



The figure shows the FASERT strategy and its positioning in the business and institutional environment in which it operates. The main components are the stakeholders of the market chain (supply-demand), the linkages established among them, as well as the relationship with the program implementer and developer entities. It also shows the critical factors and trends conforming the environment and the operating conditions, as well as the mapping of services that support—or could potentially support—the efficiency of the market chain as a whole.

3.3 Stakeholders of TRET Market Dynamics

3.3.1 Developer Entities

Developer Entities (DE) are public or private institutions engaged in management and coordination activities with various agents in order to revitalize the TRET market in Peru. Thus, they promote the sustainable access to clean, efficient energy among rural and peri-urban populations, encouraging an improvement in their quality of life. DE were producer organizations (6), private companies (12), government bodies (6) and NGO (10) (see details in Appendix 2).

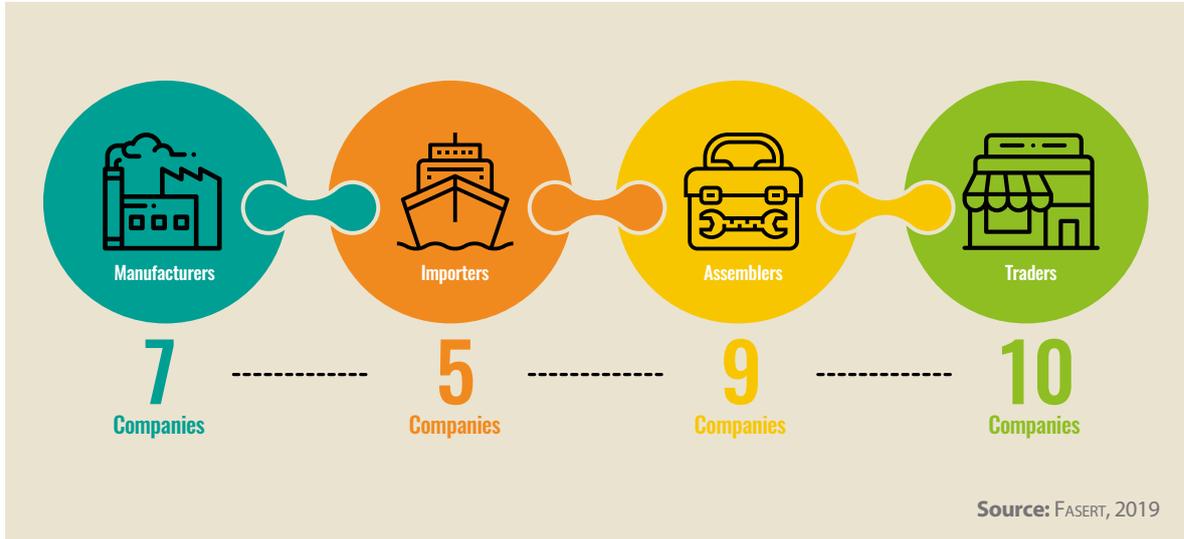
Graphic 6. FASERT Developer Entities



3.3.2 TRET Supply

The supply is represented by stakeholders of the commercial chain, including companies that manufacture, import, assemble, distribute or sell TRET, ensuring high standards of quality in products and after-sales service. In FASERT, the TRET commercial channel was made up of manufacturers (7), importers (5), assemblers (9) and marketers (10) (see details in Appendix 3).

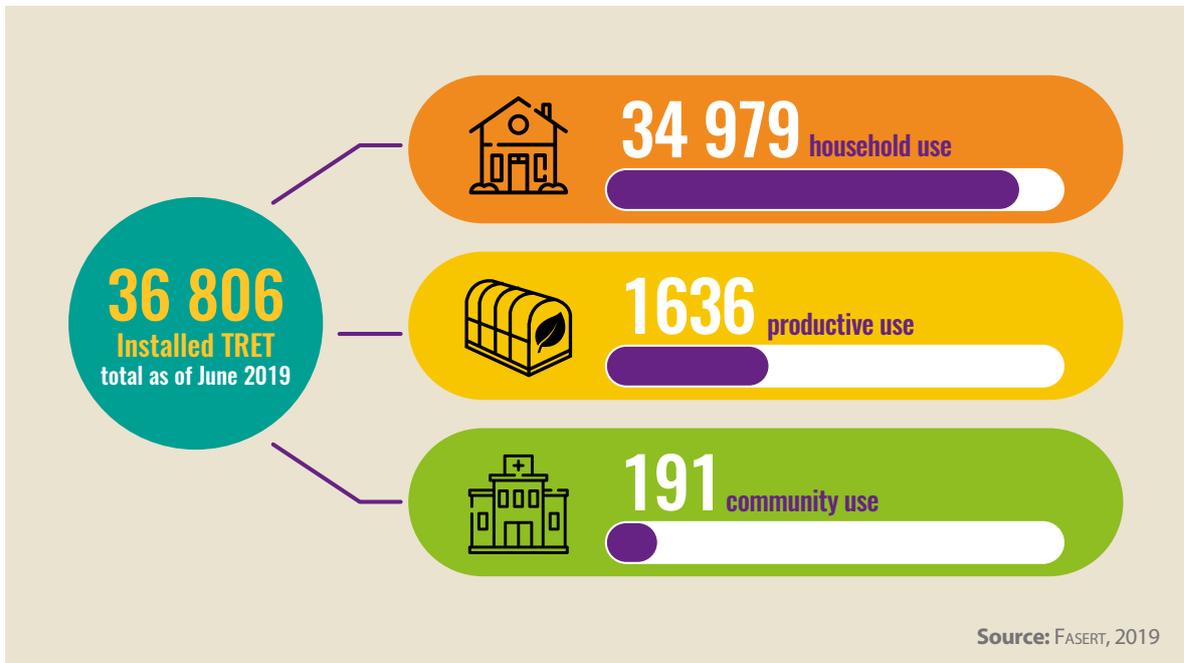
Graphic 7. Commercial Channel



3.3.3 TRET Demand

The demand includes the potential users of renewable energy technologies, represented by families and organized groups for household, productive and social infrastructure uses. FASERT's achieved demand led to the installation of 36 806 TRET, half of which were acquired by women.

Graphic. Installations according to use

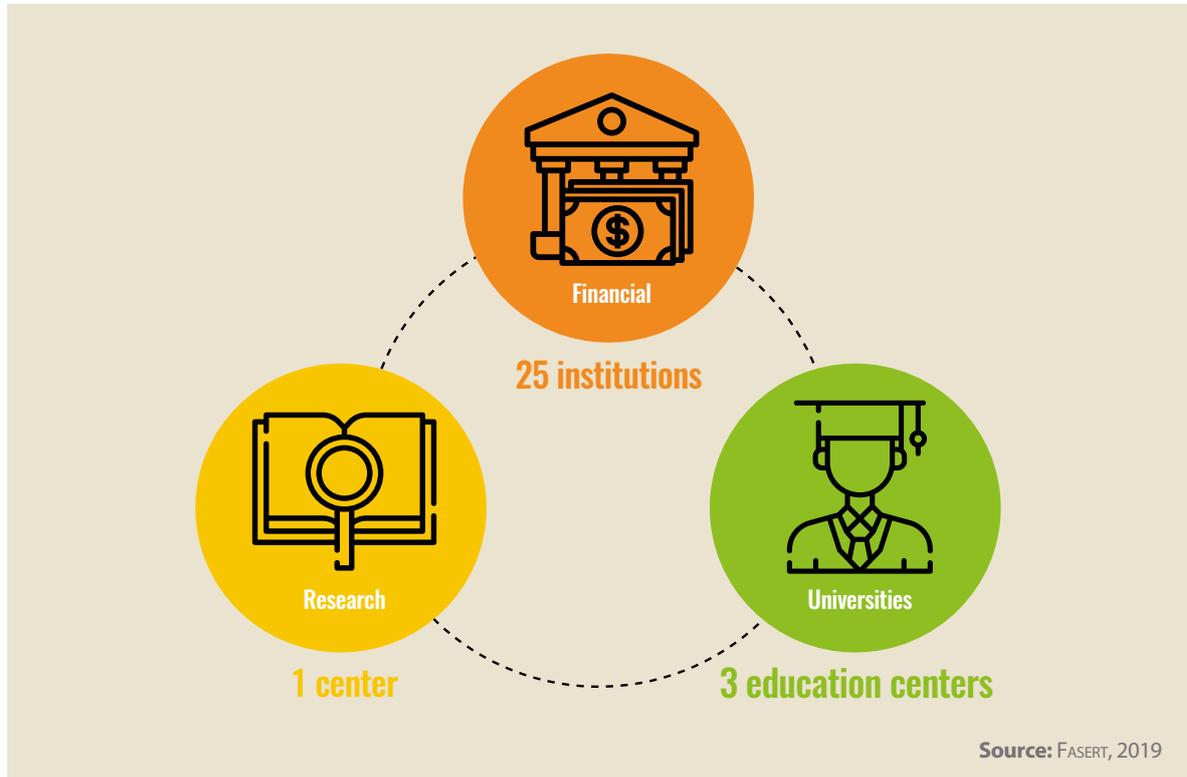


3.3.4 Enabling Environment

Research centers and universities, consisting of leading institutions in the field of research, played a significant role in validating innovations and generating new knowledge (see details in Appendix 4).

Financial institutions supported business projects and made a positive impact on low-income population segments. There were 25 entities offering their resources, which helped to extend the reach.

Graphic 9. Enabling Environment Stakeholders





Reyna Isabel Mamani Luque and her husband Jorge Paredes are partners of the Inambari Cooperative —part of CECOVASA— in the Camarón sector, Alto Inambari District, Sandia Province, Puno Region.

4. Main Findings of Capitalization

Findings obtained from the experience of FASERT confirm that is feasible to develop a TRET market. This confirmation refers specially to the TRET oriented to productive use due to its commercial viability —great acceptance in the market— and technical viability —improves the quality of life for families—.

Based on the gathered and analyzed information, we consider that in order to contribute with new organizations to improve the effectiveness of their future interventions, it must be taken in account four key aspects: the development and validation of technologies; the development and organization of the supply; the development of financing incentives and mechanisms; and the technical assistance and support.

4.1 Technology Development and Validation

- **Participation of the academia and other research centers in the validation process of TRET innovations played a significant role in the generation of new knowledge.** Studies carried out with scientific rigor allowed to demonstrate the positive impact of technologies for productive use of energy such as solar dryers, and greenhouses for flower production and biodigesters. Both technologies were validated through research studies made by thesis students of the National Agrarian University.⁶
- **Implementing technology and innovation through pilot programs allowed the community to become closer to each other and get involved since they had the opportunity to validate *in situ* the effectiveness of the TRET.** Potential users became interested because it was demonstrated that technologies facilitate the development of productive activities and had the capacity to adapt to diverse realities and requirements. For instance, under the framework of the technified dryer project in the cooperative CENFROCAFÉ, when visiting the pilot programs, partners verified directly the benefits of the technology and were convinced of their use.
- **Projects for productive use of energy were oriented into the financing of products with a greater profitability which promoted technological adoption.** Financing of productive activities, technical and economically viable, allowed users and their families to increase their incomes and to improve the quality of their lives. For instance, the project of flower production with high economic value in Matucana allowed to increase the incomes and capitalize them to extend the number of greenhouses in new areas.
- **The use of the TRET turned out to be a catalyzer for positives changes and for the social empowerment of users, especially women, since it enabled them to be inserted in the value chain of productive activities.** These technologies facilitated to introduce women into productive activities, for it represented a means to better distribution of work and therefore reduce gender gaps. That was the case of the banana chips dryer, installed in the cooperative CAPEMA, which included woman workforce in the processing.

4.2 Supply Development and Organization

- **Creation of commercial networks between the stakeholders of the commercial channel and related users promoted the TRET market development, which contributed to improve the commercial presence and overcome the limitation due to geographical dispersion.** These networks were based on the construction of trusting bonds among manufactures, importers, assemblers, traders and users, who gave testimony about their experience with TRET. Thus, the technologies contributed to generate a common good and overcome the limitations for reaching the target group in remote areas.
- **FASERT managed to articulate the TRET market and make possible to operate in remote areas with rural population.** The market chain articulation did not exist before the program started. During the market revitalization activities, there were identified the incentives and the main characteristics appreciated by the supply's stakeholders —economic benefit— and the demand —income increase and better quality of life—. This promoted the establishment of commercial relationships.
- **TRET quality assurance, together with a strong orientation to customer satisfaction, were components that made the difference for the market revitalization actions proposed by FASERT.** Strengthening qualified stakeholders in the commercial channel together with the promotion of validated technologies made possible to ensure the quality and guarantee a full service, with a strong component in the customer satisfaction and the after-sales service.

6. Investigación 1: *Producción de biogás y biol a partir de residuos agropecuarios pretratados con la técnica de Bokashi*, del tesista Diego Cándor López. Investigación 2: *Evaluación de la calidad de biol de segunda generación producido mediante fermentación homoláctica del biol I-G vacuno*, del tesista Elvis Flores Calderón. Investigación 3: *Producción de Liliun sp. var. Original Love y var. Golden Tycoon cultivados en dos sistemas de producción*, de la tesista Diana Marcelita Ponce de León.

- **During the program development, it was possible to characterize the demand and to know the characteristics more appreciated by the potential users —income increase, improvement in health or production—.** FASERT was determined to learn the characteristic of its target group and revitalize the TRET market. All this, despite that the initial lack of knowledge about the demand profile took them to the application of a trial and error method, which created delays in the fulfillment of activities due to the lack of appropriate knowledge. Likewise, in practice, it was identified that the DE -especially the producer organizations- can contribute to the initial measurement of the demand that they will deal with, in order to promote the productive use of energy.

4.3 Development of Incentives and Financing Mechanisms

- **The development of projects supported in the form of a cooperative model made possible the market revitalization through organized groups.** In areas where the credit funds were targeted, the associativity was a very common practice that contributed to the promotion of technologies. A criterion for selecting organized groups was their level of institutional consolidation. Therefore, the standard requirements for participation on the call for projects with credit funds acted as an appropriate filter in the selection of the participating organizations.
- **Mass use of the TRET caused the stakeholders of the enabling environment to develop green credit products under an energy efficiency framework.** Microfinance cooperatives and institutions have evaluated the value chains associated to productive activities and, based on that, have developed financial products which adjust to the needs of the users. All this, together with the results achieved in the framework of the program, which support economic and financial viability for credit products that promote the optimum use of energy. It is worth to mention the cases of the cooperative CENFROCAFÉ, which developed credit products to finance solar dryers and improved cookstoves; in regard to savings and credit cooperatives, Norandino and Rondesa offer credit products oriented to the financing of improved cookstoves.
- **The articulation of market stakeholders was benefited by the delivery of monetary incentives and financing mechanisms through credit fund projects.** Economic incentives provided by FASERT, together with the credit funds supported in the form of cooperative models, facilitated the TRET local market revitalization. Thanks to the funds administered by the producer organizations, the users had a chance to have access to financing for solar dryers and improved cookstoves.
- **In order to achieve the enabling environment stakeholders of the financial sector to get involved, it is important to develop TRET financing models.** In addition to the scientific validation conferred by research centers, it should be necessary to have an economic-financial evaluation model for technologies that certify their feasibility for financing and, at the same time, let the institutions have enough elements to evaluate the development of TRET specialized credit products.

4.4 Technical Assistance and Support

- **In programs that aim for the promotion of renewable energy markets, the implementing team needs to give close support to the developer entities in order to boost their revitalization role.** It should be considered the possibility of offering a special support with efficient channels of communication between the companies in charge of the market revitalization and the program's implementing team. In the case of FASERT, developer companies and the technical team based in Lima had a permanent and direct communication. Besides, strategic communication addressed to final users was emphasized.
- **The fact that the specialists had *ad hoc* technical and sociocultural abilities enable a fluent support for the TRET final users, being crucial for the successful adoption of these technologies.** The transfer of technical expertise referred to the operational capacity of the new technology and production management was more effective and clear when it was performed under an environment of cooperation and mutual trust. For instance, during the visits to strawberry producers in the Cusco region, it was validated the ability of approaching and the generation of reciprocal empathy with the population; in this process, it was essential that the specialists were capable of sharing their know-how, speaking in *quechua* language.
- **The support offered by the FASERT team and its involvement in the development of technological innovations assured its correct implementation.** The fact that the executing unit could count with a specialized team to promote the innovation and revitalize the market for the productive use of energy ended up being crucial in the process of technological adoption. That was the case of the experience in Matucana, where technical assistance was provided directly by the technical team of FASERT.

Field supervision conducted by FASERT in CECOVASA, Puno.



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Appendices

Appendix 1: FASERT Milestones

FASERT Milestones		
<p>2014: FASERT started as an initiative financed by the EnDev Program and implemented by IICA in Peru. In October, the first call for proposals was held for financing projects of access to thermal renewable energy technologies, which would be co-financed with non-refundable resources.</p>	<p>2016: The progress of the indicators is as follows: 10 960 systems sold, 33,8% of growth regarding the income of micro-entrepreneurs, 30% of biomass saved, 5987 tCO₂eq avoided, 808 systems placed through financing (58% of these clients were women).</p>	<p>2017: Addendum 3 to the Agreement was signed, in which the term was extended until December 31 2018. New goals were set: 30 000 technologies for domestic use, 1058 for productive use and 58 for social institutions.</p>
<p>2014: Eight projects were selected and executed under the modality of financing in the categories of domestic market revitalization (6), mass use (1) and productive use of energy (1). The project coverage reached the regions of Apurímac, Ayacucho, Cajamarca, Cusco, Huancavelica, Lambayeque, San Martín, Piura and Puno.</p>	<p>2016: In June, the second call was launched with a strategy aimed at encouraging the direct participation of actors in the TRET's value chain, such as technology suppliers and organized rural producers.</p>	<p>2017: The progress of the indicators was as follows: 24 824 systems installed, 33,8% of growth for the income of micro-entrepreneurs, 30% of biomass saved, 13 385 tCO₂eq avoided, 3158 systems placed through financing (41% of these clients were women).</p>
<p>2014: The implemented TRET were improved cookstoves —fixed and portable— (11 574), biodigesters (9) and brick kilns (66). The experiences in the category “productive uses” —both NGO and DE— were mostly demonstrative. Logistical, organizational, financial or market articulation issues were not considered.</p>	<p>2016: The tender of credit funds involved the submission of proposals until August. This call financed technologies of domestic use (cookstoves) and productive use (solar dryers).</p>	<p>2017: As for TRET installation progress (third Addendum), the social infrastructure installation goals were completed. With respect to the installation of technologies for domestic use, the compliance progress is 81% and for productive uses 41%.</p>
<p>2014: Co-financing contracts were signed with eight entities for a total amount of US\$ 2,26 million (52% co-financed with FASERT resources).</p>	<p>2016: The tender of credit funds was well received by producer organizations; this was the first experience of this kind for FASERT. From 10 evaluated proposals, 6 were approved and 63% of the competitive funds were allocated to them.</p>	<p>2017: Notorious achievements were gotten in technologies for productive uses, and credit funds —that started at the end of 2016— were consolidated as a disseminating mechanism for the use of technologies. The recruitment of credit promoters was considered.</p>
<p>2014: A framework agreement and a specific agreement were signed between IICA and the National Training Service for Construction Industry (SENCICO), in order to strengthen the technical capacities of the staff of the Improved Cookstoves Laboratory.</p>	<p>2016: In the component “Direct Promotion for the TRET Market”, 9 projects of the first phase were completed. Thus, 10 132 TRET out of a number of 11 650 planned, were installed (87%).</p>	<p>2018: The installation of improved cookstoves, photovoltaic systems and solar water heaters stood out at homes. With regard to productive uses, through credit funds managed by producer cooperatives, a greater number of solar dryers were installed, as well as greenhouses in Cusco.</p>
<p>2015: Progress was shown in the following indicators: 8577 systems installed, 37% of growth in the income of micro-entrepreneurs, 10% of biomass saved, 11,27 tons of carbon dioxide equivalent (tCO₂eq) avoided, 346 systems installed through financing (53% of the clients where women).</p>	<p>2016: In the component “TRET Innovation and Quality”, two projects and three technologies were selected: biodigesters and greenhouses for waste treatment; flower production; and ecological solar dryers for pergamino coffee with CENFROCAFÉ.</p>	<p>2018: The progress achieved in the last two years corresponds to the results obtained by projects implemented in the second phase (call 2016): 35 902 systems installed, 17 887 tCO₂eq avoided, 13 643 systems placed through financing (39% of the clients where women).</p>
<p>2015: Six project activities were pending until March 2016; and contract closures until the end of May 2016. It was planned to negotiate a term extension —without budget extension— with DE that did not meet the sales targets.</p>	<p>2016: The activities of the first phase were as follows: implementation of portable cookstoves and replicating the experience of credit and saving unions, known as “Únicas” (COFIDE); replicating the experience with Cáritas; and launching of the second call, which included credit funds for producer organizations and a replacement and maintenance program.</p>	<p>2018: The main learnings implemented in the second phase were: the need to condition project disbursements to the results obtained according to what was programmed; and monitor the fulfillment of goals in a closely manner.</p>

Appendix 2: List of Developer Entities

Type	Development Entity	Number of Projects
Producer Organizations (6 projects)	1. Cooperativa de Servicios Múltiples ADISA Naranjos (ADISA)	1
	2. Asociación Valle Grande	1
	3. Cooperativa de Servicios Múltiples CENFROCAFÉ Perú (CENFROCAFÉ)	1
	4. Cent. de Coop. Agr. Caf. Valles Sandia Ltda. (CECOVASA)	1
	5. Cooperativa Agraria ACOFAGRO	1
	6. Cooperativa Agraria Cafetalera Shankivironi	1
Private Companies (19 projects)	7. Corporación Financiera de Desarrollo S. A. (COFIDE)	1
	8. Consultora y Constructora Firus E. I. R. L.	2
	9. Eco Soluciones Sumaq Kawsay E. I. R. L.	3
	10. ENERSELVA E. I. R. L.	2
	11. ENVIROFIT Perú S. R. L.	1
	12. Faro Corporation S. A. C.	2
	13. Geoenergía Perú E. I. R. L.	1
	14. KRM Perú E. I. R. L.	3
	15. Energía y Tecnología Molisol E. I. R. L.	1
	16. Servicios de ingeniería de equipamiento mantenimiento y construcción (SIEMAC) E. I. R. L.	1
	17. Solarcytec S. A. C.	1
	18. Unión de Crédito y Ahorro (ÚNICA), Lambayeque	1
Government Bodies (8 projects)	19. Municipalidad Distrital de San Juan, Cajamarca	2
	20. Municipalidad Distrital de La Encañada, Cajamarca	1
	21. Municipalidad Provincial de Cajamarca	2
	22. Gobierno Regional de San Martín	1
	23. Gobierno Regional de Ucayali	1
	24. Proyecto Especial COPASA, Arequipa	1
NGO (13 projects)	25. Asociación Solidaridad de Países Emergentes (ASPEM)	1
	26. Asociación de Turismo Rural Solidario Inti Wasi Chifron Hilata, Capachica (ASTURS)	1
	27. Cáritas del Perú, Cusco	2
	28. Centro Ecueménico de Promoción y Acción Social Norte (CEDEPAS Norte)	1
	29. Centro de Estudios Regionales Andinos Bartolomé de Las Casas (CBC)	1
	30. Chakipi Acceso S. A.	1
	31. Instituto Trabajo y Familia (ITyF)	1
	32. Servicio Holandés de Cooperación para el Desarrollo (SNV)	1
	33. Practical Action	3
	34. Fundación Suiza de Cooperación para el Desarrollo Técnico (Swisscontact)	1

Appendix 3: List of Suppliers

Type	Company	Region
Manufacturers	1. Ingetecdeso S. A. C.	Andahuaylas, Apurímac
	2. Empresa Artesanal Koyllor E. I. R. L.	Putina, Puno
	3. Cocinas Mejoradas Multiusos JCS E. I. R. L.	Cajamarca
	4. Consorcio e Inversiones Myfranver E. I. R. L.	Lima
	5. Centro Tecnológico Metalmecánico (CTM)	Arequipa
	6. Consorcio Hass S. R. L.	Jaén, Cajamarca
	7. Estructuras Metálicas Carhua	Tingo María
Importers	1. Energía y Tecnología Molisol E. I. R. L.	Puno
	2. Envirofit Perú S. R. L.	Lima
	3. Imperio Inca S. A. C.	Arequipa
	4. Powermundo en el Perú S. A. C.	Lima
	5. Eco Solar Energy	Lima
Traders	1. Faro Corporation S. A. C.	Tarapoto
	2. ENERSELVA E. I. R. L.	Moyobamba
	3. Constructora y Consultora Firuz E. I. R. L.	Moyobamba
	4. Geoenergía Perú E. I. R. L.	Arequipa
	5. Enerchingol E. I. R. L.	Cajabamba, Cajamarca
	6. Eco Soluciones Sumaq Kawsai E. I. R. L.	Puno
	7. Inoxol E. I. R. L.	Juliaca
	8. Solarcytec S. A. C.	Cajamarca
	9. KRM Perú E. I. R. L.	Puno
	10. Soluciones Innovadoras M&M E. I. R. L.	Cusco
Assemblers	1. ENERSELVA E. I. R. L.	Moyobamba
	2. Empresa Constructora y Servicios Generales Waira	Cusco
	3. Constructores Darío	Cusco
	4. Constructora, Consultora y Servicios Amaru	Cusco
	5. Gladys Ramos	Lambayeque
	6. Cruz María Villarreal Guerrero	Chiclayo
	7. Wilmer Ramos Baldera	Lambayeque
	8. Henry Yalta	Tingo María
	9. Juan Sahuanay	Arequipa

Appendix: List of Research Centers and Universities of the Enabling Environment

Type	Institution
Universities	1. Universidad Nacional de Jaén [National University of Jaen]
	2. Universidad Nacional Agraria La Molina [National Agrarian University La Molina]
	3. Universidad Nacional Autónoma de México Laboratorio de Innovación y Evaluación de Estufas de Biomasa [The National Autonomous University of Mexico] Biomass Stove Innovation and Assessment Laboratory
Research Centers	1. Servicio Nacional de Capacitación para la Industria de la Construcción (SENCICO) [National Training Service for the Construction Industry]



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