

IDB-KIAT Collaboration Project Proposal

Project Overview

Project Title	Green energy electrification project for 150 rural homes and 3 schools for peacekeeping in ETCR Los Monos (Caldono, Cauca), Colombia		
Sector (sub-topics)	<i>Energy Storage System (ESS)</i> <i>Micro-grid (MG)</i>		
Country	Colombia	Location	<i>Caldono/Cauca</i>
Project Duration	4 yrs 5 months	Budget	USD 2.250.000
Association with Other Projects	<i>Green energy electrification project for ETCR in Pandores Colombia funded by KIAT</i>		

Submitter's Information

IDB (country office)	
Name	(details to be provided when selected)
Position	
E-mail	
Telephone	

Partner Country's Implementing Organization(s)

Partner Country Contact 1	
Name	(details to be provided when selected)
Position	
Organization	Reincorporation and Normalization Agency (ARN)
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Partner Country Contact 2	
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Organization	Ministry of Energy of Colombia
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Partner Country Contact 3	
Name	(to be provided when selected)
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Organization	Municipality of Caldono
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1. Project Background

Current Situation

The Colombian electricity scenario is divided in two: the National Interconnected System (NIS) and the Non-Interconnected Zones (NIZ). The first one consists in energy plants centrally dispatched and transmission networks that carry the energy to parts of the national territory. The second one refers to those areas not linked to the NIS (2/3 of the country), where the government provides directly the electricity service and fuel supply.

The energy isolation in the NIZ is a consequence of the complex geographical conditions and the diversity of climates in the country, which hinders the expansion of electrical networks and, consequently, the connection to the NIS becomes more expensive. Furthermore, these areas are considered of high ecological and cultural importance due to the presence of natural parks and reserves, as well as ethnic and Afro communities.

This is the case of the municipality of Caldono, located in the department of Cauca, a multiethnic and multicultural territory inhabited by indigenous peoples where 95% lives in rural areas. One of the 24 Territorial Spaces for Training and Reincorporation (ETCR) where the former FARC members advance in their reincorporation process to civil life is located in Caldono, where 95% self-recognize as indigenous population, assigned to the Nasa ethnic group. In ETCR Los Monos are also found the indigenous reservations of San Lorenzo de Caldono and Pueblo Nuevo.

As part of the reincorporation route, in 2020, the Colombian Ministry of Housing transferred resources for the construction of rural houses for 150 families in the reincorporation process, the majority of whom are descendants of indigenous population, with different profiles from the leadership in social and community work. Also, ARN contracted the Javeriana University for the social diagnosis and the elaboration of the structural designs of the houses. The Ministry of Housing allocated a budget of COP \$90.000.000 (USD 24.294) per house to grant contracting and start of work in the first semester of 2022.

However, the supply of electricity is limited in terms of quality and quantity in this area. The absence of reliable energy affects living standards and restricts the possibility of creating sustainable business models to promote rural development, with a negative impact also in the development of daily activities such as cooking using very rudimentary methods like firewood. These practices contribute to the reduction of natural resources such as forests, biodiversity, water and soil. It also limits lighting, communications, and agricultural and livestock activities, which must be carried out manually or by hand.

The energy obtained through alternative systems such as photovoltaic energy systems can have the most diverse uses, increased productivity of daily tasks, access to information and communication technologies, well-being and comfort such as the use of ventilation artificial electricity in hot areas or climates and a better education and health service.

Relevant National Development Plans, Policies, and Strategies

- **National Development Plan (2018-2022).** Within the goals contained in the National Development Plan, it must be provided the access to electricity to 100,000 new users by 2022, and 50,000 users benefited from energy efficiency programs. In addition, the National Development Plan prioritizes the investment of royalties for the provision of public services, including electricity, in the framework of the peace process. In order to have financing sources for the expansion of energy coverage, the National Development Plan extended the duration of two programs whose purpose is to provide public funds for rural electrification (Financial Support Fund for the Energization of Interconnected Rural Areas – FAER and Financial Support Fund for the Energization of Non-interconnected Areas - FAZNI).
- **The National Energy Policy (2006-2025).** The National Energy Policy understands that, given the uncertainty in the availability of hydrocarbons in Colombia, the energy sector plays a fundamental role in the future of the Colombian economy. Therefore, it is proposed a series of strategies to be considered in the development of the energy policy, with a long-term vision, in order to ensure the supply energy, self-sufficiency, regional integration, consolidation of energy markets, promote efficient prices and generate local development for marginal sectors and non-interconnected areas.
- **Energy Transition Law (2021).** With the Law 2099 of 2021, the Colombian government aims to modernize the current legislation on energy transition, the promotion of non-conventional sources of energy and the economic reactivation of the country by strengthening public electricity and fuel gas services. Likewise, this law introduced modifications and additions to Law 1715 of 2014, through which the integration of non-conventional renewable energies into the National Energy System was regulated.
- **Final Peace Agreement between the Colombian Government and FARC (2016).** Within the framework of the peace process, the Government of Colombia, through Decree 1274 of 2017, created 24 Territorial Spaces for Training and Reincorporation (ETCR), to continue the process of reincorporating former FARC members. These ETCR were located in 13 departments, with the aim of generating social and economic rooting through the provision of land for housing and productive projects. The opportunity offered by the concession of land and housing facilitates the process of a new start for people in the process of reincorporation and their families, stimulates the optimization of infrastructure in the areas surrounding the settlements, promotes the generation of security schemes by the Public Force, contributes to the updating of land use plans and the optimization of land use; and it attracts the presence of new productive and financial economic activities, as well as the more stable presence of the basic institutions of the State.

Association with Other Projects/Programs

- **“Green energy electrification project for ETCR in Pandores Colombia”.** In 2019, the ARN and the Ministry of Mines and Energy, through the IDB, submitted to the Government of Korea an official ODA request for the construction of a microgrid in the ETCR Pandores (Fonseca, La Guajira) for an estimated value of USD 10 million. This

project seeks to provide clean energy to 250 households of people in the process of reincorporation. This year, the project was approved by the Korean Government and its implementation is expected to begin in May 2022 up to 2025.

- Although Los Monos' project is similar to Pondores' in terms of an ETCR and the population in process of reincorporation as beneficiaries, the approach differs regarding the geographical context and the population, which in this case is indigenous. In addition, this new proposal includes 3 rural schools, which means there is an important component of education. In this sense, ETCR Los Monos' project proposal not only contributes to the Peace Agreement implementation, by providing reliable energy to the housing solutions sustainability for the population in process of reincorporation, but it also has a high impact in closing economic and social gaps concerning the ethnically differentiated population, rural population and isolated rural areas.
- The lessons learned by the Pondores project will be useful for this project proposal. The ARN will be in charge of making the pertinent synergies between both projects and stakeholders.

2. Project Objectives

The objectives of the project are to:

- Provide clean, affordable and reliable energy to 150 rural homes of former FARC members.
- Improve the income and quality of life of 150 families of former FARC members.
- Reduce the school dropout of children and adolescents
- Increase the agricultural and livestock productivity
- Reduce dependence on conventional fuels such as firewood, coal, candles, batteries.
- Contribute to the establishment of peace through the construction of sustainable settlements for the people in reincorporation process.

These objectives would be achieved through the installation of individual photovoltaic solar systems to supply electricity to 150 housing solutions for ex-combatant families in the ETCR Los Monos and 3 rural schools located in Caldonio (Cauca), Colombia.

3. Project Components

The project will have the following components:

Component 1: Feasibility study. Carry out the diagnostic survey and identify the baseline list of beneficiary families. At this stage, the aim is to delve deeper into the solution alternative, obtaining information that will allow to determine all the variables and conditions for the project execution. In this stage, a geospatial analysis and other technical studies will be carried out, in order to select and recommend the best project configuration based on electricity demand and prepare technical specifications, risk analysis and location of the alternative. The study would cover the technical evaluations required for the installation of 30 pilot plants for photovoltaic solar energy solutions for the three surrounding rural schools.

Component 2: Installation of the 30 pilot plants for photovoltaic solar energy solutions in 3 rural schools. This would include the design, supply and installation of the solar kit, including:

solar panel, controller, stationary batteries, installation on ceilings, placement of supports, programming of the inverter, etc.

Component 3: Installation of 150 autonomous photovoltaic solar energy solutions. This would include the supply and installation of the solar kit per home, including: solar panel, controller, stationary batteries, installation on ceilings, placement of supports, programming of the inverter, etc.

Component 4: Capacity building. Awareness workshops will be held in homes and schools on the proper use and care of photovoltaic devices and the proper use of energy resources. Permanent monitoring of the photovoltaic solutions will be carried out in order to ensure the quality and continuity of the service and preventive and corrective maintenance, since these installations require maintenance at least twice a year, in which it is done a general cleaning of the panels, review of the operation of the equipment, change and final disposal of the replaced elements at the end of their useful life.

4. Project Location, Period, and Estimated Cost

Location: The project would be implemented in the ETCR Los Monos, in the municipality of Caldono (Cauca), Colombia (2° 48' 0" North, 76° 28' 59" West). The exact locations would be determined based on the feasibility study.

Image 1. Geographical location ETCR Los Monos, municipality of Caldono



Period: The estimated duration to complete the project would be as follows:

- Feasibility study: Jan 2024 – May 2024
- Project design: Jun 2024 – May 2025
- Purchase of materials and transportation: Jun 2025 – May 2026
- Installation and Testing: Jun 2026 – May 2027
- Capacity building: Jun 2027 – May 2028

Estimated Project Cost: USD 2.250.000

Component	Amount (US\$)
• Component 1: Feasibility study	80.000
• Component 2: Installation of 30 pilot plants in 3 rural schools	358.000
• Component 3: Installation of 150 autonomous photovoltaic solar energy solutions	1.787.000
• Component 4: Capacity building	25.000

5. Project Implementing Organization

- The Reincorporation and Normalization Agency (ARN) is the national public entity of the Colombian Presidency that will be directly involved in the project implementation and decision making.
- The Mayor's Office of the Municipality of Caldonio is the public entity that will be the main stakeholder for the project coordination at the local level.

6. Required Coordination at National/Regional Level

- The project implementation would be coordinated at the national level with the Ministry of Energy of Colombia, as head of the national energy sector policy. Also, it would be coordinated at the local level with the members of the Multiactive Cooperative Ecomun Hope for the People (COOMEPE), integrated by the people in reincorporation process beneficiaries of the project.

7. Risks and Opportunities

Colombia, being a territory that is located on the line of the equatorial zone, makes it a suitable place for the implementation of photovoltaic systems, since this place has a great impact of solar radiation and for this reason the generation of electricity through the photovoltaic panels is greater than the other parts of the world.

The benefits for the environment are high. Photovoltaic energy is part of the "green energy" group: it does not produce noise, or spills, and any type of pollutant, it does not affect the environment in any way.

Solar energy is the cleanest energy and is inexhaustible and its positive environmental impact Ecologically, this project favors sustainable development since its influence on global warming is zero, a renewable resource is used for years.