USAID
FROM THE AMERICAN PEOPLE

ENERGY FOR PEACE:
A BLENDED FINANCE MODEL FOR RENEWABLE ENERGY IN OFF-GRID COMMUNITIES

This report is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this brief are the sole responsibility of DAI and do not necessarily reflect the views of USAID or the United States Government.

CONTENTS

I. EXECUTIVE SUMMARY 1

II. THE CHALLENGE 4

III. A HOLISTIC APPROACH 7

IV. DERISKING INVESTMENT 11

V. CO-CREATION OF THE PRIVATE SECTOR PARTNERSHIP 14

VI. ECONOMIC VIABILITY AND SUSTAINABILITY 17

VII. DEVELOPMENT IMPACT 19

VIII. CALL TO ACTION: AN OPPORTUNITY TO SCALE THE E4P BLENDED FINANCE MODEL 21

FIGURES

Figure 1. The E4P Model 2

Figure 2. Interdependent Components 8

Figure 3. Potential Use of Energy Per Value Chain in Producer Clusters 9

Figure 4. Project Development Process 11

Figure 5. Co-creation Process 15

Figure 6. Income and Cost Assumptions 17

Figure 7. E4P Blended Finance Model 18

Figure 8. Sensitivity of IRR to the % of CAPEX Financed by Catalytic Contribution 19

I. EXECUTIVE SUMMARY

The Energy for Peace (E4P) Global Development Alliance (GDA)—a collaboration among the companies ISA, Ecopetrol, SUNCOLOMBIA (SUNCO) and the U.S. Agency for International Development (USAID) Colombia Mission—demonstrates the vital role blended finance can play in catalyzing private sector investment to deliver clean energy to hard-to-reach off grid communities that are critical for peace and development.

E4P was established in response to a complex and challenging scenario. Years of conflict have resulted in significant underinvestment, depressing income potential and hindering productive capacity. Many rural communities in Colombia continue to grapple with the absence of a dependable, cost-effective, and environmentally sustainable source of energy. Public agencies have struggled in this environment to ensure energy access, and the financial sustainability of donated energy projects has been weak. Meanwhile, the private sector has been deterred by high costs and risks and consumers' limited ability to pay for services.

The E4P activity co-created a comprehensive strategy to catalyze private investors and experienced energy operators for long term sustainability. The implementing Alliance, which includes some of Colombia's strongest energy suppliers and operators, has developed an innovative blended finance model to implement renewable energy projects that may otherwise continue without power. Together, they aim to accelerate the transition to renewable energy and the mitigation of greenhouse gas (GHG) emissions in conflict-affected communities, progressing significantly towards the implementation of Colombia's Peace Accords.

The success of this strategy stems from several core tenets:

- Access to energy is necessary to boost productivity and quality, but technical assistance is necessary to foster a virtuous cycle of strengthened markets, increased demand, and enhanced willingness to pay, which are critical for the long-term sustainability of energy investments.

- Donors can play a vital role by facilitating stakeholder consultations, consolidating community relationships, supporting technical and financial pre-feasibility studies, and leveraging private investment into high cost/high risk energy projects that would otherwise be financially unsustainable.

- Private sector investment, expertise, and operation of renewable energy solutions can improve the quality, reliability, and financial sustainability of energy solutions for small rural communities.

- Economic viability and sustainability can be achieved through the strategic use of catalytic capital, ensuring access to public incentives, and applying economies of scale through a portfolio approach: aggregation of multiple communities, standardization of technologies, and targeting technical assistance to promote stronger demand, better prices for goods and services, and increased incomes.

In the next five years, the E4P alliance in Colombia is expected to provide sustainable electricity for nearly 8,000 people and six producer clusters in conflict-affected communities, reducing GHG emissions and creating an estimated $6 million increase from increased sales of goods and services.

The purpose of this learning report is to inform development professionals that may be interested in building on the E4P blended finance model for any type of development activity focused on leveraging private sector investment. It details the innovative design process spearheaded by USAID Colombia and highlights the critical components driving the model's success. This experience showcases to energy

companies, public agencies, investors, community leaders and donors the transformative potential that can occur when donors leverage private investment towards common development goals.

Figure 1. The E4P Model

INNOVATIVE SOLUTIONS FOR ENERGY ACCESS

II. THE CHALLENGE

Two million individuals reside in Colombia's rural ZNIs, regions lacking access to the national electricity grid.

These ZNI communities often **rely on diesel generators** for their energy needs, a practice burdened by high fuel transportation expenses and the consequential emission of CO2.

Energy poverty is **11 times higher** in rural areas, approximately 47.9% compared to 4.3% in urban centers.

Energy access is an acute problem in PDET municipalities, home to marginalized communities that have been deeply affected by the Colombian conflict.

28% of the population in PDET municipalities live in poverty; this increases to 32% in dispersed rural areas.

Public agencies have struggled to address the problem of energy access in remote areas. The geographical remoteness of *Zonas Non-Interconectadas* (ZNIs), often isolated from both markets and state services and lacking transport and telecommunications infrastructure, renders the investment to connect them to the national grid financially unviable. The Colombian government has pursued several approaches to advance rural electrification with limited success. These efforts have included providing incentives for energy companies to invest in ZNIs, directly allocating resources to deploy renewable energy solutions to be operated by the communities themselves and pursuing policies to subsidize diesel to supply the existing small-scale combustion plants.

The recent peace accords[1] prioritized energy related investments in communities that were most affected by conflict. The Colombian government launched the National Rural Electrification Plan[2] in 2021 with the goal of attaining universal public service coverage for ZNIs; including Territorially Focused Development Plan (PDET, for the acronym in Spanish) municipalities and marginalized territories affected by conflict and poverty.

Although incentives for energy companies ranged from tariff subsidies, tax breaks and technical assistance, financial sustainability of investments is of particular concern to donors. Mirroring past experiences, donors seek alternatives to address the ability of these communities to generate sufficient income to pay for the energy service, and to address the complexity of operating and maintaining energy generation and distribution facilities. For its part, the Colombian government launched the Energy Communities Program in 2023 and installed, to a limited scale, solar panels in rural areas.[3]

1 Government of Colombia, Acuerdo Final para la Terminación del Conflicto y la Construcción de una Paz estable y Duradera, 2016

2 Government of Colombia, Plan Nacional de Electrificación Rural, 2021

3 Government of Colombia, El Gobierno le sigue cumpliendo a las regiones! Más de 500 familias del Cesar cuentan por primera vez con energía eléctrica gracias a la instalación de paneles solares, 2022

The dominant source of energy in rural areas—diesel—contributes to greenhouse gas emissions and are environmentally unsustainable. The baseline fuel for ZNIs' energy has resulted in enormous diesel subsidies that have become fiscally unsustainable. This option involves several negative externalities such as poor reliability, quality, and adverse environmental effects. Expanding access to renewable energy is essential for Colombia to achieve its climate transition goals. Colombia's commitment towards overall reduction of 51% by 2030 looms, and renewables are key. Public investment and operation can only provide part of the energy access solution: private sector investment and operation is needed to meet this goal.

The energy access gap is especially large in PDET municipalities, which are home to marginalized communities that have been deeply affected by the Colombian conflict. PDET territories have endured prolonged violence and poverty, resulting in a lack of private sector investment. This isolation from markets has hindered opportunities for economic development and social progress. Twenty eight percent of the population in PDET municipalities live in poverty, and this number increases to 32% in dispersed rural areas. [4] Many PDET sites lack connectivity to the national electricity grid, leaving them without conventional energy sources. Average access to energy in PDET municipalities is 8% lower than the national average.[5] Households, the focus of most government programs, lack ability to pay for energy, further discouraging infrastructure investment by energy companies.

Local communities struggle to operate donated renewable energy solutions on their own. The Colombian government as well as international donors have experimented with building the infrastructure and then transferring ownership to local municipalities. This approach has proven ineffective due to a lack of technical and administrative capacity; energy generation and distribution are highly complex undertakings. Regulatory authority *Comisión de Regulación de Energía y Gas* (CREG) reported that 72% of donated solutions did not function after five years of operation. Between 2012 and 2016, USAID invested in renewable energy solutions for 17 rural communities in Colombia and trained the communities to operate and maintain them. Three years later, USAID's evaluation revealed that only two locations were still in full operation. Some projects were completely neglected, others operated part time, and others were repurposed as makeshift roofs. In some cases, the community leaders forced down the tariffs, reducing resource flows necessary to sustain operation and maintenance. When salaries could no longer be paid, many of the trained individuals migrated to larger cities for better job opportunities, further undermining the effort.

There is little incentive for private companies to tackle the challenge of energy access in these regions independently. Private energy operators are discouraged by high investment costs, risks, and the limited ability of consumers in the ZNIs to pay commercial rates. The physical remoteness of these communities further increases the cost of initial investments, exacerbated by the relatively small scale of operations. Revenue streams from service payments are too small and fraught with uncertainties due to the precarious economic conditions of the communities and the perceived security risks. Financial rates of return are often near zero in the baseline case. Although they may wish to contribute to social and development goals, companies need to provide minimum benchmark rates of return in order to allocate scare investment resources. The challenge for the donor is to discover that minimum benchmark rates of return, so that donor contributions can be optimized across their development portfolios.

4 Government of Colombia, El Gobierno le sigue cumpliendo a las regiones! Más de 500 familias del Cesar cuentan por primera vez con energía eléctrica gracias a la instalación de paneles solares, 2022

5 ASP Colombia, Distribución territorial con enfoque PDET, 2023

REDUCING HARMFUL SOURCES OF GREENHOUSE GAS

What a great idea to bring a company like ISA to these rural areas. If there is energy, there is development. – Colombian cocoa offtaker

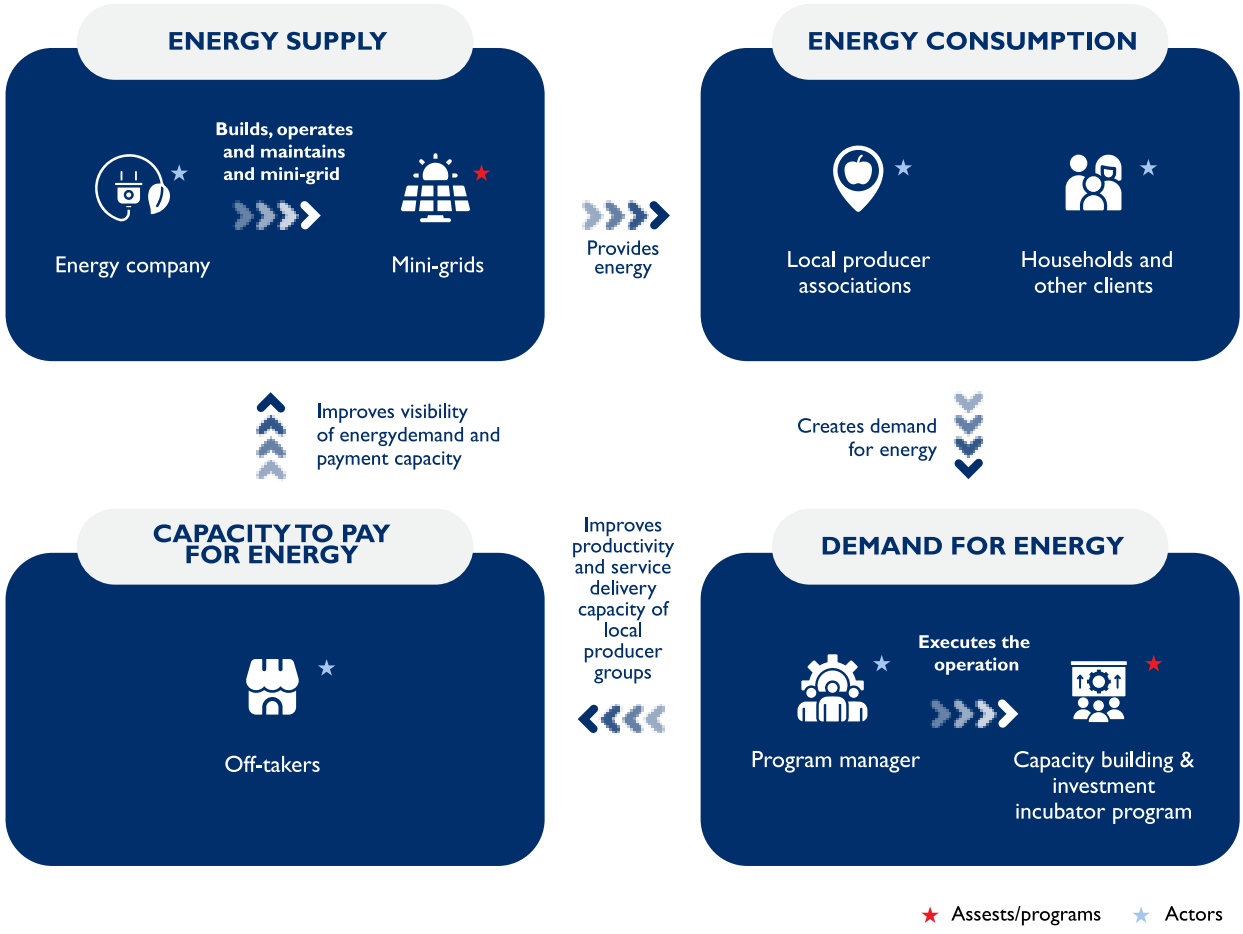
III. A HOLISTIC APPROACH

Access to energy is necessary to boost productivity and quality, but technical assistance is necessary to foster a virtuous cycle of strengthened markets, growing demand, and enhanced willingness to pay, which are critical for the long-term sustainability of energy investments.

USAID Colombia developed the Energy for Peace model as a holistic approach to addressing the ecosystem's diverse challenges. The model hinges on four interdependent components. The underperformance or absence of any single component jeopardizes the effectiveness of the others.

- **Energy supply** – guaranteed by a private sector energy partner that builds, operates, and maintains mini-grids financed by E4P's proposed CAPEX structure.
- **Energy consumption** – to ensure that the energy partners' revenue projections match the consumption from both local producer clusters and household clients.
- **Demand for energy** – through complementary interventions that strengthen the productivity and service delivery capacity of local producer clusters to increase the demand for energy.
- **Capacity to pay** – guarantees demand, at fair prices, of locally produced goods and services through offtaker companies, thereby strengthening the capacity to pay for increased energy demand.

Figure 2. Interdependent Components



The model starts with **energy supply**, led by the private sector energy partner. The private energy partner builds, operates, and maintains the mini-grids and ensures the generation and distribution of energy, as well as the collection of energy payments. The up-front costs of investment in building the infrastructure are shared between the energy partner and USAID. Working capital is derived from the profitable operations of the energy partner.

The second component is **energy consumption**, which anchors on local producer clusters and households as primary consumers to guarantee revenue projections. Sustaining—and growing—energy consumption hinges on local producer clusters and households having access to (and/or ownership of) appliances and productive assets. Producer clusters in these municipalities engage with high potential value chains such as coffee, cocoa, dairy, fish, honey, coconut, and tourism, each presenting unique opportunities for energy utilization.

The third component is **demand for energy**, which can be increased by strengthening the capabilities of local producers. As productivity grows so will the demand for energy. USAID designed the Capacity Building and Investment Incubator program to provide technical assistance and facilitate investments to improve the productivity and service delivery capacity of productivity hubs and local businesses. Support is tailored to the needs of different value chains in each E4P site. The E4P energy partner is responsible

for coordinating the implementation of the program alongside other strategic partners with the capabilities to deliver the required technical assistance.

The fourth component is the **capacity to pay** for energy, which pertains to the ability of local communities to afford increased energy consumption at commercial rates. This capacity is significantly bolstered by the presence and involvement of offtakers: companies that commit to purchasing a minimum volume of locally produced goods and/or services at fair market prices, thereby increasing the earnings of local communities. This arrangement expands market access, eliminates intermediaries, and promotes local development. Offtakers can range from multinational companies in agriculture to domestic enterprises in the hospitality sector. As production, quality, and sales increase, producers can clearly see the value of the new energy and are willing and able to pay for it.

Figure 3. Potential Use of Energy Per Value Chain in Producer Clusters

VALUE CHAIN	CURRENT VOLUMES	POTENTIAL USE OF ENERGY
COFFEE	1,636 tons/year of parchment coffee	Electric coffee grain dryer, electric coffee pulping machine
COCOA	90 tons/year of dry cocoa	Electric water pump and electric cocoa grain dryer
DAIRY	170,000 liters/month of milk	Operate a milk lab *(analyze solid residuals in milk and bacteria count),* refrigeration and pasteurization.
FISH	90 tons/year of fish	Fish refrigeration, electric to scale, gut and filet
TOURISM	132,000 tourists a year	Facilitating communication via access to internet, charging electronic tools (e.g., cameras, TVs), and allowing the use of fan or air conditioning
HONEY	35,000 kgs/year of honey	Electric centrifuge (allows the honey to come off the honeycombs) and electrical honey dehumidifier (prevents honey fermentation)
COCONUT	125 tons/year of coconut	Electric coconut dryer and electric coconut press for oil production

Source: Tetratech (2021) | This machine removes the coffee skin before processing it.

INCREASING INCOMES OF LOCAL PRODUCERS

IV. DERISKING INVESTMENT

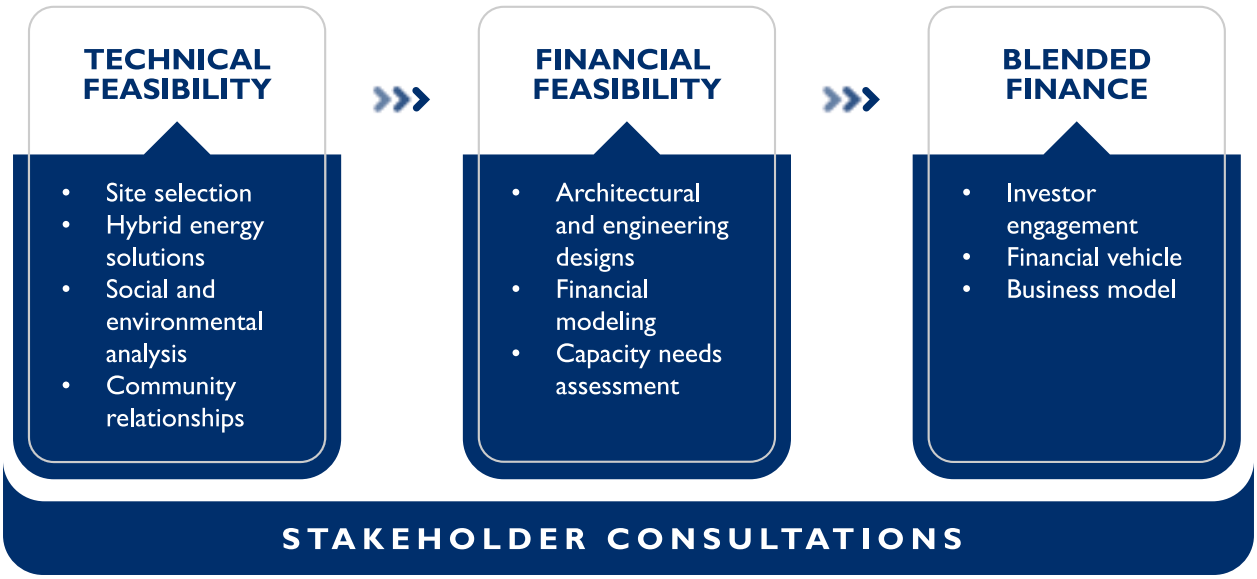
Donors can play a vital role by facilitating stakeholder consultations, consolidating community relationships, supporting technical/financial pre-feasibility studies, and leveraging private investment into high cost/high risk development projects that would otherwise be financially unsustainable.

USAID Colombia engaged INVEST, a global buy-in mechanism, in early 2020 for support in designing and implementing the E4P model. Together, USAID Colombia and INVEST co-designed a phased process. Given the innovative nature of the initiative, multiple uncertainties surrounded the feasibility of the model, including the identification of productive clusters in PDET sites, the financial and technical aspects of the renewable energy solution, and the incentives required to involve a private sector partner in co-funding and executing the project.

Utilizing Indefinite Quantity Contracts (IQCs), INVEST involved a consortium of expert firms through a series of task orders. This approach provided the necessary flexibility, as the outcomes of each task order significantly influenced the scope and scale of subsequent work. When feasible and to enhance efficiency, some tasks were carried out concurrently, allowing information gathered from one component to inform the design of another. The comprehensive assessment of technical and financial feasibility, alongside exploration of blended financing approaches, proved instrumental in mitigating risks for the private sector. Facilitating access to information is crucial for decision making reduce transaction costs and project uncertainties.

At the same time, USAID's leadership lent credibility to the E4P efforts by leading consultations with a wide range of stakeholders including local communities, public agencies, industry associations, offtakers, and municipal governments.

Figure 4. Project Development Process



1. Technical Feasibility Studies

USAID collaborated with the *Agencia de Renovacion Territorial* (ART), a government agency formerly responsible for supporting the rehabilitation of conflict affected communities to review potential sites for E4P energy generation. Information was accessed from government databases and site visits. In addition to presence in ZNIs, considerations for site selections included the level of development of production clusters, support from the local population, and overall potential for economic, social, and environmental impact.

Studies estimated the current and projected energy demand in a large cross-section of potential sites, gauged the potential of value chains, and analyzed the geographic and environmental aspects relevant to energy generation. Likewise, technical designs for the energy solution were explored to assess feasibility of a hybrid solution utilizing solar mini-grids, battery storage, and backup diesel generation.

There was a commitment to cultivating solid relationships with the communities throughout the process, positioning them as agents of change and central to decision-making regarding economic priorities. Municipal governments and community leaders played a crucial role in sustaining this dialogue.

Finally, a thorough social and environmental analysis was undertaken to identify potential environmental impacts and formulate effective risk mitigation strategies. Special attention was devoted to the potential of engaging and empowering historically marginalized groups, particularly women.

2. Financial Feasibility Studies

Initial architectural and engineering designs were crafted in alignment with demand studies and existing supporting infrastructure. Cost studies, budgets, and long-term cash flow analyses were carefully prepared for each site. A financial model and a "data room" was set up for each site, featuring comprehensive details on estimated capital expenditure and projected operational costs, with a view to sharing this data with private investors and operators. Under baseline conditions, rates of return were between 1% and 3%, far too low to attract private investment.

This analysis included considerations of the appropriate level and use of catalytic or concessional funding needed to attract private sector investors and ensure positive returns. Financial analysis was based on a portfolio of sites that would allow for the standardization and aggregation of technology and equipment to reduce procurement, construction, and operating costs and enhance profitability for private investors.

Furthermore, assessments were conducted to evaluate the economic potential of the targeted productivity clusters. This included consultation with potential offtakers in key value chains (coffee, cocoa, fish, honey) to realistically assess demand. This analysis was accompanied by research into the requisite technical and financial assistance needed to guide future capacity building efforts. Gaps were identified across three dimensions: 1) Productive – technical capabilities and key productive assets specific to each value chain; 2) Operational – governance and business management skills and digital capabilities; and 3) Financial – financial literacy programs, accounting and business finance skills, and access to financing.

3. Blended Finance

The blending of finance from the donor, public incentives, and private investors was recognized from the beginning as essential for risk mitigation and for attracting private energy investors and operators to the endeavor. USAID played a pivotal role in educating potential investors about the opportunity, engaging with a spectrum of participants including development finance institutions (DFIs), banks, energy companies, and impact investors.

Through personalized consultations and extensive workshops, USAID gleaned valuable insights into stakeholders' risk appetites and expectations related to financial rates of return. Input from consultations helped refine the business model to focus first on productivity clusters, and guided decisions on the structuring of a financial model to channel investments into target PDET sites.

E4P CAPACITY BUILDING AND INVESTMENT INCUBATOR

- Connect producer associations with potential offtakers and prioritizing technical assistance providers who may also serve as offtakers.
- Strengthen technical and business capabilities for producer clusters, market chains, and local businesses to enhance production processes and develop new business and investment opportunities.
- Enhance producer profiles to access better credit conditions by strengthening production and business practices, and by providing financial education.
- Reduce gender disparities by ensuring women have equal access to program supports.

V. CO-CREATION OF THE PRIVATE SECTOR PARTNERSHIP

Private sector investment, expertise and operation of renewable energy solutions can improve the quality, reliability, and financial sustainability of energy solutions for small rural communities.

Evaluations of previous USAID experiences indicated that private sector investment and operation of the energy solutions could significantly improve their operational efficiency and long-term sustainability. In April 2023, USAID Colombia launched a Global Development Alliance (GDA) process to invite potential private sector energy partners to co-create and implement a jointly funded market-based portfolio of PDET solar energy projects.

USAID advertised a $6.5 million funding opportunity ($4.5 million for implementation and operation of five solar mini-grids and $2 million for capacity building and productivity hub programs) that required a minimum of a 1:1 investment from the private sector. USAID invited four groups of firms to submit a concept note detailing their capacity and aspirations.

USAID selected an alliance of companies formed by ISA, the largest transmission company in the country; Ecopetrol, the largest energy company in Colombia; and SUNCO, a leading private firm in solar energy projects. Each had specific proposed roles:

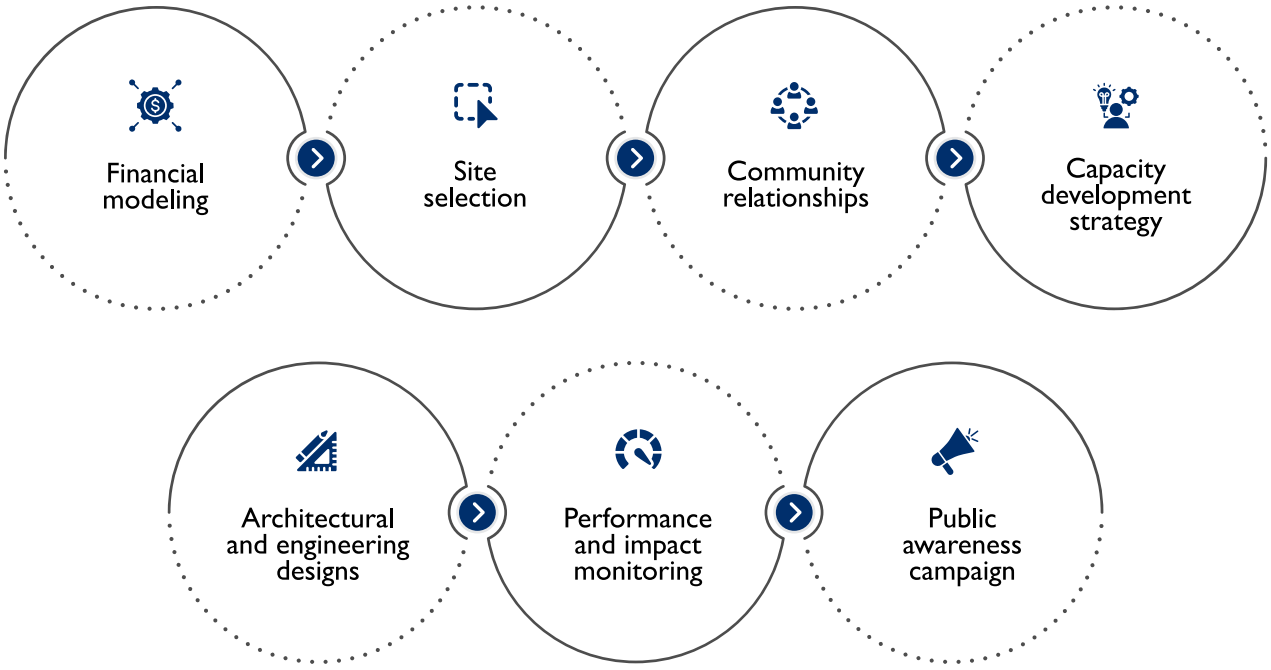
- **ISA** – recipient of USAID's resources, to serve as the energy partner responsible for implementing the energy solution and the capacity building/productivity hubs.
- **Ecopetrol** – passive investor, to provide oversight and facilitate working relationships with key energy sector and government stakeholders.
- **SUNCO** – co-investor and designated subcontractor of ISA, tasked with engineering, procurement, construction, operations, and maintenance of the energy portfolio during their useful lives.

USAID and the alliance worked together over eight months in a co-creation process to develop and finalize key elements of the E4P model. The co-creation process worked to optimize the solar project designs within the regulatory context, calculate appropriate tariffs, estimate applicable subsidy streams, and apply available tax incentives. This required careful budgeting and financial modeling that allowed USAID to discover the minimum investor rate of return that the Alliance partners needed to engage.

The process demonstrated the impact of USAID's catalytic funding and the cost effectiveness of the portfolio approach, which significantly lowered anticipated capital expenditures. The energy partner brought a wealth of experience in energy project design and operation, rich experience in social infrastructure investments and capacity building, and provided a clear vision of the economic realities of the selected sites. The energy partner also led on the key elements and social infrastructure that the productivity hubs would require to promote a sustained development effort.

The process also allowed USAID and the alliance to finalize the capacity development and market strengthening strategies to ensure local producer groups achieve their potential. Together, they established metrics for monitoring the economic, social, and environmental performance of E4P over the long term.

Figure 5. Co-creation Process



GROWING BUSINESSES

VI. ECONOMIC VIABILITY AND SUSTAINABILITY

Economic viability and sustainability are achieved through the strategic use of catalytic capital, access to public incentives, efficiency gained from co-creation, and economies of scale from a portfolio approach.

The co-creation process culminated with the consolidation of an innovative blended finance model. The energy partners' minimum benchmark level of investor internal rate of return (IIRR) [6] was determined through careful budgeting and financial modeling.[7] Baseline and with-project scenarios incorporated conservative assumptions for both income and cost modeling.

Through this intensive co-creation, USAID found that contributing approximately 30% in catalytic funding towards the capital expenditures of a portfolio of five energy sites could elevate the IIRR to levels sufficient to consolidate private sector engagement. It found that raising the contribution to 50% would attract Alliance investment for productivity hubs—building learning centers; providing computer equipment, common production enhancement facilities, internet, and communications systems; and providing energy for schools and health centers. The final agreement combined $6.5 million of USAID resources with $6.5 million from the energy partner to build a portfolio of five E4P sites and support a capacity development and productivity hub program for six producer clusters.

Figure 6. Income and Cost Assumptions

Income assumptions: Energy demand was modeled based on the current socio-economic conditions of each site, assuming a 10% increase for the first three years of operation, followed by a stabilization growth rate of 2% through the project lifetime. A public energy subsidy[8] was estimated following the methodology outlined by the regulation for ZNI communities which will cover, on average, 70% of the electricity tariff. Users are expected to pay only 30% of the tariff, which is appropriate for PDET communities.

OPEX assumptions: The energy solution operation assumes a 24-hour service availability. Personnel and operational costs are estimated accordingly, and maintenance and other administrative costs are determined based on benchmark references from similar projects implemented by SUNCO, who will provide operation and maintenance.

CAPEX assumptions: Feasibility studies referenced the costs of installing a solar-based generation capacity of approximately three-megawatt peak (MWp) to cover at least five sites. This includes all necessary mini-grid infrastructure, such as batteries, solar panels, regulators, control panels, and backup generators.

6 IIRR calculates the rate of return on the specific capital contribution provided by the private energy investors, excluding the capital provided by the donor and the state. This contrasts with the traditional IRR which calculates the rate of return on the entire set of capital contributions (donor + state + investor capital contributions).

7 The specific investor internal rate of return is not revealed here due to confidentiality agreements.

8 By the Comisión de Regulación de Energía y Gas (CREG).

The E4P model is designed as a portfolio, rather than as individual sites in isolation. This approach generates economies of scale from the standardization of generation technologies and aggregation across a portfolio. The target IIRR is achieved across the portfolio of sites rather than for an individual location, balancing opportunities and risks with a single implementer. The costs of energy infrastructure and equipment, regulation and subsidy management, construction, operation, and maintenance all decrease significantly from standardization and aggregation. Both USAID and the Alliance's financial contributions will be channeled through a Special Purpose Vehicle, with disbursements contingent upon the completion of specific milestones, including project preparation and planning, delivery of technical assistance, infrastructure installation and full completion of the capacity building and productivity hub programs.

The financial arrangement allows the model to be self-sustaining, with expected returns for the consortium to be realized through the collection of energy payments by the community and the subsidies provided by the government. Over the project's lifetime, the blended finance model is expected to achieve a leverage ratio of at least 1:10 for external capital mobilized. The financial modeling demonstrated that 10% of the net present value of all financial contributions will come from the USAID capital expenditure (CAPEX) donation; 49% was provided by monthly government subsidies throughout the project lifetimes, 28% by the private sector partners investments, and 13% from energy users through monthly billing and collections. The possibility of leveraging additional sources of capital like preferential debt from the U.S. Development Finance Corporation (DFC), interest-free capital, or grants by other donors or DFIs remains an option that could enhance the potential for positive returns and increase scale.

Figure 7. E4P Blended Finance Model

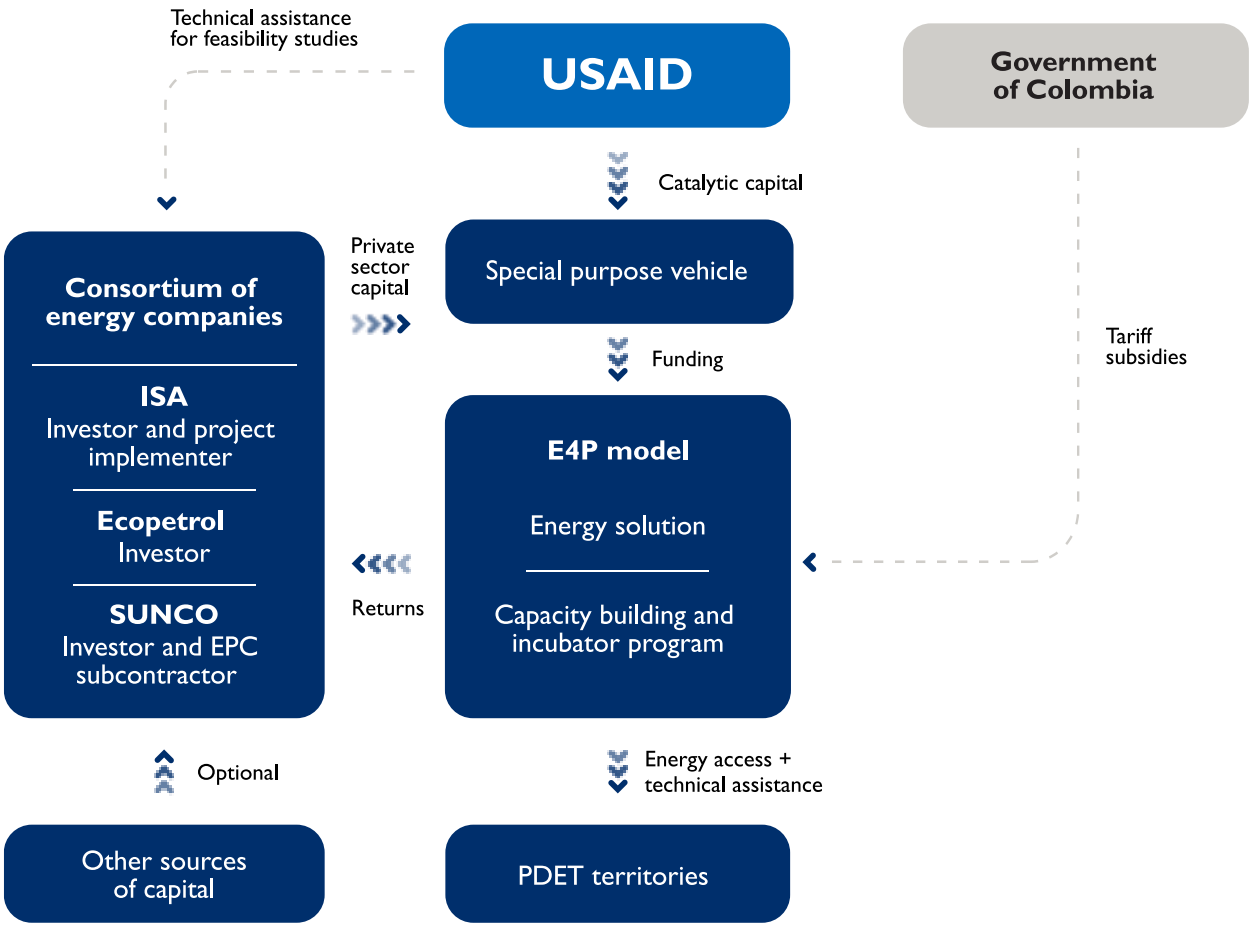
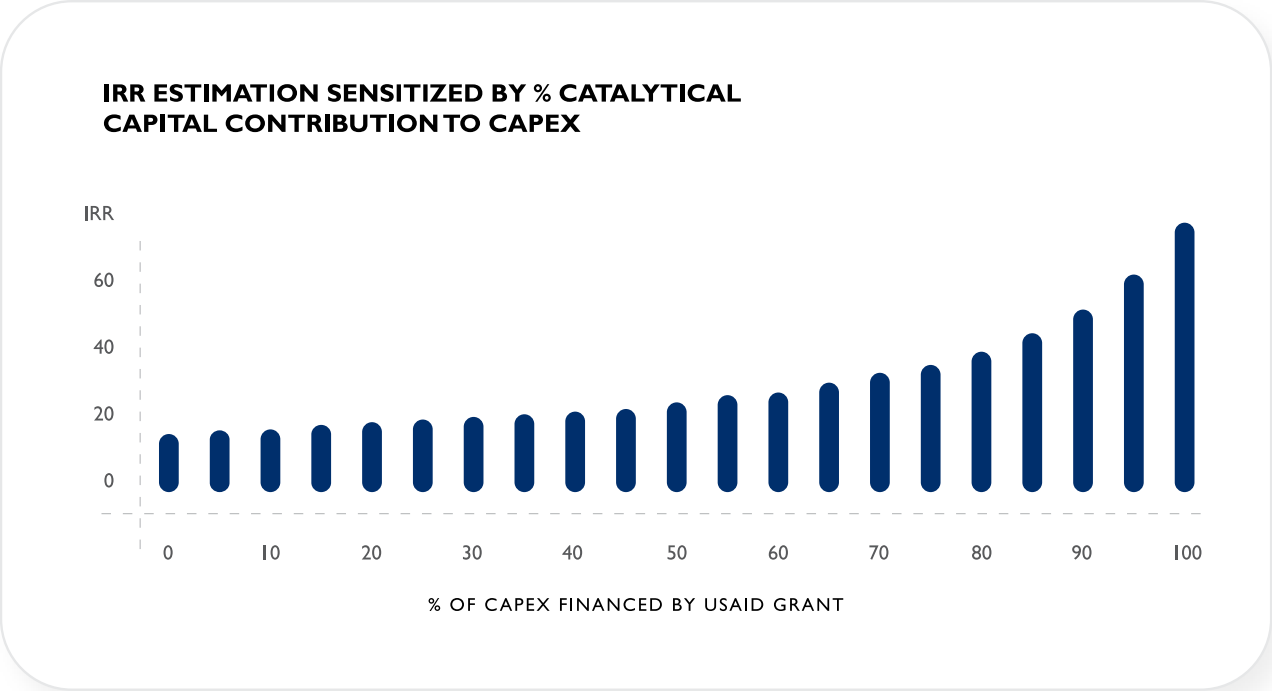


Figure 8. Sensitivity of IRR to the % of CAPEX Financed by Catalytic Contribution



VII. DEVELOPMENT IMPACT

The North Star of the E4P model is to contribute to the consolidation of the peace process in strategic PDET communities, once ravaged by conflict and in need of an economic transformation pathway. The implementation of the model sets out to contribute to this overarching objective by engaging private sector investment and operation, anticipating positive impacts through energy access and improved welfare, and indirectly, through broader development outcomes. Long-term financial sustainability of the energy solutions is a key objective of the model.

The energy solution will provide electricity access for 7,950 people and six producer clusters, resulting in an estimated $6 million increase in economic activity during the project's lifetime. The E4P targeted population includes approximately 7,950 people across two PDET territories, currently lacking access to or experiencing a low-quality electricity supply, including up to 430 individuals from indigenous communities.

Through 24-hour energy access, households will experience notable improvements in wellbeing. Access to electricity will enable the use of domestic appliances, which can reduce the time spent on care work, particularly benefiting women. It will also allow for the replacement of wood as a cooking fuel, thereby reducing fume exposure and respiratory risks. Improved lighting for studying and access to digital learning opportunities can enhance education outcomes.

Additionally, the project aims to extend energy access to six producer clusters across diverse value chains, including: nature tourism, coffee and cocoa production, dairy and honey farming, fisheries, and local crafts manufacturing. Energy access coupled with offtaker engagement, purchase agreements, and targeted

technical assistance will enable several levers that conduct to productive transformation and creation of economic value for local businesses, these include:

- **Increased production efficiency:** Access to energy could empower the utilization of essential machinery to scale production and drive higher sales. For instance, in a fisheries cluster, refrigeration appliances powered by energy access will increase inventories for sale while minimizing produce loss.

- **Improved product quality and diversification:** Energy access could facilitate the adoption of innovative equipment or techniques, enabling the production of value-added products resulting in higher sales driven by higher prices. For instance, in dairy clusters, energy access can enable production methods for premium cheese variants.

- **Cost savings:** Energy access enables the use of high-productivity assets that can optimize production inputs. For example, coffee growers could reduce processing costs by employing electric depulper machines, conserving water and optimizing labor.

- **Business model innovations:** Access to energy could provide internet connectivity that transforms new and established businesses by granting access to knowledge and networks. For example, lodging providers in tourism hubs could leverage internet services to develop digital strategies, attracting previously underserved tourist segments.

The use of solar energy will displace the use of highly polluting diesel fuels reducing GHG emissions by 90 MtCO2e per year. In the selected territories, communities obtain their already scarce electricity supply from diesel-run plants. Apart from failing to provide a reliable, high-quality supply, they contribute to greenhouse gas emissions. While solar-based generation won't entirely replace diesel usage — still necessary as a backup power source—it will significantly diminish dependence on it for electricity generation. Additionally, the model would significantly advance a just energy transition for these PDETs territories, by supporting producer clusters and local communities to uptake the renewable energy supply effectively and improve their livelihoods.

The implementation of the E4P model could have broader positive development outcomes, including enhanced connection to markets for producer clusters, the upskilling of the local workforce, and diminished gender inequalities. If producer clusters capitalize on energy access and leverage the technical assistance provided, including product development, technification, formalization, among other programs offered, they will establish long-term commercial relationships with key offtakers from other markets. Additionally, the productive transformation of producer clusters will upskill the local workforce, enabling them to acquire technical proficiency in specific value chains and foster formative skills such as business or financial management.

These developments could yield higher incomes and stimulate business creation. Energy access through the E4P model will also present an opportunity to foster women's empowerment. Energy-enabled domestic appliances can optimize care work for women, freeing up time for income-generating activities or self-care. Additionally, access to electrical productive assets will benefit women-led businesses through increased production and income, while also granting them ownership of assets which can rebalance power dynamics within communities.

VIII. CALL TO ACTION: AN OPPORTUNITY TO SCALE THE E4P BLENDED FINANCE MODEL

The Ministry of Mines and Energy of Colombia (MME) has established the Energy Communities (CE) initiative as a public policy action to expand energy coverage in off-grid, isolated areas. Through CE, the Ministry has built a database of over 18,000 projects that have expressed interest in becoming Energy Communities. The Ministry will now need to review, characterize, and prioritize these projects and ensure they are technically and financially viable throughout their lifetime.

The E4P Blended Finance Model offers a robust business model to increase energy access for ECs in a way that leverages the unique assets and expertise of different players. Leveraging E4P as a foundation, the MME can bring together experienced energy providers, impact investors and donors to finance the energy solution. It can also increase the ability and willingness to pay for energy in off-grid zones through market access for local products and services, financing from financial institutions, and a capacity building program to support the socio-economic development of local communities.

Scaling E4P into a model that can be deployed across the country requires multiple donors to coalesce and pool resources in a mutually reinforcing way. USAID invites peer donors and aid agencies to create a pooled funding mechanism for catalytic capital that can be allocated through an Off-grid Energy Reverse Auction.

The Off-grid Energy Reverse Auction proposes the creation of a platform through which energy companies can compete to develop projects drawn from the CE portfolio. These projects would match the strategic priorities and focus geographies of bidders, who would be in charge of conducting a standardized due diligence process on the proposed projects ahead of placing a bid. Energy companies would then bid for the construction and operation of energy systems in selected sites and auction winners would be able to leverage catalytic capital from the pooled funding mechanism to partially finance the development of awarded projects.

Building on learnings from E4P, USAID is developing the Off-grid Energy Reverse Auction concept and invites potential donors to co-create and socialize it with relevant stakeholders in Colombia's energy sector. The standardized due diligence and auction process enables donors to have accountability on the impact potential and additionality of their resources. It also allows them to explore the best-fit models for engaging local communities in the project development cycle, which could be done through shared ownership models or other engagement approaches depending on the context of each project and site. Finally, this collective funding approach encourages donors to find greater synergies across their portfolios of work in Colombia, maximizing the impact return on their development contributions.

REDUCING GENDER INEQUALITIES FOR PROSPERITY

USAID
FROM THE AMERICAN PEOPLE

CONTACT INFO:

Thomas Black
Renewable Energy Leader
Sustainable Ecosystems and Economic Development (SEED)
USAID Colombia Mission