

TECHNICAL BRIEF

# Applying Blended Finance to Support the Conversion to Clean Cooking

## Engaging the Private Sector to Increase Household Use of Alternatives to Fuelwood

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Lovely Joseph, FERRE Haiti S.A. sales coordinator, showcases the new line of FERRE stoves for employees at MAS AKANSYEL's textile factory in the USAID-funded Caracol Industrial Park in Northern Haiti. *Photo Credit: Maxwell Marcelin*

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## I. The Risk of Charcoal

Haiti's trees and environment are the country's natural capital, and its value is rapidly declining. Deforestation has afflicted Haiti since well before it became a country in 1804. During the 17th and 18th centuries, the French empire cut down forests in fertile lowlands to make way for sugar cane plantations and cleared vast swaths of upland forests following the introduction of coffee. After France imposed indemnity on Haiti in exchange for independence, Haiti depended on trading mahogany and other precious hardwoods to pay France. Subsequent governments' unequal land distribution policies left smallholder farmers with only sloped plots above fertile plains for subsistence farming, and the soils on such plots are particularly susceptible to depletion and erosion (Paskett and Philoctete, 1990). The increasing population, migration to urban areas, worsening poverty, and lack of coherent national agricultural or energy policy accelerated deforestation during the 1950s, severely limiting livelihood options for Haitian farmers. More and more, farmers depended on producing charcoal to rapidly growing urban areas to make ends meet (Dubois, 2016).

As a result of these factors, Haiti is now the only country in the Americas whose residents depend on biomass for power. Haiti relies on approximately 4,000 kilotons of wood for more than 70% of the energy it consumes annually. Each year, millions of trees are harvested domestically and in the Dominican Republic to convert into charcoal (USAID/Haiti, 2017). The average family in Haiti uses a bag of charcoal every two weeks, and according to charcoal makers surveyed, one bag of charcoal equals about two trees. Entrepreneurial farmers who manage sustainable woodlots for timber or charcoal by applying rotation harvesting techniques are growing with USAID's support, but it is still common practice to cut older trees on sparsely populated hillsides to make charcoal. Charcoal production, the biggest driver of deforestation, leads to destabilized soil. The root systems of the critically low natural forest cover are sparse. Their sparseness reduces water infiltration, and the resulting erosion washes away approximately 15,000 acres of topsoil each year (USAID/Haiti, 1999-2004). This environmental degradation limits the productive potential of Haitian farmers, particularly those in highlands; damages already depreciated infrastructure like dams, irrigation canals, and roads; and smothers coastal marine ecosystems with sediment and garbage runoff.

Inhaling smoke indoors while cooking with charcoal is a major health threat to Haitian women and children. According to USAID's 2007 study on Environmental Vulnerability in Haiti, Acute Lower Respiratory Illness is the greatest killer of children under 5 years old in Haiti. Studies estimate that the impacts of burning biomass indoors shorten the average lifespan by nearly seven years (USAID/Haiti, 2007). Cooking with charcoal also takes much more time than cooking with liquefied petroleum gas (LPG), time that could otherwise be spent earning wages or completing other family and household responsibilities. The USAID Reforestation Project has supported the manufacturing of LPG stoves and engaged the private sector in blended financing to decrease deforestation and build resilience to natural and economic shocks and stresses (see box).

### USAID Reforestation Project Strategy

Increase forest and tree cover by overlaying planting activities with resilience-building environmental techniques at the micro-watershed landscape level, primarily in the highlands

## II. Challenges of Switching from Charcoal to LPG

Many barriers impede Haitian lower-income households' large-scale conversion from charcoal to LPG cooking (see Table 1, next page).

**Table I. Barriers to the Switch from Charcoal to LPG**

<p><b>Cost of stoves</b></p> 	<p>Imported appliances, such as domestic LPG cookstoves, are expensive in the local market after transportation costs, duties, and retailer margins. With 6 million residents living under the poverty line of \$2.41 per day, purchasing an \$80 to \$180 LPG stove for home use is cost-prohibitive (World Bank, 2020). Haitian families generally reserve their limited cash savings and any discretionary income for life events, school fees, and economic or health emergencies.</p>
<p><b>LPG access</b></p> 	<p>The lack of storage and distribution infrastructure limits the accessibility and affordability of energy sources for cooking that are alternatives to charcoal. Even urban households, which are generally close to at least one LPG refill station, cannot refill their tanks in the event of increasingly common energy shortages. Presently, the Haitian government does not have a national energy policy. The centralized nationalized procurement process distributes petroleum products through a private sector network and subsidizes the price at the pump for consumers. But when the government does not have the cash or credit to pay international suppliers, the process has led to petroleum product shortages. The petroleum products sector is becoming more dynamic thanks to the initiatives of a few private distributors, yet there is a long way to go before all Haitians can access LPG.</p>
<p><b>Livelihoods</b></p> 	<p>Low capacity to cope with economic shocks and stresses, particularly among youth, leaves many Haitians without gainful employment options. They may, in response, rely on negative coping strategies, such as cutting trees for fuelwood. Initiatives to reduce charcoal consumption or convert to the use of LPG could undermine the incomes of hundreds of thousands of Haitians who depend on the charcoal market. The young men cutting trees and producing charcoal in traditional clay kilns capture only 10% to 20% of charcoal's end market value (FERRE, 2020). Women and youth help bag charcoal, small and medium enterprises transport charcoal from rural communities to markets, and street vendors sell charcoal to consumers. Conversion efforts must consider what disruption to the charcoal supply chain might mean for those who rely on it for income; a price reduction in charcoal resulting from lower demand could lead to more deforestation as those in the charcoal value chain seek to bridge the revenue gap. Rural unemployment will remain deforestation's biggest threat, so the project is building community resilience through access to markets, crop diversity, and new productive assets. Activities include supporting agribusinesses in the cashew, mango, pineapple, ackee value chains in growing their network of smallholder farmer suppliers, promoting diversity of crops in agroforestry systems and <i>jaden lakou</i> (a traditional agroforestry system that includes trees, food crops, and forage), and improving production households' production techniques for milk and honey.</p>
<p><b>Cost of financing</b></p> 	<p>Access to capital is crucial to make it out of poverty and generate income and savings. However, Haitians are financially underserved; only 27.5% of adults have a bank account, and only 10% have a loan with a formal finance institution (World Bank, 2019). Haiti's credit markets are focused on trade financing, notably imports, and the three largest banks hold 75% of the loan portfolio, while 70% of loans are monopolized by 10% of borrowers (U.S. Department of Commerce, 2018). Over 66% of Haiti's banks are in or around Port-au-Prince, and the bank branches that have recently proliferated outside the capital are focused on capturing remittances from abroad instead of providing access to credit (Coates, 2018). Given a lack of effective civil or cadastral registries, banks are very conservative with loans and require real property as collateral. These credit dynamics, combined with a concentration of assets in a socioeconomic environment in which there is a high-income inequality, do not incentivize commercial banks to innovate or offer credit products designed for the average Haitian household. New innovations must serve Haitians who need credit the most.</p>

### III. Solution

As part of the effort to reduce threats of deforestation and build resilience to natural and economic shocks and stresses, the USAID Reforestation Project partnered with Turkish manufacturer FERRE-FEMAS to establish Haiti's first domestic LPG stove manufacturing plant. The project brought \$120,000

in funding to cover the first two quarters of operational expenditures, paid out based on household conversion milestones, and FERRE-FEMAS invested almost \$500,000 in importing manufacturing equipment and establishing a local franchise, FERRE Haiti S.A. In addition to providing financial resources, the project helped convene stakeholders in the region, such as large employers, public officials, and the chambers of commerce. FERRE provided technical expertise in stove assembly lines and product marketing. The chosen site for the FERRE plant was the USAID-funded Caracol Industrial Park (CIP), located just outside Haiti’s second-largest city, Cap-Haitien, on the northern coast. The plant commenced stove production in October 2020.

The manufacturing plant’s establishment is a major accomplishment in blending public and private resources, yet the plant would not succeed without the financial commitment and collaboration of a third category of private sector stakeholders: employers. Almost 15,000 factory workers, mostly in the textile industry, commute daily to the CIP. Employers have a vested interest in their employees’ health and well-being — both critical to maintaining an efficient, effective workforce. Therefore, employers are willing to facilitate their employees’ conversion from using charcoal to using alternative fuel by helping administer a corporate-backed credit scheme that mitigates risk for financial institutions. Specifically, employers agreed to do the following:

1. Share with creditors the H.R. and payroll information of employees interested in financing stoves
2. Sponsor high-performing and loyal employees for credit as an employment benefit
3. Allow FERRE to market stoves to employees in cafeterias during employee lunch breaks
4. In some circumstances, deduct installments directly from payroll

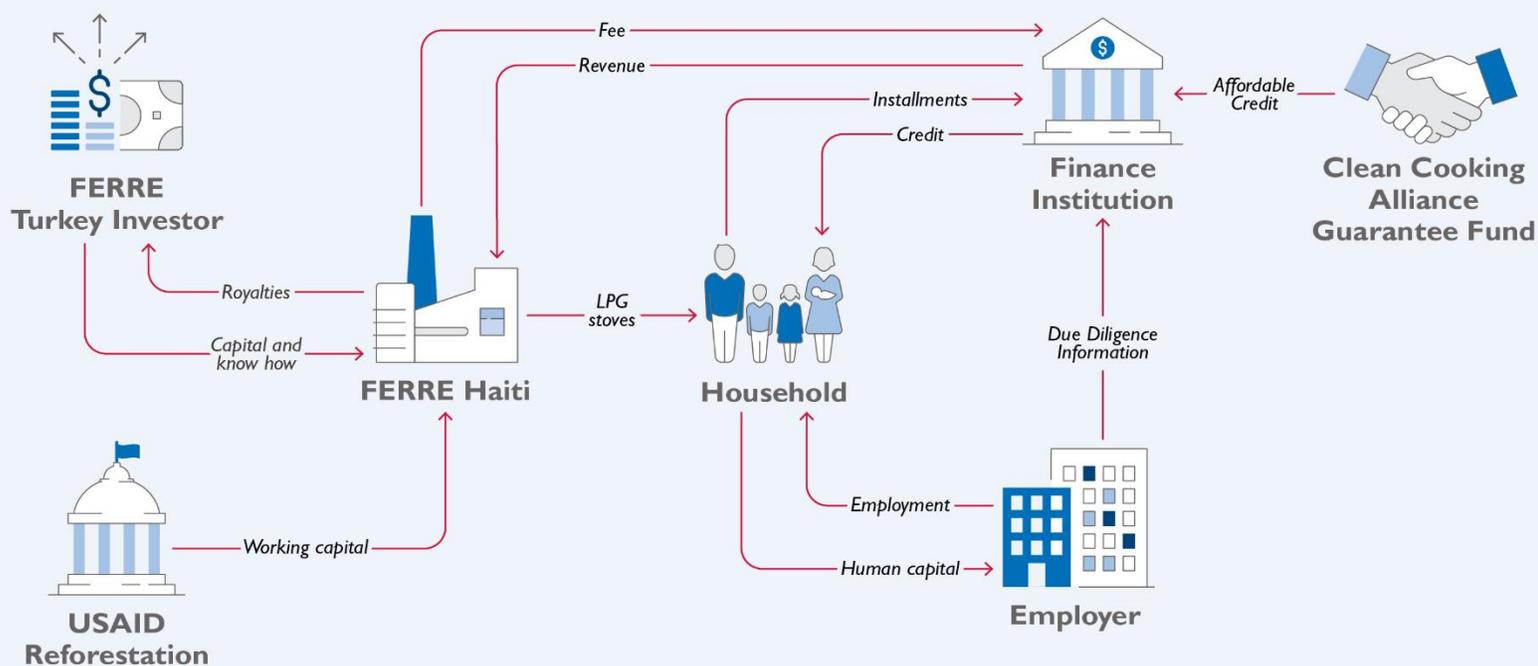


Figure 1. Blended Finance for Conversion Model

With this model in place, the project and FERRE selected Paon Bleu as the partner financial institution to underwrite, process, and service microloans to convert from using charcoal to LPG. Aligned incentives

and support from employers allowed Paon Bleu to charge only 1.5% to 2% monthly interest on stoves bought on credit, which is significantly lower than market rates in Haiti. For entry-level tabletop stoves priced at \$75, FERRE also pays Paon Bleu a \$5 fee to cover administrative costs of managing a surge in microloans, which is passed onto the borrower as part of the total stove price. See Figure 1 (previous page) for an illustration of how each stakeholder’s contribution led to affordable LPG stoves for households in the Nord département.

## IV. Impact

Thanks to the USAID Reforestation Project’s innovative blended finance approach, Haiti’s first domestic LPG cookstove manufacturing plant, which FERRE Haiti owns and manages, is helping thousands of households switch from using charcoal to LPG and laying the foundation for tens of thousands more to switch. See Figure 2 for the impact to date of the collaboration among USAID, FERRE, and Paon Bleu.

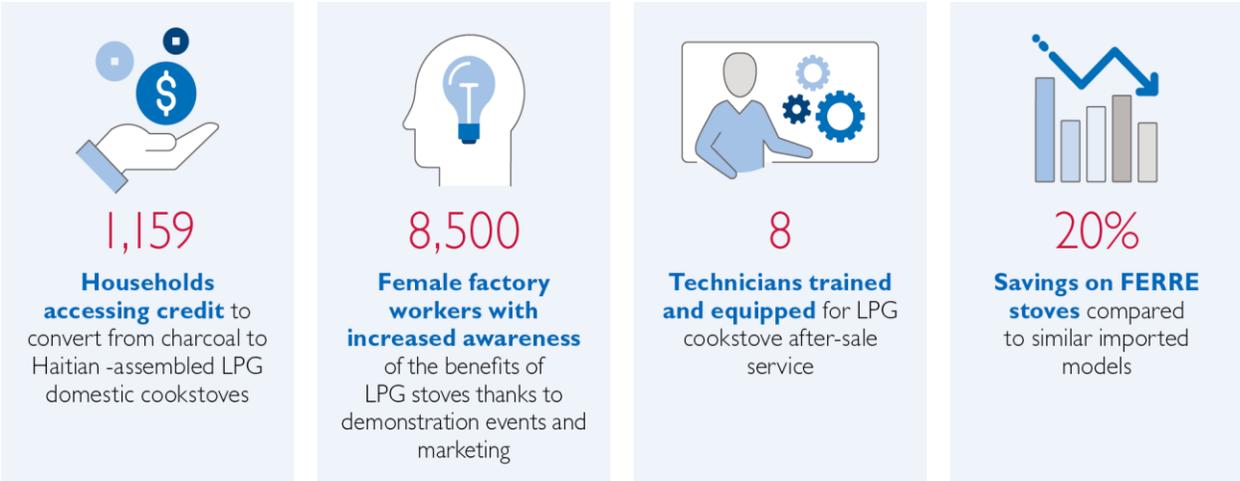


Figure 2. Impact Between October 2020 and January 2021

## V. Ingredients for Success

The success of the USAID Reforestation Project’s collaboration on blended finance with FERRE benefited from the right mix of ingredients. Five of the most important factors behind the early adoption of LPG stoves included a high demand among working-class women, a proactive financing partner, a pilot de-risked with a guarantee fund, a high-level commitment from all partners, and a detailed financing model for planning and learning.

### High Demand Among Working-Class Women

During business planning, FERRE and the project estimated that they could address the demand for LPG stoves of approximately 940,000 Haitian households that were using fuelwood for cooking. A broad marketing strategy, however, might lead to slow overall uptake of FERRE stoves, and it was critical that the plant meet sales targets in its first few months to break even financially before the end of the project grant. Based on a market segmentation analysis focused on quick financial and social wins, FERRE

targeted female CIP workers in its first quarter of operations. The women in the textile industry were receptive to FERRE's value proposition because most of them were responsible for preparing food in the household, had credit access through their employers, and benefitted from wholesale prices given their proximity to the plant. The central message of FERRE's marketing campaign was "cook faster, cook cleaner, and cook cheaper" (see Figure 3). FERRE also noted environmental benefits in radio and social media posts. In the plant's first three months, 58% of sales were to this core market segment of female CIP workers.

## A Proactive Financing Partner

Paon Bleu is Haiti's first credit institution to serve customers entirely online. Using fintech tools and employer partnerships to reach underserved borrowers, Paon Bleu is disrupting Haiti's financial markets. As a relatively new institution that has grown in two years to 1,000 customers through 20 affiliated partners, Paon Bleu is hungry to further increase its clientele by collaborating with like-minded stakeholders that want to develop innovative solutions to Haitians' lack of access to finance. Paon Bleu also focuses on "positive incentives" for borrowers to repay their loans for stoves.

In contrast to traditional banks, which are quick to apply penalties and seize collateral, Paon Bleu creates an online credit profile and progressively broadens customers' credit opportunities. The blended finance partnership's success hinged on Paon Bleu's alignment with the goals of the USAID Reforestation Project and FERRE and willingness to be flexible in pricing and due diligence.

## A Pilot De-risked with a Guarantee Fund

Although Paon Bleu targets Haitians underserved by banks, it is too risky for a financial institution with a business model that operates on small margins to issue \$75 loans to a new class of borrowers. Paon Bleu was ready to offer credit with 4% interest per month for loans of at least \$200 to workers whose employers deducted installments from paychecks, but this arrangement left out employees who wanted the entry-level tabletop stove or worked for employers reluctant to deduct installments from paychecks. FERRE and the project needed to mitigate Paon Bleu's risk while reaching target beneficiaries. The solution was a partial credit guarantee fund. Donors can use the fund to mobilize financing to underserved borrowers in new sectors, markets, or regions (USAID, 2014). In this case, FERRE approached the UN-funded Clean Cooking Alliance (CCA) to serve as the guarantor. The CCA agreed to cover 50% of Paon Bleu's non-performing loans up to \$75,000 if Paon Bleu and FERRE followed proper due diligence and focused on charcoal-consuming households. The initial guarantee fund pool is structured to support the conversion of 2,000 households, and the project is seeking partnerships with other donors or investors to scale up the employer-backed credit model by increasing the size of the guarantee pool.

## High-Level Commitment from All Partners

Not just any cadre of professionals, technicians, or investors could have successfully launched and managed Haiti's first domestic LPG stove plant. When seeking the best fit for its franchise, FERRE



Figure 3. Sample Marketing Poster

approached the social enterprise SWITCH, which specializes in facilitating the switch from charcoal to LPG for schools, orphanages, and street food vendors. One founder of SWITCH, Maxwell Marcelin, is now the CEO of FERRE Haiti S.A., bringing nearly a decade of experience in Haiti’s energy sector and expertise in marketing for social impact. FERRE’s global growth strategy is to find like-minded enterprises that have invested in their local market’s energy sector and partner with them to franchise the FERRE brand of stoves in a new country. On the assembly line, FERRE-FEMAS’ Turkish engineers were instrumental in setting up the plant and training FERRE Haiti’s technicians in the assembly of their stove models. The FERRE-FEMAS team brought experience setting up similar plants in countries such as Ethiopia, Sudan, and Jamaica. On the employer side, managers and H.R. directors recognized the value FERRE could bring to their workforce and offered credit sponsorship as a benefit and retention tool. They collaborated on the details of the due diligence requirements and marketing campaigns to increase employee awareness of the benefits of switching from charcoal to LPD.



“Our employees got an opportunity to look at affordable option to cook with LP Gas. This is a great sustainable initiative to reduce deforestation and to introduce our team members to clean cooking. We look forward to having another open “Group Sale” day.  
 — Giri Chandrasena, MAS AKANSYEL general manager

## Detailed Financial Modeling for Planning and Learning

Before making a significant investment, the project needed to verify that FERRE’s business plan could bring an affordable array of stove products to the market and break even after the project’s financial support ended. The project supported FERRE in developing a detailed financial model to forecast its cost of production in the Haitian context and analyze how the plant’s profitability could vary depending on different adoption scenarios. The project was only ready to move forward with catalytic funding after FERRE was certain that all potential fixed and variable costs were accounted for and that it had a path to a steady cash flow based on a conservative demand scenario and an affordable target price for stoves. The financial model also serves as a monitoring and evaluation tool for comparing actual revenues and costs against forecasts from the design stage, allowing FERRE to identify potential cash flow issues early and adjust to correct them.

## VI. Moving Forward

Early success is not enough, and all enterprises need to maintain a long-term vision to develop and make progress toward financial and social objectives. The USAID Reforestation Project is advancing the strategic initiatives below to build an impactful business on the foundation of blended finance.

### Partner with LPG Distributors

The uptake of stoves is limited by the unreliability of LPG in Haiti. LPG is generally accessible to urban and peri-urban households, yet FERRE’s addressable demand is limited to households with easy access

to LPG refill stations. One of FERRE's commitments is to establish an LPG refill station in Caracol, outside the CIP, under the franchise of one of Haiti's certified LPG distributors. But broader partnerships with LPG distributors are needed to connect more households to LPG. The project and FERRE are in touch with various LPG distributors to expand their network of refill stations, particularly in the Nord département; these distributors have a financial incentive to increase Haitians' access to LPG stoves. Initial discussions for two distributors to develop win-win plans to invest in LPG infrastructures, such as refill stations, transportation trucks, and inventory of cylinders, are underway.

## **Facilitate Diaspora Financing**

Some of Haiti's most undervalued assets are the intellectual and financial resources of Haitians living abroad. About a third of Haiti's gross domestic product, more than \$3 billion, is generated from remittances that members of the Haitian diaspora send to family members or friends living in Haiti. Recent advances in fintech and digital banking have made sending remittances easier and facilitated the direct purchase of products by diaspora members to be delivered to or picked up by their loved ones. Instead of sending cash, a growing number of diaspora members want to directly purchase food, consumer products, or appliances for their loved ones. To tap into this market and leverage the growth of digital shopping sites, FERRE and the project will seek to feature FERRE stoves on the sites and thereby convert remittances into stove sales.

## **Enter New High-Potential Markets**

The project estimates that 76% of the national demand for stoves is in Port-au-Prince, almost a six-hour drive from the FERRE plant. The market is dominated by imported stoves that, due to distributor and retail margins, are more expensive than similar models. Once FERRE has a sustainable base of distributors in the northern market, penetrating the market in and around the capital will present a major growth opportunity. The Dominican Republic's appliance market is also dominated by expensive imports, but the country's border is only an hour's drive from the FERRE plant. In the longer term, when the Haitian market is saturated, taking advantage of the Dominican Republic's proximity to the FERRE plant will create valuable new market opportunities. A market-based approach that looks beyond the core market segments while capturing lessons learned over the next year will ensure FERRE's continued success in helping Haitian households switch from using charcoal to LPG for cooking well beyond the end of the project.

## **Apply Blended Finance to New Sectors**

Experience engaging the private sector to blend USAID funding with private capital can be applied beyond the stove sector, particularly to build Haitian communities' resilience to economic and natural shocks and stresses. The project has already matched the investments of agribusinesses to strengthen agroforestry supply chains, such as by organizing networks of smallholder tree crop farmers, establishing traceability and quality control systems crucial for premium markets, and increasing partners' processing and value-add capacity. The project is also supporting entrepreneurs in making a long-term investment in sustainable woodlot management, which can profit enterprises that reduce pressure on Haiti's natural resources. Blended finance to de-risk private investments offers additionality as well as strengthens businesses and makes them more profitable. Diversified revenues and new markets for smallholders, strong value chain actors that advocate for enabling environment reform, and new employment opportunities and fiscal revenues all contribute to building resilience capacities and strengthening market systems.

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