

## BOTTLED GAS FOR BETTER LIFE MICROFINANCE PROGRAM REPORT

### 1. Introduction

*Bottled Gas For Better Life* is a new LPG microfinance program established and promoted by the Global LPG Partnership (GLPGP) and partners in Cameroon, Kenya, and Ghana. The program was piloted for the first time in Southwest Cameroon in 2017. It supports microfinance lending operations, including provision of loan capital, to facilitate equipment purchase (double burner stove, cylinder and accessories) by lower income households, to help them adopt LPG for clean cooking.

A number of pilots have been initiated and are at different stages of completion (Table 1).

	Cameroon			Kenya
	Phase I	Phase IA	Phase II	Phase I
Households	150 (target reached)	50 (target reached)	680 (target), 481 registered at time of reporting (repayments into 2019. 66% repayment at time of writing, which is encouraging as all the communities did not register at the same time)	150 (target), 63 registered at time of reporting
Location	One community in South West Cameroon	One community in South West Cameroon	10 communities across Centre, Littoral, South West, North West, West regions of Cameroon	One community in Nyandarua County
Project period	March - October 2017	November 2017 - May 2018	April - December 2018	August 2018 - April 2019
Status	Complete	Complete	In progress	In progress

TABLE 1: BOTTLED GAS FOR BETTER LIFE – COMPLETED AND INITIATED PILOT PROJECTS

*Bottled Gas For Better Life* has been made possible by the generosity of donors including the OPEC Fund For International Development (OFID), the European Union with KfW, Friedrich Scharr KG, Cavagna Group, and the Clif Bar Family Foundation.

### 2. Cameroon

#### 2.1 Program Design and Initial Results

##### 2.1.1 Summary of Phase I (first-ever pilot) – 150 households

The pilot took place in 2017 in Batoke, a coastal village of Southwest Cameroon. GLPGP's Cameroonian implementing partners in the pilot phase included LPG marketer Glocalgaz and microfinance institution (MFI) Mutuelle Financière des Femmes Africaines (MUFFA). Participants self-selected and were not screened for credit risk because it was uncertain what the demand would be initially, and loans were interest-free for piloting purposes. As LPG microfinancing is brand new in Cameroon and there were

unknown risks involved, the MFI partner required GLPGP to advance the funds to be loaned to loan recipients. Funding for this was provided by donors. GLPGP also handled most field operations, such as community sensitization and loan repayment collection.

The breakdown of costs to participants (in Central African Francs, or CFA), in comparison to the subsequent pilots conducted in other communities (Phases IA and II), is shown in Table 2. A total of 150 households made initial security deposits of 7,500 CFA (US\$13.50), followed by six equal monthly payments for full repayment of the remaining loan capital.

Item	Phase I (cost in CFA)	Phase IA	Phase II
12.5kg Gas cylinder	18,500	18,500	18,500
Gas: initial fill (12.5 kg)	6,500	6,500	6,500
Double burner stove	20,000	20,000	18,000
Regulator	3,500	3,500	3,500
Gas hose	1,500	1,500	1,500
<b>Equipment</b>	<b>50,000</b>	<b>50,000</b>	<b>48,000</b>
<b>Loan amount including interest</b>	<b>50,000 (interest-free)</b>	<b>50,000 (interest-free)</b>	<b>51,600 (1.25% monthly interest)</b>

TABLE 2: LPG-START UP EQUIPMENT LOAN COST TO PARTICIPANTS IN THE THREE PHASES

### 2.1.2 Phase IA – 50 households

Following Phase I in Batoke, an additional 50 households in Buea, Southwest Cameroon were offered interest free loans in the amount of CFA 50,000 (US\$90) (Table 2), to cover the purchase costs of a double-burner stove, a filled 12.5kg LPG cylinder, a regulator and a hose. The purpose was to test repayment rates if households were selected and screened for credit suitability by the financial institutions, unlike in Phase I, when the loan recipients had self-identified interest. Some of the repaid loan capital from Phase I was used to help capitalize the loan payments in this phase.

Loans were issued in November 2017 and repaid by May 2018. Households made initial security deposits of 8,333 CFA (US\$15), followed by six equal monthly payments.

### 2.1.3 Phase II – 484 households to date

A second expansion program in multiple communities across five regions (see Figure 1) was launched in March 2018. It involved a larger group of program partners including a new LPG marketer, Tradex, and a new MFI, MC2. Glocalgaz and MUFFA which had participated in Phase I also continued working with GLPGP. This second phase included a phased approach, community by community, across urban, peri-urban and rural areas (see Table 3). Community sensitization and participant registration commenced in mid-April. Civil unrest in two Anglophone regions of Cameroon slowed registrations considerably and forced GLPGP to reassign some loans to new communities in unaffected areas. However, a renewed marketing push by GLPGP and its Cameroonian partners in July 2018 doubled the number of registered households within a month.

The MFIs, rather than GLPGP, are responsible in this phase for all field operations. This includes assessing the creditworthiness of interested households, a key differentiator from Phase I, although community

sensitization has been a shared task. Interest in the amount of 1.25% per month is charged on each loan to ensure longer term commercial viability for the MFIs involved.

Site visits and LPG usage and safety training were organized by GLPGP in collaboration with the local MFI branches. Through November 16, 2018, 481 households had registered and received LPG equipment. 81 households re-paid the loan fully in three repayment cycles or less.

Program partners had agreed to limit the number of existing LPG users to about 30% of all loan recipients, since the main goal was to catalyze LPG adoption by non-users. A number of existing LPG users, particularly in urban and peri-urban communities where LPG use was already common, who wanted the microloan to purchase new or better equipment, therefore were turned away to allocate more loans to new LPG users.

Sensitization and education plays a crucial role in getting non-LPG users interested in the microfinance program. Non-LPG users are more likely to adopt LPG if they are aware of the benefits of LPG, how to cook local dishes using LPG, and the health hazards of continuing to cook with charcoal, firewood and kerosene. Education focused on household economic decision-making is also important. A woman who was interviewed after a *Bottled Gas For Better Life* sensitization event stated: **“I can use a [12.5kg] bottle of gas for one month and a half. I will not regret it, because if I calculate the charcoal or the firewood [I'd use], it will be more expensive than the gas I'm using.”** LPG usage per capita among this group of microfinance participants who attended the sensitization event was high, suggesting sustained and near-exclusive use of LPG. More attention to educating users about the cost advantages of LPG compared to other fuels is likely to encourage – beyond initial adoption – more sustained use of LPG over time.

Buy-in from community leaders has also proven important. In Phase I, support from the Chief of Batoke village, a strong advocate for the program, was instrumental in encouraging families to register for the microloan. In Phase II, local leaders are recruited as “LPG champions” ahead of the public awareness raising events. GLPGP also works with the Chiefs to recruit the local town criers to spread awareness about the program.

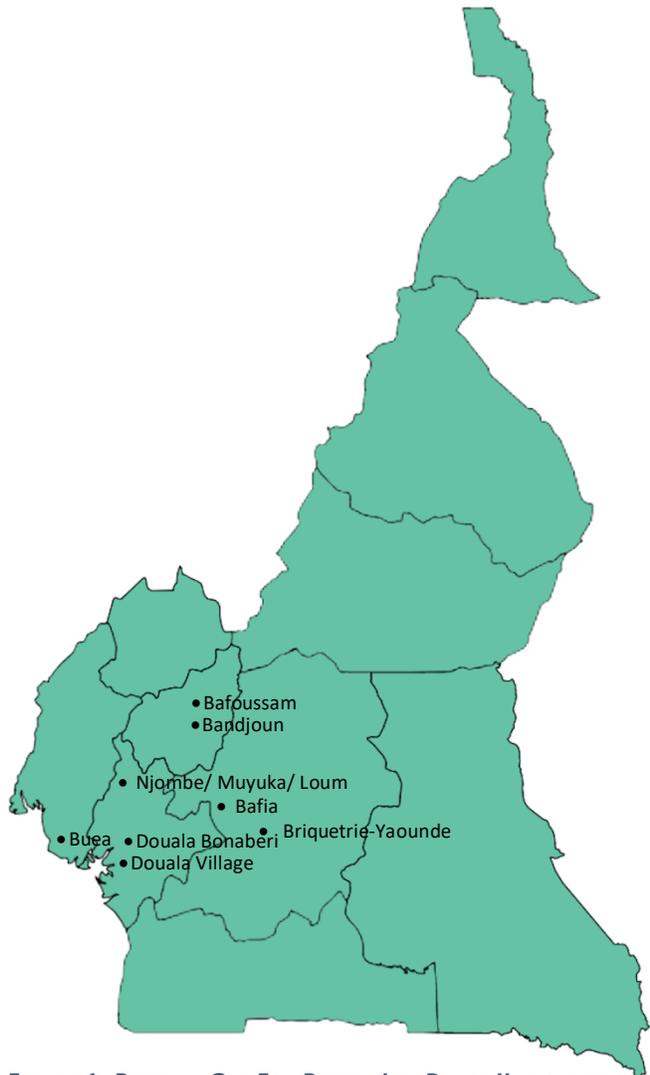


FIGURE 1: *BOTTLED GAS FOR BETTER LIFE* PHASE II LOCATIONS IN CAMEROON

Region	Community	Type	MFI	LPG Company	Households Registered <sup>1</sup>
Littoral	Douala Bonaberi	Urban	MUFFA	GLOCALGAZ	34
	Douala Village	Urban	MUFFA	GLOCALGAZ	25
	Njombe	Peri-urban	MC2	GLOCALGAZ	64
	Loum	Mixed	MC2	GLOCALGAZ	20
South West	Tiko	Peri-urban	MUFFA	GLOCALGAZ	0
	Buea	Peri-urban	MUFFA	GLOCALGAZ	8
	Muyuka	Peri-urban	MC2	GLOCALGAZ	20
North West	Njinikom	Rural	MC2	TRADEX	0
Centre	Bafia	Rural	MC2	TRADEX	51
	Briquetrie-Yaounde	Urban	MUFFA	TRADEX	100
West	Bandjoun	Rural	MC2	TRADEX	57
	Bafoussam	Urban	MUFFA	TRADEX	105
<b>Total Loans</b>					<b>484</b>

TABLE 3: BOTTLED GAS FOR BETTER LIFE PHASE II COMMUNITIES, PARTNERS AND HOUSEHOLDS REGISTERED

## 2.2 Monitoring & Evaluation

Since 2016, GLPGP has been partnering with the Department of Public Health and Policy at the University of Liverpool, UK and Douala General Hospital, Cameroon, which are jointly studying enabling factors to support large-scale population shifts from traditional polluting fuel use to LPG for cooking. This includes testing initiatives designed to help households make the switch, especially in poorer, peri-urban and rural communities.



Equipment distribution in Douala, April 2018.

### 2.2.1 Phase I evaluation

As part of the LACE studies, the researchers conducted an independent evaluation of *Bottled Gas for Better Life* Phase I, carrying out household surveys with beneficiary households before and after they received their LPG equipment. They also measured Household Air Pollution (HAP) exposure (kitchen emission concentrations and personal exposure in primary cooks). During both the baseline survey and six-month follow-up, they surveyed an additional 500 households (beyond the loan recipient group) in the pilot community and 500 households in a nearby control village. Data from non-recipients were compared with those who received the microloan, to help determine the effectiveness of the loan scheme in driving

<sup>1</sup> As at September 21, 2018. Almost all these households have received the LPG equipment.

LPG adoption as well as health benefits. Key results from this independent study showed<sup>2</sup>:

- A high level of loan repayment (94%) and LPG usage;
- Reductions in HAP personal exposure (fine particulate matter which contribute to respiratory illnesses and pneumonia in children) due to LPG adoption;
- Reductions in self-reported health symptoms and burns in women and children;
- Ongoing LPG usage by borrowers after the initial cylinder, as measured through refill purchases;
- Wider LPG community adoption beyond the microloan recipient group. The program was so popular that nearby communities wanted to replicate it; Glocalgaz independently initiated a similar program with plantation workers.

Detailed results:

- The beneficiary sample covered a range of socio-economic status, with 24% earning below the national monthly average household income of 50,000 CFA (US\$90). Only 38% owned their own property and 45% rented their homes.
- Most households repaid the loan (89%), although 41% reported difficulty making repayments. The main reasons for delays in payments are reported below.

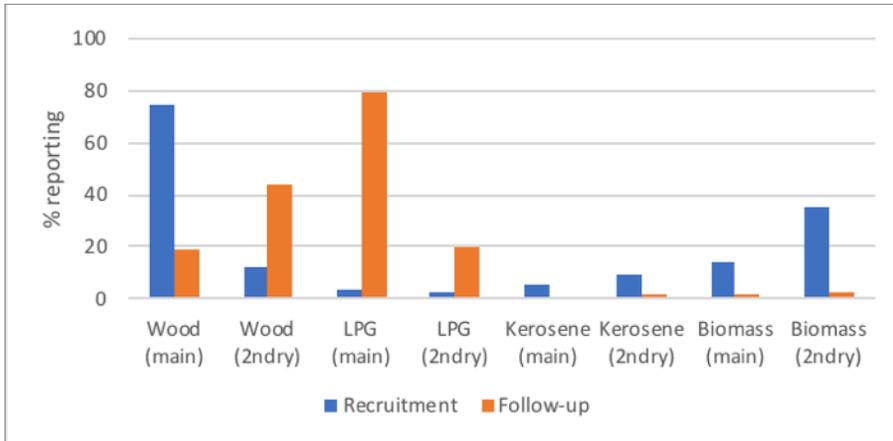
Why delays	No.	%
Family problems	4	7.1
Financial problems	9	16.1
Health (own or child)	16	28.6
Work problems	12	21.4
Bereavement	3	5.4
Travel	9	16.1
Other	3	5.4

TABLE 4: REPORTED DELAYS IN MAKING REPAYMENTS (N=56 OUT OF 110)

- Amongst program participants, primary fuel used shifted from wood (75%) and other biomass (15%) to LPG (79%) after the loan period, although no household yet used LPG exclusively. In comparison, almost no change in polluting fuel usage was observed in a control community where the microloan was not offered.

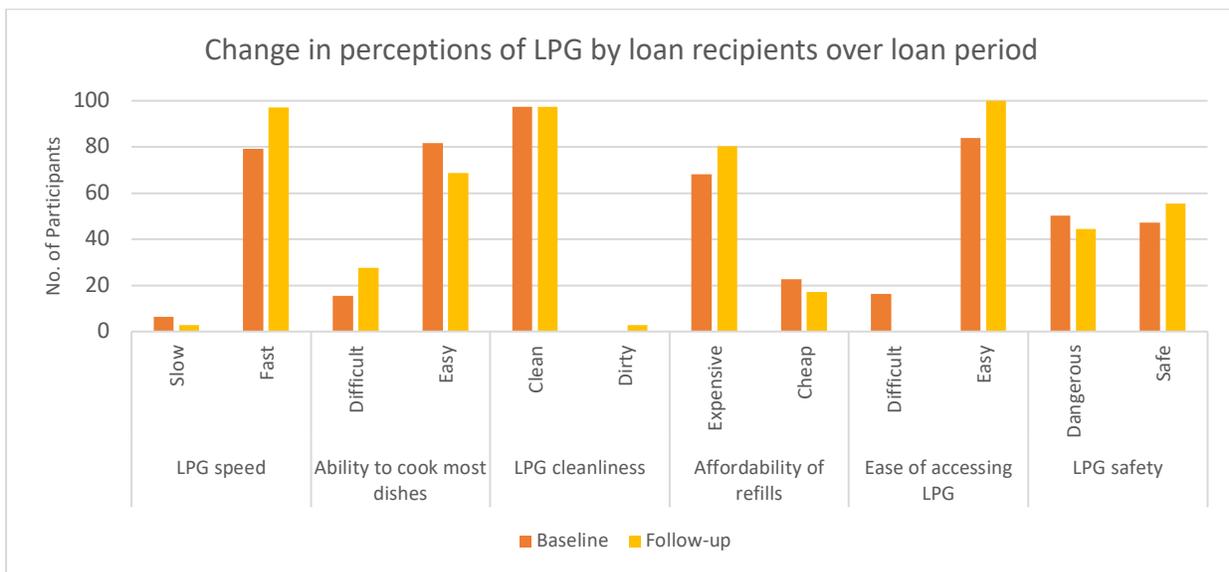
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<sup>2</sup> Pope et al. (2018). The Bottled Gas for Better Life Pilot: An Evaluation of the First Microfinance Initiative in Cameroon to Support Households Switch from Solid Fuel to LPG for Cooking. ISES-ISEE 2018 Abstract Book. Addressing Complex Local and Global Issues in Environmental Exposure and Health.



**FIGURE 2: PRIMARY AND SECONDARY FUELS REPORTED BY PROGRAM PARTICIPANTS**

- Levels of PM<sub>2.5</sub>, responsible for most of the disease related to household air pollution, were reduced significantly. Exposure in primary cooks was recorded to be below the World Health Organisation’s (WHO) indoor air pollution interim target I (WHO-IT1 of 35 ug/m<sup>3</sup>), which confirmed LPG’s health protective role.
- Significant reductions in headaches (46% to 9%), eye problems (66% to 8%), cook burns (25% to 3%) and child burns (9% to 0%) were also observed after families adopted LPG through the loan program.
- Changes in perceptions of LPG by loan recipients over the loan period are shown in the chart below. These results indicate that future iterations of the program need to address the need for education on cooking local dishes using LPG, as well as the affordability of LPG refills.



**FIGURE 3: CHANGE IN PERCEPTIONS OF LPG BY PROGRAM PARTICIPANTS OVER LOAN PERIOD**

Key results from 20 face-to-face qualitative interviews conducted with loan recipients include:

- Most reported using their gas stoves every day, some up to three times a day.
- Interviewees reported preferring cooking with their gas stove (to a three-stone fire) due to a

faster cooking speed, and it being cleaner and easy to use.

- Both loan recipients and non-recipients found gas cheaper than firewood if calculated according to the time the fuel lasted.
- Interviewees reported planning to continue using LPG after the loan was repaid.
- Most non-recipients of the loan reported that if they had taken the loan, they would have been able to pay it back on time.

### 2.2.2 Phase Ia evaluation

Key highlights on loan performance and LPG usage are as follows.

- By the end of the loan period, 94.9% of the loaned capital had been repaid.
- 43 out of 50 households (86%) completed repayments (Figure 4), with 38 (76%) of the total households completing repayments in under six months (Figure 5).
- Violent civil disorder broke out in the South West region of Cameroon towards the end of the loan period,<sup>3</sup> preventing the remaining seven households from completing repayments. The unrest also delayed loan collections for some households.

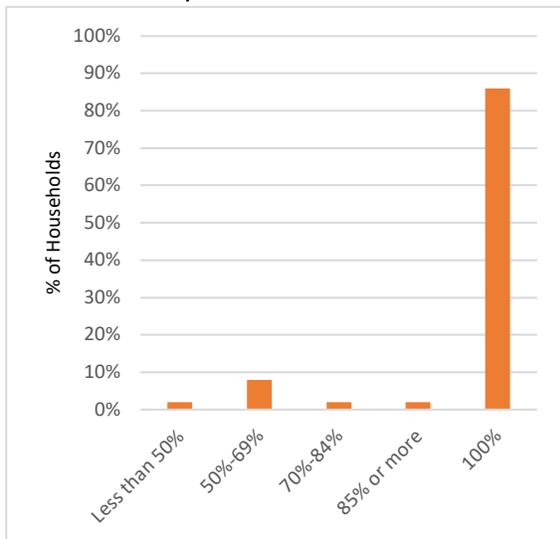


FIGURE 4: LOAN AMOUNT RE-PAID AFTER 6 MONTHS (N=50)

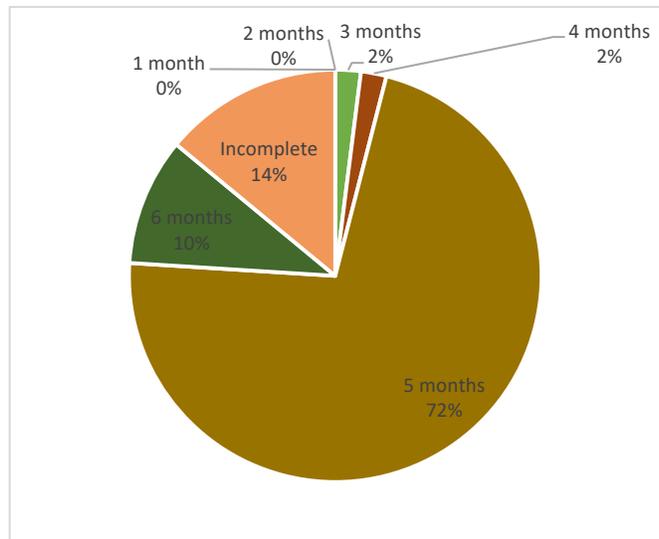
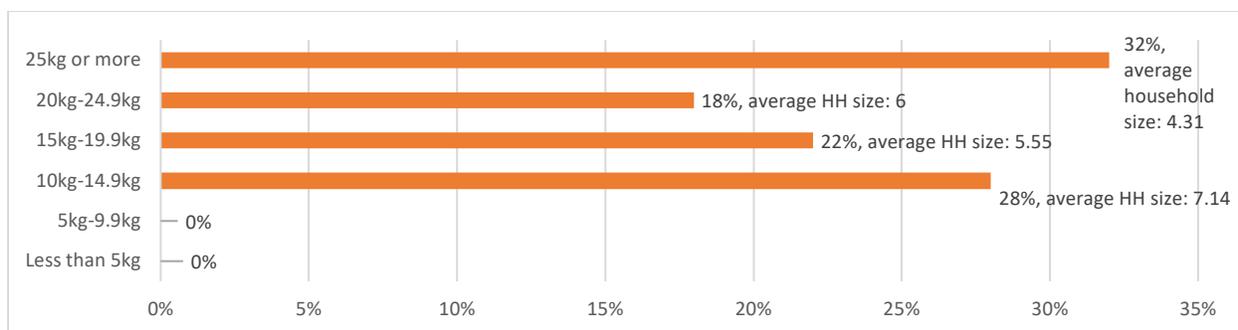


FIGURE 4: MONTHS TO COMPLETE LOAN REPAYMENTS (N=50)

- Overall LPG usage by participating households over the six-month period was reported at an annualized rate of 19kg/capita per year<sup>4</sup>. This is nearly five times the current national average in Cameroon of 4kg/capita per year.
- 50% of households had an annualized LPG consumption of 20kg/capita or more (Figure 6). Around 25kg/capita generally indicates sustained primary use of LPG for cooking.

<sup>3</sup> See: <https://www.theguardian.com/global-development/2018/may/30/cameroon-killings-escalate-anglophone-crisis>

<sup>4</sup> Methodology: Number of cylinder refills purchased during loan period multiplied by 12.5(kg) / Loan period in months multiplied by 12. An alternate methodology was used in earlier reports, which included the initial cylinder fill. The average consumption calculated this way was 22.9kg/capita/year. This is likely an overestimate, because not all customers would have fully used the final cylinder refill by the end of the loan period.



**FIGURE 5: HOUSEHOLDS' ANNUALIZED LPG CONSUMPTION IN KG/CAPITA (N=50)**

- Households sampled that consumed more LPG had a smaller household size (average of 4). It can be inferred that the households consuming more LPG used it for the majority or all of their cooking needs, while those consuming less LPG added it to their existing cooking fuels (fuel stack).
- Households purchased an average of 4.3 cylinder refills (12.5kg each) over the loan period, with almost 50% of households having purchased either 5 or 6 refills during the loan period.
- Interestingly, some households continued purchasing refills in the months in which they missed loan repayments. Six out of the seven households that did not re-pay the full loan amount had an average annual LPG consumption of 20kg per capita or more. This suggests that the households were unable to manage making both loan repayments and LPG refill purchases, and prioritized the latter.

### 2.2.2 Phase II preliminary baseline survey results

Baseline survey data collection is ongoing for Phase II, using a 10-minute survey questionnaire adapted from the survey used by the University of Liverpool in its Phase I evaluation. Baseline surveys are administered by the MFI staff prior to participants' receiving their new LPG equipment.

Preliminary results through the end of September, 2018 from 358 households (86% of total recipients to date) who had registered earlier for the loans, are summarized below. They represent all the communities except Njinikom (rural), Loum (rural/peri-urban) and Tiko (peri-urban).

- 55.9% of participants surveyed (n=200) live in urban areas, 20.7% (n=74) in peri-urban areas and 23.5% (n=84) in rural areas.
- The most common occupations of those registering for the loan were small business employees (38.5%) (e.g. who work in a shop), government employees (e.g. doctors, teachers) (16.2%), and shop owners (14.5%). Smaller groups included farmers (5.3%) or day laborers (8.1%).
- Households of different income quintiles registered for the loan, with close to 40% falling in the monthly household income range of CFA 101,000-200,000 (US\$89 - US\$176) (Figure 7). 40% of households have a monthly household income range of US\$89-176, or about US\$0.57-1.13 per capita per day, well below Cameroon's average per capita income in 2017 of US\$3.96 per day<sup>5</sup>.
- 61.2% of participants reported having taken a loan before.
- Wood was the primary cooking fuel used (43.9% of participants, n=157), followed by LPG (24.6%, n=88), charcoal (13.4%, n=48), kerosene (10.9%, n=39) and saw dust (7%, n=25) (Figure 8).
- Wood was the most common primary fuel used in rural areas (64.3%, n=54) and peri-urban areas

<sup>5</sup> World Bank data: <https://data.worldbank.org/country/cameroon>

(62.2%, n=46). In urban areas, the most common primary fuels were LPG (30.0%, n=60) and wood (28.5%, n=57).

- 85.2% of participants (n=305) paid for their primary fuels, including for wood (35.1%, n=107) (see Figure 9). Among those that did not pay for their primary fuels (14.8%, n=53), 30 lived in rural areas and 23 in peri-urban areas.

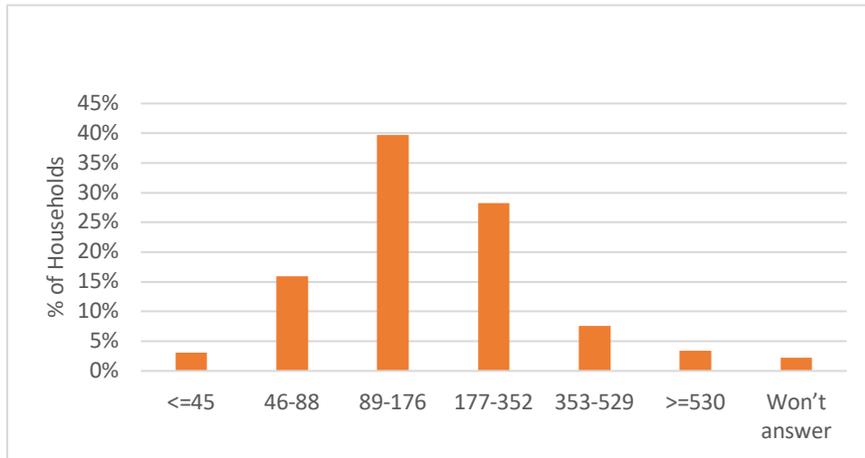


FIGURE 7: MONTHLY HOUSEHOLD INCOME (US\$) (N=358)

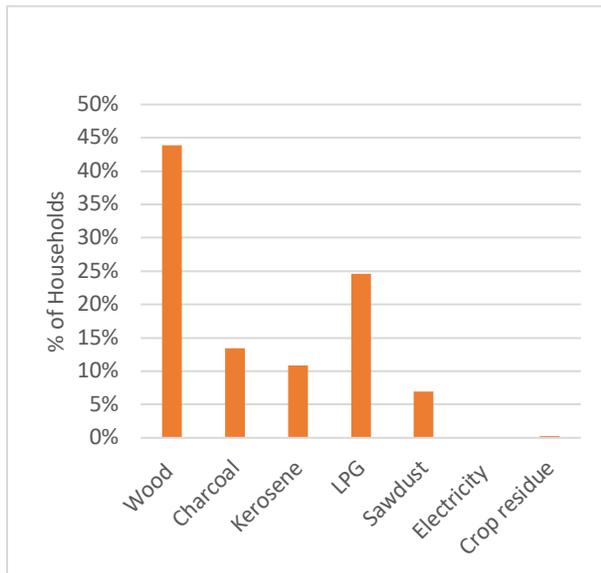


FIGURE 6: PRIMARY COOKING FUEL USED (N=358)

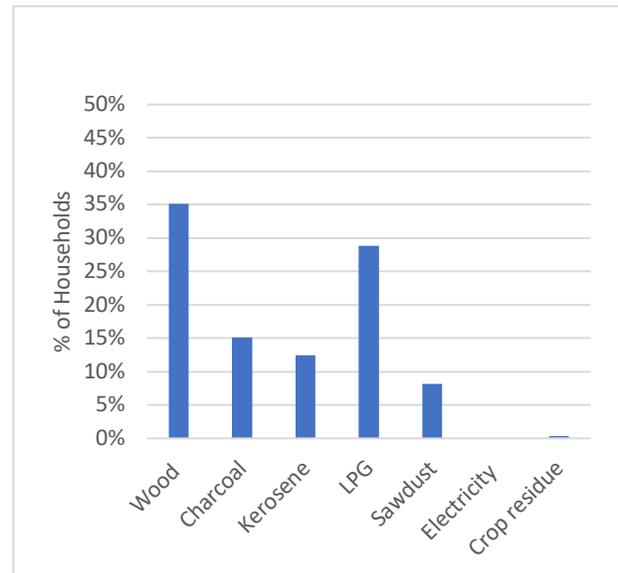
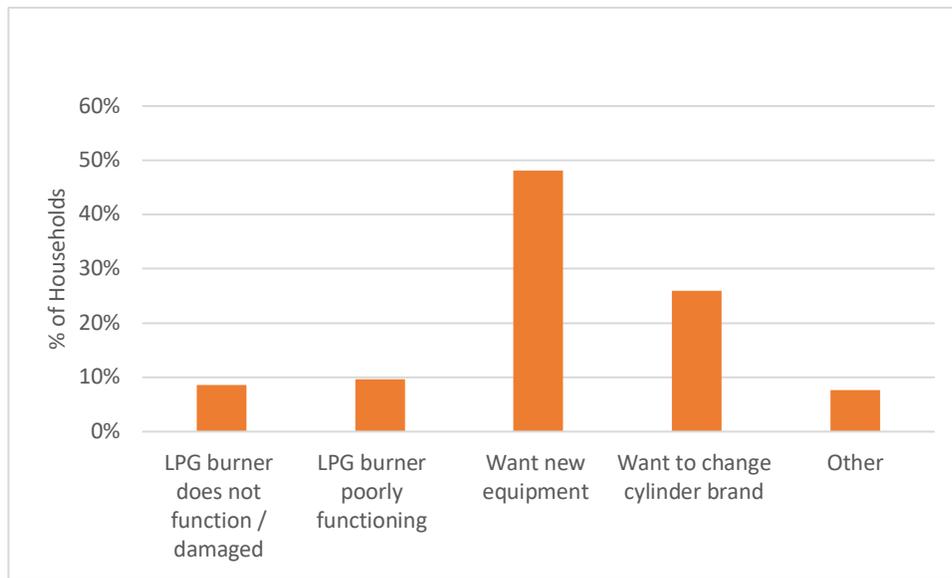


FIGURE 9: PRIMARY COOKING FUEL PAID FOR (N=305)

- Existing LPG users who requested the loan did so primarily because they wanted new LPG equipment through the loan (48.1%, n=50), 26.0% (n=27) because they wanted to change cylinder brands and 17.8% (n=19) because of a poorly or non-functioning burner (Figure 10).



**FIGURE 7: EXISTING LPG USERS’ REASON FOR REQUESTING LOAN (N=104)**

- Of the 104 existing LPG users, 73.1% (n=76) lived in urban areas, 13.5% (n=14) in peri-urban areas and 13.5% (n=14) in rural areas.
- At baseline, participants whose primary cooking fuel was wood (43.7% of all participants) reported spending an average of 3.2 hours cooking all meals in a typical day – including lighting a fire. Those whose primary fuel was LPG (24.8% of participants) spent an average of 2.7 hours cooking all meals daily.

### 3. Kenya

#### 3.1 Program Design

With Equity Bank as the financial partner and the National Oil Company of Kenya (NOCK) as the operational partner, the microfinance pilot program was launched in August 2018, targeting 150 households, to encourage household switching to LPG from biomass and kerosene for cooking. The equipment package offered includes a double burner stove, a 13kg LPG cylinder (6kg option also offered) and accessories.

A key criterion was to select an MFI that would likely be able to make LPG loans a part of its regular lending portfolio, and serve a large population across all regions of Kenya over time. Equity Bank is the largest bank in Kenya, with prior experience with financing LPG equipment for households, and has grown its customer base largely by serving “base of the pyramid” customers. Equity Bank was also able to provide the loan capital with a partial risk guarantee from GLPGP (unlike in Cameroon where GLPGP provided the loan capital).



Mwananchi Gas package with cylinder and single burner.

*Bottled Gas For Better Life* in Kenya complements NOCK’s Mwananchi Gas project, in which 6kg LPG cylinders with single burners on top (see image at right) are being made more affordable to low-income

Kenyans. It is part of the national goal to enhance LPG penetration from approximately 10%<sup>6</sup> to 70% by 2020.<sup>7</sup> Unlike NOCK's program, *Bottled Gas For Better Life* encourages participants to use larger 13kg cylinders and double burner stoves to encourage more exclusive use of LPG for cooking, as well as to address reported problems with the 6kg cylinder/single burner package offered through the Mwananchi Gas project.

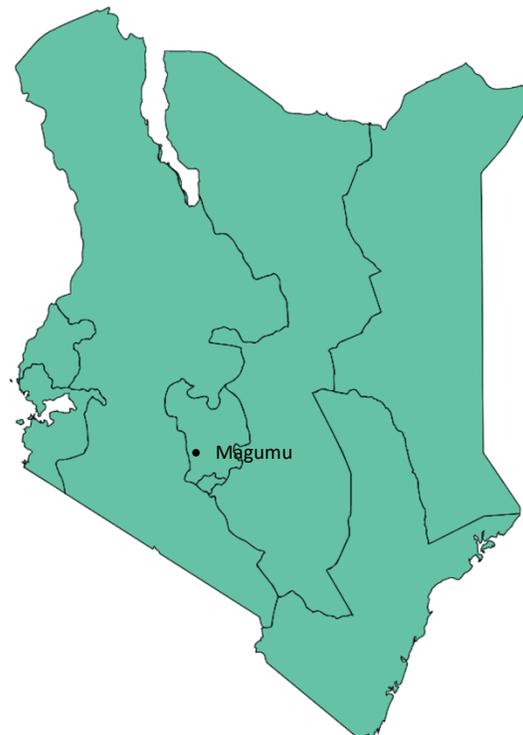
The selected community is Magumu village in Nyandarua county. A large proportion of residents cook with charcoal. This area is not currently served by the Mwananchi Gas project. The microloan program participants receive loans to cover the purchase of LPG equipment, which costs 9,900 KES (US\$98.01). Households pay an initial 0.625% insurance fee and a 5% processing fee, followed by six equal monthly repayments. Interest is charged on the loan principal, excluding the security deposit, at a rate of 1.083% per month on a declining balance basis. Ineligible households under Equity Bank's existing lending policies may be approved for the microloan on the condition of a co-guarantee with other households in the same village.

Loan recipients are requested to open an account with Equity Bank, which is requiring that new customers also pay a refundable security deposit of 2,000 KES (US\$19.80). As mobile banking is a well-established practice amongst Kenyans, customers will most likely make monthly loan repayments and purchase LPG refills using the Bank's mobile money platform. This will not only facilitate data collection on LPG refill purchases, but is intended to also minimize "leakage" from participants purchasing gas refills from illegal fillers, which remains common practice in Kenya.<sup>8</sup> A 13kg gas refill currently costs 1,900 KES (US\$18.81).

GLPGP, NOCK and Equity Bank jointly organized an awareness-raising event in a central shopping mall in



Cooking demonstration in Magumu on July 28, 2018.



*Bottled Gas For Better Life* in Nyandarua County, Kenya.

<sup>6</sup> The latest Kenya Integrated Household Budget Survey (KIHBS) recorded 13.4% primary LPG use in 2015/16 and 7% using LPG as secondary cooking fuel.

<sup>7</sup> See: <http://nationaloil.co.ke/gas-yetu-the-mwananchi-gas/>

<sup>8</sup> This is unlikely as the LPG price charged by NOCK's local distributor is competitive in the selected community.

Magumu on July 28. Local women were recruited to demonstrate cooking Kenyan delicacies using LPG stoves (including *githeri*, a slow-cooking staple meal that many Kenyans perceive can only be cooked with charcoal or firewood). Equity Bank staff explained the loan selection process and repayment terms; the branch manager was well versed in the local dialect and was able to explain the financing scheme. GLPGP and its partners had publicized the event through women’s groups, churches, and schools.

A small number of attendees at the event expressed interest in purchasing the LPG equipment via a “layaway plan”, paying in installments without taking out a loan. These customers would open an account with the NOCK distributor (i.e. becoming their customers), and pay for the equipment in interest-free installments. Unlike loan recipients, this group would only receive their LPG equipment upon completion of full payment.

Through mid-November, 63 households had registered for the program, of whom 12 purchased the equipment on a cash basis without taking the loan. Of the remaining 51, who had been approved by Equity Bank for credit suitability, 21 were members of a community savings association, SEMA. Another 21 households had already received their LPG equipment. There was also community interest in LPG for heating, which the program partners agreed to explore for a future microfinance pilot.

The microfinance program created policy momentum early on. The Woman's Representative for Nyandarua County visited NOCK's Head Office, and expressed concern that she had not been informed about the project. GLPGP and NOCK assured her that she would be invited to participate in program launch activities. She also expressed interest in providing resources towards the program. In addition, the Governor of Nyandarua County was enthusiastic and requested a briefing by NOCK and GLPGP. Other local political leaders including a Member of Parliament, a member of County Assembly, and the Chief of Administration were also engaged. The goal was to ensure that each leader felt involved so that they would provide goodwill and support towards the program.



Equipment delivery in Magumu on August 23, 2018.

### 3.3 Monitoring & Evaluation

GLPGP, in partnership with the University of California, Berkeley, USA and the University of Liverpool, received a grant from the London School of Economics (LSE)/International Growth Center (IGC) to fund M&E activities relating to the microloan program in Kenya. The evaluation will investigate:

- i. Whether the provision of microloans for upfront LPG switching costs is effective in driving low-income Kenyan households to switch from solid fuels/kerosene to cooking with LPG;
- ii. The effects of LPG adoption on health and time use;
- iii. Whether a commercially acceptable percentage of the loans will be repaid so that lenders are encouraged to embark on a larger roll-out; and
- iv. The household decision-making process in signing up for the loan and what population segment is the best target for lenders.

Equity Bank staff conducted baseline participant surveys designed by GLPGP to collect data relating to

demographics, cooking habits, and fuel use in the home. These will supplement more comprehensive surveys to be led by the Berkeley team. LPG refill purchases will be monitored to assess participants' LPG usage. Changes in outcomes within the loan recipient group will be compared with changes in outcomes in several nearby control villages where microloans will not be offered, controlling for individual-level baseline characteristics, as well as in other Magumu households that may have heard of the offer but not taken it. After the end of the 6-month repayment period, households participating in the microloan program will be surveyed, as well as randomly-sampled eligible households in Magumu (who did not take up the loan) and in nearby control villages.

## 4. Ghana

### 4.2 Program Design

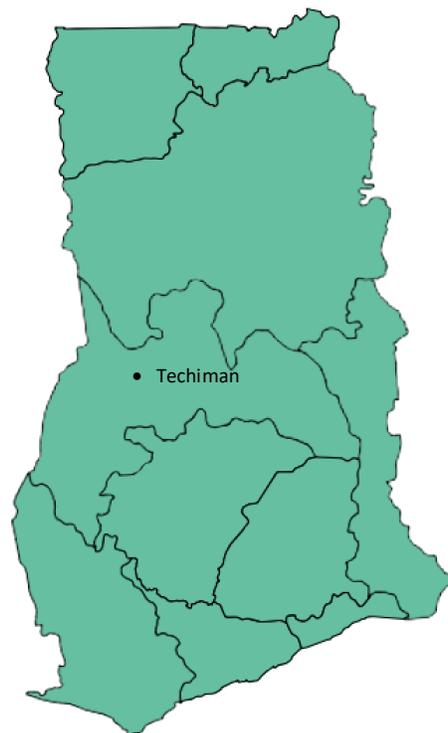
GLPGP is in process of negotiating a multiparty agreement for the microfinance pilot, which will cover 150 households switching to LPG from biomass and charcoal for cooking.

The microloan program participants will receive loans to cover the purchase of LPG equipment (double burner stove, 14.5kg cylinder and accessories), which costs 359 GHC (US\$71.80). Households will make an initial security deposit of 71.80 GHC (US\$14.36), followed by six equal monthly payments. Interest of 4% per month be charged on the principal, excluding the security deposit.

The selected project area is Techiman, Brong Ahafo Region. GLPGP and its partners will select a specific target community and plan next steps such as sensitization, registration, credit screening and baseline surveying of participants.

The microfinance sector in Ghana has proven much more difficult to navigate than in Cameroon and Kenya. Many MFIs were reluctant to lend to households due to the high level of non-performing loans in the microfinance sector, and the minimum capital requirements imposed by the Bank of Ghana. Some MFIs, unwilling to lend to households, would participate in a microloan pilot with commercial users such as street food vendors using charcoal who could be converted to using LPG – they are even more exposed to toxic smoke than household members. GLPGP may consider a microfinance program for commercial LPG users at a later stage, which could in turn also catalyze more household LPG adoption.

In addition, *Bottled Gas For Better Life* in Ghana will be conducted in connection with the transition to the cylinder recirculation model<sup>9</sup>, currently being implemented by the National Petroleum Authority to improve LPG distribution and safety. Therefore a key requirement of the selected LPG marketer is that it should be an early adopter of cylinder re-circulation, either via home delivery or exchange of marketer-branded cylinders (empty cylinder for full) at the marketers' distribution points.



*Bottled Gas For Better Life* location in Ghana.

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<sup>9</sup> See: <http://www.npa.gov.gh/news/cylinder-re-circulation-module>

## 5. Future *Bottled Gas For Better Life* Program Enhancements In Sub-Saharan Africa

*Bottled Gas for Better Life* continues to increase the visibility of LPG for clean cooking in Cameroon, Kenya and – prospectively, Ghana – as well as GLPGP’s partners’ profiles as socially responsible organizations.

Data from *Bottled Gas For Better Life* is still emerging. Complete results will allow GLPGP to more fully assess scalability and impact. There are already indications that our Cameroonian and Kenyan program partners see the program’s strong potential for replicability and scalability. The initial pilot partners in Cameroon agreed to an almost five-fold expansion of the program after seeing positive results from Phase I. Equity Bank in Kenya has also partnered with a new LPG company, Proto Energy, to provide first-time LPG users with loans to buy filled 6kg or 13kg cylinders, or a 6kg cylinder and single-burner stove package.

The longer-term objective remains to prove the concept of LPG microfinancing in order to help catalyze and develop a successful nationwide program. Such a program should be supported by local financial institutions fully responsible for loan funding and collections on a commercially sustainable basis, incorporating an LPG loan product within their regular lending portfolios.

*Bottled Gas For Better Life* has garnered interest not only from households but also from small businesses in the food services sector. A future phase of the program may involve providing business microloans for the purchase of LPG for commercial use. Loans to micro and small enterprises (SMEs) should constitute a lower risk lending activity to MFIs than household lending, since the LPG is used for an income-generating purpose. Many micro-entrepreneurs and small business owners in Cameroon, Kenya, and Ghana already belong to organized credit and savings groups.

There is also an opportunity to expand the program through creating synergies with other energy services. GLPGP has received extensive interest from companies in the off-grid solar energy sector to collaborate on delivering LPG for cooking and solar home systems as a bundle to customers, either via microfinancing schemes and digital repayments, or potentially using early-stage Pay-As-You-Go technologies.

As the program expands in Cameroon and gets underway in Kenya and Ghana, more data will be aggregated which can be compared across countries. More in-depth household surveys including, wherever possible, measurements of personal exposure in samples of households before and after LPG adoption, will be considered. Opportunities for acquiring data necessary for a rigorous cost-effectiveness analysis of LPG use will also be explored.