



# ELECTRIC BANKERS

Utility-Enabled Finance  
in Sub-Saharan Africa

## **ACKNOWLEDGMENTS**

This paper would not have been possible without generous time and contributions from a number of people, especially Sam Grant at CLASP and Alexander Sotiriou at CGAP. The authors would also like to thank the following people for taking the time to contribute their thoughts and insights: Samson Ondiek (KPLC), Peter Mwesiga (Umeme), Jessica Stephens (AMDA), Nicole Poindexter (Black Star Energy), Erika Lovin (CrossBoundary Labs), Katrina Pielli (USAID), Suman Sureshbabu (Rockefeller Foundation), Angus Marjoribanks (EnerGrow), Leo Blyth (Efficiency for Access Coalition), Jeffrey Stottlemeyer (CLASP), Miguel Yanez and John-Michael Cross (EESI), Gwen Yamamoto Lau (Hawaii Green Infrastructure Authority), Carlued Leon (MANAUS Consulting), Raluca Golumbeanu (World Bank), Brian Somers (Standard Microgrid), Travis Neal (OPALCO), and Fernando Alvarez Morales (Colpatria Scotiabank).

## **Consultative Group to Assist the Poor**

1818 H Street, NW, MSN F3K-306

Washington, DC 20433 USA

Internet: [www.cgap.org](http://www.cgap.org)

Email: [cgap@worldbank.org](mailto:cgap@worldbank.org)

Telephone: +1 202 473 9594

Cover photo by Wim Opmeer, CGAP 2018 Photo Contest

© CGAP/World Bank, 2020.

## **RIGHTS AND PERMISSIONS**

This work is available under the Creative Commons Attribution 4.0 International Public License (<https://creativecommons.org/licenses/by/4.0/>). Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the terms of this license.

Attribution—Cite the work as follows: Waldron, Daniel, and Siena Hacker. 2020. "Electric Bankers: Utility-Enabled Finance in Sub-Saharan Africa." Working Paper. Washington, D.C.: CGAP.

All queries on rights and licenses should be addressed to CGAP Publications, 1818 H Street, NW, MSN F3K-306, Washington, DC 20433 USA; e-mail: [cgap@worldbank.org](mailto:cgap@worldbank.org).

# CONTENTS

<b>Executive Summary</b>	<b>1</b>
<b>Moving Beyond Access to Financing Energy Use</b>	<b>2</b>
<b>What Is Utility-Enabled Appliance Financing?</b>	<b>4</b>
<b>Models, Benefits, and Challenges in Utility-Enabled Finance</b>	<b>8</b>
<b>Recommendations and Conclusion</b>	<b>13</b>
<b>References</b>	<b>15</b>



# EXECUTIVE SUMMARY

**A**ccess to electricity can be transformational, but only if people also have access to the appliances and technologies needed for its use. Research in Sub-Saharan Africa shows that high-quality appliances are largely out of reach for poor people. This paper focuses on one of the critical roadblocks to the uptake of appliances—a lack of access to consumer financing for lower income households—and explores how energy providers can close the credit gap.

Energy providers, specifically electric utilities and minigrids, are uniquely qualified to provide underserved customers with consumer financing for appliances. They have broad and diverse customer bases, rich customer data, established payment channels, and collateral. Providers in low-income areas, who struggle to recoup their infrastructure investments with payments from poor customers, also have strong incentives to help customers put their energy to work.

Utilities and minigrids that want to facilitate appliance financing have a spectrum of options. Utilities that are able and willing to play a more active role could offer good-paying customers credit on their own balance sheet to purchase approved appliances. More financially constrained or risk-averse utilities could use their data and relationships to help third parties offer similar financing to the same clients. They also could make customer data and/or repayment channels available to multiple lenders who meet their criteria.

Utility-enabled financing can benefit customers as well as providers. Low-income households have few affordable options for financing appliance purchases. A utility finance program in Latin America was the only formal credit available to 29 percent of customers (Leon 2016). Responsible financing can unlock latent demand for electricity and improve customers' perception of their utility.

Successful utility-enabled financing models must overcome several financial and operational challenges while protecting their customers. Loss-making utilities may struggle to raise additional capital or manage a credit operation. Issues with the reliability of electricity may make customers less willing to pay for appliances that they cannot use consistently. Energy providers must ensure that any lending program embodies consumer protection principles and does not result in customer overindebtedness. Protections and verification need to be in place around the use of consumer data, product warranties, and customer understanding of terms and conditions.

Increasing ownership of electrical appliances can turn energy access into development impact by reducing drudgery, saving time, and unlocking greater economic potential. Offering financing that enables appliance ownership and higher levels of electricity demand is part of a larger shift that utilities can make toward a customer-centric, service-based approach. Powering households was the first step. Empowering them is the next.

# MOVING BEYOND ACCESS TO FINANCING ENERGY USE

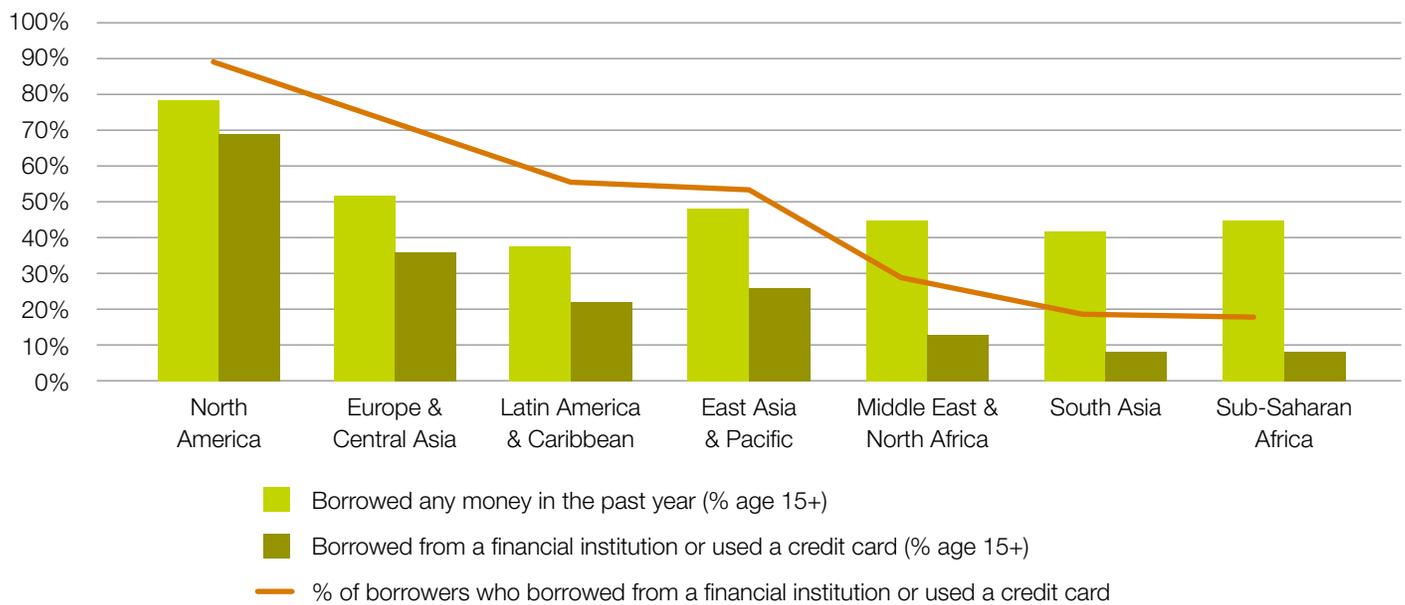
**T**HE NUMBER OF PEOPLE WITH ELECTRICITY IN SUB-SAHARAN AFRICA (SSA) has increased by 73 percent from 2010 to 2018, reaching 490 million people. Twenty-two countries in SSA have doubled the number of people with access to electricity over that time (IEA 2019a). Though there is a long way to go to reach universal access—595 million Africans still do not have any form of electricity—there also is a need to better support households in using their newly acquired energy.

Access to electricity can transform a life, a house, a village—but only if the appliances and technologies needed to use it are present (McCall and Santana 2018). Financial inclusion plays a key role in this transformation. Prevailing theories on financial inclusion are that people do not want a bank account for its own sake: they want financial services that help them grow their opportunities. Similarly, people do not want electricity, but rather the things it can power: welders or water pumps that can increase incomes, washing machines or refrigerators that save time and money, fans or televisions that improve the quality of life.

Research shows that appliances are largely out of reach for poor people in SSA. Just one in nine households owns a computer (ITU 2020), one in six owns a refrigerator, and one in three owns a television. In rural areas, access is particularly low: 4 percent and 18 percent of households own a refrigerator and television, respectively. In contrast, the country of Japan has one-eighth the population of SSA, but 40 percent more refrigerators (Efficiency for Access Coalition 2019a).

There are many reasons why appliance ownership has lagged in SSA. These include low incomes, high electricity tariffs, and many low-quality or unaffordable appliances. This paper focuses on one aspect of affordability—consumer finance—and energy providers as a potential provider or facilitator of that finance.

In this paper, consumer finance is defined as credit tied to the acquisition of a product that allows the acquirer to pay over time. It can help low-income households acquire the appliances they need to increase their quality of life. In Côte d'Ivoire, one in two households can afford a television bundle with financing, compared to 1 in 10 without financing (Efficiency for Access Coalition 2019a). In many SSA countries, households lack access to formal credit sources, such as consumer finance. As shown in Figure 1, just 18 percent of SSA adults who borrowed money in 2017 reported borrowing from a formal lender, the lowest of any region (Demirgüç-Kunt et al. 2018).

FIGURE 1. **Borrowing and formal borrowing across regions, 2017**

Source: Demirgüç- Kunt et al., 2018.

Energy providers, specifically electric utilities and minigrids, are uniquely qualified to bridge that credit gap and provide underserved customers with consumer financing for appliances. (See Box 1 for a brief description of electric utilities and minigrids.) They have broad and diverse

customer bases, rich customer histories, and established payment channels. Providers in poor areas, who struggle to recoup their infrastructure investments with payments from poor customers, also have strong incentives to help customers put their energy to work (Márquez and Rufin 2011).

A report on Kenya's grid expansion noted that in 2016, rural households connected for two years still used less than 700 watts-hours per day—barely enough to power two small incandescent light bulbs through the night (Taneja 2019, p. 9). The report concluded, “Without improving consumption density, rural areas are likely to remain poorly-developed, limiting human and economic development. . . . Simply providing access to electricity has not proven to be enough to catalyze rural development; a more holistic approach is needed.” Appliance finance, enabled by energy providers, is a part of that holistic approach.

#### BOX 1. **Public utilities and minigrids**

Public utilities are businesses that provide a public service, such as water or electricity, and maintain the infrastructure to do so. They can be privately or publicly owned. For services such as electricity, utilities are granted natural monopolies in their area of operations (i.e., a city needs only one set of power lines). Due to the importance of their service and the lack of competition, utilities are regulated more closely by dedicated utility regulatory commissions than are normal businesses.

Minigrids are small utilities that provide electricity to a localized set of customers and do not rely on national power grids. They can be owned by governments, localities, or private operators. Approximately 15 million people in Africa get electricity from minigrids (ESMAP 2019). Minigrids are the least costly way to provide access for 30 percent of those who are currently without power (IEA 2019b).

# WHAT IS UTILITY-ENABLED APPLIANCE FINANCING?

**U**TILITY-ENABLED FINANCING IS AN UMBRELLA TERM FOR A RANGE of financial and business services that utilities and minigrids can offer or facilitate, with the goal of increasing customer access to consumer finance for electric appliances. These services can range from allowing appliance finance companies to use utility payment channels and distribution, to partnering with financial institutions that can underwrite appliance loans using consenting customers' data, to providing credit directly to customers for appliance purchases at specific retailers. For customers, utility-enabled financing can significantly increase the value they receive from their access to energy and improve their quality of life.

## What assets enable utilities and minigrids to offer appliance financing?

Energy providers, particularly those in poor areas, have a history of finding ways to enable customers to consume their energy. As early as 1909, the Commonwealth Edison Company in Chicago was selling electric appliances (Field 1990). Consumer financing from retailers, utilities, and electric cooperatives played an important role in America's rural electrification, as it did elsewhere (Cebul 2018).

Case studies of success in this area point to four major enablers that utilities and minigrids can leverage to deliver inclusive, impactful financing (Leon 2016):

1. Broad and diverse customer base
2. Consumer data
3. Established payment infrastructure
4. Collateral

### BROAD AND DIVERSE CUSTOMER BASE

In exchange for their natural monopolies, electric utilities and minigrids are required to serve everyone: poor, rich, formally or informally employed. Customer-provider interactions may differ, but the mayor of a city and someone living in a connected shack on its outskirts both purchase electricity from the same provider.

### BOX 2. Lessons from Promigas

Promigas operates six local gas utilities in Colombia, reaching 4.4 million users. Decades of financing \$500–600 gas connections taught Promigas two lessons (IFC 2014):

- Low-income households were not as risky as believed (with repayment rates at 98 percent on connection loans).
- 70 percent of its clients had no access to formal credit or an established credit history, except with utilities.

Drawing on these insights, Promigas developed a credit facility called Brilla. It is available to any customer who has not missed a payment in 24 months and has no defaults or arrears in the local credit bureau. Retailers check the customer's credit limit through an online portal (average credit is \$570 for poor customers) before selling them a preapproved product (Promigas 2018; Leon 2016). As of 2015, Brilla had lent \$460 million to over 1.7 million households, with nonperforming loans at 2.7 percent. An impact study found that Brilla was the only formal finance available to 29 percent of users (Leon 2016).

Energy providers in SSA serve many low-income customers. Only 15 percent of the continent's population lives on more than \$5.50 a day (World Bank 2020), but 44 percent have electricity (IEA 2019). This means that 300 million low-income Africans have a relationship with an energy provider, which in most cases is a utility.

Utilities interact with poor customers in ways that few other companies do. They have hardware installed in households, accept small, frequent payments, and address service issues. These regular touchpoints offer them an opportunity to understand the cash flows of low-income households and to tailor products and services accordingly. This is illustrated by the experiences of Promigas in Colombia described in Box 2.

### CONSUMER DATA

Utilities possess a wealth of data on consumers who otherwise have little to no measurable financial activity. They know how frequently customers pay, how much energy they consume, and even at what time they consume it. These data, if used with the customer's informed consent, can expand access to credit for customers who have few

other analyzable financial transactions. In the United States, the inclusion of utility and telecom data in credit bureau scoring increased coverage of adults from 88 percent to 98 percent, and it particularly benefited minorities, young adults, and the elderly (Turner et al. 2012).

These data enable utilities to determine a customer's risk profile and/or whether a given appliance will save them money on electricity—factors that can help them decide whether to approve consumer loans. In one example of this approach, Hawaii's Green Energy Money Saver (GEM\$) on-bill program first screens out customers that have been issued a disconnection notice in the past 12 months, then approves remaining customers if the financed improvement lowers their monthly bill by at least 10 percent.

Utility data also can be made available (with informed consent) to third parties who can conduct sophisticated credit analyses or use them to guide their marketing efforts. See Box 3 to learn how Codensa, a utility in Colombia, works with its banking partner to leverage customer data.

In another example, Uganda's main utility, Umeme, recently partnered with EnerGrow, an asset-financing company that provides business training and loans to small businesses for approved

income-generating assets. Using repayment and consumption data from Umeme, EnerGrow can offer more customers finance for productive assets.

## ESTABLISHED PAYMENT INFRASTRUCTURE

Utilities must collect regular payments from their customers. Some bill monthly, while others sell prepaid tokens. In either case, utilities offer a variety of ways to make these payments: payment halls, partner banks, mobile or online channels, and third-party payment points, such as local partner shops.

Through on-bill financing (OBF) and on-bill repayment (OBR) programs, utilities allow customers to make repayments for financed assets on their monthly utility bills or as an addition to their prepaid tariff. These loans can be represented as a line item on an owner's or renter's utility bill until they are repaid.

This billing or tariff mechanism can be used to repay a utility loan (OBF). It also can be used to repay loans from other private lenders (OBR). In some jurisdictions, such as Colombia, laws allow utility customers to pay their energy bill only in a given month. Still, providers like Codensa–Colpatria credit OBR for customers' high repayment rates (Enel X 2019).

For a variation of this approach that caters to landlords and their tenants, see Box 4 for an example of an on-bill tariff system.

### BOX 3. Experiences of Codensa and Colpatria

Codensa, a utility operating in Bogota, Colombia, works with its banking partner Colpatria to analyze payment and consumption data, along with other data, to make decisions on loan approvals and limits for its Crédito Fácil loans and credit cards. Customers who want the product can apply for it through a Crédito Fácil agent at a retail outlet or directly through Colpatria.

Approval rates are 40–50 percent, and credit limits range from \$110 to \$3,700, with a maximum of four times the applicant's monthly income. For three-quarters of borrowers, it is their first source of formal credit (Alvarez 2020). Crédito Fácil's 30-day portfolio at risk was 4.4 percent in September 2019, well below Colpatria's portfolio average. Codensa and Colpatria also report repayment information to the credit bureau. Subsequently, 23 percent of Crédito Fácil participants have been able to access financing elsewhere thanks to the program (Leon 2016).

### BOX 4. GEM\$ and on-bill tariffs

The use of the energy bill to facilitate loan repayment can have powerful advantages for renters, who make up the majority of households in African cities: 8 out of 10 households in Kampala rent, 9 out of 10 in Nairobi rent (CAHF 2019; Gardner et al. 2019). Yet renters often are unwilling to pay for durable goods in a residence they don't own, while landlords who don't pay utility bills have little incentive to invest in energy-saving upgrades.

Programs such as GEM\$ in Hawaii mitigate this misalignment by using an on-bill tariff system, where the obligation to repay an appliance-backed loan is attached to the meter of a residence, rather than to an individual customer. If the customer moves, the appliance stays, and the obligation is assumed by the next resident, who will pay the monthly tariff on their utility bill. If a property sits vacant, utilities can reschedule repayment for some amount of time until the residence is occupied again. This flexibility can help renters to access higher-quality appliances.

## COLLATERAL

Utilities can stop electric service for customers who don't pay their loans, which may reduce the probability of default. However, disconnection is a recourse of last resort for energy providers, as it can eliminate future electricity sales, damage the reputation of the provider, and hurt the same lower-income customers that the programs are meant to help. Rules around disconnection for nonrepayment also vary by utility and regulator. In the Colombian examples cited in Box 2 and Box 3, regulation allowed users to continue paying their energy bill without servicing an OBF loan, although it is unclear whether customers fully understood this option (Leon 2019).

Because of consumer protection, political, and regulatory concerns, shutting off utility service as a payment enforcement mechanism is likely to function better as psychological collateral than actual collateral, at least for traditional appliance financing. But, as shown in Box 5, innovative providers are exploring ways of bundling energy service and appliances to create a pay-as-you-go experience for grid customers.

### BOX 5. **Standard Microgrid and bundling**

Standard Microgrid in Zambia takes the bundling of energy and financing to a new level. Instead of selling households a grid connection, which they can use to power any electric appliance they choose, it offers grid energy as a service. Households can choose from a menu of appliances for a set fee per day. For example, use of a light may cost 40 kwacha per night, while a TV may cost 125.

Use is prepaid and managed by a smart meter. When users don't make payments, none of the assets works. After a set period of time, ownership reverts to customers, and they pay less to use the asset. The approach is intuitive and understandable, and it incentivizes Standard Microgrid to use efficient appliances to keep its energy generation costs low.

# MODELS, BENEFITS, AND CHALLENGES IN UTILITY-ENABLED FINANCE

**UTILITIES AND MINIGRIDS THAT WANT TO FACILITATE APPLIANCE** financing have a plethora of options. These range from active, utility-led consumer finance to more passive enabling of one, or several, lenders. This section explores the potential benefits and challenges of utility-enabled appliance financing and various scenarios of involvement.

## Models and their trade-offs

When offering consumer finance, the level of involvement can vary widely. Energy providers that want a hands-off commitment may skew toward the less involved end of the spectrum shown in Figure 2. Others, however, may find that a more involved approach fits their needs best.

### HIGH INVOLVEMENT

In a high-involvement scenario, a utility could offer good-paying customers credit, on its own balance sheet, to purchase approved appliances at a trusted retailer. The utility would pay the

FIGURE 2. **Spectrum and examples of utility involvement in asset finance schemes**



retailer upfront, while the customer would pay the utility back over time. The finance payments could be paid separately or added to electric payments already in place as a separate line item on a single bill.

**Advantages.** The utility would capture most or all of the additional revenue from financing. It could ensure that lower-income customers are given a chance to participate. Higher involvement would keep more customer-facing operations under a single roof, allowing for closer monitoring and better controls on important concerns like appliance quality (see Box 6). Successful programs could improve the utility's reputation with customers.

**Disadvantages.** This approach would be subject to regulatory scrutiny from utility commissions, which would need to ensure that core utility service is not compromised. Utilities may struggle with various aspects of consumer finance such as asset–liability management, underwriting, or collections. Establishing and funding the lending operation will require surplus capital that most African utilities lack and could struggle to raise.

**BOX 6. Appliance quality:  
Penny wise or pound foolish?**

There is a link between high-quality appliances, customer experience, and repayment rates: if an appliance does not work, no one will pay the financing charge for it. A Sri Lankan case study on solar home systems with poorly functioning batteries found that “very often households refuse to pay their loans when their systems become inoperable” (Laufer and Schäfer 2011). By contrast, a similar program in Bangladesh that took “due care on the quality assurance and post-installation maintenance service of the systems at the local level” achieved “very low default in loan repayment” (Palit 2013). Quality-verified products can decrease defaults and improve the sustainability of financing initiatives.

## LOW INVOLVEMENT

In low-involvement scenarios, the energy service provider could use its data and relationships to help a third party offer similar financing to the same clients.

**Advantages.** This would require fewer regulatory approvals (as the utility would not be offering financing itself), allow more experienced lenders to set up and run the credit business, and protect the utility from the risk of nonpayment. The utility could still receive some share of financing revenue, and expenses would be lower. The potential for greater access to other financial services, such as formal savings, insurance, or business loans, may also be greater with established financial services providers.

**Disadvantages.** Third parties might be naturally inclined to target less-risky, higher-income customers and ignore poorer segments. Revenues from financing would likely be lower. Consumer protection also would be harder to manage through an outside firm, which could threaten clients with more aggressive credit practices and expose the utility to reputational risk. Conversely, a successful program may not redound to the utility's benefit.

In open scenarios, a utility makes its customer data or repayment channels available to multiple lenders who meet given criteria.

## OPEN

**Advantages.** This approach could create helpful competition, potentially creating better terms for borrowers. Instead of picking winners, the utility could let other firms innovate. More specialized credit offerings also might become available.

**Disadvantages.** Outcomes still must be tracked, and multiple partners would add a monitoring burden. Increased competition could lead to negative customer circumstances, such as overindebtedness.

Each of these approaches entails trade-offs that will need to be understood, assessed, and mitigated. But contextual factors also will play a major role in dictating the appropriate financing model for each utility and minigrd.

## Benefits

Utility-enabled financing can benefit electricity providers and their customers through impact, inclusivity, complementarity, and profit.

**Impact.** First and foremost, utility-enabled financing can increase the ownership of electrical appliances—tools that turn energy access into development impact. In the United States, the penetration of modern household appliances, like refrigerators and stoves, decreased women's weekly housework time burden by approximately 70 percent, from 45 to 15 hours a week (ESMAP and Dalberg 2015). In addition to reducing drudgery and saving time, appliances can unlock great economic potential. Ugandan micro, small, and medium enterprises that

FIGURE 3. High-performing appliances help achieve the SDGs



purchased off-grid refrigerators increased their daily incomes by 250 percent on average (Efficiency for Access 2019b). Figure 3 further explores the links between various appliances and the UN Sustainable Development Goals.

**Inclusivity.** The impact of appliances can be large, but the real advantage of utility-enabled financing is that it can reach lower-income households. These households often are excluded from more traditional forms of credit and are forced to pay higher rates for informal borrowing or unsecured digital credit. Utilities and minigrids can help poor households access affordable, secured credit and high-quality appliances. Evidence shows that increased availability of consumer finance helps poor households acquire consumer durables and shift their borrowing from informal sources of credit to formal ones, potentially at lower cost and greater security (Ruiz 2013).

**Complementarity.** Offering electricity without appliances is akin to giving a chef the ingredients for a meal and asking her to prepare it with her hands. Appliance financing is an important tool that utility customers can use to unleash the full potential of their electricity connection. There are clear synergies here for electricity providers who want to create thriving, electrified economies in areas where they extend access. Offering financing that will enable appliance ownership and higher levels of electricity demand is part of a larger shift that utilities can make toward a customer-centric, service-based approach.<sup>1</sup> See Box 7 for a brief look at minigrid appliance financing in SSA.

**Profit.** Although not all utilities will want or be able to turn a profit through appliance financing, it can be a profitable business line. Empresas Publicas de Medellin, a Colombian utility conglomerate that started a socially oriented financing program in 2008, incurred losses for years until it adopted a financially sustainable approach in 2013 (Leon 2016). By 2018 it had recouped earlier losses and reported a profit of \$6.3 million (EPM 2019).

**Reputation.** Electric utilities in SSA do not always have positive reputations with their customers for several reasons, including unreliable service and load shedding. This can be a challenge to a financing scheme, but it also is an opportunity for improvement. Enabling customers to realize value from their relationship with a utility could improve customers' perception of the utility and create positive feedback loops.

#### BOX 7. Minigrid appliance financing

Minigrid operators in SSA routinely struggle with low consumption. In 2016, one minigrid developer revealed that its median customer used less than 250 watt-hours per day, but also reported that 44 percent of customers said they “would purchase more electricity, if they could afford the upfront cost of appliances.” (Blodgett et al. 2016).

In 2019, seven operators in East Africa and Nigeria began addressing affordability by offering appliances to their customers on credit, financed on the minigrid operators' own balance sheets. Customers could pay down 20 percent, and pay the rest in 12 monthly installments. This offer drew 663 customers who used the financing to purchase refrigerators, televisions, speakers, and fans.

In the five months after appliance sales, energy consumption doubled and loan repayments were financially sustainable. An initial report concluded, “There is latent demand for appliances, but high upfront costs and credit constraints prevent customers from purchasing appliances” (CrossBoundary Lab 2019).

1 This approach, which brings together multiple energy technologies to deliver sustainable customer-centric energy service, is described by PowerForAll (2019) and others as “Utilities 2.0.”

## Challenges

Although the potential benefits of utility-enabled financing are significant, there also are very real challenges to implementing various schemes. Many of these issues can be mitigated through careful planning or well-structured partnerships, but each of them deserves full consideration.

**Finance.** Energy utilities in SSA have been almost uniformly unable to turn a profit. One report looked at the energy sectors in 39 African countries and found that just two were profitable (Trimble et al. 2016). Losses were mainly due to underpricing, overstaffing, high transmission losses, poor collections, and low consumption. Loss-making utilities may struggle to raise the capital needed to staff additional projects and finance appliance purchases repaid over months or years.

**Operations.** In some SSA markets, utility service can be unreliable. In a recent survey of 93 Nigerian technology start-ups, 57 percent reported that a lack of reliable electricity was a “major” or “severe” obstacle to their business, with the average firm reporting more than 30 power outages a month (Ramachandran et al. 2019). If a utility cannot provide reliable electricity, then few customers will trust it as a financial facilitator. Customers that cannot use their financed appliances also are unlikely to repay their loans. And the parastatal nature of many utilities can make it difficult to adopt new business lines and innovations.

**Consumer protection.** Credit is a double-edged sword. Unlocking finance for important appliances and assets, such as electric pressure cookers and refrigerators, can enable access for lower-income borrowers. But if these customers are sold financed assets that they are unable to repay, no one benefits. In 2020, Fernando Alvarez Morales, general manager of the Colpatria–Codensa program, talked about the program’s approach to lower-income customers: “If you over indebt customers from the beginning, if you don’t approach them judiciously, what you end up offering can end up punishing them, and that ends up being a social problem because you harmed that person for life. So, you have to be responsible when lending.”

**Finding partners.** Financing schemes may require collaboration, and lenders that are already in the market, such as banks or microfinance institutions, can be powerful partners. Utilities can augment their partnerships with lenders by using their data and marketing, as long as robust consumer protection frameworks are in place. However, there may be few established lenders willing to partner with utilities to reach their targeted audience: low-income customers. For example, Codensa’s initial search for a banking partner failed: “All banks...declined the offer, stating that they saw no sense in providing credit to high risk, low-income borrowers” (Lobo et al. 2014).

**Coordination.** If partnerships are made, incorporating partners into the program means aligning incentives and monitoring their activities to ensure customers are being protected. Appliance financing can succeed only if it embodies consumer protection principles.<sup>2</sup> Protections and verification need to be in place around the use of consumer data, product warranties, and customer understanding of terms and conditions.

2 Useful examples include the Client Protection Principles of the SMART Campaign (<https://www.smartcampaign.org/about/smart-microfinance-and-the-client-protection-principles>) or the Global Off-Grid Lighting Association’s Consumer Protection Principles (<https://www.gogla.org/consumer-protection>).

# RECOMMENDATIONS AND CONCLUSION

**A** **CONNECTED HOUSEHOLD'S POTENTIAL IS LOST WITHOUT THE** ability to acquire transformative appliances and technologies. Well-structured appliance financing programs can multiply the development impact of energy access, create new streams of revenue, and help overcome the financial challenges of last-mile electrification.

Utility-enabled financing will not be appropriate for every provider or every customer, but many utilities will be able to find a model that works for their market context, regulatory structure, and financial/operational situation. Data-sharing or co-marketing can work for those with lower capacity or risk appetite. Partnerships with lenders or direct financing of customers are options for better-capitalized and more progressive providers.

## Next Steps

Utilities and minigrids interested in appliance financing can take several steps to enter this market based on the four enablers highlighted in this paper.

**Customer base.** Talk with customers to understand what appliances they want but find to be unaffordable, where they buy these appliances, and if/how they access credit. Supplement this research with data on customers' repayment patterns and finance needs to create a hierarchy of appliance finance priorities.

**Consumer data.** Collaborate with donors to bring in data scientists and credit analysts to review utility data. Build an evidence-based framework for assessing potential borrowers and structures for sharing information with third-party lenders.

**Repayment channel.** Map all customer interaction channels (payment points, customer service, support centers, banking halls, etc.) to identify nodes that could be leveraged to apply for and access appliance credit. Postpaid providers can review the approval process for adding line items to a regular bill. Prepaid providers can assess the viability of adding a finance charge to a prepaid tariff and evaluate other payment options, such as mobile applications or prepaid credit vendors.

**Collateral.** Review the laws and regulations around disconnecting utility service.

Quantify the costs associated with disconnection, and incorporate this exercise into a larger exercise on formulating detailed credit policies.

In addition, utilities and minigrids can research potential credit and retail partners, and they can meet with them to get a sense of their capabilities and risk appetites, as well as potential requirements around data and revenue sharing.

Armed with a clear understanding of demand, supply, and options, utilities can begin to strategize and allocate resources for implementation, product design, fundraising, and/or partnerships. They also can begin scoping the appliances already on the market, keeping in mind the importance of high-quality appliances to the success of any asset-financing scheme.

## Role for Donors

Our research also shows that donors to, and investors in, the African utility sector play a catalytic role. They can enable appliance financing by helping to facilitate strategic planning, funding early-stage pilots, and bringing financing partners into the process (possibly with grant or guaranty funds to de-risk initial lending).

There are potential synergies for the many development finance institutions that work with both utilities and financial institutions in African markets. For some financial institutions, partnerships with utilities could be a valuable path to growth as they have the customer relationships, transaction data, and repayment channels needed to catalyze responsible lending to a new group of clients. Donors who are focused on increasing uptake of certain appliance categories, such as electric pressure cookers, could also help to encourage innovation through experimentation and convening.

## Powering empowerment

For any energy provider to be viable, it has to create sufficient value: for its customers and for its shareholders and partners. Currently, many African utilities are unable to do that. Appliance financing that is embraced as part of the holistic shift to customer-centric service can create value for customers and improve utility operations at the same time. Powering households was the first step. Empowering them is the next.

# REFERENCES

- Blodgett, C., E. Moder, L. Kickham, and H. Leaf. 2016. "Powering Productivity: Early Insights into Mini Grid Operations in Rural Kenya." Vulcan Impact Investing. <https://sun-connect-news.org/fileadmin/DATEIEN/Dateien/New/Kenya-Mini-Grids-White-Paper-VI2.pdf>
- CAHF (Center for Affordable Housing Finance in Africa). 2019. "Housing Finance in Africa: A Review of Africa's Housing Finance Markets." [http://housingfinanceafrica.org/app/uploads/2019\\_yearbook-20.12.2019-compressed.pdf](http://housingfinanceafrica.org/app/uploads/2019_yearbook-20.12.2019-compressed.pdf)
- Cebul, Brent. 2018. "Creative Competition: Georgia Power, the Tennessee Valley Authority, and the Creation of a Rural Consumer Economy, 1934–1955." *The Journal of American History*, 105 (1): pp. 45–70. <https://doi.org/10.1093/jahist/jay007>
- Colpatria. 2020. "Estados Financieros Condensados Consolidados al 30 de septiembre de 2019 y 31 de diciembre de 2018." <https://scotiabankfiles.azureedge.net/scotiabank-colombia/Colpatria/pdf/acerca-de/estados-financieros/notas-e-informe-del-revisor-fiscal-consolidados/Notas-Consolidado-y-EEFF-finales-Septiembre-2019.pdf>
- CrossBoundary. 2019. "Innovation Insight: Appliance Financing." <https://www.crossboundary.com/wp-content/uploads/2019/08/CrossBoundary-Innovation-Lab-Innovation-Insight-Appliance-Financing-Final-07-Aug-2019-1.pdf>
- Demirgüç-Kunt, Asli, Leora Klapper, Dorothe Singer, Saniya Ansar, and Jake Hess. 2018. "The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution." Washington, D.C.: World Bank. <https://datacatalog.worldbank.org/dataset/global-financial-inclusion-global-findex-database>
- Efficiency for Access. 2019a. "2019 State of the Off-Grid Appliance Market." <https://efficiencyforaccess.org/publications/2019-state-of-the-off-grid-appliance-market-report>
- . 2019b. "Learning Paper: The Challenges of Testing Off-Grid Refrigerators." <https://efficiencyforaccess.org/publications/learning-paper-the-challenges-of-testing-off-grid-refrigerators>
- Enel X. 2019. "Enel Partners with Scotiabank Colpatria to Expand Financial Services Offering in Colombia." Press Release. <https://www.enelx.com/en/news-and-media/press/2019/100/enel-partners-scotiabank-colpatria-financial-services-colombia>
- EPM. 2019. "Separate Financial Statements and Notes December 31, 2018 and 2017." <https://2018.sostenibilidadgrupoepm.com.co/pdf/29a.pdf>
- ESMAP (Energy Sector Management Assistance Program). 2019. "Mini-Grids for Half a Billion People." Washington, D.C.: International Bank for Reconstruction and Development/World Bank Group. [https://www.esmap.org/mini\\_grids\\_for\\_half\\_a\\_billion\\_people](https://www.esmap.org/mini_grids_for_half_a_billion_people)
- ESMAP (Energy Sector Management Assistance Program) and Dalberg Advisors. 2015. "The State of the Clean and Improved Cooking Sector." [http://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP\\_State\\_of\\_Globa\\_Clean\\_Improved\\_Cooking\\_sector\\_Optimized.pdf](http://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP_State_of_Globa_Clean_Improved_Cooking_sector_Optimized.pdf)
- Field, Gregory B. 1990. "Electricity for All: The Electric Home and Farm Authority and the Politics of Mass Consumption, 1932–1935." *The Business History Review*, 64 (1): pp. 32–60. <https://www.jstor.org/stable/3115844>
- Gardner, David, Keith Lockwood, Jacus Pienaar, and Miriam Maina. 2019. "Assessing Kenya's Affordable Housing Market." Centre for Affordable Housing Finance in Africa. <http://housingfinanceafrica.org/app/uploads/CAHF-Kenya-Housing-Analysis-FINAL-20190430.pdf>
- IEA (International Energy Association). 2019a. "World Energy Outlook 2019." <https://webstore.iea.org/world-energy-outlook-2019>
- . 2019b. "Africa Energy Outlook." [https://webstore.iea.org/download/direct/2892?fileName=Africa\\_Energy\\_Outlook\\_2019.pdf](https://webstore.iea.org/download/direct/2892?fileName=Africa_Energy_Outlook_2019.pdf)
- IFC (International Finance Corporation). 2014. "Inclusive Business Case Study: Promigas." <https://www.ifc.org/wps/wcm/connect/31d3f99f-9dbc-4a86-98a8-c3a63e3eb78b/Promigas.pdf?MOD=AJPERES&CVID=IJY4lwi>
- Laufer, Dino, and Martina Schäfer. 2011. "The Implementation of Solar Home Systems as a Poverty Reduction Strategy—A Case Study in Sri Lanka." *Energy for Sustainable Development*, 15 (3): pp. 330–6.

- Leon, Carlued. 2016. "Analysis of Utility Models for the Base of the Pyramid." MANAUS Consulting and Inter-American Development Bank. <https://www.manausconsulting.com/s/UTILITY-BUSINESS-MODELS-FOR-THE-BASE-OF-THE-PYRAMID>
- Lobo, Ivan D., Nathalia Franco, Roberto Gutierrez, and Eric F. Rodriguez. 2014. "Codensa: Easy Credit for All." Social Enterprise Knowledge Network, SKE-147.
- Márquez, Patricia, and Carlos Rufín. 2011. "Introduction: Utilities at the Base of the Pyramid." In Patricia Márquez and Carlos Rufín, eds, *Private Utilities and Poverty Alleviation: Market Initiatives at the Base of the Pyramid*. Northampton, Mass.: Edward Elgar Publishing.
- McCall, Margaret, and Scarlett Santana. 2018. "Closing the Circuit: Stimulating End-Use Demand for Rural Electrification." Rocky Mountain Institute. <https://rmi.org/insight/closing-the-circuit/>
- Palit, D. 2013. "Solar Energy Programs for Rural Electrification: Experiences and Lessons from South Asia." *Energy for Sustainable Development*, 17 (3), 270–9.
- Power for All. 2019. "Utilities 2.0: Integrated Energy for Optimal Impact." <https://www.powerforall.org/resources/reports/utilities-20-integrated-energy-optimal-impact>
- Promigas. 2018. "Promigas S.A. E.S.P. and Subsidiaries Consolidated Financial Statements June 30, 2018, and December 31, 2017." [http://www.promigas.com/En/Investors/InformacionRelevante/Promigas\\_Consolidado\\_EF\\_Jun\\_2018\\_Dic\\_2017\\_ENG.pdf](http://www.promigas.com/En/Investors/InformacionRelevante/Promigas_Consolidado_EF_Jun_2018_Dic_2017_ENG.pdf)
- Ramachandran, Vijaya, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. 2019. "The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector." Washington, D.C.: Center for Global Development. <https://www.cgdev.org/sites/default/files/new-economy-africa-opportunities-nigerias-emerging-technology-sector.pdf>
- Ruiz, Claudia. 2013. "From Pawn Shops to Banks: The Impact of Formal Credit on Informal Households." World Bank Policy Research Working Paper 6634. Washington, D.C.: World Bank. <http://documents.worldbank.org/curated/en/465221468286796985/pdf/WPS6634.pdf>
- Taneja, Jay. 2018. "If You Build It, Will They Consume? Key Challenges for Universal, Reliable, and Low-Cost Electricity Delivery in Kenya." Working Paper 491. Washington, D.C.: Center for Global Development. <https://www.cgdev.org/publication/if-you-build-it-will-they-consume-key-challenges-universal-reliable-and-low-cost>
- Trimble, Chris, Masami Kojima, Ines Perez Arroyo, and Farah Mohammadzadeh. 2016. "Financial Viability of Electricity Sectors in Sub-Saharan Africa: Quasi-Fiscal Deficits and Hidden Costs." Policy Research Working Paper 7788. Washington, D.C.: World Bank.
- Turner, Michael, Patrick Walker, Sukanya Chaudhuri, and Robin Varghese. 2012. "A New Pathway to Financial Inclusion: Alternative Data, Credit Building, and Responsible Lending in the Wake of the Great Recession." PERC Press. <https://www.perc.net/wp-content/uploads/2013/09/WEB-file-ADI5-layout1.pdf>
- World Bank. 2020. "World Development Indicators." Washington, D.C.: World Bank Group. <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>



