BRIEFING NOTE

PAYGO SOLAR: Lighting the Way for Flexible Financing and Services
Cover Photo: FIBR team members Javi Linares and Sushmita Meka in the field with PEG.
Briefing Note
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Background
Access to electricity is essential for economic development and human well-being. Globally, 1.2 billion people live without access to electricity, and another billion have extremely unreliable access to national electricity grids. These consumers spend a significant portion of their household budget on inefficient alternatives such as kerosene, candles, dry-cell batteries and diesel fuel that are expensive and cause damage to the environment and human health. The vast majority of this potential market is unlikely to receive a connection to national electricity grids in the near term, requiring standalone “off-grid” solutions that can operate independent of traditional utilities. An off-grid solar sector has emerged in the last decade, providing affordable energy solutions such as solar lanterns, portable solar kits and solar home systems to meet this substantial demand. With low, irregular and often unpredictable incomes, affordability and limited access to consumer financing options have been key barriers to mass adoption of off-grid solar products.

Pay-as-you-go (PAYGo or PAYG) is emerging as a solution that addresses both end-customer affordability and provides sufficient margins to fuel operational models that can scale. Under a PAYGo model, a low-income household can take home a high-quality solar home system by paying a deposit – typically 10-20 percent of the total cost of ownership – and committing to a certain number of ongoing payments by signing a solar lease with a PAYGo operator. The end customer makes payments in daily, weekly or monthly increments through a mobile money account; each payment typically pays down a portion of the principal. Proprietary hardware in the solar device regulates usage, disabling the energy services when the customer’s prepaid usage is used up or expires. Under most PAYGo models, the device permanently unlocks at the end of the lease period and ownership is transferred to the end customer.

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With over 1 million units installed in the last four years, and over 40,000 units installed each month, the PAYGo technology and financing model is responsible for unlocking significant growth for the off-grid solar industry.\textsuperscript{2,3} PAYGo company operations have been concentrated within the East African region, largely to take advantage of the high penetration of mobile money services among target customer segments. In these markets, PAYGo payments are made predominantly from a customer’s own mobile wallet via a bill payment service offered by the local mobile money operator. It’s common for PAYGo providers in these markets to integrate with multiple mobile money operators, giving their customers the capability to pay with any mobile wallet. By combining high-quality energy products, point-of-sale financing, mobile payments and data, PAYGo business models are able to deliver an energy and financing solution that is more flexible for end consumers and more operationally scalable than previous models.
The PAYGo solar sector also faces formidable challenges. First, there is a growing tension between the current rates of growth – as measured by number of new active users – and portfolio quality, particularly in markets where competition is forcing providers to lower the financial hurdles to become a new PAYGo customer. As PAYGo companies scale, figuring out the right agent engagement and compensation model becomes critical to driving sustainable growth and customer satisfaction, while also lowering what are currently high agent network churn and management costs. Many PAYGo providers are also finding that a large portion of the off-grid solar market is new to mobile money in general and to bill pay options in particular, forcing companies to play an active role in reducing frictions in the customer payment experience to minimize payment delays and customer churn. The PAYGo model is inherently capital intensive, requiring financing at a scale that will require new approaches to unlock capital from local financial institutions. The good news is that the PAYGo solar value chain is largely digitized already, creating opportunities to leverage smartphones and data to make progress toward meeting each of these challenges.

Introducing FIBR and PAYGo Solar

FIBR (Financial Inclusion on Business Runways), an initiative of BFA in partnership with Mastercard Foundation, brings together fintechs and banks to partner on using networks of small businesses to deliver digital financial services to low-income customers. FIBR’s the-
sis is that small and medium enterprises can act as an “indirect” channel for financial inclusion by interacting and transacting with a web of low-income employees, suppliers, and end customers on a daily basis. The proliferation of business data transaction as captured through smartphones can be used to tailor and link financial services to the low-income customer.

The emerging PAYGo solar sector offers high potential to advance FIBR learning and solutions development objectives. Through the solar lease, PAYGo operators provide a form of financing to low-income consumers that is well aligned with the FIBR thesis of indirect financial inclusion. The primary touch point with these consumers is often a commission-based agent equipped with a smartphone to carry out sales, service and often mobile payment functions on behalf of the PAYGo operator. Through predictive analytics and machine learning, data generated by products, payments and touch points are used by PAYGo operators to deliver flexible financing and services customized to low-income consumers. PAYGo solar is providing a tangible reason for low-income consumers to sign up for and use mobile money services, with over 1.6 million mobile money transactions recorded every month to top up PAYGo products. The PAYGo lease generates payment and credit histories that can be leveraged to provide additional services in the form of product upgrades, financing appliances and other livelihood-improving devices, and even financial products such as life insurance and school fee loans tailored to the PAYGo end customer needs.

This brief provides a summary of four key industry challenges that align with the FIBR learning agenda and that will be a focus of FIBR
investments in the sector over the next three years: 1) unlocking local capital, 2) building data-driven financial operations, 3) tackling customer payment frictions and 4) driving smarter agent network management.

Unlocking Local Capital

The PAYGo industry is beginning to attract significant capital from a diversity of funding sources. In the last two years, PAYGo companies have raised over $380M in debt, equity, and grant capital. There is now a large community of international funders putting money into the sector – at least 17 foundations, 21 impact investors, 4 four VC funds, two corporate VC funds, and 8 eight large companies. Financing of the sector is growing, but is still a significant bottleneck – particularly as regards debt. Debt is required for short-term working capital, financing for supply and distribution chains, and in other areas all the way to receivables and consumer-financing PAYGo portfolios. According to CGAP, reaching 15 million households with PAYGo off-grid solar by 2020 will require debt of at least $1 billion in that year, greater than what donors and impact investors alone may be able to provide.

Funding efforts to date have concentrated on equity and debt financing, largely to a select few enterprises concentrated in East Africa with a sizable customer base and multiple years of sales traction. So far, most debt offered to the PAYGo solar market has so far come from specialized bilateral development lenders with a focus on the energy access sector, such as OPIC or FMO, and has been denominated in USD, exposing PAYGo players to significant forex risk as their revenue is received in local currencies that are often volatile against the dollar. It is expensive and often difficult to hedge illiquid currencies, especially for small players with small volumes.

Driving up access to local sources of debt financing will be critical in the long-run. FSPs (financial service providers) in local markets could be the natural long-term solution to the sector’s debt financing needs, but so far have viewed PAYGo companies and their portfolios as too risky for a number of reasons. First, PAYGo models often permit irregular, or flexible payments that make it difficult to predict an individual customer’s repayment term. The loan portfolios at even the largest PAYGo players are still relatively small, and do not have a long enough repayment history (also contributing to the difficulty securitizing them). Most PAYGo operators are still in what could be
FSPs and PAYGo Operators appear to have complementary assets that could be leveraged to scale financing of the sector if properly synched up. On one side, banks and other financial institutions have access to low-cost sources of funding, specialize in managing consumer loan portfolios, and have the balance sheet strength to take on additional lending. PAYGo operators’ natural capabilities are in large-scale sales and distribution, lease origination, call center teams and technology to manage ongoing customer care relationships; they also, and have strong payment risk mitigation tools in the PAYGo hardware, and often have the ability to repossess the asset. A recent white paper by CGAP describes three ways in which PAYGo Operators and FSPs can combine forces: a) through a close partnership focused on core competencies, b) a PAYGo operator setting up a retail bank itself, or c) a financial institution can set up or acquire a PAYGo Operator.\(^8\) PAYGo technologies offer investors, donors, and eventually local financial institutions access to significant data on end consumers, payment and usage behavior, and the corresponding risk of non-payment and churn that could enable one or more of these models to be operationalized in the near term and replicated across multiple markets. Several MFIs (Micro Financial Institutions) have already started rolling out PAYGo solar offerings (FINCA International in East Africa and MicroCred in West Africa),\(^9\) and Equity Bank recently launched the “EcoMoto Loan,” which is a fully digital energy loan via the Equitel platform that facilitates the purchase of multiple home energy solutions, and is well-positioned to also integrate PAYGo solar offerings in the future.

Data-Driven Financial Operations

The sector’s ability to sustain the current pace of growth will largely depend on PAYGo operators effectively managing consumer finance risk at scale. PAYGo operators are flush with data generated on a daily basis through products, mobile payment transactions, and customer touch points. There are opportunities to significantly improve how PAYGo operators leverage these data sets to make better point-of-sale decisions and customize the financing offering, to segment and incentivize customers to pay in a timely manner, to inform future follow-on product and financial services offered. Improvements could ultimately be packaged and sold to third parties i.e., consumer electronics/fast-moving consumer goods (FMCG) companies interested in understanding these same markets.
PAYGo providers bring together multiple data sources when selecting sales and service areas, including population density, national grid penetration, mobile/data network coverage, competition’s operational reach and the location of mobile money and digital finance agents. Once operational in an area, PAYGo operators deploy a number of tools to inform whether or not to accept a prospect as a customer, and to gauge potential risks (non-payment, switching, dropout/churn) at point of sale. Data informing these decisions include geographic location, demographic information and amount and mode of payment selected by the customer to pay the initial deposit. Many operators also tie a portion of the sales commission earned by agents to the timeliness of the end customer’s first few payments as a way to incentivize the sales agent to select low-risk customers. In some markets, PAYGo operators are leveraging data from existing credit bureaus or telcos (calls, data purchases, mobile money transactions) to build a sense of the cash flow of a potential client before activating a new solar lease. A few PAYGo providers are also experimenting with the use of surveys to measure factors such as optimism, business acumen and confidence as part of the screening process.
Once in the system as an active customer, PAYGo operators shift their attention to ongoing customer management activities to drive payment behavior and retention. Many PAYGo providers allow for moderate to significant payment flexibility – i.e., customers can pay in amounts and frequencies that they choose – giving the company insights into the seasonality of income and expenditures within their customer base, as well as into geographic variations. At least four of the top five PAYG providers have also started to use a combination product, payment and usage data sets to inform the design of “upgrade” (upsell/cross-sell) products offered to good, paying customers, which is quickly becoming one way to measure retention in the industry.

As the industry begins to focus on sustainable growth and healthy unit economics, we can expect to see PAYGo providers begin to increase investments in internal credit management and data analytics functions. There is an opportunity to integrate internal (product performance and usage) and external data (telco, mobile, social) into improved customer selection and credit-scoring approaches. PAYGo operators could also explore partnerships with alternative data companies to analyze call/airtime/mobile money usage data and weather/crop records to improve payment prediction. As companies diversify their solar offerings to reach new segments and new markets, the PAYGo financing solutions may also begin to change, as data is used to more accurately assess risk and predict customer behavior at point of sale. For example, providers may begin to offer a “sliding” deposit that is informed by a prospect’s risk score, recommend a specific product configuration based on the assessment, or even test removing the deposit requirement altogether for extremely low-risk customers who are acquired through strong referrals or strategic partnerships that offer a transaction history on the prospect. A similar approach could be taken with other lease terms, extending a longer repayment term or added flexibility to customers deemed lower risk through segmentation and scoring at point of sale.

**Customer Payment Frictions**

The ability for low-income consumers to make micro payments via mobile money on a flexible schedule is a key enabler of the PAYGo solar model. As PAYGo operators move deeper into rural areas of the first few scaled East African markets and establish operations in other markets with lower mobile money penetration and infrastructure, these companies are playing an important role in pushing mobile money into frontier areas. CGAP research indicates that...
even in “advanced” mobile money markets such as Tanzania, 30 to 50 percent of PAYGo solar customers may be new to mobile money – i.e., setting up a mobile wallet in order to access solar.\textsuperscript{10} PAYGo solar operators are often facilitating this initial mobile wallet activation, providing training on mobile money bill pay, and have started to push their own solar sales agents into playing a role to facilitate the ongoing digitization of cash and actual bill pay transaction – roles otherwise played by a mobile money agent in more urban contexts.

In markets with established mobile money offerings and decent penetration (i.e., Tanzania, Uganda, Ghana), PAYGo enterprises still experience a number of challenges with last-mile payments, as their sales and operational footprint can extend beyond the existing reach of mobile money agents. In such areas, payments can be delayed as customers cannot conveniently access a cash-in point, agents are not equipped with sufficient float to meet demand or limited mobile network connectivity causes friction in the payment experience (i.e., delayed receipt of PAYGo product activation code). A cumbersome payment experience, combined with inconvenient access to cash-in points, can lead some customers to leave out of frustration, rather than out of dissatisfaction with the solar product and financing solution, or the inability to pay.

In markets with limited or emerging mobile money networks, developing effective solutions to frontier agent and customer payment issues is likely to become a standard part of business practice. In these markets, companies will begin to develop and deploy solutions that enable their own sales and service agents to conduct top-ups and activate new mobile money wallets, and may begin to issue and manage agent
liquidity. These companies are also likely to explore partnerships with agent aggregators and other players who could more effectively address these barriers. As smartphone penetration increases, providers may also explore the opportunity to deliver payment capabilities through a consumer-facing app that integrates with bank and mobile wallet solutions. Companies that invest the time and resources in perfecting such solutions will have a competitive advantage in the region, as new market entrants struggle to adapt their model to fit a market with limited last-mile agent coverage.

Agent Network Management

PAYGo businesses rely extensively on agents as the primary touch point with low-income consumers to conduct sales, payments, and customer care functions. The industry is increasingly digitizing these touch points by equipping agents with proprietary smartphone apps that enable a wide range of functions to be carried out at the village level in real time, including signing up leads, processing orders, troubleshooting hardware problems and even collecting cash payments.

A number of challenges are emerging on the agent side. First, operators are grappling with the overall agent engagement compensation model, with some pursuing a purely commission-based contractor model and others employing sales agents on a fixed monthly salary and commission basis. Recent analysis conducted by Hystra found that while the agent compensation costs as a percentage of sales may be lower under the commission-based contractor model, total sales costs may be higher due to higher levels of agent churn, which in turn requires more resources for recruitment and management. It’s not yet clear which model is the most appropriate for sustaining growth. Providers are also still experimenting with models that incentivize sales agents to play a role in vetting customers at point of sale, as well as to follow up on non-payment, by tying a portion of the sales commission to the end-customer’s ongoing payments. These all point to a higher level challenge of designing an agent model that balances both sales growth and portfolio performance.

As the industry scales, solutions will need to be developed to address these agent network management challenges. The smartphone plus app combination unlocks a number of opportunities for PAYGo operators. Data generated by the agent side of the business can be used to improve sales effectiveness (i.e., pre-screening of prospects), reduce operational costs (i.e., using GPS to determine
optimal routing for sales/service agents), real-time productivity and liquidity management (for agents conducting top-ups, or for income shaping) and direct compensation via instantaneous bank-to-bank, mobile money or e-float transactions. At the back end, PAYGo providers can leverage agent data to monitor sales and service performance against pre-set targets, set and adjust commission and bonus levels, and automate the assignment of sales and service tasks to agents based on location.

Conclusion
From FIBR’s perspective, the emerging PAYGo solar sector is already implementing what can be described as an “indirect financial inclusion” model. The low-income consumers are, in effect, being included into the formal financial sector by the PAYGo operators through the solar lease and digitization of the agent touch points. Data generated by PAYGo products, payments and touch points is already being leveraged to optimize field operations, and holds the potential
to inform both the design of more customized energy offerings and a wide range of financial solutions learned from the PAYGo industry experience. This is all happening at scales that are quickly giving FIBR the opportunity to both learn from the practitioners as well as to accelerate research and solution development to benefit the wider PAYGo solar and financial inclusion communities.

FIBR will work with a wide range of stakeholders across the PAYGo industry to conduct research and develop solutions in the four key target areas highlighted in this brief: 1) unlocking local capital, 2) data-driven financial operations, 3) agent network management and 4) customer payment frictions. Through the course of supporting innovative individual projects, FIBR will be collecting generalizable lessons that will be shared with the broader energy access and financial inclusion sectors, and will be updating the PAYGo sectoral thesis accordingly.

Notes


Bibliography


http://hystra.com/a2e/


About FIBR

FIBR (Financial Inclusion on Business Runways) is an initiative of BFA in partnership with Mastercard Foundation. FIBR seeks to learn how to transform emerging data on mobile phones about low-income individuals into inclusive financial services. FIBR supports technology, business and financial partners in Ghana who, with technical assistance and funding, could design and develop new ways to link savings, credit and insurance products to reach underserved people. With the rapid uptake of smartphones in emerging markets, financial and non-financial service providers can reach customers over apps, resulting in new data about an individual’s transactions as an employee, a customer or a supplier in the trusted context of their communities and its businesses. FIBR launched in 2016 and will be active over four years to help partners roll out new or existing services and grow their customer base. FIBR also seeks to cultivate the lessons learned through this work and share them with the wider financial inclusion industry to build the knowledge base about new ways to approach digital financial services. For more information, please visit www.fibrproject.org.

About Mastercard Foundation

The Mastercard Foundation works with visionary organizations to provide greater access to education, skills training and financial services for people living in poverty, primarily in Africa. As one of the largest private foundations, its work is guided by its mission to advance learning and promote financial inclusion to create an inclusive and equitable world. Based in Toronto, Canada, its independence was established by Mastercard International when the Foundation was created in 2006. For more information and to sign up for the Foundation’s newsletter, please visit www.mastercardfdn.org. Follow the Foundation at @MastercardFdn on Twitter.
About BFA
Innovating solutions for finance, for life.

BFA is a global consulting firm specializing in financial services for low-income people. Our approach is to seek out, create and implement financial solutions to help people manage challenges and seize opportunities. We partner with cutting-edge organizations that touch the lives of low-income consumers such as financial institutions, fintech companies and information providers. In creating solutions, we integrate our deep expertise in customer insights, business strategy, new technology, and growth-enabling policy and regulation. Founded in 2006, BFA’s clients include donors, investors, financial institutions, policymakers, insurers and payment service providers. BFA has offices in Boston, New York, Nairobi and Medellín. For more information, please visit: www.bfaglobal.com or follow BFA on Twitter @BFAglobal.

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