

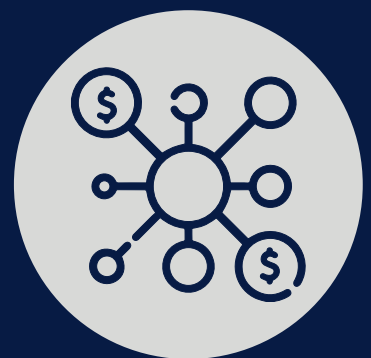
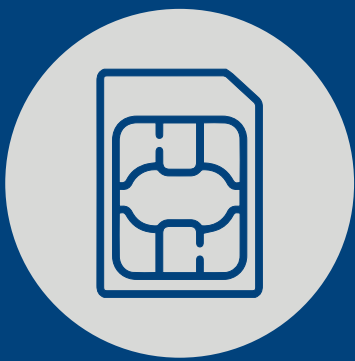


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PAY-AS-YOU-GO GUIDE

FOR OFF-GRID ENERGY COMPANIES



PAY-AS-YOU-GO GUIDE

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PREPARED AUGUST 2021

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INTRODUCTION

Ever more off-grid companies (OGCs) across sub-Saharan Africa are adopting pay-as-you-go (PAYGO) business models, which allow customers to pay for off-grid products and electrification solutions over time. PAYGO allows new customers, who do not have significant savings or easy access to loans, to subdivide a product’s cost at the point of purchase into several smaller installments over months or years. OGCs may offer either a rent-to-own or service-based payment model. This flexibility helps lower-income customers, in particular those in off-grid rural areas, to overcome the high up-front costs of products, to gain access to electricity.

PAYGO systems often include remote monitoring software, which allows companies to collect data on system usage, identify faults, and disable systems remotely if customers do not pay. Remote monitoring drastically increases customers’ payment rates. A variety of PAYGO products are available. Solar home systems (SHS) may have lighting, mobile phone-charging, radio, and television capabilities. PAYGO cooking products may come equipped with liquefied petroleum gas (LPG) canisters. Productive use of energy (PUE) systems, such as solar water pumps, refrigerators, and grain mills, enable customers to engage in income-generating activities.

This guide serves as an introduction to PAYGO for OGCs. It outlines the major characteristics of a successful PAYGO business model, including the advantages and challenges of various PAYGO technologies, to assist OGCs to make informed business decisions. For more information about the Power Africa Off-grid Project, please see the contact information below.

PAYGO FUNDAMENTALS

Once a customer decides to purchase a solar product on a PAYGO plan, the customer must agree to the terms of the PAYGO contract with the OGC. This contract typically includes the amount of the customer’s deposit payment, the amount and frequency of the regular payments to continue powering the system, and the terms of the warranty and maintenance plan. The payments can be regular or intermittent and large or small, depending on the flexibility of the contract and the agreement between the customer and OGC. Once each payment period ends, the customer needs to “top up” (or make a new payment) to resume drawing power from the solar system.

A PAYGO model typically includes:



Hardware and software integration



Product distribution and sales



After-sales service



Financing

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The following sections summarize typical requirements of a successful PAYGO model. In some cases, a PAYGO company has the capacity to implement all components by itself, while other PAYGO companies partner with another firm or firms to provide certain components of the model.



CUSTOMER PAYMENT METHODS

A PAYGO company can allow its customers to make payments through one or more options according to the characteristics of a given market, national regulations, and local customers’ needs.^a



Cash

Where mobile money (MM) is not available or convenient (or in otherwise more cash-oriented societies), a customer can pay cash installments directly to the retailer or through a local agent.



Mobile Phone Credit (Airtime “Top Up”)

How customers pay for airtime varies by country and mobile network operator (MNO). In some countries, customers can purchase scratch cards with redeemable codes to add airtime through their keypads. A PAYGO company and its partner mobile network operator may be able to repurpose these credit systems by allowing customers to make PAYGO product payments with mobile phone airtime.



Mobile Money (MM)

A customer with access to a mobile phone can pay electronically on a PAYGO platform. This method also facilitates third-party payments, such as remittances, for products. Remote MM payment can broaden a PAYGO company’s target market and affect its sales strategy.

^a Altai Consulting, “Mobile Money Ecosystem in Somalia,” Altai Consulting, June 2017, <https://www.altaiconsulting.com/insights/mobile-money-ecosystem-somalia/>.

Once the company and customer agree upon a payment type, the company can activate the PAYGO product in the following ways:

GSM-integrated payments



GSM-Integrated Payments GSM (Global System for Mobile Communications) is the standard network for mobile phones. A customer who buys a GSM-enabled solar system must operate it within a GSM network coverage area when making payments, typically through MM. GSM allows the PAYGO company to activate the system remotely via the mobile phone data signal after a payment or to deactivate it after credit runs out. To guarantee coverage to customers across its markets, a PAYGO company needs to spend time and money to integrate its products with one or more MNOs, depending on available network coverage.

Advantages

- OGCs can activate products (and remotely deactivate them after non-payments).
- OGCs can collect data on customers' product usage.
- Technology issues are easier to diagnose than with other payment types.
- Products activate remotely more easily than with other payment methods.

Challenges

- Products cost more.
- Products require a mobile network signal for activation and deactivation.
- Manufacturers can take longer to integrate GSM than with other payment methods.
- Markets with multiple telecommunications companies (telecoms) require multiple integrations.
- Mobile network service may be unreliable.

Keypad or remote-control payments



Keypad (non-GSM) technology allows a customer to make an MM payment, receive a token message (*i.e.*, a code) by SMS (short message service) via mobile phone, and enter it into a keypad or an infrared-enabled remote control to activate the product. A customer who lives outside of a network coverage area can still take a mobile phone, rather than the product itself, to a network coverage area to receive a code. Company agents can also use this system to provide codes to customers in exchange for cash payments.

Advantages

- Customers can operate products in areas outside of mobile network coverage.
- Manufacturers can integrate this technology into their products more easily and cheaply than GSM integration.
- Customers can receive codes by SMS, which may be more familiar than MM.

Challenges

- Network service may undergo outages, slowdowns, and discontinuations, which affect SMS messages.
- OGCs cannot control the systems remotely or collect data on customers' product usage.

Bluetooth and cable payments

While other options rely on remote connections to a telecommunications network, Bluetooth and cable technologies require a company agent to be physically present to recharge, refill, or reload the product. Agents can connect with the product either over a short-range wireless Bluetooth signal or through a digital connector cable. Companies generally deploy these technologies in markets with low MM adoption, for cases in which customers can easily carry products short distances, and in locations that customers traverse weekly. Companies often use these payment methods for lanterns, charging stations, and lighting solutions for schools and refugee camps.



Advantages

- Manufacturers can integrate this technology more cheaply than GSM or keypad technologies.
- In some cases, companies can collect product usage data.
- Agents have regular contact with customers, which can be useful for sourcing feedback, troubleshooting, and providing other support.
- This method is more user-friendly for customers with low literacy and numeracy.
- Companies can offer customers the option to pay in cash.

Challenges

- A company agent must be physically present with the product to activate it, which can add costs.
- Offline mobile applications (apps) may not support this technology.

I. DEVELOP AND INTEGRATE HARDWARE AND SOFTWARE

Companies that provide PAYGO products fall into two categories:



PAYGO Payment Integrators

- Integrators often design and develop the hardware and software (e.g., the printed circuit board, cloud platform systems, and more) together with the system manufacturers, which then integrate these systems to facilitate mobile payments.
- Integrators also offer combined hardware and software to global importers and distributors of solar systems. Importers and distributors can choose the PAYGO platform they want to integrate and operate with the manufactured system they plan to sell.

Advantages

- Integrators offer distributors a range of already developed and tested product lines.
- Integrator services are typically more cost-effective than developing new proprietary services.

Challenges

- The distributor needs to receive customer service from multiple manufacturers as well as its payment platform provider.
- For after-sales support, it can be more difficult to distinguish between manufacturing defects and platform issues.

Examples:

- Angaza Design (software only)
- Mobisol Paygee (hardware and software)
- Solaris Offgrid (hardware and PaygOps software)



PAYGO Companies with Proprietary Technology

- Some OGCs design, develop, manufacture, and sell their own PAYGO platforms, which they integrate into their own solar system hardware as a package.
- Such packages allow a single company to provide customer service for both the PAYGO platform and solar system hardware.

Advantages

- All-in-one packages simplify the process of navigating options and providing customer service for importers.
- Distributors may receive more thoroughly tested and corrected products over time.

Challenges

- Importers cannot switch between manufacturers.
- With only one supplier, distributors may be prone to additional risks and costs, as product selection may be limited.

Examples:

- Azuri Technologies
- d.light
- Fenix International

The following table provides examples of product integrations of both PAYGO payment integrators and companies with proprietary technology.

| EXAMPLES OF PAYGO INTEGRATORS AND COMPANIES WITH PROPRIETARY TECHNOLOGY | | |
|--|--|--|
| COMPANY | CURRENT INTEGRATIONS | GSM- OR NON-GSM-ENABLED |
| INTEGRATORS | | |
| <p>Angaza Design Features:</p> <ul style="list-style-type: none"> • Workforce management • Supply chain reporting and analytics • Inventory controls • 60+ MM providers • Online and offline capability • Record digitization • Sales and customer-service team management • Asset tracking and forecasting • Full customization with API data • Data visualization | <ul style="list-style-type: none"> • Amped Innovation: 5 • ATEC Biodigesters: 2 products • BioLite: 1 product * • Bluetti by PowerOak: 2 products • Bright: 2 products • Cello Solar: 6 products • d.light: 5 products • Endless Solutions: 1 product • Fosera Solarsystems: 2 products • Futurepump: 1 product • Greenlight Planet: 6 products • Iluméxico: 1 product • Jua Energy: 6 products | <ul style="list-style-type: none"> • Lorentz: 1 product • Mara Phones: 1 product • Micergy: 2 products • NIWA Solar: 8 products • NuovoPay: 1 product • Omnivoltaic Energy Solutions: 4 products ** • Plug the Sun: 1 product • Renewit: 2 products • RDG: 1 product • SolarVillage: 1 product • SolarWorx: 1 product |
| <p>Bboxx Features:</p> <ul style="list-style-type: none"> • Real-time mapping • Payment dashboard • Business key performance indicators (KPIs) • Portfolio management • Remote monitoring | <ul style="list-style-type: none"> • SHS + (Bboxx’s own platform) • Victron Energy: 15 products | <ul style="list-style-type: none"> • These products are GSM-enabled and can integrate with other manufacturers’ current and future systems |
| <p>Paygee Features:</p> <ul style="list-style-type: none"> • Customer relationship management • Payment collection and management • Workforce management • Product and service management • Inventory management • Credit management • Business intelligence • Hardware-agnostic | <ul style="list-style-type: none"> • Baobab+ • BioLite * • Fosera Solarsystems: 2 products • Futurepump • Greenlight Planet • Lorentz Pumps • ENGIE Mobisol • Omnivoltaic Energy Solutions ** | <ul style="list-style-type: none"> • Power Solution • Rensource • SolaRun • Suntransfer Kenya • Victron Energy • Vitalite Group |

EXAMPLES PAYGO INTEGRATORS & COMPANIES WITH PROPRIETARY TECHNOLOGY

| COMPANY | CURRENT INTEGRATIONS | | GSM- OR NON-GSM-ENABLED |
|--|---|---|--|
| INTEGRATORS | | | |
| <p>Solaris Offgrid (with its PaygOps software) Features:</p> <ul style="list-style-type: none"> • Lease management • Sales management • After-sales service management • Customizable features • Inventory management • PaygOps mobile app • KPI dashboard • Telecom integration • Business support services | <ul style="list-style-type: none"> • Amped Innovation • ATEC Biodigesters • BioLite * • Bluetti • Bright • Cello Solar • Connected Energy • Emponi Off-grid Solutions • Endless Solutions • Ennos • Fosera Solarsystems • Jua Energy • Koolboks • Leadsun | <ul style="list-style-type: none"> • Lorentz • Micergy • Niwa Solar • Omnivoltaic Energy Solutions ** • PayJoy • Plug the Sun • Renewit • RDG • SolaRun • Solar Village • Solarworx • Greenlight Planet • KGS Group • Victron Energy • Zimpertec | <ul style="list-style-type: none"> • PaygOps works with both GSM- and non-GSM-enabled products. • PaygOps offers OGCs customer usage data via GSM-enabled products and (with its open PAYGO metrics) via non-GSM-enabled products. |

PAYGO COMPANIES WITH PROPRIETARY TECHNOLOGY

| | | |
|----------------------------|--|--|
| Azuri Technologies | <ul style="list-style-type: none"> • SHS plus its own platform • Integrated with Lorentz pumps | <ul style="list-style-type: none"> • Non-GSM-enabled • Bluetooth |
| d.light | <ul style="list-style-type: none"> • SHS plus its own platform (Atlas) | <ul style="list-style-type: none"> • GSM-enabled |
| Fenix International | <ul style="list-style-type: none"> • SHS plus its own platform | <ul style="list-style-type: none"> • Non-GSM-enabled |
| M-Kopa | <ul style="list-style-type: none"> • SHS plus its own platform (M-Kopa+) | <ul style="list-style-type: none"> • GSM-enabled |

Note: This table includes both information that is publicly available online and information that Power Africa Off-grid Project staff have collected directly from companies.

* In addition to its integrations with Angaza Design, BioLite also has its own free platform called BioPay and supports payments through both technologies.

** Omnivoltaic Energy Solutions is GSM-enabled.

2. DISTRIBUTE AND SELL PAYGO PRODUCTS

PRODUCT OWNERSHIP

A PAYGO company can customize its product and the terms of customer payments according to the needs and expectations of customers in a given market. For example, when one Kenyan PAYGO company expanded into a new region, its new customer base complained about the company's practice of next-day product delivery. The company adapted by offering same-day deliveries for each purchase, where feasible. Other companies have extended payment periods, thereby reducing recurring installment amounts, in certain regions where customers have a lower ability to pay. Although customer contracts and add-on services may vary, PAYGO has two basic models of product ownership:



Rent-to-own

This most popular option allows an OGC to deactivate a product temporarily after a customer's credit runs out and to activate it again once the customer pays the next installment. After a customer completes all payments, the OGC permanently unlocks the product to grant the customer full ownership. The majority of OGCs across sub-Saharan Africa employ a rent-to-own model, including Azuri Technologies, Fenix International, M-Kopa, Paygee, PEG Ghana, and Waka Waka.^b



Energy Service

When an OGC provides energy only as a service, it retains indefinite ownership of the product, while the customer makes regular payments for the duration of use. This model typically allows the company to offer lower costs of energy to end-users. Examples of companies using this method include Bboxx in the Democratic Republic of Congo (DRC) and Foundation Rural Energy Services in multiple countries.

MOBILE MONEY PARTNERS

Somalia, a Market with Exceptional Mobile Money Adoption

In Somalia, the banking sector is limited, yet free MM services are widely available and popular. PAYGO customers, therefore, prefer to pay with MM. Displaced and mobile populations rely on the convenience of MM, and it improves their resilience (e.g., during droughts). MM also empowers women to achieve financial independence.

^b "Fee-For-Service or Pay-As-You-Go Concepts for Photovoltaic Systems," Energypedia, June 16, 2020, https://energypedia.info/wiki/Fee-For-Service_or_Pay-As-You-Go_Concepts_for_Photovoltaic_Systems.

To facilitate easy customer payments through MM or mobile phone credit, a PAYGO company needs to integrate with one or both of the following two types of partners:



Mobile Network Operator (MNO)

A telecom company operates a mobile telephone network and sells access to its services.



Mobile Money Operator (MMO)

An electronic financial service provider, functionally distinct from a bank, facilitates the transfer of funds between senders and recipients, including transfers from different countries. These companies often extend MM to more remote areas where MNOs are not present. MMOs can also sometimes facilitate remittance programs, whereby someone working in a foreign country can wire funds to someone in the home country, or someone in an urban area can pay for someone in a rural area.

MOBILE NETWORK OPERATOR EXAMPLES

MOBILE NETWORK OPERATOR (MNO)



Customer or Remittance Payer



Pays
(through MNO agent or platform)



Mobile Network Operator



Transfers Money



Mobile Money Platform
(managed by the PAYGO company, MNO, MMO, mobile money integrator, or multiple parties)



Activates
(by sending an activation code or signal)



Product
(temporarily until the next payment installment is due; or permanently after the completion of payments)

MOBILE MONEY OPERATOR (MMO)



Customer or Remittance Payer



Pays
(through MMO platform)



Mobile Money Operator



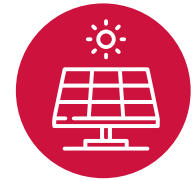
Transfers Money



Mobile Money Platform
(managed by the PAYGO company, MNO, MMO, mobile money integrator, or multiple parties)



Activates
(by sending an activation code or signal)



Product
(temporarily until the next payment installment is due; or permanently after the completion of payments)

PAYGO COMPANY AND/OR MOBILE MONEY INTEGRATOR



Customer or Remittance Payer



Pays
(through a PAYGO company agent or the mobile money platform)



Mobile Money Platform
(managed by the PAYGO company, mobile money integrator, or multiple parties)



Activates
(The platform sends the customer an activation code or signal or prompts an agent to manually activate)



Product
(temporarily until the next payment installment is due; or permanently after the completion of payments)

MOBILE NETWORK OPERATOR EXAMPLES

A PAYGO company may consider partnering with one or more MNOs in its markets to integrate its PAYGO platform with the MNO's MM system. The following table lists some popular MNOs in selected sub-Saharan African countries.^c These examples may not necessarily be comprehensive or current, and further research is necessary for a more complete understanding of these markets.

| EXAMPLES OF POPULAR MNOs AND MM INTEGRATIONS BY COUNTRY | | | |
|---|--|-----------------------------------|--|
| COUNTRY | MAJOR MOBILE NETWORK OPERATORS (LISTED BY HIGHEST TO LOWEST SUBSCRIBER COUNT) | EXAMPLE OF A MOBILE MONEY SERVICE | MOBILE PHONE PENETRATION ^d (RATE AND YEAR) |
| Benin | MTN, Moov, Glo, Libercom, BBCom | Moov Flooz | 90% in 2015 |
| Burkina Faso | Orange, Telmob, Telecel Faso, Airtel | Airtel m-ligdi | 36% in 2011 |
| Cameroon | MTN, Orange, Nexttel, Camtel, YooMee | MTN MoMo | 43% in 2011 |
| Chad | Moov, Airtel | Moov Money | 24% in 2010 |
| Côte d'Ivoire | Orange, MTN, Moov, Koz, GreenN, Warid, Mobile Café, YooMee | Orange Money | 68% in 2010 |
| DRC | Vodacom, Orange, Tigo/Orange, Africell, Airtel, Supercell, SemaTel, U-Com, Smile | Tigo Cash | 50% in 2016 |
| Ethiopia | Ethio Telecom | M-Birr | 4% in 2010 |
| Ghana | MTN, Vodafone, Glo, Expresso Telecom | MTN MoMo Pay | 127% in 2015 |
| Guinea | Orange, MTN, Cellcom, Intercel, Sotelgui | Orange Money | 99% in 2015 |
| Kenya | Safaricom, Airtel, Telkom Kenya, Jamii | Safaricom M-PESA | 77% in 2018 |
| Lesotho | Vodacom, Econet Telecom Lesotho | Vodacom M-PESA | 86% in 2016 |
| Liberia | Lonestar Cell (MTN), Cellcom, Novafone, Libtelco | Lonestar Cell MM | 68.3% in 2013 |
| Madagascar | Airtel, Telma Mobile, Orange, Blueline, bip Madagascar | Airtel Money | 42% in 2014 |
| Malawi | Airtel, TNM, G-Mobile, Lacell, G-Expresso | Airtel Money | 19% in 2010 |
| Mali | Orange, Sotelma-Malitel, Planor | Orange Money | 113% in 2016 |
| Mozambique | mCel, Vodacom, Movitel | mCel Carteira Móvel | 27% in 2010 |
| Niger | Airtel, Sonitel, Orange, Moov | Airtel Money | 20% in 2010 |
| Nigeria | MTN, Airtel, Glo Mobile, 9mobile | MTN MoMo | 84% in 2013 |
| Rwanda | MTN, Airtel, Rwandatel | MTN MoMo | 63% in 2013 |
| Senegal | Sonatel (Orange), Free, Expresso, Hayo Telecom | Expresso E-Money | 110% in 2015 |
| Sierra Leone | Africell, Orange, Sierratel, Comium, GreenN | Africell Afrimoney | 13% in 2007 |
| Somalia | Hormuud, Telcom Somalia, Telesom Mobile, Nationlink | Hormuud EVC Plus | Unknown |
| Tanzania | Vodacom, Airtel, Tigo, Halotel, Zantel | Vodacom M-PESA | 86% in 2020 |
| Togo | Togocel, Moov | Togocel TMoney | 60% in 2014 |
| Uganda | MTN, Airtel, Africell, Warid (Airtel), UT Mobile, Essar, Smart Telecom | MTN MoMo | 30% in 2010 |
| Zambia | MTN, Airtel, Zamtel | MTN MoMo | 62% in 2011 |

^c "Mobile phone penetration" measures the number of SIM cards or mobile phone numbers in a country and does not include a count of devices. For more up-to-date counts about smartphone penetration, more information is available through Newzoo's Global Mobile Market Report.

^d "List of mobile network operators of the Middle East and Africa," Wikipedia, July 5, 2021, https://en.wikipedia.org/wiki/List_of_mobile_network_operators_of_the_Middle_East_and_Africa.



HOW TO CHOOSE A MOBILE MONEY PARTNER

When a PAYGO company seeks one or more partners for MM services that meet its needs, there are several factors to consider:

- 1 What coverage does the MM provider offer, specifically in rural areas?
- 2 How many agents does the MM provider employ?
- 3 What transaction channels does the MM provider use (e.g., last-mile agents, supermarkets, fuel stations, etc.)?
- 4 What partner financial institutions (e.g., banks and microfinance institutions) are involved?
- 5 What customer benefits and add-ons does the MM service provide?
- 6 Is the MM service able to transact in foreign exchanges (forex)?
- 7 Is the MM service interoperable with banking systems or other MM services?
- 8 Does the MM service integrate with any existing PAYGO platforms already?

MOBILE MONEY OPERATOR EXAMPLES

MMOs provide users the ability to send and receive payments in person or electronically through local partner institutions—usually banks, forex institutions, microfinance institutions, and MNOs, and sometimes post offices and retailers. MMOs may allow users to manage payments through smartphone apps.

Below is a partial list of MMOs that facilitate remittances in Africa:^e

Azimo
Coinstar
Money Express
MoneyGram
PayPal
Remitly

Ria Money Transfer
Western Union
Wise (formerly TransferWise)
World Remit
Xoom
Xpress Money

^e Manuel Orozco of the Inter-American Dialogue, "Sending Money Home to Africa: Remittance markets, enabling environment and prospects," International Fund for Agricultural Development, November 2009, <https://www.ifad.org/documents/38714170/40193590/Sending+Money+Home+to+Africa.pdf/90b3ec93-5ece-4b90-9e5c-2159ebebda6>.

3. PROVIDE AFTER-SALES SERVICE

A PAYGO company that promptly addresses customers' questions and solves maintenance and warranty issues has better repayment rates among its customers, because system issues may prompt customers not to pay. The following are some of the key features of quality after-sales service:



Call Center

The call center is generally the first point of contact for customers to discuss repayment issues, product problems, general inquiries, marketing upgrades, and new products. Call centers can start with only a few people, a few computers to retrieve data, a dependable phone system, product training, and a platform to retrieve data quickly and resolve problems efficiently. As an OGC's sales grow, it should expand its call center to ensure adequate support. Many PAYGO platforms come with built-in features that allow an OGC to set up a call center.



Repairs and Maintenance

After-sales support requires technicians to be able to go back to a site to fix challenges that the call center may not have been able to resolve through a call. After-sales support can also facilitate a customer's sending a product back to a facility for repairs (i.e., reverse logistics). Ideally, an OGC should train its agents to repair and maintain products, especially in rural areas.



Credit Management

Credit management is also an important part of quick and efficient after-sales support. With proper credit management, a company can respond to requests from customers regarding changing payment periods or payments amounts.

NURTURING LONG-TERM CUSTOMER RELATIONSHIPS

One key advantage of PAYGO companies is that their interactions with customers extend beyond the initial sale of a product. Companies can apply certain business practices and strategies to nurture long-term customer relationships to encourage brand loyalty and future sales:

- **Product upgrades:** One of the main benefits of PAYGO business models is that OGCs can support their customers to upgrade to newer or larger systems with additional appliances, such as radios, refrigerators, and TVs. For example, Amped Innovation has a modular system that facilitates its customers purchases of additional units to increase the size of their systems to power more appliances, without having to replace them completely.
- **New product lines:** Beyond selling a range of solar products, OGCs can also sell additional product lines, including a range of productive use of energy (PUE) systems, such as solar water pumps and LPG cookstoves. For example, in DRC and Kenya, Bboxx sells SHS as well as LPG cookstoves. Some OGCs also offer other services. For example, PEG Africa offers customized insurance to its customers in West Africa.
- **Longer payment periods:** PAYGO companies can consider offering customers longer payment periods, especially when entering new markets where customers have a lower ability to pay or when targeting lower-income market segments.

- **Credit profiles:** Low-income customers buying their first PAYGO product may also be signing the first credit contract of their lives. An OGC that facilitates and records customers' payment histories over time are also incidentally building those customers' credit profiles. OGCs' customers can then share their credit profiles with banks, microfinance institutions, and other companies, which enables them to take loans for income-generating activities, contributing to their financial inclusion and economic empowerment.

AGENT MANAGEMENT TOOLS

The COVID-19 pandemic accelerated the digitization of OGCs' sales. OGCs have the opportunity to digitize all day-to-day operations, including PAYGO, by leveraging online and offline applications to:

- 1 Improve and expedite communications between headquarters and agents.
- 2 Set up and track sales objectives and goals for field agents in real time.
- 3 Improve the visibility and monitoring of agents' daily activities.
- 4 Keep records of and manage sales leads.

While some OGCs develop in-house solutions for agent management, others rely on specialized solutions-providers—such as the information technology (IT) firm MAAD and distribution system company Optimetriks—which can tailor solutions to an OGC's unique processes. Solutions typically include dashboards, offline messaging systems, ticketing systems, and workflow-management tools. Such digitization can also be a good opportunity to review work practices or develop new ones.

The key advantage that an OGC achieves through digitizing its processes is greater consistency of data collection in all aspects of PAYGO operations. Agents can geolocate customers, scan barcodes, validate identification cards and phone numbers, upload and store photos, collect data on peripheral markets, and access maps and routes. Digital tools allow managers to assign individualized tasks to agents, monitor their results, and personalize their dashboards. Digitization further allows an OGC to develop digital training materials to facilitate adaptive and on-the-job staff training and re-training.

4. SECURE FINANCING

To successfully operate a PAYGO model, companies need to complete the following objectives:



Raise Capital

Companies require access to capital through equity, debt, and grant funding to keep inventory moving.



Provide Customer Credit

Companies can develop partnerships to provide customer credit.



Provide Customer Service

Companies must ensure they provide strong after-sales support to ensure customers are satisfied and make repayments.

A PAYGO company can implement these services by ensuring excellent financial reporting, which the following resources can support:

- **Power Africa Financial Modeling Tool for PAYGO Energy Access Companies** guides internal financial management processes, enables projections of company financials based on different scenarios, introduces methods that can guide company valuation, and models key aspects of PAYGO companies: <https://www.usaid.gov/powerafrica/beyondthegrid/off-grid-solar-market-assessments#finmodtool>.
- **PAYGO Performance, Reporting and Measurement (PERFORM)** framework and key performance indicators (KPIs) enable companies to track, benchmark, and improve their performance while providing investors with a more accessible profile to stimulate capital investment: <https://www.findevgateway.org/paygo-perform-kpis>.

In general, the following areas of financial management are key:

A. Liquidity Management

Because liquidity is essential, the recommended practice is for a PAYGO company to offer credit to its customers for a minimum of one to two years for an SHS and around three months for a lantern, such as Greenlight Planet's Sun King Pro product. It is good practice for a PAYGO company to secure credit for its inventory for three to five months before its products reach the warehouse. A PAYGO company can also partner with a microfinance institution to finance the customer for up to another one to two years of end-consumer credit. Such an offering requires an average of 18–30 months of credit along the value chain. The OGC can expect inflows of cash from a ten- to 30-percent deposit on the product, followed by weekly or monthly payments from customers to pay off their products.

C. Inventory Turnover

PAYGO companies must carefully manage the turnover of their inventory to ensure they have enough products to sell but also do not have too many products in a warehouse waiting to be sold. As a general guideline, a small company must financially prepare to have one standard container of products in its possession, one in transit, and one in the manufacturing cycle.

E. Credit Scoring

PAYGO companies must determine the risk that a customer may bring to their overall portfolios. Evaluating risk is particularly important, as portfolio quality is key to raising more debt and growing. Customers with a low credit score affect the reliability of repayments and, thus, the ability of the company to raise more funds. Agents or employees in the field require tools that assist them to determine, according to the company's credit policy, the credit risk that each new customer brings. For many households, purchasing a PAYGO product may be their first technology purchase and first loan, both of which bring challenges. Therefore, a company must develop and use a standard credit-assessment tool or process.

B. Equity-to-Debt Ratio

A company needs to raise equity, ideally with a ratio of three times the amount of requested debt. Alternatively, an OGC can seek debt financing for inventory purchases, finance its customers, and manage its own balance sheets. Raising equity can be challenging for companies for several reasons. Some owners may be reluctant to sell part of their company, while some companies may have too-high valuations or experience disappointing sales growth. Other companies may face market saturation, high exposure to risky market sectors, or bankruptcy. It can be challenging for companies to find investors in countries where there are restrictions on foreign ownership of local companies or where there are requirements for companies to invest in local assembly or manufacturing.

D. Forex and Currency Risk

Managing foreign exchange and currency risk is often a major challenge for PAYGO companies globally, as local-currency debt is difficult to access and most inventory financing is in U.S. dollars. As credit periods increase from one to two years, the currency risk increases. To mitigate currency risk, PAYGO companies can try to match local-currency loans with repayments in local currencies. Risk mitigation can involve working with local banks and MFIs, using currency-hedging products (such as cross-currency swaps or forex forwards) and creating forex reserve accounts that include a depreciation of around ten percent in their payment terms.

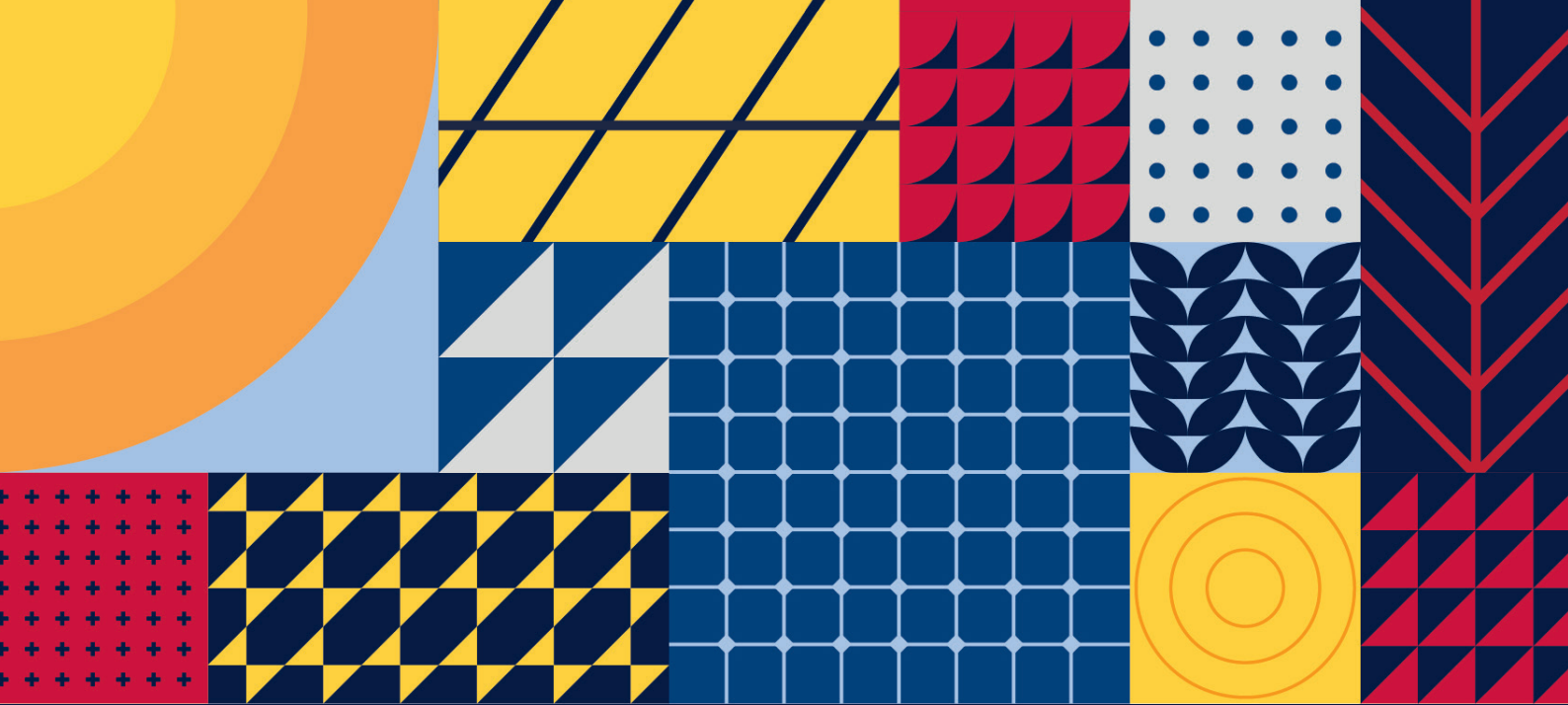
F. Accounts Receivables

A company can control the quality of its accounts receivables, which can help it achieve financial stability and profitability, through several actions. For example, some companies, such as d.light and Azuri Technologies, transfer their receivables to off-balance sheet financing vehicles. A PAYGO company can also partner with a credit provider, such as an MFI, which absorbs the financial risk of customer credit to increase the company's cashflow. The company and MFI must work together to establish credit-management strategies, decide credit terms, and communicate clear information to their teams and customers, both orally and through written contracts.

5. POLICY AND REGULATORY CONSIDERATIONS

Beyond managing internal business operations and processes, a PAYGO company should keep up to date regarding external factors affecting its markets, such as national and regional policies and regulations. The following key questions can help a company analyze and adapt to its environment:

- 1 Do your off-grid products need to be certified, such as through International Electrotechnical Commission (IEC) quality standards, which many sub-Saharan African countries have recently adopted?
- 2 What policies and regulations related to banking, microfinance, digital services, and customer credit affect your company?
- 3 Does your company need to comply with regulations to lease or offer products on credit?
- 4 Are there value-added taxes and duties on the import of PAYGO products or for MM transactions? Are waivers or exceptions available?
- 5 Do MM regulations, such as digital taxes, affect your PAYGO model?
- 6 Does your company comply with local consumer protection principles and industry standards? Are there regulations concerning data storage (i.e., general consumer data protections)?
- 7 Are there any labor regulations or restrictions on international operations, employment, or partnerships?
- 8 Can a PAYGO company operate as an essential service provider in areas that face restrictions due to COVID-19?



Power Africa's goal is to add at least 30,000 megawatts (MW) of cleaner and more reliable electricity generation capacity and 60 million new home and business connections by 2030.