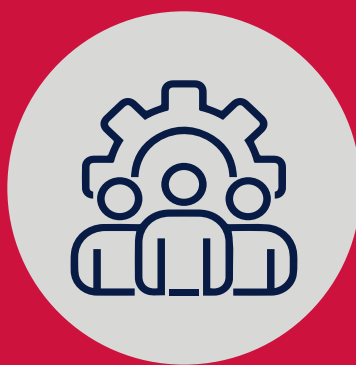




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PAY-AS-YOU-GO CREDIT RISK MANAGEMENT GUIDE FOR OFF-GRID ENERGY COMPANIES



PAY-AS-YOU-GO CREDIT RISK MANAGEMENT GUIDE

FOR OFF-GRID ENERGY COMPANIES

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CONTENTS

INTRODUCTION	1
---------------------	----------

2. RISK MANAGEMENT: AN OVERVIEW	2
--	----------

3. STRUCTURES AND PROCESSES FOR MANAGING CREDIT RISK	3
---	----------

3.1 Drafting the risk management policy	3
---	---

3.2 Analyzing data	3
--------------------	---

3.3 Implementing the risk management policy	4
---	---

3.4 Designing the loan product and financing model	5
--	---

3.5 Implementing the credit risk assessment (CRA)	6
---	---

3.6 Reducing credit transaction risk	6
--------------------------------------	---

3.7 Sales agents' incentives	7
------------------------------	---

3.8 Growing sustainably	7
-------------------------	---

3.9 KPIs for PAYGO finance	8
----------------------------	---

4. TRANSPARENCY AND CUSTOMER PROTECTION	9
--	----------

4.1 Transparency	9
------------------	---

4.2 Onboarding new customers	10
------------------------------	----

4.3 After-sales service and warranties	11
--	----

5. PORTFOLIO MANAGEMENT	12
--------------------------------	-----------

6. CONCLUSION	13
----------------------	-----------

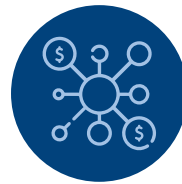
REFERENCE LIST	14
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I. INTRODUCTION

Solar pay-as-you-go (PAYGO) companies can be classed as asset finance companies (AFCs) because they provide solar products on credit to lower-income, often rural, customers who tend to work in the informal economy. For AFCs, managing asset-backed loans is complex, involving many components such as:



Calculating the cost of the solar system and appliances.



Bearing the costs of finance, loan collection, and loss.



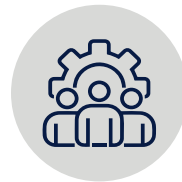
Sourcing products and overseeing logistics.



Tracking operational expense and profitability.



Factoring the cost of acquiring new customers.



Managing a PAYGO software platform.

Complexity grows when AFCs finance rural customers, many of whom have never taken a loan from a formal financial institution such as a bank or microfinance institution (MFI). Such customers are unfamiliar with the time-value of money and the contractual commitments to repay within a fixed term.

Early-stage solar AFCs' inexperience in managing portfolios of loans or leases, and in developing effective credit and risk procedures, puts their financial sustainability at risk. Risk hinders AFCs from raising funds to help them scale their operations and achieve profitability. Risk can also create negative incentives: Some AFCs grow their portfolios quicker than they should to create repayment metrics that appear healthier than they are.

To be sustainable businesses, solar AFCs must manage their credit risk while growing their operations. AFCs can balance risk and growth by building a good foundation of credit risk management practices. This foundation consists of:

- 1 A well-designed asset finance product.
- 2 A robust loan and payment collection process.
- 3 An analytical framework to manage credit risk at the portfolio level.

This report shares best practices, in the areas above, gathered from several CGAP and GOGLA publications included in the reference list.

Even if an AFC is a young business, with a small team and limited resources, it should develop a high-level risk management policy from the outset. By implementing a credit risk management strategy while the business is still small, an AFC ensures that its credit policy evolves with the company and its market.



Example 1

If a PAYGO solar company disburses 12-month loans, each worth 1,000 Kenyan Shillings (KSH), with an annual interest rate of ten percent, the expected payment after 12 months would be KSH 1,100 per loan or lease contract.

If the borrower of one loan can no longer afford it, the company would need to earn the interest on ten fully repaid loans (each of them earning KSH 100, or KSH 1,000 in total), to compensate for the loss. Avoiding one credit default is as valuable as ten repaid loans.

2. RISK MANAGEMENT: AN OVERVIEW

Asset finance refers to loans or leases that allow a borrower to use a physical asset, such as a solar home system, while paying for it over time, leading to improved productivity, increased income, and enhanced quality of life for low-income customers. Solar AFCs help bridge the financing gap of low-income households and small businesses—many of which have never taken loans—catalyzing their asset ownership and growth. However, those on a low income are a high-risk group of customers who often work in the informal sector of emerging economies, with no proof of employment or cashflow records. As a result, many solar PAYGO AFCs face unique challenges in managing risk to ensure that they operate sustainably, profitably, and avoid illiquidity and insolvency. AFCs should avoid increasing the expense of their capital as this can lead to more expensive prices for their future customers, who may not be able to afford them.

To overcome these financial risks, solar AFCs have been adopting tools from MFIs or developing their own new tools, such as:

- 1 Remote-sensing and location-tracking devices that reduce the risk of theft, mitigate unauthorized use of the system, and facilitates its repossession (as a last resort).
- 2 Remote-controlled systems that allow more flexible payment options, which better meet the needs of low-income households. Because these households often have unstable incomes, adjusting payment terms remotely can help avoid repossession.
- 3 Digital payments, automated loan-management software, and well-trained call centers that keep costs low by allowing large numbers of systems to be serviced by relatively few staff.

However, if a solar AFCs has a greater appetite for credit risk, then it needs processes to manage this, including:

- 1 A well-articulated risk management policy, clearly outlining the company's risk strategy and risk appetite for all credit processes and collections. This policy should be developed soon after an AFC is founded and adapted as the company grows.
- 2 The risk strategy should outline the company's risk management procedures by setting targets for risk-capacity, tolerance, and limits, and by developing measures for identifying, reviewing, and mitigating all sources of risk.
- 3 Company executives should establish the AFC's "risk culture," ensuring that the business adheres to all aspects of the risk policy and strategy and that managing risk is a priority for all staff.
- 4 Companies should train staff regularly to ensure that everyone understands the risk management process thoroughly.



3. STRUCTURES AND PROCESSES FOR MANAGING CREDIT RISK

To manage their risk effectively, solar AFCs can study, adapt, and implement the processes outlined below.

3.1 Drafting the risk management policy

A risk management policy should include:

- 1 An introduction, outlining the company's vision, mission, risk management strategy, and risk appetite.
- 2 An outline of the organization's structure, which reviews staff, job descriptions, and responsibilities.
- 3 An overview of loan or lease products and pricing, including customer-assessment methods, onboarding, monitoring, cross-selling, payment collection, and recovery procedures.
- 4 An explanation of standards and compliance procedures, in particular consumer protection principles and the company's code of conduct.
- 5 The company's portfolio management approach, which illustrates market segmentation and specifies credit limits.
- 6 The reporting procedure, explaining the company's key performance indicators (KPIs) and reporting frequency. Credit management software will aid reporting, as explained in the next section.
- 7 Once the AFC has drafted this policy, the company needs to ensure that all staff understand its content and that they will implement it consistently.



Example 2

Risk capacity: A company's credit risk capacity defines the conditions under which the firm can continue to function. For example, a company's risk capacity might be that it can continue to operate only if early defaults (within the first 90 days) are less than five percent.

Risk tolerance: Risk tolerance specifies if the company is willing to tolerate, for example, a two percent early default rate as a proportion of each month's new customers. The company might target an early default rate of only one percent, although its risk limit might be a rate of 1.25 percent.

Risk limit: If the portfolio breaches its risk limit, this requires an immediate meeting of the executive credit committee, and for the board to be notified of the credit risk.

3.2 Analyzing data

Effective risk management requires data analysis, which means that solar AFCs should standardize and digitize all their credit-related processes and collect data, ideally by using a software platform that enables staff to access information easily (gain information on such software platforms in the Global Distributors Collective's new catalogue: <https://globaldistributorscollective.org/catalogue>).



Example 3

CGAP's efforts to analyze solar companies' loan repayment data have often been hampered by a company's use of inadequate data sources.

For credit managers, the most important function of a data system is to consolidate real-time transaction and portfolio-level information into a single source of reliable information. Without an effective and reliable data system in place, credit risk management is almost impossible.

The data management system should initially collect basic data that is difficult to falsify, such as age, gender, marital status, and self-declared information on income and expenses. Companies should then add references, guarantors, and formal credit reviews to the system.

This system should provide data on all aspects of the company's operations: Movement of product stock, leads, customer assessments, credit repayments, and budgets. Such a system informs credit teams with detail on how their portfolio is performing, helping them to manage credit risk through more automation and data-based decision-making.

The data management system should visualize and analyze credit risk metrics to help the company understand if it is adhering to its risk limits. A well-designed system will assist solar AFCs to adhere to their own risk management procedures by requiring staff to document all operations and to provide a clear audit trail that can be monitored. The system should alert senior staff if credit personnel have missed any of these steps.

The system should initially focus on data that are easy to collect and are difficult to falsify, such as socio-demographic indicators like age, gender and marital status, and self-declared information on income and expenses. Credit teams should add customers' references, guarantors, and formal credit reviews to the system whenever they are available.

See Khaki, Borst, Kennedy, and Mattern (2021) for standardized performance metrics that cover all aspects of a PAYGO company's portfolio and financial performance, along with a technical guide to calculate this performance.

3.3 Implementing the risk management policy

Once an AFC has drafted its risk management policy and established a data management system, it should plan how to manage its risks throughout the organization.

This plan should involve employees whose tasks may not appear to be directly related to assessing customers' credit worthiness. Once the company has defined each staff member's role in managing credit risk, it should train personnel to carry out these duties effectively. Most people learn better through interactive learning such as group work, discussion, and roleplay. Staff can also present their work on risk management to other departments to circulate ideas and to build mutual understanding of their shared responsibilities.

When the AFC updates its risk management policy, it should notify all staff of the specific changes in the policy and allow personnel to offer recommendations and ask questions.



Example 4

Before providing consumer finance, Greenlight Planet had sold millions of solar lanterns and home systems.

When the company decided to offer consumer financing in 2015, it had built “a relentless focus on providing well-designed, high-quality, yet low-cost, products for off-grid consumers globally.”

This focus led Greenlight Planet to establish loan periods of between nine and 12 months, allowing the company to provide more affordable prices to customers.

3.4 Designing the loan product and financing model

The quality of the solar system being financed and its ability to meet the customers’ needs is one of the most important variables in managing credit risk for solar AFCs. A product that satisfies the customer and continues to operate consistently will help to mitigate credit risk significantly. Therefore, companies should take care to match the size of the solar system and its appliances to their customers’ ability to pay. Solar systems with remote-lockout technology enable solar AFCs to serve low-income customers through flexible, remote payments. These systems also provide companies with data on customers’ behavior, which allows businesses to tailor solar systems and loans to customers’ needs.

AFCs must determine the ideal interest rate and loan length for their customer base, which is typically from one to three years. Although longer loan periods make systems more affordable, they post a risk as customer fatigue sets in when newer solar systems with improved appliances become available.

Traditional MFIs do not always offer flexible loan terms, with payments often expected on a fixed date. In contrast, solar AFCs can link loan repayments to their customers’ use of the system, allowing the customer to repay the loan amount in more flexible installments over an extended time.

Some companies vary the pricing of their systems, requiring higher-income customers to pay more, which allows a company to offer reduced prices to lower-income, higher-risk customers. In addition, governments or development partners can disburse results-based finance (RBF) subsidies to reduce the cost of the systems for the lowest income households, typically by subsidizing up to 50 percent of the system’s cost. An example of such a subsidy program is Energising Development’s (EnDev’s) work in Tanzania and the Kenya Off-grid Solar Access Project (KOSAP).



Example 5

upOwa finances solar products for customers in Cameroon. It has developed a tiered customer assessment approach for their three SHS products, each increasing in capacity and price. upOwa sees the smaller products as an entry-point for new customers who, if they repay, qualify for larger financed products.

upOwa collects limited customer data for its smaller products, although it plans to develop an automated risk-based scoring system for smaller systems. For its more expensive systems, upOwa requires a detailed customer survey, which the company uses to fill out an expert-based scorecard.

3.5 Implementing the credit risk assessment (CRA)

Solar AFCs should protect their customers by ensuring that they do not become over-indebted and can afford the installments and the final price of the system. Customer protection reduces the AFC's credit risk by reducing the number of defaults.

Consumer protection starts by explaining the full pricing structure to customers, including the loan length, payment amounts, and frequency. The AFC must ensure that the customers understand these terms and should obtain assurance that the customers are able and willing to make these payments. A credit risk assessment (CRA) will help an AFC to protect its customers.

A CRA evaluates potential customers' financial profile, in particular their willingness and ability to make their repayments. The CRA identifies risks of repayment defaults by gathering and assessing data. For example, MFIs normally assess creditworthiness through in-person interviews, references, and asset-checks, but these are often time-consuming and expensive to administer. Because solar AFCs often try to limit their expenses by using their sales agents' time efficiently, they keep creditworthiness checks as limited as possible. However, AFCs must balance mitigating the risk of non-payment and minimizing the cost of assessing credit risk. Customers who already own other assets and are married with children may be more financially stable and disciplined, suggesting a lower credit risk.

Most CRAs incorporate a Scorecard Model that standardizes and tabulates a range of financial factors. This model uses data captured on various indicators and calculates an overall score based on historical predictors of financial default. Although developing a new Scorecard Model requires a significant initial investment for a solar AFC, it will enable considerable long-term returns by reducing defaults. An alternative CRA model is the Expert-based Model, which requires loan officers to grade a potential borrower according to criteria such as asset holdings, income, and references.

Sales agents should be trained to collect relevant information from customers and to assess their creditworthiness accurately through a digital data management system, combining CRAs, credit assessments, and digital credit tools.

For higher-value and more complex products, solar AFCs should consider adopting other strategies, such as requiring new customers to attend an educational session about their solar product at the beginning of their application. These sessions should educate customers about the repayment rules and procedures, help to build a trusting relationship, and identify customers who are unwilling to attend the sessions, thereby suggesting a higher credit risk.

3.6 Reducing credit transaction risk

Credit risk is the probability that a customer of a solar product will not meet the contractually agreed obligation to repay. Credit risk accounts for the cost of managing such a repayment default, the depreciation of the solar system's collateral, and the cost of repossessing the product.

To reduce this credit transaction risk, an AFC should assess each step of the credit transaction cycle, from when customers and sales agents first meet, until the end of the cycle when a customer has paid the final instalment and owns the product. At each stage of this cycle, the AFC should identify cost-effective actions that can avoid the risk of a default.

In the case of a default, AFCs will need to disconnect solar systems remotely via their "lockout" technology, and eventually repossess the unit as a last resort. AFCs must be explicit to their customers about these measures and ensure that customers understand the payment collection and repossession policies. In the case of a default, AFCs must treat customers respectfully and with care.

3.7 Sales agents' incentives

Early-stage solar AFCs often focus on growing their number of customers as quickly as possible, often because of pressure from investors. However, companies will increase their credit risk when they compensate their sales agents only at the start of a new loan. Sales incentives should be balanced to prevent sales agents from selling to customers who cannot afford loans, and ideally should reward agents for their customers' continued payments.

Sales agents often do not have tools at their disposal to identify reliable customers, so solar AFCs should support them with clear and practical sales training and tools to help them assess customers' needs and financial capacity.

Although rates of turnover typically are high among sales agents, solar AFCs can reward longevity and good portfolio health by offering bonuses to sales agents. Solar AFCs should build trust with their sales agents through frequent and timely payments and opportunities for career progression.

When developing the incentive schemes for their sales agents, solar AFCs should anticipate the potential for misuse by agents and ensure that incentives cannot be manipulated easily by unscrupulous staff, which will harm the company and its customers. One way to prevent sales incentives from being manipulated is by verifying a sale a second time through a headquarters-based telesales team, which contacts customers to confirm the purchase.

3.8 Growing sustainably

A “social impact credit trap” (Waldron 2021) develops when a well-managed solar AFC starts to attract investors. These investors then apply pressure by tying additional investments to the AFC's market growth. The AFC feels compelled to scale rapidly and may start going against its risk management procedures by, for example, lending to lower-income households with higher risk profiles.

Solar AFCs that try to grow too quickly—driven by profit and a desire for wide market reach—can become overwhelmed by credit risk, particularly when companies try to reach unbanked customers with the lowest incomes. This kind of rapid expansion can lead to over-indebted customers, non-performing assets, and lender insolvency.

Solar AFCs and their investors need to be cautious about how fast their businesses and investments grow. In addition to managing their expenses, in particular their unit and finance costs, AFCs should grow only as fast as their risk management processes allow. Sustainable growth involves developing a culture of risk management from the executive management to the frontline sales agents. Ideally, a dedicated risk team should monitor the company's credit capacity, and the company should articulate its risk appetite and portfolio limits clearly, audit its loan portfolio, and aim to achieve growth objectives while staying within risk tolerances.



Example 6

In the mid-2000s, investors saw microfinance as a profitable way to alleviate poverty, and MFIs began attracting significant investment from development finance institutions and private equity firms. In 2007, a survey ranked credit risk as only the tenth-highest source of risk in the microfinance sector.

In 2010, in Andhra Pradesh in India, excessive lending and misaligned incentives of established MFIs led to abusive payment collection practices which, in turn, led to farmers' suicides and the writing-off of most MFIs' portfolios (Waldron 2021).

Solar AFCs should use an independent auditor to assess their internal risk management capability to confirm that the company functions within the organization's stated risk appetite and limits.

3.9 KPIs for PAYGO finance

GOGLA, Lighting Global, and CGAP developed a standard set of KPIs¹ for PAYGO products with help from PAYGO solar companies, equity and debt investors, local and international banks, development finance institutions, and technical experts. These KPIs aim to help off-grid companies benchmark their performance and streamline their performance management approach, helping them to attract a broader range of capital. The KPIs help companies to be better managed, particularly by being more responsive to the needs of their customers. Increased customer satisfaction leads to repeat sales and better repayment rates, which allow off-grid suppliers to grow sustainably.

The 36 KPIs help companies and investors analyze financial performance—e.g., unit economics, profit, and liquidity—and operational aspects, such as sales models, financial needs, and portfolio quality (i.e., the type and level of the company's credit risk).

Solar AFCs should track KPIs that are easy to collect data for and to calculate. AFCs should analyze performance data more than once a year, with the KPIs reviewed for management and accounting purposes the whole year round.

¹ Access the KPIs here: https://www.cgap.org/sites/default/files/publications/2021_07_Technical_Guide_PAYGo_PERFORM_KPI.pdf.



4. TRANSPARENCY AND CUSTOMER PROTECTION

4.1 Transparency

Transparency helps customers make informed decisions. Solar AFCs can be transparent by sharing clear and comprehensive information in plain language that customers can understand easily. Companies should share information orally and visually to ensure that it reaches people who are less literate.



Example 7

One of the main goals of customer protection is to prevent customers from becoming overburdened with debt. Customer protection starts with a customer affordability assessment, which assesses a customer's ability to pay.

A company's first contact with a customer should always involve explaining the credit assessment process to ensure that the terms of the loan work for the customer and the company.

AFCs should present the following details transparently to customers to help them make well-informed decisions:

- 1 All fees and charges associated with each of their loans being offered, including the full cash-value of each of their solar products and the total cost of ownership (TCO).
- 2 The Effective Interest Rate (EIR) or Annualized Percentage Rate (APR) of all solar product loans, allowing the customer to know the full cost of the loan and to compare it to other providers' loans.
- 3 All terms and conditions of the contract, including the duration of the contract, circumstances that will result in a change of price or payment plan length (including changes in foreign exchange rates), and sanctions for late and non-payment (penalties, system lock-out, and the repossession policy).
- 4 The company's obligations to its customers, and personal data privacy practices.

Statements in all sales and marketing materials should reflect the product's features and technical performance (e.g., light output, battery time, and if the product is used or refurbished). Companies should provide visual and spoken aids to customers with low literacy levels. The company should also translate all contractual terms and product information into the most prevalent languages spoken in a particular market, and ensure that call center staff speak these languages when reaching out for after-sales service.

Customers should be given time to review information on loans, compare products and payment options, and ask questions before making a decision. The company should inform its customers which personal data it collects, and ensure that this data will not be shared with other parties and will be used internally only. The company should inform its customers that it may report those who fall behind on payments to a credit reference bureau (CRB), which may harm these customers' credit profiles and access to credit in the future.

Informing customers in a transparent manner underpins better payment rates, lower after-sales burdens, and higher customer satisfaction. Satisfied customers who are well-informed about the AFC's prices, products, and after-sales service are more likely to repay on time, maintain their products, and recommend the company to their friends and neighbors.

Quality assurance is a key aspect of transparency: Solar AFCs need to provide information on their product categories and quality (including the manufacturer, product name, and model number), advertise truthfully, and protect customers by supplying high-quality products.

4.2 Onboarding new customers

New customers should be provided with a “welcome kit” as part of the onboarding process, which contains the information they need before finalizing their purchase and paying their deposit to have their system installed. The welcome kit typically contains the customer’s contract with its terms and conditions, payment and system activation instructions, a user guide, warranty information, customer service contact information, and end-of-life disposal instructions.

In addition to written materials, sales agents should provide new customers with a general technical introduction to using and maintaining their products. This introduction should confirm customers’ understanding of the product, financial terms, and after-sales service information. After the purchase, the company’s customer service center should phone customers to take them through a checklist of essential information, review key facts, and answer questions.

On-time loan repayments are the foundation of a well-running and profitable solar AFC. The customer should therefore receive a transparent and easy-to-follow payment schedule. Customers should also gain access to clear and timely balance information that highlights the portion of the principal they are required to pay, interest and other fees, commissions, and penalties.



Example 8

SunCulture, headquartered in Kenya, sells and finances solar water pumps costing from \$500 to \$1,500 over 24 to 36 months. To determine the size of the asset and loan period, SunCulture has established a multi-step process for new customers. SunCulture’s sales agents describe the features of the product and terms of the loan to prospects. If these prospects meet minimum requirements (national ID, age, a credit bureau check, and a deposit), they are forwarded to a Relationship Manager.

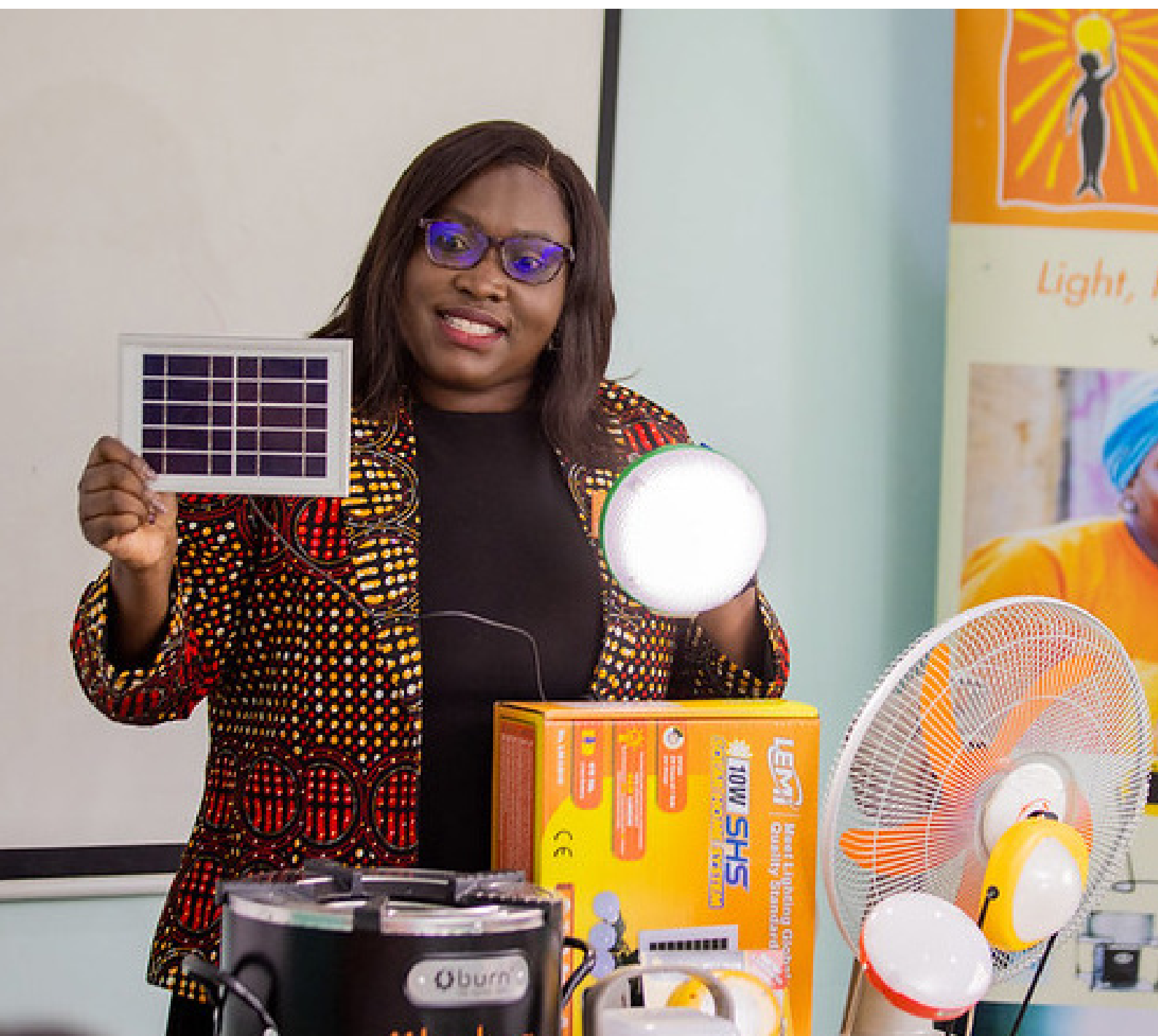
The Relationship Manager assesses clients’ intended use for the assets (e.g., for a business or household) and their ability and willingness to pay and takes them through a credit survey process. The survey weighs and tabulates its questions to produce a credit score, which aims to mitigate customer over-indebtedness and fraud. The Relationship Manager and Head of Credit use this score to approve or deny the application. Once the customer has paid the deposit, an engineer assesses the customer’s home or business to identify technical issues with the site or the product’s intended use.

After each payment, customers must receive a balance summary that confirms their payment and shows the remaining balance and when the next payment is due. The AFC should give its customers their transaction history upon request. This information should also be available to customers in the format they prefer (e.g., SMS, in print, or verbally through customer services or at a branch).

4.3 After-sales service and warranties

Ensuring that customers know how to use and maintain their off-grid solar products helps keep after-sales costs down and increase customer satisfaction. A product manual must have clear instructions on using and maintaining the device and should inform the customer how to contact customer service and to make a warranty claim. Having a well-designed manual ensures that customers use and maintain products properly and prevents failures, which can lead to non-payment. The manual should be written in plain language that most customers can understand and should be accompanied by graphic illustrations where possible.

The warranty must explain what customers must do if they wish to claim the warranty (e.g., return to the point of purchase, travel to a service center, or call or SMS a number) and how the warranty will be executed (via repair or replacement). The product warranty must be available to customers in writing to allow them to understand the terms before purchase.



5. PORTFOLIO MANAGEMENT

Although every solar AFC must accept a certain amount of credit risk, actively managing the credit portfolio ensures that the AFC's operations stay within acceptable risk boundaries. Solar AFCs need to estimate how many customers are likely to default, build this loss into their cost structure, and then ensure that defaults do not increase above this rate.

Solar AFCs must quantify their risk appetite, which is the acceptable level of exposure for all significant risks, often referred to as Key Risk Indicators (KRIs). AFCs should not exceed these indicators, which include:



Loan growth over time



Loan arrears and write-offs



Loan rescheduling as a percentage of the loan portfolio

Solar AFCs can include additional KRIs to assess their portfolio performance from different perspectives. KRI performance serves as an early warning for credit risk, provided that KRIs are easy to track and quantify. Ideally, the AFC's data management system should track the performance of KRIs automatically and should alert key personnel when credit risk approaches its thresholds.

Solar AFCs can reduce their risks further by offering multiple products to mitigate the risk of technical and supply chain failures, which helps the company hedge against product obsolescence and customers' product fatigue. Companies can also consider diversifying away from only solar home systems, to avoid overexposure to one product segment, by supplying productive use of energy (PUE) systems, such as solar water pumps.

Solar AFCs can reduce their geographic risk by serving customers who live in different regions of one country, and by operating in several countries, to reduce their exposure to droughts, floods, or civil or political unrest. Solar AFCs should assess if their portfolios are concentrated within a particular category, such as a product, location, and market. Having determined this level of concentration, AFCs should stress-test their portfolios to determine how exposed they are if a range of catastrophic events were to happen.



6. CONCLUSION

If off-grid solar companies achieve financial sustainability and profitability, then they can help to achieve a range of important global targets such as universal energy access, rural development, employment, and climate change mitigation and adaptation. However, achieving sustainability requires solar AFC to invest in risk management policies over the long term, without taking shortcuts or quick fixes.

Risk management should be embedded in all aspects of an AFC's operations and culture. A well-functioning AFC will define its risk appetite, draft and implement risk management policies, establish data management systems, and invest in its staff to ensure that everyone is involved in data collection, monitoring, and analysis. The key to credit risk management is ensuring that the company keeps all risks within acceptable limits at any pace at which the business is growing.



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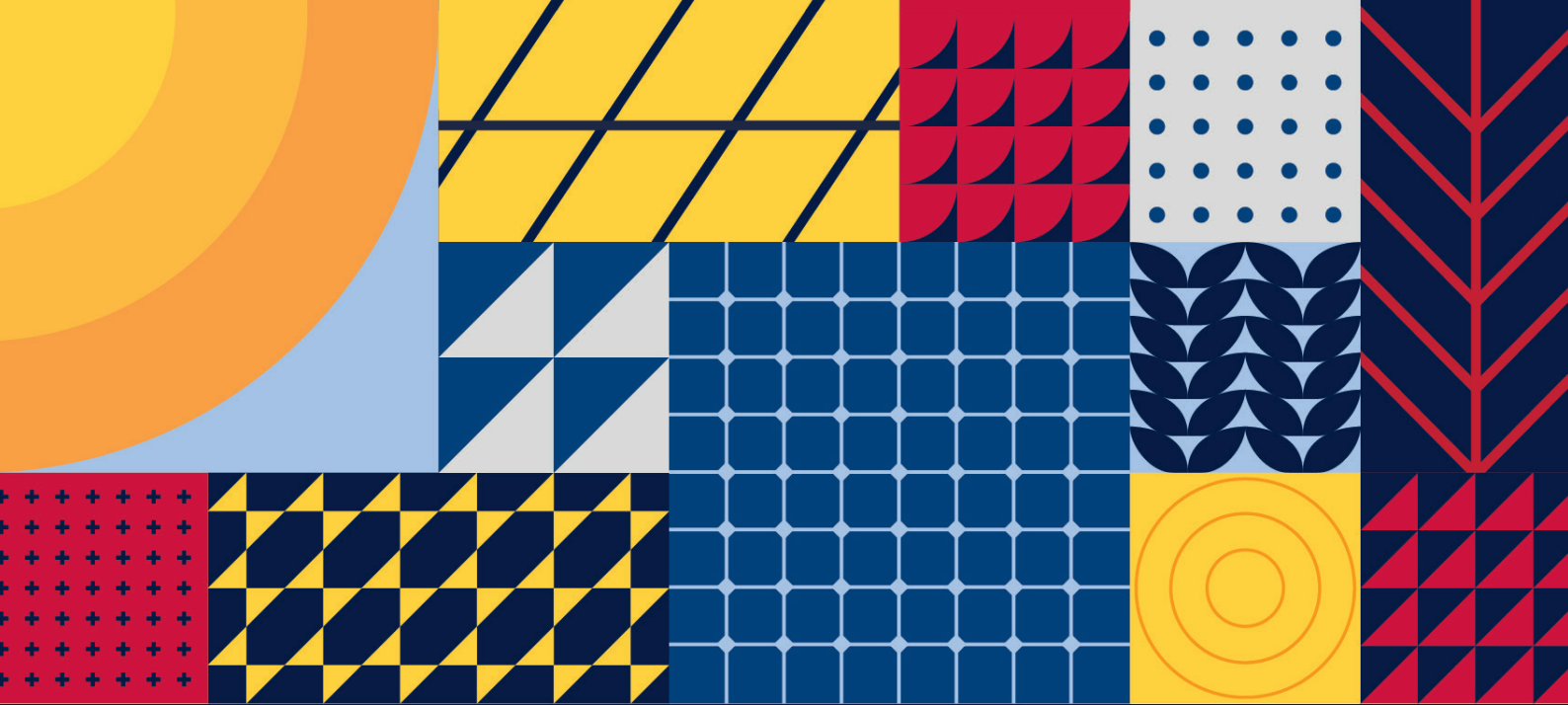
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Power Africa's goal is to add at least 30,000 megawatts of cleaner and more reliable electricity generation capacity and 60 million new home and business connections by 2030.



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