



# 7. Elements of Business Models for Off-Grid Solar

Foundations of Off-Grid Solar in Haiti





## Foundations of Off-Grid Solar in Haiti



**1. Basics of Electricity, Energy Access, and Off-grid Solar**



**2. Key Products and Quality Assurance for Off-grid Solar**



**3. Market Potential for Off-grid Solar in Haiti**



**4. Understanding Off-Grid Solar Customers**



**5. Designing and Modeling Off-Grid Solar Systems**



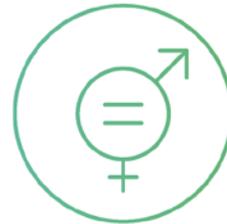
**6. Installation, Operations, and Maintenance of Off-Grid Solar Systems**



**7. Elements of Business Models for Off-Grid Solar**



**8. Financial Modeling for Off-grid Solar**



**9. Gender and Off-Grid Solar**



**10. Productive Use of Energy**



**11. Climate Adaptation and Resilience**

# Overview



The objectives of this module are to provide an overview and key resources/tools for understanding:

- What are the basic business models for off-grid solar? ([Go to Section](#))
- What is credit risk management and why is it important for Off-Grid Solar companies? ([Go to Section](#))
- What are the investment space and financing pathways for Off-Grid Solar? ([Go to Section](#))
- What should Off-Grid Solar companies do to protect customers? ([Go to Section](#))
- How do you evaluate and track the impact from off-grid solar? ([Go to Section](#))
- What considerations are there for end-of-life management of Off-Grid Solar? ([Go to Section](#))

What are the basic  
business models for off-  
grid solar?

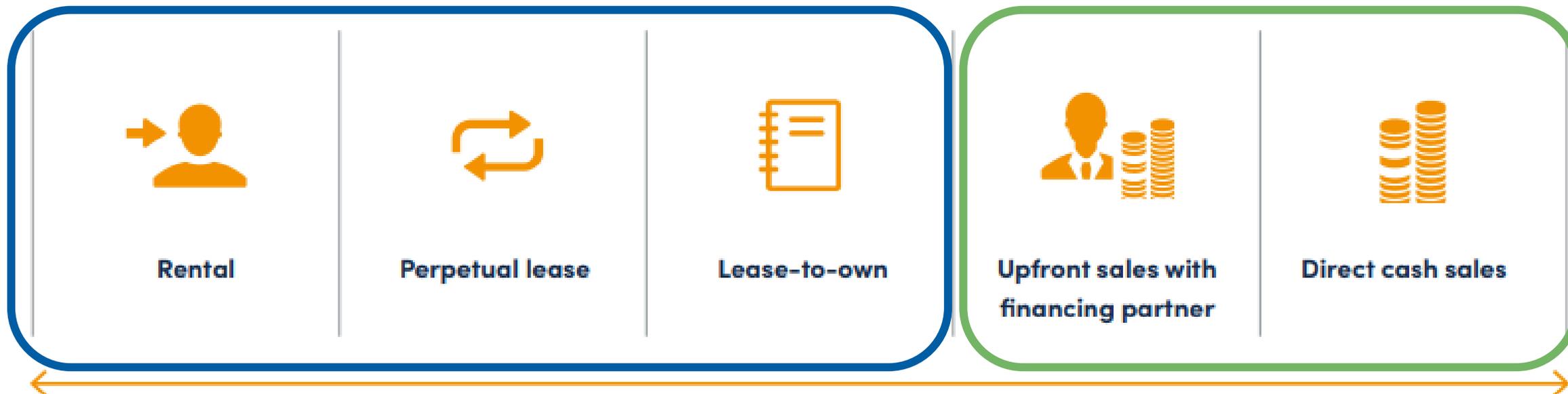
# Overarching Business Models for Off-Grid Solar



Two primary business models for Off-Grid Solar: **1) Cash sales** ; **2) Pay as you go (“PAYGo”)**. Cash sales have customers paying upfront for the product or service either directly themselves or with the help of a financing partner. PAYGo models combine the retail and financing value chains and leverage mobile money, allowing customers to pay for systems in small installments. Many companies do employ both a cash and a PAYGo model.

## PAYGo

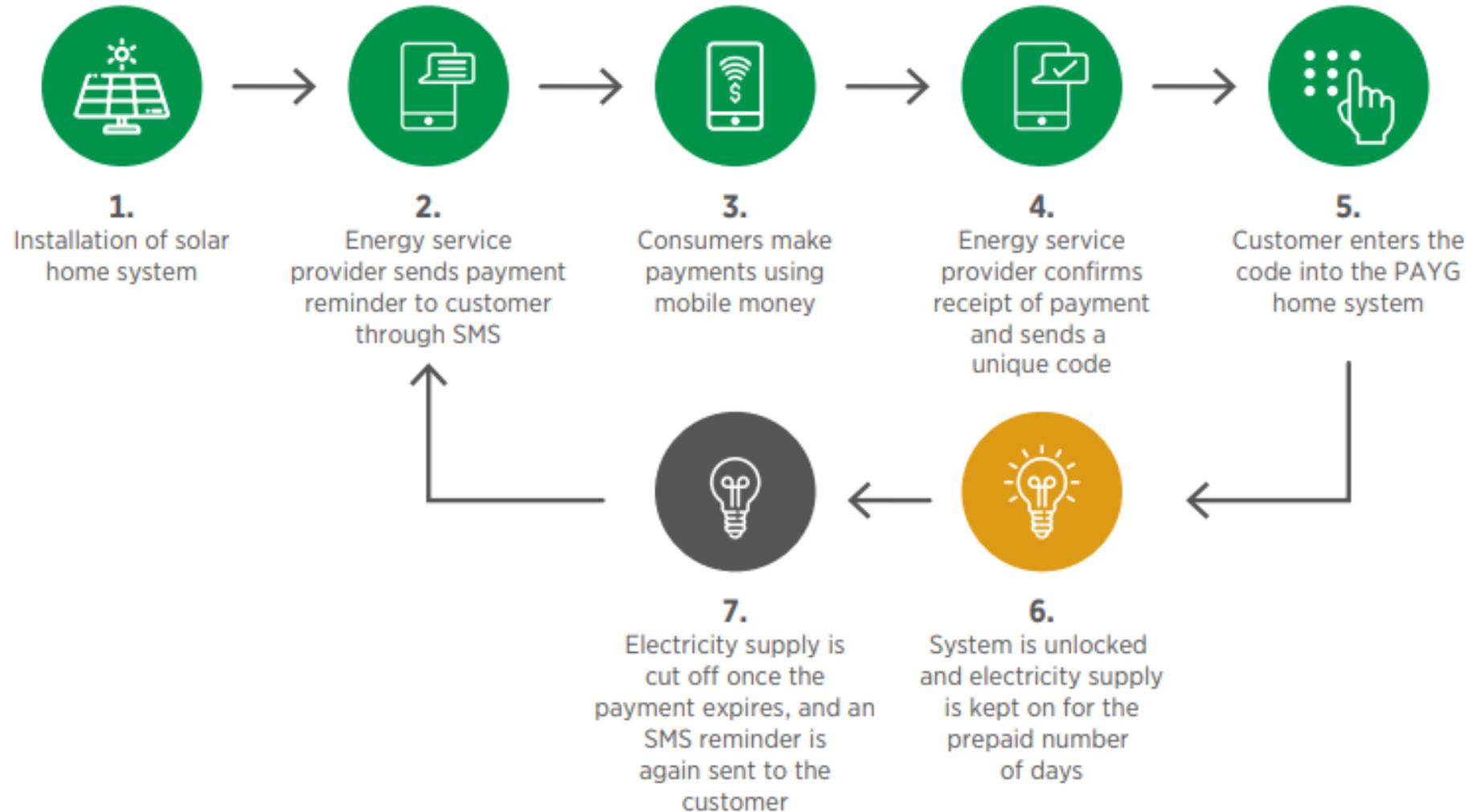
## Cash



Consumer buys a **service**

Consumer buys a **product**

# Overview of PAYGo Architecture



# PAYGo vs. Cash Sales for Global Off-Grid Solar Sector



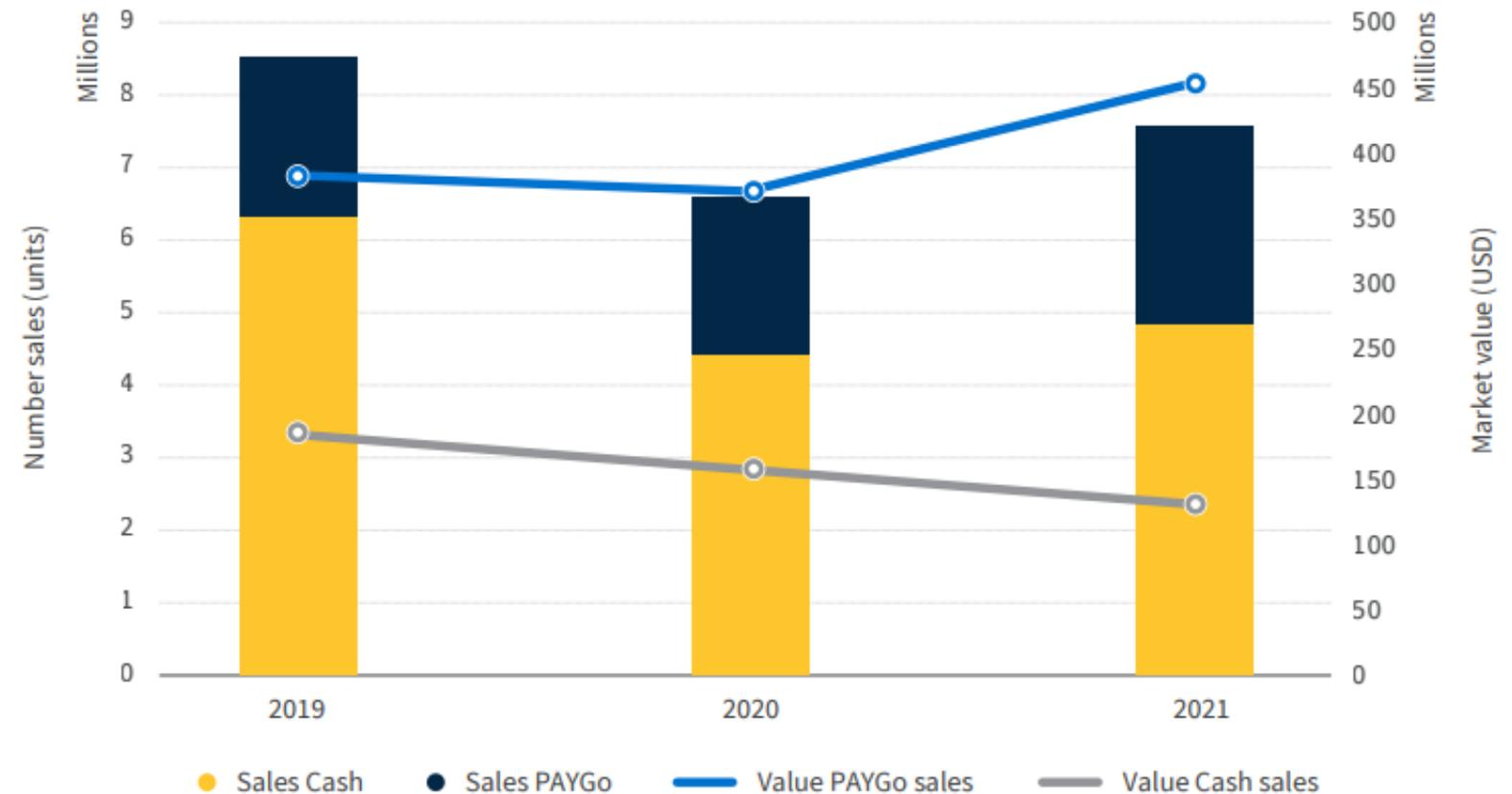
PAYGo sales represented:

- **36%** of sales

Yet...

- **75%+** of the total market value

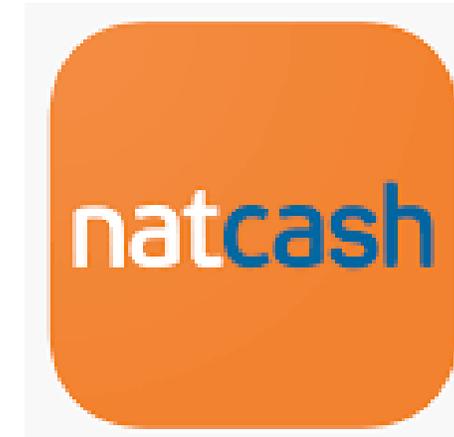
Figure 53: Number and market value of cash sales and PAYGo sales from affiliates<sup>280</sup>



# PAYGo is Nascent in Haiti; Most Sales are Cash



Digicel and Natcom both have mobile money applications in Haiti, but most off-grid solar companies operate on cash sales only which reflects a focus on larger systems.



# Additional PAYGo Resources

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Additional information on PAYGo and off-grid solar business models can be found in the resources below:

- [GCAP Strange Beasts Making Sense of PAYGo Business Models](#)
- [USAID PAYGo for Financial Inclusion](#)

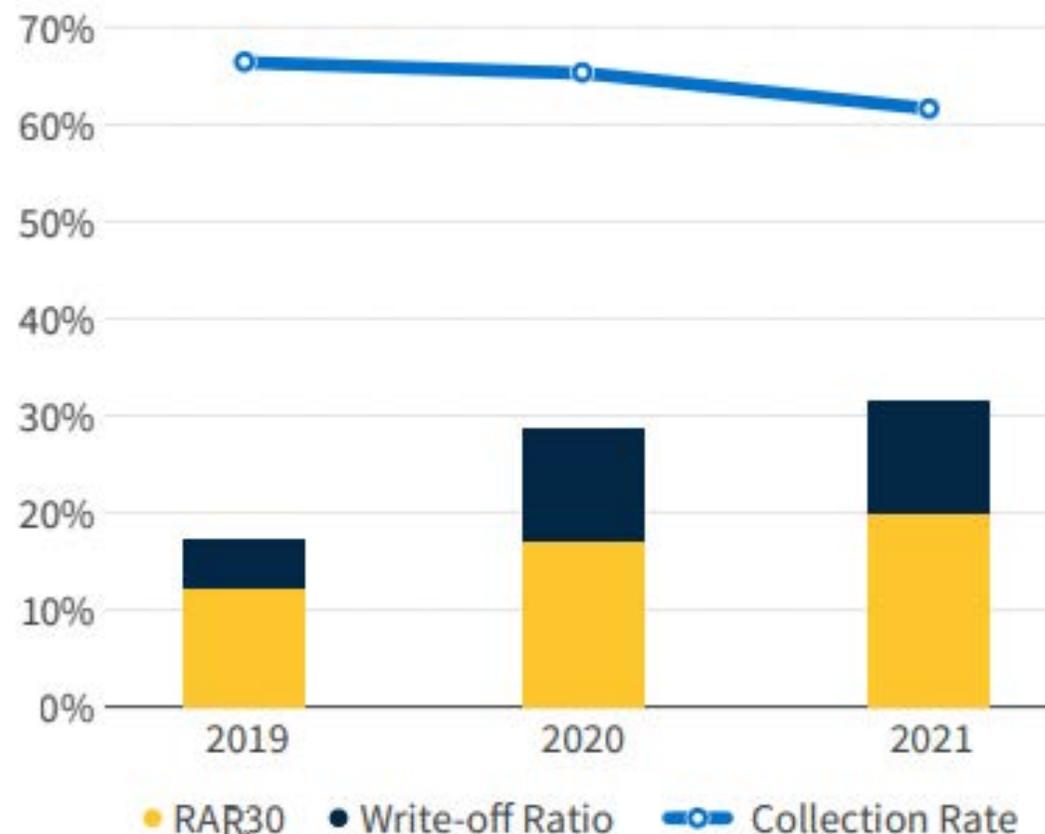
What is credit risk management and why is it important for off-grid solar companies?

# Credit Risk Management is a Key Challenge for OGS Companies



- In 2021, PAYGo companies on average were collecting just 62% of payment volumes owed to them each month (collection rate) – down from 67% in 2019.
- This undermines the financial sustainability of the business model, and places PAYGo customers at risk of losing their purchases.
- The Write-Off Ratio + Receivables at Risk (RAR) 30 indicator (a measure of non- and slow payments) also worsened from 18% in 2019 to 32% in 2021 in the same period.
- Overall, this indicates an increase in the number of customers who lost access to their systems after defaulting on their payments, and presents a significant concern for customer wellbeing.

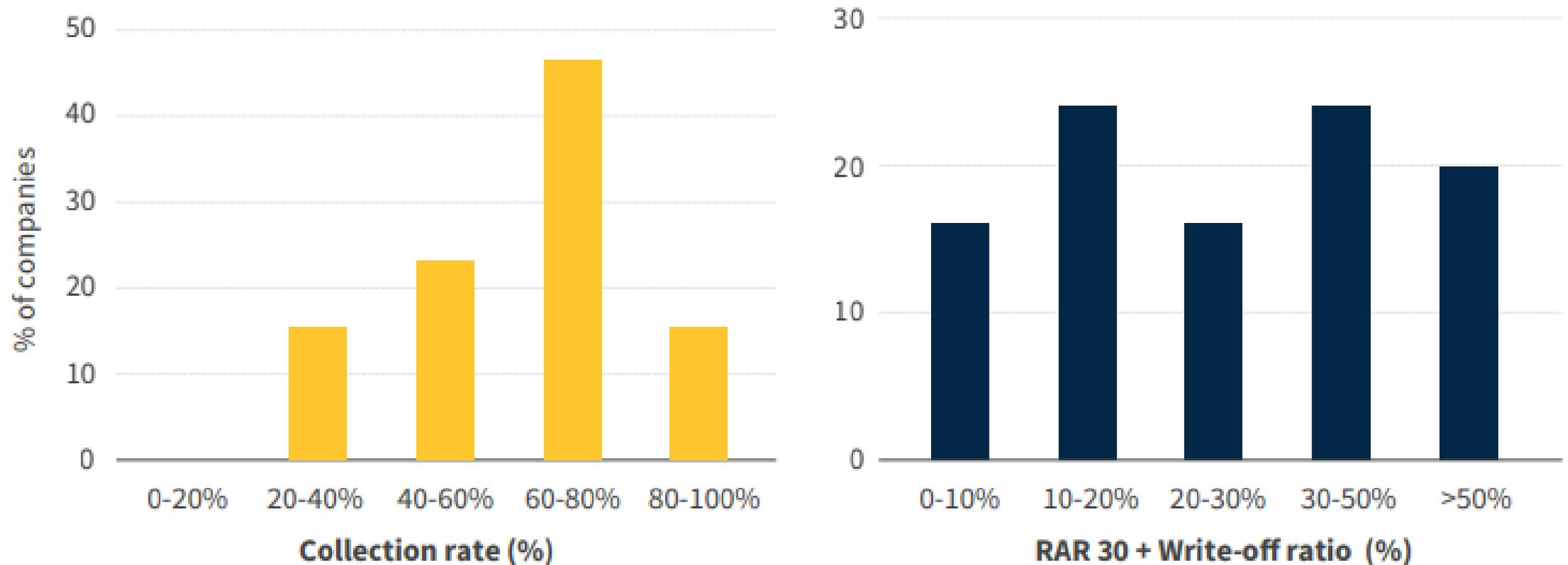
Figure 55: Trends in non-weighted mean PAYGo Collection Rate and Write-Off Ratio + RAR 30<sup>292</sup>



# Most PAYGo Companies Face the Credit Risk Challenge



Figure 54: A histogram of the median portfolio quality results of PAYGo companies in 2021<sup>287</sup>



# Credit Risk Management Resources

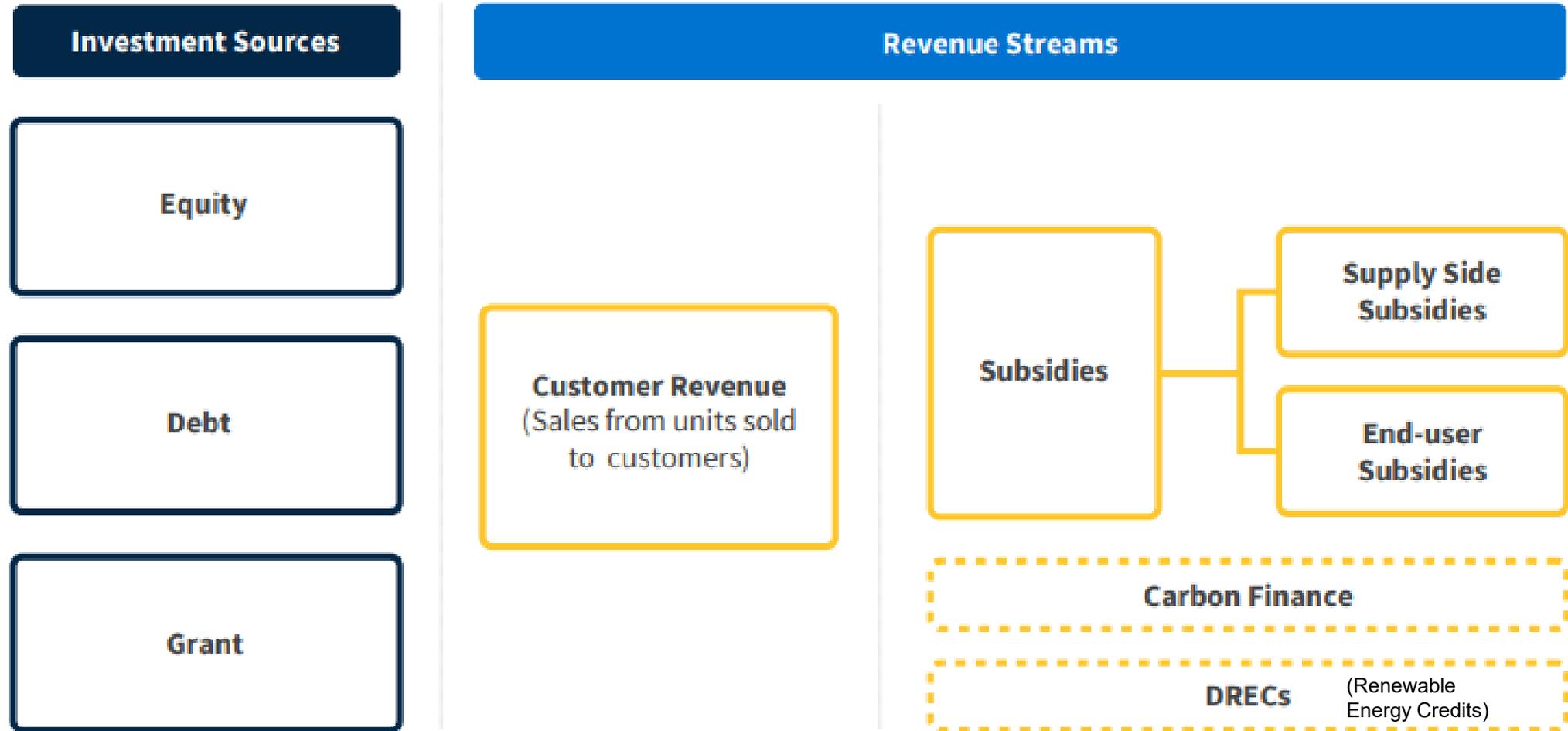


**Credit Risk Management is too detailed to address fully in this training, so for those interested, the below resources provide detailed approaches for understanding and managing credit risk:**

- USAID PAYGo Credit Risk Management Guide; available [here](#).
- GETTING REPAYED IN ASSET FINANCE – Technical Guide for Credit Risk Management; available [here](#).
- GOGLA Agent and Management Model for Credit Risk Management; available [here](#).
- Full 1-hour Training Webinar on PAYG Credit Risk Management from GOGLA and Power Africa; available [here](#).

What is the investment  
landscape and financing  
pathways for off-grid solar?

# Overview of Investment and Returns for Off-Grid Solar



**Equity financing** is an investment taking a stake in a company in exchange for a share of future revenue; **Debt financing** is a loan for example where a company is borrowing money and paying it back over time. **Grant financing** is philanthropic, innovation, or other awards given without expectation of payback.

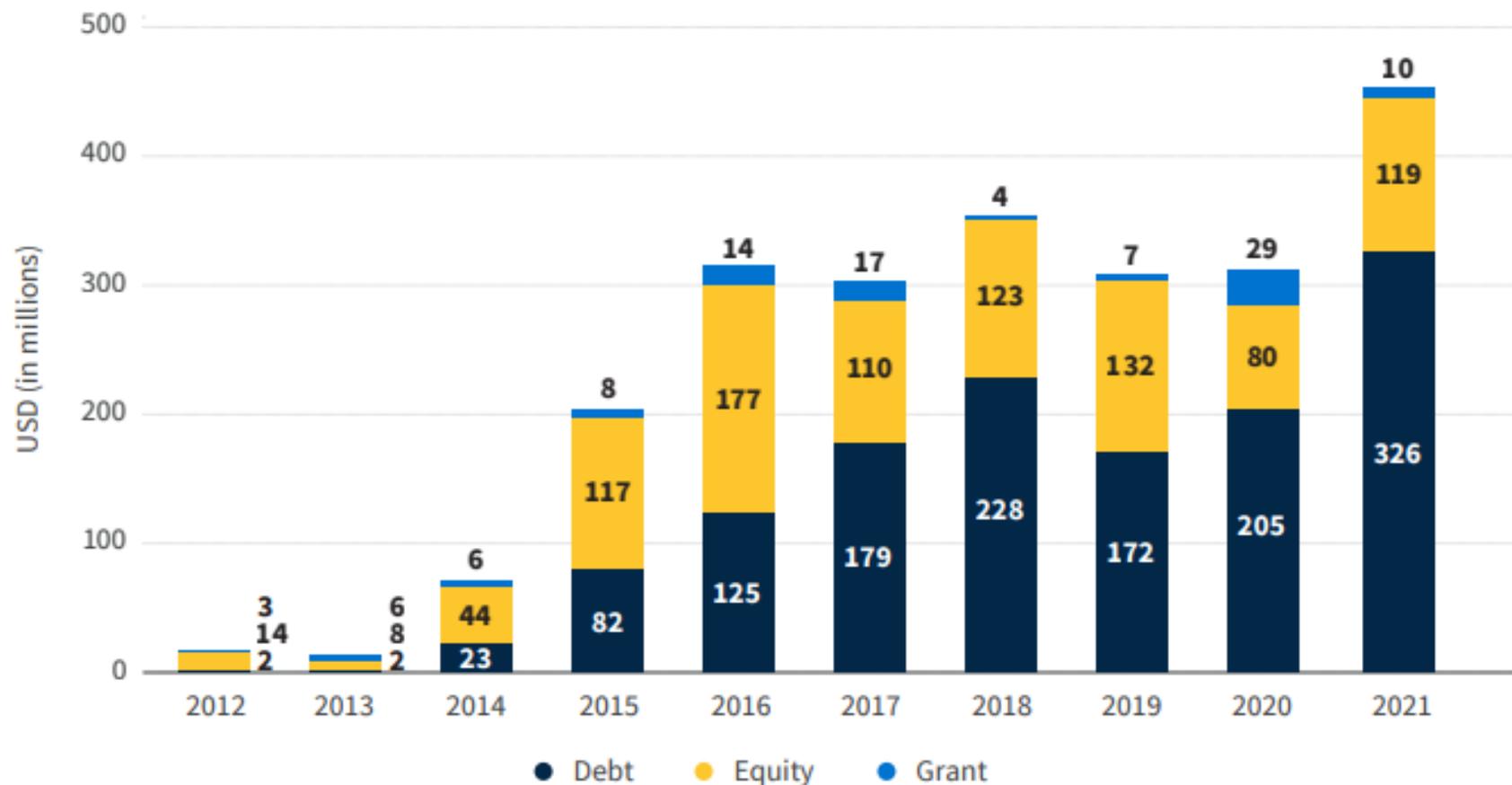
# Off-Grid Solar Investment Volumes



**\$457 million** of investment in 2021.

**72% of current industry investment** has been directed to just 7 companies, with the remaining 26% directed to the other 150+ OGS companies.

GOGLA has an [interactive dashboard](#) that highlights investment data flows including types of capital, funders, recipients, etc.



# General Investment Stages



**As annual revenue increases, companies need to move into different investment phases.**

A detailed description of different funding paradigms and their benefits / challenges for off-grid solar companies can be found in the World Bank [“Funding the Sun” report](#).



## Blueprint

Companies are undertaking customer research, developing value propositions, and a business plan for core services or products.

**Funding Target:** 10k - 1M (USD) in grants or seed funding to support planning and research and development.



## Validate

Companies test their assumptions and refine their business models, services or products. Focus is on operationalisation of their model - cost, value, and pricing is paired with a need to create innovation.

**Funding Target:** 250k - 5M (USD) in early equity or debt financing.



## Prepare

Professionalize operations and establish processes, strengthen team capacity for sales and marketing to stimulate demand, and develop the supply chain.

**Funding Target:** 3M - 10M (USD) in early equity or debt financing.



## Scale

Companies move into new geographies and/or segments, invest into assets and talent, streamline systems and processes, and mobilize to respond to competitors.

**Funding Target:** >10M (USD) generally in off-balance sheet financing or special purpose vehicles (SPV).

# Investor Confidence in OGS Companies



Investor confidence in off-grid solar is evolving, but there is a generally favorable outlook.

Figure 66: Investor survey 2020 & 2021: How is your off-grid solar portfolio performing relative to your financial expectations?

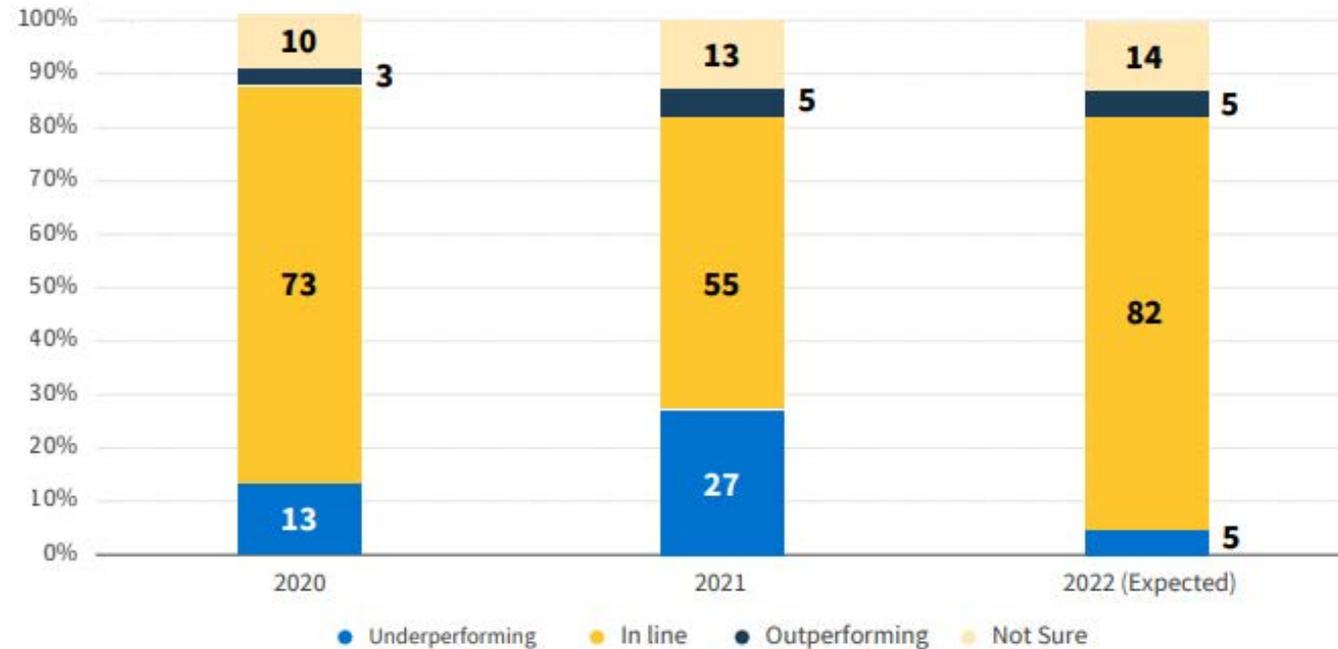
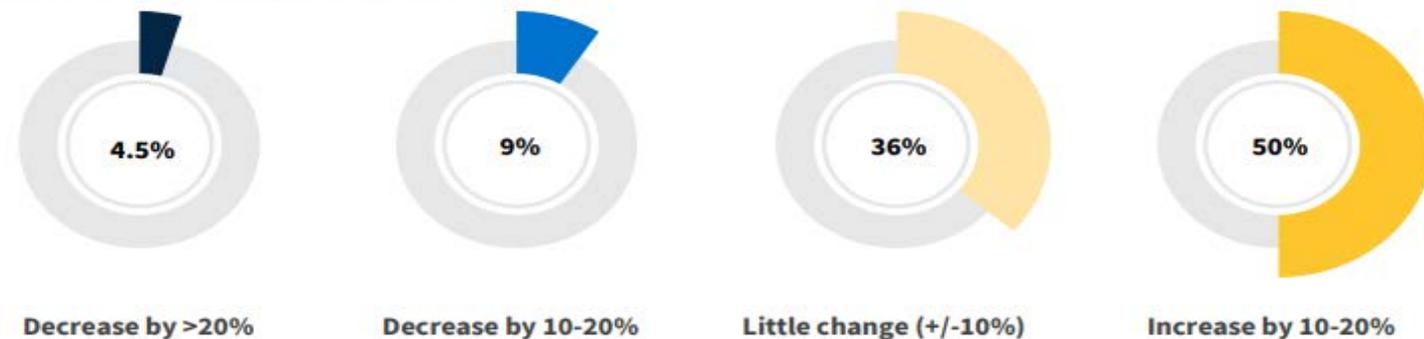


Figure 67: Investor survey 2021: Relative to past years, how do you expect your off-grid solar activity to change in 2022 (in terms of total amount invested)?

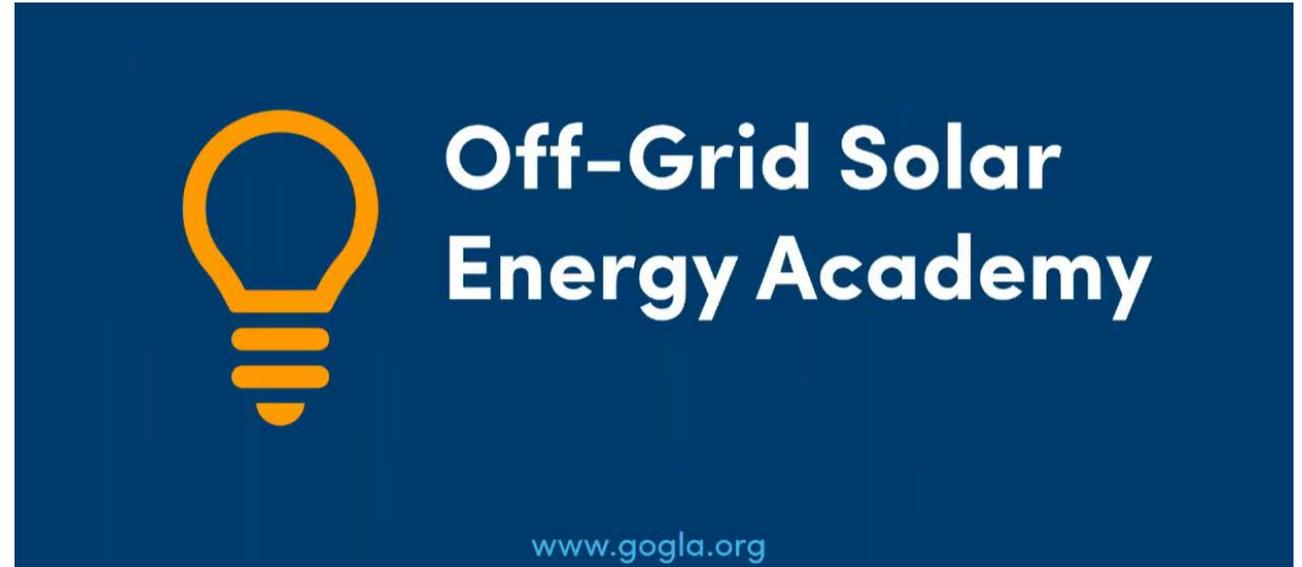


# GOGLEA Access to Finance Academy



GOGLEA has developed a [series of recorded workshops](#) to help companies understand and overcome barriers for accessing investment and financing for off-grid solar. Specific modules include:

- Financial Analysis
- Investor Relationships
- Foreign and Local Currency Lending
- Corporate Governance

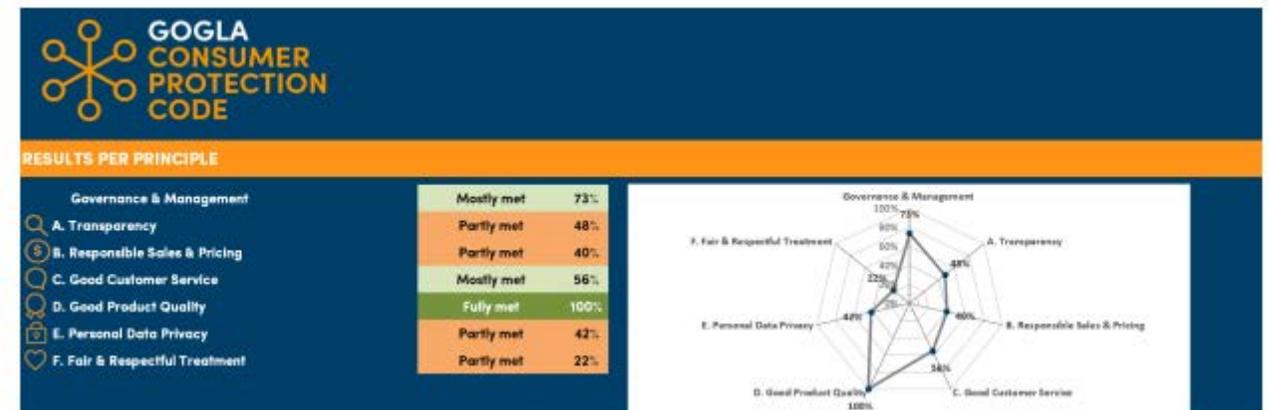
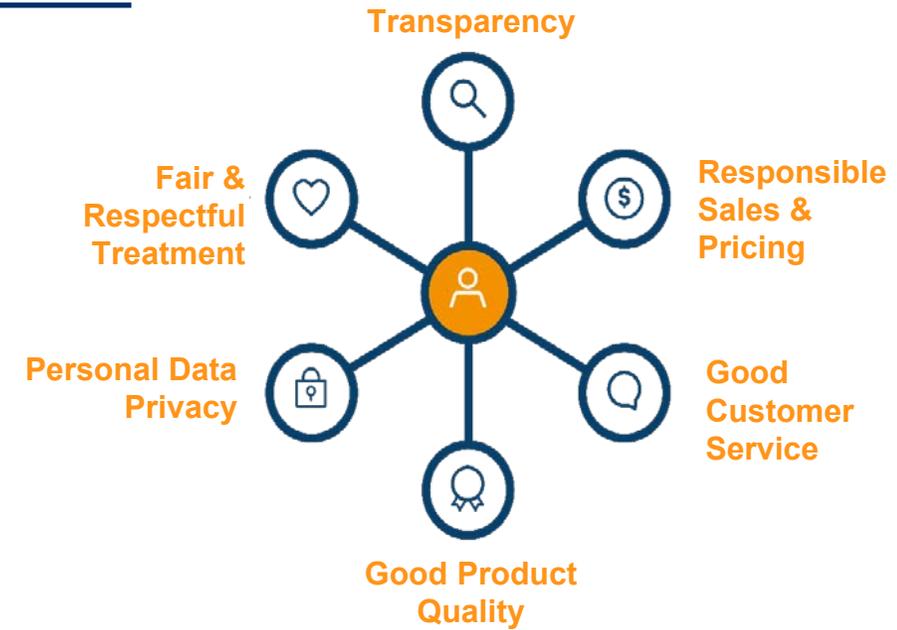


What should off-grid solar companies do to protect customers?

# Consumer Protection Principles (GOGLA)



- The Consumer Protection Code defines the minimum standards of practice consumers should expect from an off-grid solar company.
- Full list of Consumer Protection Principles are available in [English](#) and [French](#).
- Self-assessment tool for companies are available in [English](#) and [French](#).



# Consumer Protection Principles



Principle	Definition
<b>Transparency</b> 	<ul style="list-style-type: none"><li>• The company shares clear and sufficient information on the product, service, payment plan, and personal data privacy practices to enable consumers to make informed decisions.</li><li>• The company shares relevant and timely information before, during, and after sales.</li><li>• The company communicates in a language and manner consumers can understand.</li></ul>
<b>Responsible Sales &amp; Pricing</b> 	<ul style="list-style-type: none"><li>• The company takes adequate care to ensure consumers can afford to pay for the product and/or service without becoming overburdened.</li><li>• The company ensures consumer characteristics are taken into account in the price, payment structure, and fees of the product and/or service.</li></ul>
<b>Good Consumer Service</b> 	<ul style="list-style-type: none"><li>• The company ensures availability of technical and after-sales service support, including warranty and post-warranty service for a reasonable period of time.</li><li>• An accessible, effective, and timely mechanism for complaints and problem resolution is in place.</li><li>• The company instructs consumers on proper use, care, and any health and safety risks related to the product usage or disposal.</li><li>• The company considers measures to enable continued operability of the product in the event of the failure of the company.</li></ul>

# Consumer Protection Principles (cont.)



Principle	Definition
<b>Good Product Quality</b> 	<ul style="list-style-type: none"><li>• The company ensures the product/system is appropriate, good quality, safe, and performs as advertised.</li><li>• The user interface/payment platform is appropriate for consumers.</li><li>• The company takes reasonable measures to ensure product longevity, including ease of operation and maintenance, repairability, and durability.</li></ul>
<b>Personal Data Privacy</b> 	<ul style="list-style-type: none"><li>• The company applies good practices and complies with relevant laws and regulations governing consumer data privacy.</li><li>• The company only collects, uses, retains, and shares personal information that is necessary for the stated consumer service and legitimate interests of the business.</li><li>• The company ensures consumer data is kept secure and confidential.</li></ul>
<b>Fair &amp; Respectful Treatment</b> 	<ul style="list-style-type: none"><li>• The company ensures fair and respectful treatment of current and prospective consumers, with adequate safeguards in place against corruption and abusive treatment.</li><li>• The company promotes inclusive practices and does not discriminate, for example, by gender, religion, or ethnicity.</li><li>• The company seeks consumers' views and feedback on the design and delivery of the product, service, and payment plan.</li></ul>

# Benefits of Consumer Protection



Consumer protection helps:

- Empower consumers to make informed decisions
- Protect consumers from low-quality products
- Protect consumers from undue financial burden
- Increase benefit and satisfaction with products
- Safeguard against unfair treatment and exploitation
- Increase profitability and growth through improved brand perception
- Increase customer referrals
- Reduce risk of over-indebtedness
- Support innovation for product quality and sales.

Figure 1. Consumer experience and satisfaction ratings for 15 PAYGo SHS companies<sup>6</sup>



# Process for Endorsing Consumer Protection Code



- The Consumer Protection Code is available to all off-grid solar companies and start ups. The process to join is detailed [here](#).
- Additional insights on the off-grid solar sector and consumer protection can be found in the GOGLA report [here](#).



How do you evaluate and track the impact from off-grid solar?

# GONGLA Standardized Impact Metrics for Off-Grid Solar



- GONGLA has developed a set of [standardized impact metrics for off-grid solar products](#) (mostly lanterns and solar home systems (SHS), but the approaches are adaptable to larger systems). GONGLA also [developed companion impact metrics for appliances](#) (fans, tvs, etc.)
- The framework has formulas (as well as default values) to help companies estimate the impact of their off-grid solar sales across a variety of metrics including:



*Number of people with improved energy access (disaggregated by Tier of service)*



*Households generating additional income; Energy expenditure savings*



*Additional lighting hours enabled; improved lighting quality*



*People undertaking more economic activity; people supporting enterprise; increased operating hours*



*Kerosene replacement and CO2 emissions avoided*



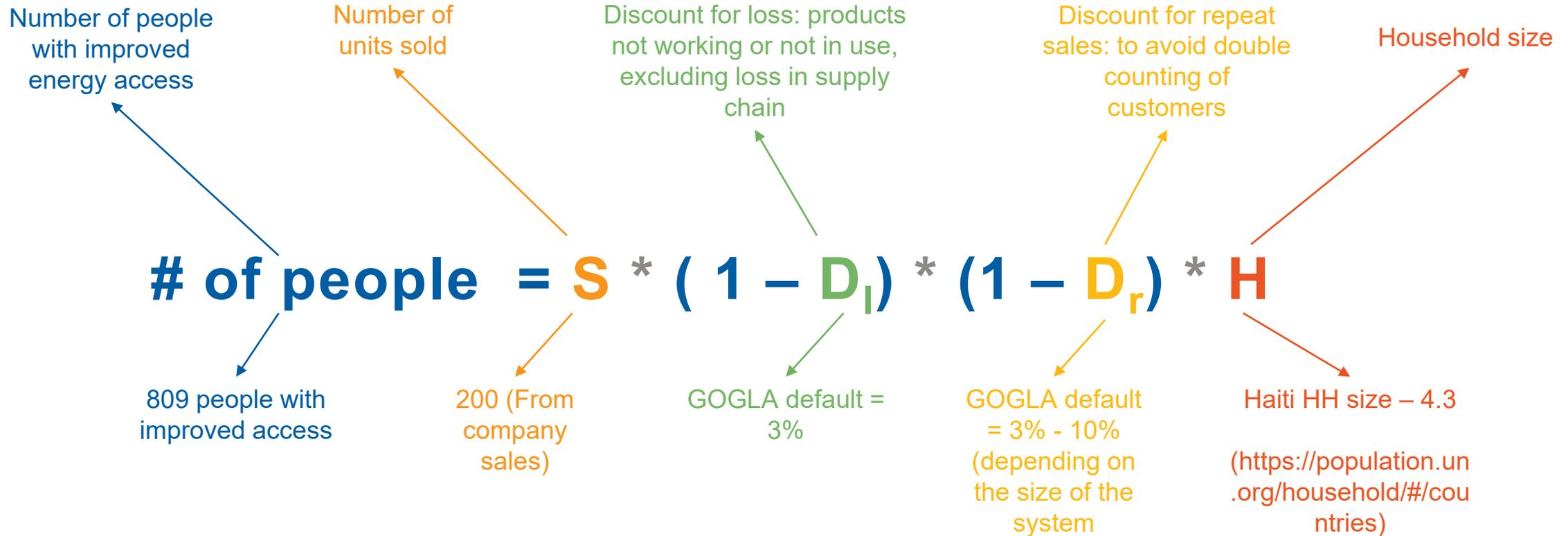
*Financial inclusion*

# GONGLA Off-Grid Solar Impact Calculator

- GONGLA has also developed an [impact calculator tool](#) to help companies estimate the impact of their off-grid solar projects and portfolios.
- Companies input their sales and impact estimates for energy access, economic activity, light availability, energy spending, income generation, financial inclusion, and CO<sub>2</sub>e reduction.



# Example Calculation – Number of People with Improved Access



*For larger systems, a simple estimate is # of systems installed \* household size*

# PAYGo Perform



FIGURE 1. PAYGo PERFORM KPI categories

- Lighting Global also developed a set of key performance indicators specifically for PAYGo companies focused on portfolio quality, company and operational health, and unit economics.
- The full set of key performance indicators (KPI) as well as guidance for their calculation and utilization can be found in the technical guide [here](#).
- There is also a [review of accounting practices](#) for off-grid solar companies.



What considerations are there for end-of-life management of off-grid solar?

# End-of-Life for Off-Grid Solar Products



- Off-grid solar companies have a responsibility to manage their products and limit their negative impacts on both the environment and people, especially when there is no national policy for waste management as is the case in Haiti.
- A matrix of key risks for off-grid solar companies related to e-waste is detailed [here](#).
- More than 85% of people who owned an SHS were not aware of its expected lifespan. ~50% of SHS owners would seek advice from the seller before disposing of their systems, while around 17% would throw them away, and close to 7% would keep them in the house.
- End-of-life management can improve company perception and standing with customers and investors, differentiate the company amongst competitors, and be a potential revenue stream for companies.

Figure 2 - Barriers to relinquish solar products at end-of-life<sup>16</sup>



# Three General Methods for Recovery of E-Waste



## Take-Back Scheme

An initiative organized by a manufacturer or distributor to collect used, end-of-life products or components from consumers to either reintroduce them to the market through repair and refurbishment or ensure that they are safely and appropriately recycled or disposed of.

## Third-Party Collection

An activity to collect and process e-waste carried out by a third party such as a national waste electrical and electronic equipment (WEEE) recycling facility, or a producer responsibility organization (PRO) acting on behalf of the original equipment manufacturer. Retail outlets, filling stations, or government agencies' buildings are also possible options for collection. **This is a key emerging business model and revenue opportunity in the off-grid solar space.**

## Informal Sector

Covers many different types of actors including informal repair shops (often known as a 'fundi'), recyclers, or collectors to cover an entire informal waste-management process. E-waste in this stream often ends up either in informal landfill or being burnt so that components can be extracted – posing risks to both the environment and health of those involved.

# GONGLA E-Waste Toolkit



GONGLA has developed a toolkit for end-of-life considerations for off-grid solar. Specific modules include:

- [Introduction to E-Waste & Recycling](#)
- [Design for E-Waste Reduction](#)
- [Financials of Solar E-Waste](#)
- [Policy and Regulation](#)
- [E-Waste and the Consumer](#)
- [Takeback and Collection](#)

## e-waste toolkit

Identifying and sharing good practice  
with off-grid solar e-waste management

[www.gogla.org](http://www.gogla.org)

# GONGLA Blueprints for E-waste Management - Assess



## E-waste readiness conversation

Ensure your off-grid solar company has the fundamental requirements in place and capacity to initiate an e-waste project.

## E-waste assessment framework

Review your company's e-waste operations to identify areas of strength and weakness. Includes recommended actions and a roadmap template.



## **Resources to understand context**

- [GONGLA's catalogue of e-waste service providers](#)
- [GSMA's e-waste legislation map](#)
- [Global e-waste statistic partnership, country data](#)

# GONGLA Blueprints for E-waste Management - Plan

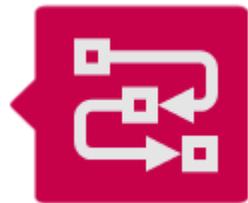


## Build your e-waste roadmap

The roadmap template is part of the assessment framework and provides recommended activities that can be prioritized according to operational context.

## Develop an e-waste policy

The E-waste Policy Blueprint provides a template document that helps companies outline their ambitions, roles and responsibilities, and processes.



## Establish Standard Operating Procedures (SOPs)

The SOP template guides companies through the design of e-waste process flows and identification of key stakeholders along the e-waste chain.

# GONGLA Blueprints for E-waste Management - Execute



## KPIs and data tracking

List of KPIs to help off-grid solar companies measure, monitor, and report progress in e-waste management.

## E-waste processor pack

Identifying, selecting, and managing e-waste service providers can be complex in off-grid markets. This guide aims to help off-grid solar companies navigate those challenges and form effective partnerships.



## Training Guide

Access resources to help you build the knowledge and skills for effective and safe e-waste management.

# Thank you



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