2020 Off-Grid Solar Market Trends Presentation

15th May, 2020

Open Capital
LIGHTING GLOBAL
Catalyzing markets for modern off-grid energy
AN INNOVATION OF WORLD BANK GROUP
THE WORLD BANK IBRD · IDA
IFC International Finance Corporation

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During this webinar we will cover the following key topics

- The 2020 Off-Grid Solar Market Trends Report
- The off-grid solar market growth
- Key business trends
- Investor and government involvement
- Consumer insights & market opportunity
- Opportunities for Chinese manufacturers to get more involved
- Q&A

The 2020 Off-Grid Solar Market Trends Report

Introduction to the 2020 Off-Grid Solar Market Trends Report

The 2020 Off-Grid Solar Market Trends Report

Over the past decade, the IFC Lighting Global, ESMAP & GOGLA Off-Grid Solar Market Trends Report has been the report of record for the off-grid solar industry. It is the biennial anchor of the Lighting Global, ESMAP & GOGLA franchise of market data and trends reports, which is the go-to source of sector information for companies, investors, industry members, policy-makers, and other stakeholders in the sector (link).

125+	19	1200+
consultations	Country profiles	conference attendees

GOGLA | LIGHTING GLOBAL | WORLD BANK GROUP | IFC International Finance Corporation | ESMAP | THE WORLD BANK | Open Capital | vivideconomics

The 2020 Edition included a fact-finding mission to China with:

BeeBeeJump, Boxin, JCN, Jingyinfeng, Kingsako, Leadsun, Lemi, Longi, Poly Solar, ShenZhen Power Solutions, Solar Run, Sopray, Sunny Power, Suns Energy, Topray, Zonergy

Introduction to the 2020 Off-Grid Solar Market Trends Report

We used dozens of public and private data sources, including:

- GOGLA sales, investment and impact database
- ESMAP Multi-Tier Framework Survey
- Global Electrification Platform
- IRENA data and statistics
- World Bank PovcalNet
- Afrobarometer Data
- ESMAP RISE
- World Bank Rural Access Index
- IIASA SSP Database
- UN demographic and economic data

Key information in the 2020 report includes:

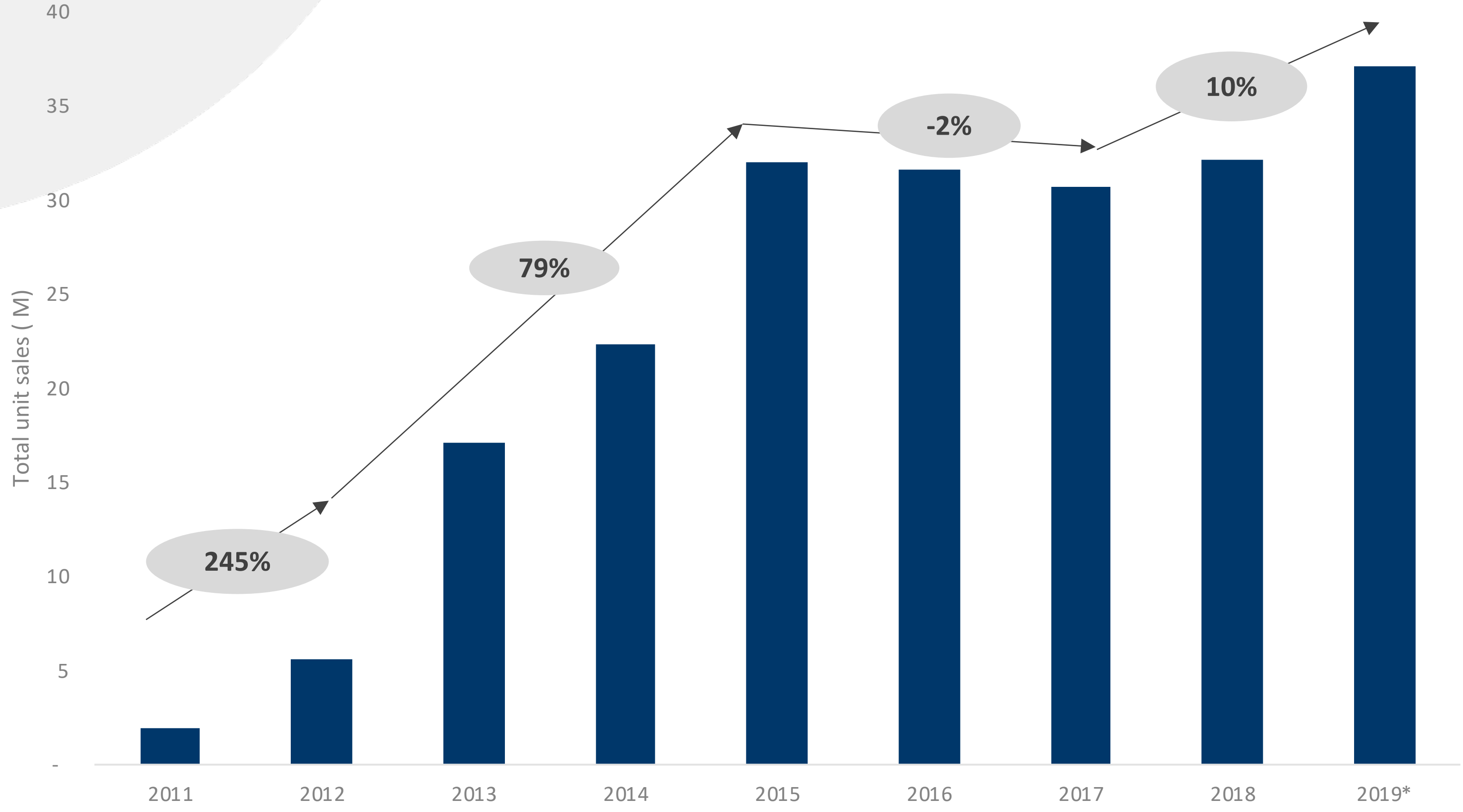
- Market Trends
- Market Outlook 2030 and SDG7
- Policy and Regulations
- Access to Finance
- Market Potential
- Turnover and Sales Trends

Caveat: The impact of COVID-19

- The true extent of the impact of COVID-19 on the OGS market is still being discovered.
- The 2020 report was prepared prior government lockdowns and public health regulations.
- Throughout this webinar we will try to include additional information on the impact COVID-19 on the findings.

The off-grid solar market growth

In just 9 years, the off-grid solar sector has grown to serve 420M users and sold at least 180M units



Key insights

- Rapid growth until 2015 as companies received substantial capital and reached easy customers
- Declines in sales from 2015 to 17 due to localized shocks in key pico product markets and companies' adaptations to sector-wide trends
- Since then growth rate has stabilized at around 10%, indicating a maturing market

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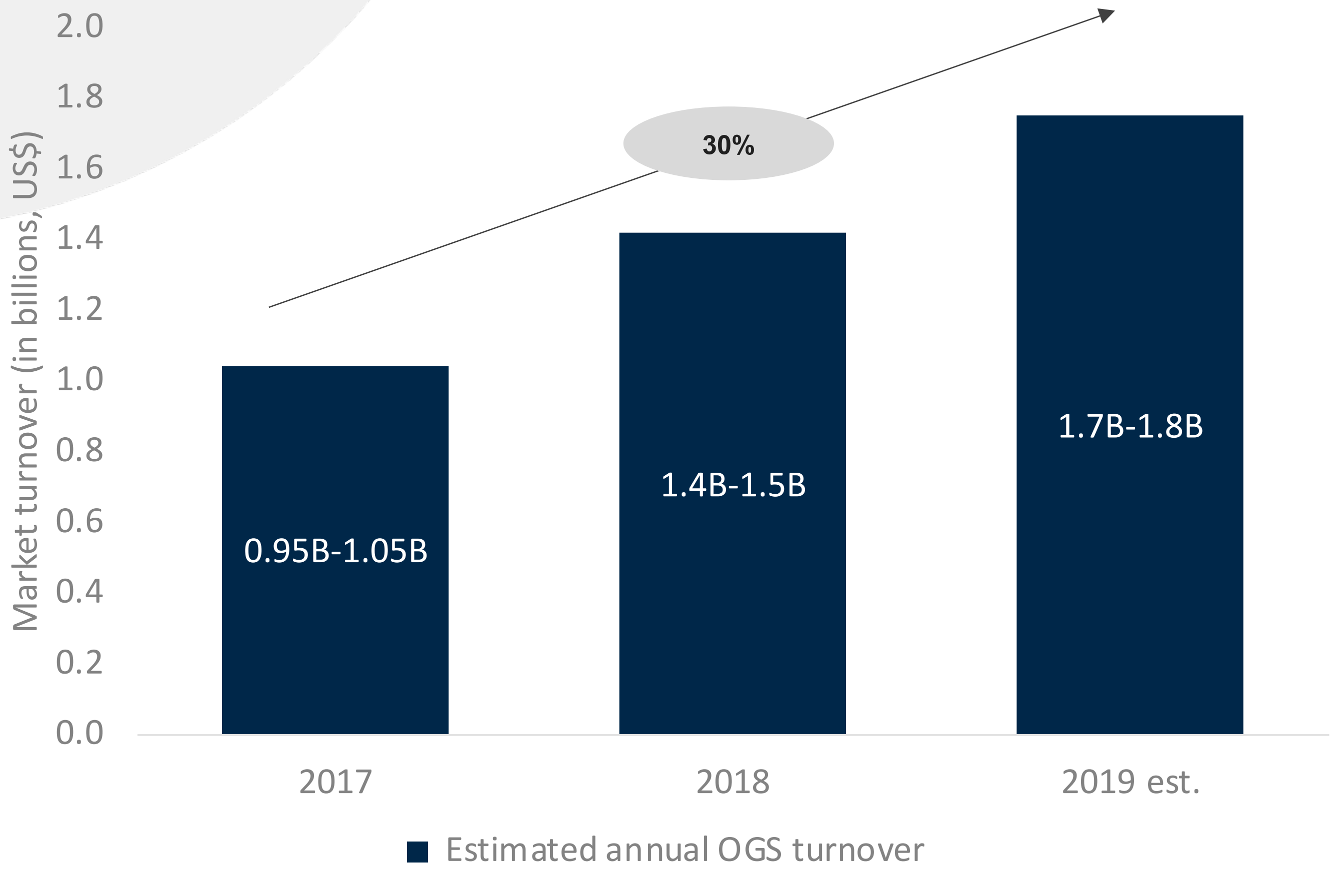
Revenues are growing rapidly at 30% annually, driven by this shift towards larger SHS and appliances enabled by PAYGo



Larger systems are driving revenue growth, despite slower sales unit growth

- Consumer research shows increased demand for appliances
- PAYGo the key to selling bigger systems and appliances in markets with low affordability

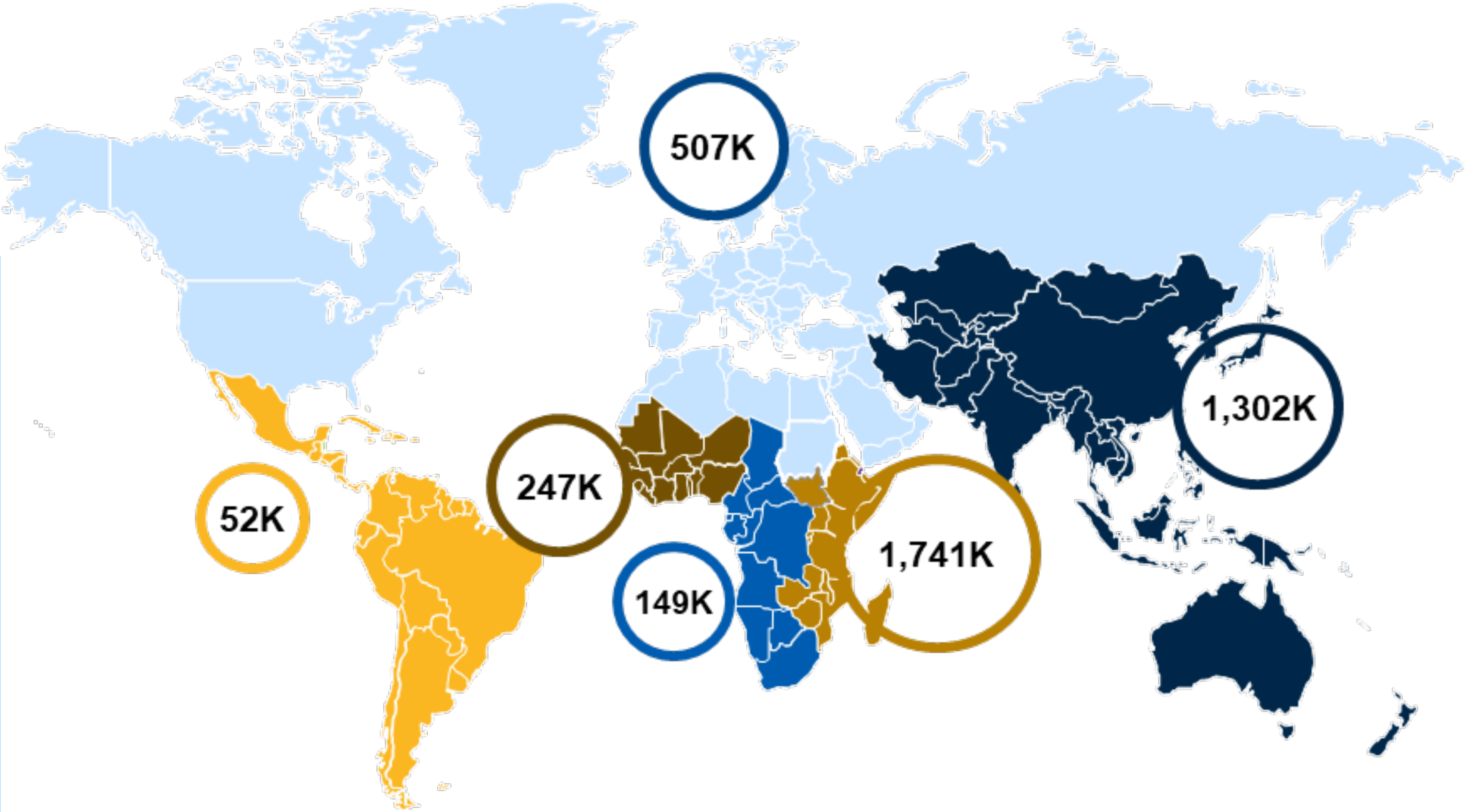
Covid-19 will have an impact on the sector, but it's still too early to say full impact

- Larger distributors report record sales in Q1 2020 as customers stock up
- Smaller distributors in countries on lockdown negatively impacted
- Major concerns about receivables quality as end users struggle with lower incomes
- Some OGS companies have been deemed essentials services
- Impacts will be highly country dependent

For companies that participate in the GOGLA sales data collection, 4.1M units of products were sold in H1 2019

4.1M units

- 42% of sales in East Africa
- Demand in West Africa starting to be met
- Rest of World sales include a large market potential for the humanitarian market
- Fans hugely popular in South Asia compared to huge TV market in East Africa



Legend: Eastern Africa, Western Africa, Middle & Southern Africa, Asia, Latin America & the Caribbean, Rest of World

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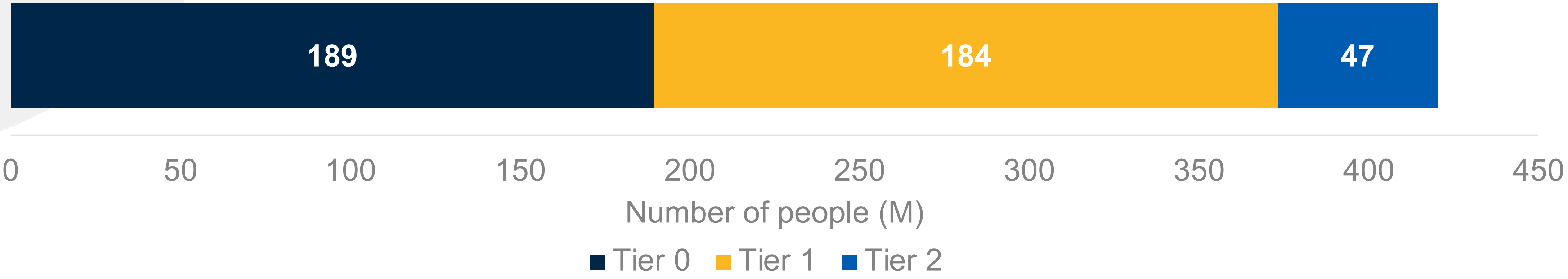
Even among the 420 million people benefitting from OGS products there is a huge potential to upgrade their access



Tier 0 products have:[1]
- Up to 3 Wp or12 Wh energy daily
- <4 hr availability per day, <1 hr per evening
- An important first step to energy access
- Example: Pico lantern

Tier 1 products have:[1]
- >3 Wp or >12 Wh energy daily
- >4 hr availability per day, >1 hr per evening
- At least 1,000 lmhr/day
- Generally the minimum requirement for energy access
- Example: Small SHS

Tier 2 products have:[1]
- >50 Wp or >200 Wh energy daily
- >4 hr availability per day, >2 hr per evening
- Powers small appliances, e.g. TVs
- Some governments consider this as minimum requirement, e.g. Rwanda
- Example: Large SHS

Sources: [1] *World Bank ESMAP,* Beyond Connections: Energy Access Redefined, Link

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Key business trends

Companies in the OGS sector are increasingly becoming value chain specialist to focus on their core competencies

Hardware manufacturing | Hardware design | Software Development | Marketing & distribution | Consumer financing | After-Sales support

Specialist providers

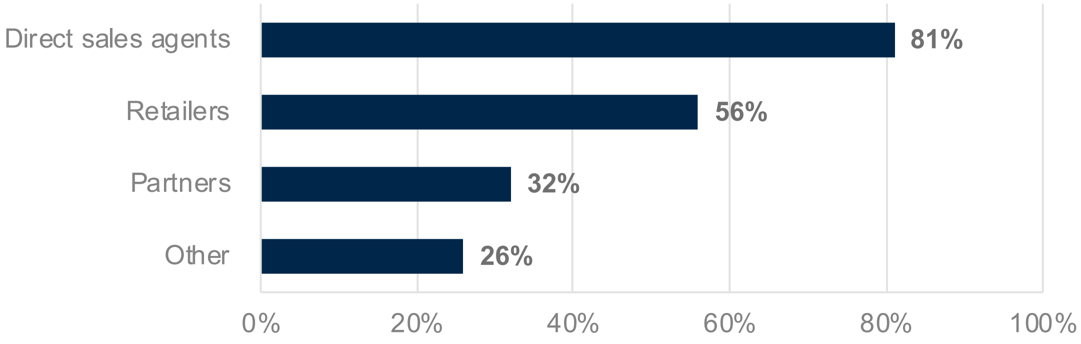
- Hardware manufacturing: JONS Energy 晶昶能, SINOWARE Power-Solution, renewit Solar solutions, Boxin Solar Co., Ltd.
- Hardware design: BioLite, AMPED Innovation
- Software Development: angaza, Paygee, Solaris Offgrid, enable|digital, CARMA
- Marketing & distribution: Frontier Markets, MTN, BITLINK, orange, orb, AWANGO by Total
- Consumer financing: musoni, KWFT Banking on Women, NMB, JamiiBora Bank, Grameen Koota, Equity Bank, Faulu
- After-Sales support: Village Energy
- Hardware manufacturing & design: Poly Solar, fosera, solaRun, Omnivoltaic, LEMI 雷铭科技
- Marketing & distribution to After-Sales support: Ignite Power, OOLU, BrightLife, pawame, easy solar, NIZAM ENERGY, ZONFUL ENERGY, PEG

Vertically integrated companies

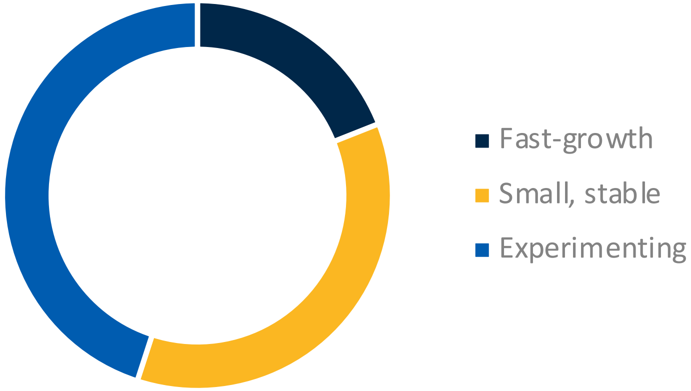
azuri, ZOLA Electric, fenix intl, d.light, BBOXX, solar now, greenlight planet, LUMOS, mobisol, M-KOPA SOLAR, simpanetworks

Last-mile distributors are gaining significant traction, with an array of distribution models that manufacturers can leverage

Share of LMDs, by Distribution Channels[1]



Breakdown of LMDs, by scale[2]



LMDs comprise a diverse set of companies

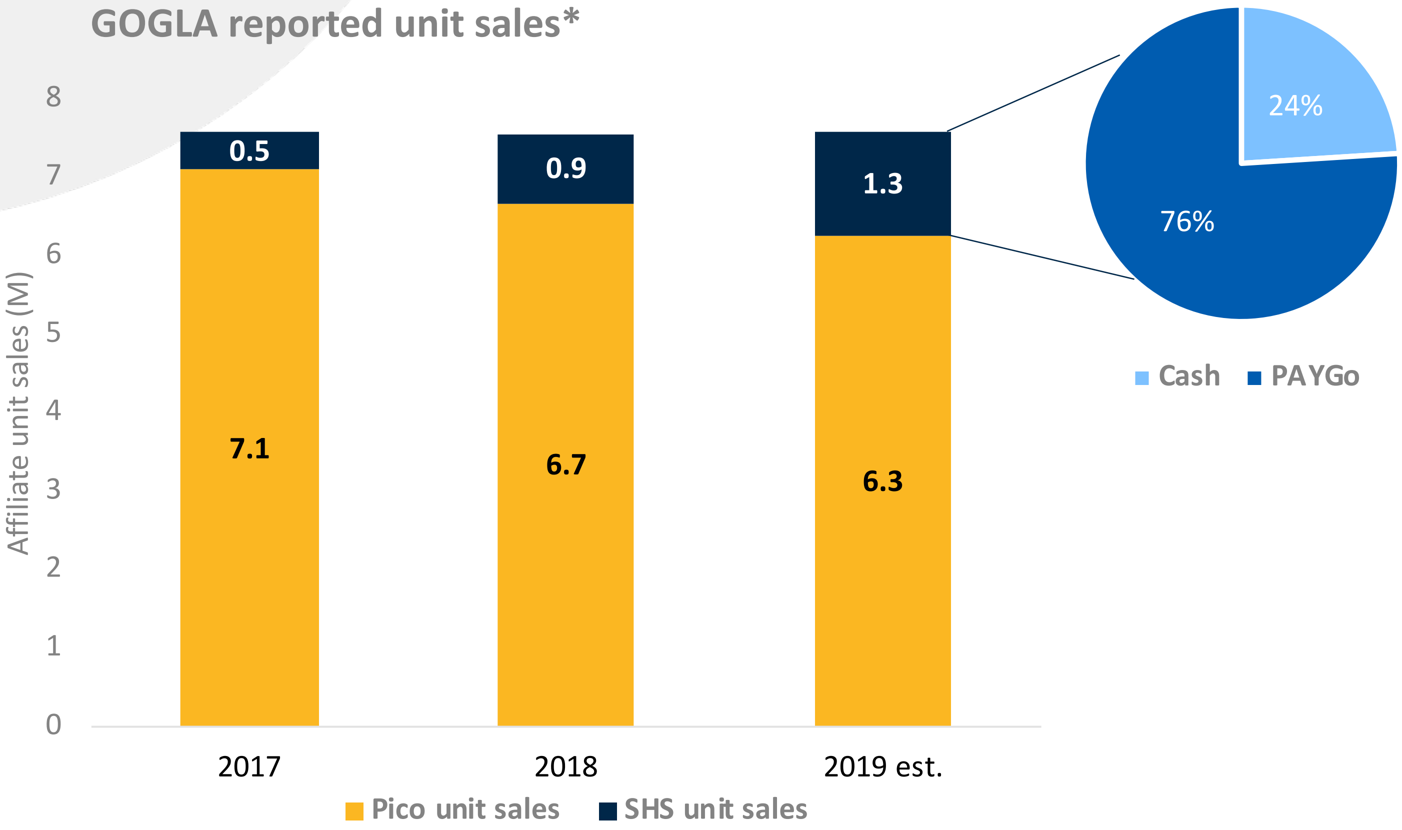
- Last-mile distributors (LMDs) have two primary channels for B2C marketing and distribution: networks of sales agents and retail shops
- Marketing techniques include community events and door-to-door demonstrations.
- LMDs are adopting software platforms to manage sales and payments, collect data, and communicate

LMDs can be a vital partner for manufacturers, and they have specific needs

- The biggest challenges for LMDs are procurement, sales efficiency, and access to finance[3]
- Manufacturers can design products in partnership with LMDs, reduce lead times, and provide favorable credit terms to LMDs
- Long-term strategic partnerships can be beneficial to both parties in the long term

Source: [1] *Global Distributors Collective,* Last Mile Distribution: State of the Sector Report., *p 14;* [2] *Global Distributors Collective, p 12-13; Note: Fast-growth LMDs have increased revenue by >USD 150K per year, Small, stable have increased revenue at <USD 150K per year while being >6 years old, and Experimenting LMDs have increased revenue at <USD 150K per year while being founded <6 years ago;* [3] *Global Distributors Collective, p 44*

Pico products still dominate the market, but the SHS segment is gaining traction quickly, often enabled by PAYGo



83% Pico unit sales

17% SHS unit sales

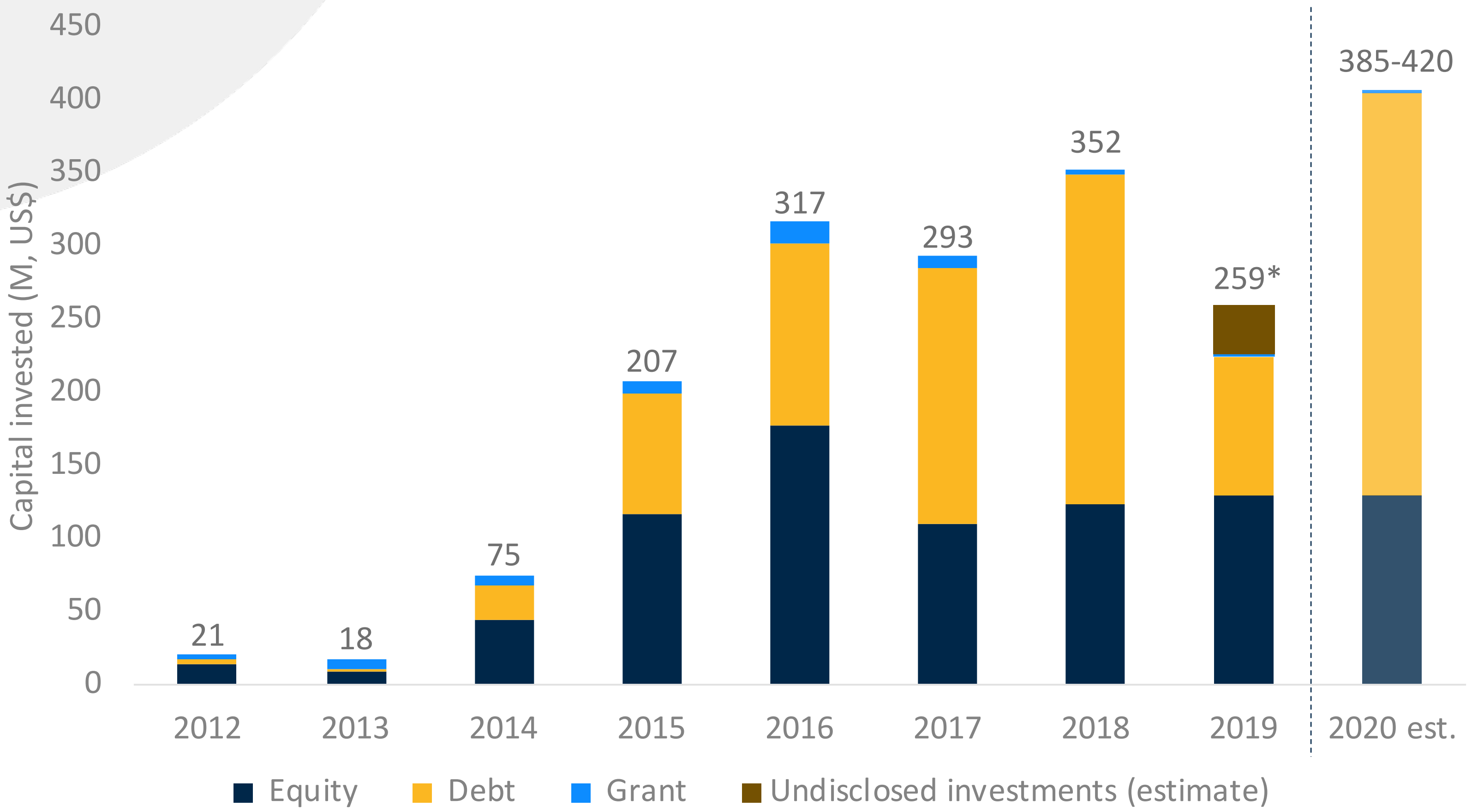
53% Annual 11+Wp SHS unit sales growth

38% Annual PAYGo unit sales growth

*Note: * Sales shown here are for companies that report through the GOGLA sales data collection process. These are also known as affiliate sales*

Investor and government involvement

Investors have responded to sector growth and innovation, with US$1.5B raised to date and an uptick expected in 2020



Despite significant capital, there are major gaps:

- Vast majority of funding to European- and American-led companies
- Local currency and early-stage equity limited

We are excited about several opportunities:

- Funds with smaller ticket sizes targeting LMDs
- Funding to accelerate partnerships between manufacturers and LMDs
- Working capital debt and receivables financing

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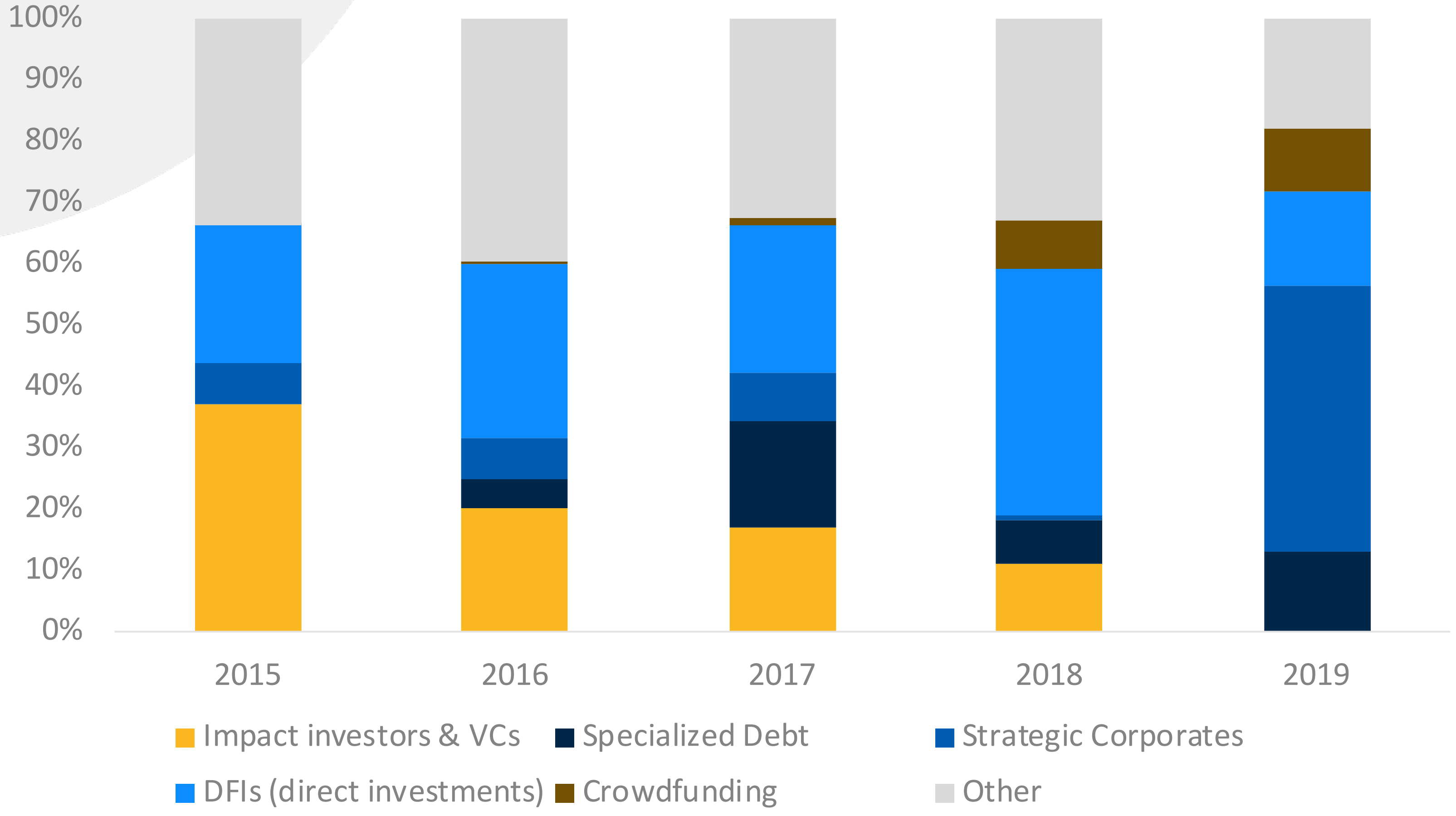
Investor types are shifting, with an increased presence of larger strategic investors, specialized debt providers, and crowdfunding



The sector is starting to mature with bigger corporate companies taking an interest:

- Initial funding was very impact focused
- ENGIE, Shell, EDF, Mitsubishi, Marubeni, etc. are now seeing opportunities to enter the sector
- Local currency financing through commercial banks is still limited
- World Bank backed debt facilities are helping to fill this gap

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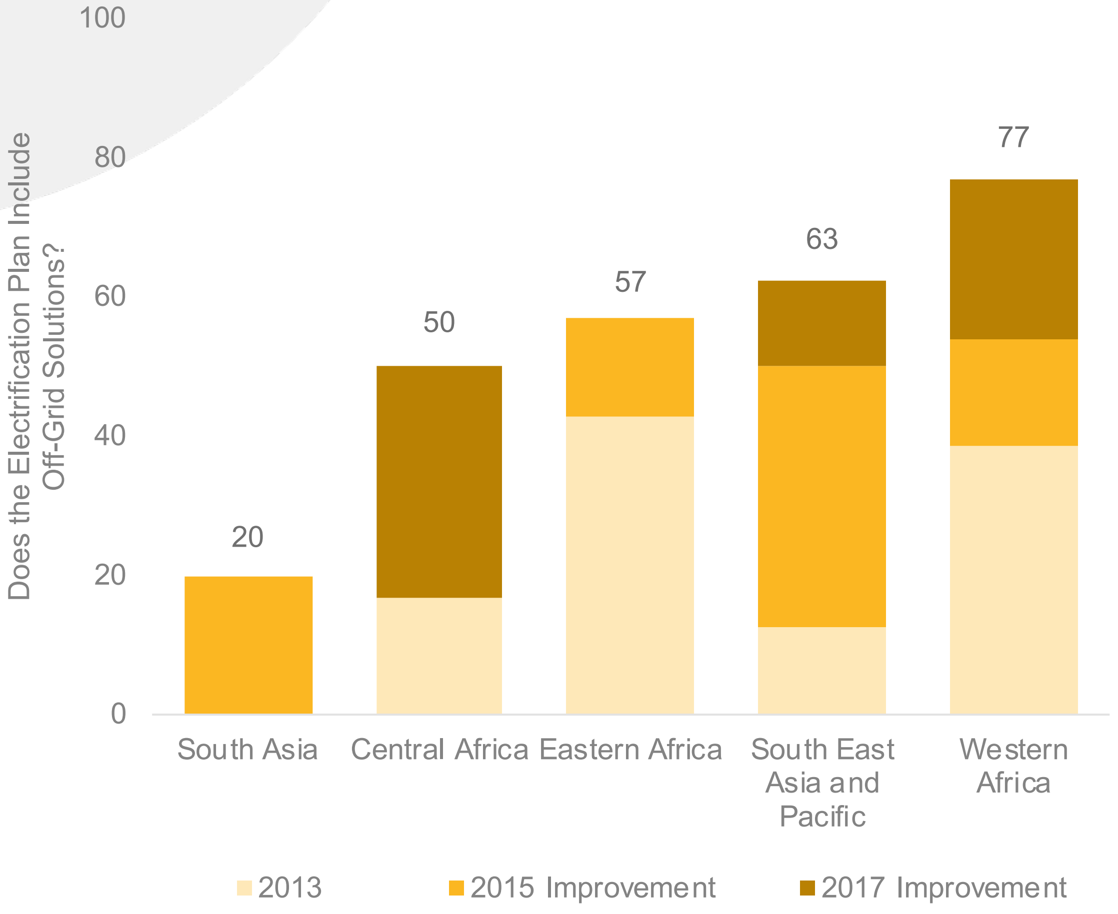
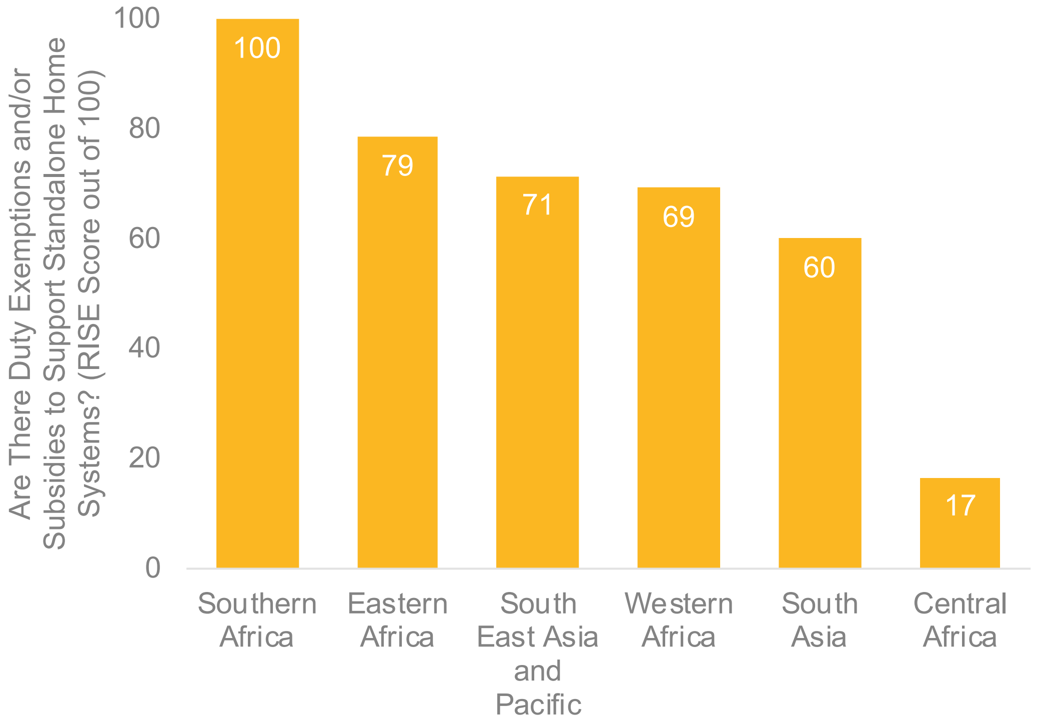
Governments are increasingly recognizing the importance of OGS with many exploring tax incentives to enable growth



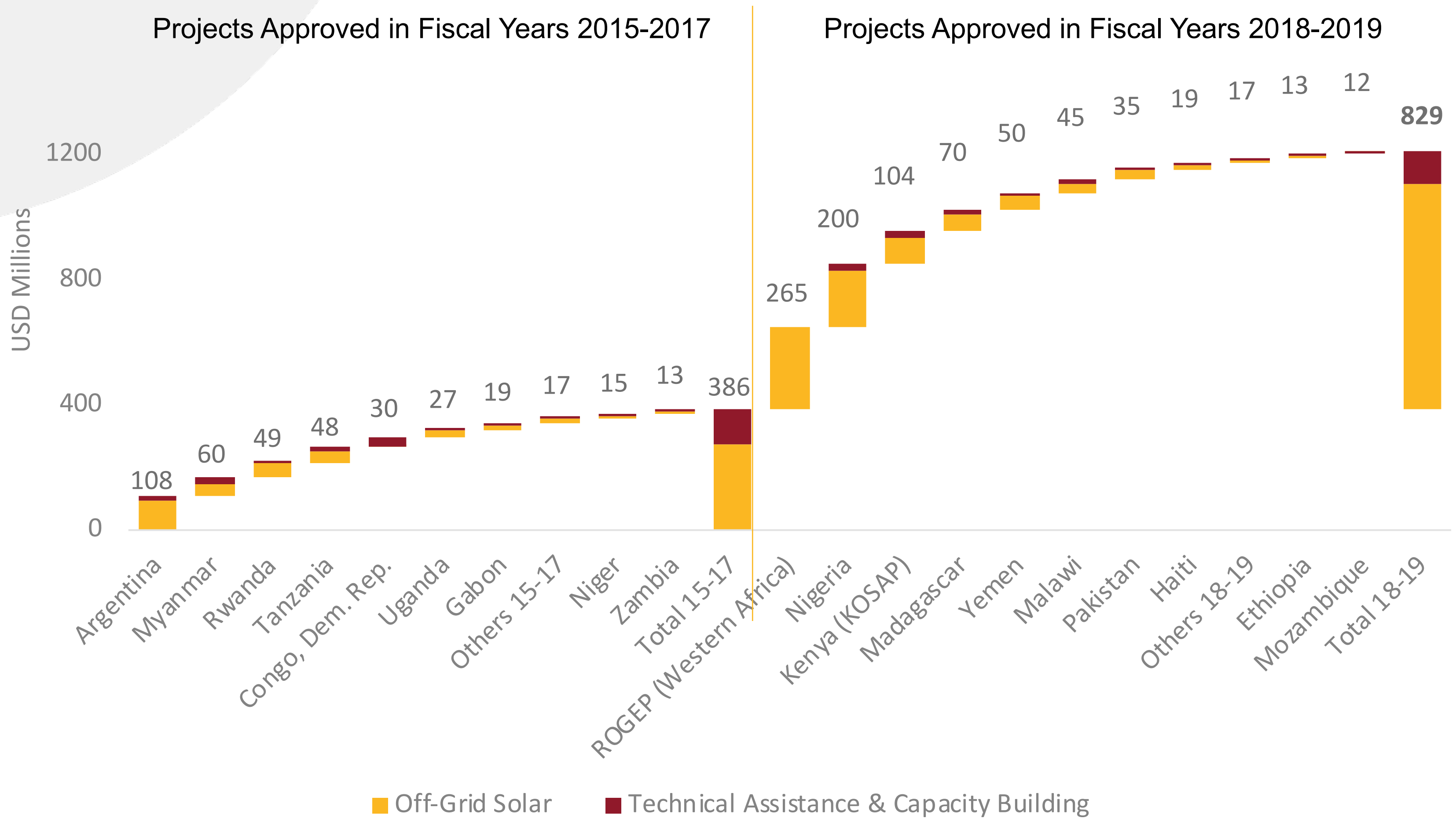
Duty exemptions or supply side subsidy programs

43% of countries in 2013 → **65%** of countries in 2017



For more information on RISE scores, see World Bank, Regulatory Indicators for Sustainable Energy, *Link*

Public funding has grown rapidly; World Bank approved >US$ 800M for OGS and energy access TA from 2018-19



Access to development partner program benefits often requires Lighting Global quality-verification, or similar quality

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Consumer insights and market opportunities

Consumer preferences and demand varies by region and country, but certain key attributes, such as low ability to pay, are shared

Ability to pay

Household appliances

Back-up systems

Consumer awareness

Larger systems

Productive use appliances

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The current global potential OGS market remains substantial

420 million users currently served

840 million people without access

Over 1 billion people with unreliable grid

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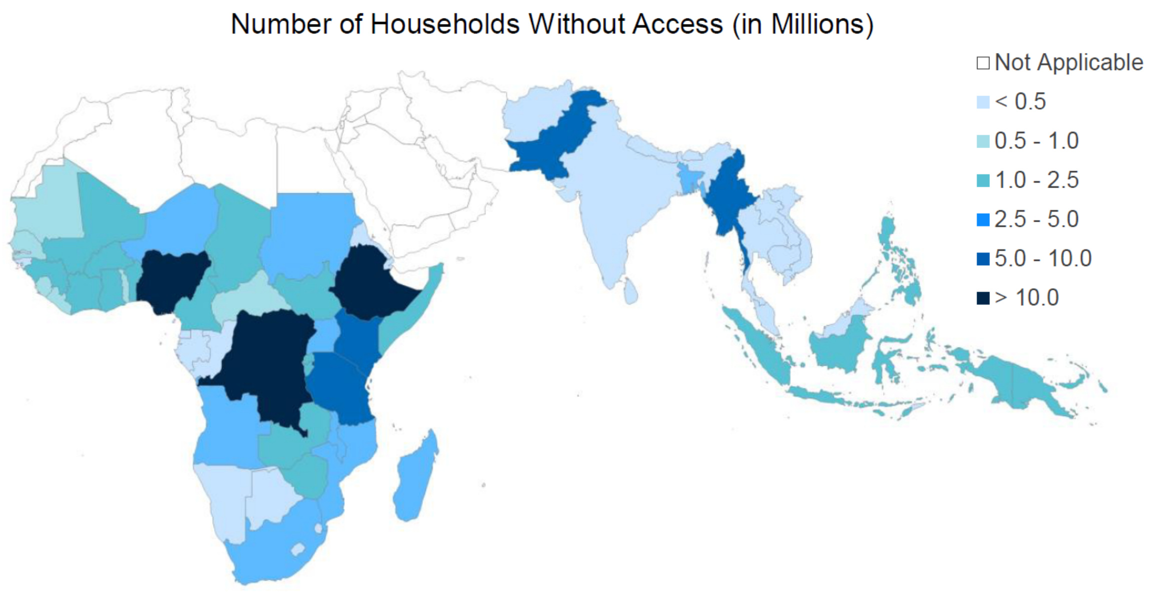
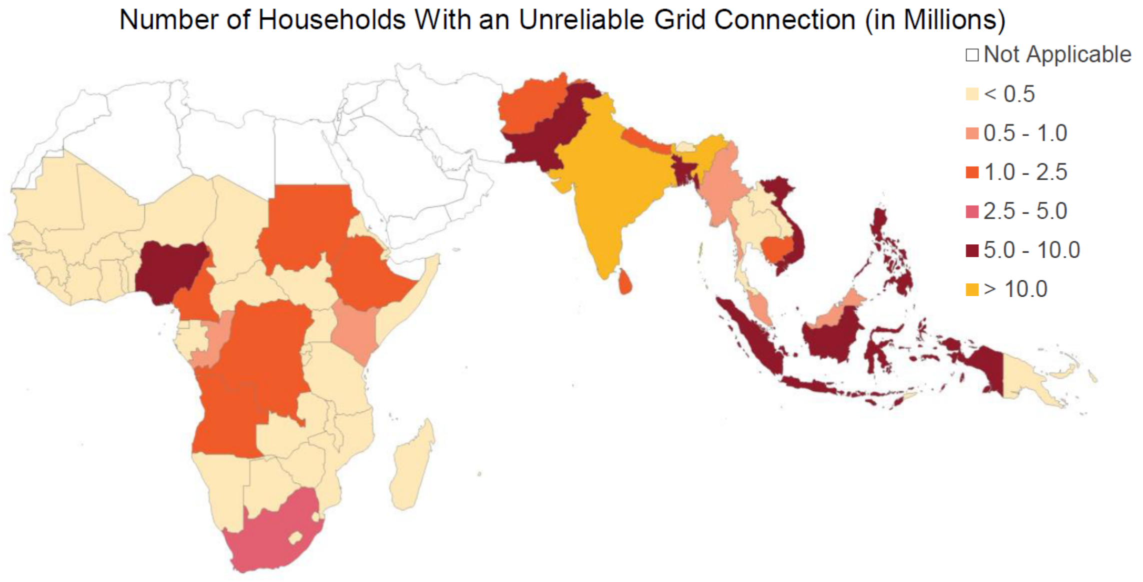
Most of the Population without Access Is in SSA while the Billion People with an Unreliable Grid Are Mainly in South Asia





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There is also tremendous growing potential from productive use solutions and products serving public institutions

Dual-use appliances

Solar water pumps

Agricultural solar cold storage

Solar post-harvest processing

Products for public institutions

https://efficiencyforaccess.org/publications/2019-state-of-the-off-grid-appliance-market-report

There is a huge addressable market potential for PULSE technologies

Segment	Region	Potential Market	Addressable Market 2019	Addressable Market 2030
SWP	Sub-Saharan Africa	5.4 million smallholder (non-subsistence) farmers*	701,000 smallholder (non-subsistence) farmers	2.83 smallholder (non-subsistence) farmers
Solar Cold Storage	Sub-Saharan Africa	6.5 million farmers	225,000 farmers	1.6 million farmers
Solar Agro-Processing	Sub-Saharan Africa	940,000 units	54,000 units	257,000 units
Appliances	Global		38 million households	60 million households

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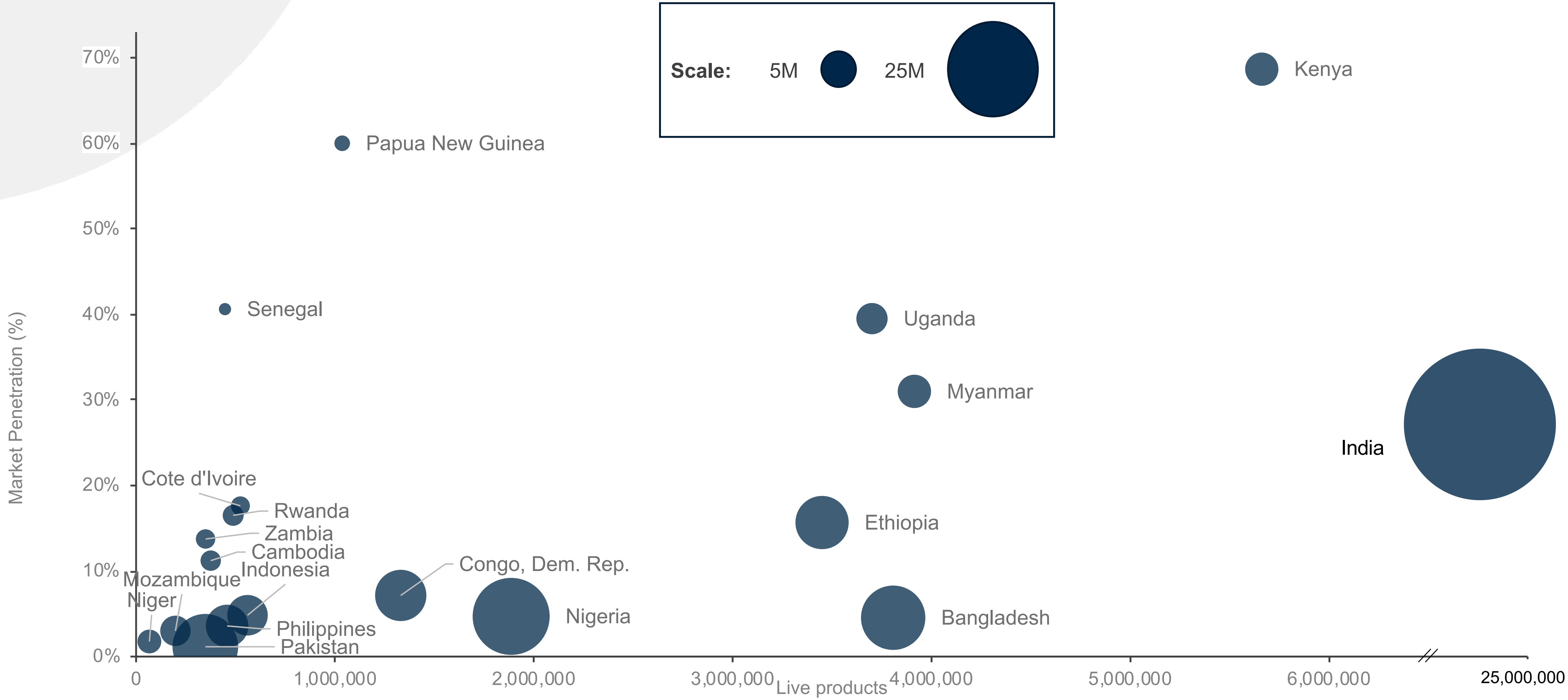
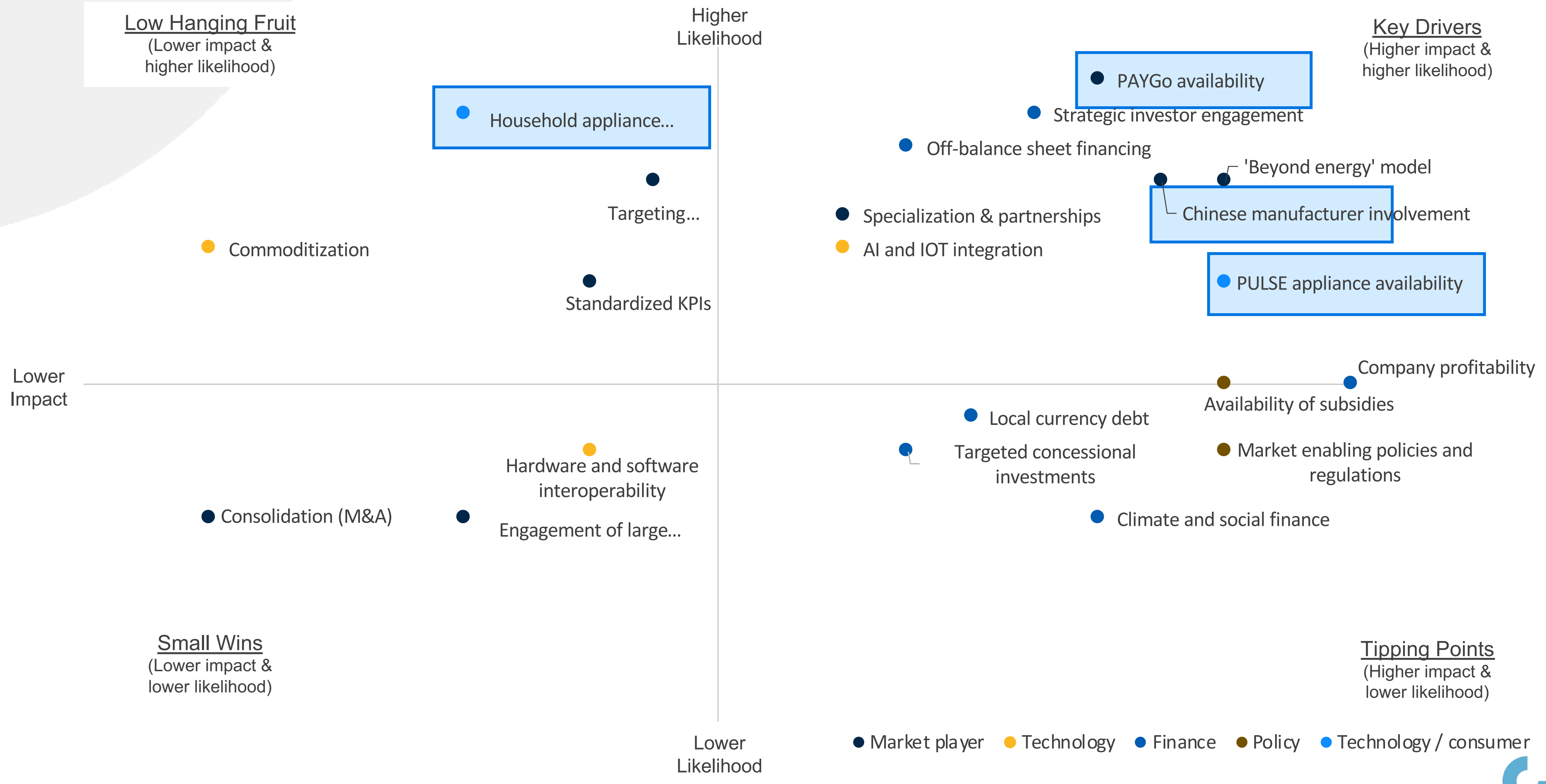
Countries are at very different stages of OGS development, each presenting unique opportunities



Opportunities for Chinese manufacturers to get more involved

The current global potential OGS market remains substantial



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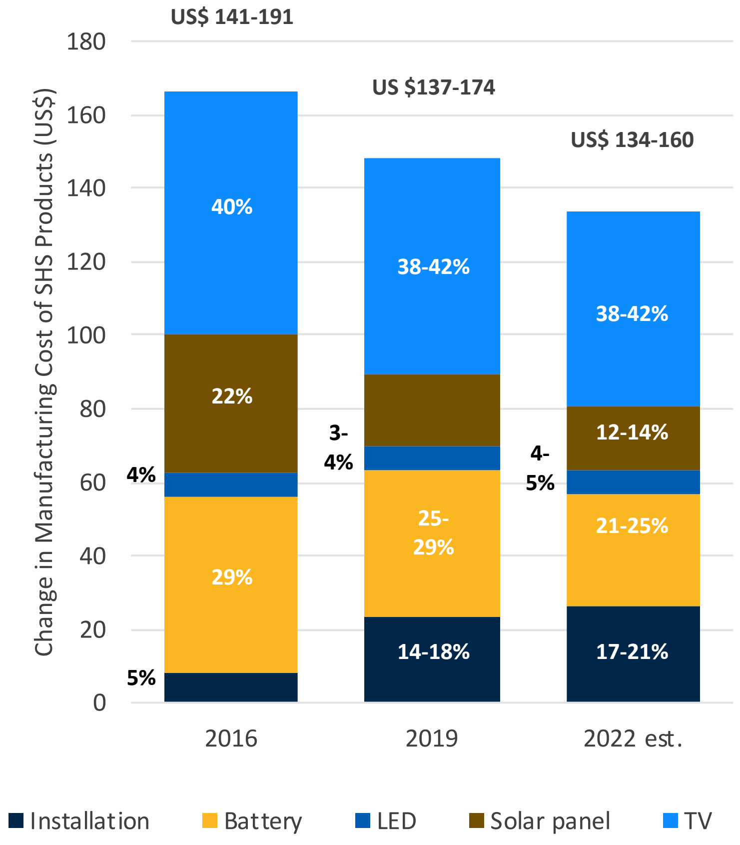
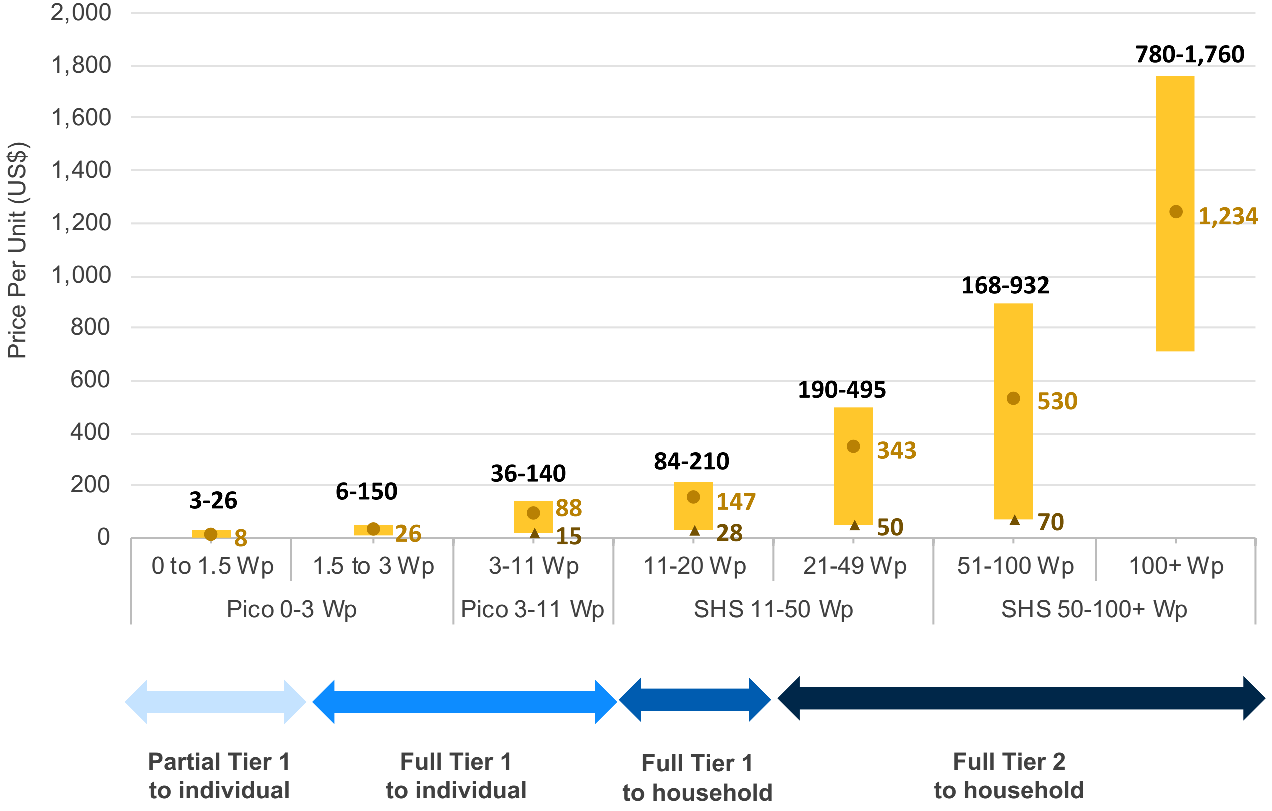
Chinese manufacturers' participation is a market driver, particularly on cost and ultimately consumer price





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Price Points for Affordability Analysis of Off-Grid Solar Products

OGS Device	Corresponding MTF Tier of Electricity Access Enabled by Use of Product*	Business Model	MTR 2018: Average	MTR 2020: Minimum Price	MTR 2020: Maximum Price	MTR 2020 Cash or Deposit: Average
Single Light (Less than 1.5 Wp)	Partial Tier 1 to one person	Cash	5	3	26	8
Single Light & Mobile Charger (1.5–3 Wp)	Full Tier 1 to at least one person, partial to household	Cash	25	6	50	26
Multi-Light & Mobile Charger (3–11Wp)	Full Tier 1 to at least one person up to full household	PAYGo	20	36	94	15 (deposit)
Entry-Level SHS (11–21 Wp)	Full Tier 1 to a household	PAYGo	36	84	146	28 (deposit)
Basic SHS (21–50 Wp)	Full Tier 2 to a household when coupled with high-efficiency appliances	PAYGo	53	190	495	50 (deposit)
Medium SHS (50–100 Wp)	Full Tier 2 to a household even when using conventional appliances	PAYGo	102	168	892	70 (deposit)
High-Capacity SHS (100+ Wp)		PAYGo	N/A	708	1,760	N/A

We need to create a more integrated market which is able to meet consumer demand at scale, affordably and to a high quality

The future role of Chinese manufactures

- Continue to sell higher-quality, own-brand products through local distribution partners
- Increasingly sell through their own distribution networks, including on PAYGo
- Increase competition at the product level and increase the amount of high-quality but lower-cost products reaching the market
- Increase knowledge of regional markets, including consumer preferences
- Increasingly become quality verified to enable access to more subsidy programs, tax incentives and debt facilities

Lighting Global Quality Assurance

- Become eligible to receive business development support (BDS) through the Lighting Global program
- Support may include help with entry into new markets, access to financing, business advising and B2B matchmaking.
- More information at https://www.lightingglobal.org/about/chinese/

Support can be found from a range of stakeholders

THANK YOU

Please download the report at https://www.lightingglobal.org/resource/2020markettrendsreport/

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