Speaker introductions

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During this webinar we will cover the following key topics

- 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

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+ consultations
19 Country profiles
1200+ conference attendees

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

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
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

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

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

Tier 0 products have: 1
- Up to 3 Wp or 12 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 lm/hr/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
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:
- JONS
- BIOlime
- AMPED
- angaza
- Paygee
- enable|digital
- MTN
- BITLINK
- orange
- orb
- AWANGO
- JaninBorg
- KWT
- Ignite Power

Vertically integrated companies:
- Boxin Solar Co., Ltd.
- SolaRun
- CARMA
- Zola Electric
- fenix
- solar now
- greenlight planet
- M-KOPA

Sponsors:
- Open Capital
- CIGS

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

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
- 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

Share of LMDs, by Distribution Channels

<table>
<thead>
<tr>
<th>Distribution Channel</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct sales agents</td>
<td>81%</td>
</tr>
<tr>
<td>Retailers</td>
<td>56%</td>
</tr>
<tr>
<td>Partners</td>
<td>32%</td>
</tr>
<tr>
<td>Other</td>
<td>26%</td>
</tr>
</tbody>
</table>

Breakdown of LMDs, by scale

- **Fast-growth**
- **Small, stable**
- **Experimenting**

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.

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
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
Governments are increasingly recognizing the importance of OGS with many exploring tax incentives to enable growth.
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.
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
The current global potential OGS market remains substantial

- Over 1 billion people with unreliable grid
- 840 million people without access
- 420 million users currently served
Most of the Population without Access Is in SSA while the Billion People with an Unreliable Grid Are Mainly in South Asia
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

There is a huge addressable market potential for PULSE technologies

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

**Key Drivers**
- Higher impact & higher likelihood
  - Beyond energy model
  - Specialization & partnerships
- Higher impact & lower likelihood
  - Off-balance sheet financing
  - ‘Beyond energy’ model
- Lower impact & higher likelihood
  - Local currency debt
  - Market enabling policies and regulations

**Tipping Points**
- Higher impact & lower likelihood
  - Targeted concessional investments
  - Climate and social finance
- Lower impact & lower likelihood
  - Targeting…
  - Hardware and software interoperability

**Small Wins**
- Lower impact & lower likelihood
  - Commoditization
  - Standardized KPIs
- Lower impact & higher likelihood
  - Consolidation (M&A)
  - Engagement of large…

**Low Hanging Fruit**
- Lower impact & higher likelihood
  - Household appliance…
Chinese manufacturers’ participation is a market driver, particularly on cost and ultimately consumer price.
## Price Points for Affordability Analysis of Off-Grid Solar Products

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</thead>
<tbody>
<tr>
<td>Single Light (Less than 1.5 Wp)</td>
<td>Partial Tier 1 to one person</td>
<td>Cash</td>
<td>5</td>
<td>3</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Single Light &amp; Mobile Charger (1.5–3 Wp)</td>
<td>Full Tier 1 to at least one person, partial to household</td>
<td>Cash</td>
<td>25</td>
<td>6</td>
<td>50</td>
<td>26</td>
</tr>
<tr>
<td>Multi-Light &amp; Mobile Charger (3–11Wp)</td>
<td>Full Tier 1 to at least one person up to full household</td>
<td>PAYGo</td>
<td>20</td>
<td>36</td>
<td>94</td>
<td>15 (deposit)</td>
</tr>
<tr>
<td>Entry-Level SHS (11–21 Wp)</td>
<td>Full Tier 1 to a household</td>
<td>PAYGo</td>
<td>36</td>
<td>84</td>
<td>146</td>
<td>28 (deposit)</td>
</tr>
<tr>
<td>Basic SHS (21–50 Wp)</td>
<td>Full Tier 2 to a household when coupled with high-efficiency appliances</td>
<td>PAYGo</td>
<td>53</td>
<td>190</td>
<td>495</td>
<td>50 (deposit)</td>
</tr>
<tr>
<td>Medium SHS (50–100 Wp)</td>
<td>Full Tier 2 to a household even when using conventional appliances</td>
<td>PAYGo</td>
<td>102</td>
<td>168</td>
<td>892</td>
<td>70 (deposit)</td>
</tr>
<tr>
<td>High-Capacity SHS (100+ Wp)</td>
<td></td>
<td>PAYGo</td>
<td>N/A</td>
<td>708</td>
<td>1,760</td>
<td>N/A</td>
</tr>
</tbody>
</table>
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/2020 markettrendsreport/

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