Designing Public Funding Mechanisms in the Off-Grid Solar Sector

ESMAP
Energy Sector Management Assistance Program

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AGENDA

- **Introduction** (5 mins | Juliet Pumpuni)
- **Presentation of the Report** (30 mins | Charlie Miller)
  - The case for public funding in the off-grid sector
  - The off-grid solar sector's funding needs
  - Steps for designing a public funding program
  - Public funding mechanisms
  - Conclusions and recommendations
- **Panel Discussion** (30 mins)
- **Audience Q&A** (25 mins)

INTRODUCTION

1 **Objective**	• Provides guidance to governments and their development partners on how public funding can be used to provide energy access through off-grid solar (OGS) solutions • Shares lessons learnt regarding how mechanisms can be designed and implemented effectively.
2 **Scope**	• Focuses on domestic solar solutions such as solar lights, home systems and related appliances
3 **Funding Mechanisms**	• Supply side: Funding companies or investors to reduce the cost/risk of supplying products to end users • Demand side: Funding mechanism designed to reduce the cost for the end user.
4 **Methodology**	• Extensive desk research and stakeholder consultation

The Case For Public Funding in the Off-Grid Solar Sector

i. Credible, Fast and Cost-Effective way to Achieve Access

The off-grid solar sector already serves 420 million users, and will continue to play a key role in achieving SDG 7.

OGS is the fastest and most cost-effective way to reach a significant proportion of the population.

ii. Leverage Private Sector Capacity and Co-Investment

OGS companies are present in almost all access deficit countries, with the capacity to support government efforts to achieve universal access.

Governments can leverage private investment to help them achieve their access goals, and ensure they use scarce public funding as efficiently as possible.

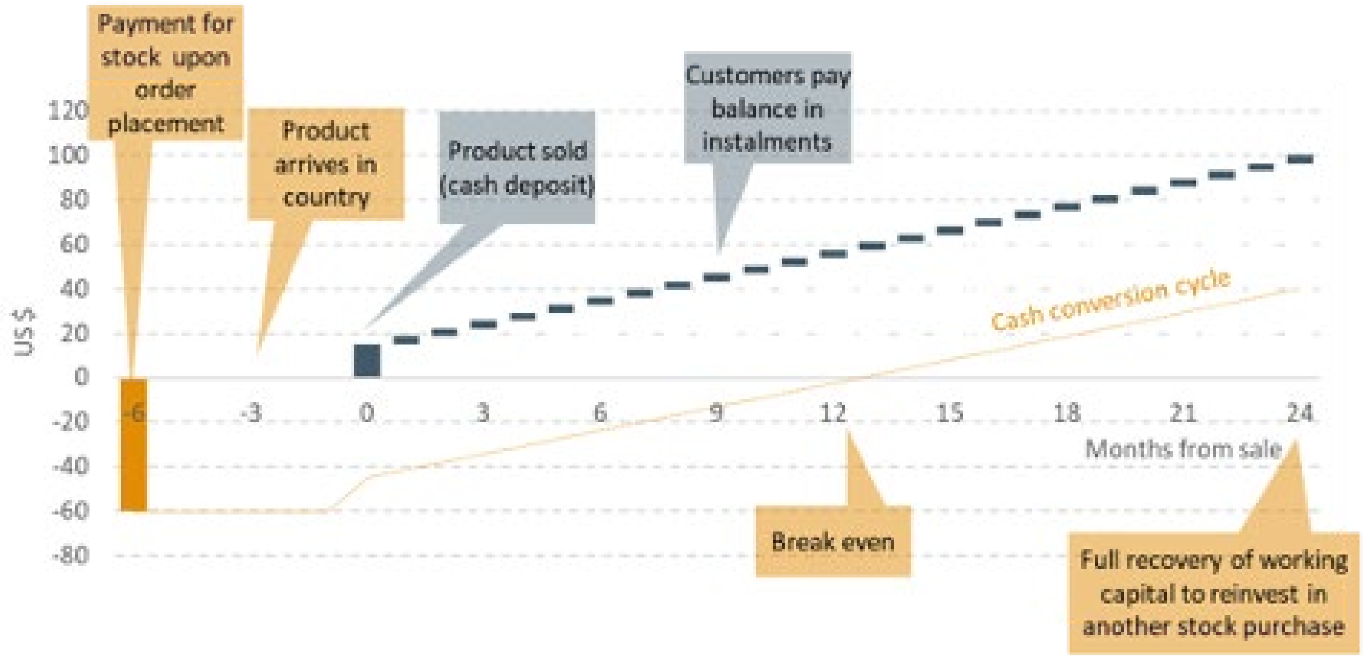
iii. Promote Affordable, High-Quality Products

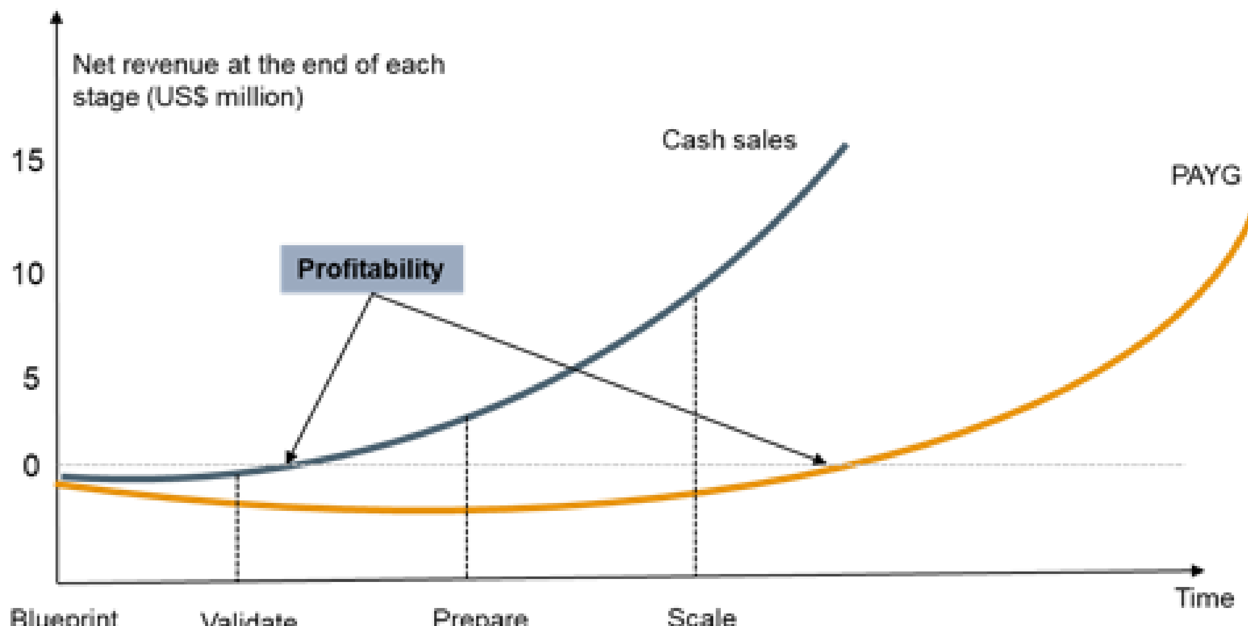
Governments can promote quality and protect consumers by providing funding and support to companies selling quality-verified (QV) products.

PAYG is helping to overcome affordability barriers and enabling end users to access a higher level of service than they would otherwise be able to afford.

FUNDING NEEDS OF THE OGS SECTOR

- Depending on their stage of development, **companies need different types and volumes of financing**
- Not all OGS companies pursue scale as a means to achieve profitability
- All OGS companies have significant **working capital needs**, especially PAYG companies
- OGS companies face a **variety of challenges in raising capital** to sustain operations and growth
- Public funding can help address these challenges, but projects always **need to consider the sector's broader financing situation**





Steps for Designing a Public Funding Program

Review if/how OGS is integrated into the National Electrification Plan	If off-grid solar (OGS) is not yet integrated into a country's national electrification plan, consider using geospatial, least-cost electrification planning tools to model optimal electrification pathways.
Consider a Multi-Tier Framework Survey	Provides a deep understanding of energy access in terms of quantity, quality, availability, reliability, convenience, affordability, and safety. MTF surveys allows for a nuanced tracking of SDG 7 targets, and help governments fine-tune their policies and approaches for reaching them.
Undertake an Off-Grid Solar Market Assessment	A thorough understanding of the market's needs is the cornerstone of effectively selecting and designing a public funding mechanism. Stakeholder mapping and capacity assessment exercises can also be useful.
Consider the role of the lead agency, and potential partners, in project implementation	The Lead Agency is usually a Rural Electrification Agency (REA), or Ministry of Energy. If the Lead Agency lacks capacity, potential partners such as national development banks or an independent fund manager should be considered. Ideally, all implementing partners should have deep knowledge of the OGS sector and the country context.
Consider other Interventions that might be needed	Complimentary interventions, such as consumer awareness campaigns, technical assistance to private sector, government or financial stakeholders, or regular market intelligence studies, might also be needed.

SELECTING FUNDING MECHANISMS

The choice of funding mechanism depends on program objectives, available time, implementing capacity of lead agency and other factors.

Supply-side mechanisms	
Upfront grants	• Young and innovative companies that lack track record to attract investment • Incentivize established companies to enter a new market
Results Based Financing (RBF)	• High costs/risks preventing companies from entering an underserved locations • To rapidly scale up the people or regions reached, by existing OGS companies
Tax Exemptions	• The OGS sector is a government priority but affordability is a major barrier to growth • There is a need to promote quality OGS and the revenue/custom authorities are on board. • Tax exemptions can be relied upon to remain in place
Credit Lines	• Companies close to meeting lender requirements need working capital • Domestic financial sector is close to having capacity to lend to the OGS sector • Banks are reluctant to lend because of liquidity constraints
Risk Mitigation Instruments	• Financial Institutions (FIs) have liquidity but are reluctant to/lack experience to lend because of perceived risk or are unable to accept OGS assets as collateral. • Bank procedures or regulations disincentivize lending to OGS companies.

Demand-side mechanisms	
Demand Side Subsidy (DSS)	• Households are unable to afford OGS products.
Public Procurement	• A market-based solution is not viable because target population is too poor, too remote, too few, or too disbursed.

Tip: In most settings, supply side mechanisms should be considered before demand-side mechanisms

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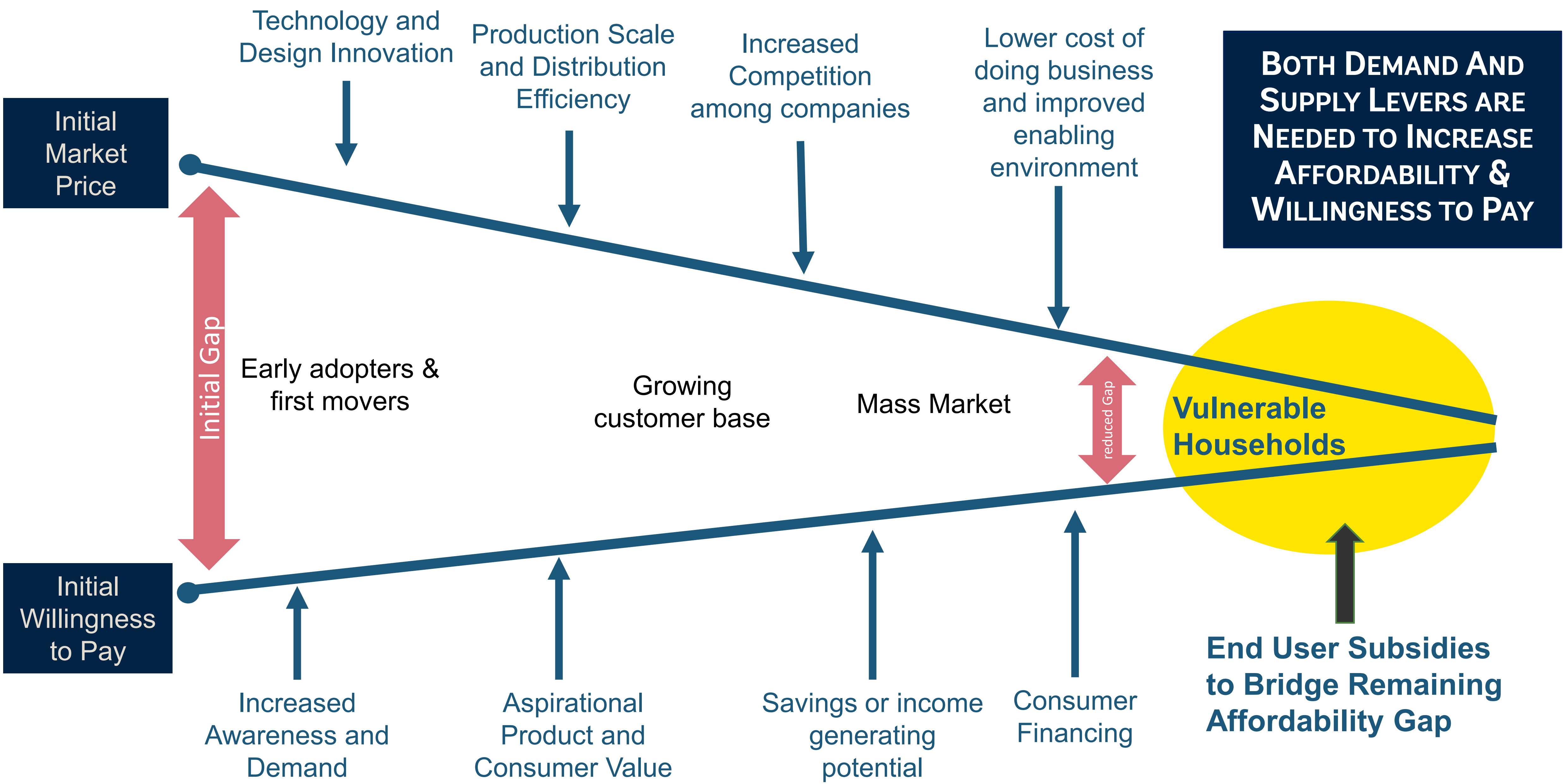
Supply & Demand Levers for Affordability



Combining Funding Mechanisms

If companies lack access to working capital financing, but are otherwise close to being able to meet lender requirements, **credit lines and risk mitigation** can be considered

If the objective is support nascent markets, or expand them into underserved areas, a combination of **upfront grants and results-based financing** can work well.

In settings where risks are already very high and affordability is low, the provision of **demand-side subsidies** from the outset can work well.

A **holistic approach** that combines more than one public funding mechanism with other interventions is usually needed

In situations where market-based solutions are not viable, a **public procurement** approach can be used

UPFRONT GRANTS

Non – repayable funds from public sector and donors to help solar companies expand into new markets and products

Advantages	• Can have a catalytic role in nascent markets, helping businesses develop track record and get investment-ready, especially when combined with capacity building support. • Can accelerate product or business model R&D • Can incentivize companies to enter high-risk markets
Disadvantages	• Distorts the market by 'picking winners'; • Can be difficult to build inclusive portfolios that support both larger and smaller companies • Risk of poor performance lies with grant maker • Grants may not be large enough, or long enough, to enable companies to access private capital – more than one phase of grant support might be needed
When are they suitable	• Nascent markets • Young and innovative companies • Companies lack track record to attract investment • There is a need to incentivize established companies to enter a new market

Results Based Financing

Payments to service providers upon achievement and verification of predefined results

Advantages	• Can incentivizing companies to enter a new area, or scale up • Can address financial bottlenecks at different points along the value chain (e.g., providing funding to manufacturers, importers, or their retail partners) or the sales cycle (e.g., providing funding for procurement, importation sales or after-sales service) • Financial risk lies with the recipient company rather than funder • Lower risk of misuse of funds compared to upfront grants
Disadvantages	• Not an appropriate mechanism for smaller, more basic solar lights sold for cash • Need to be carefully designed if there is an objective to support smaller companies • Determining the 'right' amount of incentive can be challenging. • Tracking, verification, disbursement and reporting could be challenging for both companies and funders • RBFs can have a limited impact if companies remain capital-constrained.
When are they suitable	• High costs or risks are preventing companies from entering an underserved geographical area, but companies are already operating nearby • There is a need to rapidly scale up the number of people reached, or the geographical area served by existing OGS companies

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TAX EXEMPTIONS

The removal of vat and/or import duty for qualifying solar products or components products to make them more affordable

Advantages	• Send a powerful signal that helps to attract companies and investors into a market • Improves affordability and accelerates market growth, with low market distortion risk • Can help quality-verified products to compete on price, with non-quality verified products
Disadvantages	• Quality-linked importation and taxation processes can be challenging to set up • Can be politically contentious, with a risk of change at short notice • Governments may be concerned about loss of government revenue
When are they suitable	• The OGS sector has political support and is a government priority • Affordability is a major barrier to growth • There is a need to promote quality verified OGS • Revenue and customs authorities are willing and/or able to implement quality-linked tax exemptions • Can remain in place for a reasonable length of time

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Credit Lines

Funding to address liquidity issues in banking sector and provide acceptable borrowing terms for OGS companies.

Advantages	• Enables financial institutions to select companies to invest in, using their normal commercial process. As lenders gain experience in the sector, risk perception and need for de-risking decrease. • Play a critical role in providing OGS companies with working capital upfront, in either local or global reserve currency. • Can be used to improve access to finance in either local or global reserve currency.
Disadvantages	• Can ‘crowd-out’ commercial investment if poorly designed. • Even if in place, banks may still be unwilling to lend, and companies may still not meet requirements. • Need to be carefully designed if intended to support smaller, local companies. • Can take time to set up, and by the time facilities are in place, companies may be able to access cheaper capital elsewhere. • Can be slow to adapt to rapidly changing market dynamics.
When are they suitable	• Companies require working capital and are close to meet lender requirements. • Domestic financial sector is close to having capacity to lend to the OGS sector. • Banks are reluctant to lend because of liquidity constraints.

Risk Mitigation Instruments

Risk sharing between commercial lenders and donors when risk perception is high and/or OGS sector is not well developed

Advantages	• Help to mitigate risk and encourage lending, with or without an accompanying credit line. • Help to moves the market towards sustainable, commercial working capital financing. • Can reduce borrowing costs or collateral requirements for companies.
Disadvantages	• Partial risk guarantees are sometimes deemed insufficient by participating commercial banks. • Risk of high transaction costs, administrative burden and disbursement delays for participating financial institutions.
When are they suitable	• Companies require working capital and are close to being able to meet lender requirements. • Domestic financial sector is close to having the willingness and capacity to lend to the OGS sector. • Financial Institutions (FIs) have liquidity but are reluctant to lend because of perceived risk. • FIs lack of experience lending to the OGS sector. • FIs are unable to accept OGS assets, such as receivables as collateral. • Bank systems & processes, or regulatory requirements disincentivize lending to OGS companies.

DEMAND-SIDE SUBSIDIES

Subsidies provided to reduce the prices paid by end-users and address affordability constraints

Advantages	• If prices go down, demand and sales volumes increase significantly. • DSS can also help to reduce default rates on PAYG sales. • Supports more vulnerable households to gain access to electricity.
Disadvantages	• High market distortion risks, especially if implemented in parallel with supply-side mechanisms and attempts to build a commercial market in parallel, or in nearby locations. • Targeting, setting of appropriate subsidy amounts, verification and exit strategy can all be challenging.
When are they suitable	• Households are unable to afford OGS products • Supply-side mechanisms to address affordability are either not feasible, or are already being implemented, but an affordability challenge remains

PUBLIC PROCUREMENT

Government agencies purchase systems through an organized bid and distribute the systems to end users directly

Advantages	• Appropriate solution for poor, remote or isolated communities, or for humanitarian settings where market-based solutions are not viable. • Central government purchasing can reduce costs through bulk tendering of equipment. • Can be used to reach large numbers of people relatively quickly.
Disadvantages	• Requires that government agencies or their contractors have, or be able to build, the capacity to provide distribution, installation, and maintenance services over the long term. • Requires long term source of public financing to ensure energy services are sustained over time. • Can be challenging to adapt to evolving needs and demands over time. • High risk of misuse of funds and moral hazard if tenders are not designed carefully • Potential to disrupt and undermine any existing commercial market.
When are they suitable	• A market-based solution is not viable because target population is too poor, too remote, too few, or too disbursed.

Conclusion and Recommendations

There is **no one-size-fits-all public funding solution** that meets the evolving needs of diverse off-grid energy markets at different stages of development.

FLEXIBILITY

Allow quick adaptation to changes in market condition, response to emerging challenges and opportunities and efficiently implement lessons learned.

TARGETING

Maximize the effectiveness of a program to reach energy access goals while minimizing public resources, while ensuring that no one is left behind

PROPORTIONALITY

Adequate level of funding to compensate for costs and risks faced while ensuring sufficient company participation, without compromising efficient use of public funds.

EFFICIENT FUND MANAGEMENT

Automation and digitization of fund management systems and processes to reduce transaction costs and avoid risks of delay in disbursement of funds.

VERIFICATION

Verification of results is essential to managing fiduciary risks, ensuring programs are achieving their objectives and that public funding is being used appropriately.

SUSTAINABILITY

Carefully designed phase out strategies are essential for ensuring sustainability of the OGS market

Panel Discussion

Emma Colenbrander
Head
Global Distributors Collective

Victoria Sabula
CEO
African Enterprise Challenge Fund

Christian Schattenmann
Head of Energy Access
Bamboo Capital Partners

Chiara Rogate
Senior Energy Specialist
World Bank

AUDIENCE Q&A

Thank you.

Please send comments and feedback to Charlie Miller (cmiller6@worldbank.org)

Energy Sector Management Assistance Program
The World Bank
1818 H Street, NW || Washington DC || USA
www.esmap.org || esmap@worldbank.org