



CLEAN ENERGY
MINISTERIAL

Accelerating the Transition to Clean Energy Technologies

FINANCE FOR ENERGY ACCESS

PRE-READ FOR PUBLIC-PRIVATE ROUNDTABLE

Sixth Clean Energy Ministerial

27 May 2015, 3:00pm

Mérida, Yucatán, Mexico

OUTLINE

- 1 **Overview**
- 2 Current Landscape
- 3 Energy Access Finance Needs and Challenges
- 4 Policy Levers for Energy Access
- 5 Potential Finance Mechanisms
- 6 Examples of Finance Mechanisms in Use

OVERVIEW

Finance for Energy Access: CEM Roundtable 4: The objective of the roundtable is to bring together practitioners, financiers, and policymakers to collectively identify the most promising strategies to leverage established and emerging financing mechanisms with the overarching goal to unlock sustainable private capital for the small-scale, distributed energy access solutions that are central to achieving universal energy access targets.

Presentation: Provides background information on the distributed energy access supply chain with a focus on the financing needs and challenges for the small and medium enterprises (SMEs) in the sector. The presentation identifies a range of financial mechanisms for the energy access sector including current examples of innovative models and description of enabling policies. These materials are intended to support the Roundtable discussion on energy access financing on: improved delivery of existing funding sources, promising innovative financing mechanisms, and transformational strategies to unlock sustainable private investment for energy access.

"Donors, governments, and businesses need to become more strategic about how the public and private sectors collaborate in financing pro-poor energy access."

Source: Information in this presentation has been drawn from recent published literature, global organizations, and a report under development by the National Renewable Energy Laboratory (NREL), in collaboration with the International Institute for Environmental Development (IIED) and other organizations.

WHAT IS ENERGY ACCESS?



By 2030, 2.7 billion people will still be without clean cooking facilities and 1 billion will be without access to electricity.

What: electricity, clean cooking systems and mechanical power.

Who: the unserved. Could be absolutely poor, poor or not poor. Both urban and rural areas.

Why: water, health, education, income generation, empowerment of women, and sustainable development.

Economy

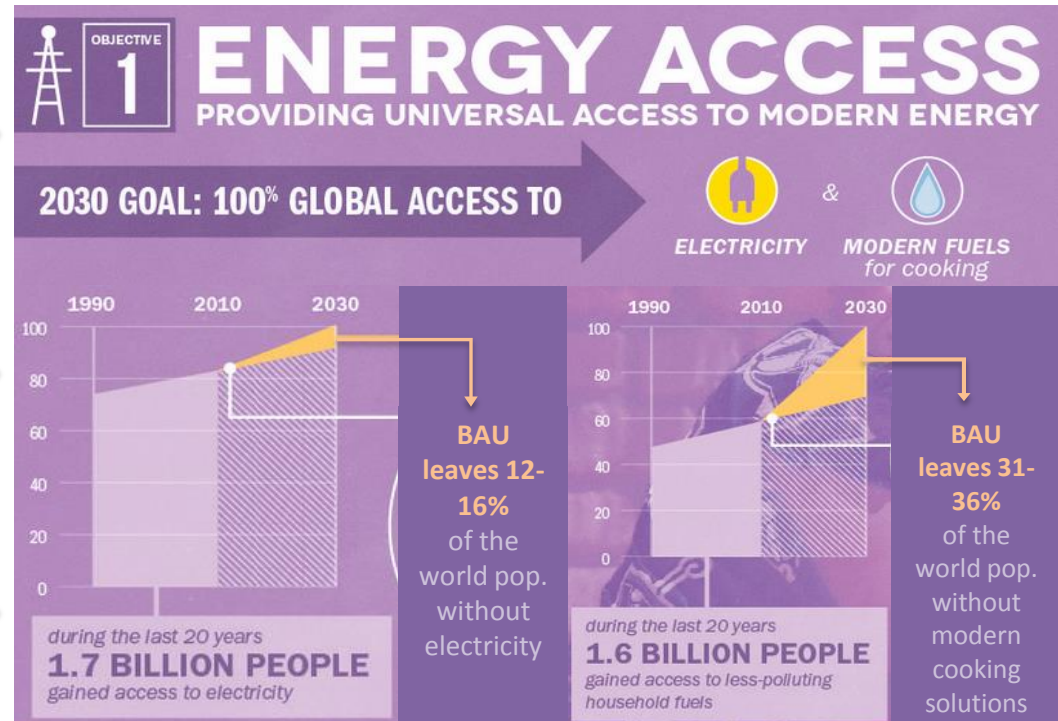
• Researchers estimated that Africa misses out on 2–4% a year in GDP growth due to power shortages.

Income

• Up to 40% of African household income is spent on fuels for heating, lighting and cooking.

Health

• Four million deaths per year are attributed to inhalation of indoor smoke



Sustainable Energy SE4ALL, Access Committee report and Infographic World Bank 2014

Accelerating Access to Energy. Shell Foundation. December 2014

THE ELECTRICITY ACCESS CHALLENGE

- Electricity access is a crucial component of every advanced economy.
 - Access to affordable, reliable electricity is critical to meet development goals:
 - Jobs
 - Agriculture
 - Health
 - Education
 - Sanitation
 - Gender equality
 - Quality of life
 - Individual productivity, future earning potential and country GDP improve with energy access
- SE4ALL has targeted universal energy access by 2030
 - Energy incentives must increase by \$45 billion per year until 2020 to reach universal electrification
 - Comprehensive policy measures, financial incentives, phasing out of fossil fuel subsidies, and carbon pricing are essential steps to universal access

***For the purposes of this roundtable, the term energy access refers to electricity only**

1.2 billion people have zero access to electricity; additionally, **800 million** have unreliable grid power to meet basic energy needs.

80% of people without electricity live in **rural areas**, mostly in **Asia and Sub-Saharan Africa**.

The current rate of electrification is almost completely offset by population growth; without further investments an estimated **1.0 billion** people will still lack electricity in **2030**.

PATHWAYS FOR CLEAN ENERGY ACCESS

HOUSEHOLD LIGHTING DEVICES

HOUSEHOLD ENERGY SYSTEMS

MINI-GRIDS

CENTRAL GRID

Household Lighting Devices

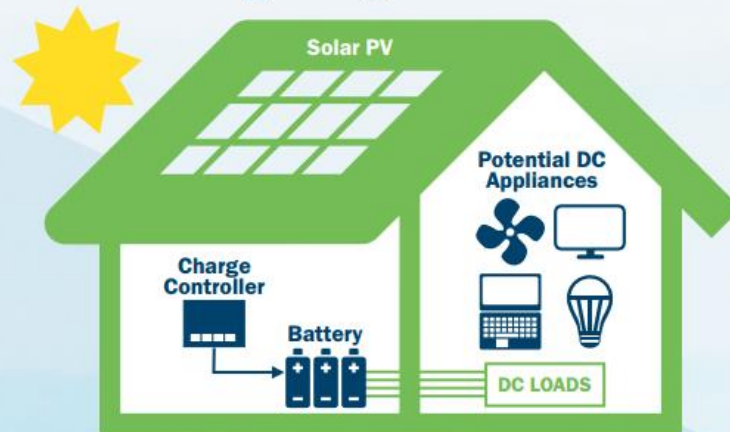
Solar lanterns and small solar kits

- May have charging capabilities for cell phones and other small devices



Household Energy Systems

Powering a single home

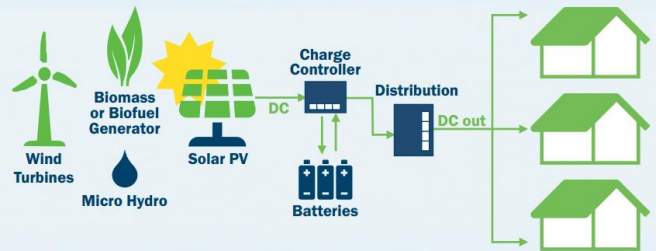


- Fairly low cost
- Easy installation
- No central grid connection
- Powers small loads and DC-based appliances
- AC appliances can be supported using a DC to AC power converter

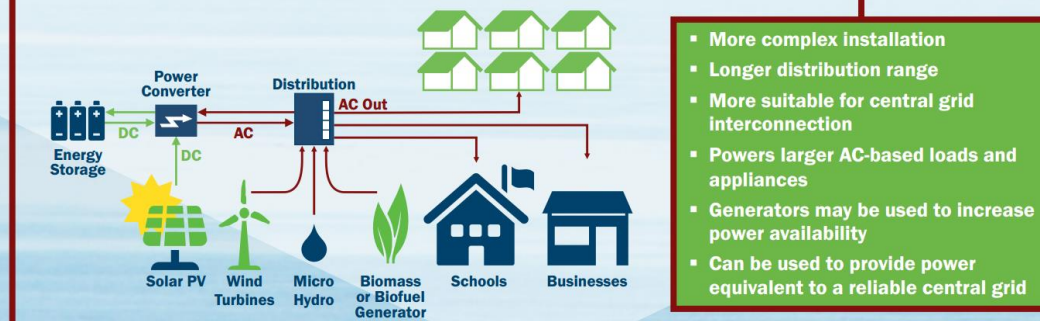
Mini-Grids

Powering a community

- Easier installation than AC mini-grids
- Limited distribution range
- Limits central grid interconnection
- Powers small loads and DC-based appliances
- AC appliances can be supported using a DC to AC power converter



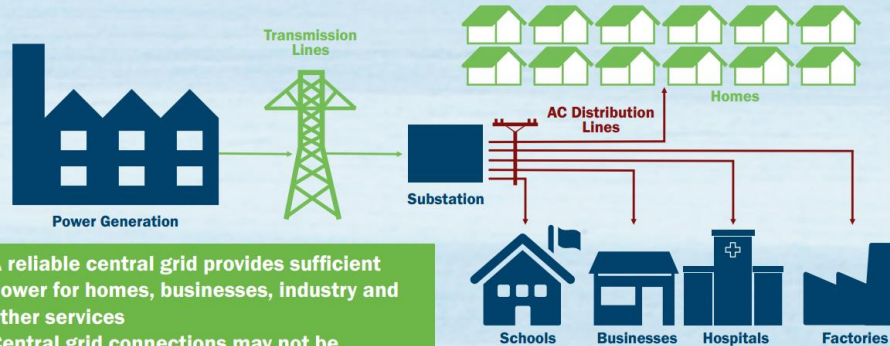
AC-Based



- More complex installation
- Longer distribution range
- More suitable for central grid interconnection
- Powers larger AC-based loads and appliances
- Generators may be used to increase power availability
- Can be used to provide power equivalent to a reliable central grid

Central Grid Connection

Connecting communities to the central power grid



- A reliable central grid provides sufficient power for homes, businesses, industry and other services
- Central grid connections may not be technically or financially feasible for all rural and developing areas

GLOBAL TRACKING FRAMEWORK: TIERS OF ACCESS

The World Bank and IEA have developed a new framework for SE4ALL to define levels of energy access that takes into account both the *quality of energy supply* as well as the *energy services* that the energy can support.

- Five Tier Framework to discern levels of energy access and services
- Electricity supply access
 - Evaluated by criteria emphasizing reliability, adequacy and accessibility.
 - Tier is independent of how the power is delivered
- Tiers correspond with ability to use energy services and appliances
- Number of households at each tier can be used as a metric for overall progress towards universal energy access within a country or region.

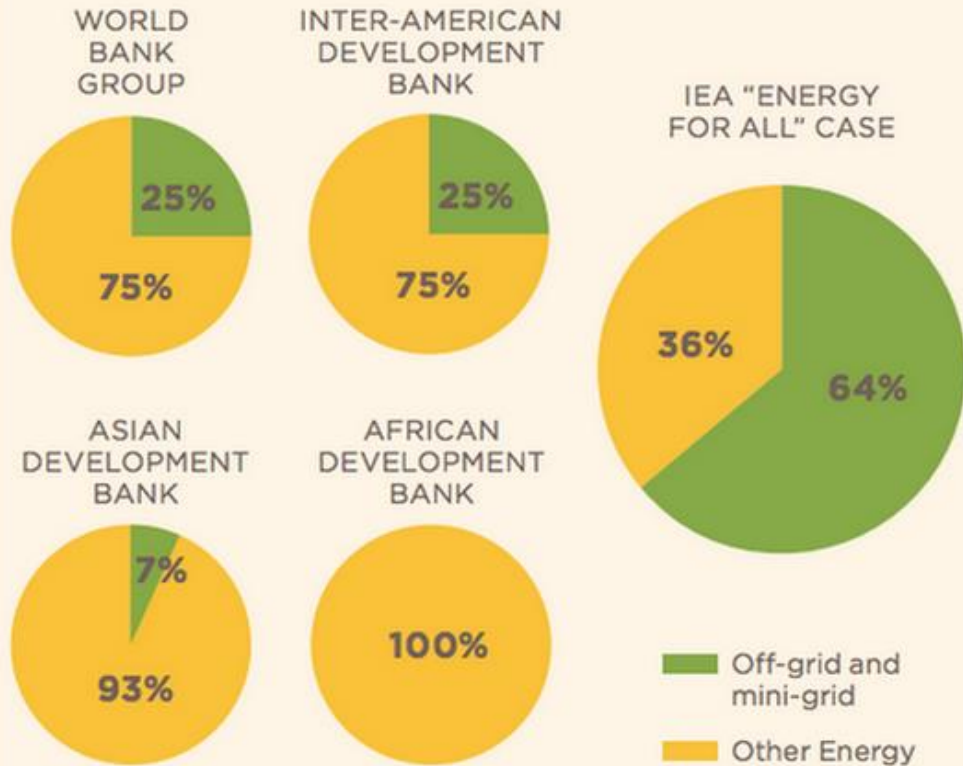
	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	
Peak Available Power (W)	None	>1 W	>20 W	>200 W	>2,000 W	>2,000 W	
Consumption (kWh/year)	< 3	3 - 66	67 - 321	322 - 1,319	1,319 - 2,121	> 2,123	
Duration of Supply	None	> 4 hrs	> 4 hrs	> 8 hrs	> 16 hrs	> 22 hrs	
Evening Supply	n/a	> 2 hrs	> 2 hrs	> 2 hrs	4 hrs	4 hrs	
Quality	n/a	low	low	Adequate	Adequate	Adequate	
Typical Applications (Cumulative)	None	Radio, Task lighting	fans, TV, light office needs	General Lighting, and task oriented food preparation	Air cooling, food processing, and task oriented food preparation	Refrigeration, Air water heating, conditioning pumps, expanded food preparation	, space heating and full food preparation

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CURRENT FOCUS ON GRID EXTENSION FINANCING

Off-Grid and Mini-Grid Renewable Energy Spending as a Percentage of the Annual Energy Access Portfolio (THREE YEAR AVERAGE)



Grid Extension

- Current financing efforts focus heavily on grid-extension, while financing for off-grid solutions falls short.
- Long-term goal in many countries will be universal grid access, but development can take decades and require enormous capital.
- Will not reach everyone by 2030
- Cost to build and maintain grid increases and ROI decreases with rural populations.

Decentralized energy (off-grid and mini-grids)

- Quicker pathway to energy access
- Benefits to providing basic energy services prior to full access
- Relies heavily on small and medium enterprises (SMEs) that can foster local, sustainable economic development

DISTRIBUTED ENERGY SERVICE OPTIONS

I Market segment	II Service offering	III Energy asset/source	IV Financing method	V Additional services
<p>Household</p> 	<p>Tier 2: <200 Wh/d</p> <p>“Two lights and a charger”</p>  <p>“Basic households needs”</p> 	<p>Device</p> <ul style="list-style-type: none"> ▪ Task lamp/“plus” ▪ Solar kit  <p>Home system</p> <ul style="list-style-type: none"> ▪ Solar home system 	<p>Pay-per-use</p> <ul style="list-style-type: none"> ▪ User buys right to X amount of energy for Y of time, with no further commitment ▪ Revenue can be unpredictable <p>Rental/pure lease</p> <ul style="list-style-type: none"> ▪ User has access to X time, Y energy or X time + Y energy ▪ User pays regular fee (weekly/monthly...) ▪ DESCO services asset ▪ Revenue is more predictable 	<p>Appliance add-on</p> <ul style="list-style-type: none"> ▪ Requires users to comply with certain appliance standards ▪ Provides optional appliances to users <ul style="list-style-type: none"> — Out-right cash sales — Form part of and therefore financed through pay-per-use, rental or rent-to-own package
<p>Commercial</p> 	<p>Tier 3: <800 Wh/d</p> <p>“Small productive power”</p>  <p>Tier 4: <1,600 Wh/d</p> <p>“Large productive power”</p> 	<p>Village system</p> <p>Mini/micro grid¹</p>  <ul style="list-style-type: none"> ▪ Battery charging ▪ 4-6 hrs/d of either AC or DC power ▪ 24/7 AC or DC power 	<p>Rent-to-own/lease finance</p> <ul style="list-style-type: none"> ▪ User has access to X time, Y energy or X time + Y energy ▪ User pays regular fee (weekly/monthly...) ▪ At end of a certain contractual period, use owns asset ▪ May be option for on-going service ▪ Revenue is more predictable 	<p>VI Payment collection</p> <p>Manual</p> <ul style="list-style-type: none"> ▪ Local staff recoups cash from customers <p>Scratch-card</p> <ul style="list-style-type: none"> ▪ Vendor sells scratch-card containing code to activate access or top up usage credit <p>Mobile money</p> <ul style="list-style-type: none"> ▪ Virtual payment and system activate/top-up of usage credit

¹ Can be powered using a range of energy sources, including solar, wind, hydro, biomass and diesel, including in combination

RECENT INVESTMENTS IN DISTRIBUTED ENERGY ACCESS



OMC Power, a small-scale power company in rural India, secured major funding from Singapore-based renewable energy fund Energy Investment Tech.¹

Simpa, a solar-as-a-service company in rural India, completed a **\$4 million** debt financing round from Overseas Private Investment Corporation (OPIC) and GDF Suez.⁴

d.Light solar lighting and power products raised **\$11 million** in Series C financing; now impacting over 2 million customers with lighting products and sold more than 125k solar home power units.²

BBOXX, a pay-as-you-go remote battery enabled finance solution, earned **\$1.8 million** in financing from Khosla Impact.⁵

M-KOPA Solar raised **\$20 million** to fund the expansion of their customer base from 50,000 homes to one million homes by 2018 fronted by the Commercial Bank of Africa (CBA).³

Angaza, a Pay-As-You-Go platform, secured USAID funding from Development Innovations Ventures (DIV) to fund research in rural Tanzania.⁶

1. <<http://www.omcpower.com/blog/p/press-release-omc-secures-funding-to-reach-3-million-people>>

2. <<http://www.dlight.com/about-us/media/press-releases/>>

3. <<http://www.gsma.com/mobilefordevelopment/m-kopa-solars-new-funding-a-landmark-for-off-grid-energy-service-companies>>

4. <<http://simpanetworks.com/2014/12/16/simpa-networks-announces-4m-commercial-debt-financing-from-opic-and-gdf-suez/>>

5. <<http://www.greentechmedia.com/articles/read/why-khosla-is-investing-nearly-2m-in-this-plug-and-play-solar-firm>>

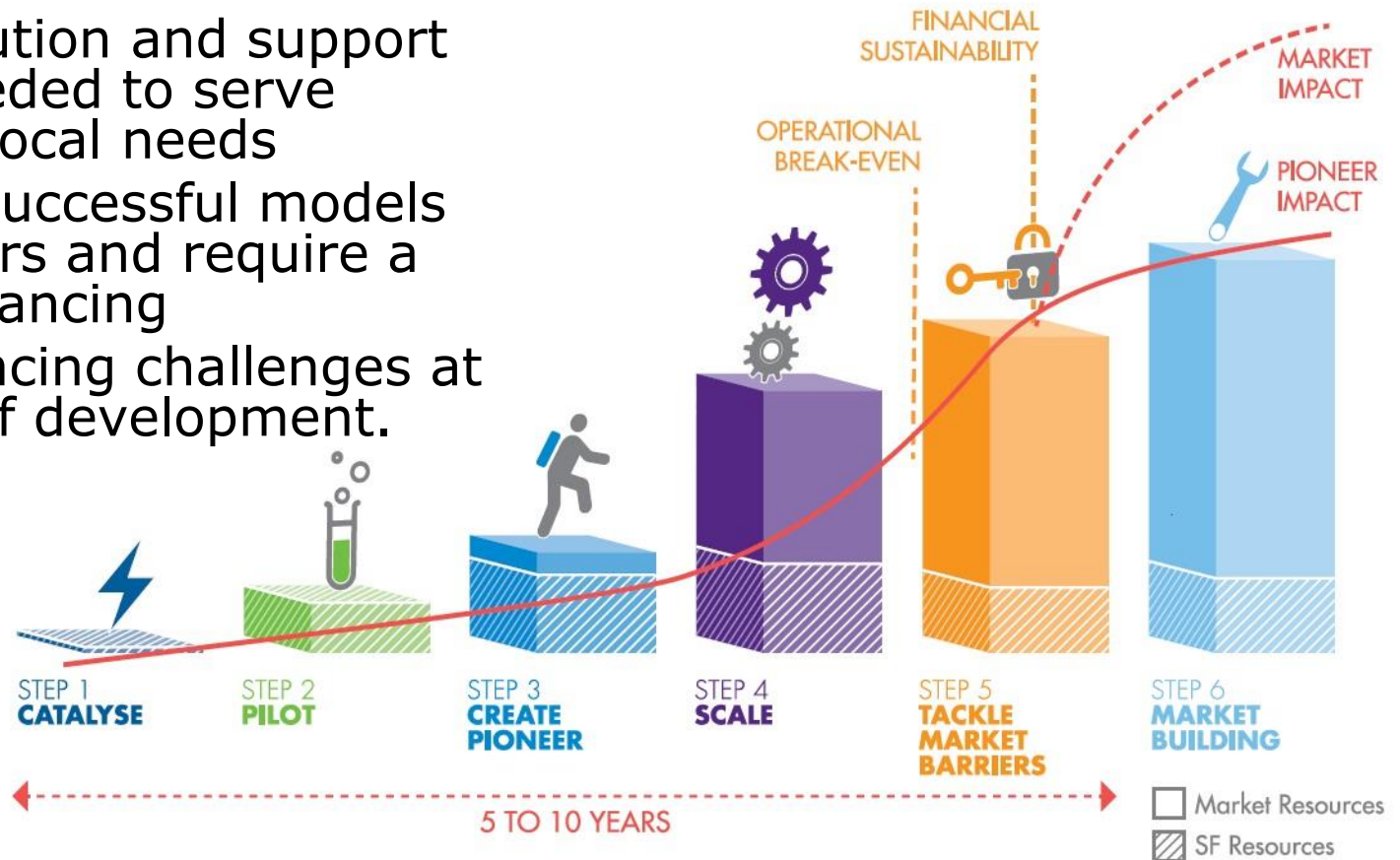
6. <http://www.angazadesign.com/news_custom/angaza-announces-funding-from-usaid-div/>

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SCALING UP PRIVATE SECTOR ENERGY SERVICES

- Private sector, particularly small and medium enterprises (SMEs), provide more flexibility and innovation
- Local distribution and support channels needed to serve market and local needs
- Scale up of successful models can take years and require a variety of financing
- Distinct financing challenges at each stage of development.



INVESTMENTS IN SUPPLY CHAIN: LIGHTING



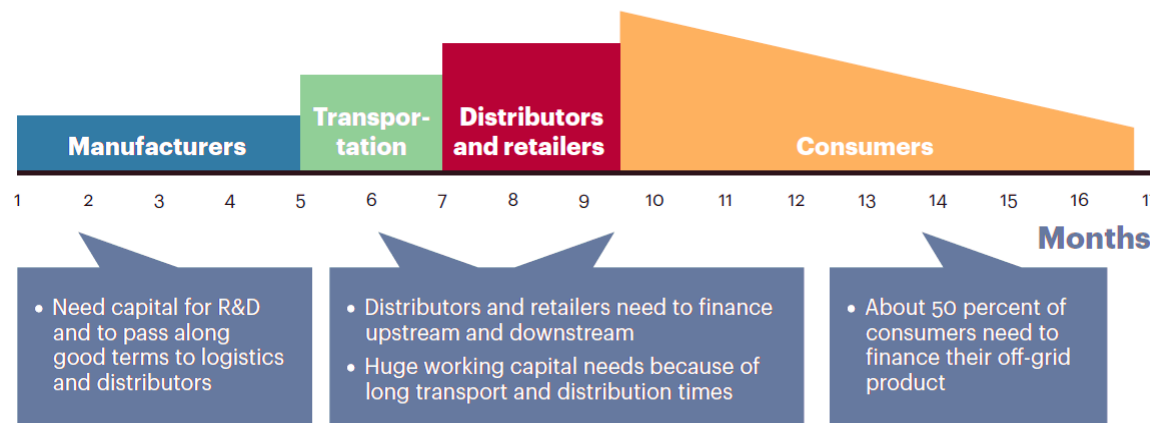
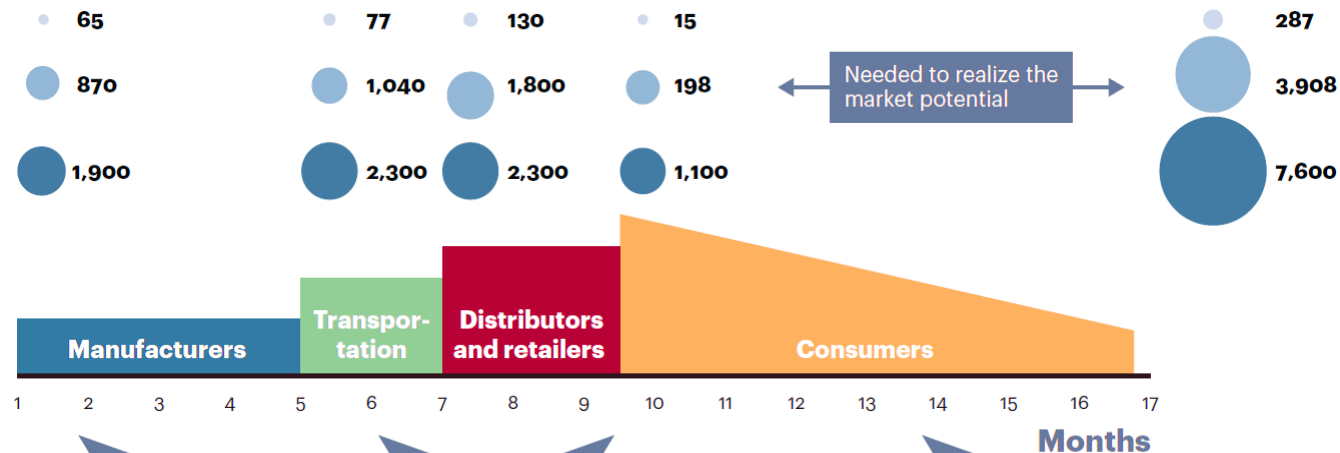
Changing capital requirements make it financially difficult to get products from manufacturers to consumers.

Solar-powered lighting (SPL) products have varying needs with their value chain

- Bottleneck at the national distributors and resellers
- Distributors face a finance double burden:
 - Upstream (ordering from suppliers)
 - Downstream (affordable products for end-users)

Capital requirements per value chain step¹

(\$ million)



¹Capital requirements satisfied or to be satisfied by equity or debt (actual financing demand should be lower than capital requirements)

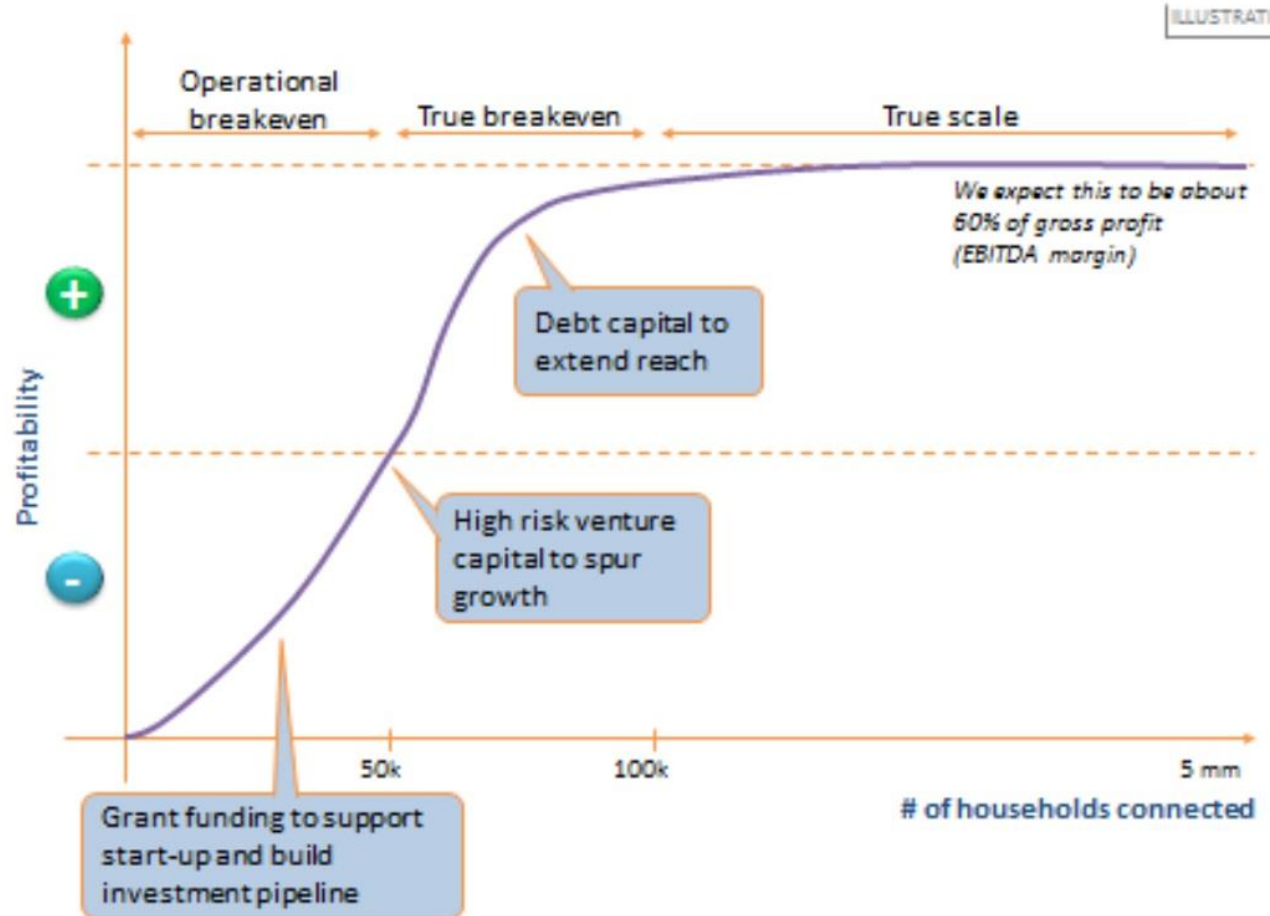
Sources: Niwa, Lighting Africa, Dalberg Analysis, csimarket.com; A.T. Kearney analysis

FINANCE NEEDS BY STAGE OF DEVELOPMENT: MINI-GRID EXAMPLE

	Grants		Equity		Debt	
	Subsidies / TA	Seed / Start-up	Growth / Expansion	Infrastructure	SME / Corporate	Project Finance
Sources	<ul style="list-style-type: none"> ▶ Governments ▶ Foundations ▶ Donors / DFIs 	<ul style="list-style-type: none"> ▶ Friends & Family ▶ Angel investors ▶ Impact funds ▶ Foundations 	<ul style="list-style-type: none"> ▶ Impact funds ▶ Venture cap funds ▶ PE funds 	<ul style="list-style-type: none"> ▶ PE funds, most DFI-sponsored 	<ul style="list-style-type: none"> ▶ Local banks ▶ Int'l banks w/ local presence 	<ul style="list-style-type: none"> ▶ Commercial banks ▶ EXIM banks ▶ DFIs
Risk appetite	++++	+++	++	++	+	+
Amount	\$30k – 10m	\$100k – 1m	\$1 – 5m	\$10m+	\$20k – 10m	\$15m+ (selected smaller transactions)
Expected tenure	N/A	3 – 7 years	3 – 5 years	5 – 10 years	6 months – 5 years	7 – 15 years

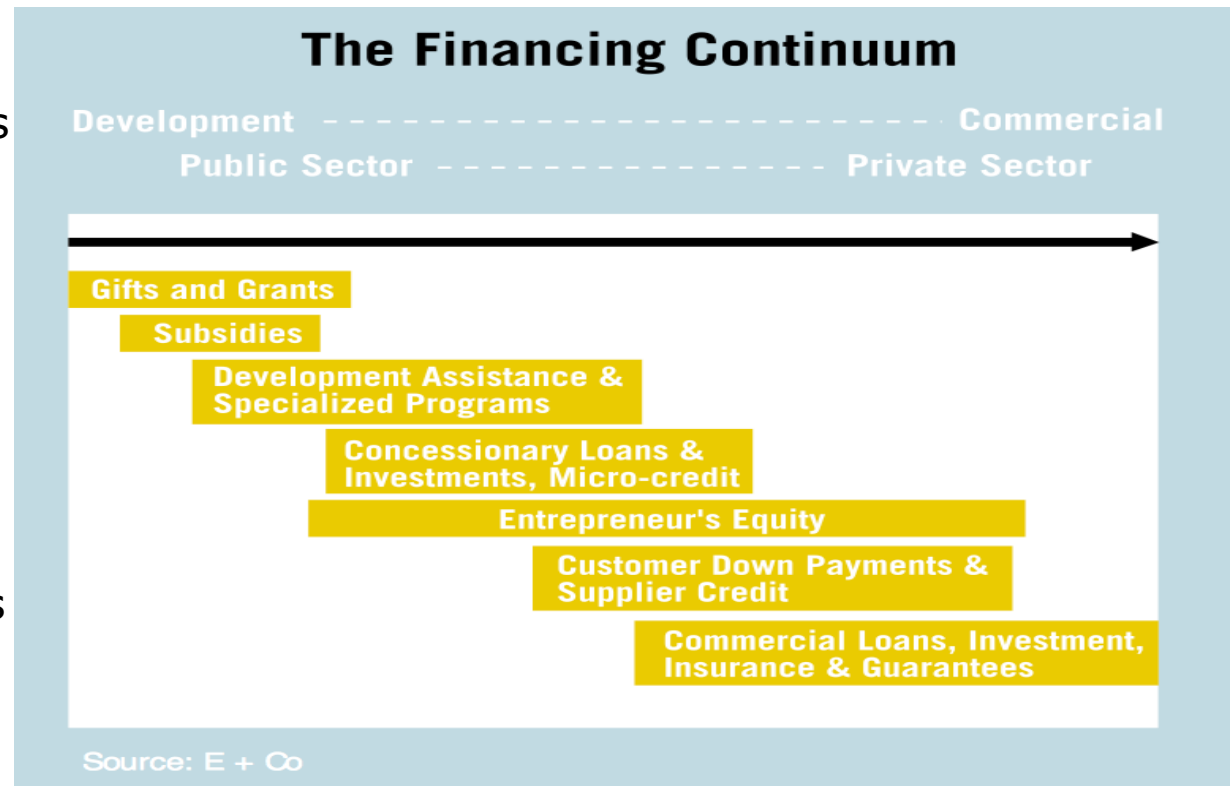
PROFITABILITY (AND RISK) VS. SCALE

- Need for different types of finance at different stages of company growth, with profitability dependent on growth.
- Funding gap can exist between venture capital and debt where risk tolerance and capital size requirements are mismatched (i.e., much capital is needed, however risk is still high). Thus this financing stage is not appealing to either venture capital investors or lenders.



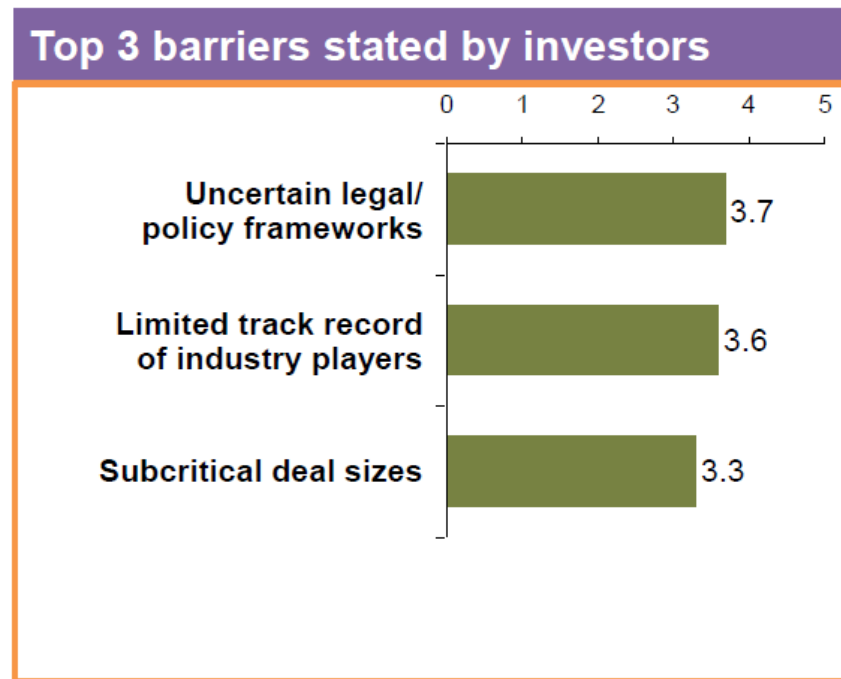
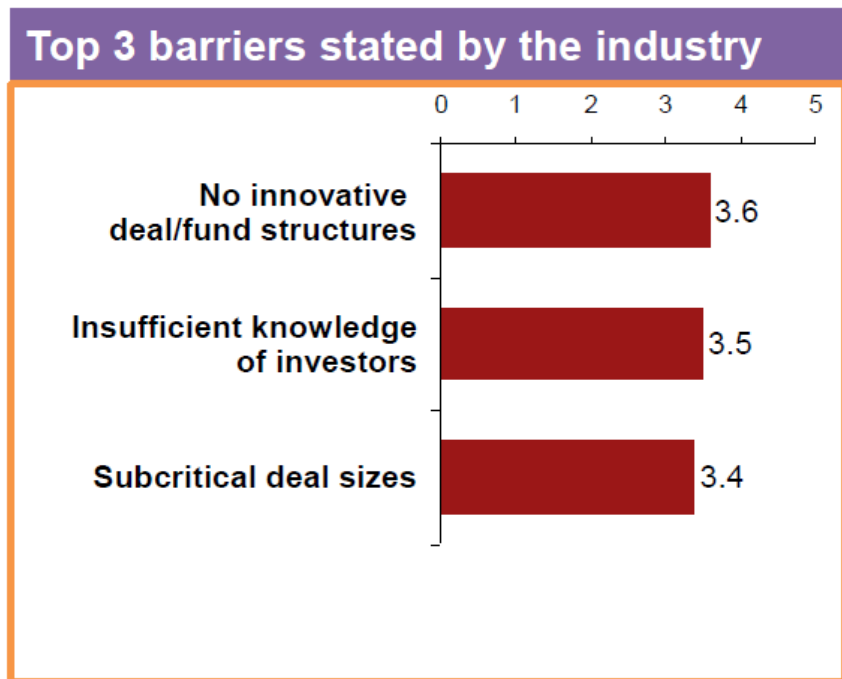
PUBLIC CAPITAL INTERVENTIONS TO CATALYZE THE TECHNOLOGY CYCLE

- Public capital investment in energy access is needed for two primary reasons
 - Catalyze business development cycle by overcoming market barriers, as shown in figure.
 - Provide public service by financing and/or derisking projects that are not likely to be (very) profitable
- Scale of need for energy access requires public sector investors to spur private sector investment through smartly designed policies and programs.



BARRIERS TO INVESTMENTS IN ENERGY ACCESS

Top barriers to finance by stakeholder group



■ Manufacturers and distributors ■ Investors

Source: Interviews and surveys with 30 manufacturers and distributors (December 2013) and 13 investors (December 2013 - February 2014), Energypedia, A.T. Kearney

BARRIERS TO INVESTMENTS IN ENERGY ACCESS

Risks

- Investor anxiety is increased with uncertainty and risk; Political and economic risk are often high in poorer countries, furthermore, government perception of private sector is important.

Obstructive Environment

- Non-enabling, weak or even obstructive environments could include tax and subsidies competing fossil fuel industries or lack of clear regulations.

Finance Channels

- Large investors need the mechanisms and ability to target small-scale enterprises, local banks, microfinance institutions, and low-income consumers.

Capital Availability

- Local businesses face high capital costs via standard routes such as local banks, emerging distribution enterprises need the knowledge and ability to take advantage of opportunities.

Low ROI

- Low-income customers living in rural areas have less money to pay for services and are expensive to reach, investments are long term, high risk, and offer low financial return.

Security

- Investors prefer reliable customers and investments which have the ability to pay.

Investment Size

- Mainstream investors invest many sizes of magnitude larger than low-income markets; small investments have high transaction costs, high interest fees which lead to exclusions for the poor.

Business Models

- Proven business models and well-developed plans soothe investors into knowing risks are being mitigated and returns are ensured

Impatient Investors

- Under-developed markets require time commitments to build relationships and market demand where none existed before, commercial investors may be impatient.

Market Pioneers

- Immature markets lack the builders and pioneers required to overcome barriers and transform the market.

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POLICY LEVERS TO ENABLE ENERGY ACCESS

"Private sector participation is essential to meet energy investment needs in full, but mobilising private investors and capital will require a concerted effort to reduce political and regulatory uncertainties." -- IEA World Energy Investment Outlook, 2014



Establishing a foundational policy environment

- Government goals, policies and regulations need to prioritize and enable SMEs and distributed energy options. Stability and transparency are key to attract investment.

Building human capacity

- Government programs can foster business support for SMEs, provide workforce development and increase market understanding for all actors from regulators to investors to end users.

Integrating with development programs

- Government policies on energy access extend far beyond energy. Working across ministries can leverage social development programs on poverty, education, health, and climate.

Catalyzing Finance

- Governments can play a significant role in bringing investors to the market including public-private programs, risk mitigation, and targeted incentives. Policies may need to address finance needs of all players in the sector.

OUTLINE

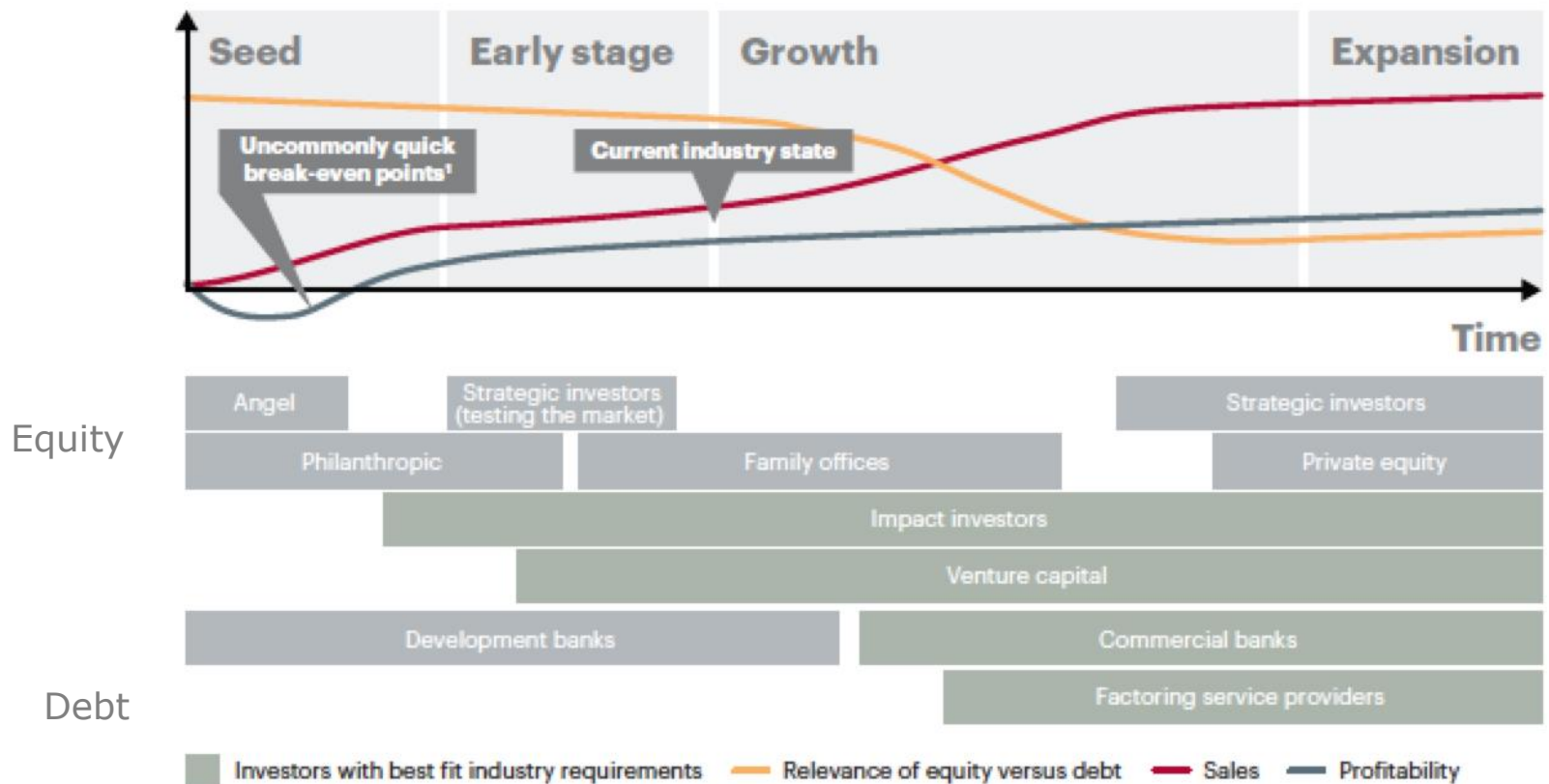
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SOURCES OF FINANCING AND THE THEIR FINANCING INSTRUMENTS

	Grants/credits	Concessionary Loans	Market-rate loans	Credit line for on-lending	Partial credit guarantees	Political risk guarantees	Equity	Quasi-equity	Carbon financing	Subsidy/ cross-subsidy	Feed-in tariff	Technical assistance
Multilateral development banks	•	•	•	•	•	•	•	•	•			•
Bilateral Development Banks	•	•	•	•					•			•
Export-Import Banks/Guarantee Agencies			•			•						•
Developing Country Governments	•	•					•	•		•	•	
State-owned Utilities							•			•	•	
National Development Banks		•	•	•	•							•
Rural Energy Agencies/Funds	•									•		•
Foundations	•						•		•			
Microfinance			•									
Local Banks			•									
International Banks			•					•	•			
Investment Funds							•		•			
Private Investors							•		•			•

INVESTORS ALONG THE INDUSTRY LIFECYCLE

Investors and financiers engage at various stages of the business development cycle, depending on when their investment timeframe and risk appetite align with those of a given technology/business model within a certain market (or group of markets)

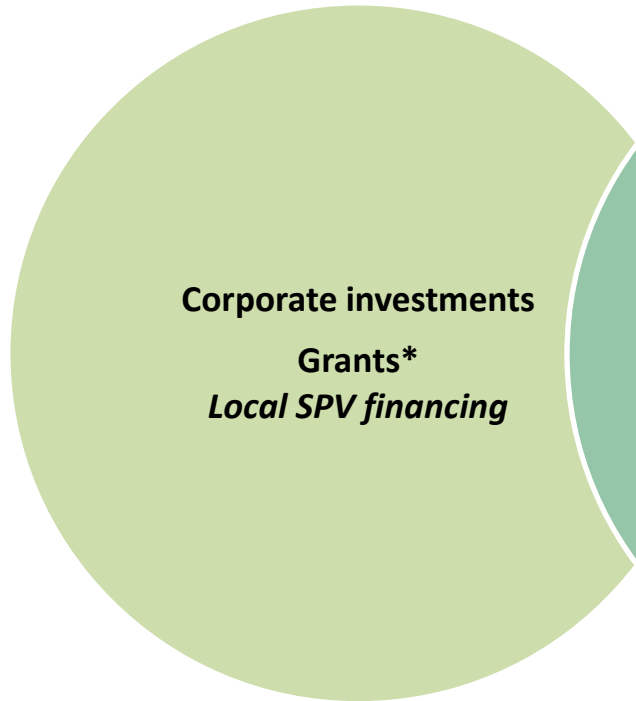


FINANCING NEEDS FOR BUSINESS DEVELOPMENT AND DIFFUSION VARY BY RECIPIENT

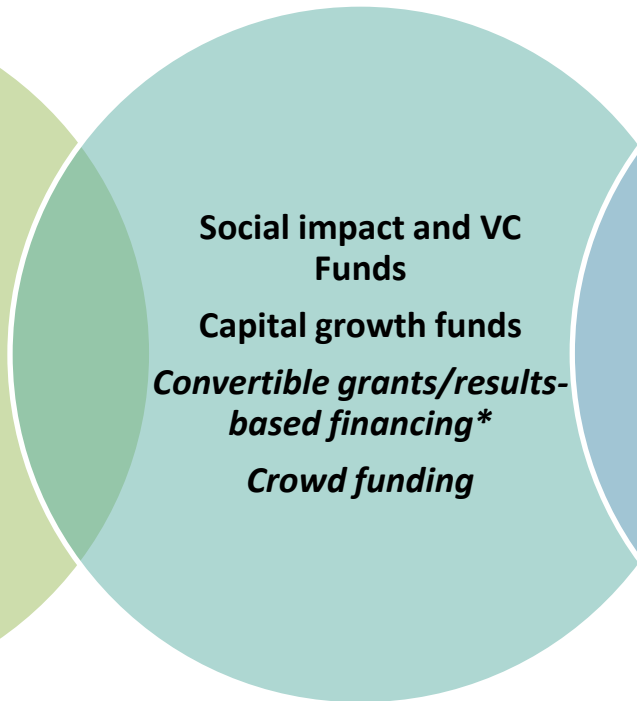
Recipient	Examples of Types of Finance and Investment Needed (non exhaustive)
Technology developers	Angel investors, venture capital, seed capital/private equity (high net worth individuals/family offices)
Manufacturers (Design, engineering and production of off-grid energy technologies)	Angel investors, venture capital, seed capital/private equity (high net worth individuals/family offices), debt (credit lines and loans from local banks, microfinance), credit enhancements (insurance, export)
Retailers	Equity, debt (credit lines and loans from local banks, microfinance), corporate finance
Project developers	Loans (credit lines), seed capital/private equity, corporate finance, credit enhancements (surety bonds, insurance), feed-in tariffs, project finance
Utilities	Ratemaking/energy sales, corporate finance, investor equity, insurance
Governments (National development banks, treasuries, sovereign wealth funds)	Ratemaking/Energy sales (for municipal or government owned utilities), taxes, grants from development banks and charitable organizations, carbon funds
Development capital (Regional development banks, international finance institutions)	Government contributions, foundations
End-users	Energy savings, personal equity/income, personal loans (local banks, micro finance)

TYPES OF CAPITAL

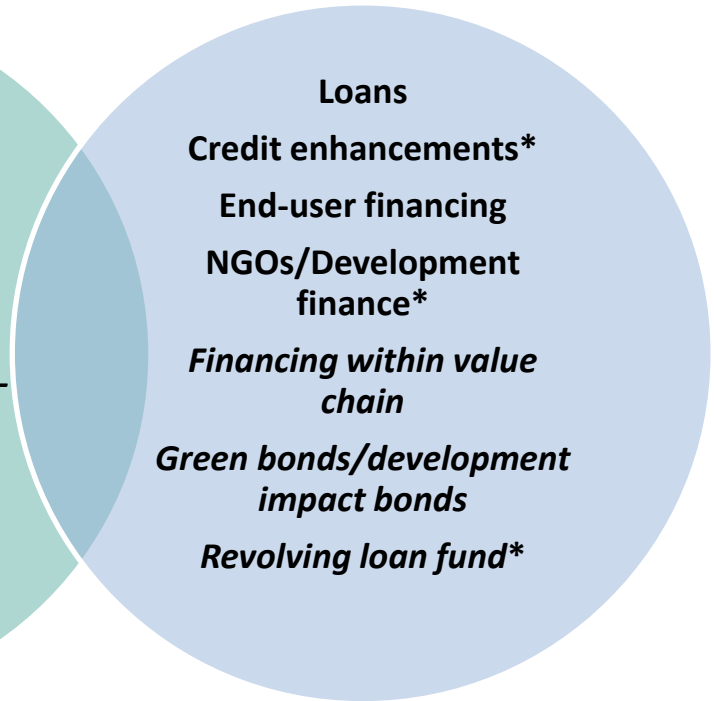
Equity



Equity-Debt Crosscutting



Debt



***Indicates could be considered as a subsidy/soft loan**

Italics indicate innovative solutions for energy access

TYPES OF CREDIT ENHANCEMENTS AND SUBSIDIES

Credit enhancements and soft lending/subsidies can improve access to capital by lowering risks and increasing returns, respectively.

- **Credit Enhancements (public and private sector)**
 - Partial credit guarantees, including loan loss reserves, loan guarantees, and debt service reserves
 - Surety bonds
 - Insurance (construction, operation, cargo, sovereign risk, currency, weather)
 - Hedging contracts (commodities, exchange rates, interest rates)
 - Export Guarantees
- **Additional Revenue Sources (to suppliers and end-users)**
 - Carbon finance (carbon credits)
 - Grants (e.g., convertible grants, performance-based grants)
 - Fee waivers (e.g., interconnection fees, capacity surcharges)
 - FITs, kWh payments
- **Soft lending**
 - Climate finance and carbon funds
 - Concessional loans, performance-based loans, and hybrid grant-loans
 - Revolving working capital fund with first-loss tranche

CHALLENGES AND BENEFITS OF DIFFERENT TYPES OF CAPITAL

- **Debt**
 - Benefits:
 - Cost of capital is typically less expensive than equity as debt takes losses after equity
 - Challenges
 - Need sufficient cash flow to cover debt payments
 - Lenders look for lower returns over longer tenors, and these market expectations may not be suitable for energy access SMEs' who are in need of more favorable terms
 - Requires collateral
- **Equity**
 - Benefits
 - Helps complete capital stack and is often needed to access debt(see slide 14)
 - Challenges:
 - Usually has a higher cost of capital compared to debt as equity takes first losses
 - Given the risks, investors may be looking for double-digit returns when only single digits are plausible for energy access
 - Small-scale entrepreneurs may not want too much equity finance early on given loss of ownership stake.
- **Credit enhancements and subsidies**
 - Benefits
 - Credit enhancements lower the cost of capital and may increase the total size of financed project
 - Of subsidies, provides for an additional source of revenue
 - Challenges
 - Can be difficult to qualify for
 - Expense to access and manage may outweigh benefits
 - Subsidies can distort market if not designed to coordinate with SME activities

ADDITIONAL CONSIDERATIONS

- **Start-up capital vs. working capital:**
 - Initial angel, development bank or philanthropic equity may be used for start-up where investors are not seeking market-rate returns.
 - Working capital is needed once a company has a functional business model and is used to cover operational expenses such as maintaining inventory
- **Local currency vs. foreign currency denominated finance:**
 - Borrowing and repaying in same currency reduces currency risk
- **Project finance vs. corporate finance:**
 - Risks and collateral are based at the project rather than corporate level.
 - Access to capital may be cheaper at the corporate level but puts corporate assets at risk.
 - For project finance, risks and collateral are assessed at the project level, which may provide some protection to SMEs' corporate level assets
 - Many energy access projects may be too small to access project finance.
 - Scale of mini-grids may provide best opportunity for project finance, but investor requirements for returns and cash flows make this difficult to access.
 - Given these constraints, raising corporate finance may be more feasible for many SMEs in the near term.
- **Institutional investors:**
 - Include pension funds and insurance funds. Seek low return/low risk, long-term investments. Energy access may be too high risk and yet not provide sufficient returns
 - Can partner with philanthropic funds to reduce risks to the institutional investor (e.g., a foundation takes the first loss ahead of the institutional investor).
- **Public vs. private capital:**
 - Public funds could be either 1) government funds or 2) bilateral/international development funds
 - Public funds may come from taxes or ratemaking and have specific stipulations as to how they can be used
 - Development funds are usually philanthropic in nature and can include concessional finance as well as subsidies (e.g., grants). In the case of concessional finance, public capital might not require market-rate returns
- **Impacts-oriented (social investors) vs. bottom-line oriented investors**
 - Similar to public capital, social investors may not seek market-rate returns and may make investment decisions based in part on co-benefits, such as those related to the environment or economy. Impacts-oriented investors can include institutional, angel, and venture capital investors

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THREE DEBT FINANCING SOLUTIONS

DEBT FINANCE PROVIDER	responsAbility energy access fund (Working Capital)	IntelleGrow (Short term Debt for Capacity Building)	GroFin GroFin (Start-up & Growth Finance)
Established	2015	2011	2004
Type of Funding	Loans for growing energy enterprises.	Venture debt (early-stage, viability-based loans linked to cashflow).	Viability-based loan, linked to cashflow. Risk-adjusted returns.
Size of Investment	Up to \$3 million	\$50K to \$1.25 million	>\$50K to \$1.5 million
Fund Size	Target first close of \$30 million with investment from IFC, Lundin Foundation and other social investors.	\$10 million from a range of social investors including Omidyar Network and Michael and Susan Dell Foundation.	\$400 million under management from a range of social and commercial investors.
Non-financial Support	Technical assistance services for borrowers.	Nimble structure with decision to lend made within six weeks (rather than months).	Extensive business support pre-, during and post-investment and links to international supply chains and functional expertise.
Investment time horizon	Six to 24 months revolving fund	12 to 36 months	Three to six years
TARGET IMPACT	Expected to impact 50 million livelihoods and significantly reduce CO ₂ emissions.	\$230 million deployed by 2020 improving 10 million livelihoods	\$650 million deployed, creating over 75,000 jobs and benefiting more than 1.2 million people.

Shell Foundation took “first loss” position on responsAbility fund to attract IFC and other investors.

CONCESSIONAL LOANS & GRANTS

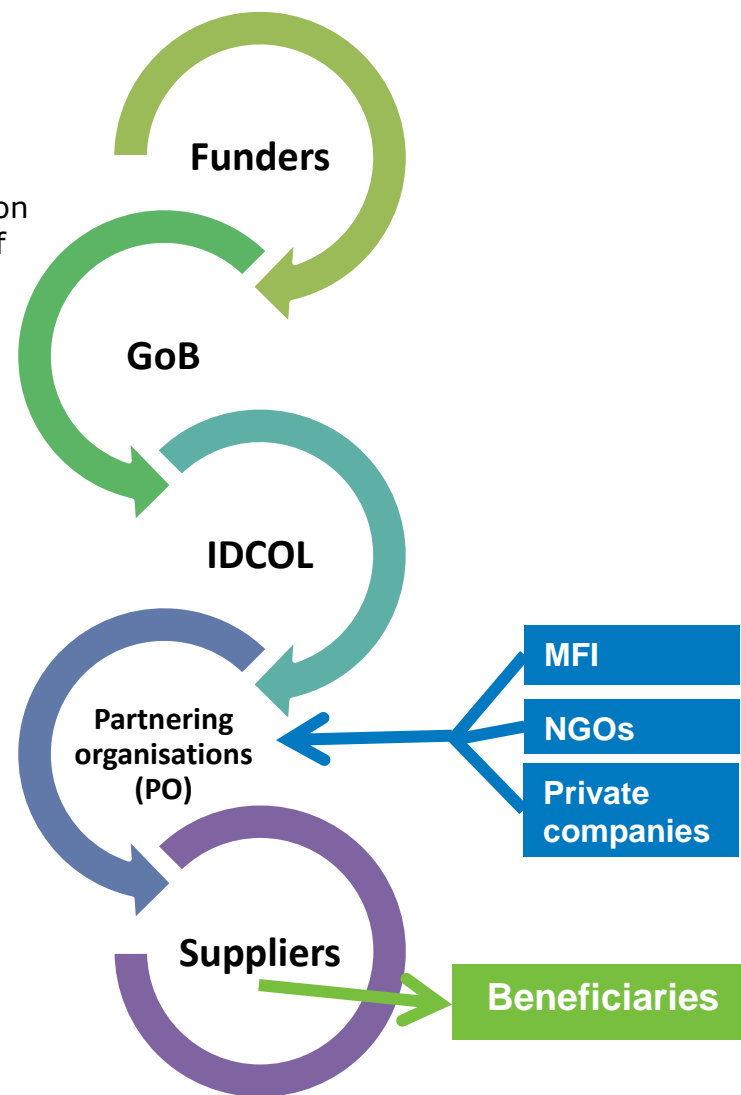
Bangladesh

IDCOL Solar Home System (SHS) program

- **IDCOL Model**
 - IDCOL licensed by Bangladesh Bank as non-bank financial institution
 - Most funds flow from multilateral donor agencies to Government of Bangladesh to IDCOL.
 - IDCOL provides grants and low-cost loans for 5-7 years to Partner Organizations (POs)
 - IDCOL sets specifications for SHS equipment.
- **Partner Organizations**
 - Include microfinance institutions, NGOs and private sector entities sell and install SHS to end-users.
 - Use soft loans to extend microcredit to end users
 - Use grants to enhance capacity and reduce system costs
- **Impact:**
 - 47 Partner Organizations involved with IDCOL
 - IDCOL Goal: Started in 2003 with 50,000 SHS goal by 2008.
 - Actual: Over 3 million SHS by 2014 serving more than 12 million people.

Bangladesh Central Bank

- In 2010, the Central Bank introduced a USD 26 million refinancing facility in green energy in Bangladesh from the government's own budget.
- The fund is being used to incentivize and leverage low cost funding from commercial and state banks.



USING NATL BANK TO LEVERAGE DONOR FUNDS

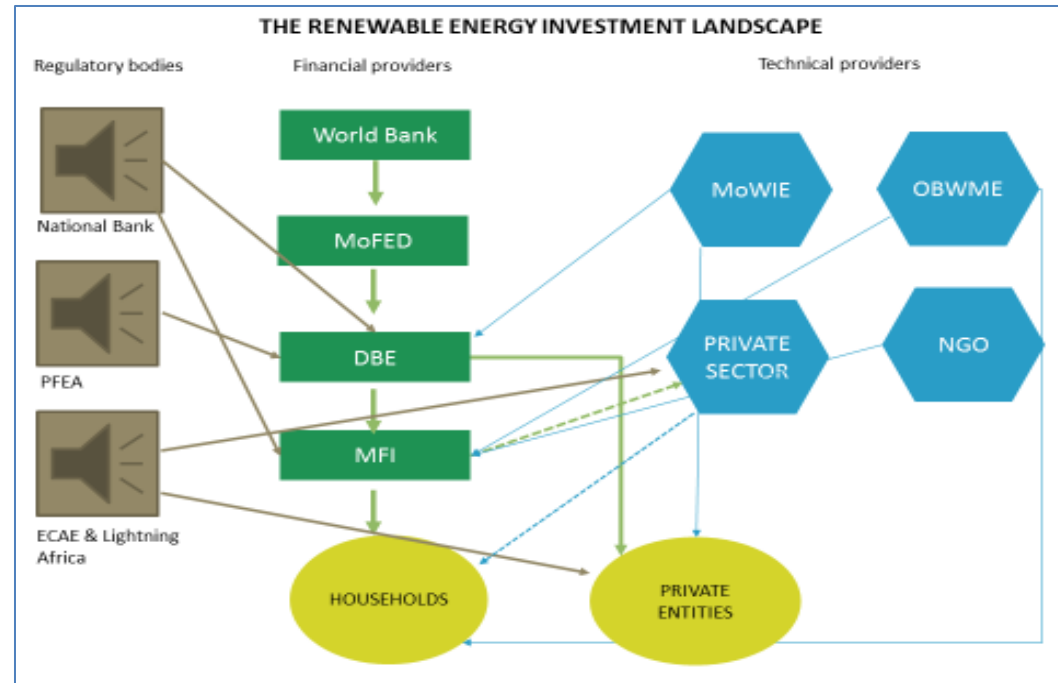
Ethiopia: Market Development for Renewable Energy and Energy Efficient Products Program (MDRE & EEP)

MDRE & EEP Model:

- World Bank providing \$40 million to Ethiopia to be disbursed by Development Bank of Ethiopia
- DBE provides concession rate Lines of Credit (LOC) to:
 - Private companies for working capital (in foreign currency) to invest in RE & EE products
 - Requirement to provide 30% project equity and fixed asset collateral limits use.
- MFIs to provide market rate micro-loans to end users

Impact:

- Of initial \$20 million in program, \$18 million in loans have been approved and nearly \$12 million disbursed.
 - 5 MFIs approved at ~USD 2.5 million each
 - 6 SMEs so far approved to import solar lanterns
- MFIs providing short-term loans to households, so only supporting certain technologies – lighting and household biogas
 - Need for longer-term concessional loans from MFIs to access solar home systems



Source: Development Bank of Ethiopia/MDRE&EEP Case Study, Nanki Kaur, et al from the DRAFT report, Policies to Spur Energy Access from the Clean Energy Solutions Center and IIED. Anticipated June 2015.

RESULTS-BASED FINANCE

UK Department of International Development (DfID)

- Results Based Finance (RBF) program for low-carbon energy access
 - Offers incentive payments, on the basis of results achieved, to businesses which deliver pre-specified outputs within the low-carbon off-grid energy sector
 - Contract signed in advance, but payments made only as sales are achieved and independently verified
 - Operates predominantly in Sub-Saharan Africa and South-Asia with incentives being offered over a 4 year period.
- Funds intended partly for market development.
- Participants must demonstrate long-term financial viability

Tanzania Impact:

- Early results from the RBF program in the Lake Zone of Tanzania indicate:
 - 11 new pico-solar product-service options being market-available to rural consumers
 - First half-year sales benefitted nearly 14,000 rural Tanzanians
 - RBF funding has leveraged commercial financing for at least 2 approved companies

Country	RBF Title	Expected total of incentive amounts (€m)	Products to be marked by participating firms and organisations
Benin	Lifting up 3 Offgrid PV market segments to the next level	2.4	361k PV lamps, 72k PV lamps with charger, 7,234 pico SHS, 2,550 streetlights, 262 solar pumps
Ethiopia	Cooking stoves – RBF to extend supply chains into rural areas	1.2	206k clean cookstoves
Rwanda	Sustainable Market Creation for Solar Lighting	3.4	160k task lights, 192k room lights
Rwanda	Sustainable Market Creation for Renewable Energy Village Grids	1.891	25 pico-hydro mini grids, 10 micro-hydro mini grids
Tanzania	Sustainable Market Creation for Renewable Energy Village Grids	1.541	88k pico PV desk lights, 27k pico PV room light kits
Bangladesh	Output-based PicoPV system development	2.5	255k pico PV systems (mix)
Vietnam	Creating a Market Driven Biogas Sector	2.75	55,000 biogas digesters

First sub-sectors designated for incentives

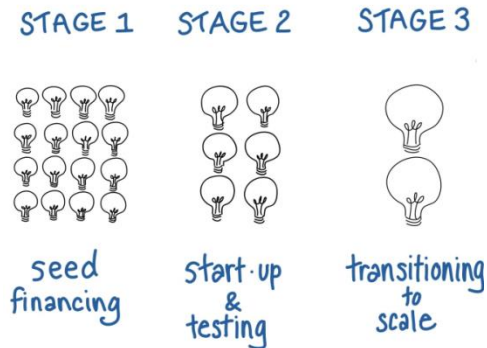
Source: DfID Guidance on Results Based Finance for Low-Carbon Energy Access, updated 26 Aug 2014 and "How Results Based Financing is spurring solar market development in Tanzania". SNV, 25 Feb 2015.

Examples of Finance Mechanisms

USAID FINANCING PROGRAMS

USAID's Development Innovative Financing (DIV)

- Year-round grant competition awards three distinct stages of financing in small increment testing in order to scale-up those with widespread impact and cost-efficiency
- Tiered funding model approach supports discovery, advances what works, and avoids failure



21% of awards are dedicated Energy projects

- In rural India, Mera Gao Power (MGP), secured stage 2 financing to improve its cost effectiveness of solar power and battery backup microgrids for off-grid villages
- Off-Grid Electric Tanzania provides rural populations with pre-paid electricity via mobile banking in small increments to reduce risk and increase consumer services¹

USAID's Development Credit Authority (DCA)

- USAID backed credit increases access to small loans in developing countries; USAID provides guidance and shares risks with local banks
- With encouraged lending and less risk, private banks are more willing to lend money to local businesses



DCA PORTFOLIO 1999-2014

\$3.7 BILLION in credit made available in **74 countries**

In 2012, DCA backed credit of \$77 million dedicated toward Clean Energy in India, Nigeria, and South Africa

- Kenya Commercial Bank (KCB) provided access to \$1 million credit for SMEs in the clean energy sector
- Post-tsunami programs in Indonesia utilized \$16 million towards projects including renewable energy and rural electrification²

¹ <http://www.usaid.gov/sites/default/files/documents/15396/DIV%20FactSheet%20Fall%202014%20Final.pdf>

² Source: <http://www.usaid.gov/what-we-do/economic-growth-and-trade/development-credit-authority-putting-local-wealth-work>

CAPITAL COST SUBSIDIES

Mali

Support for Private-Sector Minigrid Developers

- Agency for the Development of Domestic Energy and Rural Electrification (AMADER) is a rural electrification agency that serves as a “one stop shop.”
 - AMADER regulates the market, selects projects, and provides capital subsidies to mini-grid developers
- Capital cost subsidies for approved developers
 - Technology neutral, based on mini-grid capital costs and operating conditions
 - Fund can accommodate private sector funding, but mostly funded by international donors at present
 - Developers finance remaining project costs through private sector
- AMADER runs two programs for private developers
 - “Top down” method involves competitive bidding by developers on pre-set concessions
 - “Bottom up” method allows developers to submit an unsolicited proposal.
 - Developers prefer the “bottom up” method.
 - Developers set their own tariffs
 - Support for diesel-powered mini-grids to hybridize

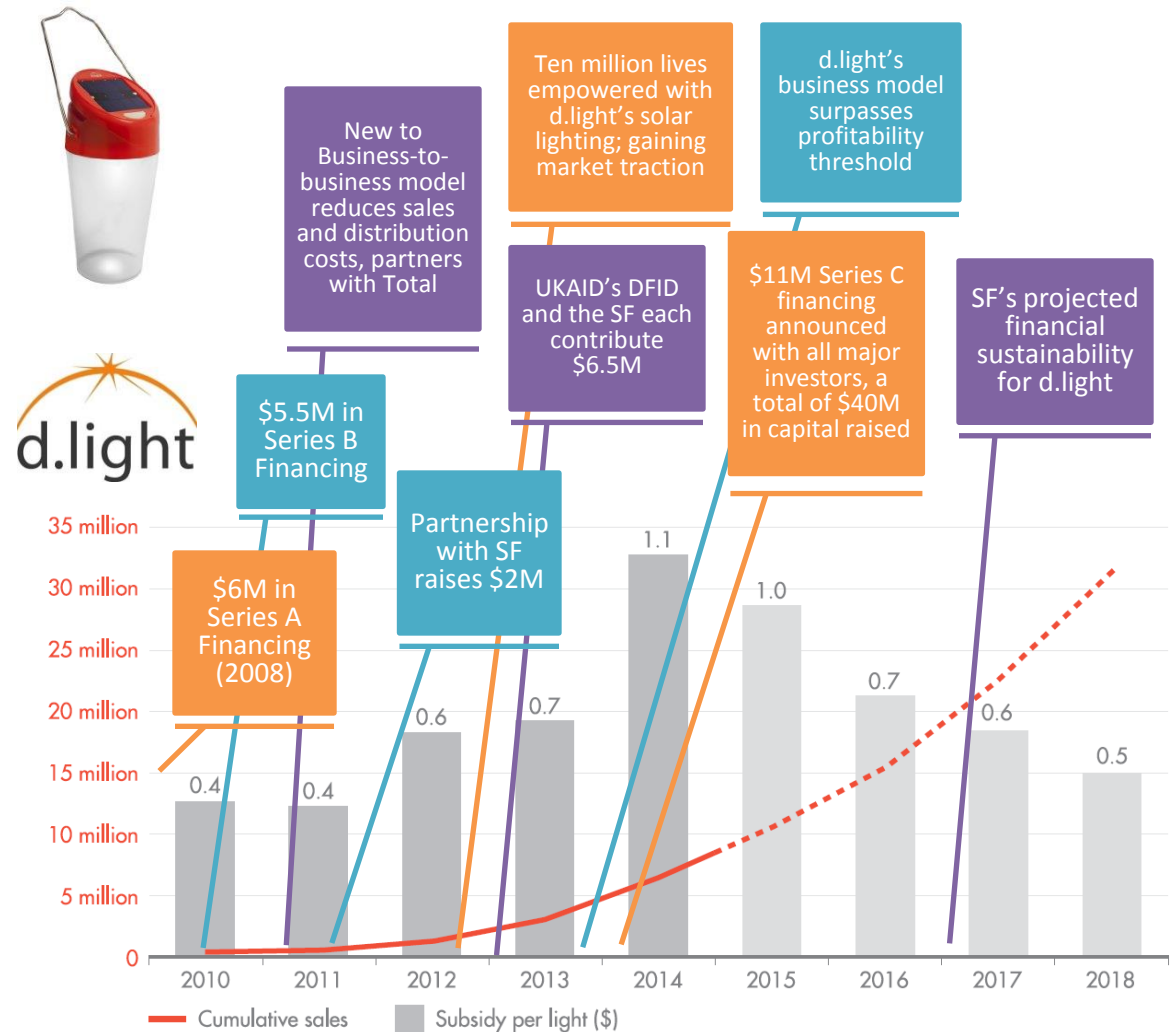


Asantys Systems has installed 550 kWp in Solar-Diesel Hybrid Village Power Systems in Mali

Source: Photo: Asantys Systems,
Text: Mali Mini-grid Development
Case Study, James Knuckles from the
DRAFT report, *Policies to Spur
Energy Access* from the Clean Energy
Solutions Center and IIED.
Anticipated June 2015.

UTILIZING RESOURCES AND PARTNERS

- D.light is a for-profit company which designs, manufactures, and distributes solar-powered lights and power products throughout the developing world
 - D.light’s business decisions transformed a student-led design contest into a global powerhouse for access to light and power
 - Company partnerships include:
 - UKAID’s DFID
 - Shell Foundation (SF)
 - USAID
 - Venture Capital Investors include:
 - Omidyar Network
 - DFJ
 - Nexus Venture Partners
 - Acumen Fund
 - Gray Ghost Ventures
 - Garage Technology Ventures
 - The Mahindra Group



SOCIAL ENTERPRISE DEBT FUND: DEUTSCHE BANK'S ESSENTIAL CAPITAL CONSORTIUM (ECC)

- ECC is an innovative \$50 million **global venture debt impact fund** established by Deutsche Bank's Global Social Finance to address the lack of high-risk growth debt capital for businesses in impact-oriented sectors such as energy access
- **Products** offered:
 - **Type of funding:** senior or subordinated debt
 - **Tenor:** 2 – 3 years, up to 5 years
 - **Amount:** between \$1 to \$5 million USD
 - **Currency:** USD and local currency (swapped to USD using hedging partners)
 - **Rate:** concessionary to market based rates, varying by product and tenor
 - **Collateral:** secured (receivables, inventory, etc) or protected by external guarantees
 - **Product Use:** working capital and other growth
- **20% guarantee against losses** from Swedish Development Agency (SIDA) provides credit enhancement to investors
- **4% target investor return** with 5 year tenor



Source: <<http://global-off-grid-lighting-association.org/wp-content/uploads/2015/01/ECC-Summary-Paper-for-Investees.pdf>>
Source:

<http://www.businesswire.com/news/home/20150316005601/en/Deutsche-Bank-Closes-USD-50-Million-Essential#.VVPo7dLF_QI>

Examples of Finance Mechanisms

CONCLUSION

Please Consider these Questions Before the Roundtable:

1. Which of the financial mechanisms listed in this presentation hold the most promise for scaling up energy access?
2. Are different mechanisms best suited for various market segments – manufacturers, distributors, project developers, retail service, end users?
3. Which, if any, of the innovative finance mechanisms have transformational potential in the market?