Off-grid PPPs towards access to electricity scale-up in Africa

Yann Tanvez, Energy Specialist, IFC

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Outline

1. Why off-grid PPPs?
2. **Off-grid PPP approaches**
3. Conditions for successful off-grid PPPs
4. **Looking forward – market trends**
5. **Lessons for off-grid PPPs**
6. **IFC DESCO SSA program**

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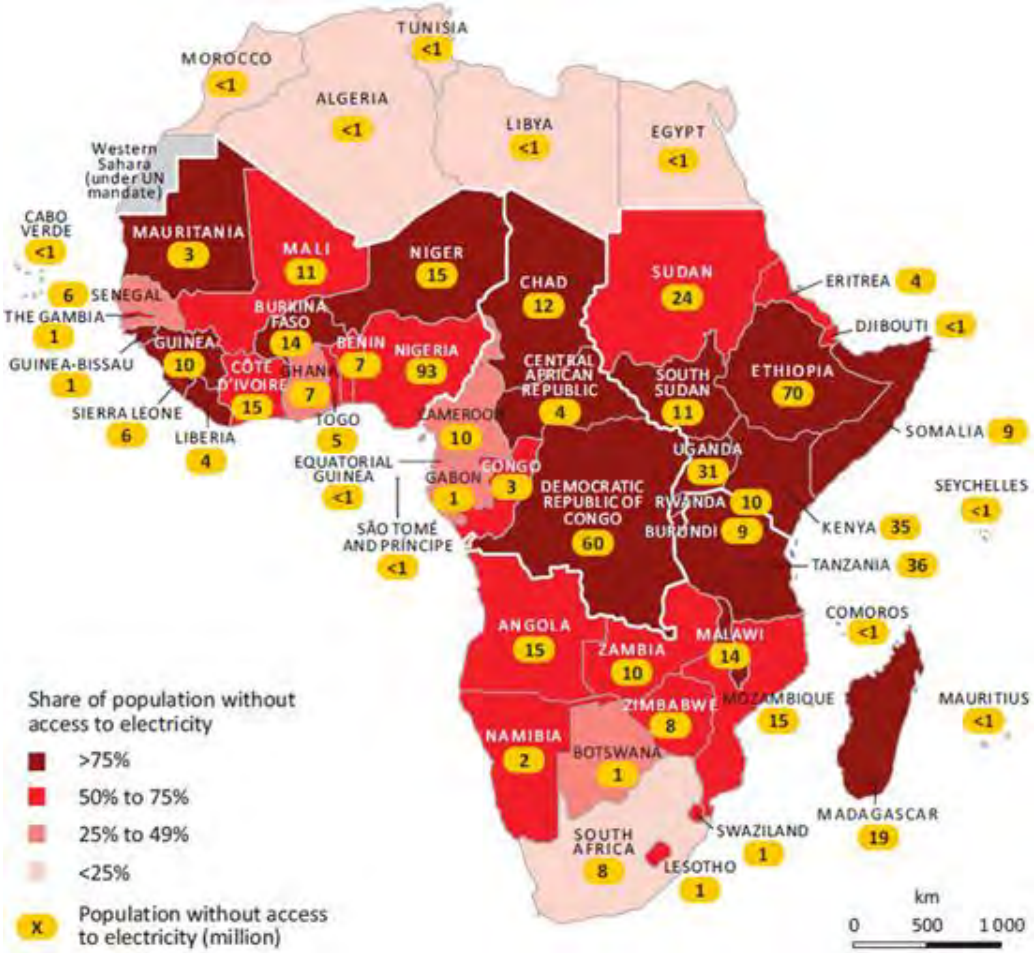
Sub-Saharan Africa is the most electricity-poor region in the world

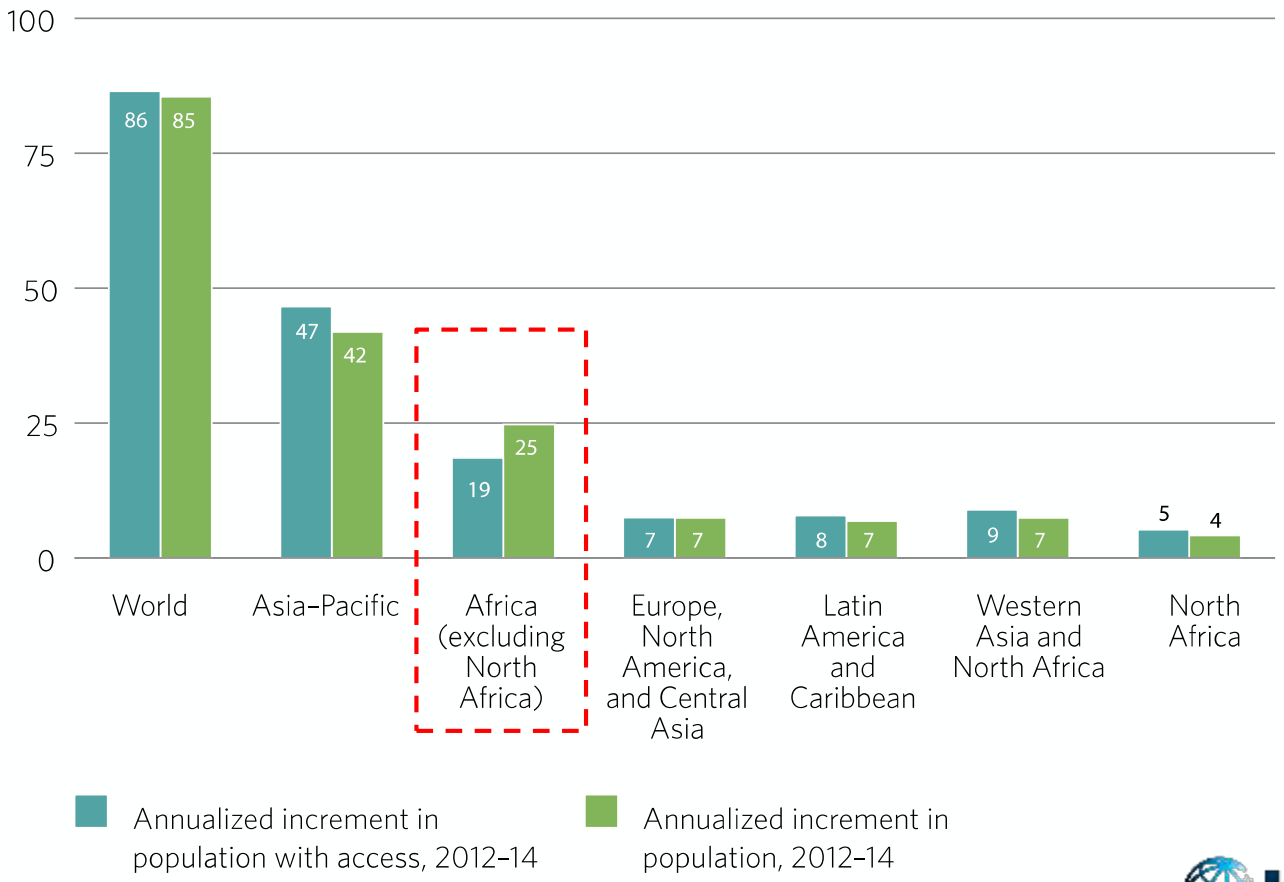
Two-thirds of Africa's population – over 600 million people – lack access to electricity



Source: IEA WEO 2012, 2014

Population growth is currently outpacing access progress in Sub-Saharan Africa

Under current trajectory, more African will lack access to electricity in 2030 than today



Source: World Bank, 2017

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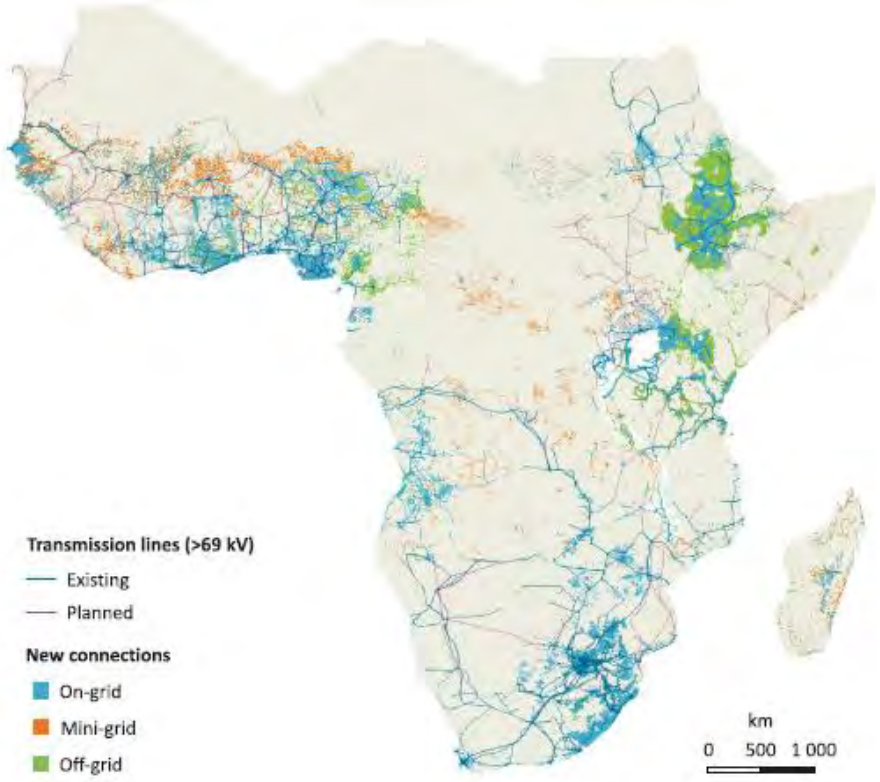
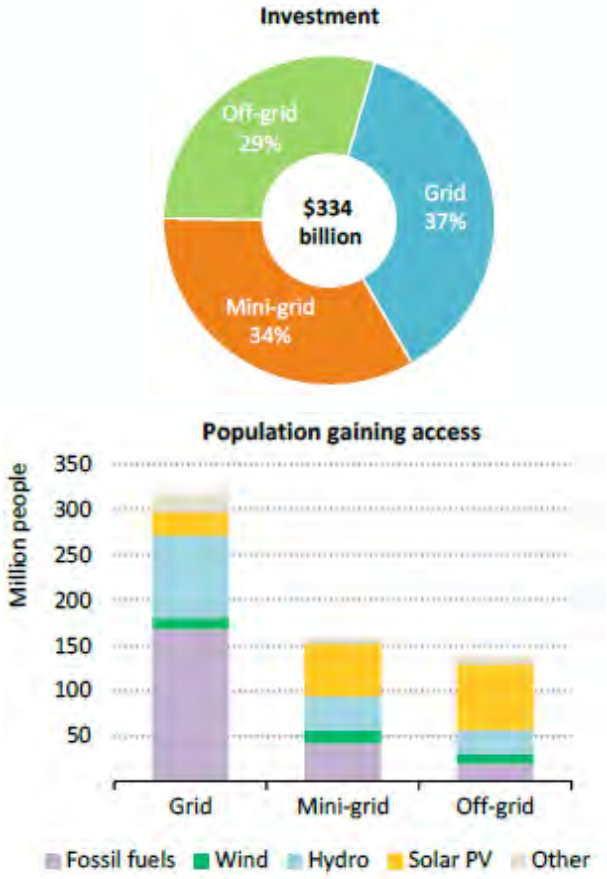
Off-grid solutions are foreseen to play a major role in solving SSA access challenge

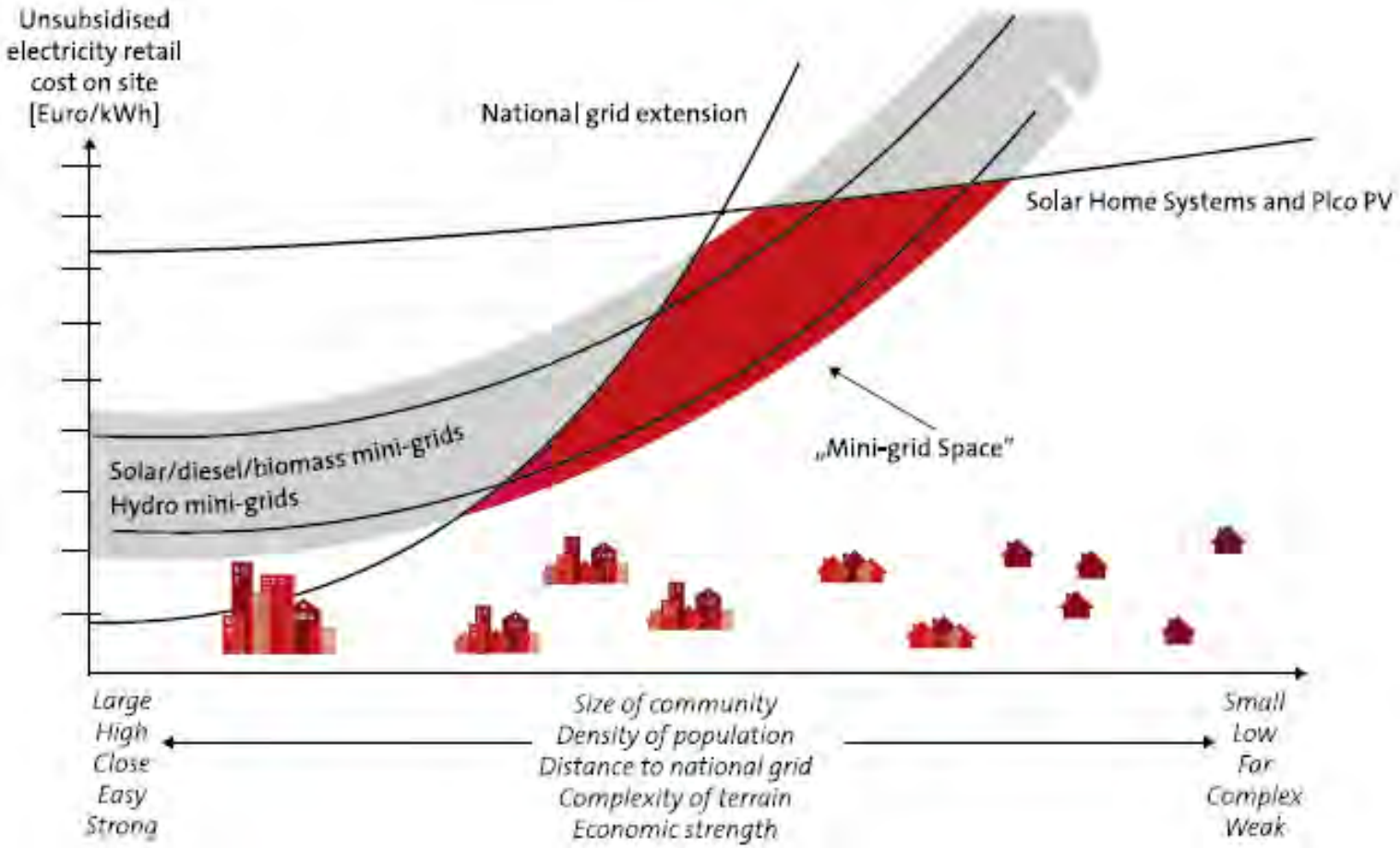
IEA projects that universal access by 2030 will be best achieved with off-grid solutions for almost half of the continent population, representing 63% of electricity sector investments





Source: World Energy Outlook, 2017, International Energy Agency

Off-grid space as part of the electricity sector new ‘continuum’



Source: Inensus in EUEI-PDF, Mini-grid policy toolkit, 2014

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Public-Private Partnerships offer an approach to addressing challenges facing public sector-led infrastructure delivery

Infrastructure delivery challenges	Benefits of PPPs
Large **gap between available financing** and investment required to address infrastructure needs	**Mobilisation** of additional sources of **financing** through improved asset utilization and implementation of user fees
Difficulties with project planning and selection process	Application of extensive **analysis of costs and revenues** and development of **innovative ways** to meet infrastructure needs
Ineffective or inefficient project delivery and management and inadequate **maintenance,** potentially leading to **higher costs**	Alignment of **incentives and measurement of outputs** to ensure effective and efficient infrastructure delivery, operations and maintenance

To support realization of these benefits, PPPs should be:

- Structured to **allocate risks** to the parties best placed to manage the risk
- Assessed based on affordability and **value for money**
- Procured through **competitive processes** (where bids are comparable)

Source: IFC PPP Knowledge Lab

Key roles between public and private actors in off-grid PPPs

Public sector partners

- Energy access commitments
- Ability to set regulations
- Convening power (national level)
- Large contracts
- Competing priorities/ limited resources

What does each party bring to the table?

Private sector partners

- Multi-country presence
- Innovative business models
- Operational expertise
- Financial strength
- Understanding of/ desire to enter new markets

Off-grid energy PPPs have been implemented in emerging markets over the last couple of decades

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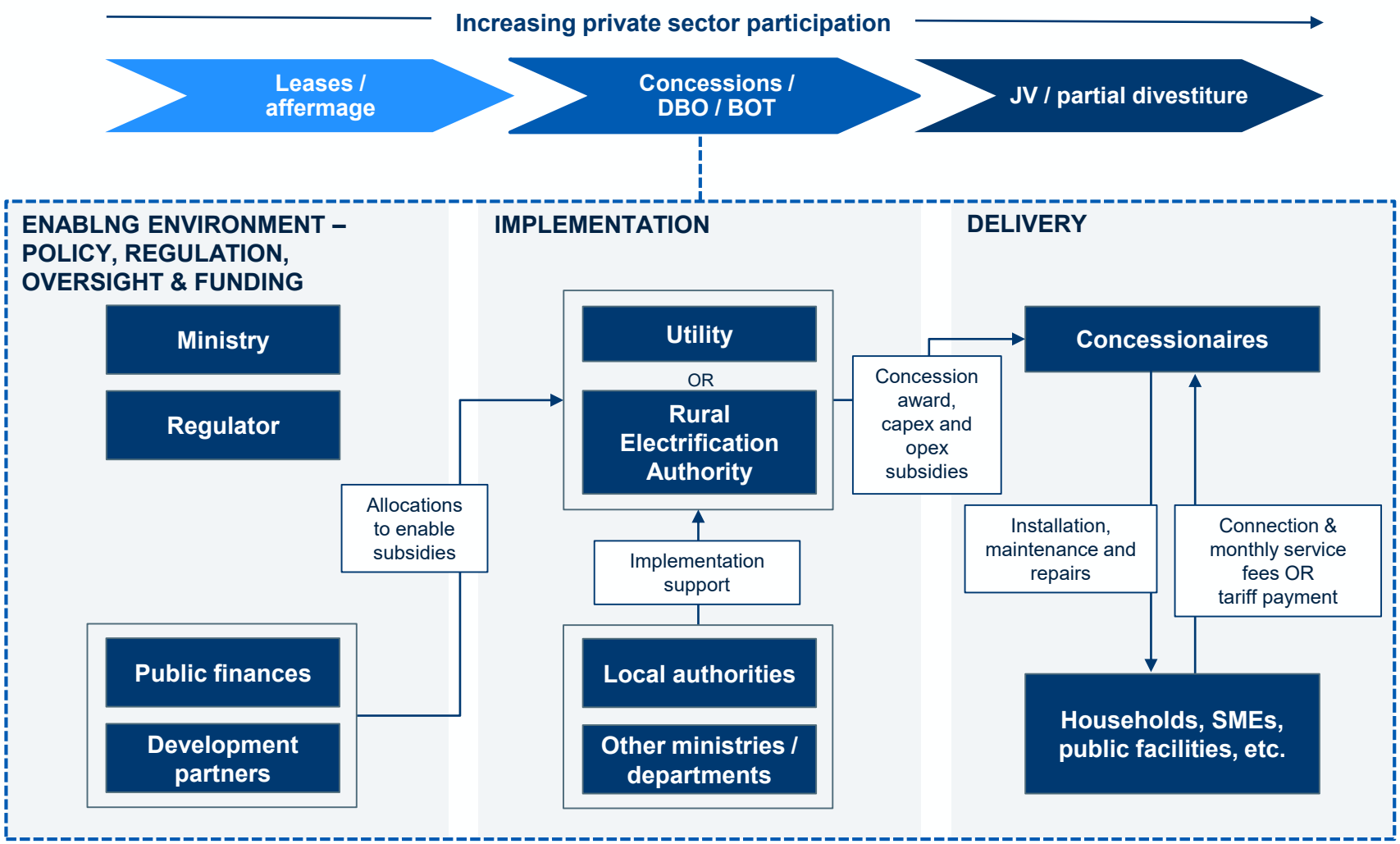
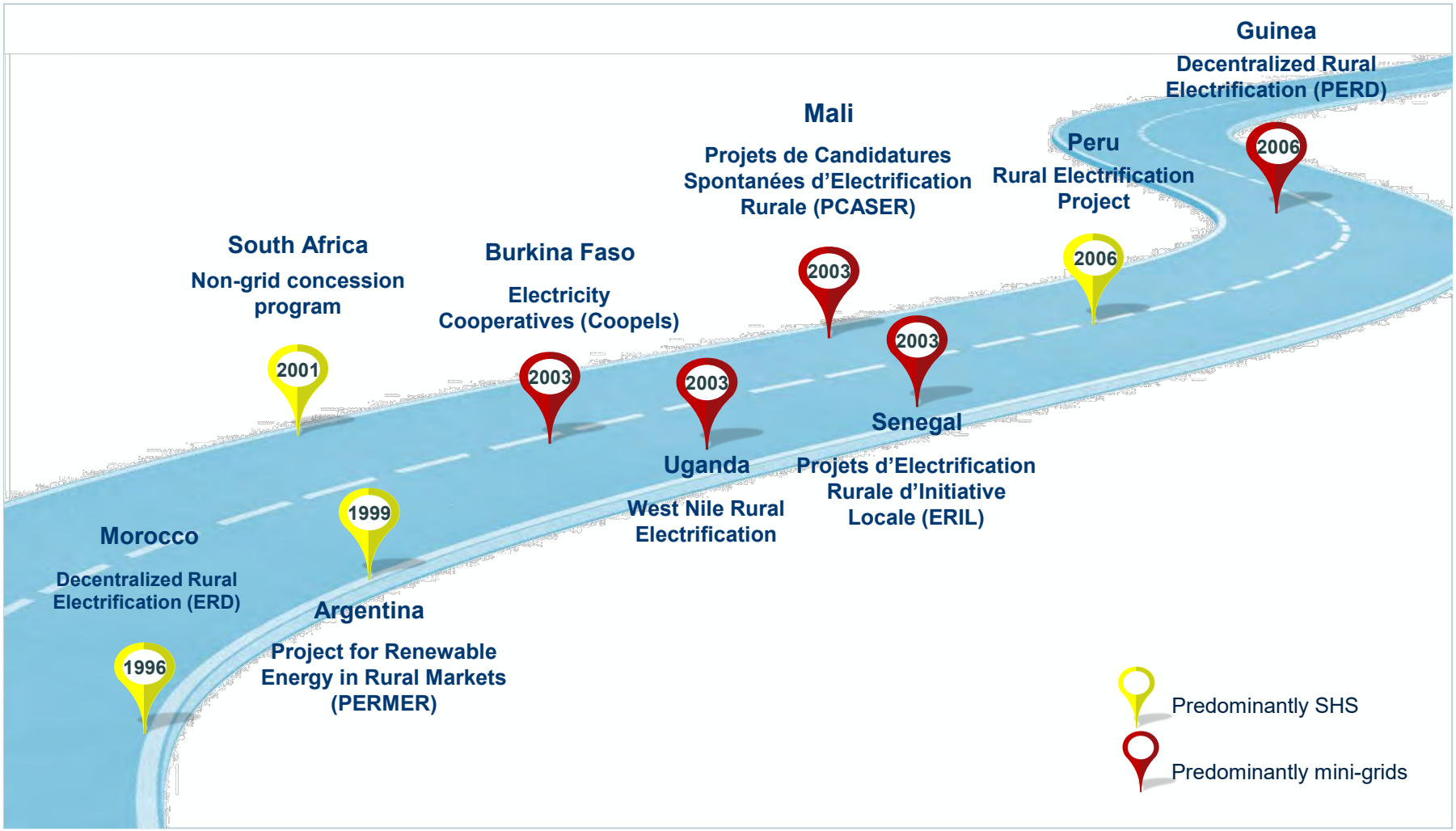
Historically, off-grid PPPs have taken the form of concession models



Lessons are emerging as countries implement programs with varying approaches and outcomes



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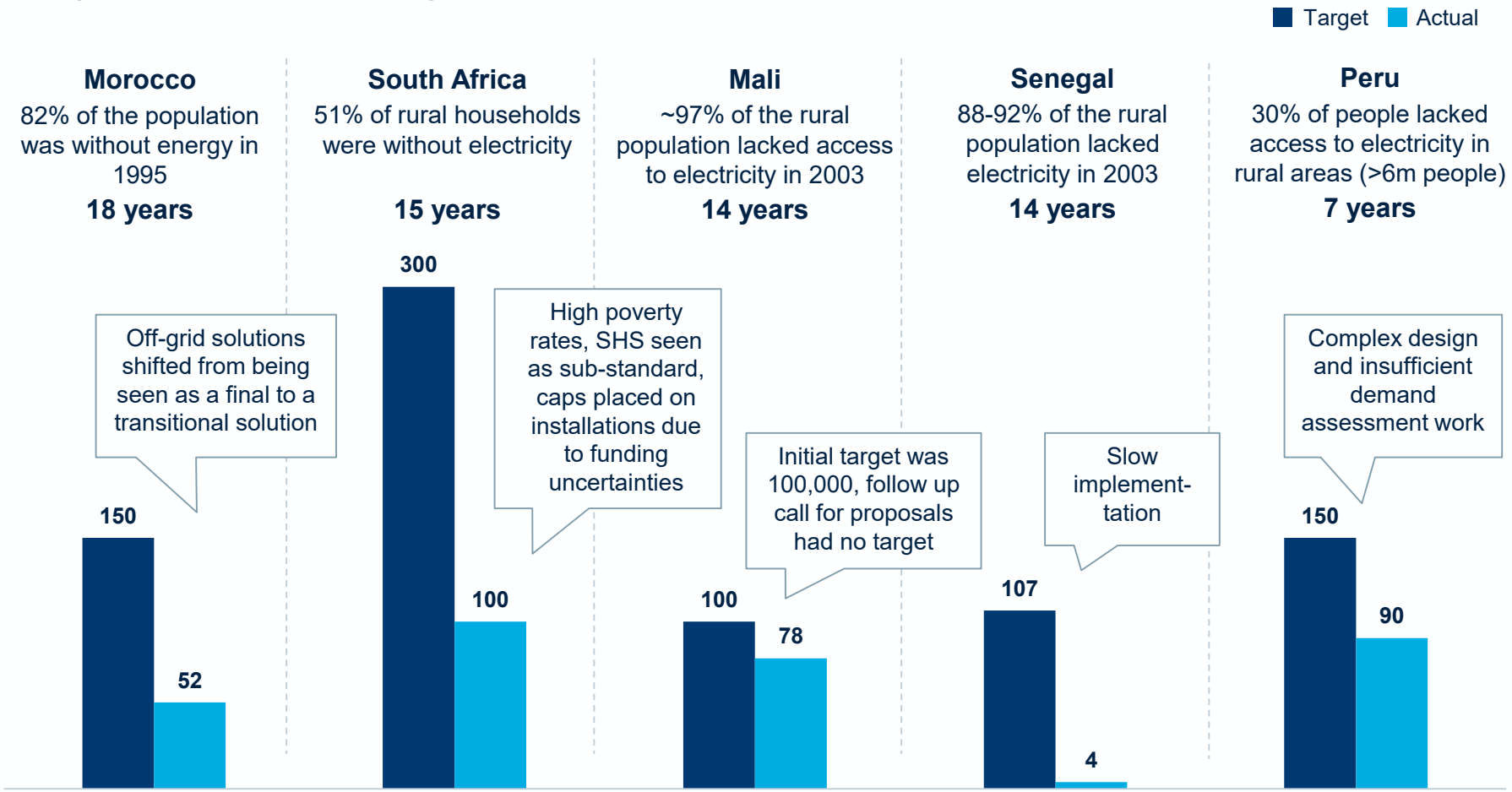
Programs have tended to underperform vs targets but can still provide valuable lessons

Program performance – targeted and installed connections (’000)



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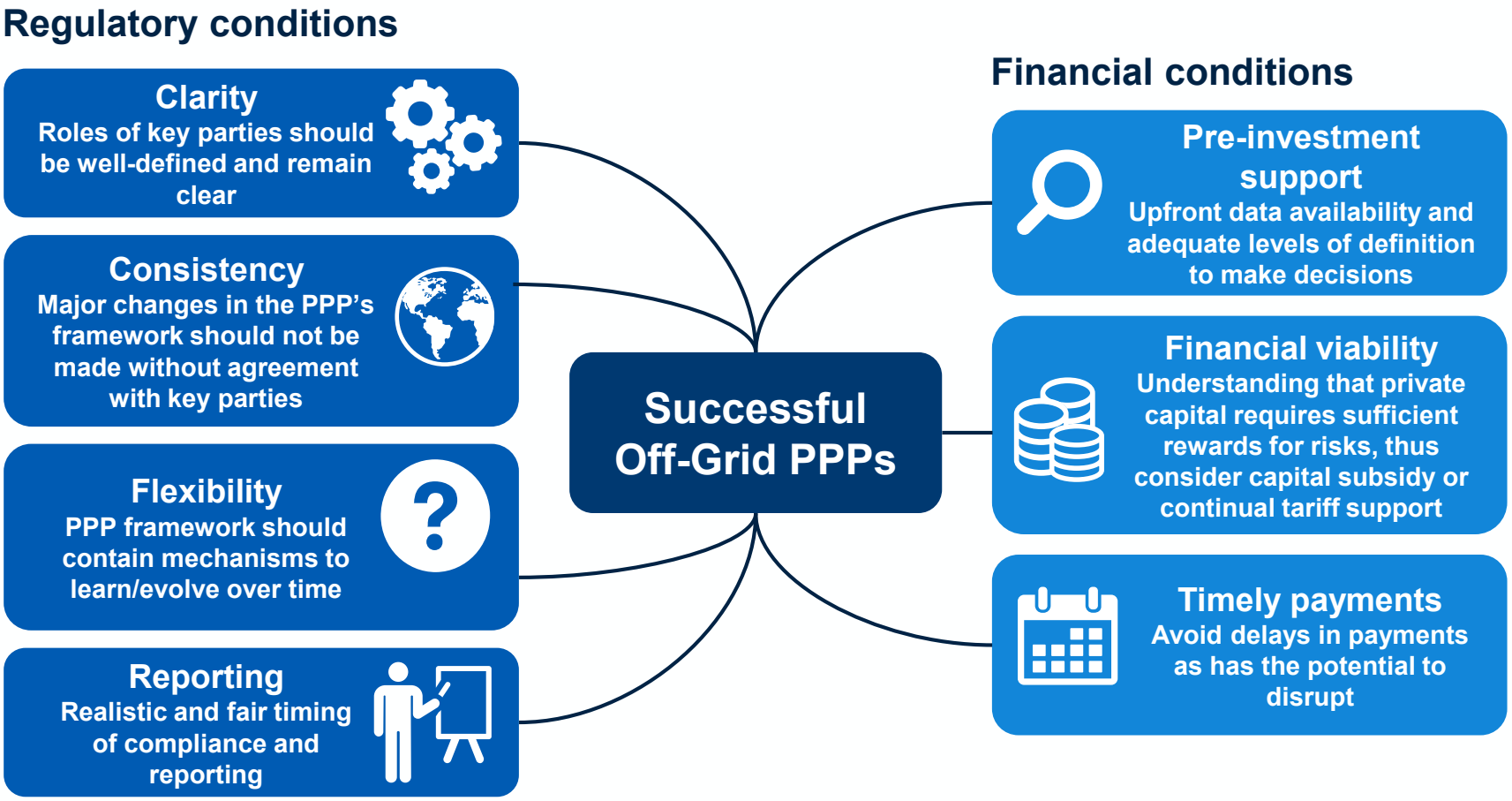
Conditions for successful off-grid PPPs



Source: Hosier, R. et al. 2017. Rural Electrification Concessions in Africa: What Does Experience Tell Us? Washington, DC: World Bank.

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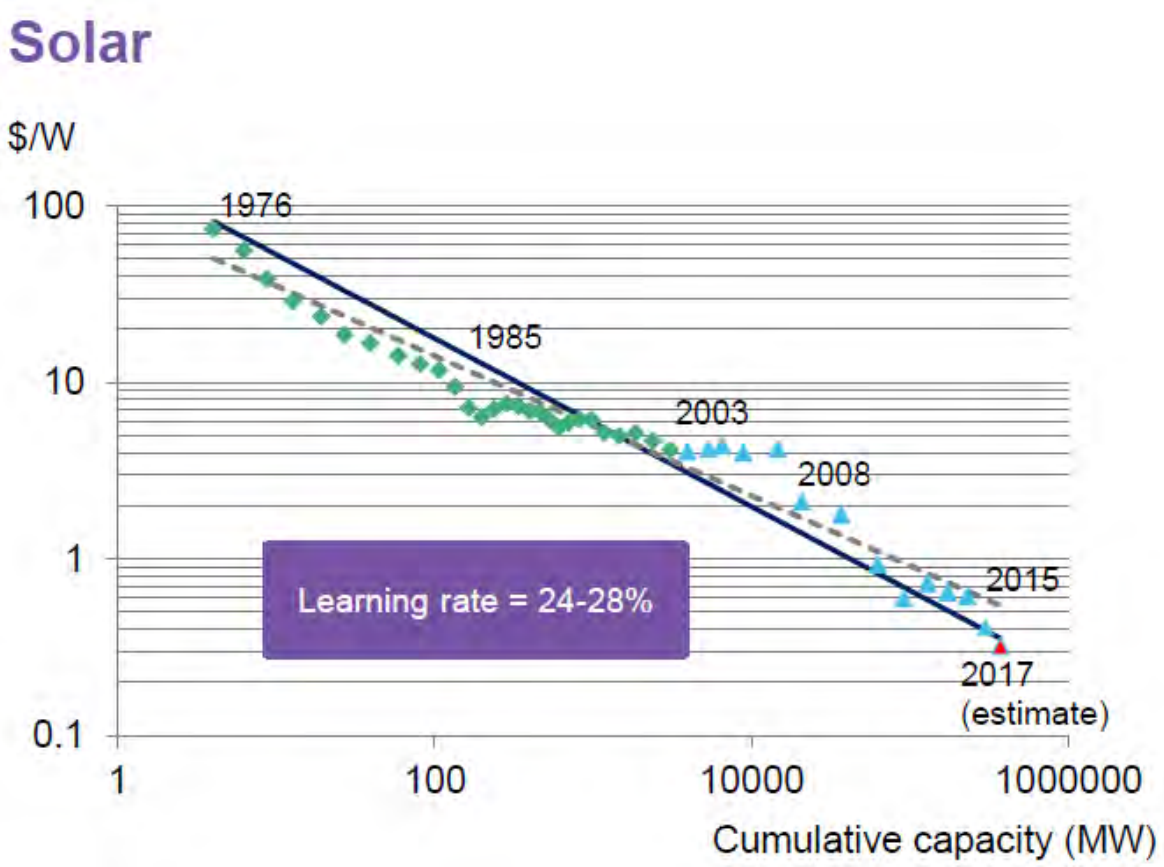
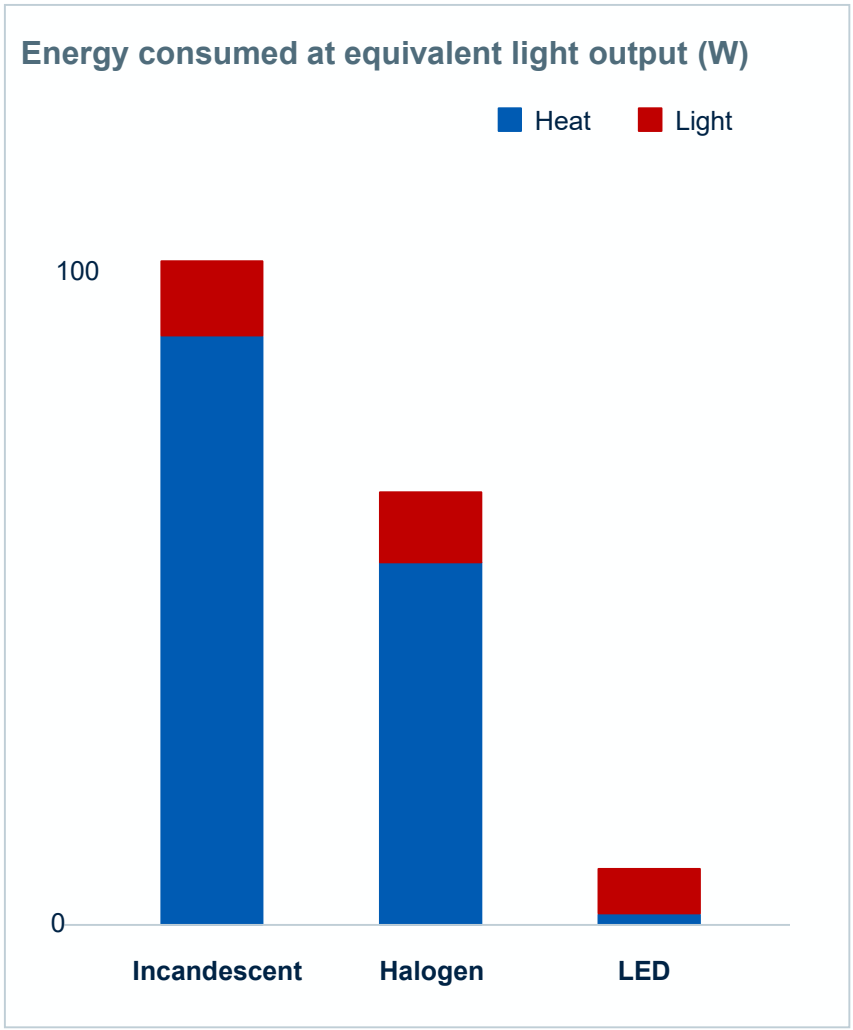
Prices of solar PV energy have dropped dramatically

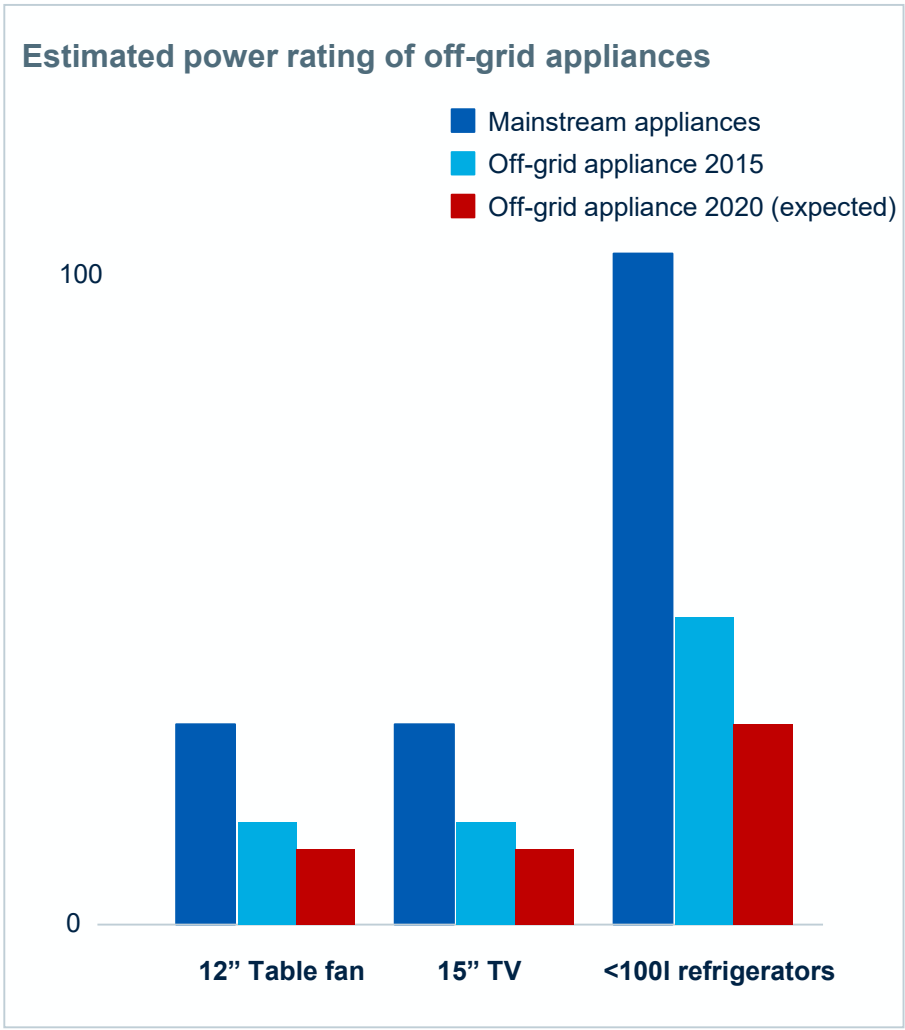


- Declines in costs are making solar PV installations (and hybrids) **more attractive**
- This has been evident in recent solar IPPs, but holds true for off-grid energy projects as well

Source: Bloomberg New Energy Finance

Energy efficiency of appliances has improved significantly

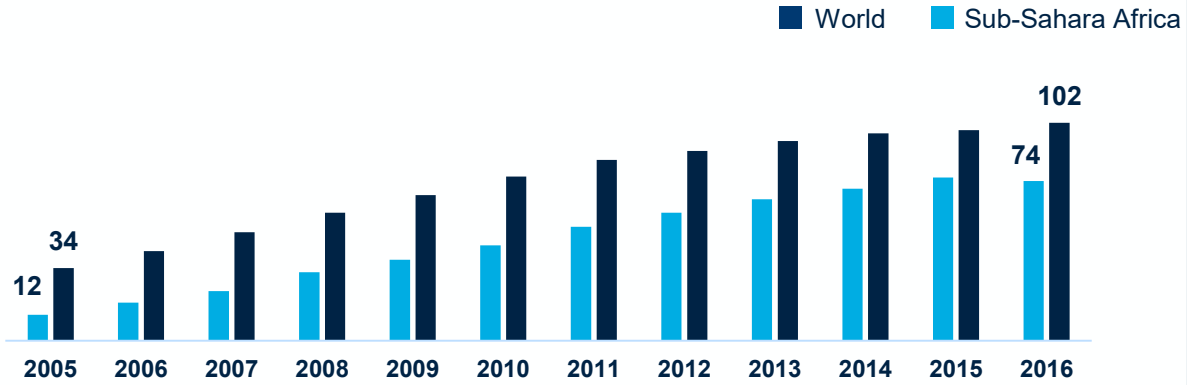




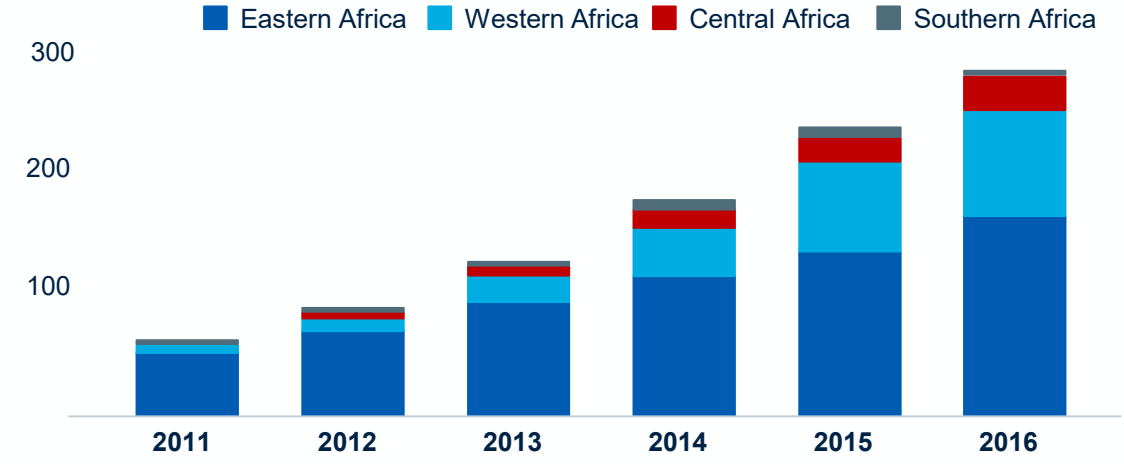
Source: superbrightleds.com; Global LEAP, The State of the Global Off-Grid Appliance Market

Mobile money and smart metering have made business models more attractive

Mobile cellular subscriptions (per 100 people)



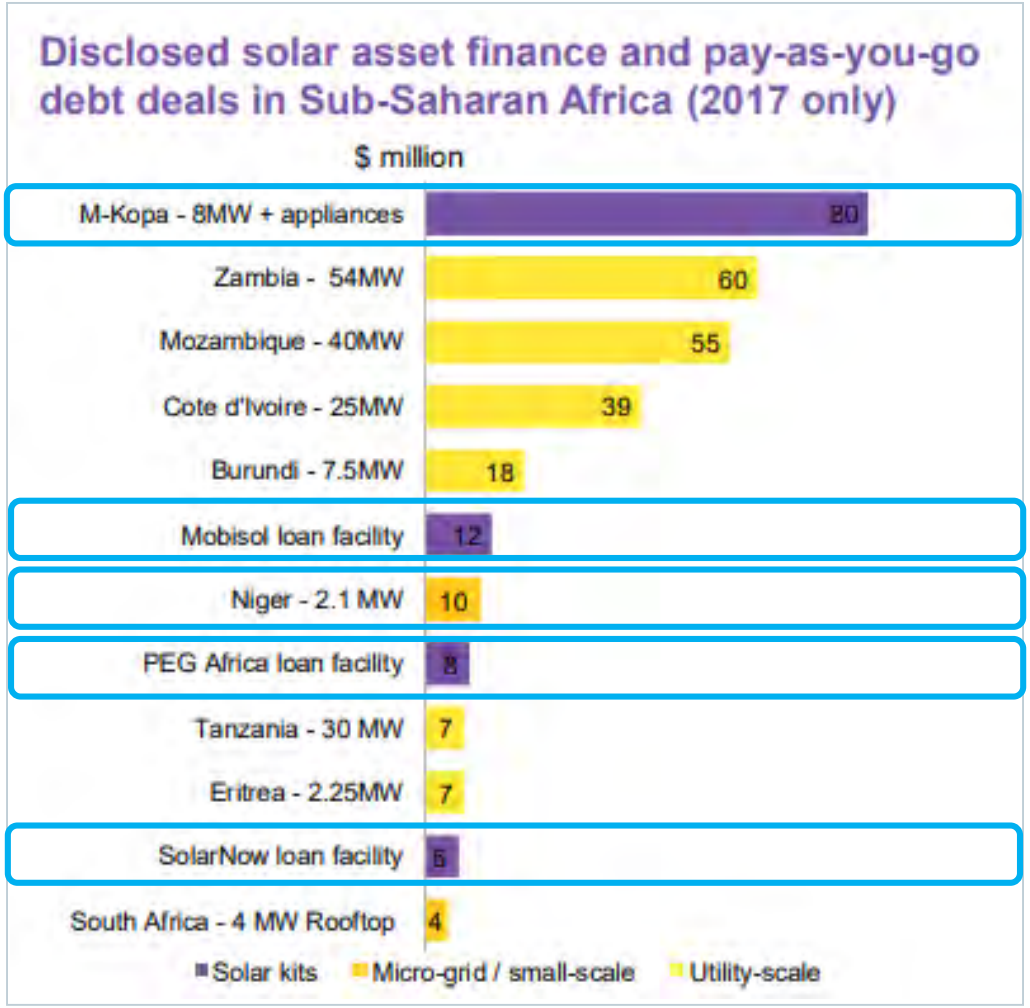
Registered mobile money accounts (million)



- Mobile money accounts mean that **collection costs and risks** can be reduced
- Mobile money accounts enable **access to credit services** and therefore access to higher quality / tier services
- **Other innovations** such as smart meters allow for greater certainty around energy usage and revenue collection and the ability to switch equipment off remotely for non-payment

GSM, 2017, the Mobile Economy

Off-grid deals are increasing and becoming larger



- **Half of the largest solar deals in SSA in 2017 were off grid**
- **Niger solar minigrid deal** ranked 7 out of the 12 SSA largest solar deals with $US10M
- **Additional government backed minigrid tenders to be expected in 2018-2019** including but not limited to Kenya, Sierra Leone, DRC, Zambia, Togo, Benin, Niger, Cote d'Ivoire (TBC).

Source: Bloomberg New Energy Finance, December 2017

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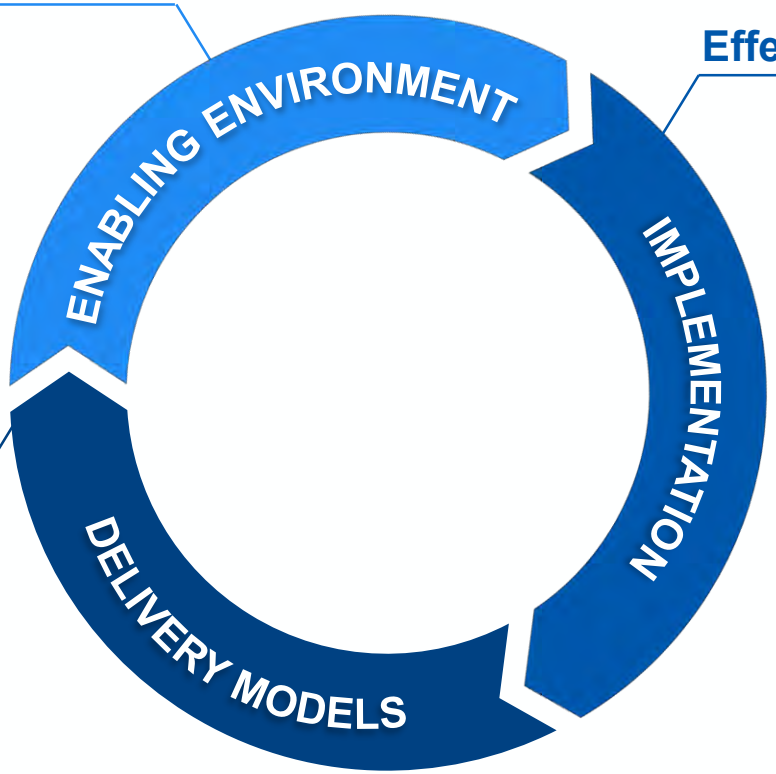
Several lessons drawn from international experience remain applicable

Strong policy commitment & sustainable funding

- Develop a **clear vision** and secure strong, consistent government commitment
- Provide a clear **regulatory framework**
- Involve **local governments & communities** in planning

Delivery models with sufficiently attractive risk-return profiles

- **Reduce risks** where possible by providing certainty through long and clear PPP terms & compensation rules
- Enhance **business models** by allowing economies of scale
- Allocate **sufficient subsidies** based on a strong understanding of cost structures and potential revenues



Effective implementation

- Task a **strong authority** with dedicated capacity (and not subject to political interference) to operationalize the program (ensuring that grid and off-grid planning is integrated)
- Conduct transparent processes that **leverage competition** for price discovery
- Specify clear, up-to-date **technical and quality standards**

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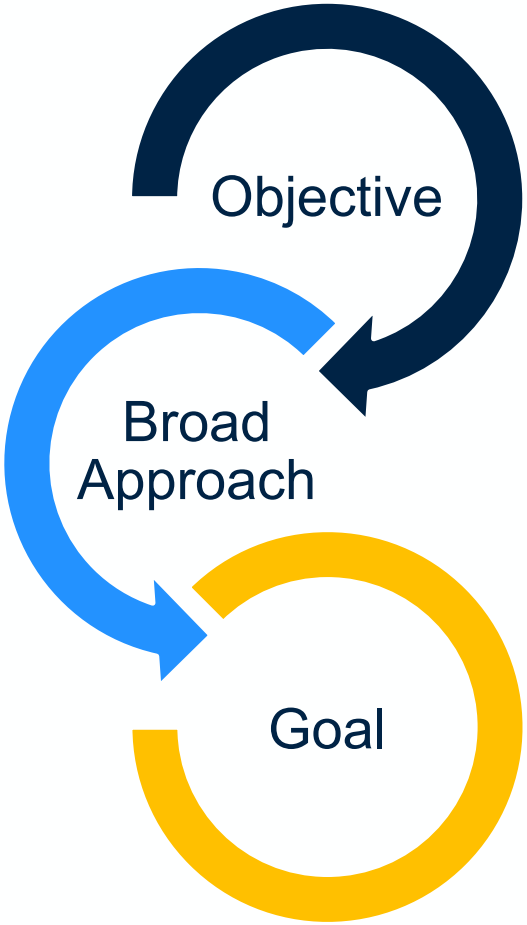
IFC off-grid PPP "DESCO SSA" program overview



To increase access to modern, off-grid energy services in Sub-Saharan Africa through a PPP approach.

Promote DESCO business models based on mini-grid and solar home system technologies that will serve off-grid populations at a significant scale and, provide support to clarify and minimize different obstacles related to site selection, policies, regulations as well as the possibility of leveraging a mix of concessional and commercial capital.

Help expand access to energy through renewable energy technologies that will mitigate climate change by converting consumers using fossil fuel-based lighting and energy sources to modern, clean energy solutions, avoiding emissions of greenhouse gases (GHG).

IFC off-grid PPP "DESCO SSA" program engagements

A. Country-specific mandate

For each market, there would be a separate engagement with a public sector agency that has the remit to expand access to energy through a PPP approach.

B. Technical feasibility studies and due diligence

IFC will commission a study to help the government determine (a) the energy access gap that may be reachable through a DESCO PPP approach; and, (b) where in the country that the approach would make most sense.

C. Licensing and permitting

IFC (i) works with governments to secure all permits that can be obtained prior to tender; and, (ii) draft a clear and simple process for any remaining permits that is overseen by the client or other agency responsible for project implementation, and whose procedures, requirements, and timelines are guaranteed as part of the tender document.

D. Tender design and implementation

Structure the PPP transactions and adjust the standardized documents as necessary to the specific country context.

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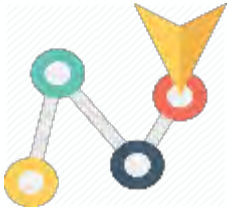
TOGO IFC DESCO program overview

Geospatial Analysis

- Identifying theoretical technological options based on demand across the country
- Developing cost scenarios based on level of service and timeline targeted
- Complement to ‘Rural Electrification Program of Togo’s Localities 2018-2032’ adopted in December 2017 by Government

Business Model Assessment

- Leveraging best practice business models for serving the energy access market
- Defining key success criteria for private sector entry/public-private partnerships
- Understanding successes/challenges and business model “fit” in Togolese market
- Estimating “viability gap” between required RoI and likely end-user contributions
- Mapping public, private and donors’ stakeholders and funding sources



Strategic Roadmap Definition

- Reconciling planning scenarios with private sector models and funding needs
- Outlining key milestones and action plan for the period 2018-2030
- Defining ”what it will take to deliver on the strategy” (immediate operational challenges to address, organizational needs, additional analysis required)

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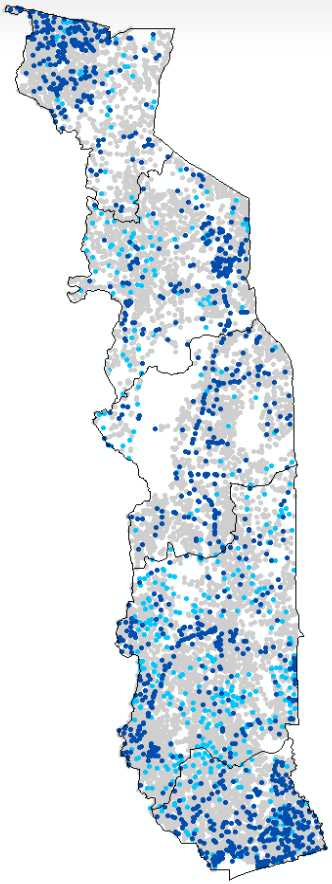
TOGO IFC DESCO program: designing electrification strategies inclusive of off-grid PPPs

Optimal technology per locality (n=3248)



Results (for 100% access in 2030)

		Total
Connexions *% of households to be electrified*	21%	~270k
	31%	~400k[1]
	4%	~55k
	43%	~555k
Localities *% of localities to be electrified*	30%	~965
	0%	N/A
	10%	~315
	61%	~1970
Génération *Additional capacity in MW*	44	
	64	
	9	
	85	

Grid Extension | Grid Densification | Minigrids | SHS

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ZAMBIA IFC DESCO program overview

Objective

The project will **undertake upstream work as an important input to the development and delivery of public-private partnerships (PPPs)** intended to scale-up energy access in Zambia, using off-grid solutions (specifically minigrids and SHS, as appropriate to the location-specific demand).

Approach

Three key workstreams:

(a) **engaging with the Government of Zambia to carve out space for off-grid** solutions in its broader electrification plans, and to define parts of the country in which private firms would be invited to develop off-grid systems

(b) **generating critical market data that private developers require**, including demand for energy services, consideration of the affordability of such solutions for the end-users, and how the viability gap can be covered

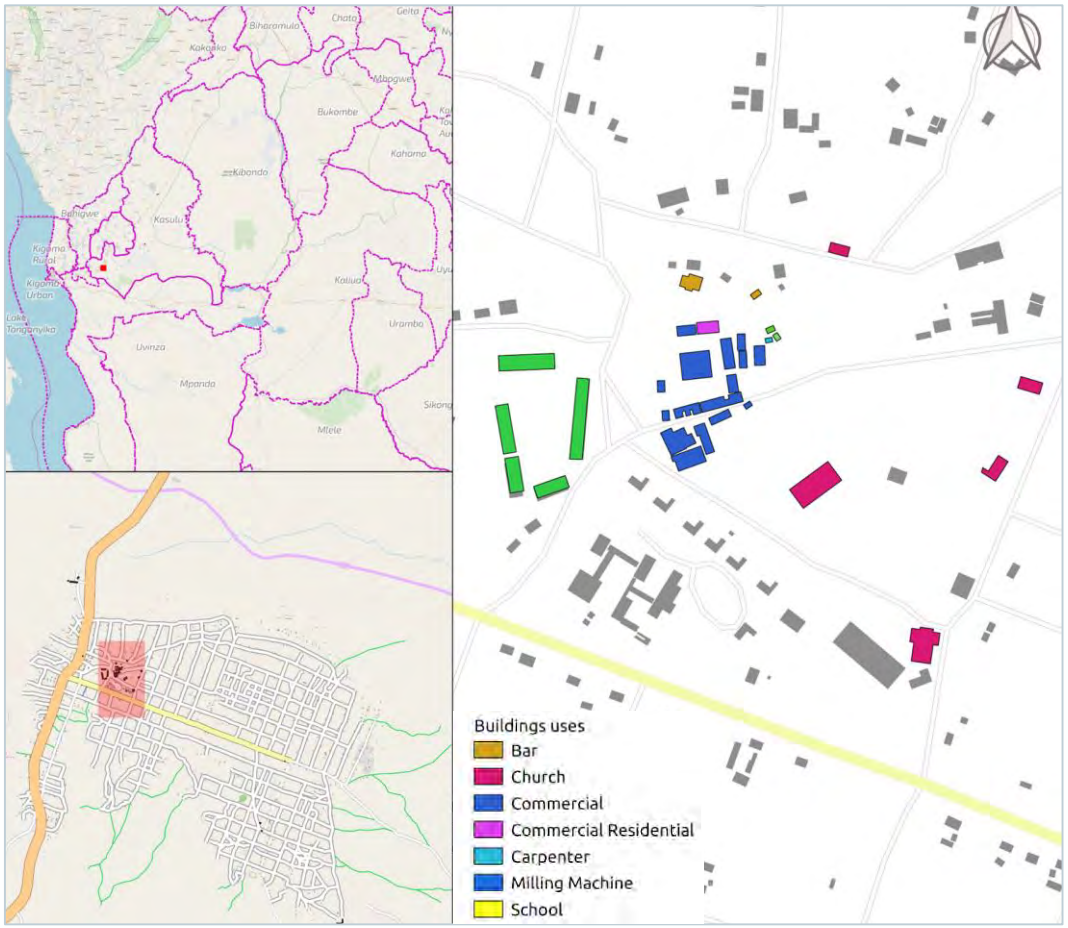
(c) **addressing uncertainty in the legal and regulatory framework** to attract high-performing international and domestic firms to serve the off-grid market.

Key counterpart

Rural Electrification Authority (REA)

- Day-to-day engagement through Project Implementation Unit (PIU)

TANZANIA IFC DESCO program: data provision towards reducing private sector risk



- **IFC works with private and public off-grid stakeholders in Tanzania** towards market scale-up
- One key area of support has been on the provision of **detailed demand data to reduce private sector risks**
- Allows **private companies to target markets more effectively and reduce investment risks**
- Allows **governments to assess business models and viability gaps** with more precision

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Yann TANVEZ
Energy Specialist, Infrastructure Department
Sub-Saharan Africa, IFC
ytanvez@ifc.org

Daniel SHEPHERD
Regional Lead, Energy & Water Advisory
Sub-Saharan Africa, IFC
dshepherd@ifc.org