Delivery Models for Decentralized Renewable Energy for Rural Health Centers

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November 2, 2018

Photo Credit: Innovation Africa

About UN Foundation

- Started by Ted Turner in 1998 with $1 billion grant
- Supports the United Nations as a platform for effective global problem solving
- Thematic priorities: Energy and Climate, Global Health, Girls and Women and Data

About Powering Health Care

Our goal is to improve access to quality health care services by promoting universal electrification of health facilities by 2030

1 MAKE THE CASE

We ensure access to adequate and reliable power in health facilities is recognized as a key determinant of health outcomes and necessary to achieving universal health coverage.

2 ENABLE SYSTEMIC CHANGE

We address key structural and market barriers limiting the provision of modern energy solutions for health facilities in low-resource settings.

A variety of decentralized renewable energy solutions exist

$/Wp*

* Costs are estimates and only include capital and their design and installation

20
16
12
8
4
0

Portable solutions (suitcase/pico-solar)

- <200 Wp
- Solar + battery
- Deployed in 30+ countries, at primary health care facilities and in emergency settings
- Focused on mobile lighting or MCH services, some medical appliances included
- Easily deployable
- DC-based

Solar vaccine refrigerator

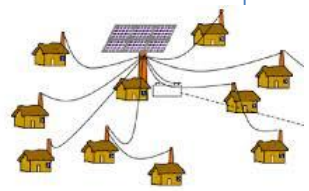
- 200-300 Wp
- Solar + battery (when not direct drive)
- Deployed globally
- Isolated to cold chain
- Often DC-based
- Direct-drive (optional)

Stand-alone Solutions

- 250 Wp - 1 kWp
- Solar + battery
- SSA + South Asia
- Typically powers limited ambient lighting, phone charging, ICT, cold chain
- Deployed either as SHS or containerized solutions
- DC and AC

Facility-wide ‘micro-grids’

- 1-10 kWp
- Solar + battery
- In select countries throughout SSA and South Asia
- Covers most health services
- AC
- Grid-ready (and alternative sources)

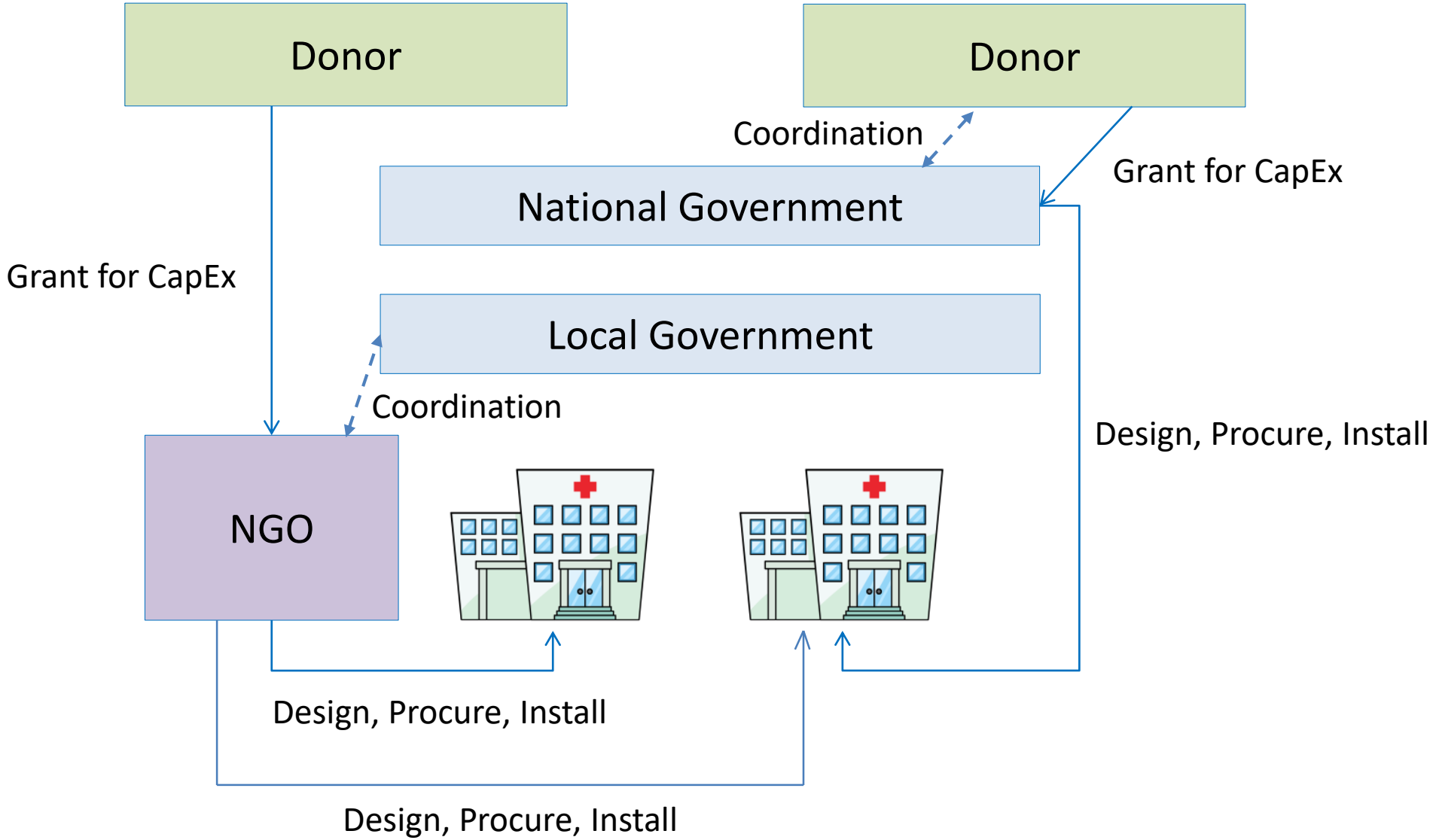


Mini-grids

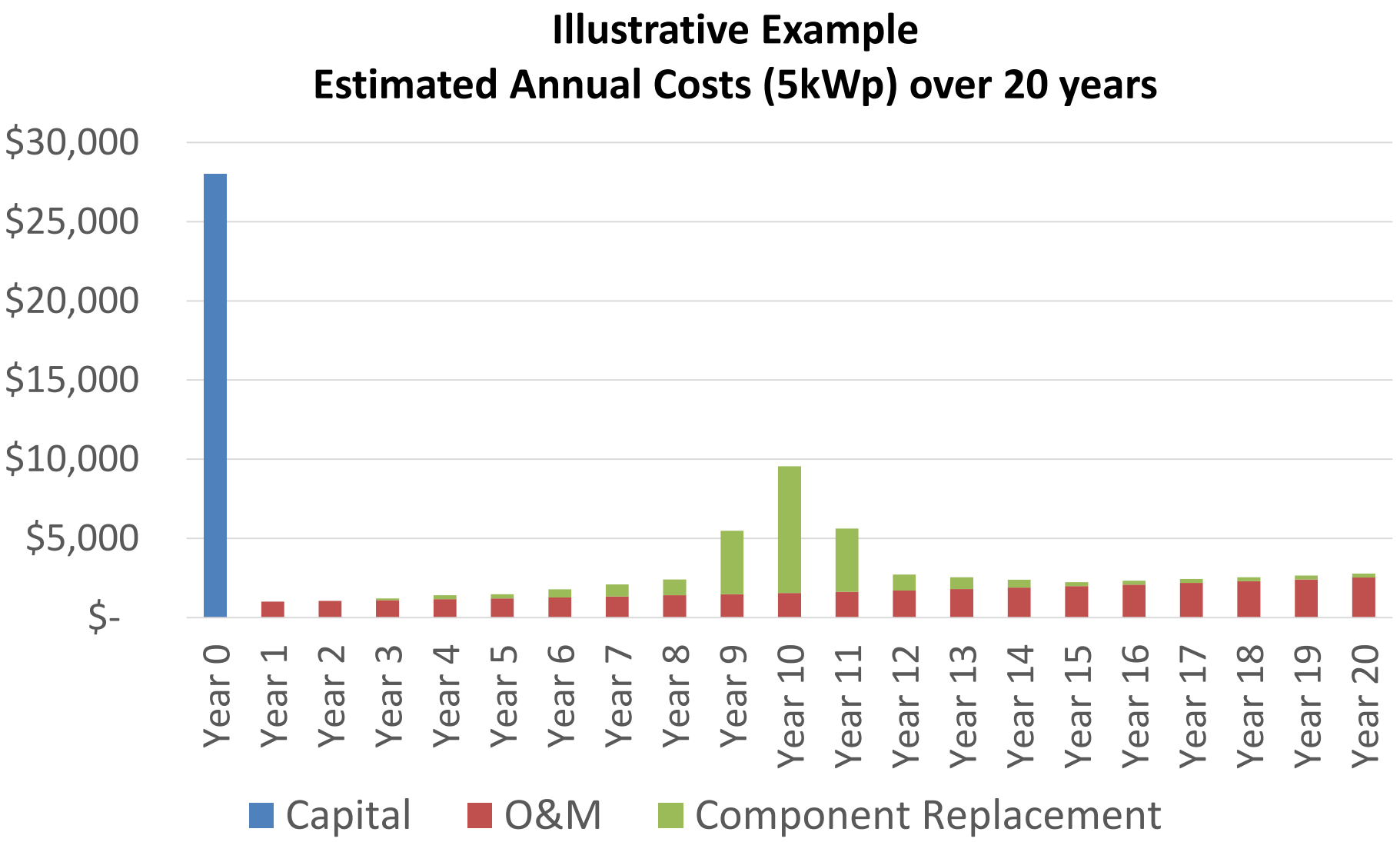
- Solar + battery (+ genset/hybrid)
- In select countries; primarily hospitals
- Covering all health facility energy needs
- Grid-tied, hybrid, or grid-ready

Tier 0 Tier 1 Tier 2 Tier 3 Tier 4 Tier 5

The conventional way of delivering stand-alone solutions



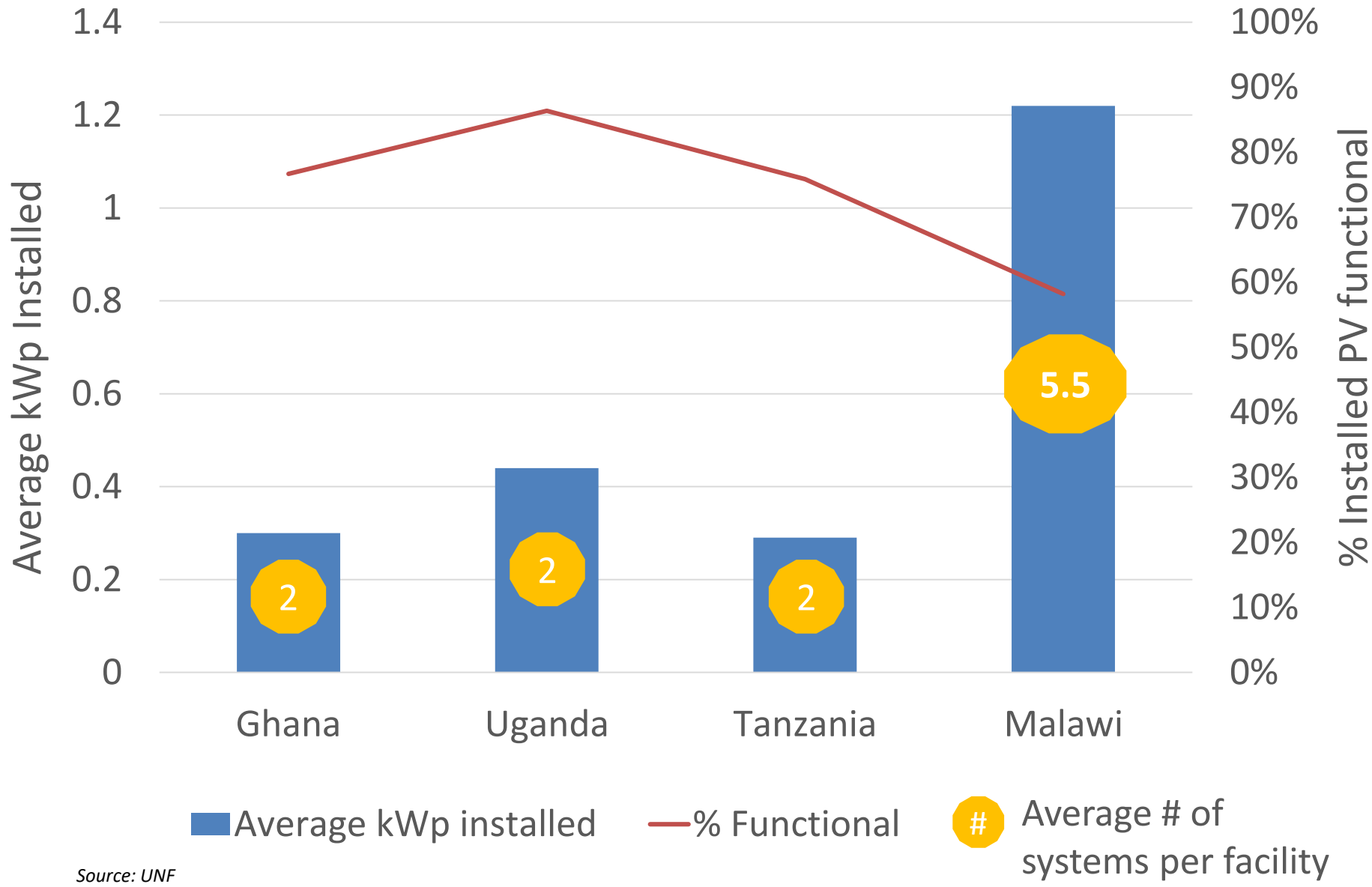
Don’t forget about O&M costs



Assumptions:

- CapEx excludes soft costs (design, logistics, installation, training, community mobilization)
- O&M estimated based on economies of scale across multiple installations; assumes inflation
- Component replacement costs are conservative as they don’t factor in declining battery costs

Track record of solar PV in health facilities is mixed

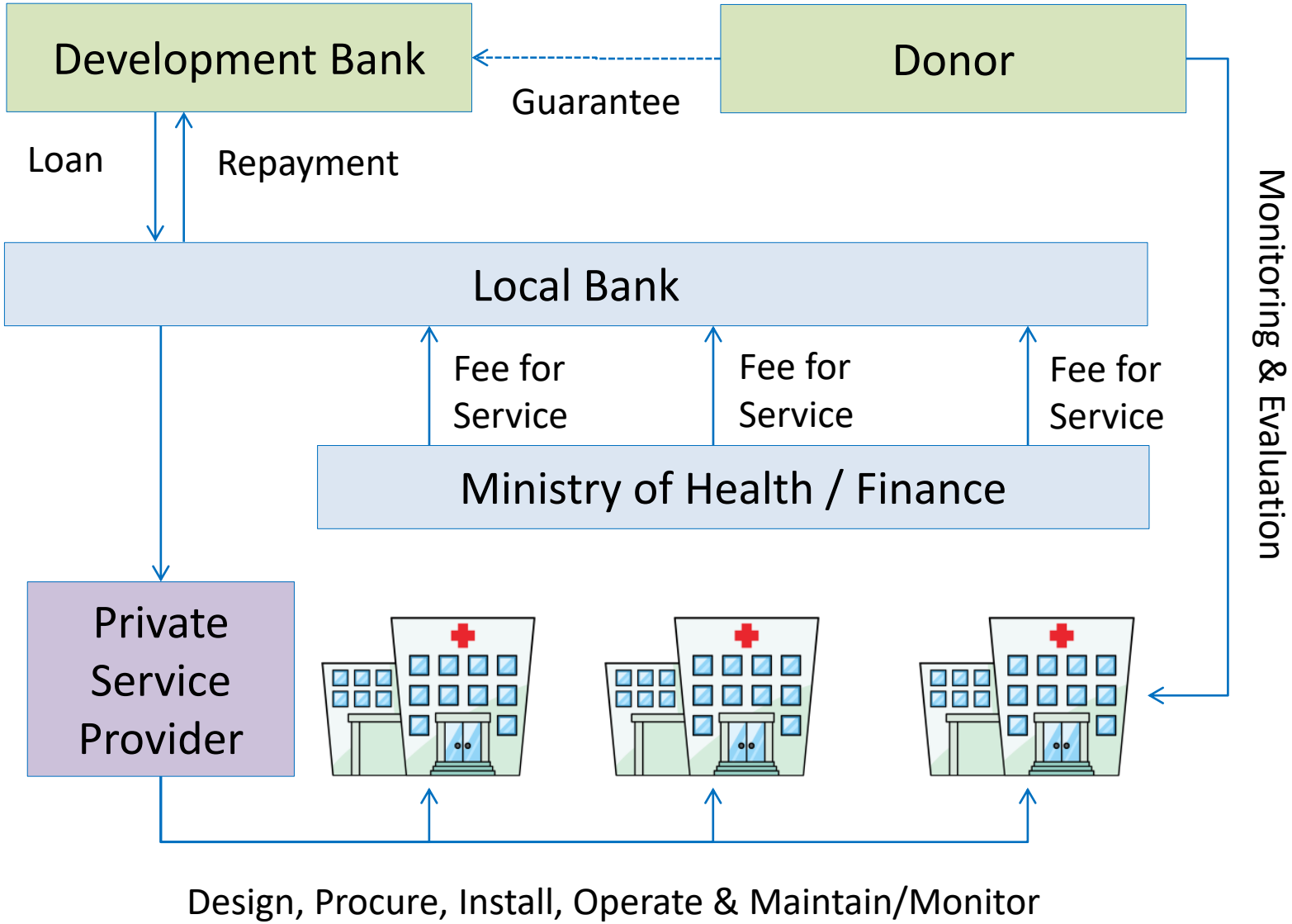


Source: UNF

Options for financing O&M (under the conventional procurement model)

Options	Pros/Cons
Public Funding (govt./donor) **Maintenance fund**	**Pros:** Keeping energy solutions operational is in the public interest, as it contributes to the delivery of quality health services (a public good). Creates accountability with those providing health services. **Cons:** Many governments are resource-constrained (in both financial and capacity terms). Donors have a strong bias towards funding capex vs opex.
User Fees	**Pros:** Aligns incentives as better quality health services (as enabled by improved access to power) should create value for users. **Cons**: Most rural medical clinics struggle to secure sufficient operating funds due to the inability to pass along true costs of medical service to users who lack the resources to pay actual costs. The inability of patients to pay, coupled with the challenge of managing the collection and disbursement of funds, makes this approach difficult to implement.
Sale of Excess Electricity	**Pros:** Generating income at the source, and providing a level of accountability closer to where the system is being used helps ensure that the systems are being kept operational. **Cons:** Potential customer base is often far from the facility. Revenues may be insufficient to cover full O&M costs. Complexities around set-up (tariffs, ownership, etc).

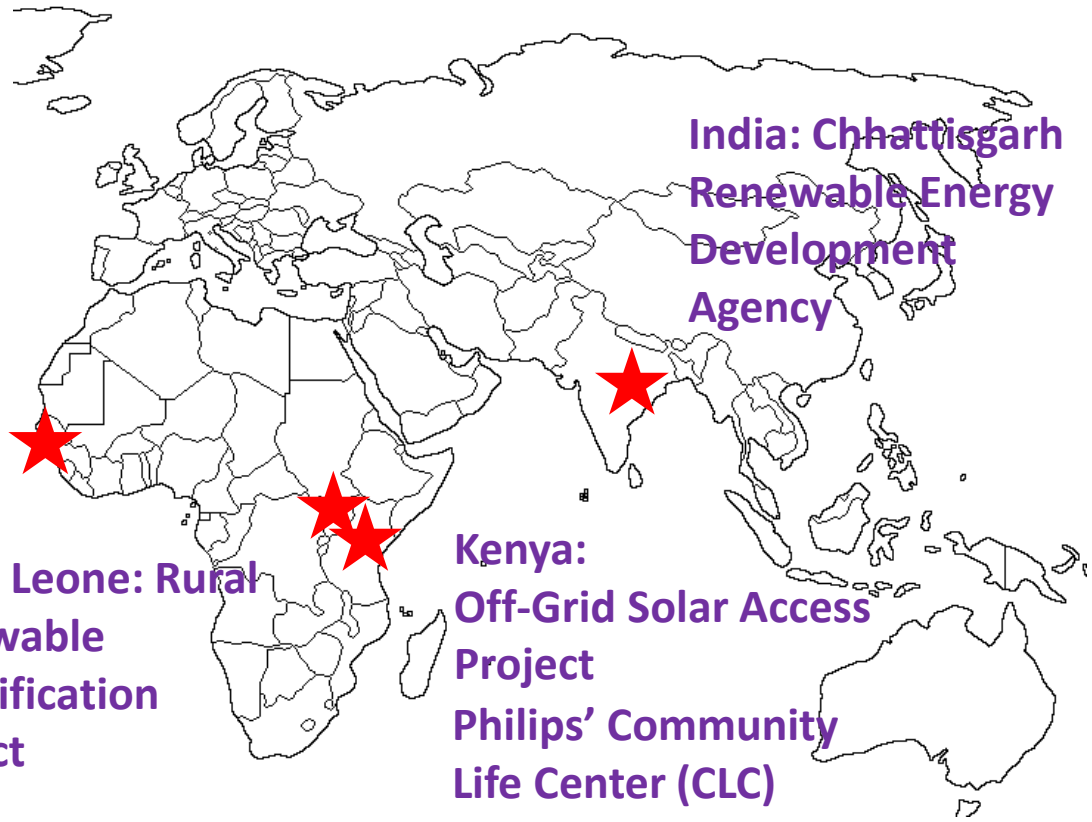
Can/should we shift to a service-based model?



A new UN Foundation study…

Off-Grid Solar PV Systems for Public Institutions: Delivery Models for Scale and Sustainability

- Being commissioned Nov. 2018; to be launched in the Spring 2019 at the UN Foundation's next *Powering Health Care* Forum in Africa.
- Will compare and evaluate delivery models in terms of their scalability and sustainability, particularly their ability to support the long-term O&M of off-grid solar PV systems in public institutions.
- Intended to help government planners and their development partners design sound off-grid electrification projects for rural schools and health clinics by helping them evaluate the most effective and appropriate delivery model and financing mechanism for their specific country context.

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