



Uganda Off-Grid Energy Market Accelerator

# Off-grid energy in Uganda

Market Map

2022 edition

# Market Map 2022: Foreword by the Ministry of Energy and Mineral Development

As Uganda, the region, and indeed the world at large, reels from the triple threat of conflict, climate change, and COVID-19, there is a critical window of opportunity to accelerate off-grid energy to spur recovery at both household and business level through increasing productivity.

The Government of Uganda remains strong in its commitment to increase access to energy towards Universal Access by 2030. Indeed, in the past year, we piloted a tariff of US 5 cents per kWh for industrial parks significantly less than the 12 cents per kWh charged for commercial & industrial customers. We also introduced a declining block tariff for domestic consumers to provide customers with access to clean energy for cooking. In addition, the government launched a last-mile strategy targeting achieving 60% access to grid by 2030. Underpinning the last-mile strategy, the government has secured a funding facility of USD 638M to support both on-grid and off-grid energy solutions under the Energy Access Scale-up Project (EASP). The government also launched a Sustainable Energy Response Plan (SERP) to support refugee and host communities attain universal access to affordable, reliable, and clean energy for socio-economic transformation in an environmentally sustainable manner.

In addition to the programs and initiatives implemented over the last year, the government has also worked to strengthen the enabling and regulatory environment to increase investment in the energy sector in Uganda. An amendment to the Electricity Act intended to remove inconsistencies in the law by introducing flexibility in its implementation and to streamline operations of the electricity sector was passed by parliament. A net-metering code to facilitate the bilateral sale of electricity between off-grid and on-grid operators is also being drafted and a pilot being conducted by the Ministry of Energy and Mineral Development.

The government recognizes that a collaborative and coordinated effort among the government, development partners and private sector players is key to achieving continued pronounced progress towards universal access. Although under-represented in investment, local companies are especially recognized in their ability to leverage local contextual knowledge in designing, distributing and marketing products and services.

The work by industry stakeholders such as the Uganda Off-Grid Energy Market Accelerator

(UOMA) is vital to ensure that the sector can keep up its momentum. UOMA's annual Market Map publication provides an in-depth perspective on the current state of the off-grid energy sector in Uganda and illuminates the work being done by the various actors.

Sincerely,



A handwritten signature in black ink, appearing to read 'Irene Batebe'.

**Eng. Irene Pauline Batebe**

Permanent Secretary

Ministry of Energy and Mineral  
Development

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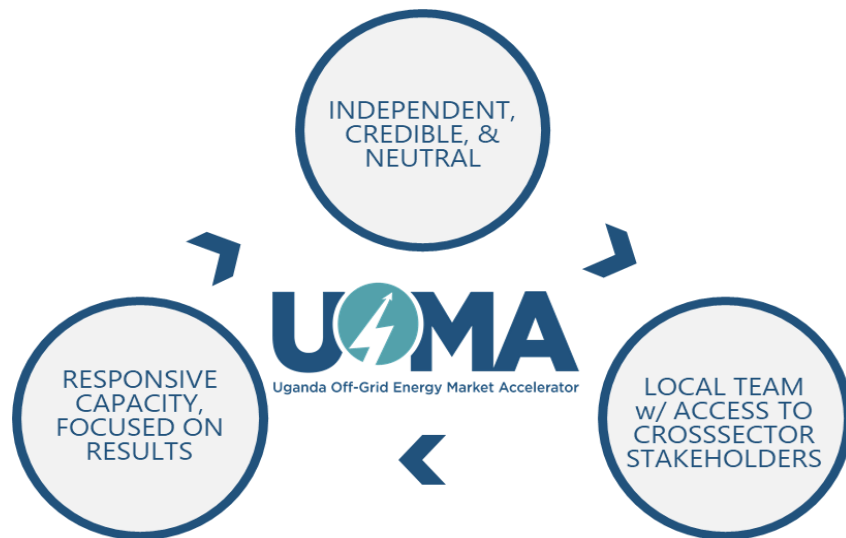
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# The Uganda Off-Grid Energy Market Accelerator (UOMA) is a dedicated and neutral intermediary, focused on scaling off-grid energy access through 5 core initiatives

**UOMA started in 2017 and is focused on supporting sustainable & universal access of affordable clean energy for Ugandans**


The Uganda Off-Grid Energy Market Accelerator (UOMA), implemented by Open Capital in partnership with the **Shell Foundation, FCDO, USAID, and Power Africa**, completed a 6<sup>th</sup> successful year, growing from an early catalyst for innovation to being a trusted partner and central advisor for off-grid energy access in Uganda.


Through this pioneering concept, we are coordinating industry actors, providing technical input, expertise and substantial support for private and public sector strategies to drive towards SDG 7 and universal access of affordable and clean energy for Ugandans.





UOMA serves a distinct function by 1) being independent & neutral, 2) having a local team with responsive capacity focused on results, and 3) providing access to cross-sector stakeholders. This ensures that UOMA complements and accelerates other Ugandan off-grid energy initiatives.


## Since 2017, our activities have been focused on 5 core initiatives

 **Expanding access to finance** for solar operators through increasing local currency debt and bridging a critical working capital shortfall and currency mismatch, enabling operators increase affordability of units

 **Reaching unserved populations** by reducing barriers to better target low income households in Uganda, improving access for some of the hardest to reach communities

 **Expanding productive use technology** through supporting the industry to test and validate technologies that can achieve economic benefits for off-grid Ugandans while growing energy demand

 **Strengthening the enabling environment** by supporting the public sector to create effective policies and a conducive environment to increase off-grid energy uptake in Uganda

 **Facilitating communication & coordination** in the off-grid energy sector in Uganda, resulting in better resource allocation and accelerated progress in achieving universal access

# UOMA is run by a technical team supported by a cross cutting senior advisory board representing government, private sector, and development partners

## Core Technical Team

The technical team is composed of a variety of professionals with regional and national experience including off-grid energy finance, distribution, business models, bank finance, economics, public relations, marketing and others. The team has experience working with regional consulting firms, statutory bodies in Uganda and government agencies. This provides a wide range of skills that can be relied on to effectively implement UOMA's initiatives.














Locally implemented by Open Capital Advisors (OCA), who bring deep sector expertise and local Ugandan execution capability

## Advisory Board

Through our comprehensive industry insights, our local team based in Kampala, and the Advisory Board, which comprises of senior sector stakeholders, we have quickly built relationships and achieved close working relationships with government, private sector and development partners, enabling us to connect stakeholders and present a diversity of perspectives. Senior representatives from key cross-sector stakeholders make up the Advisory Board, across government, development partners, and the private sector:



# Over the last 5 years, UOMA has published more than 15 research pieces, supported capital raises of more than USD 30 M, and facilitated over 125K new connections

Direct interventions	Research & insights	Independent coordination
 <b>15+</b> Innovative pilots enabled to reach unserved areas and scale prod. use tech	 <b>15+</b> New, influential research pieces & insights	 <b>5</b> Annual versions of market map, now an industry-standard, landmark “go-to” document relied upon by sector
 <b>125,000+</b> New connections from pilots for UG’s hardest to reach	 <b>10,000+</b> Downloads of market map across Uganda and globally	 <b>400+</b> Annual individual interactions - with investors, development partners, several others - outside of core activities
 <b>5+</b> New key gov’t papers informed and influenced	 <b>87%</b> Feel UOMA helps to improve market transparency	 <b>Local expert team works closely with sector actors to collaborate on and facilitate several targeted workshops and matchmakings</b>
 <b>30M+</b> Capital deployed following deal-focused TA to local financiers and operators	 <b>60%</b> Believe UOMA positively facilitates sector deals	

More of UOMA’s research can be found here: [uoma.ug](http://uoma.ug)

# This Market Map, comprised of 3 sections, seeks to provide a holistic and objective description of the off-grid energy industry in Uganda

## Objective of the Market Map

As part of our goal to promote more cohesion and coordination in the market, UOMA releases a Market Map annually to provide a holistic & objective description of the off-grid industry in Uganda to better inform innovation, interventions, and resource allocation.

This edition highlights trends within the sector, details the impact of sector interventions, and recommends opportunities for further support to the market, focusing on 3 key segments: Solar Home Systems (SHS), Mini-grids (MG), and Productive Use (PUE).

## Methodology

**Data collection & analysis:** This report is a culmination of data obtained from dozens of consultations with key private & public sector stakeholders and data obtained from pilots & research with operators, gov't & financiers

**Validation & publication:** Prior to publication, this report was also peer reviewed by >20 stakeholders to validate findings and verify data presented

The Market Map provides a comprehensive overview of the off-grid market in Uganda with 3 sections:



Gives an overview on the key trends in the off-grid landscape for each segment and highlights primary barriers to scale. It also provides an update on key changes within the enabling environment and the funding landscape.



Presents data-driven analysis to provide context & trends of off-grid development; outlines key barriers to growth, opportunities for innovation & stakeholder support



Presents information detailing stakeholders & activities currently active across in the Ugandan market, covering the private sector players, NGOs, financial institutions, government and development partners

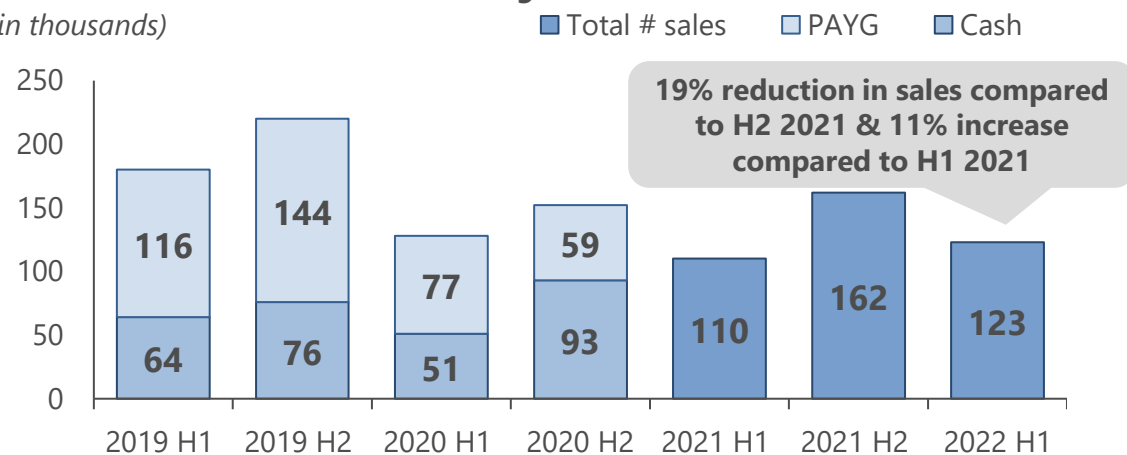
# Industry update



# Solar Home Systems: Sales show a recovery from the impact of Covid-19 and while PAYGO SHS is poised to grow, it faces limited access to finance & mgmt. capacity

SHS unit sales of GOGLA affiliates in Uganda 2018-2022<sup>1</sup>

(in thousands)



## Although sales of SHS have dropped in H1 2022, year-on-year growth shows a positive trajectory

- Sales dropped by 19% in H1 2022 compared to H2 2021 but increased 35% compared to H1 2022
- The year-on-year increase in sales is a positive signal that the sector is back on a growth track after the impact of Covid-19

## Technical assistance providers are offering subsidized services to business to support recovery

- GET.Invest provided finance readiness TA to local OGS companies<sup>2</sup>
- Energy Access Efficiency provided strategy support<sup>3</sup>
- Finding XY is offering investment readiness to OGS SMEs<sup>3</sup>

## Uganda is poised to remain one of the largest PAYGO markets but concerns of exploitation by providers have surfaced

- Uganda remains one of the largest SHS PAYGO markets in the world<sup>1</sup>
- The country is ranked 5<sup>th</sup> on Lighting Global’s PAYGO Market Attractiveness Index (MAI) among 24 countries assessed in sub-Saharan Africa and Asia showing relatively strong underlying market conditions for growth<sup>4</sup>
  - Uganda scores high on market size and willingness to pay, which offsets a slightly weaker score in the ability to pay indicator
- PAYGO SHS continue to stimulate economic development, but risks of exploitation have emerged<sup>5,6</sup>
  - Solar is now the cheapest form of new energy and can deliver an economic impact to the poor, but the costs of purchase and maintenance remain prohibitive for those who need it most, leading to exploitation through debt burden

## Limited access to finance and limited capacity still restrict market growth

- Investors are inclined to support large operators with proven business models and traction, reducing the pool of companies that can receive funding<sup>3</sup>
- Local businesses often lack management experience to scale<sup>7</sup>

Sources: 1. GOGLA, Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data H2 2021 [Link] 2 GET.Invest website [Link] 3 UOMA consultations 4 Lighting Global, PAYGO MAI Index, 2020 [Link] 5 Bloomberg, Tesla-Backed Startup Made Cheap Power a Debt Burden for the World’s Poorest, 2022 [Link] 6 Sun Connect, Expanded Access to Solar Power can Stimulate Economic Development, 2022 [Link] 7 UNEP-DTU, Unlocking Support for Local Clean Energy Companies, 2022 [Link]

## Mini-grids: 33 mini-grids have been commissioned and the pipeline of projects looks promising, but challenges continue to hinder sector growth

Type of mini-grid	Known number of mini-grids in Uganda <sup>1,2</sup>	
	Existing*	Upcoming
Bio-gas	3	0
Hydro-power	2	8
Solar powered	42	19
Solar-diesel	1	0
<b>Total</b>	<b>48</b>	<b>27</b>

### 32 mini-grids have been commissioned in the past year

- WWF constructed 6 mini-grids in Western Uganda with a total capacity of 170 kW to power 900 households and 205 businesses. The mini-grid was handed to MEMD and is being operated by a contractor – Sagewood Limited<sup>2</sup>
- Engie Equatorial commissioned a 600 kWp solar hybrid mini-grid on Lolwe Island with an integrated production hub<sup>3</sup>
- Winch commissioned 25 mini-grid sites in Lamwo, Northern Uganda of capacity 30-80 kW per site<sup>2,4</sup>
- SustainSolar commissioned a 60kWp solar PV mini-grid in Kayunga district serving 174 households, local businesses and a school<sup>5</sup>

### Development partners are supporting mini-grid development through subsidy and grant funding

- Winch Energy is constructing 14 mini-grid sites in South-Western Uganda as part of GIZ's USD 28.5 M mini-grid development subsidy under the Pro Mini-grids program<sup>2</sup>
- Winch Energy in partnership with Mobile Power are developing a 120 kWp mini-grid in Rwamwanja settlement with funding support of USD 840K from USAID Power Africa & SCC<sup>6</sup>

### Medium-long-term pipeline of projects is promising<sup>2</sup>

- Equatorial Power has secured construction permits for 15 mini-grid sites in Central and Eastern Uganda for a combined capacity of 1.56 MW<sup>7</sup>
- 110+ mini-grids are expected to be tendered by KfW in 2022<sup>2</sup>
- GEAPP is expected to support the development of several mini-grid sites identified in the draft National Electrification Strategy<sup>2</sup>

### Limited access to capital, an uncertain regulatory environment, and the poor mini-grid economics hinder sector growth

- Inadequate access to capital, especially debt, as financiers are skeptical about the financial viability of mini-grids<sup>2</sup>
- There is a lack of regulatory security of tenure and lack of clarity on compensation upon grid arrival<sup>7</sup>
- Despite the tariff ceiling, most developers don't have a PUE strategy to increase energy demand and improve economics<sup>2</sup>

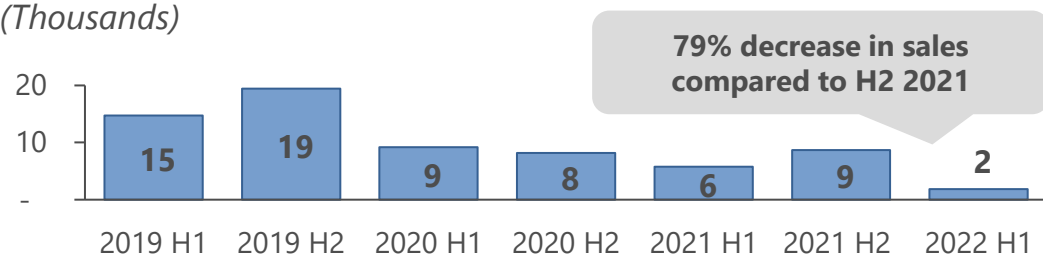
Notes: \*Only includes mini-grids confirmed to be operational

Sources: 1.SEFA & AfDB, Mini-Grid Market Opportunity Assessment: Uganda, 2018 [\[Link\]](#) 2 UOMA consultations 3 Engie Energy Access website [\[Link\]](#) 4 PV-Magazine, Uganda turns to Solar in Northern Uganda, 2021 [\[Link\]](#) 5 AFSIA, Green Bitcoin Mining: A game changer for mini-grids in Africa, 2022 [\[Link\]](#) 6 Sun Connect, USAID Power Africa awards 840K to install Mini-grids [\[Link\]](#) 7 ERA, Application for Licence Exemptions, 2022 [\[Link\]](#)

# Productive use: While the market is yet to recover from Covid-19, PUE potential is promising with continued support from gov't, dev partners and investors

## Combined solar appliance sales in Uganda 2019-22<sup>1</sup>

(Thousands)



### Solar appliance sales have dropped significantly due to the impact of Covid-19 on the Uganda economy<sup>1</sup>

- Sales were 79% lower than in the second half of 2021 and 68% than during the first of 2021
- Sales of refrigeration units (RUs) and solar water pumps (SWPs) are still below pre-pandemic levels

### Despite the PUE market being nascent, potential across various segments is promising<sup>2</sup>

- SWPs sales are expected to grow to 600 by end of 2022 compared to ~ 252 in 2021
- Cold storage is expected to reach market potential of over USD 31 M
- E-mobility has seen increased interest over the last few years and is projected to grow over 2022 led by the motorcycle segment
- E-cooking appliance sales are projected to surpass 710K achieved in 2019

### Development partners, investors and government are providing funding and technical assistance to support research and product testing<sup>2,3</sup>

- EEP Africa, SEFFA, WE4F, PREO and E4A have provided grant funding to PUE businesses across e-mobility, cold storage, bio-gas, agriculture and clean cooking
- The E4A Coalition, GIZ, SNV and early-stage investors such as Acumen and Persistent have contributed concessional funding
- Other development partners such as LEIA, Power Africa, GET.Invest and UOMA have offered technical assistance to support the inflow of capital and strengthen the enabling environment
- Government through the Ministry of Agriculture (MoA) is implementing a micro-scale irrigation program with subsidies for solar water pumps with funding from the World Bank

### Despite efforts, challenges persist<sup>2,3</sup>

- Lack of access to finance by PUE providers in terms of required ticket sizes and type of finance hinders ability to offer credit to consumers
- Limited awareness of consumers regarding the full offer of PUE appliances on the market limits uptake by the public
- An uncertain regulatory environment where some of the appliances are VAT exempt while others are not

## C&I solar: Current capacity of the sector is 3.5 MW with an additional 2 MW expected this year driven by developers and development partners

C&I captive power plants by size and capacity (2013-2021)<sup>1</sup>

Size	No of plants	Total capacity (kWp)
10-49 kWp	75	1,495
50- 100 kWp	8	617
100 -500 kWp	5	861
>500 kWp	1	516
<b>Total</b>	<b>89</b>	<b>3, 454</b>

### Most captive power plants are commercial and grid-tied<sup>1</sup>

- 90% of the captive power plants are commercial while 10% are industrial
- 69% of the captive solar systems are grid-tied with or without battery storage, while 31% are off-grid with battery
- Majority of the projects are developed through a rent to own model as more sophisticated models such as PPA are yet to gain traction

### An additional capacity of ~2MW is expected to come online by end of 2022<sup>1,2</sup>

- Increase in capacity is mostly from large industrial processors contributing ~ 1,500 MW
- Other sectors of interest include health centres, commercial buildings and agro-processing

### Development partners and developers are playing a key role in the sector through research and business model innovation

- UNEP-DTU undertook a comprehensive study of the C&I sector in Uganda while GIZ is publishing a market guide for ESCOs in Uganda<sup>1,2</sup>
- GET.Invest has supported several developers with technical assistance to support investment readiness<sup>1,2</sup>
- Developers such as All in Trade and Equator Solar are experimenting with a PPA model<sup>2</sup>

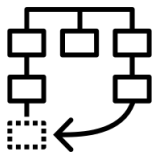
### The government is in the process of drafting a net metering code that w development of C&I solar projects<sup>2</sup>

- Government through ERA is drafting a net metering code that will guide the bi-lateral sale of electricity between grid-connected C&I projects and the grid
- ERA and MEMD are currently piloting net-metering in partnership with Nexus Green on their 0.5 MW facility at Kololo Airstrip

### Despite recent sector growth, a number of challenges remain<sup>1,2</sup>

- Lack of government buy-in and an unclear regulatory environment
- Developers struggle to access financing through international funders who lack confidence in the regulatory environment
- Local developers continue to lack capacity to execute complex projects and often have to partner with international developers

# Enabling environment: REA's merger into MEMD is being finalized while gov't has drafted policies & strategies to provide a framework to increase for energy access



**MDA restructuring**

## REA was absorbed into MEMD, becoming the department of rural electrification<sup>1</sup>

- In 2021, MEMD kicked off the process to reabsorb the Rural Electrification Agency (REA); All employee contracts with REA were terminated effective Oct 2022; majority of former employees are being absorbed through a competitive hiring process
- Structure of the Rural Electrification Department was approved by Cabinet

## The merger of UEGCL, UETCL and UEDCL into one company is ongoing<sup>1</sup>

- The structure of the proposed new company – the Uganda Electricity Company has been drafted
- A financial impact analysis is being conducted with support from the World Bank



**Regulation and policy**

## Regulations and policies initially slowed by Covid-19 have been progressed by MEMD while other policies are also being drafted to strengthen the enabling environment<sup>1</sup>

- National Electrification Strategy: Government's universal energy strategy was approved by the Ministry of Energy
- Electricity Amendment Bill: An amendment to the Electricity Bill, 1999 that will make it possible for isolated grid operators to sell power directly to customers has been approved by the Ministry of Energy
- Net Metering Code: Regulation governing bi-lateral sale of power between isolated grid operators and national utilities is currently being drafted and expected to be public in 2023
- National Electrification Policy: The policy to ensure sustainable development and utilization of energy resources, services, and products is undergoing review and expected to be approved in early 2023
- PUE Strategy: Strategy to improve the productive use of energy for solar applications is being developed by MEMD with support from UOMA
- National PUE Roadmap: USEA in partnership with GOGLA is developing a national road map on scaling-up productive use of energy for food security and economic empowerment in Uganda; to be published in 2023

**The government has a pipeline of upcoming regulations such as the Off-grid Strategy, the National Transition Plan, the Clean Cooking Strategy, National Bio-gas dissemination strategy and an Integrated Resource Master Plan**

## Funding: Funding is skewed to mostly international OGS and cookstove players largely from development partners and a few investors








OGS providers and improved cookstoves (ICS) companies have continued to raise capital although raises are still dominated by international players. Notable raises include:

- SunKing raised USD 260M in series D funding from a consortium of funders led by BeyondNetZero to expand its PAYGO solutions and introduce larger systems<sup>1</sup>
- d.light secured USD 50M in debt financing from SunFunder, TDB and FMO to support expansion of its PAYGO business and development of new products<sup>2</sup>
- M-Kopa raised a USD 75M growth equity round to support growth<sup>3</sup>
- Innovex received grant funding of USD 300K to support local component manufacturing<sup>4</sup>
- Mandulis Energy raised EUR 349K from DFCD to create waste to energy solutions to power agriculture processing facilities<sup>5</sup>
- Winch Energy raised USD 840K in grant funding from Power Africa to develop a mini-grid in Rwamwanja refugee settlement<sup>6</sup>
- UpEnergy closed funding of USD 20M from Carbon Streaming<sup>7</sup>

**Local banks continue to provide debt financing but on a relatively small scale**

- Equity Bank launched Equi-Green loan financing for renewable clean technologies supported by UECCC<sup>8</sup>
- Other banks such as Stanbic Bank, Centenary Bank and NCBA have continued providing local debt on a small scale<sup>4</sup>

Development partner programs and investors have committed more than USD 50M in the last year

Funder	Fund description
 WORLD BANK GROUP	The World Bank through the Uganda Energy Access Scale-up project has committed USD 30M for on-lending to local companies through UECCC <sup>9</sup>
 BGFA Beyond the Grid Fund for Africa	BGFA launched an ~USD 24.5M results-based financing (RBF) facility managed NEFCO <sup>4,10</sup>
 SIMA SOCIAL INVESTMENT MANAGER & ADVISOR	SIMA's Energy Access Relief Fund (EARF) continues to provide debt funding <sup>11</sup>
 UGANDA GREEN ENTERPRISE FINANCE ACCELERATOR	EU'S UGEFA discounted loan facility continues to support businesses with USD 10K to USD 100K <sup>12</sup>
 UNCDF UNITED NATIONS DEVELOPMENT FUND	UNCDF's working capital facility continues to support the growth of local OGS companies <sup>4,13</sup>
 EDFI ElectriFI	ElectriFI launched a EUR 5M facility for early-stage renewable energy companies <sup>14</sup>
 endev	GIZ EnDev continued to accelerate market based approaches through an RBF <sup>4</sup>

Note: More details on the capital raises and investors active in the space included in the industry stakeholders section

Sources: 1. TechCrunch, Sun King raises \$260M, 2022 [\[Link\]](#) 2. Solarquarter, d'light secures USD 50M debt, 2022 [\[Link\]](#) 3. M-Kopa raises \$75M in equity funding [\[Link\]](#) 4. UOMA consultations 5. DFCD website [\[Link\]](#)

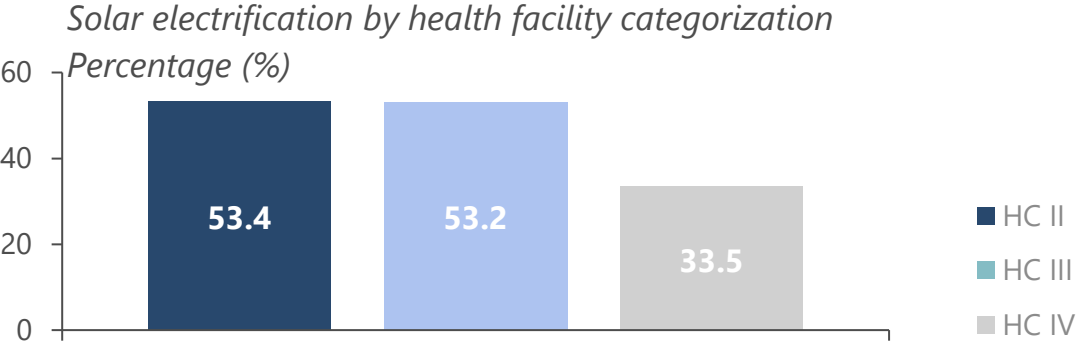
6. Sun Connect website [\[Link\]](#) 7. Community Carbon Stream [\[Link\]](#) 7. Equity Bank launches Equi-Green financing [\[Link\]](#) 9 World Bank, Electricity Access Scale-up, 2022 [\[Link\]](#) 10 .BGFA, Call for proposals launched, 2021 [\[Link\]](#) 11

SIMA EARF [\[Link\]](#) 12. UGEFA website [\[Link\]](#) 13 GOGLA, Global Off-Grid Solar Market Report Semi-Annual Sales and Impact Data H2 2020 [\[Link\]](#) 14 ElectriFI launches EUR 5 M facility, 2022 [\[Link\]](#)

# Industry insights

# Healthcare: Off-grid solar contributes significantly to electrification of lower tier health centres and stakeholders continue supporting with funding and innovation

Despite solar electrifying majority of lower tier health centres<sup>1...</sup>



..long-term sustainability of solutions remains a challenge

- Most of the health centres lack maintenance budgets for solar systems installed<sup>2,3</sup>
- Many of the systems become inoperable in 3-5 years due to lack of maintenance and repair services<sup>2</sup>
- In other cases, the arrival or extension of the grid renders solar systems redundant<sup>2</sup>

**30%** of systems installed on ERT I are non- functional<sup>4</sup>

**13%** of 522 systems installed on ERT II are non-functional<sup>4</sup>

Private sector OGS players continue collaborating with funders to electrify rural health centres

- Equatorial Power in partnership with GIZ is in the process of installing solar power solutions at 27 health centres in villages in West Nile with a total capacity of 150kWp<sup>5</sup>
- Aptech Solar with funding from UNDP and government, installed and commissioned solar power systems at 11 health centres across Uganda<sup>6</sup>
- Equatorial Power with grant funding from Power Africa electrified 11 public healthcare facilities on the Lake Victoria islands in the Buvuma and Kalangala districts<sup>7</sup>

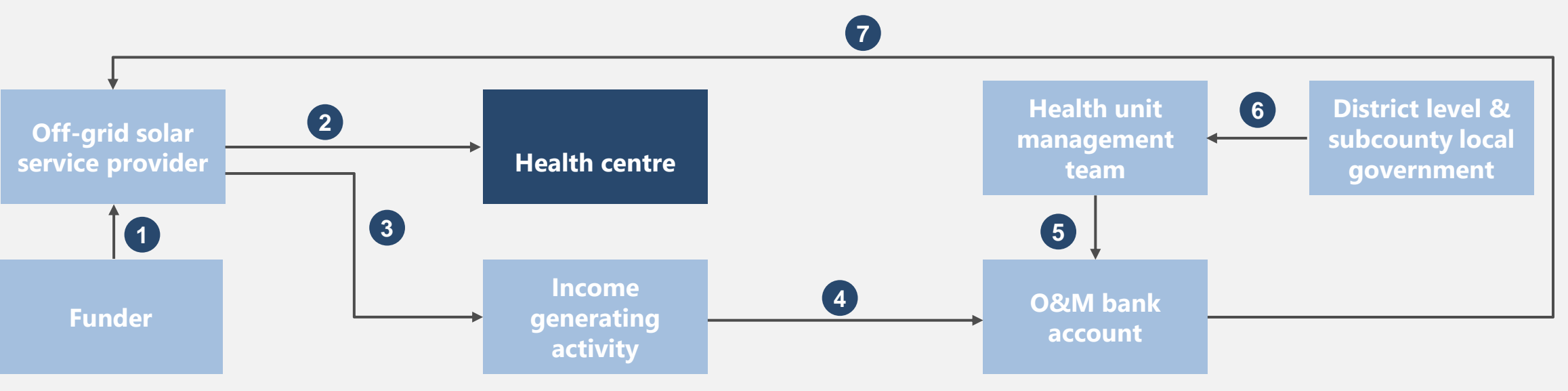
Development partners are providing support to increase sustainability of business models through research and pilots

- USAID Power Africa is completing a market assessment for off-grid electrification of healthcare facilities in Uganda. The market assessment estimates and summarizes the potential addressable Health Facility Electrification (HFE) markets within Uganda and leverages GIS to support private sector operators become more targeted in providing solutions<sup>3</sup>
- GIZ EnDev piloted an O&M service model that supported health centres in displacement settings generate additional income from phone charging and sale of sundries to subsidize the cost of maintenance of solar systems<sup>8</sup>

Notes: ERT – Energy for Rural Transformation; ERT I was implemented from 1999 to while ERT II was implemented from 2000 to 2010  
 Sources: : 1 MEMD, National Electrification Report, 2020 2 Solar for Health: Five Ways Solar Power Can Make Universal Healthcare a Reality, 2019 [Link] 3 UOMA consultations 4 MEMD, Uganda Energy Access Scale-up Project, 2020 [Link] 5 Africa Energy Portal, Equatorial and GIZ team up to solarize 27 rural clinics, 2022 [Link] 6 Aptech website [Link] 7 USAID Awards an additional USD 2.3M in grant funding for healthcare electrification, 2022 [Link] 8 EnDev, Solutions for Displacement Settings: Electrification of Health Centres, 2021 [Link]



# Case study: GIZ/ESDS piloted an O&M service model that supports health centres generate additional income with potential to increase sustainable electrification



**The O&M service model is structured as follows\*:**

- 1 Funder covers cost of solar system by paying directly to OGS provider
- 2 OGS provider installs solar system, provides basic training for usage and trouble shooting and is contracted to carry out O&M for at least 2 years
- 3 The health center with support from the funder sets up an income generating activity
- 4 Funds from income generating activity are banked on a dedicated O&M account set up with support from the funder
- 5 Health unit management team constituted of local leaders and management of the health centre provides oversight over the O&M account
- 6 District level & subcounty local government provides an enabling environment and passes by-laws to operationalize the O&M account as required
- 7 Funds from the O&M account are used to pay the OGS provider for maintenance of the system

Note: \*The model is being adopted by EnDev for health centres in displacement settings  
 Sources: 1 EnDev, Solutions for Displacement Settings: Electrification of Health Centres, 2021 [\[Link\]](#) 2 UOMA consultations

# Displacement settings: Off-grid energy has potential to solve energy needs in refugee settings; gov't & dev partners are developing strategies and providing grants

**Despite Uganda being the largest refugee hosting country in Africa, access to electricity for people in displaced settings remains low**

**1.5M** Uganda hosts over 1.5 million refugees and asylum seekers from South Sudan, DRC, and other neighboring countries<sup>1</sup>

**270K** With a population of over 270K people, Bidibidi is the second largest refugee camp in the world<sup>2</sup>

**90%** 90% of refugees living in rural settlements have very limited access to energy<sup>3</sup>

**Off-grid energy can solve for unmet energy needs of refugee and host communities and unlock economic and social benefits**

- Pico lanterns and SHS can be used to light homes at household level, larger systems can be used for institutions such as hospitals and schools while mini-grids have the potential to power entire communities<sup>4,5</sup>
- Energy access leads to job opportunities, a better living environment, more hours of light, access to communication, access to information, safer and cleaner cooking practices, increased productivity, better education, improved health, decreased gender-based violence, and overall improvements in the quality of life for refugees and host communities<sup>4</sup>

**Gov't has developed plans to increase energy access while development partners have provided grants & distribution support**

- The Uganda government recently developed a Sustainable Energy Response Plan (SERP) outlining a roadmap for achieving clean energy access for refugees and host communities in Uganda
  - An estimated USD 286M is required for implementation of the SERP over the next 4 years<sup>6</sup>
- Development partners have supported increased access for displaced settings through providing grant funding and direct distribution of products e.g.,
  - SCC and Power Africa provided a USD 840K grant to Winch Energy to develop a mini-grid in Rwamwanja refugee settlement<sup>7</sup>
  - UNHCR distributed more than 300K lanterns to new arrivals to refugee camps in Uganda from 2016 to 2021<sup>8</sup>
  - EnDev Uganda is piloting result-based financing approaches for the sales of improved cook stoves and solar products<sup>9</sup>

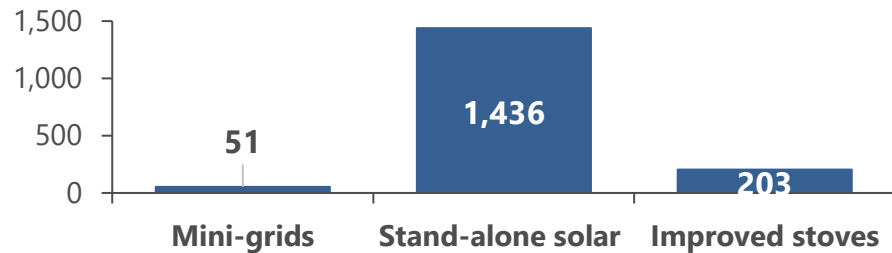
**There is an opportunity for development partners and private sector players to scale energy access in displaced settings<sup>4,5</sup>**

- Development partners can provide subsidies in the short and medium term to stimulate uptake of energy solutions
- Private sector companies can provide energy choice in displacement settings supporting scaling of energy access

Sources: 1 UNHCR, Uganda Profile [\[Link\]](#) 2 EU, Contested Refugee: The Political Economy and Conflict Dynamics in Uganda's Bidibidi Refugee Settlements, 2018 [\[Link\]](#) 3 Shell International BV, Access to More: Creating Energy Choices for Refugees, 2020 [\[Link\]](#) 4 UOMA consultations 5 High-Level Meeting on Clean and Safe Energy in Refugee Settings, 2021 [\[Link\]](#) 6 Sun-connect, USAID/Power Africa awards USD 840K, 2022 [\[Link\]](#) 7 UNHCR, Access to Energy for Refugees: Uganda Case Studies, 2021 [\[Link\]](#) 8 EnDev, Progress Report 2021 [\[Link\]](#) 9

# Innovative financing: Gov't, dev partners & private sector players are supporting the development of solutions but more needs to be done to scale access to finance

Volume of financing required to close the energy access gap in Uganda by 2030 by technology category<sup>1</sup>  
(USD, millions)



## Government and development partners are piloting solutions but more needs to be done to address the energy access gap

- Government through the Bank of Uganda passed the regulatory sandbox framework that allows innovative financial solutions in the payments eco-system to be tested in a live environment<sup>2</sup>
- Development partners are supporting the increase of energy access by providing de-risking facilities and providing grants for innovation e.g.,
  - The joint SDG fund is designing a USD 5M guarantee fund for humanitarian and social sectors<sup>3</sup>
  - UNDP is developing a platform – The Climate Aggregation Platform to promote the scale-up of financial aggregation; UNDP put out a request for proposals in Sept 2022 to crowdsource innovative financing structures<sup>4</sup>

## Private sector players are developing innovative low-cost financing mechanisms to scale energy access

- Private sector operators in both SHS and mini-grids are leveraging blockchain to raise finance through cryptocurrency e.g.
  - Engie in partnership with Energy Web piloted a capital raise of USD 100K through a cryptocurrency crowd funding platform to power homes in Uganda, Rwanda and Zambia at 10% p.a<sup>5</sup>
  - Sustain Solar in partnership with INENSUS is piloting a bitcoin mining pool to improve mini-grid economics by generating an additional revenue stream<sup>6</sup>
- Crowd-lending platforms are supporting local companies tap into cheap finance e.g., GoParity, a Portuguese impact investment platform has supported SolarPipo develop more than 225 kW of solar projects in the dairy value-chain<sup>7</sup>
- Developers like Winch Energy are leveraging distributed renewable energy certificates (D-RECs) to subsidize the cost of mini-grid development<sup>8</sup>

## To further scale innovative financing, further support from government and development partners is required<sup>9</sup>

- There is an opportunity for government to strengthen the regulatory environment to catalyze more financing innovation
- Development partners can provide more grants and guarantees to support piloting of new solutions

Sources: 1. SE4All and Catalyst Off Grid Advisors, Taking the Pulse 2019 [Link] 2. BOU, National Payments Systems Regulatory Sandbox, 2021 [Link] 3. Joint SDG Fund website [Link] 4. UNDP website [Link] 5. Engie website [Link] 6 AFSIA, Bitcoin mining a game changer for mini-grids, 2022 [Link] 7 Sun-connect, GoParity crowlends for Solarpipo, 2022 [Link] 8 3Degrees, First ever Uganda P-RECs provide funding, 2022 [Link] 9 UOMA consultations

# Innovative financing: Engie Energy Access in partnership with Energy Web raised USD 100K in 2 days leveraging cryptocurrency at 10% p.a

## Case description<sup>1</sup>



energy web

Engie Energy Access, one of the leading PAYGO SHS providers & mini-grid developers partnered with Energy Web, a cryptocurrency crowd-funding technology provider powering decarbonization solutions to raise USD 100K in financing. The financing was intended to increase access to energy for 50 households in Uganda, Rwanda and Zambia

## Overview<sup>1,2</sup>

- Energy Web developed a crowdlending platform – Crowdfund for solar to support Engie raise the target financing of 100K
- The pilot platform was the first proof of concept leveraging decentralized finance (DeFi) to accelerate clean energy for all
- The DeFi platform leveraged the open-source Energy Web technology stack and run on the Energy Web Chain
- Funds raised were distributed as micro-loans to residents of low-electrification countries such as Rwanda, Uganda, and Zambia – enabling communities to gain affordable access to solar energy
- Micro-investors financed the installation of clean energy assets by staking their Energy Web Tokens (EWT), the native token of the Energy Web Chain

## Results<sup>1</sup>

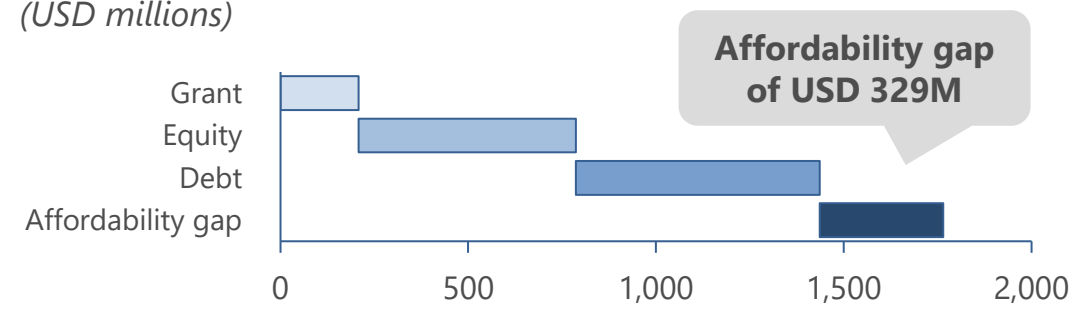
- Engie was able to raise in debt financing of USD 100k through crowdlending within 48 hours
- Financing from the pilot was used to increase clean energy access for at least 50 households and small businesses
- Investors are expected to be paid back their principal and 10% interest after the 1-year completion of the campaign

## Sector considerations<sup>1,2</sup>

- Cryptocurrency can be leveraged to develop small projects through crowdfunding considering they offer lower ticket sizes often required by local players
- The intermediating party usually the platform is the key creator of trust for successful capital raises. The party must be reliable and trustworthy to ensure investor confidence
- Investor accounts have to be explicitly connected with projects, investors and assessors, which has to be verified by the scheme supplier. This guarantees that every investor and project is existent in reality and nobody is able to pretend to be someone else
- Cryptocurrency is unregulated in Uganda therefore investors must ensure enforceability of smart contracts with the platform in countries of origin

# Demand side subsidies: Development partners and private sector players are implementing pilots, but scale is required to close the affordability gaps

**Volume of financing needed to close energy access gap (off-grid solar) in Uganda by 2030<sup>1</sup>**  
(USD millions)



## Demand-side subsidies (DSS) can be an essential tool in reducing the affordability gap<sup>2</sup>

- DSS aim to bridge the affordability gap where consumers cannot afford products or services with their current income
- DSS can include cash transfers, voucher schemes, or results-based financing (RBF) that includes a mandatory price reduction

## Demand subsidies have been piloted over the past year and scale-up and additional pilots are in the pipeline<sup>3</sup>

- GIZ EnDev is implementing a blended subsidy program pilot in Bidibidi refugee camp in Northern Uganda; expected to scale-up with support from the Dutch government in 2023
- ESMAP’s End-User Subsidy Lab is in the process of developing DSS pilots in several countries including Uganda

## Considerations for researchers<sup>2</sup>

- A new energy burden threshold for measuring the affordability gap in developing and emerging economies is needed to ensure replicability, relevance, and accuracy
- The percentage of household income spent on electricity forms part of the calculation of the electricity affordability gap. This means that if more than 6 percent of a household’s total income is spent on electricity, an energy burden exists
- The affordability gap is informed by the percentage of household income spent on electricity over a certain period compared to the cost of the system. If the share of income is below the cost of the item, the household is deemed unable to afford the product

## Considerations for policy makers<sup>2</sup>

- Demographic data are needed for more accurately targeted subsidies. Household electricity consumption data and corresponding income or wealth data are key to creating accurately targeted end-user subsidies.
- Currently, government lacks data on electricity consumption levels within vulnerable households. Government needs to invest in up-to-date census data and identification card systems that would allow for effective targeting and verification to minimize market distortion

## *Demand side subsidies: World Bank provided subsidies for 14,000 SHS installations but program had faced from payment delays & complicated monitoring process*

### Case description<sup>1</sup>



The Energy for Rural Transformation (ERT) subsidy program has been implemented jointly by the Ugandan Government and the World Bank since 2002. It has been the main channel for delivering subsidies to rural communities and has 3 phases; Phase 1 ran from 2002–2009, phase 2 from 2009–2012, and phase 3 from 2016 to date. The case study focuses on phase 2

### Overview<sup>1</sup>

- Phase 2 of the program provided a subsidy of USD 5.5 per Wp installed if the system did not exceed 50Wp and USD 4 per Wp for systems up to 500Wp targeting 20,000 SHSs
- Delivery of products was direct to households through a registered financial institution and through third parties i.e., SHS companies with a proven track record
- Targeting of communities was done administratively and focused on rural communities
- Verification and monitoring processes were manual with payments made to third-party providers upon proof of installation of systems
- The target market was non-commercial market which would not have been viable for SHS companies without the subsidies

### Results<sup>1</sup>

- Phase 2 of the program realized only 14,000 SHS installations against a target of 20,000 due to continued delays in subsidy payments that posed a liquidity challenge for SHS companies and the complicated monitoring processes
- The program had challenges with companies adding bigger panels than were required for the systems to increase their share of the subsidy, leading to protracted legal issues

### Sector considerations<sup>1</sup>

- Government support is critical to the successful implementation of demand-side subsidies. Government should be leveraged to collect data required for targeting and buy-in is helpful to navigate uncertain regulatory environments
- Better transparency around the subsidy design process, including data sources and methodology used, would allow for better harmonization across end-user subsidy design
- Leveraging technology to support the monitoring and verification process e.g., ensuring systems are installed through remote monitoring instead of manual verification can save time and money

## Industry stakeholders

# Summary: Stakeholder landscape consists of 7 categories: private sector, NGOs, financiers, development partners, government, associations & other stakeholders

**Development partners** consist of international independent agencies backed by gov't to fund and support initiatives in both public & private sectors

**Financiers** consist of DFIs, PE funds, and investors that develop financing facilities to meet capital needs of energy players

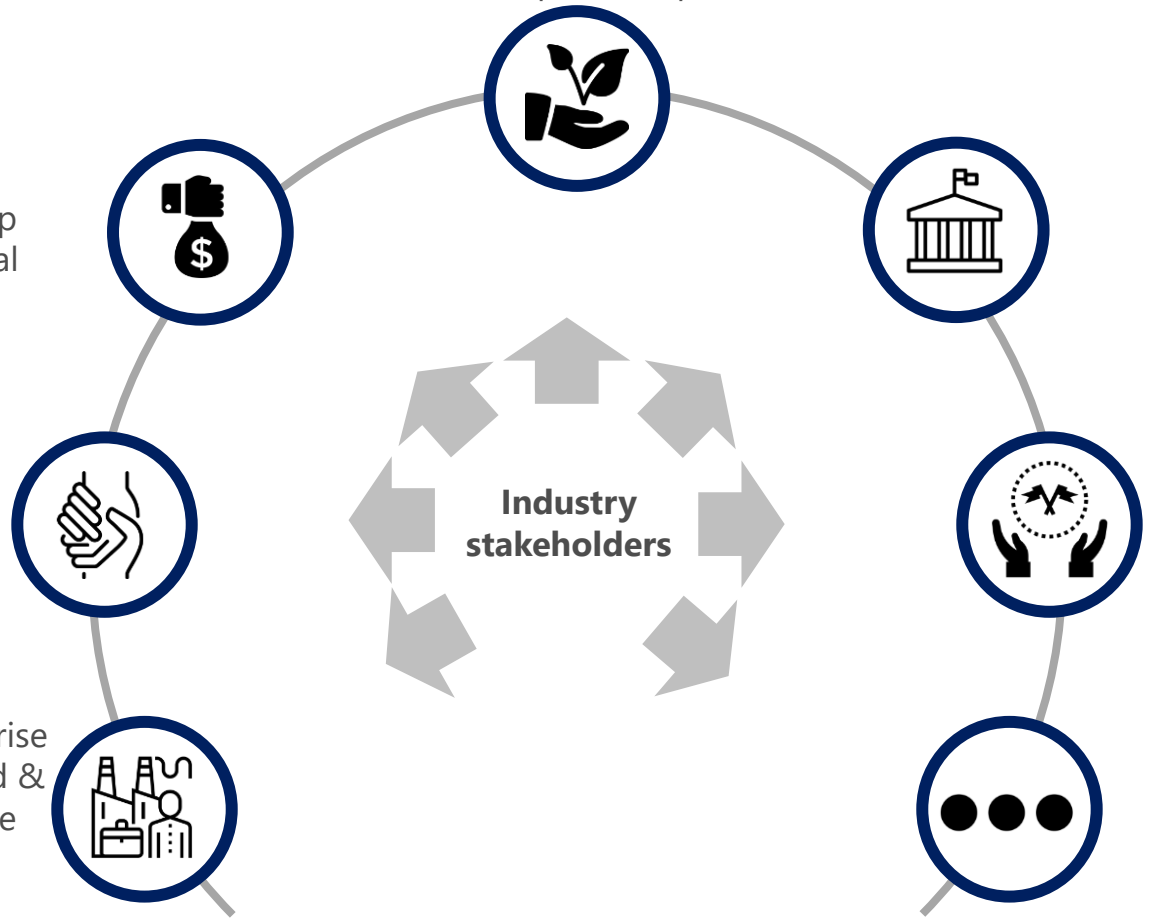
**Government** consists of bodies that have the mandate for regulation distribution & generation of energy

**NGOs** consist of international and local NGOs that are supporting electrification of schools and health centers

**Associations** are organizations that represent private sector players like operators & advocate for favorable policies and conditions to accelerate energy





**Private sector operators** comprise of Solar Home System, Mini-grid & Productive Use providers in the market

**Other stakeholders** consist of global & regional organizations that support private sector with data, market linkages, etc.














# Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (1/15)

Business	Summary	Product offering	Milestones and updates
	Engie is distributor, installer, consumer financier and after sales service provider of solar home and lighting and mini-grids systems	Residential products such lanterns & PAYGO SHS, commercial products including large integrated systems and mini-grids	Partnered with Signify Foundation to launch a demand side subsidies pilot
	SolarNow is a, distributor, installer, consumer financier and after sales service provider of solar products like SHS, panels, lights, etc., since 2011	Residential & commercial products, served small businesses and institutions like hospitals & schools	Large focus on PUE appliances such as pumps
	Kambasco Technologies is a distributor and consumer financiers of solar powered products and systems such as home lighting systems and water pumps since 2015	Residential and commercial products	Focused on coordinating and accelerating efforts to expand access to energy to rural and off grid health facilities
	BrightLife Uganda is a social enterprise that distributes, installs, finances and offers after sale services on solar lanterns, solar home lighting systems since 2015	Residential product; mainly serves BoP consumers	Adapted operation due impact of COVID-19 restrictions
	M-KOPA is a manufacturer, distributor, installer, consumer financier and after sales service provider of solar products like SHS and fridges, since 2012	Residential and commercial products, serves small businesses	Developed and is currently selling a solar-powered PAYGO fridge for BoP consumers





## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (2/15)

Business	Summary	Product offering	Milestones and updates
	Solantis solar is a manufacturer, distributor, installer, and consumer financier of solar products like SHS and lanterns, since 2016	Residential products including solar home systems, lanterns and accessories such as radios & TVs	Filled for bankruptcy in 2020 & acquired by Village Power
	Davis & Shirliff is distributor, installer and after sales services provider of water solutions and solar products since 1996; the company offers solar products such as batteries, SHS and refrigerators	Residential, commercial and institutional products	Undertook the solarization of existing boreholes in Bidi bidi refugee camp in Northern Uganda
 Greenlight Planet	SunKing is a social business that designs, distributes and finances solar powered products such as lamps and solar home systems since 2009. GLP also offers consumer after sales services to its customers	Residential and commercial products	SunKing raised USD 260M in series D funding from a consortium of funders led by BeyondNetZero
	Solar Today is a distributor and installer of solar products like SHS and water heaters, since 2010	Residential and institutional products, serves hospitals	Partnered with Innovex-a Uganda-based startup enabling PAYGP and remote monitoring for OGS companies
	Atritex is a water solutions company that distributes, installs and provides after sales services for water equipment and solar such products as water pumps and water heaters since 2014	Residential, commercial & institutional products; partners with the gov't to develop large-scale irrigation projects	Contracted by FAO to install solar sprinkler irrigation systems in Nebbi and Zombo districts in Northern Uganda

## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (3/15)

Business	Summary	Product offering	Milestones and updates
	Anuel Energy is a distributor and installer of plug and play solar home systems since 2015. The company also offers consumer financing and after sales services to their customers	Includes products domestic households but also provides for commercial and institutional products	Pivoted business models from PAYGO to PUE & institutional consumers such as schools & health centers
	Davis & Shirliff is distributor, installer and after sales services provider of water solutions and solar products since 1996; the company offers solar products such as batteries, SHS and refrigerators	Residential, commercial and institutional products	Distributor and in-country partner for Agsol solar powered mills
	Village Energy is a distributor installer, consumer financier and after sales service provider of solar products like SHS, water pumps, water heaters and lights, since 2009	Products serve refugee camps, institutions like schools and commercial clients like SMEs	Supported the electrification of health centers in partnership with SENDEA & Signify Foundation
<b>AB Matra Uganda Ltd</b>	AB Matra is distributor and installer of solar powered products such as inverters, panels, home systems, lanterns and water heaters	Residential, commercial and institutional products, serve schools	Not available
	ADH Group is a distributor of solar powered products such as refrigerators, panels, and batteries at both retail and wholesale since 2013	Residential and commercial products	Not available





## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (4/15)

Business	Summary	Product offering	Milestones and updates
	Assen Ventures is a distributor, installer and after sales services provider on both electrical and solar powered products such as water pumps, water heaters and irrigation systems since 2008	Residential, commercial products, products can also serve and institutional clients	Executed solar water pumping projects in Palabek refugee settlements, Bidi refugee camp and Rhino refugee settlement
	Battery Plus Ltd is a distributor and installer automotive batteries and solar products such as batteries, inverters and water heating systems since 1996	Residential and institutional products	Not available
	D.Light is a distributor, installer, consumer financier and aftersales services provider of solar lighting systems and solar appliances like fans and TVSs since 2017	Residential and commercial products, serves small businesses	Launched rapid response rural healthcare solution, including solar arrays, smart phone and fridge for storing medicines
	Kirchner Solar is a distributor an installer of solar powered products like SHS, water heaters, TVs, etc. since 1996	Residential and commercial products, serves small businesses	Received EUR 400K subsidy to construct 22.5 kW mini-grid in central Uganda with Airtel as an anchor customer
	Solar Energy for Africa is a distributor, installer and after sales service provider of solar products like SHS, streetlights, batteries, etc., since 1995	Residential, commercial and institutional products, serves hospitals	Not available





## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (5/15)

Business	Summary	Product offering	Milestones and updates
	Water & Pumps international is a distributor and installer of solar products like water pumps, water heaters and street lights, since 2013	Residential products	Not available
<b>Advanced Solar Power Ltd</b>	Advanced Solar Power Ltd is a distributor, installer and after sales provider of solar products such as streetlights, solar water pumps and solar water heaters since 2015	Residential and commercial products	Not available
	African Energy Depot Ltd is a distributor of solar, mini-grid and power backup products since 2015; the company distributes solar products such as batteries, water pumps and lighting products	Commercial and institutional products for the government and medical centers, etc.	Expanded product portfolio to include higher capacity battery storage & high-performance remote monitoring equipment
	All in Trade is a distributor of quality solar products like inverters, water heaters and pumps and has installed ~25MW solar power to date since inception in 2008	Institutional, commercial products for corporate use	Supported the electrification of 46 health centers with support of various partners such as UNHCR & Care International
<b>All Africa Ultimate Solar Energy</b>	All Africa Ultimate Solar Energy is a distributor, installer and after sales services provider of solar products such as home systems, street lights, batteries and CCTV cameras	Residential, commercial products for hotels, gas stations, cold warehouses, etc. and institutional products for the gov't and hospitals	Not available




## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (6/15)

Business	Summary	Product offering	Milestones and updates
	Baseline Africa Ltd is a distributor of solar home systems and components such as batteries and inverters since 2002	Data not available	Not available
	Bitcom Delta EA Ltd is a provider of both ICT and power solutions since 2017; the company distributes and installs solar products such as batteries, inverters, panels and water heaters	Residential, commercial and institutional products	Installed C&I 172 kW solar project at NUCAFE factory in partnership with Village Energy
	Chloride Exide is a distributor and installer of automotive batteries and solar equipment such as panels, heating systems and batteries since 2001	Residential and commercial products that also serve small businesses	Not available
<b>Crown Energy Systems</b>	Crown Energy Systems is a distributor, installer and aftersales service provider of solar products such as panels and water pumps since 2010	Residential and commercial products	Not available
	Access to Solar Technologies is a social enterprise that distributes, installs and offers after sales services for solar products such as water pumps, water heaters, TVs, refrigerators, etc since 2016	Residential products	Implements a "Solar Village Project" model that prioritizes concentrated power supply to the entire village

## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (7/15)

Business	Summary	Product offering	Milestones and updates
<b>ASE Solar Ltd</b>	Ase Solar Ltd is a manufacturer and distributor of solar products such as panels, lighting products and energy backup systems like batteries and regulators since 2004	Residential products	Not available
	Azuri Technologies is a full-service provider of solar home systems and solar water pumps, offering all services across the value chain from manufacturing to after sales services since 2012	Residential and commercial products for small businesses like shops	Growfast, Azuri's solar irrigation solution, was named winner of Uganda renewable energy fund by the UN CleanStart program
	Barefoot Uganda is a social enterprise that distributes solar lighting products and solar phone charging systems since 2008	Residential and commercial products; mainly serve BoP consumers	One of the implementers of the Inclusive Dairy Enterprise project funded by the Netherland Embassy
	Basal Solutions is a distributor, installer and after sales services provider for solar products such as water pumps, water heaters, SHS and batteries	Residential, commercial and institutional products that can serve telecommunications companies	Supported the electrification of 46 health centers with support of various partners such as UNHCR & Care International
	Aptech Energy is a solar and water pump specialist since 2012; the company distributes, installs and offers after sales services on solar products such as water pumps, heaters, streetlights and batteries	Residential and commercial products	Received 250K debt funding from UNCDF for inventory financing (2018), and in 2021 was awarded funding from the Jack Ma Foundation

## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (8/15)




Business	Summary	Product offering	Milestones and updates
<b>ARED SMC</b>	ARED SMC is a service company that designs and distributes smart solar powered kiosks that offer phone charging, wifi connectivity and airtime purchase since 2013	Commercial products, targeting mainly women and low-income earners	Not available
<b>Ekorn Solar Ltd</b>	Ekorn Solar Ltd is a distributor and installer of energy saving and solar products such as batteries, SHS, water heaters, pumps, streetlights and refrigerators since 2011	Residential & commercial products for small businesses & farmers; serves institutions like prisons, hospitals & schools	Not available
 <b>ENERGY SYSTEMS LIMITED</b>	Energy Systems Limited is distributor, installer and after sales service provider of solar energy products such as refrigerators, water pumps and power hybrid systems since 2002	Residential, commercial, institutional products	Not available
	Epicenter Africa is a distributor, installer and after sales services provider of solar products such as home lighting systems, street lightings, solar water pumps and energy back up systems since 2009	Residential, and commercial products that serve industries	Implemented solar water pumping project in Kakuma refugee camp with funding from UNHCR
	E- Power Solutions is a distributor and installer of air conditioning and solar power products such as panels, streetlights, water pumps and batteries since 2004	Residential products	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (9/15)

Business	Summary	Product offering	Milestones and updates
 <p><b>Fresca Investments</b></p>	Fresca Investments is a distributor, installer and after sales provider of both electrical and solar equipment; the company offers solar products such as panels and water heating systems since 2012	Residential, commercial and institutional products	Not available
	Global Solar Systems Limited is a distributor of solar powered equipment such as water heaters and water pumps since 2005	Data not available	Not available
	Great Seas (U) Ltd is a distributor of solar powered products such as water heaters, fans, refrigerators, lanterns	Residential and commercial products	Not available
	Green Power International is a manufacturer, distributor and installer of solar powered products such as water pumps, streetlights, panels and SHS since 2017	Residential and commercial products	Key projects include solar power system for NURI in Adjumani & 10 kW system for Kitalya prison
<p><b>Hagotech Gen. Electricals &amp; Technical Service (HTGETS)</b></p>	HTGETS is a distributor, installer and after sales provider of solar products such as energy back up systems, refrigerators, water heaters and home & street lighting systems since 2015	Residential and institutional products for hospitals; also partner with NGOs on community electrification projects	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (10/15)

Business	Summary	Product offering	Milestones and updates
	Solar Pipo is a system designer, installer and financier of solar cooling systems and water pumps mainly in the dairy sector	Commercial products; targeting dairy and agricultural projects	Installed 15 projects in the dairy sector with a total energy demand of 225 kW & has 3 projects in the pipeline
<b>Kenni Invest Uganda</b>	Kenni Invest Uganda is a distributor, installer and consumer financier of solar home systems since 2012	Residential products	Not available
<b>LEEM Electronics</b>	LEEM Electronics is a distributor and installer of SHS since 2014	Residential products	Not available
	Mr. Solar Limited is a distributor and installer of solar products like solar panels since 2018	Residential products	Not available
	Innovation Africa is a distributor & installer of solar powered products like motors and water pumps since 2005	Institutional products for schools and hospitals; supplies products for residential projects like water access in villages	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (11/15)

Business	Summary	Product offering	Milestones and updates
	Nature Solar is a distributor of solar products like solar panels, since 2018	Residential and commercial products; sells to other solar distributors	Not available
<b>New Age Solar Technologies</b>	New Age solar Technologies is a distributor, installer and after sales service provider of solar products like street bulbs, batteries, inverters, refrigerators and TVs since 2010	Residential and commercial products for small businesses	Not available
	New Sun Limited is a distributor, installer and after sale service provider of solar products like solar panels, inverters, batteries, etc., since 2005	Residential & commercial products; also serves government & large organizations	Licensed importer of African Energy and Suntech solar panels
<b>New Sun Solar</b>	New Sun Solar is an installer of solar water pumps, since 2012	Institutional products for government organizations	Not available
	Powercon Solar Energy Company is an installer of solar products like SHS, since 2010	Residential and commercial products for small businesses	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (12/15)

Business	Summary	Product offering	Milestones and updates
	Seven Hills Impex Limited is a distributor of solar products like solar panels and batteries, since 2001	Residential products	Not available
	Solar Point is a distributor of solar products like solar panels and lamps, since 2014	Residential products	Not available
	SoloGrid is a manufacturer, distributor, installer and consumer financier of SHS, since 2012	Residential and commercial products; also serves institutions like schools	Signed technology partnership with Angaza and has develop products targeted at the medical & school markets
	Solvic Solutions Limited is an installer of solar products like solar panels and charge controllers, since 2015	Institutional products for telecommunication companies	Not available
	Sunami solar is a distributor, installer, consume financier and after sales service provider of solar products like SHS, water pumps, TVs and fridges, since 2016	Residential and commercial products for small businesses	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (13/15)

Business	Summary	Product offering	Milestones and updates
	Sunny Money is a distributor of solar lanterns, since 2008	Residential products	Not available
	SunTap Uganda Limited is a solar distributor and installer of solar products like SHS and streetlights, since 2015	Residential and institutional products; also serves international alert sites	Supported the electrification of health centers e.g Mpuge HC in Mukono
	Trans African Supply Services is a solar distributor and installer of SHS, water pumps and streetlight, since 2002	Residential and institutional products for government & organizations	Constructed solar piped water schemes in rural areas in Uganda in partnership Ministry of Water
	Ugasolar Suppliers Limited is a solar distributor and installer of SHS	Residential products	Not available
	Ultratec Uganda Limited is a distributor and installer of solar products like lamps, panels, water pumps and water heaters since 1999	Residential and institutional products for government organizations	Not available






## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (14/15)

Business	Summary	Product offering	Milestones and updates
	Village Power is a distributor, installer, consumer financier and after-sales service provider of SHS, since 2014	Residential products	Partnered with Mercy Corps to provide 54 households and 6 businesses in Bid bidi refugee camp with solar solutions
	W. Water Works is a distributor and installer of solar water pumps since 2015	Institutional and commercial products for farms and small businesses	Supported the electrification of health centers e.g. Mpuge HC in Mukono
	One Lamp is a distributor of solar lamps and solar milk chillers since 2014	Residential products	Received EUR 350K grant funding from EEP Africa to a solar-powered refrigeration and milk storage solutions for dairy farmers in Western Uganda
	Ital Trade Limited is a solar distributor, installer and after sale service provider of solar powered products like inverters, solar panels and batteries since 1996	Residential and commercial products	Not available
	Luk Solar Uganda is a distributor and after sales service provider of solar lamps since 2013	Residential clients and institutional products for government organizations	Not available

## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (15/15)






Business	Summary	Product offering	Milestones and updates
	gnuGrid Africa is a Uganda based fin-tech and clean-tech social enterprise that is enabling financial and energy inclusion through data	Credit reference bureau for informal financial institutions, CRM for solar companies and smart batteries for off-grid communities	Raised USD 612K seed round to pivot into fintech
	Mwezi is a last mile solar energy distributor that aims to improve the lives of households in rural communities	Residential and commercial products	Raised USD 500K investment from the BUILD Fund created in partnership with Bamboo Capital partners & UNCDF
	Yellow Solar is a last mile distributor of PAYGO solar home systems to low-income rural households	Residential products	Received debt financing of USD 4 million for expansion in Malawi and Uganda
	Fin-e Innovations Limited is a Ugandan based clean energy fintech that aims to decentralize and scale funding for Uganda energy SMEs	Commercial and industrial products	Closed pre-seed funding of USD 300K
	Balton Uganda is the Uganda subsidiary of Balton CP that offers environmentally friendly green solutions in areas of power and solar water heating systems	Commercial and industrial products such solar water heater, solar irrigators & solar pumps	Balton has a distribution partnership with Chromagen, a leading international manufacturer of solar and electric water heaters

## Business models, product offering, regional distribution and sales to date by SHS and PUE operators in Uganda (15/15)


Business	Summary	Product offering	Milestones and updates
	gnuGrid Africa is a Uganda based fin-tech and clean-tech social enterprise that is enabling financial and energy inclusion through data	Credit reference bureau for informal financial institutions, CRM for solar companies and smart batteries for off-grid communities	Raised USD 612K seed round to pivot into fintech
	Mwezi is a last mile solar energy distributor that aims to improve the lives of households in rural communities	Residential and commercial products	Raised USD 500K investment from the BUILD Fund created in partnership with Bamboo Capital partners & UNCDF
	Yellow Solar is a last mile distributor of PAYGO solar home systems to low-income rural households	Residential products	Received debt financing of USD 4 million for expansion in Malawi and Uganda
	Fin-e Innovations Limited is a Ugandan based clean energy fintech that aims to decentralize and scale funding for Uganda energy SMEs	Commercial and industrial products	Closed pre-seed funding of USD 300K
	Balton Uganda is the Uganda subsidiary of Balton CP that offers environmentally friendly green solutions in areas of power and solar water heating systems	Commercial and industrial products such solar water heater, solar irrigators & solar pumps	Balton has a distribution partnership with Chromagen, a leading international manufacturer of solar and electric water heaters





## E-mobility players are starting to get some traction in motorcycle, motor vehicle, and fishing boat markets

Business	Summary	Product offering	Milestones and updates
	Kiira Motors is a vehicle manufacturer, launched in 2007 as a research project in Makerere University, Uganda. It was incorporated in 2011, and is owned jointly by the Government of Uganda (96%) and Makerere University (4%)	Several vehicles including solar powered buses and private cars	Currently in the final stages of construction of a factory in Jinja district, Eastern Uganda, with a projected capacity of 22 vehicles per day
	Bodawerk is a Ugandan social enterprise founded in 2017 that is developing mobility solutions in the field of lithium-ion batteries. Bodawerk retrofits existing bodas' petrol-driven power engines with electric ones	Electric motorbikes and electric tractors	Secured support from the DOEN Foundation & CarbonTrust / PREO to pilot their agriculture technologies and business models in Apac, Northern Uganda
	ASOBO is a start-up developing sustainable platforms for e-mobility services on the water in emerging markets. ASOBO e-Boarders are electric outboard engines for small fishing boats powered by renewable energy	Fishing boat engines	Closed grant funding of EUR 500K from EEP Africa to pilot a PAYGO model in Uganda, Tanzania and Kenya
	Modjo Energies is a Ugandan tech company using sustainable technologies to innovate & deploy accessible and affordable transport solutions	Electric motorbikes	Received USD 20K from NSSF Hi Innovator program to scale access to e-motorbikes
	Zembo (Zero Emission Motorcycle Boda) is a start-up founded in 2018 specializing in innovative and sustainable mobility solutions for Africa	Electric motorbikes	Raised USD 3.4M from several international funders including Toyota and InfraCo to expand operations in Uganda

## A number of mini-grids have been constructed in Uganda due to support from the private sector, UG government, dev't partners & other financiers (1/4)


Region	Existing mini-grids	Years in operation	Technology & capacity*	Developer & partners	Funds raised and financiers
 <b>Central</b>	<b>Tiribogo gasification</b>	8	32kW Biomass gasification 170 connections	<b>Developer:</b> Pamoja Energy Ltd <b>Partner:</b> Former REA	Grant from Royal Institute of Technology Stockholm & Renewable Energy Business Incubator (REBI)
	<b>Magara gasification</b>	7	32kW Biomass gasification 72 connections	<b>Developer:</b> Pamoja Energy Ltd <b>Partner:</b> REA	Grant from Royal Institute of Technology Stockholm & Renewable Energy Business Incubator (REBI)
	<b>Bukuzindu solar-diesel plant</b>	7	Hybrid gen. station 600 kW (Solar) & 1.6MW (Diesel) 40 villages (~2500 hhs)	<b>Developer:</b> Kalangala Infrastructure Services	\$50M from a mixture of debt, grants and equity from Uganda Development Cooperation, Industrial Development Corporation of South Africa, Nedbank, Emerging Africa Infrastructure Fund & GuarantCo <sup>1,2</sup>
	<b>Kiboga solar mini-grid</b>	10	1kW Solar PV 11 connections	<b>Developer:</b> Centre for Research in Energy and Energy Conservation	Grant from National Council for Science and Technology (NCST)
	<b>Kitobo Solar Plant</b>	5	230kW Solar PV 541 connections	<b>Developer:</b> Absolute Energy Africa Ltd	\$730K grant financing from Energy and Environment Partnership (EEP) , Shell Foundation, FinAfrica <sup>3</sup>

## A number of mini-grids have been constructed in Uganda due to support from the private sector, UG government, dev't partners & other financiers (2/4)


Region	Existing mini-grids	Years in operation	Technology & capacity*	Developer & partners	Funds raised and financiers
 Central	<b>Kichner solar minigrid</b>	12	22kW Solar PV 60 connections	<b>Developer:</b> Kirchner Solar Ltd <b>Partners:</b> Former REA	\$246K grant subsidy from GiZ <sup>1</sup>
	<b>Bunjanko Island mini-grids</b>	<1	128 kW Solar PV 500 connections	<b>Developer:</b> Winch Energy <b>Partner:</b> Total Energies	Equity funding of USD 1M from both Winch Energy and Total Energies <sup>2,3</sup>
	<b>Kiwumu solar mini-grid</b>	<1	40 kW solar PV 300 households and 60 businesses	<b>Developer:</b> Equatorial Power <b>Partners:</b> UMEME, Power for All	Grant funding from the Rockefeller Foundation <sup>4</sup>
 West	<b>Kayanja Solar microgrid</b>	7	5kW Solar PV 70hhs	<b>Developer:</b> Remergy Energy Ltd <b>Partners:</b> World-Wide Fund for Nature, Access 2 innovation	Equity from Remergy Energy solutions
	<b>Bwindi community microgrid</b>	7	64kW Hydro 42 connections	<b>Developer:</b> Bwindi Community Hospital <b>Partners:</b> GiZ & EnDev	\$1.23M - \$123M grant from GiZ and EnDev <sup>5</sup>

Sources: UOMA research and analysis 1. Ivan Nygaard et al, Market for the integration of smaller wind turbines in mini-grids in Uganda, 2018 [\[Link\]](#) 2.UOMA consultations 3. Winch Energy website [\[Link\]](#) 4. Power for All, Twaake Pilot Factsheet, 2021 [\[Link\]](#) 5. SEforALL, Market study on available financial instruments in support of GMGs and assessment of GMG developer needs, 2017 [\[Link\]](#)



## A number of mini-grids have been constructed in Uganda due to support from the private sector, UG government, dev't partners & other financiers (3/4)

Region	Existing mini grids	Years in operation	Technology & capacity*	Developer & partners	Funds raised and financiers
 West	<b>Kisiizi Hydropower</b>	38	300kW hydro & 60 kW hydroelectric & diesel generator of 80kva 710 connections	<b>Developer:</b> Kisiizi Power <b>Partners:</b> Kisiizi Hospital, Church of Uganda	\$900K; 30% equity from Kisiizi Hospital and 70% grant from the World Bank <sup>1</sup>
	<b>Kyamagaruru solar plant</b>	7	13kW Solar PV 68 connections	<b>Developer:</b> Energy for Development <b>Partners:</b> Former REA	Grant from University of Southampton
	<b>Kanyegaramire solar plant</b>	7	13kW Solar PV 74 connections	<b>Developer:</b> Energy for Development <b>Partners:</b> REA	Grant from University of Southampton
	<b>Eco-Garden micro-hydropower plant</b>	8	5kW Hydro 16 connections	<b>Developers:</b> Eco-Gardens Rwenzori <b>Partners:</b> Renewable Energy Business Incubator (REBI)	Equity from Eco-Garden Rwenzori
	<b>Kabalega Hydropower plant</b>		9MW Hydro 203 connections	<b>Developers:</b> Hydromax Limited <b>Partners:</b> Former REA	Equity from Hydromax; additional \$53.7M grant from the Norwegian government and \$23.7M debt from the French Development Agency <sup>1</sup>

## A number of mini-grids have been constructed in Uganda due to support from the private sector, UG government, dev't partners & other financiers (4/4)

Region	Existing mini-grids	Years in operation	Technology & capacity*	Developer & partners	Funds raised and financiers
 <p>West</p>	<b>RMS Pico Hydropower</b>	9	5kW Hydro 3 connections	<b>Developer:</b> Rwenzori Mountaineering Services (RMS)	Grant from Private Sector Foundation Uganda (PSFU)
	<b>Pamoja gasification – Kamwenge District</b>	4	75kW Biomass gasification 500 connections	<b>Developer:</b> Pamoja Energy Limited	\$369K grant from Energy and Environment Partnership (EEP) Programme
	<b>Nakivale Refugee camp Solar mini-grid</b>	2	10.8 kW Solar PV 4 connections	<b>Developer:</b> UNHCR Partner: Office of the Prime Minister	Grant support from UNHCR <sup>1</sup>
	<b>Katiirwe solar mini-grid</b>	2	50 kW Solar PV 200+ connections	<b>Developer:</b> PowerGen Renewable Energy	Equity from Kyegegwa Rural Electricity Co-operative Society
	<b>Suam Micro Hydropower plant</b>	9	40kW Solar PV 126 connections	<b>Developer:</b> GiZ and EnDev <b>Partners:</b> Former REA	\$1.2M - \$12M grant from GiZ and EnDev <sup>2</sup>

## A number of mini-grids have been constructed in Uganda due to support from the private sector, UG government, dev't partners & other financiers (4/4)

Region	Existing mini-grids	Years in operation	Technology & capacity*	Developer & partners	Funds raised and financiers
 <b>East</b>	<b>RMS Pico Hydropower</b>	9	5kW Hydro 3 connections	<b>Developer:</b> Rwenzori Mountaineering Services (RMS)	Grant from Private Sector Foundation Uganda (PSFU)
	<b>Lolwe Island mini-grid</b>	<1	600kW solar PV plant on Lolwe Island Namayingo District Expected to serve 3,700 connections	Developer: Equatorial Power	Development through a joint-venture with Engie Energy Access
 <b>North</b>	<b>Lamwo Mini-grids, Northern Uganda</b>	<1	Capacity of 30kW to 80kW per site 25 villages in Lamwo District	<b>Developer:</b> Winch Energy <b>Partners:</b> MEMD	\$28.5M grant from the German government

## There are several up-coming mini-grids across all regions in Uganda; some of these have already raised funds from DFIs and European governments (1/2)

Region	Developer/ Tender	Technology & capacity	Partners and funds raised & financiers
Central	<b>Bakulu Power</b>	<ul style="list-style-type: none"> <li>Solar mini-grid total of 600kW in Buvuma district</li> <li>Potential to reach ~8,000 people</li> </ul>	<b>Partners:</b> Former REA, Energy for Impact
	<b>Absolute Energy</b>	<ul style="list-style-type: none"> <li>Estimated capacity of 100kW Solar PV</li> <li>Located in Kalangala District with potential impact of 5,400 people</li> </ul>	<b>Partners:</b> Former REA
	<b>AfDB and REA</b>	<ul style="list-style-type: none"> <li>(10) decentralized mini-grids on Lake Victoria</li> </ul>	<b>Partners:</b> Former REA
	<b>Equatorial Power</b>	<ul style="list-style-type: none"> <li>(15) Solar mini-grids on Lake Victoria Islands with a combined capacity of 1.56 MW</li> </ul>	<b>Partners:</b> MEMD
Western	<b>ORIO Infrastructure Fund</b>	<ul style="list-style-type: none"> <li>(10) mini hydro projects</li> <li>Capacity of 50 to 500 Kw</li> </ul>	<b>Partners:</b> UECCC <b>Funds raised &amp; financiers:</b> \$14.5M grant from Emerging Africa Infrastructure Fund, FMO (Dutch development Bank) <sup>1</sup>

## There are several up-coming mini-grids across all regions in Uganda; some of these have already raised funds from DFIs and European governments (2/2)






Region	Developer/ Tender	Technology & capacity	Partners and funds raised & financiers
<b>Southern</b>	<b>Winch Energy</b>	<ul style="list-style-type: none"> <li>Capacity of 30kW to 80kW per site</li> <li>15 villages in Rakai &amp; Isingiro</li> </ul>	<p><b>Partners:</b> GiZ and Former REA</p> <p><b>Funds raised &amp; financiers:</b> \$28.5M grant from the German government<sup>1</sup></p>
<b>Northern</b>	<b>Mandulis Energy</b>	<ul style="list-style-type: none"> <li>20MW biomass project in Gulu</li> </ul>	<p><b>Partners:</b> KfW, Power Africa</p> <p><b>Funds raised &amp; financiers:</b> \$1M grant from Sustainable Energy Fund for Africa (SEFA) and African Development Bank<sup>2</sup></p>



## International and local NGOs are increasingly playing a role in electrification of schools and health centers (1/2)

Business	Summary	Product offering	Milestones and updates
	Solar sister is an international NGO that empowers women entrepreneurs through energy access	Residential products including lanterns and accessories	Powered several health centers as part of their COVID response including health centers in Pushit & Amuro in N. Uganda
	We Care Solar is a global NGO reducing maternal mortality with solar powered reliable lighting & medical devices with a presence in Uganda, Liberia, Sierra Leone and Zimbabwe	Developed solar suitcase, a compact solar home system for maternal health facilities that includes medical lighting, phone charging, a fetal doppler, and thermometer	Launched the "Light every birth" program in Uganda in 2018 that included the donation of 350 solar suitcases to health centers
	Solar Electric Light Fund (SELF) is an international NGO providing energy solutions to the last mile in partnership with development partners such UNHCR and UN Foundation	Residential and commercial products	Main contractor on a UN Foundation project that electrified 62 health centers in rural Uganda and Ghana; the electrification of 36 health centers in Uganda was sub-contracted to All in Trade
	Little Sun is a global NGO providing small portable solar lamps for energy impoverished communities living without electricity	Residential products such as lanterns and lamps	Distributed over 6,500 lamps to communities without electricity in Uganda in partnership with Energi Nord, a Danish energy company
	Innovation Africa is an NGO providing energy solutions for health centers and schools and has been active in 10 SSA countries including Uganda	Commercial products for institutional consumers including large modular systems, solar water pumps, and solar heaters	Electrified several schools and health centers in Uganda with systems including remote monitoring system for donors to monitor real time performance

## International and local NGOs are increasingly playing a role in electrification of schools and health centers (2/2)

Business	Summary	Product offering	Milestones and updates
	<p>Green empowerment is a global renewable energy non-profit working with rural communities and partners to improve access to energy</p>	<p>Commercial products for institutional consumers such as schools and hospitals</p>	<p>Launched an app for remote data collection in partnership Medical Teams to support community service providers to understand their energy needs without having technical expertise</p>
	<p>Solar Health is a Uganda based non-profit founded in 2017 working with local and international orgs to address entrenched energy poverty</p>	<p>Commercial products for institutional consumers, including lights and solar pumps</p>	<p>Electrified 56 off-grid health centers, distributed over 144K pico lights to vulnerable communities, and established 2 women solar entrepreneur groups</p>
	<p>Stiftung Solarenergie is a German based NGO that promotes reliable, affordable and environmentally friendly energy for households and institutions</p>	<p>Commercial and industrial products for institutions such as schools and health centers</p>	<p>Supported the electrification of 43 health centers in partnership with Sendea association and Signify Foundation</p>
	<p>Solar Aid is an international development charity working to create a sustainable market for solar lights in Africa</p>	<p>Residential products such as solar lights, lamps, and lanterns</p>	<p>Opened offices in Uganda in 2014 and set up an entity now running as Xpreme Solar Solutions which has distributed over 80K solar lights</p>
	<p>Joint Energy and Environment Projects (JEEP) is an NGO working for an environmentally safe and clean Uganda</p>	<p>Commercial products targeted at institutional consumers such as solar lighting, phone charging &amp; refrigerators</p>	<p>Electrified 63 schools with lighting systems, set up phone charging systems for 4 communities, and provided refrigerators to 3 health centers</p>

## A number of facilities have been set up in the region to promote the off-grid energy sector (1/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>SunFunder – Solar Energy Transformation Fund<sup>1</sup></b>	Support 50 solar companies to grow, with a potential to serving up to 3 million people	Solar Energy	Debt	\$70M	East and West Africa
<b>Mobile for Development Utilities Innovation Fund</b>	Test & scale the use of mobile to increase access to energy, water and sanitation	Seed grants and market validation grants	Grant	\$2.6M	SSA
<b>SunFunder – Beyond the Grid Solar Fund (BTG)<sup>2</sup></b>	Specialist debt financing partner for solar companies active in off-grid residential, commercial & industrial	Off-grid, productive use and C&I solar	Debt	\$50M	East and West Africa
<b>Global LEAP Awards</b>	Highly energy-efficient, durable, off- and weak-grid appropriate refrigerators. Awards are ongoing on an annual basis	Productive use	£100k	Dependent on co. & funds raised	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (2/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>SIMA Fund for Off-grid solar<sup>1</sup></b>	Provide commercial capital and advisory to energy businesses with financial, social, and env. impact	High risk, earlier stage businesses	Debt	\$90M	SSA
<b>Solar Frontier Capital</b>	Provide local currency lending for pay-as-you-go off-grid solar companies across sub-Saharan Africa	PAYG companies	Debt	\$100M	Africa
<b>Off-grid Energy Access Fund<sup>2</sup></b>	Catalyze local financial markets' support for innovative energy access strategies	The household energy access sector including distributors, manufacturers & credit providers	Debt	\$500M	SSA
<b>TRINE</b>	Invest in solar energy in growing markets	Solar Energy	Crowdfunding	Dependent on co. & funds raised	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (3/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Pioneer Energy Investment Initiative</b>	Support, scale, and learn from innovative energy companies impacting 8 M people through Acumen's portfolio by 2026	Energy generation (SHS, Solar & hybrid mini-grids) & Energy usage (Innovations for energy use)	Common & Preferred Equity, Convertible Debt	\$22.8M	East & West Africa
<b>Energy Entrepreneur Fund</b>	Dev. of state-of-the-art tech., products & processes in energy efficiency, power generation, heat and electricity storage	SME's Incubation support	Mezzanine debt	\$50M	SSA
<b>ResponAbility Energy Access Fund</b>	Provide working capital to manufacturers & distributors of modern energy products	Solar, biomass, geothermal & wind distributed generation (captive generation & mini-grids)	Equity and quasi equity	\$30M	Kenya, UG, TZ, Rwanda
<b>African Renewable Energy Fund</b>	Increase renewable energy generation in Africa	Small hydro, wind, geothermal, solar, stranded gas and biomass projects)	Equity	\$10M – 30M / co	SSA excluding SA

## A number of facilities have been set up in the region to promote the off-grid energy sector (4/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Efficiency for Access Coalition</b>	Support & accelerate innovation in off-grid and weak grid appliance tech and markets; fund applications closed in 2019	Productive use	Grant	\$1M	SSA
<b>Facility for Energy Inclusion Off-Grid Energy Access Fund</b>	Development of state of the art tech., electricity storage	SME's Incubation support	Mezzanine debt	\$50M	SSA
<b>EU-Africa Infrastructure Trust Fund</b>	Mobilize additional finance for infrastructure projects in sub-Saharan Africa; fund applications closed in 2019 <sup>1</sup>	Geothermal, hydropower, solar & wind power, transmission lines, sustainable cooking fuels	Grants blended with long term financing	~\$920M	SSA
<b>Emerging Africa Infrastructure Fund</b>	Encourage and mobilize private investment in infrastructure in SSA to promote economic dev't	Energy, Transport Water & Sanitation ICT, Agribusiness & Mining	Senior, subordinated or mezzanine debt	~\$1.2M	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (5/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Development Innovation Ventures</b>	Provide flexible, tiered grant funding to test and scale evidence-driven innovation to any development challenge	Sector agnostic	Grant	Not available up to \$5m/co	Global
<b>Sustainable Energy Fund for Africa (SEFA)</b>	Support private-sector led economic growth through the efficient utilization of untapped clean energy resources	Clean energy	Grant and equity	\$95M	SSA
<b>USAID-Derisking PAYGO</b>	Mobilize additional finance for SHS co.s that wish to expand sales of PAYGO SHS in refugee settlements; fund applications closed in 2019 <sup>1</sup>	PAYGO SHS	Grant	Not available \$145k-175k/co.	Uganda
<b>AlphaMundi Foundation – Powering Ag</b>	Catalyse financing for businesses providing clean energy solutions that inc. ag. productivity and/or value in developing countries	Irrigation co.s operating at the nexus of clean energy & agriculture	Grant, Debt, Equity or mezzanine financing	Not stated \$100k-\$2m/co	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (6/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>BEAM investment platform</b>	Cloud-based platform, aiming to provide developmental infrastructure for off-grid energy services across SSA	Off-grid energy	Equity	\$50M	Africa
<b>Solar Electric Light Fund<sup>1</sup></b>	Design & implement solar energy solutions to assist people living in poverty	Solar	Grant	Not available	Uganda
<b>Energy Access Venture Fund<sup>2</sup></b>	SMEs active in electricity generation and distribution, and electricity related services in SSA	SHS, Micro-grid infrastructure & hybrid technologies	Equity and Quasi-equity	\$55M	EA and Southern Africa
<b>The EnAccess Foundation</b>	Address innovation challenges that renewable energy companies face through lack of financing	Irrigation companies operating at the nexus of clean energy & agriculture	Grant, Debt, Equity or mezzanine financing	\$0.5M	EA and Southern Africa



## A number of facilities have been set up in the region to promote the off-grid energy sector (7/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Biodiversity Investment Fund</b>	Provide attractive loan financing for businesses that can demonstrate impact or contribution towards biodiversity in Uganda	Off-grid energy	Equity	\$50M	Africa
<b>EnDev Uganda</b>	Give support in energy policy, improved biomass technologies, rural electrification & energy efficiency.	Pico PV & SHS Grid densification	No info	€12.25M	Uganda
<b>EEP Africa</b>	Provide early stage & catalytic financing to innovative clean energy projects, technologies	Solar PV	Grant	Not available €200k – 500k/co.	EA and Southern Africa
<b>Frontier Energy II Fund</b>	Develop, construct and operate renewable energy generation projects	Renewable energy	Equity or mezzanine debt	\$60M (\$227M – to verify) <sup>1</sup>	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (8/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Frontier Energy I Fund<sup>1</sup></b>	Develop, construct and operate renewable energy generation projects; fund closed in 2017	Renewable energy	No info	\$60M	East Africa
<b>USADF SCC Grants<sup>2</sup></b>	Support businesses to identify and scale innovative efforts to address energy access gaps for refugees; the grants were awarded in 2019	Off-grid energy, internet and digital technology	Grant	~\$370K	Uganda
<b>USADF Off-Grid Energy Challenge<sup>3</sup></b>	Support entrepreneurs to develop and scale up off grid proven technologies in rural communities	Off-grid energy but women-led projects are targeted in Uganda	Grant	\$100K/co.	SSA
<b>BEAM – ElectriFI Fund<sup>4</sup></b>	Provide early stage equity capital for SHS distributor companies to help further unlock debt capital	SHS	Equity	\$8M	Africa

## A number of facilities have been set up in the region to promote the off-grid energy sector (9/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>SIMA Angaza Distributor Financing Fund<sup>1</sup></b>	Invest in off-grid distribution companies to close cash flow gaps from customer instalment payments; fund is accepting applications	PAYGO companies	Debt	\$5.7Billion	Global
<b>Renewable Energy Challenge Fund<sup>2</sup></b>	Aim to increase adoption of off grid PV solutions that can stimulate economic activity; fund is ended in December 2020	Productive use, solar and clean cooking	Grant	~\$4M	Uganda
<b>KawiSafi Ventures Fund<sup>3</sup></b>	Invest capital to scale companies providing clean, affordable and efficient energy to low income populations	Off grid solar power	Grant and equity	\$70M	East Africa
<b>SIMA Off-Grid Solar and Financial Access Senior Debt Fund I<sup>4</sup></b>	Finance innovative companies that invest in, manufacture, and/or distribute individual SHS; 5-year fund since 2017	SHS	Senior debt	\$90M	SSA and South Asia

## A number of facilities have been set up in the region to promote the off-grid energy sector (10/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Climate Investor One<sup>1</sup></b>	Provide funding to develop renewable energy projects to reduce power deficits, energy costs and CO2 emissions	Clean energy	Debt and equity	\$80M	SSA
<b>GEEREF NeXt Funds<sup>2</sup></b>	Catalyse private sector investment for renewable energy through being an anchor investor to encourage other investors to co-invest	Renewable energy and energy efficiency	Grant, equity	\$765M	Global
<b>ARCH Africa Renewable Power Fund (ARPF)<sup>3</sup></b>	Invest capital to scale companies providing clean, affordable and efficient energy to low income populations	Wind, solar PV, hydro power, geothermal and biomass	Equity	\$25M	SSA
<b>Universal Green Energy Access Programme (UGEAP)<sup>4</sup></b>	Increase financing for renewable energy scaling up investments from local financial markets and the international private sector.	SHS, mini grids, on-grid installations	Debt, mezzanine debt, guarantees	\$500	SSA

## A number of facilities have been set up in the region to promote the off-grid energy sector (11/11)

Fund/Facility	Purpose	Focus	Instrument	Fund Size	Region Focus
<b>Beyond the Grid Fund For Africa (BGFA3)<sup>1</sup></b>	Establish up to 600,000 energy connections and benefit more than 3 million people in remote areas of Uganda.	Clean energy	Grant	€ 20.7M	Uganda
<b>Nithio Financial Intermediary</b>	Utilize innovative AI-enabled platform to finance off-grid energy companies; includes receivables and inventory financing	Mini-grids, SHS, Productive use, Microfinance	Debt	\$ 24.5M	East and West Africa
<b>SIMA Energy Access Relief Fund (EARF)</b>	Provide affordable financing to support off-grid solar firms facing financial issues due to disruptions caused by COVID-19	SHS	Debt	\$68 million	Sub-Saharan Africa and Asia
<b>ElectriFi Uganda Country window</b>	To mitigate the effects of climate shocks and build resilience by accelerating clean energy access	Clean energy		€ 5M	Uganda

# The Ministry of Energy and Mineral Development and several other agencies are dedicated to advancing access to energy

## Government body



### Ministry of Energy and Minerals Development (MEMD)

## Mandate in industry

- Has the overarching mandate to promote development of sustainable use of energy and mineral resources
- Renewable energy department serves under this Ministry and runs a number of the programs for access both for on- and off-grid energy
- Recently re-absorbed the Rural Electrification Agency (REA) that had a mandate to support rural electrification access with special regard to marginalized communities



### Electricity Regulatory Authority (ERA)

- Regulates the electricity supply industry and issues licenses for generation, transmission, distribution or sales of electricity, as well as ownership or operation of transmission systems
- Establishes tariff structures and investigates tariff charges, approves rates, terms, and conditions of electricity services provided by generation, transmission, and distribution companies

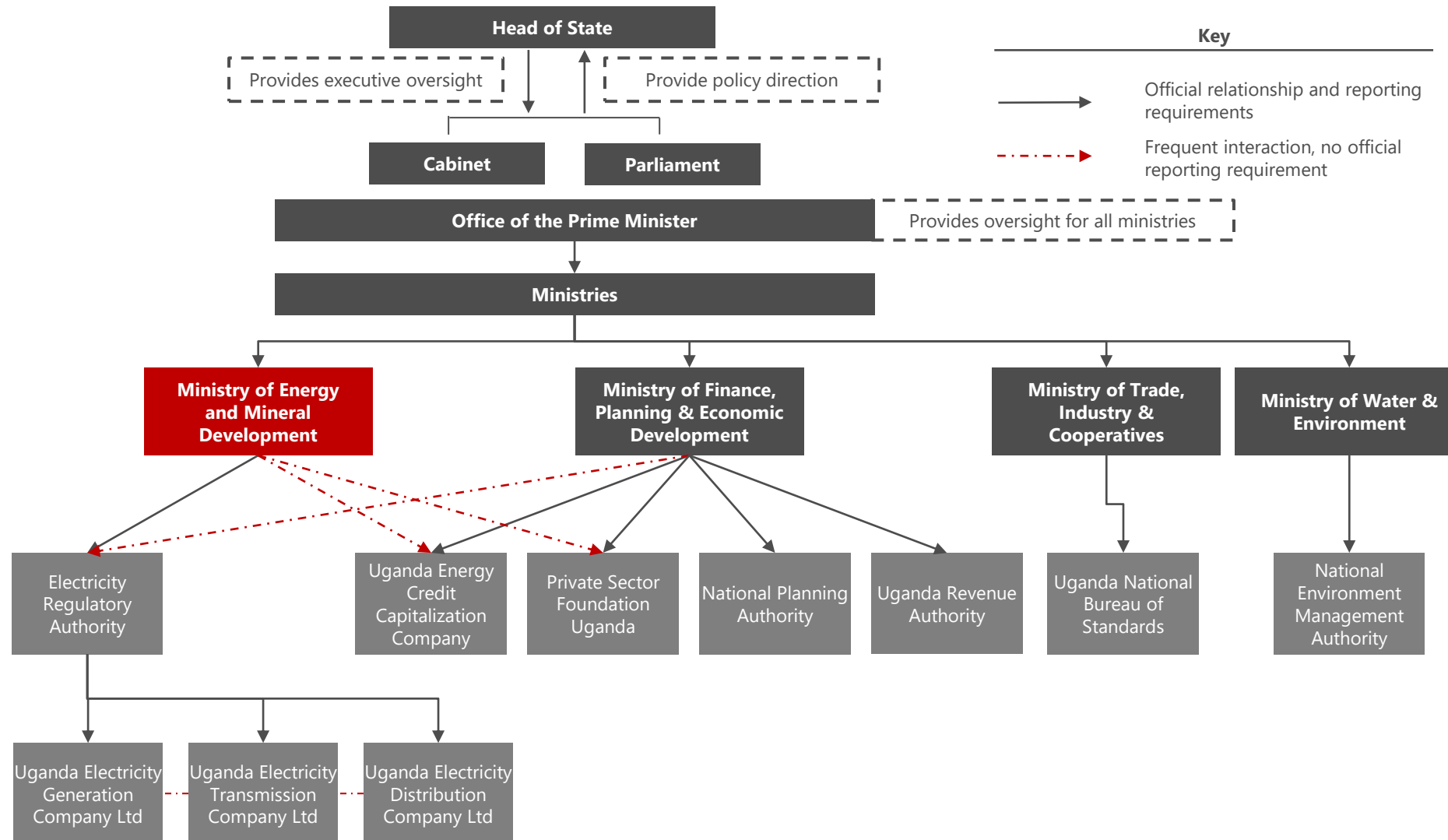


### Uganda Energy Credit Capitalization Company (UECCC)

- Facilitates investments in renewable energy sector by providing financing products and technical assistance to firms in the sector
- Channels investment to projects as the administrator of Uganda Energy Capitalization Trust, the framework for pooling resources from government and development partners

**Most notable change has been the reabsorption of REA into MEMD, with rural electrification ownership transferred back to the ministry**

# Several additional government institutions are interlinked with oversight on issues affecting off-grid



## Uganda has several policies in place to guide the energy sector (1/2)

Policy name	Policy description	Status
<b>2002 Energy policy</b>	Policy sets out meet the energy needs of Uganda's population for social and economic development in an environmentally sustainable manner <sup>1</sup>	Active
<b>Draft Energy policy, 2019</b>	The Uganda Energy Policy is a policy document that is geared toward facilitating access to modern, affordable, and reliable energy services among Ugandans. The policy advocates for the use of off-grid energy solutions to facilitate energy access in rural/remote parts of Uganda <sup>2</sup>	In draft
<b>National Electrification Strategy</b>	This off-grid regulation will help Uganda's energy sector to encourage further private sector investment and achieve its ambitious national electrification target of 80% electricity access by 2040 <sup>3</sup>	Active
<b>Electricity Act 1999</b>	Provides the legal, regulatory and institutional framework governing the energy sector in Uganda. It contains provisions on rural electrification, licensing requirements for the energy sector; electricity supply activities; land use for electrical supply activities; and criminal penalties for licensing-related offenses. <sup>3</sup>	Active



## Uganda has several policies in place to guide the energy sector (1/2)

Policy name	Policy description	Status
<b>Electricity Amendment Bill, 2022</b>	The objects and principles of this bill are to amend the Electricity Act, Cap. 145 to provide for among other things deterrent penalties for theft of electricity and vandalism of electrical facilities. <sup>1</sup>	Active
<b>Electricity Connections Policy, 2018-2027</b>	The policy was developed by the Government to address the challenge of low connection rates and aims to achieve a 60% level of access to electricity for Uganda by 2027 <sup>2</sup>	Active
<b>Isolated Grid Regulation, 2020</b>	This off-grid regulation seeks to help Uganda's energy sector to encourage further private sector investment and achieve its ambitious national electrification target of 80% electricity access by 2040 <sup>2</sup>	Active
<b>Rural Electrifications Strategy plan 2013-2022</b>	RESP seeks to increase off-grid energy services by approximately 140,000 additional installations of solar PV systems and mini-grid distribution service connections by 2022. <sup>3</sup>	Active
<b>Guidelines for electronic waste management in Uganda</b>	The overall objective of the E-waste management policy is to facilitate the sustainable management of E-Waste in Uganda, including OGS waste. <sup>1</sup>	Active

# The European Union is supporting a number of programs to influence the private sector and advance off-grid access (1/5)



**Program:** Scaling-up rural electrification using innovative solar photovoltaic (PV) distribution models

## Approach

- Provide business training & specific solar PV energy training to CBOs
- Provide 51 social institutions with solar PV systems
- Set up solar mini-grids in 6 trading centers in Kasese and Rubiziri districts

## Impact to date

- 3,000 households connected to solar home systems
- Solar systems (1000W each) installed in 31 schools and 20 health centers in 6 districts
- Contractor selected for installation & management of 6 mini-grids
- Capacity of CBOs to install & manage solar photovoltaic technology strengthened

## Affiliated organizations



**Implementers:**

WWF in partnership with Kasese District Local Government and Enterprise Uganda Foundation



**Funders:**

ACP-EU

## Overview

- **Target action:** Scale up the use of solar PV systems at schools, health centers, and business levels in the districts of Kasese, Arua, Masindi and 17 other districts in Albertine & build local capacity to install & maintain solar PV systems
- **Project status:** Ongoing
- **End date:** 2023
- **Target industry:**



SHS



Mini-grids

# The European Union is supporting a number of programs to influence the private sector and advance off-grid access (2/5)



**Program:** Access to energy services in rural and peri-urban areas in Northern Uganda (Teko Wa Project)

## Approach

- Provide a no. of social institutions with energy efficient cook stoves & solar systems
- Disseminate, in co-operation with private companies, SHS and cooking stoves to households
- Include awareness and build capacities of local communities in sustainable management of bio- energy resources

## Impact to date

- 2,924 ha of woodlots and orchards established within by the project and a number of tree seedling businesses set up
- 35,366 households and 24 institutions accessed energy efficient stoves
- 25,750 households and 24 institutions accessed with solar home systems for lighting

## Affiliated organizations



**Implementers:**

Church of Sweden in Partnership with Lutheran World Federation Uganda



**Funders:**

EU

## Overview

- **Target action:** Sustainable management of bio – energy resources, increasing use by households and social institutions of solar PV energy and energy efficient cook stoves
- **Project status:** Closed
- **End date:** April 2020
- **Target industry:**



SHS



Cook stoves



Bio fuels

# The European Union is supporting a number of programs to influence the private sector and advance off-grid access (3/5)



**Program:** Scaling up access to modern electricity services on a regional scale in rural Sub-Saharan Africa by means of a fee for service business model

## Approach

- Provide several households and SMEs with access to energy services via SHS and solar mini-grids
- Facilitate bi-annual workshops for areas in the four countries concerned

## Impact to date

- The project has 3,460 new SHS customers in Mali and Uganda (42% of the target). Target achieved in Mali and 60% customers recruited in Uganda.
- 4,496 SHSs have been installed in Mali, Guinea-Bissau and Uganda.

## Affiliated organizations



**Implementers:**

Foundation Rural Energy Services



**Funders:**

ACP-EU

## Overview

- **Target action:** Working to scale up access, in the predominantly rural, poor communities of the targeted countries in Cameroon, Mali, Uganda and Guinea-Bissau
- **Project status:** Closed
- **End date:** December 2020
- **Target industry:**



SHS



Mini-grids

# The European Union is supporting a number of programs to influence the private sector and advance off-grid access (4/5)



**Program:** The Uganda Green Enterprises Finance Accelerator (UGEFA)

## Overview

- **Target action:** Offers integrated package of enterprise capacity building through workshops and peer mentoring for investor readiness and;
  - Facilitation of tailored and accessible loans in partnership with local banks and;
  - Building an a supportive ecosystem around green SMEs by training business advisors and trainings for financial institutions
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Cook stoves

## Approach

- The fund discounts loans of between US\$ 10,000 to US\$ 100,000 with 1/3 of the total loan amount repaid directly by a UGEFA grant, thereby reducing total principal and interest repayment amounts
- Additionally, investees receive 6 months of technical assistance to help restructure operations to build resilience under COVID-19

## Impact to date

- Announced first call for application and admitted first cohort of businesses into the accelerator
- Announced second call for applications for green enterprises
- Signed MOUs with three Uganda banks including Yako Bank Limited, Equity Bank Limited and Opportunity Bank Limited to begin lending to entrepreneurs

## Affiliated organizations



### Implementers:

Finding XY, Adelphi



### Funders:

EU

# The European Union is supporting a number of programs to influence the private sector and advance off-grid access (5/5)



**Program:** COVID-19 Economic Relief Fund For The Off-Grid Solar And Cook Stove Sector

## Overview

- **Target action:** To temporarily cover the costs of households to maintain their solar PAYGO systems, to temporarily cover solar and ICS companies' operating costs to maintain their activity and to implement trainings, while also allowing for strategic investments that increase the companies' resilience and future growth potential
- **Project status:** Closed
- **End date:** March 2021
- **Target industry:**



SHS



Cook stoves

## Approach

- COVID-19 Relief to SMEs covering customer monthly payments– to mitigate loss of energy access in Ugandan households and the losses of energy access companies  
Provide ICS and solar companies funding to invest into their company for production and distribution infrastructure
- Develop the training offer from sector associations and other entities

## Impact to date

- Disbursed grant support to 26 off-grid solar and improved cook stove companies ranging from early-stage to mature; 14 solar companies & 12 cookstove companies
- An impact assessment that was conducted after the close of the fund showed that customers had continued energy access

## Affiliated organizations



### Implementers:

PSFU, EnDev



### Funders:

EU

# World Bank has partnered with the government to implement the 15-year ERT initiative to improve lives of rural households



WORLD BANK GROUP

**Program:** Energy for Rural Transformation Phase III (ERT-3)<sup>1</sup>

## Approach

**Off-grid component:**

- Installation of solar PV systems for public institutions in rural areas
- Business development support
- Provision of credit facilities & quality standards enforcement support

## Impact to date

- USD 8.5 million fund to disbursed to local banks to provide working capital financing to SHS PAYG operators
- 944,963 people provided with access to electricity by household
- 37,364 people provided with electricity using off-grid and mini-grid solutions
- 329 health centers provided with access to electricity

## Affiliated organizations



**Implementers:**

REA, MOWE, MOH, MOESD, UECCC, PSFU & MEMD



**Funders:**

World Bank/GEF

## Overview

- **Target action:** Increase access to electricity in rural Uganda, with focus on three components:
  - On grid access
  - Off-grid access
  - Institutional strengthening through impact monitoring
- **Project status:** Ongoing; near completion
- **End date:** Closed
- **Target industry:**



SHS



On-grid



Mini-grids

Sources: UOMA interviews & consultations, supplemented by

1. World Bank, [Energy For Rural Transformation III](#), 2021

# World Bank also runs independent programs to advance access & create a conducive environment for private sector growth



WORLD BANK GROUP

**Program:** Lighting Africa Campaign<sup>1</sup>

## Overview

- **Target action:** Enable access to off-grid lighting and energy products for 250 million people across sub-Saharan Africa by 2030
- **Project status:** Ongoing; near completion
- **End date:** December 2021
- **Target industry:**



SHS

## Approach

### Catalyze the market through:

- Market intelligence and quality assurance
- Access to finance
- Consumer education, business development support and policy and regulation support

## Impact to date

- Market assessment study to determine demand for solar products, market bottlenecks, & assess options for supporting the growth; consumer awareness campaigns
- Supporting UNBS in adopting and enforcing internationally recognized standards
- 2M people impacted, ~920k quality products sold & ~185k GHG gas emissions avoided

## Affiliated organizations



### Implementers:

Broad global alliance – imps. varying by country



### Funders:

World Bank / IFC



# Additionally, World Bank is partnering with the government on an initiative on to scale up energy access for households, businesses and public institutions



WORLD BANK GROUP

**Program:** Uganda Electricity Access Scale-up Project (EASP)<sup>1</sup>

## Overview

- **Target action:** To increase access to energy for households, commercial enterprises, industrial parks, and public institutions
- **Project status: Pipeline;** Kick off expected in 2022
- **End date:** N/A
- **Target industry:**



SHS



On-grid



Mini-grids

## Approach

### Catalyze the market through:

- Market intelligence and quality assurance
- Access to finance
- Consumer education, business development support and policy and regulation support

## Impact to date

- Currently holding workshops to get input from various stakeholders
- USD 400 million in funding commitments

## Affiliated organizations



### Implementers:

Ministry of Energy and Mineral Development (MEMD), Uganda Energy Credit Capitalization Company(UECCC)



### Funders:

World Bank/IDA/IBRB

# USAID’s Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (1/8)



**Program:** The Power Africa Uganda Electricity Supply Accelerator

## Approach

- Supported generation and access projects through grants, transaction advisory support, short term technical assistance and linkages with other Power Africa partner tools

## Impact to date

- Power Africa, developed the national electricity connections Policy (ECP) in 2018 through which 223,058 on grid connections have been made, 1+ M people provided with access to power & ~USD 42 M mobilized
- Supported various sector stakeholders including USEA, REA and private operators such as Mandulis Energy

## Affiliated organizations



**Implementers:**

Energy and Security Group



**Subcontractors:**

NRECA International, Nexant, African Solar Designs & Konserve Advisory Services



**Funders:**

World Bank/IDA/IBRB

## Overview

- **Target action:** Facilitate the increase of clean energy electricity generation and electricity access among rural and urban communities in Uganda by working with clean energy generation and access project developers to reach financial close and project commissioning,
  - and enhance the enabling environment for clean energy investment
- **Project status:** Closed
- **End date:** 2020
- **Target industry:**



SHS



On-grid



Mini-grids

# USAID's Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (2/8)



**USAID**  
FROM THE AMERICAN PEOPLE

**Program:** Quality Assurance Framework for Mini-Grids<sup>1</sup>

## Overview

- **Target action:** Address some of the root challenges of providing safe, quality, and financially viable mini-grid power systems to remote customers
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



Mini-grids

## Approach

- Provide a flexible alternative to rigid top-down standards by defining:
  - Levels of service framework
  - Accountability and performance reporting framework

## Impact to date

- Provided a formalized, common standard for classifying energy consumers
- Facilitated aggregation of mini-grid projects & unlock private investment from data generated
- Supporting implementation of consumer protections, thus a better consumer service

## Affiliated organizations



### Implementers:

NREL, DOE



### Funders:

World Bank/IDA/IBRB

# USAID’s Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (3/8)



**Program:** Last Mile Distribution Results-Based Finance

## Approach

- The project’s strategy is to temporarily lower the cost of extending off-grid solar companies service coverage for Tier 2 products to last-mile areas and provide a risk protection mechanism for customer payment defaults. This strategy will be achieved through provision of up to three types of results-based financing incentives to companies selling solar home systems (SHS)

## Impact to date

- Announced a call for proposals for first phase in November 2020 and September 2021 targeting solar companies in Uganda & 14 companies were provided with funding
- Participating companies reached more than 5000 Households in the last mile communities across Uganda
- EnDev plans to conduct an Impact Assessment in early 2023

## Affiliated organizations



**Implementers:**

EnDev, PSFU



**Funders:**

USAID

## Overview

- **Target action:** To increase energy access through solar home systems (SHS) to last-mile households in Uganda by incentivizing off-grid solar companies to develop sustainable business models towards reaching the last mile
- **Project status:** Ongoing
- **End date:** 2022
- **Target industry:**



SHS

# USAID’s Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (4/8)



**Program:** Electricity Expansion and Improvement program

## Overview

- **Target action:** Rapidly increase electricity access in its rural areas
- **Project status:** Ongoing
- **End date:** 2022
- **Target industry:**



SHS



Mini-grids



On-grid

## Approach

- Develop 12 new master plans for all the rural service territories in Uganda
- Support REA to the develop a connections policy
- Support REA to develop an Off-grid Policy

## Impact to date

- The first 3 masterplans completed & identified >100 mini-grid sites in only 3 service territories
- > 120,000 new connections identified within the existing distribution footprint
- Electricity Connections Policy developed could add 1,400,000 new connections by 2022

## Affiliated organizations



**Implementers:**

NRECA, REA



**Funders:**

Power Africa

# USAID's Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (5/8)



**USAID**  
FROM THE AMERICAN PEOPLE

**Program:** Uganda Electricity Regulatory Partnership<sup>1</sup>

## Overview

- **Target action:** Support the development of a regulatory and policy framework for electricity access with focus on the role of mini-grids to address the electricity needs of rural customers
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



Mini-grids

## Approach

- Develop a practical guide to the regulatory treatment of mini-grids to outline the practical issues and potential decision-making tracks for regulators
- Implement a technical workshop on mini-grid technical, performance and interconnection guidelines to assist ERA in developing tailored technical and performance guidelines for mini-grid providers of electricity in rural service territories

## Impact to date

- Examined international best practices on mini-grid technical requirements (e.g. interoperability, compatibility)
- Developed an outline on mini-grid technical requirements, interconnection to the national grid and business models for interconnection, power quality, and service quality
- Developed an isolated mini-grid regulation that was passed into law

## Affiliated organizations



### Implementers:

NRECA, ERA



### Funders:

USAID / Power Africa

# USAID’s Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (6/8)



**Program:** Power Africa Off-grid Project<sup>1</sup>

## Overview

- **Target action:** Support the development of Africa’s off-grid solar home system (SHS) and mini-grid sectors by providing technical assistance and targeted grant funding
  - Advance the role of the private sector in extending energy access by working with companies, investors and governments through a team of technical advisors
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



## Approach

- Offering broad-based market intelligence to investors/financiers to inform financial product design
- Advising governments on establishing supportive policy frameworks, and providing hands-on support to companies

## Impact to date

- Supported several local SMEs with CFO support and treasure management; Offered sales and marketing support to local SMEs; Offered transaction advisory to local SMEs in the energy sector
- Conducted a market assessment for SMEs in Northern Uganda
- Drafted a country brief for Uganda
- Provided advisory support to 5 entities resulting in 5.5m USD in capital raised

## Affiliated organizations

- **Implementers:** Open Capital, Persistent Energy and various others
- **Funders:** USAID / Power Africa

Source: UOMA interviews & consultations, supplemented by 1.PAOP, [Connecting a continent beyond the grid](#),2021

# USAID’s Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (7/8)



**USAID**  
FROM THE AMERICAN PEOPLE

**Program:** Uganda Strategic Investment Activity (SIA)<sup>1</sup>

## Overview

- **Target action:** USAID Uganda’s Strategic Investment Activity (SIA) works to accelerate and grow the investment ecosystem by increasing transparency, lowering transaction costs and risks, and creating partnerships that unlock commercial investments in productive use of energy, health and agriculture sectors
- **Project status:** Ongoing
- **End date:** 2026
- **Target industry:**



Prod. use

## Approach

- To create a pipeline of up to 40 investable companies in energy & other sectors
- For transactions <500K the Activity mobilizes local service providers through results-based grants and subcontracts to facilitate deals to close
- For transactions >500K partners apply blended finance tools to de-risk larger investments and provide capital structuring, deal monitoring, and aftercare support

## Impact to date

- Uganda SIA is working to mobilize \$140 million in additional private capital in agriculture, health, and productive use of energy, improving the livelihoods of 100,000 underrepresented and marginalized people in Feed the Future zones
- SIA has conducted a PUE landscape assessment that maps the landscape of PUE in Uganda, highlights challenges and identifies opportunities to scale PUE adoption for both off-grid & on-grid use cases

## Affiliated organizations



**Implementers:**

Chemonics



**Subcontractors:**

Open Capital, Cross Boundary



**Funders:**

USAID / Power Africa



# USAID's Power Africa is playing a crucial role in leading and coordinating initiatives in Uganda (8/8)



**USAID**  
FROM THE AMERICAN PEOPLE

**Program:** Power Africa  
COVID-19 response<sup>1</sup>

## Overview

- **Target action:** Power Africa's COVID-19 response is working to support partner countries respond to the health crisis and to boost self-reliance for economic recovery
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



Mini-grids



On-grid

## Approach

- Providing demand-driven assistance to companies, investors, and industry associations aimed at ensuring business continuity, mobilizing relief funding, and advocating for government policies that recognize energy access as essential
- Electrifying rural health centers to ensure reliable energy supply given the need to power diagnostic equipment, ventilators, and cold chain demands

## Impact to date

- Connected the health center on Bugala Island to the mini-grid to support COVID-19 resilience
- Disbursed two grants totaling \$363,607 to electrify seven healthcare facilities that provide maternal and child health services in Malawi and Uganda; The Uganda grant totaling USD ~225K was awarded to Sustain Solar to electrify 5 health centers in Namayingo Islands in partnership with Equatorial Power

## Affiliated organizations



### Implementers:

Sustain Solar



### Subcontractors:

Equatorial Power



### Funders:

USAID / Power Africa

# FCDO initiatives work to increase investment in off-grid energy firms, overcome regulatory barriers & foster innovation (1/4)



Foreign &  
Commonwealth  
Office

**Program:** Energy Africa  
Campaign<sup>1</sup>

## Overview

- **Target action:** Accelerate expansion of household solar market to help bring universal electricity access in Africa forward from 2080 on current trends to 2030
- **Project status:** Closed
- **End date:** 2020
- **Target industry:**



SHS



Mini-  
grids

## Approach

- Campaign to improve policy and support conditions to accelerate market-based SHS delivery
- Core tool is Energy Africa Country Compacts matched with a coordinated multi-donor support offer

## Impact to date

- Coordinated & signed Energy Africa Compact with Ug government and other stakeholders making commitment to address several challenges facing the SHS market
- Market assessment to be conducted in all countries in then campaign

## Affiliated organizations



### Implementers:

MEMD, DFID, REA, SE4ALL, USEA, USAID / Power Africa, UNCDF, et al.



### Funders:

DFID

Sources: UOMA interviews & consultations, supplemented by

1. UK Government, [Energy Africa Campaign](#), 2015, 2. U.K Government, [DFID 7621 Transforming Energy Access - Research program delivery consortium](#), 2016, 3. Practitioner Network, [Applied research program - Transforming Energy Access](#), 2015

# FCDO initiatives work to increase investment in off-grid energy firms, overcome regulatory barriers & foster innovation (2/4)



Foreign & Commonwealth Office

**Program:** Transforming Energy Access (TEA)<sup>2</sup>

## Approach

- Partnership with Shell Foundation to support private sector innovations
- Support Innovate UK's Energy Catalyst to stimulate technology innovation
- Build other strategic innovation partnerships

## Impact to date

- Shell Foundation created Uganda Off-Grid Energy Market Accelerator to advance off-grid access
- Testing P2P Solar crowding platform
- Scoping potential partnership with Gates Foundation on Mission Innovation

## Affiliated organizations



**Implementers:**

Shell Foundation, Innovate UK



**Funders:**

DFID

## Overview

- **Target action:** Address critical evidence gaps, test innovative technology applications, business models, financing, & skills development to accelerate the provision of affordable, clean energy-based services to poor households & enterprises
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Cook stoves



Bio fuels

Sources: UOMA interviews & consultations, supplemented by

1. UK Government, [Energy Africa Campaign](#), 2015, 2. U.K Government, [DFID 7621 Transforming Energy Access - Research program delivery consortium](#), 2016, 3. Practitioner Network, [Applied research program - Transforming Energy Access](#), 2015

# FCDO initiatives work to increase investment in off-grid energy firms, overcome regulatory barriers & foster innovation (3/4)



Foreign &  
Commonwealth  
Office

**Program:** Africa Clean Energy Program (ACE)<sup>1</sup>

## Overview

- **Target action:** Catalyze a market-based approach for private sector delivery of solar home system (SHS) products and services which will lead to improved energy access to people across 14 countries in SSA
- **Project status:** Ongoing in **Zambia, Nigeria and Ethiopia**; Closed in **Uganda**
- **End date:** 2023
- **Target industry:**



SHS



Mini-grids

## Approach

- Provide TA to improve the enabling environment for market-based approach for private sector delivery of SHS
- Finance businesses wanting to enter new and emerging SHS markets in SSA
- Test innovative approaches to stimulating private sector investment and market development

## Impact to date

- REACT-HS awarded US\$ 7.4 million to 10 household solar companies with 8 disbursements beginning
- Invested US\$ 72.7M in technical assistance services to governments & companies entering the solar industry
- Invested US\$ 25M in development of the mini-grids sector

## Affiliated organizations



### Implementers:

AECF, TBC, IFC, DAI



### Funders:

DFID, World Bank, AfDB

# FCDO initiatives work to increase investment in off-grid energy firms, overcome regulatory barriers & foster innovation (4/4)



Foreign &  
Commonwealth  
Office

**Program:** Renewable Energy and Adaptation to Climate Technologies (REACT) Window, Africa Enterprise Challenge Fund<sup>1</sup>

## Overview

- **Target action:** Incentivizing private sector delivery of low-cost clean energy and climate adaptation technologies to help rural beneficiaries adjust to climate change and escape poverty using grant funding to catalyze greater investments into these sectors
- **Project status:** Closed
- **End date:** July 2021
- **Target industry:**



SHS

## Approach

- Facilitate a market driven approach to increased energy access through off-grid renewable energy, as well as increasing resilience & adapting to climate change in rural areas

## Impact to date

- Helping to demonstrate the viability of many of the companies that have accessed commercial investment (e.g. M-KOPA, Mobisol and Off-Grid Electric)
- Had invested >US\$ 20.6M by 2017 to developing low-cost clean energy and climate change technologies in selected African countries

## Affiliated organizations



### Implementers:

AECF



### Funders:

DFID

# Embassy of the Netherlands runs programs to support the private sector & advance energy access



**Program:** The Inclusive Dairy Enterprise (TIDE) Project (Phase II)<sup>1,2</sup>



## Overview

- **Target action:** Provide dairy and crop farmers and their households with high quality, affordable and sustainable solar lighting systems and solar powered agricultural appliances
- **Project status:** Ongoing
- **End date:** 2023
- **Target industry:**



SHS



Solar agric. app

## Approach

- Subsidy to provide farmers with access to 20,000 solar products with reliable after sales service (Phase I)
- Encourage commercialization of the dairy sector by actively supporting farmers to adopt a business approaches to dairy farming

## Impact to date

- Over 10,000 systems in collaboration with lead partner Solar Now
- Encouraged farmers to co-invest at total of US\$ 7.4M to improve productivity
- Increased export value from dairy products, from US\$ 5.6M in 2015 to US\$ 111M in 2019; Regional prod. capacity increased from 100K to 1.5M litres of milk per day
- 300K students now have access to milk at school

## Affiliated organizations



### Implementers:

Solar Now, Barefoot Power, Uganda Crane Creameries Cooperative Union & other value chain managers



### Funders:

Government of Netherlands

# UNCDF’s global CleanStart program has partnered with other dev partners to provide financing to local businesses & advance access



Program: CleanStart<sup>1</sup>

## Overview

- **Target action:** Supports low-income household transition to renewable energy
  - Co-invests in early-stage business ideas of private companies that can bring affordable clean energy
  - Emphasis on the inclusion of women and youth in value chain
  - Increase consumer-product awareness and protection
- **Project status:** Closed
- **End date:** 2020
- **Target industry:**



## Approach

- Performance-based grant to bring early-stage business ideas to market
- Advisory services to address implementation bottlenecks
- Research initiatives, M&E, networking events & nationwide campaigns
- Partnerships with government, dev partners, & other stakeholders to leverage resources & strengthen sustainability & impact

## Impact to date

- Providing finance and business advisory services to 6 businesses under the Renewable Energy Challenge Fund- Clean cooking window
- Providing finance and business advisory services to 8 businesses under the Renewable Energy Challenge Fund- Solar Window
- With the Schatz Energy Research Center (SERC) Humboldt State University released study on Energy Access and Off-Grid Solar

## Affiliated organizations



**Implementers:**

UNCDF

**Funders:**



RECF Uganda: Embassy of Sweden in Uganda (RECF), UNCDF, DFID Uganda  
CleanStart Global: Austrian Development Agency, Liechtenstein, Norad, Sida, UNCDF

Sources: UOMA interviews & consultations

1. UNCDF, [CleanStart Program](#), 2020

# BMZ has provided support to both the government and private sector to further advance access & support clean energy (1/3)



**Program:** Promotion of Renewable Energy & Energy Efficiency program (PREEEP)<sup>1</sup>

## Approach

- Support MEMD on policies & roadmaps development regarding clean energy access; Support to private sector RE&EE associations & SMEs regarding access to finance and marketing campaigns; Training in installation and maintenance of RE & EE technologies; Support districts with RE&EE planning & experience dissemination jointly with MEMD; Gender mainstreaming regarding policy and skills development

## Impact to date

- Supported revision of the 2002 energy policy (2019 energy policy pending cabinet approval)
- Supported set up of District Energy Coordination Structures and planning for clean energy access in 22 districts
- Conducted energy management trainings for 100 SMEs and 40 energy audits

## Affiliated organizations



**Implementers:**

GIZ, MEMD, REA, ERA, 22 District Local Governments (DLGs)

**Funders:**



BMZ

## Overview

- **Target action:** Improve framework conditions for access to clean energy in rural and urban areas
- Focuses on four areas:
  - Policy advise to MEMD
  - Market Development (RE and EE)
  - Skills Development (RE, PUE)
  - Decentralization activities with DLGs
- **Project status:** Ongoing
- **End date:** 2023
- **Target industry:**



SHS



Cook stoves



Mini-grids



Solar agric. app



# BMZ has provided support to both the government and private sector to further advance access & support clean energy (2/3)



**Program:** Promotion of Mini-grids for Rural Electrification (Pro Mini-Grids)<sup>1,2</sup>

## Overview

- **Target action:** Promote decentralized electrification strategies such as mini-grids to support employment and economic development
  - Develop mechanisms to support private sector capacity for installation and operation of off-grid systems
  - Develop mini grid framework conditions to enable scale up of mini grids deployment
- **Project status:** Ongoing; near completion
- **End date:** December 2021
- **Target industry:**



Mini-grids

## Approach

- Support Ministry of Energy to develop instruments for mini-grids implementation with the private sector
- Setup of up to 40 mini-grids operated with the private developers
- Support use of productive use of electricity in the mini-grids
- Train technicians for the installation and operation of decentralized systems

## Impact to date

- Developed a tender mechanism with REA for bundled mini-grid development; installation ongoing for 25 mini-grids in Lamwo district and also developed a least cost electrification planning tool with REA for prioritization of mini-grid selection
- Developed a training program for solar electricians jointly with Nakawa Vocational Training College & Cologne Chamber of Skilled Crafts & Small Businesses & setup a Renewable Energy Training Centre at NVTC

## Affiliated organizations



### Implementers:

GIZ, MEMD, REA, ERA, Nakawa Vocational Training Institute, HWK



### Funders:

EU

# BMZ has provided support to both the government and private sector to further advance access & support clean energy (3/3)



**Program:** Green People's Energy

## Overview

- **Target action:** Promotion of productive use of electricity (off-grid, mini-grids, solar irrigation)
- Energy access for primary schools, small businesses and health centers (solar PV)
- Technical advice to enterprises intending to invest into decentralized renewable energy solution such as captive power etc.
- Skills development/training on solar PV and solar irrigation and support to VTIs
- **Project status:** Ongoing
- **End date:** September 2022
- **Target industry:**



Mini-grids



SHS



Solar agric. app

## Approach

- Set up training facilities and introduce practical curricula on solar PV and irrigation at 3 training centers; Train 50 VTI teachers and 150 renewable energy specialists in solar PV; Train 120 technicians and 180 farmers on solar-powered irrigation
- Design 50 solar-centric or solar-supported power supply systems for cooperatives, SMEs & social institutions; Rehabilitation of solar systems in 23 HCs in West Nile

## Impact to date

- Solar training room, solar demo garden and computer lab set up at 1 VTI
- Developed 2 solar irrigation training manuals: one for technicians and one for users (farmers); 45 farmers and 20 technicians trained on solar irrigation
- 17 solar designs and simulations by November 2021; 3 solar PV charging stations for e-bodas installed in the Masaka corridor; 7 primary schools and 9 small businesses acquired plug-and-play solar systems

## Affiliated organizations



**Implementers:**

GIZ GBE Uganda

**Funders:**

BMZ



# BMZ has also provided support to both the government & private sector to further advance access & support clean energy in refugee areas and host communities



**Program:** Energy Solutions for Displacement Settings (ESDS)<sup>1</sup>

## Overview

- **Target action:** Seeks to address the lack of sustainable energy supply in refugee hosting areas through advisory services and the implementation of measures in three main areas:
  - Improving the enabling environment for sustainable access to energy
  - Greening UNHCR infrastructure
  - Sustainable, energy access for households, social institutions, and SMEs

- **Project status:** Ongoing
- **End date:** December 2022

• **Target industry:**



Mini-grids



SHS



Cook stoves



Solar lantern

## Approach

- Advisory to MEMD & UNHCR concerning energy planning & inclusion of refugees in national service delivery systems; Develop market-based approaches for replacement of diesel gensets with cost-efficient RE; Pilot & promote market-based solutions for access to sustainable cooking energy and electricity for households, institutions and businesses benefiting both refugees and host communities

## Impact to date

- Supported the development of the Sustainable Energy Response Plan (SERP) & establishment of a taskforce within MEMD in cooperation with UNHCR, OPM, CRRF secretariat, REA and World Bank
- Established two solar energy kiosks with local community groups to offer basic energy-based products & services in Ofua III & Siripi Zones of Rhino Camp refugee settlement & supported solarisation of two health centers as part of C-19 response

## Affiliated organizations



**Implementers:**

GIZ



**Partners:**

MEMD, OPM, UNHCR



**Funders:**

BMZ

Source: UOMA interviews & consultations, supplemented by ESDS website [\[Link\]](#)

# BMWi has provided support to both the government and private sector to further advance access & support clean energy



Federal Ministry for Economic Affairs and Energy

**Program:** Project Development Programme (PDP)

## Overview

- **Target action:** Enhancing uptake of solar PV in the commercial and industrial sector
- **Project status:** Ongoing
- **End date:** 2023
- **Target industry:**



Mini-grids



SHS



Solar agric. app

## Approach

- Project development support regarding Solar PV installation and reduced diesel use for private sector high power consumers > 100 kW power demand
- Matchmaking with reputable German companies for project implementation
- Skilling local developers in commercial and industrial solar through the German Training Week

## Impact to date

- First German Training week conducted with local developers and German developers
- Feasibilities studies done for 10 leads regarding solar PV installation for industries

## Affiliated organizations



**Implementers:**

GIZ

**Funders:**



BMWi , AHK, DIHK

# UNDP has partnered with the government to provide sustainable energy solutions to boarding schools in off-grid areas in Uganda



**Program:** NAMA-Green Schools project<sup>1</sup>

## Overview

- **Target action:** Provide sustainable energy solutions to boarding schools in the mainly off-grid rural areas with solar energy, efficient cook stoves, and biogas technologies
- **Project status:** Ongoing
- **End date:** 2030
- **Target industry:**



SHS



Cook stoves



Bio fuels

## Approach

- Create a revolving loan fund for the planned large-scale roll out of green technologies in schools & design new business models for schools to pay back installation costs; Complement technologies with capacity-building & awareness trainings for companies and a Life Skills Programme for youth & local communities and; Streamline the roles & responsibilities of public & private stakeholders

## Impact to date

- Project has been pre-selected to receive funding by Germany and the UK of up to US\$ 73.7M to support the development phase
- Installed 55K improved Institutional Cookstoves in 22K schools in rural Uganda
- Installed 1.1K biogas cook stoves fed by latrine bio-fuels
- Installed 1.6K solar PV systems in rural Uganda

## Affiliated organizations



**Implementers:**

UNDP, MEMD

**Funders:**



UK, Germany

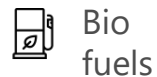
# AFD has partnered with local banks to finance renewable energy investments in order to reduce the carbon footprint in East Africa



**Program:** Sustainable Use of Natural Resources and Energy Finance East Africa (SUNREF)<sup>1</sup>

## Overview

- **Target action:** Developing the share of renewable energy in the energy mix in East Africa
  - Improving energy efficiency for companies
  - Encouraging local banks to increase lending activities towards low-carbon projects
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



## Approach

- Provide technical assistance to companies & banks to assist them in identifying opportunities for green investments
- Install & monitor projects
- Support partner banks in their risk assessment approach, communication strategy & marketing in green finance

## Impact to date

- A cumulated commitment of > US\$ 147M to finance green investments in East Africa (Uganda, Kenya and Tanzania)
- Set up the Duomo House, a solar powered commercial real estate project which received US\$ 255K funding from DTB

## Affiliated organizations



### Implementers:

AFD, Diamond Trust Bank

### Funders:



AFD, EU-Africa Infrastructure Trust Fund

# UNIDO supports the EAC's initiative aimed at refining energy policy, capacity development and knowledge management in East Africa



**Program:** East African Centre for Renewable Energy and Energy Efficiency (EACREEE)<sup>1</sup>

## Overview

- **Target action:** Create increased access of modern, affordable & reliable energy services
  - Increased energy security in East Africa
  - Mitigation of negative effects e.g. local pollution & greenhouse gas emissions
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Bio fuels



Mini-grids

## Approach

- Develop & implement a coherent regional RE&EE policy framework for the EAC & facilitate its implementation on national levels
- Develop & execute regional programs and projects in cooperation with GEF, other partners and mobilize funding & provide co-funding for demand-driven programs and projects executed by the private and public sector or civil society in the region

## Impact to date

- Holding of various workshops that have culminated in the formulation of an Action Plan which outlines strategies & measures for the successful implementation of the first phase of the center
- Continue to conduct training workshops and establish networking platforms & events that give industry stakeholders insights on the regional status of the off-grid energy sector

## Affiliated organizations



### Implementers:

EACREEE

### Funders:

UNIDO, ADA



# The Shell Foundation has launched several initiatives to catalyze sustainable and scalable solutions (1/2)



**Program:** Market Development

## Overview

- **Target action:** Leverage foundations, govt, private sector, DFIs and other financiers to amplify impact and accelerate market growth
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Mini-grids



Cook stoves



Prod. use

## Approach

- Market institutions used to tackle barriers and facilitate effective deployment of blended capital to accelerate market growth

## Impact to date

- Help build demand through communications and market advisory
- Providing learning and analysis for key themes such as last mile distribution, rural utilities & gender impact
- Funding for industry associations such as GOGLA, GACCC, supporting local accelerators to act as neutral market influencers such as EPD in RW and UOMA in UG & supporting innovation for market infrastructure such as impact valuation

## Affiliated organizations



### Implementers:

Various

### Funders:

Shell Foundation





# The Shell Foundation has launched several initiatives to catalyze sustainable and scalable solutions (2/2)



**Program:** Building an ecosystem to accelerate access to energy

## Approach

- Provide grants, innovative financing products & technology
- Support development of business skills training & market linkages
- Provide support for development of disruptive solutions to increase the availability of energy

## Impact to date

- Financing and technical assistance provided to:
- Energy Product manufacturers and service providers that providers aimed at rural households, productive use, communities and urban populations for example energy efficiency & storage, PAYG solar, waster to energy fuels etc
- Market Enablers such as supply chain intermediaries, financing facilities and catalytic institutions and bodies

## Affiliated organizations



**Implementers:**

Various

**Funders:**

Shell Foundation



## Overview

- **Target action:** Support entrepreneurs in the off-grid sector by working with partners to provide investment, business skills and market linkages in order to scale their businesses and deepen impact on BoP
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Mini-grids



Cook stoves



Prod. use

# Signify Foundation supports youth-focused, female-focused as well as SME training activities in Uganda



**Program:** Village Academy

## Overview

- **Target action:** 48 young men & women trained to be PV solar electricians by 2018
  - 60 out-of-school Ugandan & urban refugee youth trained to be by 2018
  - 20 of small/ medium size business owners trained in productive use of energy by 2019
  - At least 60% of graduates placed in employment and/or have increased income by 3Q 2018
  - At least 50% of trainees targeted being female graduates
- **Project status:** Ongoing
- **Target industry:**



SHS

## Approach

- In-village trainings for youth on technical skills, sales & soft skills necessary to enter the solar industry
- Tailor made courses for energy companies on capacity building and soft skills
- Facilitate access to start-up financing, high quality solar products & mentorship on scaling for SMEs

## Impact to date

- Held MCE Sales Agent Training on September 2017 where 20 youth were trained as solar sales agents and equipped with stock in partnership with MCE Uganda and d.light
- Conducted Soroti Solar PV Training on May 2016 where 10 young men and women were trained and certified, 8 of whom found work in the solar industry in Soroti

## Affiliated organizations



### Implementers:

Village Academy

### Funders:

Signify Foundation



# Signify Foundation supported the electrification of 43 health centers in Uganda to support COVID-19 resilience



**Program:** Electrification of health centers in Uganda

## Approach

- Support health centers identify energy needs through a needs assessment
- Partner with local solar associations to select and prioritize health centers to electrify
- Electrify health centers through in-kind donation of equipment and payment of labor and transport costs

## Impact to date

- Electrified 43 health centers in various regions of the country; 36 health centers under the SENDEA association and the rest with various local solar operators

## Affiliated organizations



**Implementers:**

MEMD, MOH, SENDEA & Village Energy

**Funders:**



Signify Foundation

## Overview

- **Target action:** Improve service delivery for health centers across Uganda at the height of the COVID-19 pandemic
- **Project status:** Closed
- **Target industry:**



SHS

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (1/9)



**Program:** Energizing Development (EnDev)<sup>1,2</sup>

## Overview

- **Target action:** Achieve sustainable access to modern energy services for 21M people across 21 countries by 2021
- **EnDev Uganda (by 2024):**
  - Increasing household access to improved cooking by 680,200 people
  - Increasing access to energy for lighting/appliances for 157,800 people by mid-2019 & provide modern energy services for 1,100 social institutions & 1,600 SMEs
- **Project status:** Ongoing
- **Target industry:**



SHS



Cook stoves



On-grid



Solar lantern

## Approach

- Rural partner synergy & private sector development approaches for cook stoves & solar market development; Specific focus on piloting & scaling market-based energy access in refugee & host communities; Implement innovative financing & distribution schemes; Enabling environment support including building association capacity, contributing to standards implementation & policy work

## Impact to date

- Access to electricity or modern cooking equipment to over 23,8M people in private households; 29K social institutions and 74K SME's have access to efficient & sustainable energy; Created over 29,000 jobs
- **EnDev Uganda:** 130K people gained sustained access to electricity, with 1.2M people gaining access to modern cooking energy; 760 social institutions & 995 SMEs gained sustained access to modern energy

## Affiliated organizations



**Implementers:**

GIZ Uganda

**Funders:**



Core funders: Netherlands, Germany, Norway, and Switzerland

Co-funded projects: with USAID, SDC, IKEA Foundation

Source: UOMA interviews & consultations, supplemented by 11. GIZ, Energizing Development (EnDev) - programme for energy access, 2005 [Link](#)

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (2/9)



**Program:** GET.invest<sup>1</sup>

## Overview

- **Target action:** Support government of Uganda to develop conducive frameworks for off-grid renewable energy access
- Support MEMD on Long Term energy planning and scenario modelling
- **Project status:** Ongoing
- **Target industry:**



## Approach

- Support ERA in the development of a tariff and subsidy framework for mini-grids
- Support ERA in the development of Isolated Grid Standards
- Support MEMD in development of an Electricity Access Data Management System
- support MEMD on Uganda energy Sector planning gaps

## Impact to date

- The final draft report of Tariff study submitted and approved by ERA
- All drafts for the IGS standards have been completed and submitted to ERA
- Soon finalizing the structure for the Electricity Access Data Management System
- Starting on the diagnostic to assess Uganda sector energy planning requirements

## Affiliated organizations



### Implementers:

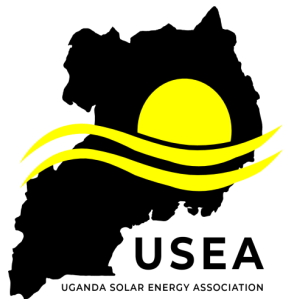
GIZ, ERA, MEMD, UETCL



### Funders:

EU, Germany, Sweden, Netherlands, Austria

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (3/9)



**Program:** Support Uganda Solar Energy Association

## Overview

- **Target action:** Promote industry-led market development for off-grid
  - Supporting USEA to have proper governance and management structure,
  - Empower USEA to deliver services to its member services such as provision of BDS services, sales data collection to ascertain number of solar system sold and big data customer research

• **Project status:** Ongoing

• **Target industry:**



## Approach

- Develop annual work plan and strategy plan
- Recruit and train three full time secretariat staff
- Develop toolkit on building strong associations

## Impact to date

- Developed handbook for solar taxation & Implemented awareness campaigns in Eastern and West Nile
- Trained 40 technicians on installation and troubleshooting solar systems & launched business diagnostic for BDS support
- Provided financial & human resource support to help USEA develop the 2018 sales data report<sup>1</sup>

## Affiliated organizations



**Implementers:**

UNCDF, GIZ

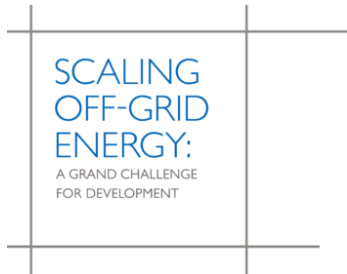


**Funders:**

Energy Africa, DFID

Source: UOMA interviews & consultations supplemented by  
 1. USEA, [USEA handbook on solar taxation](#), UNCDF, 2019 [\[Link\]](#)

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (4/9)



**Program:** Energy and Environment Partnership/ Southern and East Africa<sup>1</sup>

## Approach

- Platform for leading donors and investors to incentivize technological innovation, fund early-stage companies, and support critical elements of the off-grid ecosystem

## Impact to date

- 50+ companies & market enablers supported across 18 countries in sub-Saharan Africa
- 3.75M expected connections reaching over 15M people in SSA
- \$435M in private investment catalyzed

## Affiliated organizations



**Implementers:**

USAID



**Funders:**

USAID / Power Africa, DFID / Energy Africa, Shell Foundation

## Overview

- **Target action:** Accelerate the growth of a dynamic, commercial off-grid energy market to provide clean, modern, and affordable energy access to 20M of households and businesses beyond the grid in sub-Saharan Africa
- **Project status:** Closed
- **Target industry:**



SHS



Mini-grids

Source: UOMA interviews & consultations, supplemented by

1. GOGLA, [USAID Scaling Off-Grid Grand Challenge for Development \(SOGE\)](#), 2018, , 2. Scalling Off-Grid, [Interactive year-in-review](#), 2018

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (5/9)



**Program:** Energy and Environment Partnership/ Southern and East Africa<sup>1</sup>

## Overview

- **Target action:** Contribute to reduction poverty by promoting inclusive and job-creating green economies, and by improving energy security in the Southern and East Africa regions while mitigating global climate change
- **Project status:** Ongoing
- **Target industry:**



SHS



Mini-grids



Cook stoves

## Approach

- Funding projects in all fields of renewable energy and energy efficiency, bridging the gap between a good idea and a bankable project
- Projects are selected through two funding windows from early stage to market ready projects, including last mile feasibility studies, pilots, demonstrations, commercial scale-ups, replication and rejuvenating projects

## Impact to date

- Providing sustainable energy and agro hubs in Kamwenge district, clean energy for the Ugandan dairy industry, biogas for milk cooling & sustainable energy services for Kitobo island
- Had 15 grant funding calls for innovative programs and businesses since 2010
- Invested US\$ 85.9M in renewable energy ventures, impacted 5.1M people with enhanced energy access & created 8.2K jobs across 15 countries

## Affiliated organizations



**Implementers:**

KPMG Finland



**Funders:**

Ministry of Foreign Affairs of Finland, DFID and The Austrian Development Agency

Source: UOMA interviews & consultations, supplemented by  
 1. GOGLA, [USAID Scaling Off-Grid Grand Challenge for Development \(SOGE\)](#), 2018, , 2. Scalling Off-Grid, [Interactive year-in-review](#), 2018



# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (6/9)



**Program:** New Deal on Energy for Africa<sup>1</sup>

## Overview

- **Target action:** Increasing on-grid generation & transmission to add 160 GW of new capacity & create 130M new connections
- Increasing off-grid generation to add 75M
- Increasing access to clean cooking energy for ~130M households
- **Project status:** Ongoing
- **End date:** 2025
- **Target industry:**



SHS



Mini-grids



On-grid

## Approach

- Mobilizing domestic and international capital for innovative financing in Africa's Energy sector
- Supporting African countries in strengthening energy policy, regulation and sector governance

## Impact to date

- Approval of 29 energy sector operations worth USD 1.7 billion to deliver:
  - 546 MW of additional installed capacity of which 526 MW are from renewable energy sources & 21,264 km of distribution lines
  - 641 km of transmission lines, substations & 7,800 public lighting units
  - 688,950 new households/ businesses receiving electricity access

## Affiliated organizations



### Implementers:

AfDB



### Funders:

AfDB, Africa Energy Leaders Group, Sustainable Energy Fund for Africa, SE4ALL, UK's Energy Africa Campaign and Power Africa

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (7/9)



**Program:** Facility for energy Inclusion<sup>1,2,3</sup>

## Overview

- **Target action:** Providing consumer and corporate financing solutions to solar off-grid companies in the related ecosystem (OGEF)
  - Offering flexible project and corporate finance solutions to rural electrification projects of less than 25 MW and mini-grids (on-grid)
- **Project status:** Ongoing
- **End date:** 2025
- **Target industry:**



## Approach

- Operate with a clear mandate to maintain focus on underserved markets & encourage innovative transactions that create long term market value for investments
- Provide flexible capital on commercial basis, including local currency & have management set up across Africa to maximize local engagement & understanding

## Impact to date

- Reached its final equity close with US\$ 59M in committed equity capital & US\$ 36M in debt facilities to support off-grid energy access
- Raised US\$ 160M targeted towards financing rural electrification and mini-grid development projects

## Affiliated organizations

**Implementers:**  
LHGP & Fieldstone

**Funders:**  
African Development Bank, UKaid, USAID, Shell Foundation, Nordic Development Fund, Global Investment Facility, All On, Calvert Impact Capital, DFID

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (8/9)



**Program:** Smart Communities Coalition<sup>1,2&3</sup>

## Overview

- **Target action:** Increasing efficiency in refugee camp management & service delivery
  - Empowering refugees to provide for themselves and their families
  - Addressing the needs of community members in and around refugee settlements
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Mini-grids



On-grid

## Approach

- Employ an ecosystem approach to technology deployment:
  - Identify opportunities by engaging stakeholders on ground & establish working groups
  - Encourage exchange of ideas across groups & implement pilot projects
  - Monitor & evaluate progress

## Impact to date

- Created market profiles highlighting the latest data in purchasing power, refugee skillsets, energy & mobile access in target settlements
- Hired expert staff in Nairobi and Kampala to lead stakeholder engagement, facilitate pilot implementation and reinforce capacity to drive results
- Awarded US\$ 465K in grants to 3 companies to increase energy access in refugee settlements in Uganda

## Affiliated organizations



### Chairs:

Mastercard & USAID/Power Africa

### Members:



Over 35 members including; Mastercard, Mercy Corps, USAID, GIZ, SNV, Microsoft, Net Hope, Energy 4 Impact, Energy Peace Partners, FSD Africa, Lutheran Foundation, Total, World Vision, NRC, GSMA, etc.

# Many development partners have partnered on initiatives to further accelerate progress towards shared access goals (9/9)



Program: Utilities 2.0

## Overview

- **Target action:** Seeks to combine centralized and decentralized technology (including solar home systems, mini-grids, grid, & smart grid systems) into an integrated, intelligent, & interactive energy network that can deliver customer-centric, clean energy solutions to end energy poverty at the lowest cost, in the fastest time
- **Project status:** Ongoing
- **End date:** N/A
- **Target industry:**



SHS



Mini-grids



On-grid

## Approach

- To illustrate how the comparative advantages of centralized and decentralized energy can create a robust, integrated energy system for grid and non-grid customers alike
- Leverage digitization and data analytics to integrate DRE technologies so that utilities can have new alternatives to grid extension, faulty transformers, and unprofitable connections

## Impact to date

- Particularly in Uganda, Utilities 2.0 launched the "Twaake" pilot with UMEME, Makerere University, The Rockefeller Foundation & Power for All
- Constructed the first fully integrated mini-grid in Uganda in partnership with UMEME, PowerforAll and Engie Energy Access

## Affiliated organizations



**Funder:**

The Rockefeller Foundation

**Members:**



Power for all, Shell Foundation, AMDA, ENGIE, PowerGen, Rensource, Fenix, East African Power (EAP), UMEME, Equatorial Power, EnerGrow, ZOLA Electric and others

# Associations represent private sector interests, advocate policy issues to government

**Uganda National Renewable Energy and Energy Efficiency Alliance is an umbrella body whose aim is to avail a platform that consolidates Uganda energy sector leadership**

	Mandate & description	Membership & capacity
<b>USEA</b> <i>Uganda Solar Energy Association</i>	<ul style="list-style-type: none"> <li>Seeks countrywide mobilization of solar providers, coordinating stakeholders, playing an advocacy role and capacity building</li> </ul>	<ul style="list-style-type: none"> <li>&gt;100 members consisting of engineers running local businesses and solar product distributors; receives targeted support from dev partners like RECP, DFID, UNCDF &amp; PSFU</li> </ul>
<b>BEETA</b> <i>Bio-mass Energy Efficient Technologies Association</i>	<ul style="list-style-type: none"> <li>Promotes biomass energy efficient technologies through networking, sharing information, and developing knowledge among member organizations / individuals</li> </ul>	<ul style="list-style-type: none"> <li>50 member companies involved in production of biomass efficient technologies, such as briquettes &amp; stoves, &amp; institutions involved in research and development of biomass energy</li> </ul>
<b>HPAU</b> <i>Hydropower Association of Uganda</i>	<ul style="list-style-type: none"> <li>Champions hydropower development in the hydropower sub-sector through advocacy, capacity devt &amp; resource mobilization</li> </ul>	<ul style="list-style-type: none"> <li>Membership open to private sector companies, organizations &amp; associations, consumers, &amp; policy makers; receives support from GIZ, CREEC, &amp; WWF</li> </ul>
<b>EEAU</b> <i>Energy Efficiency Association of Uganda</i>	<ul style="list-style-type: none"> <li>Aims to foster provision for quality energy efficiency services, enhancing research, innovation &amp; knowledge transfer</li> </ul>	<ul style="list-style-type: none"> <li>Large capacity of technical members working to get association accreditation to certify Energy Efficiency Professionals in the country</li> </ul>
<b>UNBA</b> <i>Uganda National Bio-gas Alliance</i>	<ul style="list-style-type: none"> <li>Seeks to unite and support stakeholders as well as existing regional associations in the biogas sector</li> </ul>	<ul style="list-style-type: none"> <li>National umbrella organization of the UG biogas sector; four associations organized according to regions, supported by partnership with GIZ</li> </ul>
<b>WPAU</b> <i>Wind Power Association of Uganda</i>	<ul style="list-style-type: none"> <li>Promotes uptake of wind power technology through uniting stakeholders, playing an advocacy role and capacity building</li> </ul>	<ul style="list-style-type: none"> <li>&gt;10 private sector companies involved in various aspects of wind power technology</li> </ul>

# Associations represent private sector interests, advocate policy issues to government and improve sector coordination

## Organization

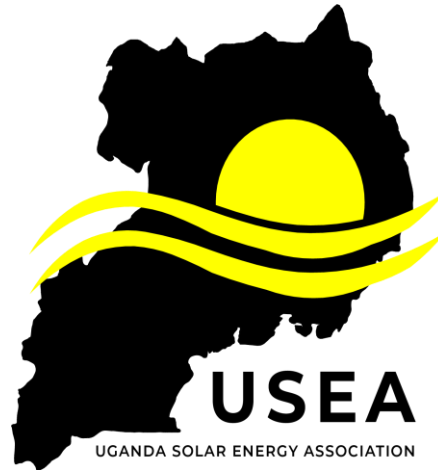


## Work in Uganda

- UNREEEA is an NGO for profit incorporated 2014 as result of the private sector players in the various renewable energy and energy efficiency sub-sectors signing a memorandum of understanding to come under one umbrella body. The primary role of the Uganda National Renewable Energy and Energy Efficiency Alliance (UNREEEA) is to avail a platform for consolidating the renewable energy and energy efficiency private sector wing as well as improving its business environment
- The association members of UNREEEA include: Biomass Energy Efficient Technologies Association, Uganda National Bio-gas Alliance, Hydro-Power Association of Uganda, Uganda Solar Energy Association, Energy Efficiency Association of Uganda, Wind Power Association of Uganda
- The alliance aims to among other objectives:
  - Identify and disseminate best practices related to market development for renewable energy and energy technologies in Uganda.
  - Establish permanent working relationships with government institutions, civil societies as well as other sector stake-holders in the energy sector.
  - Initiate and upgrade a strong private sector led approach in the development of the renewable energy sub-sector in Uganda

# Associations represent private sector interests, advocate policy issues to government and improve sector coordination

## Organization



## Work in Uganda

- Uganda Solar Energy Association was formed by companies operating in the solar sector with support from the Private Sector Foundation Uganda and had 120 members by end of January 2019.
- The aim of USEA is to facilitate business growth and promote self regulation and aimed at spurring off-grid solar industry-led advocacy and coordination to support universal energy access

### To further its' objective, USEA has partnered with the following organizations:

- **USAID's Power Africa Uganda Electricity Supply Accelerator** – supporting USEA in solar market development, public awareness and promotion, creating linkages through the supply chain, business development and capacity and monitoring and evaluation
- **UNCDF/DFID** – market sales data collection in collaboration in with GOGLA & Dalberg data insights to run a data collection pilot for the sector, business development services, media and PR campaign to increase visibility and reach and tax advisory services in conjunction with URA & government to develop a tax handbook
- **PSFU/WORLD BANK** - Through the World Bank Energy for Rural Electrification project (implemented by PSFU), USEA has obtained support in setting up the secretariat infrastructure, hiring staff and providing HR & Finance Expertise as well as TA in business strategy and financing models to adopt for an association

# The National Renewable Energy Platform was created to optimize sector coordination and increase access to partnership opportunities

## Organization



## Work in Uganda

### NREP vision

- The national renewable energy platform seeks to be the lead platform for sustainably developing and utilizing renewable energy resources, services and products in Uganda

### Mission

- To boost national collective action, harmonization, and subsidiarity for sustainable and competitive development of Uganda's renewable energy sector. Key to NREP's vision and mission is the recognition of critical value-addition to national collaboration among actors to meet the energy needs of the Ugandan population, by providing adequate and reliable energy supply for socio-economic growth and sustainable development.

### NREP has the following goals:

- Optimize coordination of players/stakeholders and increase access to wider partnership opportunities in the development and delivery of collective actions to address shared challenges in the renewable energy sector
- Shape and develop a harmonized strategic direction for the renewable energy sector
- Strengthen private sector and institutional capacities in the renewable energy sector
- Ensure quality assurance of technology implementation within the renewable energy sector
- Strengthen national and global partnership to improve access to low-cost finance for renewable energy and energy efficiency
- Improve access to pristine management of information, including funding opportunities for the renewable energy sector in Uganda and regionally
- Conduct scientific and research studies, develop and introduce new technologies



# There are a number of research institutions and consultants active in UG working to support the market (1/4)

## Organization



## Work in Uganda

- Created to enhance private sector competitiveness by providing capacity through policy advocacy and enhanced business development services
- Also play a key role in implementing some government and donor projects
- Currently implementing technical capacity aspects of the Energy for Rural Transformation phase III such as empowering USEA



- Focuses on the thematic areas of rural electrification, energy for productive use, household energy and energy entrepreneurship
- Has two departments: testing services for product development & independent testing of cookstoves & solar, and project engineering for project implementation and consultancy



- Implemented by the Department of Electrical and Computer Engineering at Makerere University in close cooperation with The Royal Norwegian Society for Development (Norges Vel). The incubator was initially funded by Nordic Climate Facility (NCF) and now funded by NORAD
- Main focus is on entrepreneurship, improved co-operation with SMEs and technology transfer from countries outside Uganda which are all innovative project activities which makes the project idea a unique and sustainable option for development

## There are a number of research institutions and consultants active in UG working to support the market (2/4)

### Organization



### Work in Uganda

- Signed five-year working relationship with GoU to foster green economic growth implementing a planning framework with three outcomes:
  - Mobilize financing for implementation of green growth strategy
  - Support improved planning of secondary cities to catalyze green growth & urbanization
  - Support govt efforts to expand electricity investing in renewable energy



- Partnered with REA to define the country's electrification strategy through the Uganda Accelerated Rural Electrification Program. Funded by the World Bank, developed a master electrification plan for one new electric service territory in Uganda
- Today, the team is on a path to lay the groundwork to produce master plans for all 13 of the country's electric service territories funded by the USAID/Power Africa



- Supports businesses serving off-grid communities with a range of services from business development services, access to finance and project development for innovative models
- Supporting the implementation of a number of initiatives such as the Off-grid Refrigeration Challenge and Transforming Energy Access programs

## There are a number of research institutions and consultants active in UG working to support the market (3/4)

### Organization



### Work in Uganda

- Engages businesses, communities, institutions, and entrepreneurs to accelerate the adoption of market-based solutions that cost-effectively shift from fossil fuels to efficiency and renewables
- Supporting the government of Uganda to develop and implement an integrated electrification strategy to drive energy access and economic growth



- Research and policy effort that aims to address the challenges around increasing access to modern energy solutions to underserved populations around the world
- Supporting the development of new, disruptive tools, such as the means to evaluate electricity access through machine learning techniques applied to aerial imagery data



- Support businesses, investors, development partners & governments globally to identify appropriate, impactful ways to support off-grid energy access
- Commissioned by the Rockefeller Foundation and Shell Foundation to develop a predictive model and report highlighting the critical climate finance opportunity that distributed renewable energy (DRE) can provide for unlocking both energy access and inclusive economic development in Uganda among several other African countries

# There are a number of research institutions and consultants active in UG working to support the market (4/4)

## Organization



## Work in Uganda

- The E4D Network is run by the Sustainable Energy Research Group (SERG) at the University of Southampton.
- It's aim is to enable a step-change in collaborative research and project development addressing the energy needs of rural communities in developing countries
- In Uganda, it has installed (2) mini-grids with a capacity of 13.5 kW



- The Alliance for Rural Electrification (ARE) is an international business association that promotes a sustainable renewable energy industry for the 21st century, activating markets for affordable energy services, and creating local jobs and inclusive economies.
- They accept members from Uganda who enjoy the benefits of advice and advocacy, knowledge and intelligence, business promotion & marketing & business creation and support



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- Research sustainable e-waste management and next generation battery technology, with the purpose to promote critical industry advocacy and build a body of evidence to inform responsible corporate waste management programs and policies around end-of-life disposal, recycling, and repair of solar home systems.

# Global and regional networks and associations are also enabling private sector players to leverage support services (1/2)

## Organization



## Work in Uganda

- GOGLA represents over 100 global members as a neutral, independent, not-for-profit industry association. Its mission is to help its members build sustainable markets, delivering quality, affordable products and services to as many households, businesses and communities as possible across the developing world
- Their key focus areas on access to finance working on standardizing reporting metrics for PAYG, creating a conducive enabling environment by working in advocacy around key issues like tax and on socio-economic research & insights for the market more broadly
- Published semi-annual market database for data collection in PAYG in Uganda



- Sendea "solar entrepreneur network for decentralized energy access" is a capacity development platform for solar entrepreneurs to build their solar company and let it grow
- Their key focus is providing support to a cohort of early stage local companies with finance, technical assistance and long-term coaching and mentorship to nurture these companies and help them grow
- In Uganda, will be carrying out business skills training, supporting productive use elements like solar irrigation and SME use and looking at the case for PV back up systems in institutions like schools and health centers

## Global and regional networks and associations are also enabling private sector players to leverage support services (2/2)

### Organization



### Work in Uganda

- Collaborating with industry, policy-makers, government authorities, donors, and other stakeholders to advocate for optimal policies and efficient capital deployment that will benefit the mini-grid sector and the people it serves
- Serving as the voice of the mini-grid development industry in Africa to promote the growth and sustainable development of the mini-grid sector and act as a unified focal point for stakeholders to engage the sector
- Provide a platform that enables transparency in industry performance through comprehensive market data and analytics in order to establish, evaluate and promote key financial, business and policy solutions to overcoming the major barriers to growth for the sector



- Over the past 10 years, Open Capital has had 1,000+ engagements for businesses, investors, development organizations, and government across 25+ countries raising >USD 1 billion in capital
- In the off-grid energy space in Uganda, Open Capital has completed ~50+ engagements for private sector, development partners, and investors, supporting many of the large solar home system businesses with strategy and operations
- Completed strategy and growth engagements with off-grid energy distributors & PAYG operators, has close relationships with >12 mini-grid companies and continues to support the ecosystem through tailored support for commercial banks to accelerate local currency funding or operators & developers



**Do contact us if you have any feedback or interest in  
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