MINISTÈRE
DE L'ECONOMIE,
DES FINANCES
ET DE LA SOUVERAINETÉ
INDUSTRIELLE ET NUMÉRIQUE

FRENCH CHAMBER
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KENYA

Club EnR Ville Durable
Afrique de l'Est & Océan Indien

AMBASSADE
DE FRANCE
AU KÉNYA

SEMINAR

Decentralized Renewable Energy Solutions for an Inclusive and Sustainable Development in East Africa

28th NOVEMBER, Hotel Movenpick, Nairobi

SEMINAR / November 28th

Decentralized Renewable Energy Solutions for an Inclusive and Sustainable Development in East Africa

Movenpick Hotel, Nairobi / 8.30 am - 1.00 pm EAT

Panel Discussion 1: Enabling access to electricity with mini-grids

9.30 am - 10.30 am EAT

Panelist
Caroline KIMATHI
Renewable Energy Manager, Energy and Petroleum Regulation Authority (EPRA)

Panelist
Muslim JANOOWALA
Energy and Water Access Consultant, French Development Agency (AFD)

Panelist
Rita LAIBUTA
Energy Project Officer, French Development Agency (AFD)

Panelist
Mathew KIMOLO
Kenya Country Director, Sagemcom

Panelist
Kennedy OMUTANYI
Government Relations and Advocacy Consulting, Africa Mini-Grid Developers Association(AMDA)

Moderated by
Mathieu ECOIFFIER

French Embassy in Kenya

MINISTÈRE DE L'ÉCONOMIE, DES FINANCES ET DE LA SOUVERAINETÉ INDUSTRIELLE ET NUMÉRIQUE

FRENCH CHAMBER OF COMMERCE KENYA

AMBASSADE DE FRANCE AU KÉNYA

Africa Minigrid Developers Association

General Presentation

Decentralized Renewable Energies Seminar

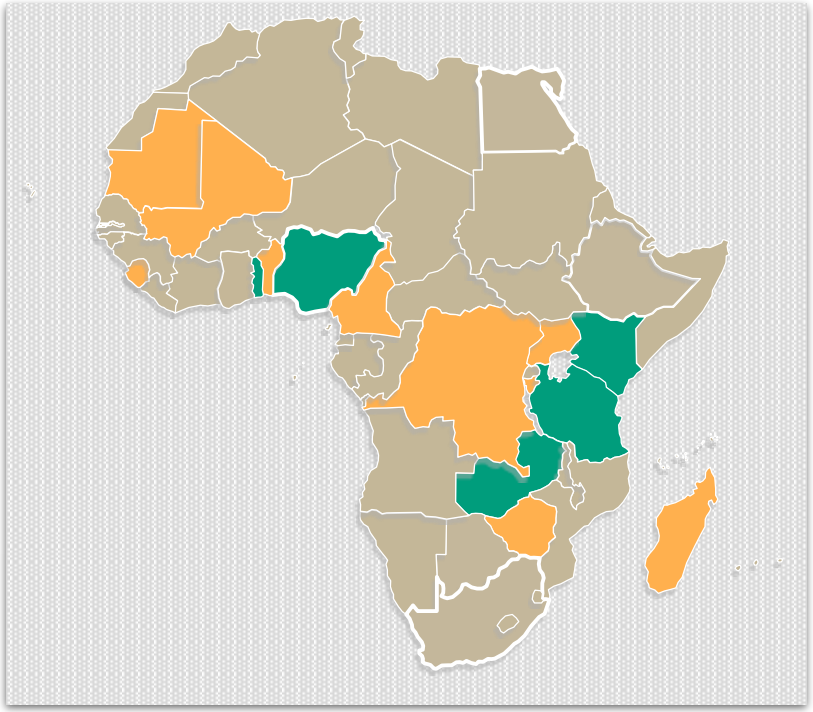
Kennedy Omutanyi
November 28, 2022

ABOUT US

Who We Are

AMDA was created by minigrid developers to boost the health of the sector and deliver on global renewable energy access objectives

AMDA blends the characteristics of an industry association, think-tank, and expert advisory firm into a single entity designed to help governments, donors, and investors grasp the intricacies needed to scale the minigrid sector.



500,000 People Electrified

78,000 Connections

400 Minigrids

42 Member Companies

86% Developers in Africa

01. Our Vision

Ending energy poverty across the African Continent by building the PPP's with governments to ensure a robust blend of energy services that leverage operational and financial experience of the private sector to develop energy services. The transition from a unidirectional energy network to a dynamic decentralized and interconnected networks where smaller-scale networks can operate largely autonomously while retaining the ability to tap into a broader network to tap additional power or sell excess power.

02. Our Mission

Ensure that minigrids are utilized effectively by governments and donors and that the policy and financing environment supports the radical scale of minigrids. We leverage private capital and efficiency to electrify Africa.

ABOUT US

Our mission and vision are accomplished through 3 workstreams:

Access to Finance

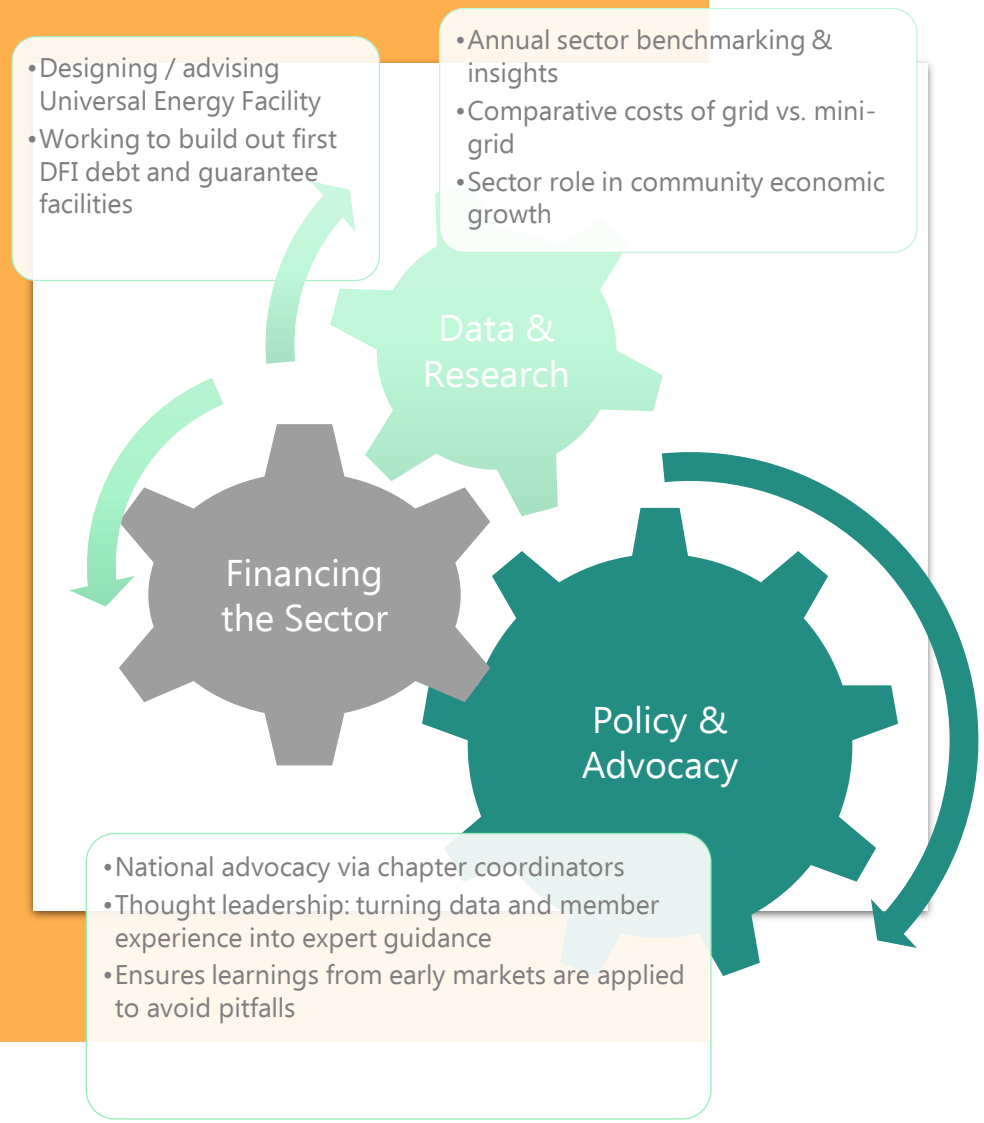
This includes serving as the voice of the Minigrid development industry in Africa to promote the growth and sustainable development of the mini-grid sector and act as a unified focal point for stakeholders to engage the sector and for capital deployment.

Policy & Regulation

We collaborate with industry, policy-makers, government authorities, donors, and other stakeholders to advocate for optimal policies that will benefit the mini-grid sector and the people it serves

Data & Research

We 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 the sector growth.



AMDA

WHO WE ARE

Breaking Down Barriers

AMDA blends **an industry association, think tank, and expert advisory firm** to help governments, donors, and investors better understand how to support the sector to scale.

AMDA's unique positioning allows research to be informed by the private sector, grounding it in the realities of industry needs.

AMDA's work ensures investors and policy makers have access to, and are using, robust and accurate evidence to create policy / regulatory environments and appropriately invest in the sector that ensures we reach SDG7

Every element of AMDA's work is focused on enabling others to do their work better, faster, and cheaper. From investors, minigrid companies and donors, to policymakers and their advisors.

IMPACT

Data and Research

First ever Africa Minigrid Benchmarking Study – Published July 2020, provides performance and cost data for over 288 minigrids, serves as the foundation for expanded advocacy efforts with policymakers and investors.

Policy and Advocacy

Defined the narrative – Removed stigma of using "subsidy" to describe needed public capital for off-grid energy resources through influence, thought leadership, engagement.

COVID 19 – AMDA has played a central role in supporting the sector and sector stakeholders in devising responses and support, including on the Energy Access Relief Fund and sector data gathering.

Financing the Sector

First Global RBF for Minigrids – Spearheaded the creation, development and fundraising for Universal Energy Facility with SEforAll and others

UNIVERSAL ENERGY FACILITY

National Policy

Uganda – Assisted drafting minigrid legislation

Kenya – Offered Support to ensure tax exemptions are not eliminated

Zambia – Working with regulators on aligning the Electricity and Minigrids acts and developed an MOU with REA to support electrification planning

Benin – developing MoU with government on national planning advisory.

Tanzania – achieved adoption of portfolio approval process, first in Africa.

More...

Coordination

DFI Coordination – Brought three leading DFIs (IFC, CDC, FMO), and donors together to collaborate around minigrid debt funding

Investor Coordination – AMDA coordinated 12 investors to craft a position paper on how RBF will unlock their capital


Investor Position Paper: Unlocking Private Capital for Mini-Grids in Africa

AMDA's pivotal role in driving collaboration and scale

Consensus building and coordination

Collaboration with international institutions to build consensus on key factors effecting scale

Recommending and designing solutions to address issues for scale

National Government Partnerships to support collaboration between Private Sector and Government

Data and research for transparency and market insights

Benchmarking African Minigrids

AMDA data is central to information key institutions

AMDA

Building financing facilities that are fit for Purpose

Co-Design of the UEF

Co-Design of Tariff Buy-down

Advisory role to key investment institutions for securitization and grant structures

Developing conducive regulations for scale

Advisory role developing and revising national regulations

Thought leadership in moving regulations from pilot to scale

Deep knowledge on operating environments and implementation issues restricting scale and investment

THE PROBLEM

In 2030, 80% of the Unelectrified will be African

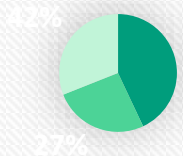
UN Member States adopt 2030 Agenda & **Sustainable Development Goals (SDGs**), 12 of which are dependent on energy as a prerequisite

840 million people globally without energy access – *business as usual will NOT close the gap*

Without increased efforts, **691 million people will still live without electricity**

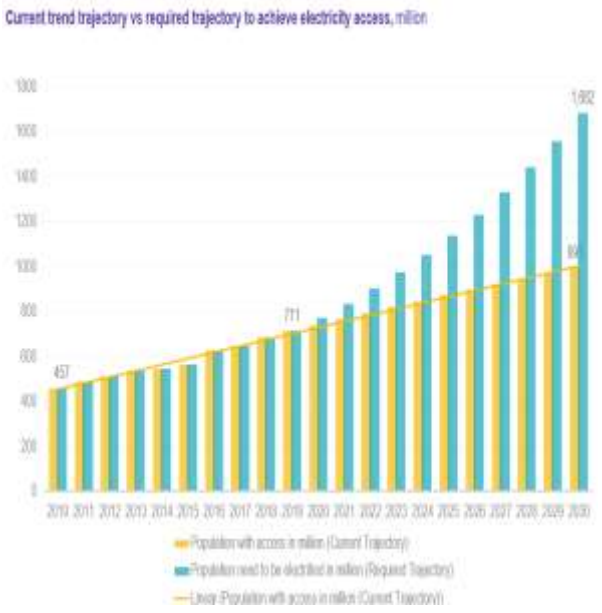
2015 **2020** **2030**

IEA Projections Least Cost Electrification



Minigrids

Solar Home Systems



691 million people estimated unelectrified in Africa in 2030

DATA SOURCE: WORLD BANK / ESMAP Tracking SDG7 Database, 2021; : World Bank Population estimate; SEforAll analysis

MINIGRIDS

Minigrids, The Environment, & Impact

74% increase in HH disposable income

% increase in agricultural yields

1,125,000+ jobs created

50% savings on diesel & kerosene for schools

MGs support COVID-19 vaccine access & information

MGs have shown 72% reduction in HH kerosene use & 4.4 Gg of black carbon saved

223,000,000 tons saved

72% increase in girls school attendance

59% increase in incomes for women

# of MG dependent SMEs empowered

2 x profit margins for SMEs and farmers

50% reduction in maternal & infant death

Lower GHG emissions in villages by 71%

140,000 minigrids will be required to electrify Africa

Key Issues

- 1. Current regulatory structures are not appropriately designed for decentralised infrastructure and will not allow the sector to deploy quickly enough to achieve universal energy access on any reasonable timeline. Dramatic simplification and shortening of licensing timelines, as well as bulk licensing of portfolios rather than individual sites is urgently needed.
- 2. Concessional capital commitments are not being honoured / deployed. Only $10 million of donor money was disbursed to developers in 2020. This is a slow trickle that is inhibiting growth and doesn't align with global objectives to develop renewable and resilient energy systems for universal electrification.
- 3. Billions of dollars continue to be poured into parastatal utilities that are failing to deliver quality services, yet minigrids which are outperforming utilities on service, connection rates and costs remain marginalized. This disparity is a major reason why the previous two points are problems, and is also completely solvable. If commitments to universal energy access are real, this must change quickly and dramatically.

Overview East Africa

Sites in the Region

Country	Total sites	Number of developers	Year of first site	Year of latest site
Democratic Republic of Congo	6	3	2017	2021
Kenya	145	6	2013	2021
Uganda	8	2	2021	2021
Tanzania	76	7	2012	2020

% Electrification Rates, 2020

Country	Rate
Zambia	44.5
Rwanda	46.6
Kenya Ethiopia Eritrea Congo, Dem. Rep. Burundi	71.4 51.1 52.2 19.1 11.7
Uganda	42.1
Tanzania	39.9
Sudan	55.4
South Sudan	7.2

source: World Banm Group

MINIGRIDS

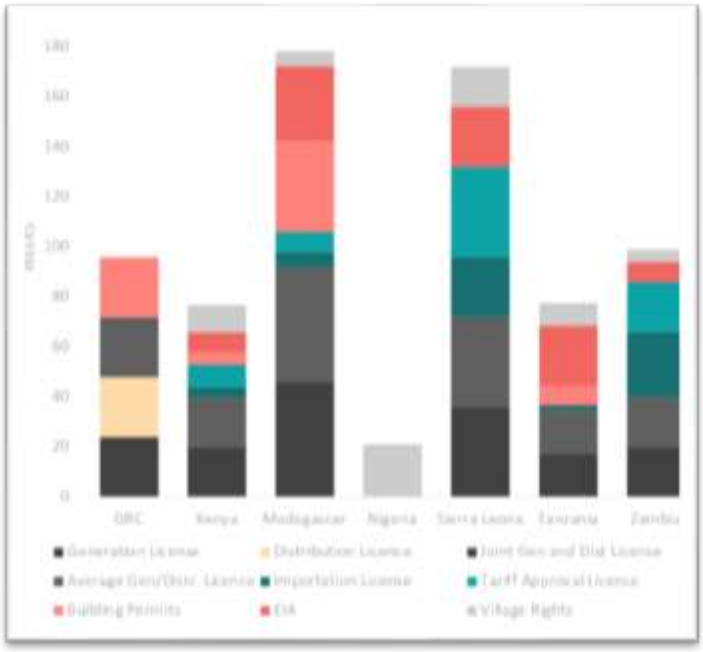
Essential Part of the Energy Ecosystem

Minigrids provide commercial and industrial quality energy to remote, marginalized areas much more quickly and affordably other options.

	SHS	Mini-grids	National Utility
Electricity Delivered	DC	AC	AC
Capex / Connection	$100 – 400	$700 – 1,200	$2,000 – 5,000
Installation Time	✓	✓	×
Reliability	✓	✓	×
Service Level	× Only Low-Power DC Devices	✓ 97% uptime	✓ 50%-89% uptime
Energy Cost	× >$4.00 per kWh	✓ $0.20-$1.00 per kWh	✓ $0.15-$0.70 per kWh
Main Grid Integration	× Not Possible	✓	N/A
Convergent with Global Future Power System	× No clear path to convergence with global system	✓ Mini-grids are building blocks of future grid	× Grid of the 20th century, not 21st

Regulatory Differences in East Africa

- Regulations in the region are mostly based on private sector market approaches, except for DRC that is mostly deploying metro grids on public private partnership (top down-market approach) .
- Most of the countries within the region have Minigrid regulations at different stages of development and implementation: Kenya-ready for gazettement, Zambia: Aligning Electricity and minigrids acts, Uganda: Minigrids legislation drafted.



THE PROBLEM

Policy and Regulation

The average time to get through regulatory compliance is 54 consecutive weeks for a single minigrid site

Minigrid regulations and financing were explicitly designed to force the consumer to bare the full price burden for electricity – This is NOT politically viable

Regulatory Compliance costs between **5%-8%** of total CAPEX Costs, and their current structure does NOT de-risk investments – in fact they increase risk for commercial investors

Regulators that do not have sufficient funding, resources, or logistical infrastructure to visit and approve minigrids at scale

Donors and TA providers that are focused on 'having' regulations but not thinking about how these regulations could be implemented or if they can leverage the right kind of finance into the market

OUR APPROACH

Addressing the Policy Problem

How AMDA Approaches Advocacy and Regulatory Reform

➢AMDA is the only organization that curates the deep sector knowledge that reflects legal oversite and operational realities across all active minigrid markets

➢AMDA specializes in national coordination to support policy reform that blends private sector operational realities, investor risk concerns, and government

➢AMDA's advocacy strategy is built upon the core elements of:

- Curating the right evidence
- Rewriting and shifting the minigrid narrative
- Recruiting champions with appropriate influence
- Launching targeted campaigns to change opinions of officials

AMDA has found that there exists a limited number of key decision-makers that determine the success or failure of political action within SSA government institutions; a list that includes heads of state, ministers, utilities, regulators, and parliamentarians.

Our approach is to engage with

AMDA is also developing a regulatory evaluation tool focused on implementation and stability that will provide insight to consultants and donors on systemic issues in regulatory structures

This will provide stakeholders, donors, and governments with a clear picture of how regulations

Regulations that can be implemented at scale → Regulators that are sufficiently funded and organized to oversee the approval of thousands of minigrids a year → Contractually based regulations that de-risk projects and provide an anchor for securitization of projects → Public Private Partnerships that blend government needs and incentives with operational realities

CLIMATE RESILIENCE

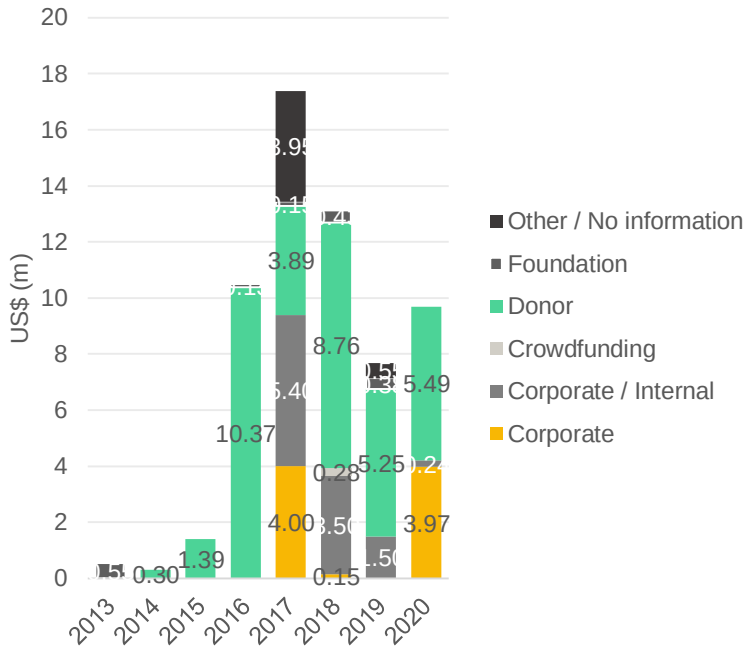
Investing in Minigrids

2022	**+USD 60mn** Concessional Deployment into MG's since 2014	**92,000** mini-grid connections	**640m unelectrified** = 47.89% electrification	**600,000** jobs created	**6.5M** generators deployed **15%** of all African NO_x emissions	**0.9 Mt CO_2e** displaced
2025 BAU	**USD 150mn** Estimated Concessional Deployment into Minigrids	**250,000** mini-grid connections	**589m unelectrified** = 55.9% electrification	**1.3mn** jobs created	**13M** generators deployed **30%** of all African NO_x emissions	**1.63 Mt CO_2e** displaced
2025 Goal	**USD 1.5bn** targeted funding (cumulative)	**1,000,000** mini-grid connections	**301m unelectrified** = 77.48% electrification	**2.27 m** jobs created through MGs	**9.75M** generators deployed **23%** of all African NO_x emissions	**3.15 Mt CO_2e** displaced

KEY STATISTICS
FINANCING THE SECTOR

$2 billion was committed to build minigrids by the end of February 2020

Only $297 million (or 13%) has been disbursed to developers in the mini-grid sector



More than 50% of the dispersed funding went to TA, and not to actual deployment assets.

SOLUTIONS

Addressing the Finance Problem

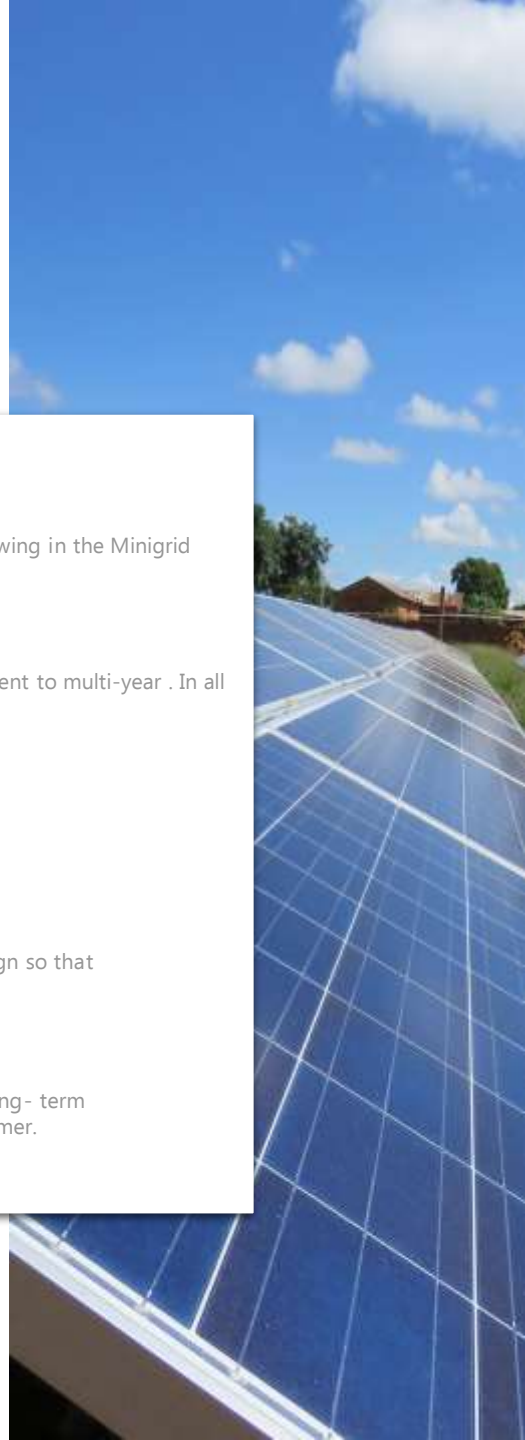
Concessional capital is important in catalyzing and unlocking private capital , we need to see concessional capital flowing in the Minigrid market.

Subsidies and Viability gap funds should incentivize private sector development. subsidies should range from permanent to multi-year . In all cases, subsidies should at least match the direct and indirect subsidies given to existing national grids.

PPP structures and contractually based regulations allow for the deployment of de-risking tools.

The appropriate level of debt and equity needs to be available at the right time. Investors and developers need align so that there are no "valleys of death" in the life cycle of growing a Minigrid development company

The sector needs patient capital which can take later returns from investment , Working capital facilities and in the long- term infrastructure debt facilities and local debt facilities to ensure that forex changes are not passed on to the end consumer.



THE PROBLEM

Data Research and Implementing Change

The Problem:

Because the minigrid market is a fledgling one, there exists significant misunderstanding amongst governments, stakeholders, donors and investors that hinders a coherent understanding of the minigrid business model and its socio-environmental impacts.

The vast majority of research and recommendations on policy and regulations focuses on an ideal rather than practical implementation. The ideal is inadequate to fully understand the implementation constraints hindering growth

AMDA believes that quality quantitative and qualitative Metrix on sector performance, unit economics, growth, policy and regulatory timelines are essential to understanding what is hindering growth and what is accelerating it. All of our sector recommendations and advisory work are underpinned by data and research.

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Benchmarking

Sector aggregated data provides insights that covers the comparative costs of grid vs. MGs, the grid vs. MGs, the sector's role in community community economic growth, as well as as environmental impact figures, amongst others amongst others – helping to tell the minigrid the minigrid story while illustrating the case for illustrating the case for minigrids at scale, and at scale, and the financing / regulation required regulation required to get there.

Policy Mapping

Policy mapping will provide stakeholders, donors, and governments with a clear picture of how regulations impact the growth of the decentralized energy markets across all AMDA chapters in SSA, ranking them according to the ease of conducting business.

Qualitative Research

The minigrid sector will employ over 1,125,000 people over the next decade, increasing the disposable income of women by 59%, and doubling the profits for rural farmers and SME owners, while lowering greenhouse gas emissions by 71%.

Ensure access to affordable, reliable, sustainable and modern energy for all

GREEN MINI GRID
FACILITY | KENYA
POWERING PEOPLE

UKaid from the British people

European Union

European Union Africa Infrastructure Trust Fund

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

iED

EPRA

Kenya Power

Monday, 28th November 2022

Movenpick Hotel

#WorldInCommon

AGENCE FRANÇAISE DE DÉVELOPPEMENT | FRENCH DEVELOPMENT AGENCY

GMG Structure

GREEN MINI GRID
FACILITY | KENYA
POWERING PEOPLE

UKaid
from the British people

Donors

European Union Africa
Infrastructure Trust Fund

Implementing Partner

AFD
AGENCE FRANÇAISE
DE DÉVELOPPEMENT

Managing Entity

Practical ACTION CONSULTING

iED

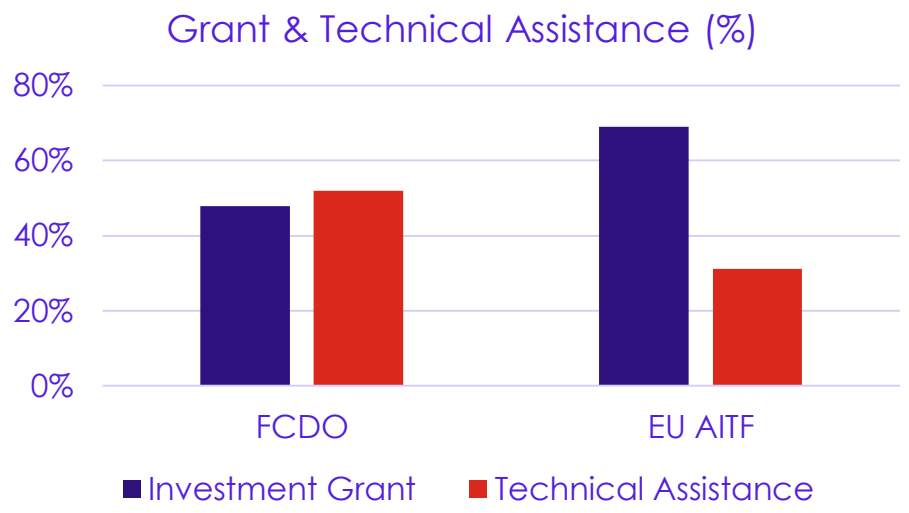
I-DEV INTERNATIONAL

FCDO Funding – EUR 10.38 MILLION

2014 – 16 Preparatory Phase	Sept 2016 Start GMG	Mar 2017 Call 1	Implementation started early 2018	Programme completed July 2021

EU- AITF Funding – EUR 5.65 MILLION

June 2018 Fund committed	Aug 2018 Call 2	July 2019 Contracting	Implementation ending 2023/2024



Mini-Grid

80

GMG Capex/Connection

EUR 800-1,200

Residential Tariff

55-80 KES
EUR 0.43-0.65

Commercial Tariff

43-88 KES
EUR 0.34-0.69

Connection Fees

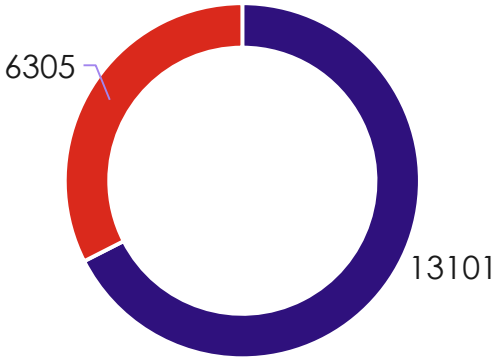
KES 500 – 6,500
EUR 4 – 51

Installed Capacity

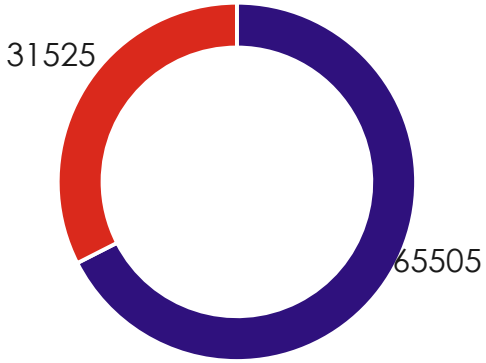
≥ 2MW

Impact

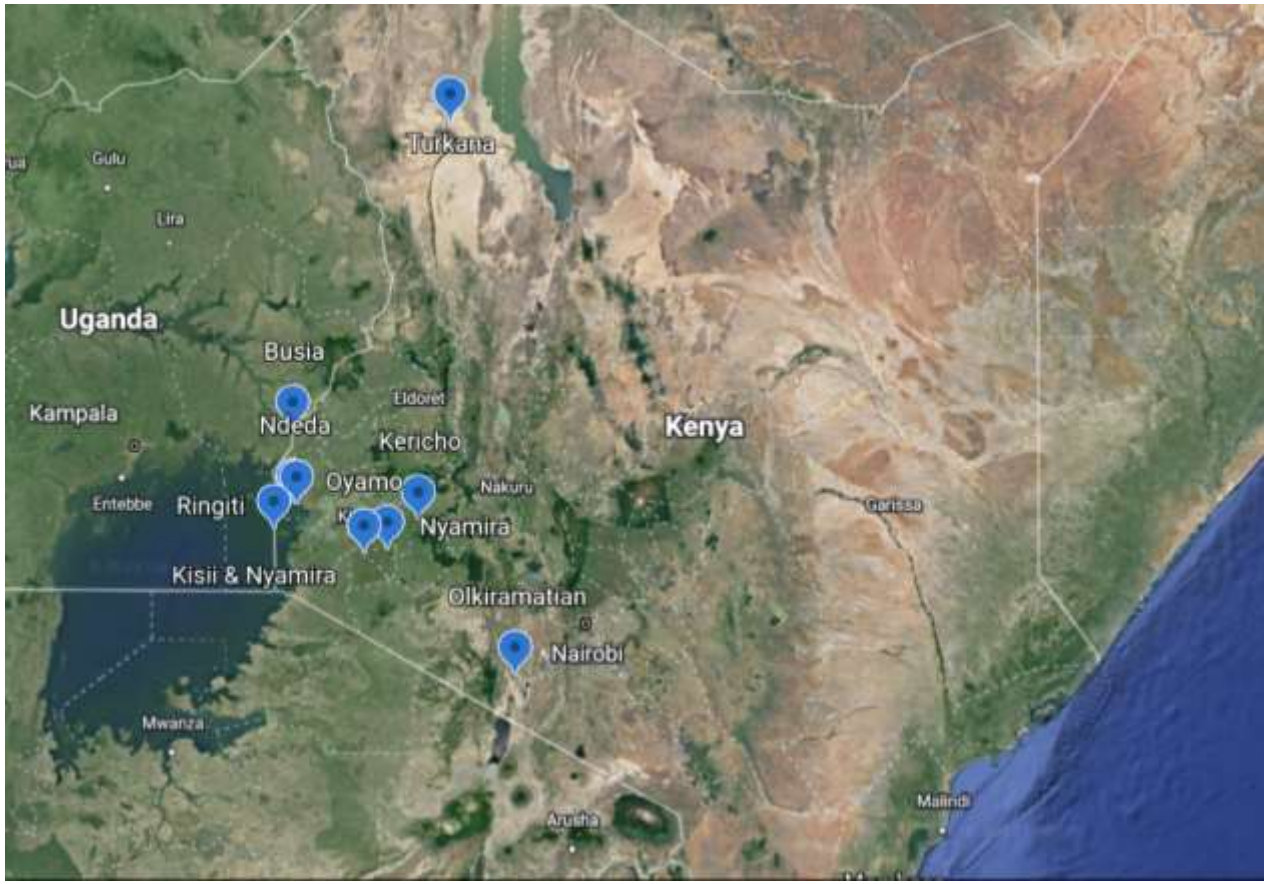
Live Connections



Population Impacted



Mini-Grid Locations



Regulatory Requirements:

- **Ministry of Energy Approval** based on EoI includes no objection of county authorities and REREC.
- **Tariff approval** by Regulator (detailed feasibility study, standard tariff calculation, ESIA etc). Reviewed annually.
- Approved tariffs varying between EUR 0.4 to 0.65/kWh and connection fees EUR 4 – 53 but vary per developer. Regulator open for different models.
- **Construction Permit** (tech specs, land registration, etc). 90 days response time from Regulator. Valid 12 months.
- **Generation, Distribution and Supply License** after commissioning of plant/ distribution network, up to 20 years .
- Regular reporting to Regulator, monthly and annually.

Financing

Pre-feasibility	Development	Execution
• Technical Assistance Max € 50,000 • Maximum per potential Connection € 100	• Technical Assistance Max. € 250,000 • Max. per potential Connection € 125	• Max. Grant € 450/ Connection • Max. Grant 50% of Eligible Costs

Technical assistance:

- Technical and Engineering
- Business and Financial planning
- Development of Productive Use of Energy
- Legal and Compliance
- Environmental and Social
- Market Assessment and Market Development

Grants:

- Investment Grants (CAPEX)
- Output-Based Grants (Connections)

Key Technical Assistance to the Sector

1. Support to Ministry/Regulator
Technical assistance supported EPRA on the development of the Mini-grid regulations, Online licensing platform, Capacity development and Tariff models.

2. Access to Finance
Demand and Supply side of Energy Finance and Market Assessment studies for HH appliances and PU applications for SMEs.

3. Environmental, Social and Gender Monitoring
To ensure relevant ESG related topics are monitored and reported throughout the project cycle.

4. Productive use of energy
Tool kits to improve economic development in mini-grid communities.

- Milling
- Ice making
- Electric pressure cookers

5. Impact Study
Track the short and long term benefits of private mini-grids in 8 counties. This study has been launched and is expected to recieve it's first set of data by Q1 2023.

Challenges

1. Regulatory approval process - Time and resource requirements have changed over time.
2. Land registration issues.
3. Developers delays in procurement/ delivery of materials.
4. Over optimistic time frame from both donors and developers.
5. Requirement of additional subsidies for operational support/tariffs in hard to reach areas and for households who earn less than 3$ a day.

Thank you

Visit our website for more information - www.gmgfacilitykenya.org

For any further questions do not hesitate to contact:
GMG: Muslim Janoowala
Consultant – Mini Grids(based in Nairobi)
janoowalam.ext@afd.fr

Energy: Rita Laibuta
Project Officer (based in Nairobi)
laibutar@afd.fr

afd.fr

Strong Track Record in Africa

Operations in about half of Africa

…and clients

Key figures

100+ **MWp solar systems**

150+ **Minigrids deployed**

350+ **MWh of battery storage**

5,000+ **sites** equipped with Sagemcom's **Energy/Monitoring systems**

50,000+ **km energy & telecom cable infrastructure**

Mini-grid in Uganda

Project description

For Engie

Sagemcom supplied and implemented a solar power plant of 600 kWp and 360 kWh to power a mini-grid in Lolwe Island located in Uganda Victoria lake. This project carried out for the account of Engie Equatorial Ltd will provide electricity to 3,500 families and businesses.

Technical characteristics

Total installed capacity	600 kWp
Energy storage	360 kWh Li-ion
Hybridation	200 kVA genset
Distribution MV/LV	Done by REA
Number of connections	3,500 done by Engie Equatorial
Beneficiaries	15,000 inhabitants

Why Sagemcom?

Present Across East Africa

CERTIFICATE OF INCORPORATION

TANZANIA

Certificate of Incorporation

Section 15

No 102848

I HEREBY CERTIFY THAT

MCOM ENERGY & TELECOM TANZANIA LIMITED

is day incorporated under the Companies

2002 and that the Company is Limited.

Given under my hand at Dar es salaam

1ST day of OCTOBER

THOUSAND AND THIRTEEN

Asst.Registrar of Companies

Registration No:

THE COMPANIES ACT

Certificate of Incorporation

CERTIFY that SAGEMCOM ENERGY & TELECOM UGANDA LIMITED (Limited by Shares) has this day been incorporated with Limited Liability.

Dated at Kampala, this 27th day of February the year 2019.

Signature: BIRUNGI ALICE SINGAHAKYE

Registrar of Companies

Relevant Permits & Deep Knowledge of Local Regulation

KENYA

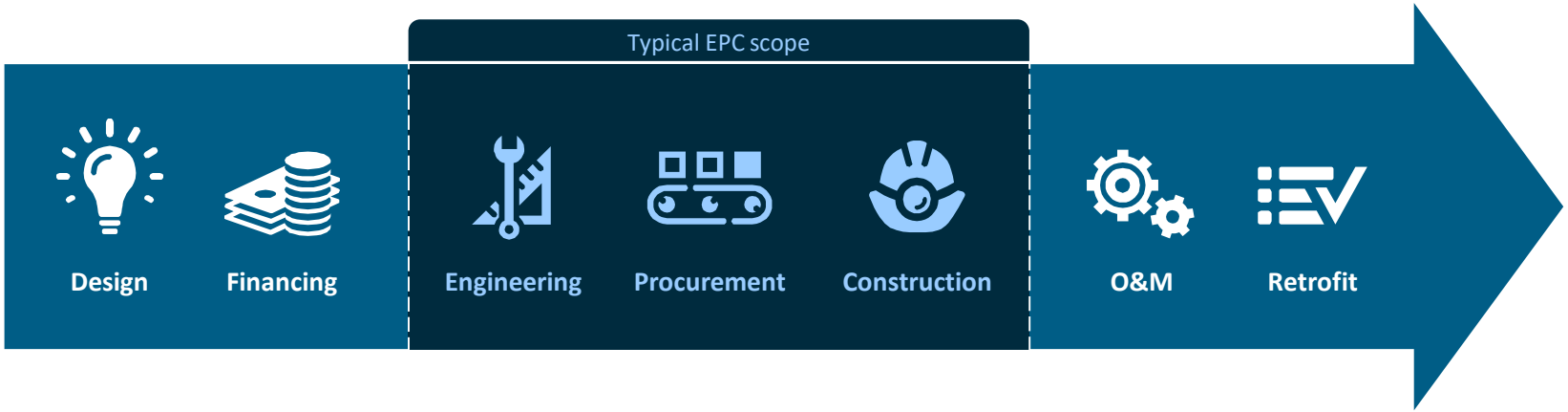
KENYA

TANZANIA

UGANDA

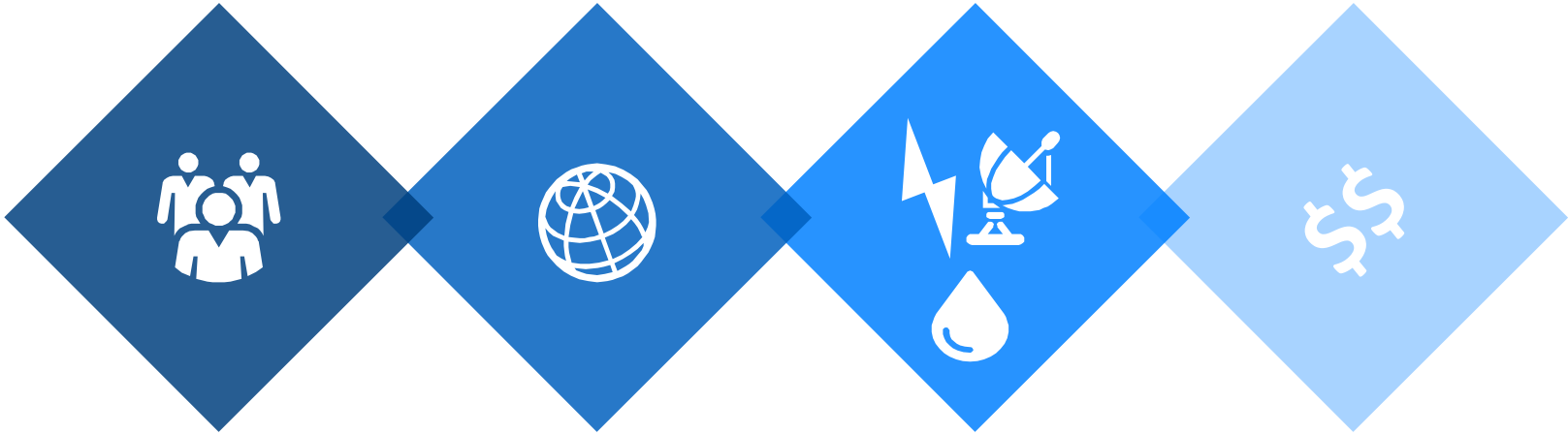
Sagemcom is much more than just another EPC

To meet the needs of our customers and help their businesses grow, we cover the full spectrum from project Ideas to designs to implementations, operations & maintenance and potential retrofits in the long-run



- Financial strength
- Local experts and implementation teams backed by a network of specialists
- Single point of contact for ambitious and cross-disciplinary turnkey projects

Sagemcom is the ideal partner to implement complex infrastructure



A Reliable Partner

Well-capitalized multinational company **incorporated in 1924** and still thriving

Fully dedicated staff
(30% employee shareholding)

Present Globally & Locally

Operating in around the world, including
half of Africa

Present in **Northern, Western, Eastern & Central Africa**

Experienced in Complex Infrastructure

Water networks require deep experience in Design, Civil Work, Home connections.

More than 40 years experience in complex infrastructure with **Maintenance**

Strong Financial Capacity

Well funded Group

With Financing Solutions

Thank you

Sagemcom

COFFEE BREAK

Next panel discussion at 10.45 :

Residential and commercial market for stand-alone renewable solutions

SEMINAR / November 28th

Decentralized Renewable Energy Solutions for an Inclusive and Sustainable Development in East Africa

Movenpick Hotel, Nairobi / 8.30 am - 1.00 pm

Panel Discussion 2: Residential and commercial market for stand-alone renewable solutions

10.45 am - 11.30 am

Panelist
Patrick TONUI
Head of Policy and Regional Strategy, GOGLA

Panelist
Jon EXEL
Senior Energy Specialist, World Bank Group

Panelist
Philippe ROBERT
East Africa Regional Director & Managing Director Uganda, Engie Energy Access

Panelist
Doreen GITHUI
Access to Energy Business Development Specialist, Total Energies

Moderated by
Julie TROGNON

French Embassy in Kenya

MINISTÈRE DE L'ÉCONOMIE, DES FINANCES ET DE LA SOUVERAINETÉ INDUSTRIELLE ET NUMÉRIQUE

FRENCH CHAMBER OF COMMERCE KENYA

AMBASSADE DE FRANCE AU KÉNYA

ENGIE Energy Access was created through the successful integration of ENGIE Mobisol, Fenix International and ENGIE PowerCorner into a single entity

ENGIE Energy Access

Fenix International

Fenix International used to focus on entry-level solar home systems (10W to 50W).

- Appliances for basic lighting, phone charging and hair clippers are provided on a **"lease-to-own" model**
- Affordable installments used to start from **USD 0.14 per day**
- Use of **PAYGo and lock-out technology** to manage customer payments

Founded in 2009

Mobisol

Mobisol used to provide off-grid solar home systems for homes and businesses.

- Kits used to have a higher power rating (50 W to 200 W) and to cover a portfolio of appliances
- Productive use of appliances to contribute to **solar-powered small businesses** to generate incremental income (e.g. phone charging, village cinemas, bars etc.)
- SHS were provided via a **"lease-to-own" model**

Founded in 2012

Solar Home Systems

ENGIE PowerCorner

ENGIE PowerCorner used to provide clean, reliable, affordable and productive electricity to rural populations through renewable Mini-Grids

- Cloud-connected smart meters and PAYGo technologies allowed for **performance tracking and payments management** of individual connections
- Energy efficient appliances were provided via a **" lease-to -own" model**

Founded in 2016

Mini-Grids

EEA has a holistic offer based on two complementary business lines: SHS and Mini-Grids

Fully-fledged spectrum of solutions from 10W to 600kW


10W


20-50W


50-200W


1-5kW


25-600kW

Home and Small Business Use

Community Scale & Large Business

PAYGo

BOO[1]

"Lease-to-own" & Cash Appliances


LEDS dimmable lights


Solar FM Radio


Hair cutter


TV


Standing fan


Refrigerator


Portable torch


Stereo

Access to Energy: mission and objectives

Today in the world, **789 M** people do not have access to Energy.

OUR MISSION : BRING ENERGY TO PEOPLE WITHOUT ACCESS

BY DEVELOPING SOLAR PRODUCTS

AND MARKETING THEM

- *Via* 230 stations on network
- Cash or with micro-finance
- *Via* resellers or NGOs
- *Through* empowering women and youth

OUR COMMON AMBITION:

IMPACT 25 MILLION PEOPLE BY 2025

Energy Access history at TotalEnergies

TotalEnergies

2010

Energy Access launch

1) Solar lamps
2) Venture Capital in Emerging Markets

2012

AWANGO by Total

launch

Lamps sold in Cameroun, Kenya, Indonesia DRC (125k units sold)

d.light sunking sundaya

2016

"Awango" phase out

Build "Total Brand" through Sunshine range

2018

Sunshine range

AE launches its own offer

2020

Evolution of the range

New Pocket Sunshine and One Sunshine

+ a new offer: SHS PayGo

2022

Sunshine full range

Arrival of 3 new products ….

20M Units sold

Objective: Impact 25 million people by 2025

Wide products catalogue to better target the customer needs

Keeping the TotalEnergies brand while testing other solutions

TotalEnergies

Single lighting

New

Pocket

ONE

Single lighting + phone charge

Family

Home kits

Home Lite

Home

2023

Q1 2023

New

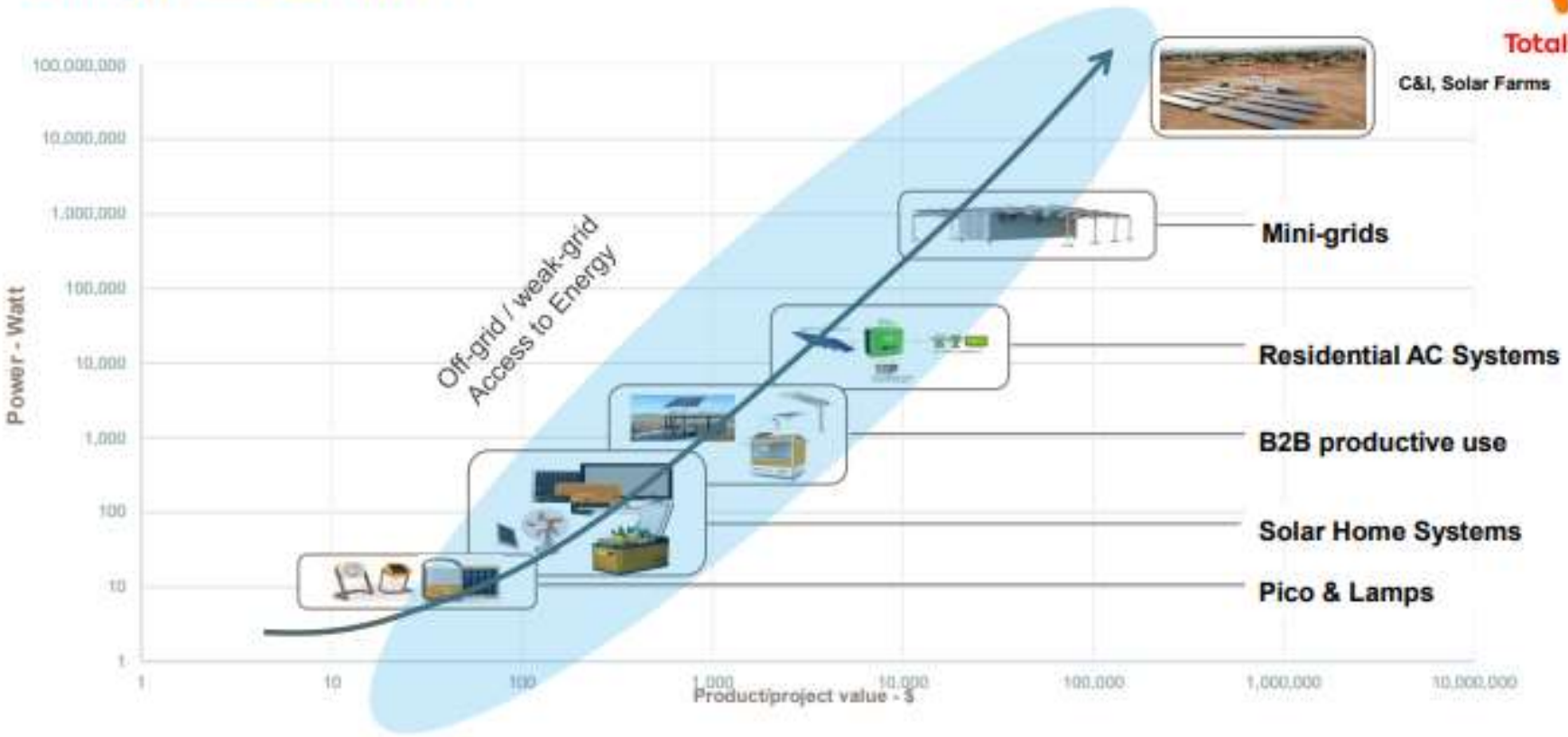
Sunshine 150

New

Sunshine 300

PayGo

Energy Access status



Advanced solar tech & digital tools provide path to end energy deficit, but formidable obstacles remain …

ACCF Project showcase

Key Challenges and Proposed Solutions

TotalEnergies

….focus on the Value Chain

Business Models	• Need to re-imagine the solar business models. • Flexibility is key • Build robust business model that encourages accountability and gender inclusion
Financial enablers	• Most local MFIs face liquidity challenges. • Need to think of building financial capacity for local MFIs
Project mensuration	• Impact analysis key to validate business models
Circular Economy	• Engage partners on End-of-Life product management
Strengthen internal & external COMs	• Promote awareness of solar solutions as key component in the energy transition • Update impact (& other metrics such as CO2)

SEMINAR / November 28th

Decentralized Renewable Energy Solutions for an Inclusive and Sustainable Development in East Africa

Movenpick Hotel, Nairobi / 8.30 am - 1.00 pm

Panel Discussion 3: Beyond energy, decentralized solutions for the provision of essential services

11.45 am - 12.30 pm

Panelist
Jason GRAS
CEO,
Stimaboda

Panelist
Dennis KEYA
Country Manager Kenya,
EDF

Panelist
Bradford MMENE
Wash Engineer,
Kenya Red Cross Society

Panelist
Beatrice MUSYOKA
Chief Economist,
KenGen

Moderated by
Laure PAUGAM

French Chamber of Commerce in Kenya

MINISTÈRE DE L'ÉCONOMIE, DES FINANCES ET DE LA SOUVERAINETÉ INDUSTRIELLE ET NUMÉRIQUE

FRENCH CHAMBER OF COMMERCE KENYA

AMBASSADE DE FRANCE AU KÉNYA

Solarized boreholes at Moa that serves approximately 3,500H/H, in Lamu County.

Desalination plant plant at Faza Island in Lamu County, the system serves a population of approximately 8,000h/h. The system has a capacity of 5m3/hr.

Kenya Red Cross

Off-grid Electrification

Reliable, sustainable and affordable

Energy Access for Rural clients


850 millions inhabitants without electricity
650 millions in Africa …

EDF Off-Grid Solutions

Solar Home System (SHS)

A SHS (or solar kit) is a standalone equipment composed of photovoltaic solar panels, that provides power for low power devices.

Type of customers : individuals, houses, small business

Mini grid

A mini-grid (or micro grid) is an off-grid electricity distribution network involving small-scale electricity generation (10 kW to 10 MW).

Type of customers : hospitals, schools, villages …

Solar Water Pump

Solar pumps are equipment with solar photovoltaic panels that allow to pump water on the surface for watering crops.

Types of customers : farmers

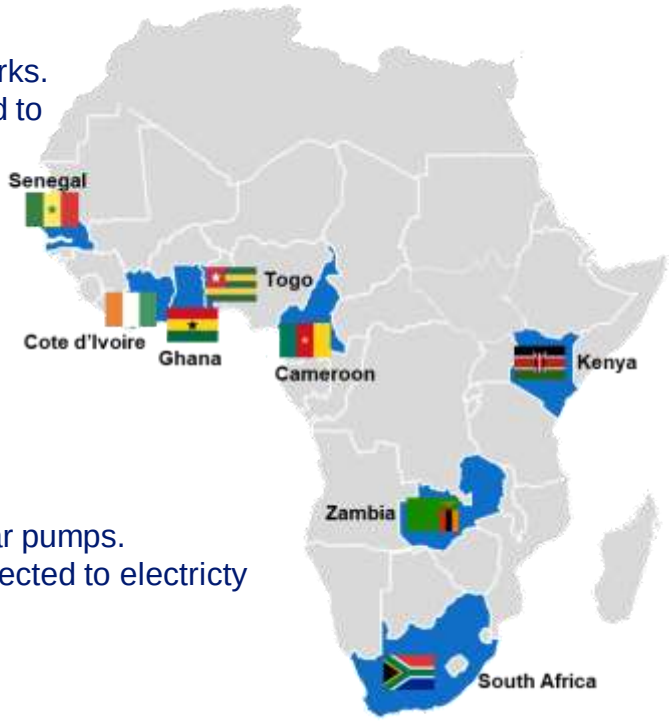
EDF’s Off-grid activities in Africa

EDF is active in **7 countries** for a total over **2 million people connected** to electricity by the end of 2022.
EDF CAP 2030 **goal** : **5 millions** people connected.

Senegal
19k solar kits and 16 mini networks.
More than 97k people connected to electricity

Ivory Coast
52k solar kits.
Solar pump activities in progress
Round 260k people connected to electricity

Togo
80k solar kits and 3k solar pumps.
Round 400k people connected to electricty



Kenya
160k solar kits and 20k solar pumps.
About 900k people connected to electricity

Zambia
14 mini grids.
More than 10k people connected to electricity

South Africa
Round 300k people connected to electricity

The Solar Home System

B2C

Solar Home Systems

Scalable, adapted to customers' income and needs

Lighting, radio, mobile, TV, fan

500 - 1000 €

(9 - 32 € / month over 36 months)

Our solar kit solutions

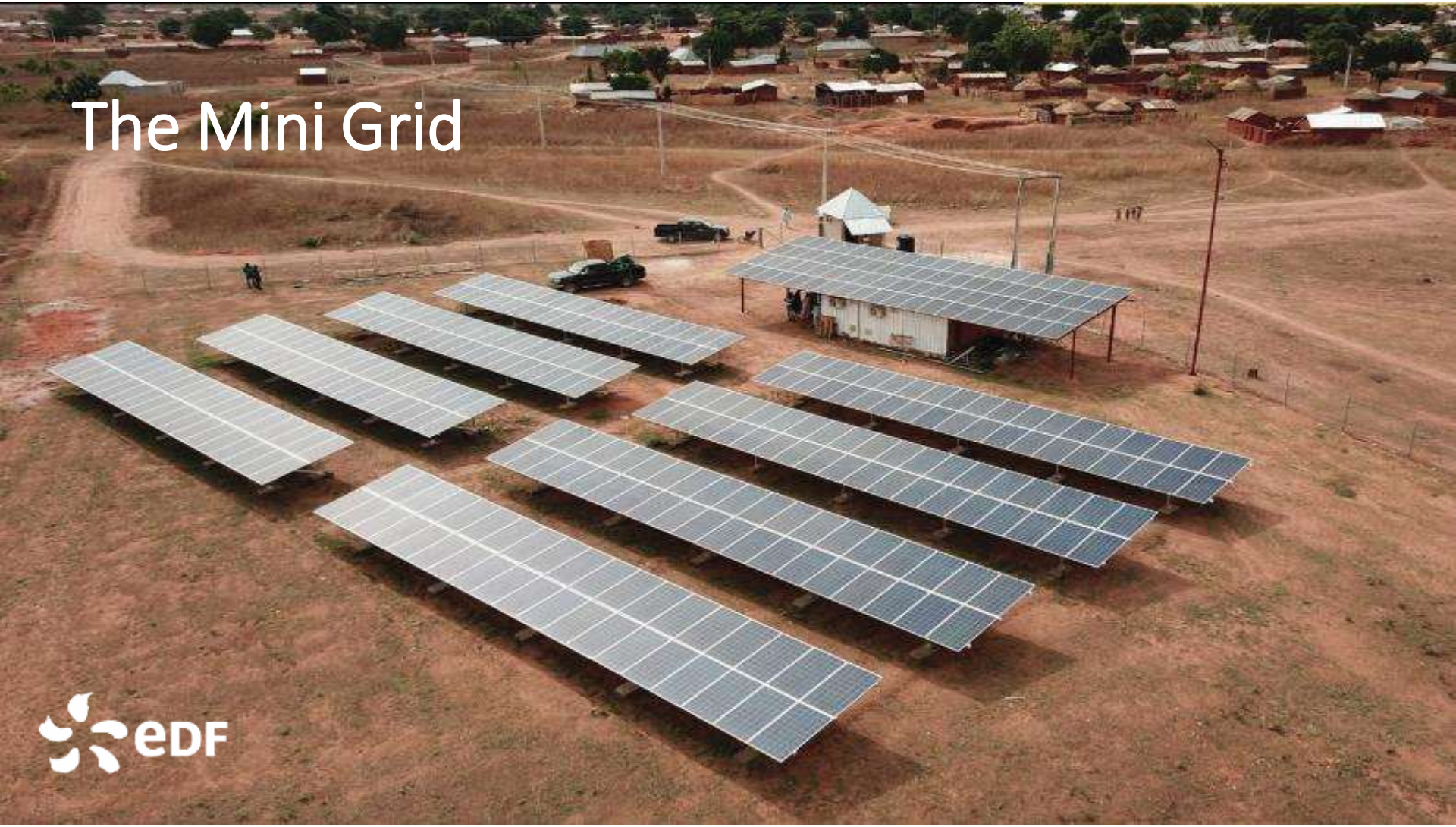
These individual kits include easy-to-install solar panels backed by batteries that store electricity.

EDF takes care of the installation and maintenance of the solar kits for rural and peri-urban households.

The solar kits are payable by simply using a telephone.

Marketing → Financial offer → Service & maintenance → EDF produces and supplies low-carbon electricity to communities

The Mini Grid



Our Mini Grids

EDF delivers a turnkey mini grid: electricity production + distribution network + meters

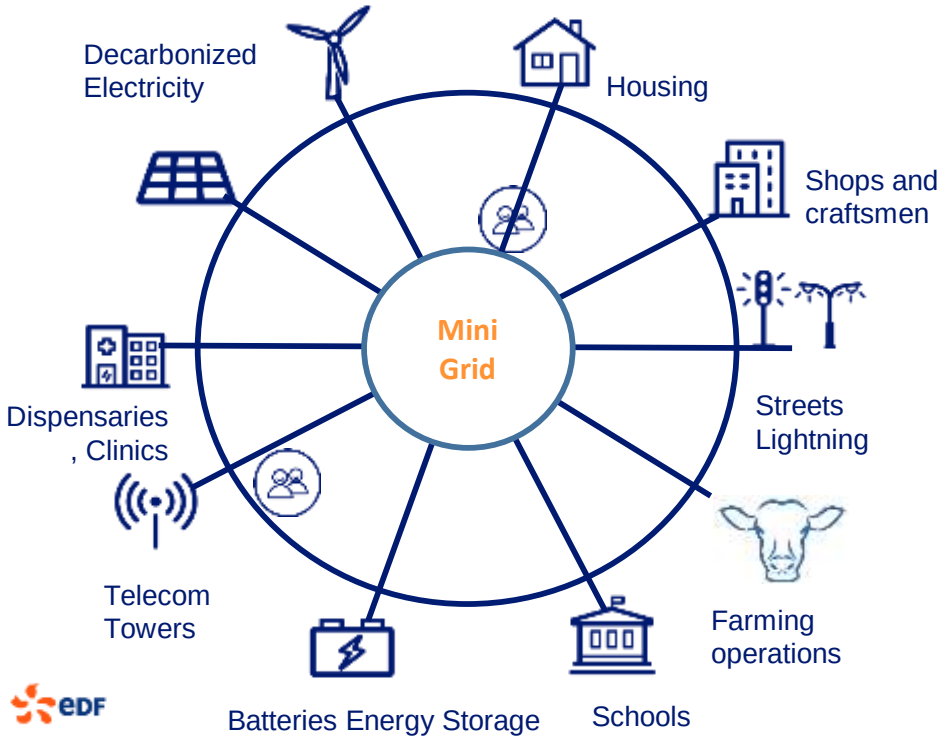
EDF builds the mini grid from A to Z, from feasibility studies to commissioning

EDF operates and maintains the mini grid for long-term efficiency

Design → Construction → Exploitation → EDF produces and supplies low-carbon electricity to communities

The mini network is reliable and environmentally friendly

The mini grid is an electrical system that connects all members of the community



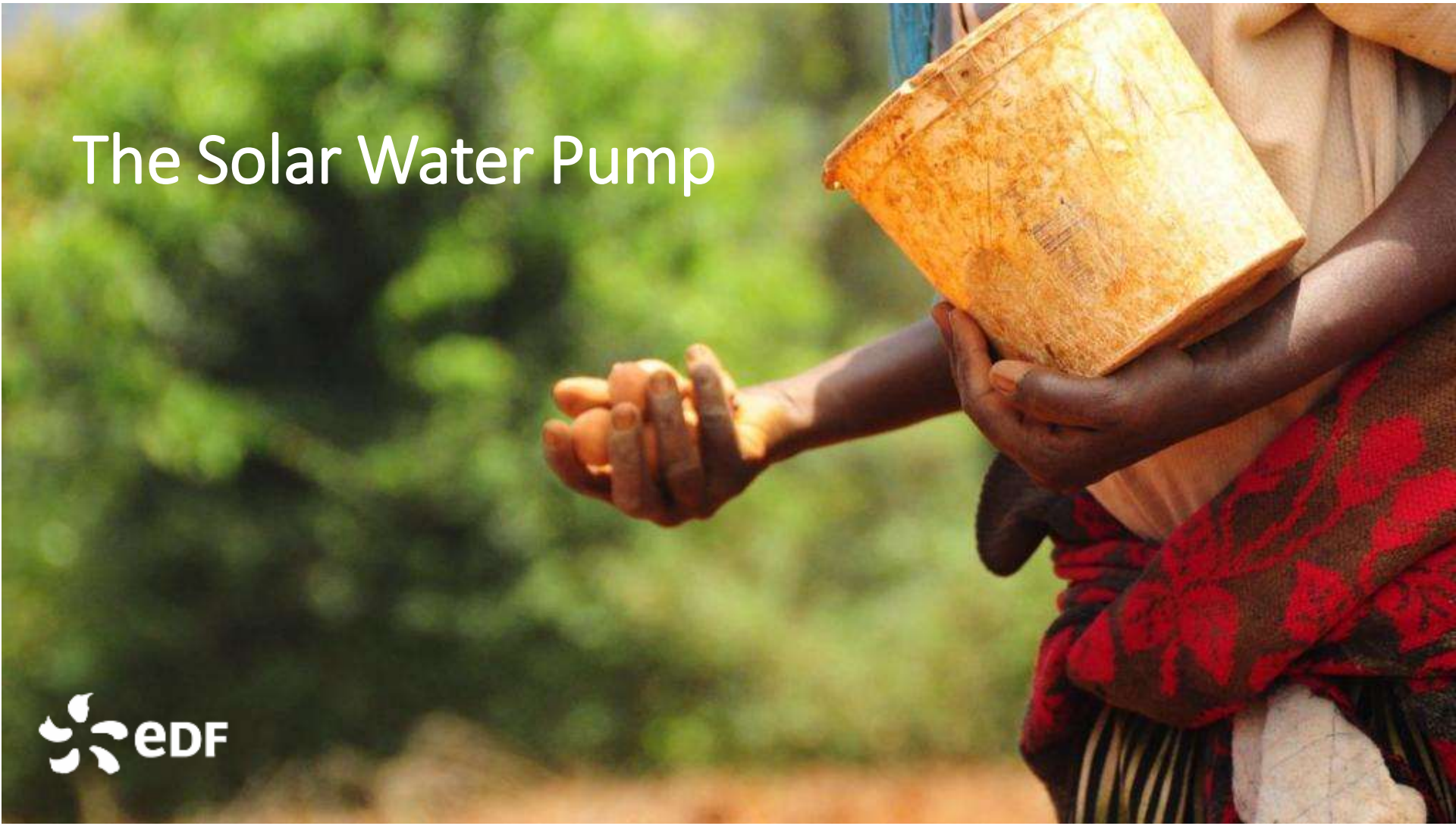
A sustainable energy
The mini grid uses local and renewable energy

A reliable system
The mini grid uses multiple sources and batteries to provide electricity

An adaptable system
The mini network grows and develops as community needs change

More affordable energy
With an optimal custom configuration, the mini grid provides substantial savings to communities

The Solar Water Pump



B2B: Solar Pumps

More economical than a diesel pump

50W to 300W

450€ to 900€

(5-34 € /month over 18-30 months)

Quality of life impact on farmers

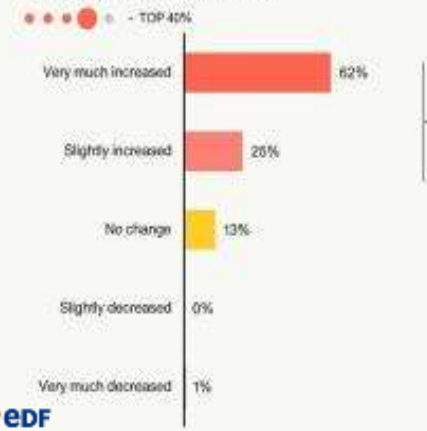
We conducted an impact survey our customers in September 2020.
The average land size per farmer was 6000 square meter and the farmers had the system for 12 months on average.

87% reported an increase in production and 81% of those did so without planting additional land.

80% of farmers reported an increase in money earned, an increase in harvest and cost reduction being the main drivers.

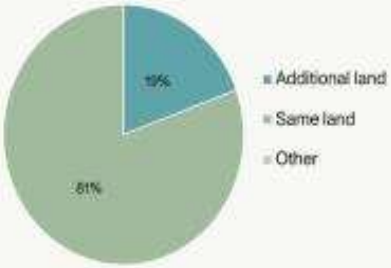
Impact on Production

Q : Has the total production from your crop changed because of our solar water pump? (n=203)



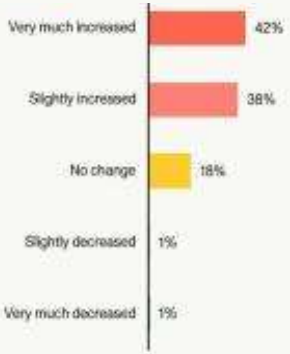
Reasons for increases in production

Q : Was this increase because you planted additional land or was it from the same amount of land ? (n=175)



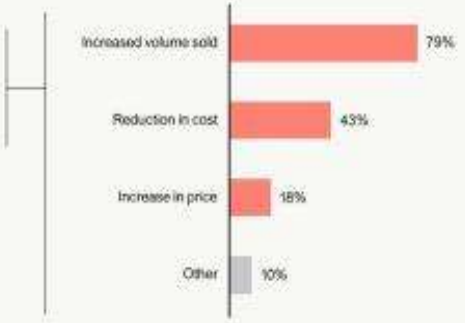
Returns from Crops

Q : Has the money you earn from farming changed because of our solar water pump ? (n=207)



Reasons for Increased Returns

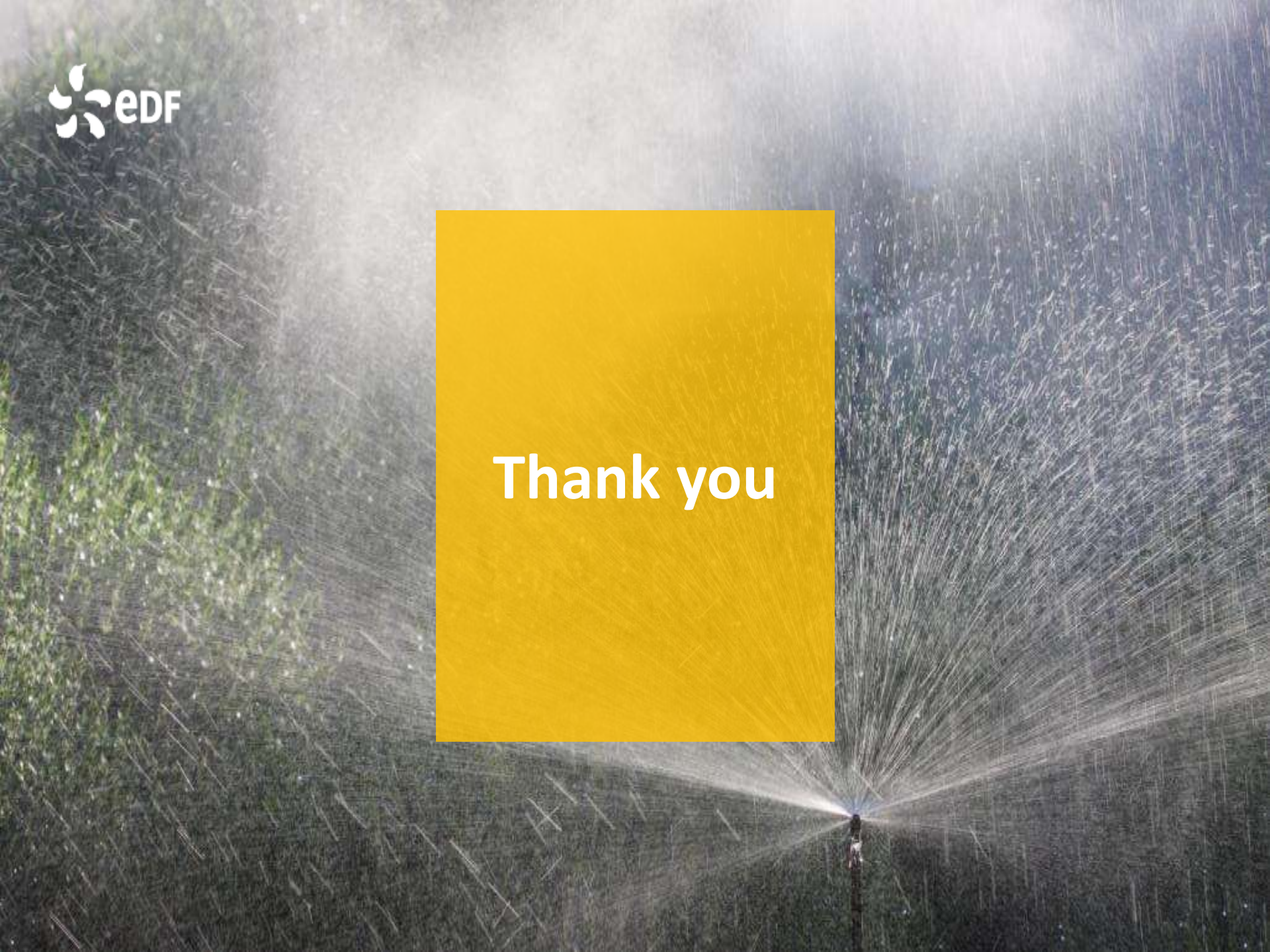
Q : What were the main reasons for the increase in money earned ? (n=165)



Main Challenges

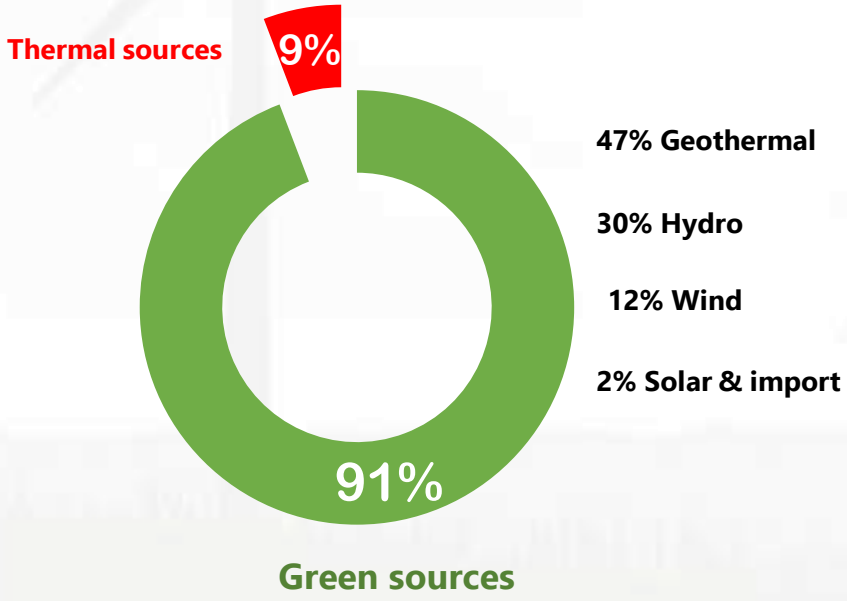
Our mains challenges

		Actions
To reach profitability	▪ Low-income population, highly sensitive to adverse situations - Covid, recession etc. ▪ Retail – B2C businesses, Competition, scale effect.	▪ Diversify products – e-Mobility, LPG etc.
Partnerships	▪ Partners have different objectives for market approach. ▪ Aligning with diverse market players	▪ Work and engage more closely with partners including National and regional government.
Regulation / DFIs support	▪ Draft MiniGrid Regulation in Kenya ▪ Financing still a challenge for Financial Institutions.	▪ More active lobbying ▪ Subsidies to lower risk


Thank you

Kenya's grid is largely green; however, it is underutilized in meeting the country`s energy needs

Kenya`s generation mix



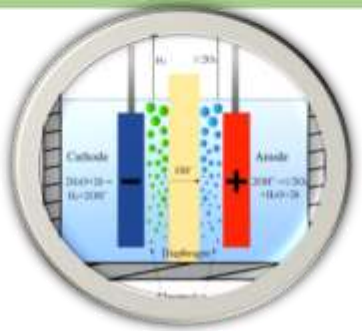
Kenya`s Greenhouse Gas Emissions` Situation

1. Total GHG emissions increased by 65% in 10 years to 93.7MtCO_{2e} in 2015; expected to rise to 143MtCO_{2e} by 2030.
2. Kenya has committed to abate this growth by 32%
3. Key contributors to the emissions are:-
   - Agriculture (livestock, fertilizer) – 40%
   - Deforestation and energy – 20%
   - Transport – 18%

Source: Ministry of Environment and Forestry

Energy Transition

1 **Green Hydrogen** - Opportunity in Fertilizer Production



1. Kenya imports 300,000+ metric tonnes of ammonia-based fertilizer per year (2021 -USD 355.45 Million in fertilizer importation)
2. **Feasibility Study for hydrogen, Ammonia and Fertilizer production & 5MW pilot plant**
3. **Partnerships in technical capacity development & for large scale production; if the pilot is successful.**

2 **E-Mobility** - Opportunity in Charging Infrastructure

1. Piloted 4 EV – Data collection
2. Roll out of EV charging stations in major towns in Kenya.
3. Accelerated transition of the Company's Internal Combustion Engines to EVs.

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SEMINAR

Decentralized Renewable Energy Solutions for an Inclusive and Sustainable Development in East Africa

28th NOVEMBER, Hotel Movenpick, Nairobi