



On-grid solar investment opportunities in Mozambique

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MOZAMBIQUE

Solar Energy Market

Presentation Overview

- Mozambique – Country profile
- Solar energy resource
- Case studies
- Final remarks

Mozambique

Solar in sub-Saharan Africa



Mozambique - Country Snapshot

Main Indicators

Source: [World Bank](#)

[World Development Indicators](#)
database

Indicators	
Population, total (millions)	28.83
Population growth (annual %)	2.9
Surface area (sq. km) (thousands)	799.4
Population density (people per sq. km of land area)	36.7
Poverty headcount ratio at national poverty lines (% of population)	54.7
GDP (current US\$) (billions)	11.01
GDP growth (annual %)	3.8

Mozambique - Country Snapshot

Electricity Access

Source: [OECD/IEA](#)

[World Energy Outlook 2016 –
Electricity Access Database](#)

Indicators	
National electrification rate %	40
Urban electrification rate %	67
Rural electrification rate %	27

Baseline scenario

Key ideas

- High poverty levels
- Low electrification
- Lack of infrastructures
- Dispersed population

Main entities

Key players

- **Ministério da Energia**

<http://www.minec.gov.mz/>

Ministry of Energy – Governmental Office



- **Electricidade de Moçambique**

<http://www.edm.co.mz/>

National Public Utility



- **FUNAE**

<http://www.funae.co.mz/>

Energy Fund – Public Institution



Legal Framework

Renewable Energy

Política de Desenvolvimento de Energias Novas e Renováveis – Resolução 62/2009

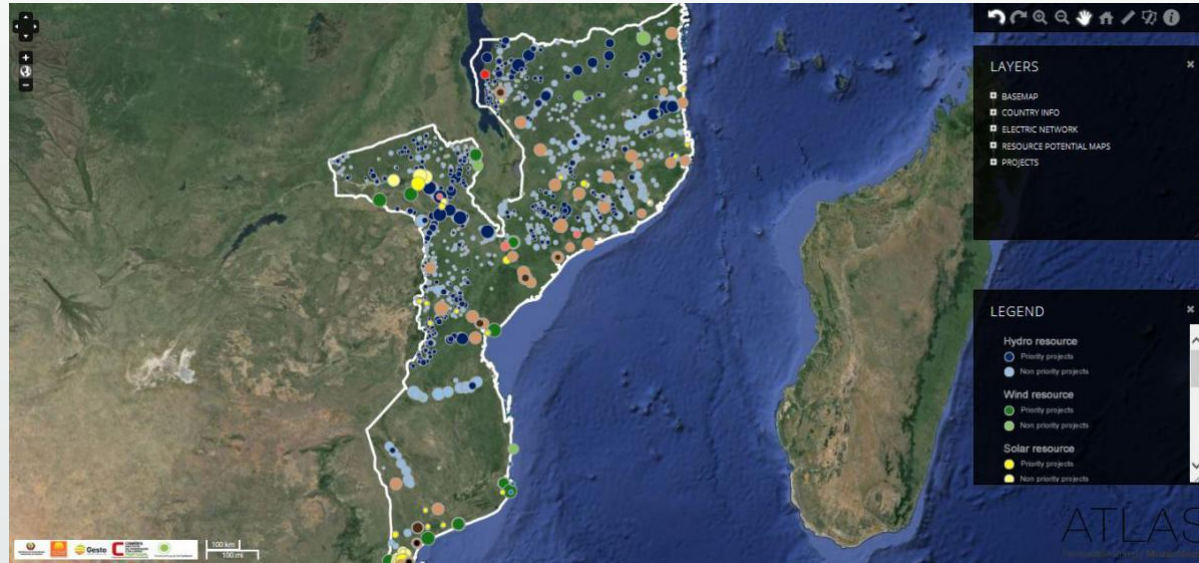
- Policy guideline for renewable energies
- 3 main goals:
 1. Improve power access and provide quality energy.
 2. Develop renewable energies technologies.
 3. Promote and boost public and private investment on renewable resources.

The public commitment



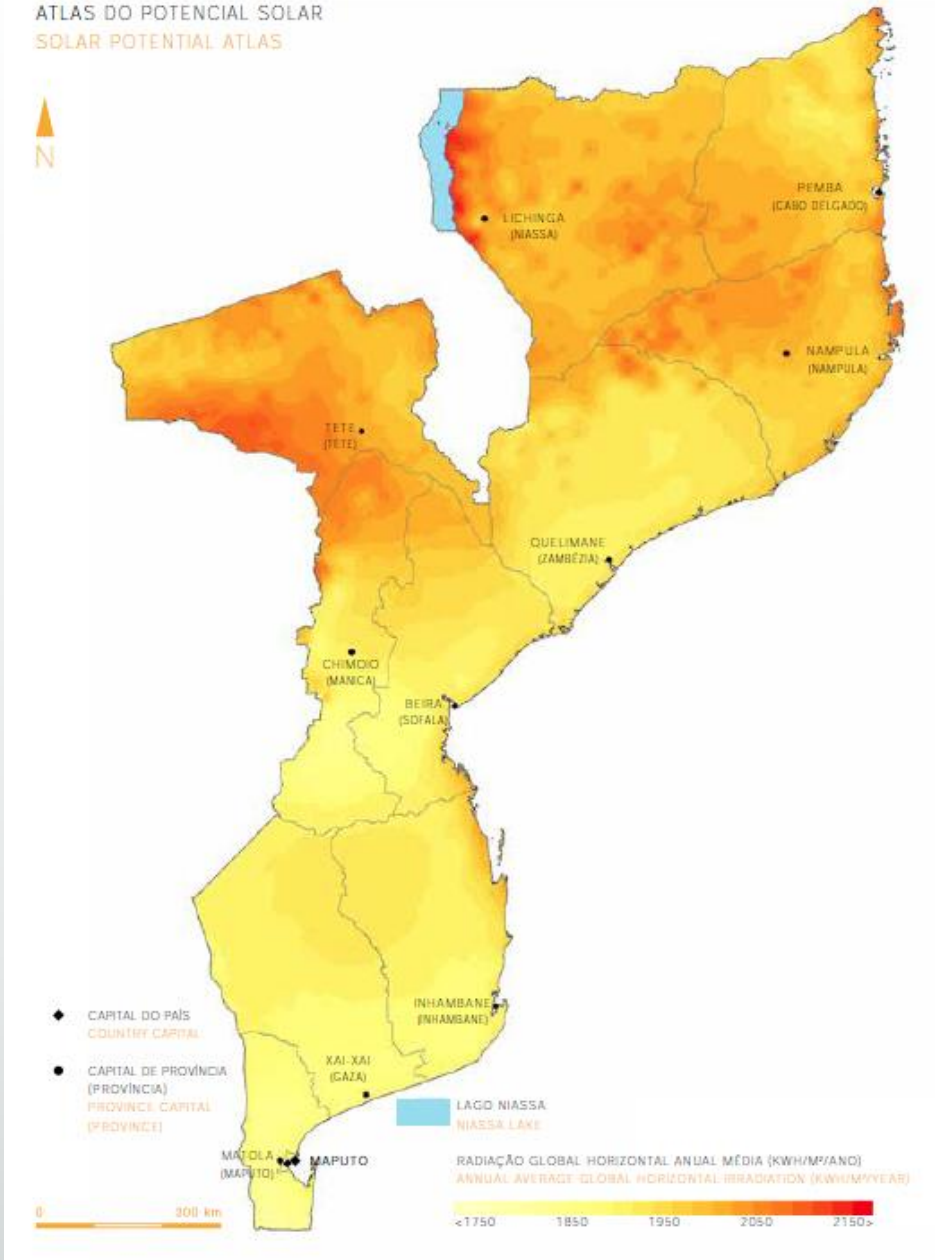
“Mozambique has always supported and will continue to support the development of its renewable energy potential.” -SALVADOR NAMBURETE Minister of Energy

Renewable Energy Atlas of Mozambique



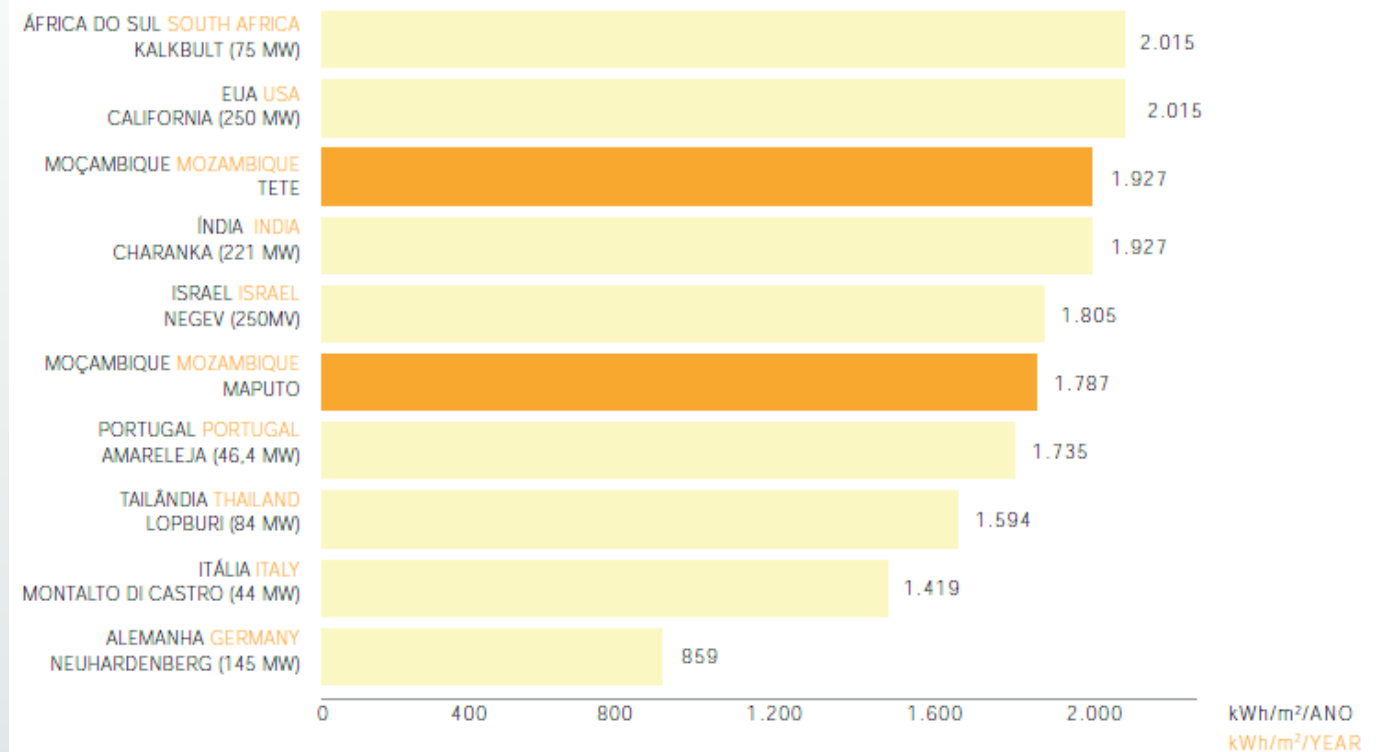
- <http://atlas.funae.co.mz/en>
- Partnership with Portugal (Governmental entities)
- Renewable Energy resources were mapped
- Analysis of potential production of electrical energy
- Hundreds of projects were identified
- Technical and economical feasibility

The Solar Resource



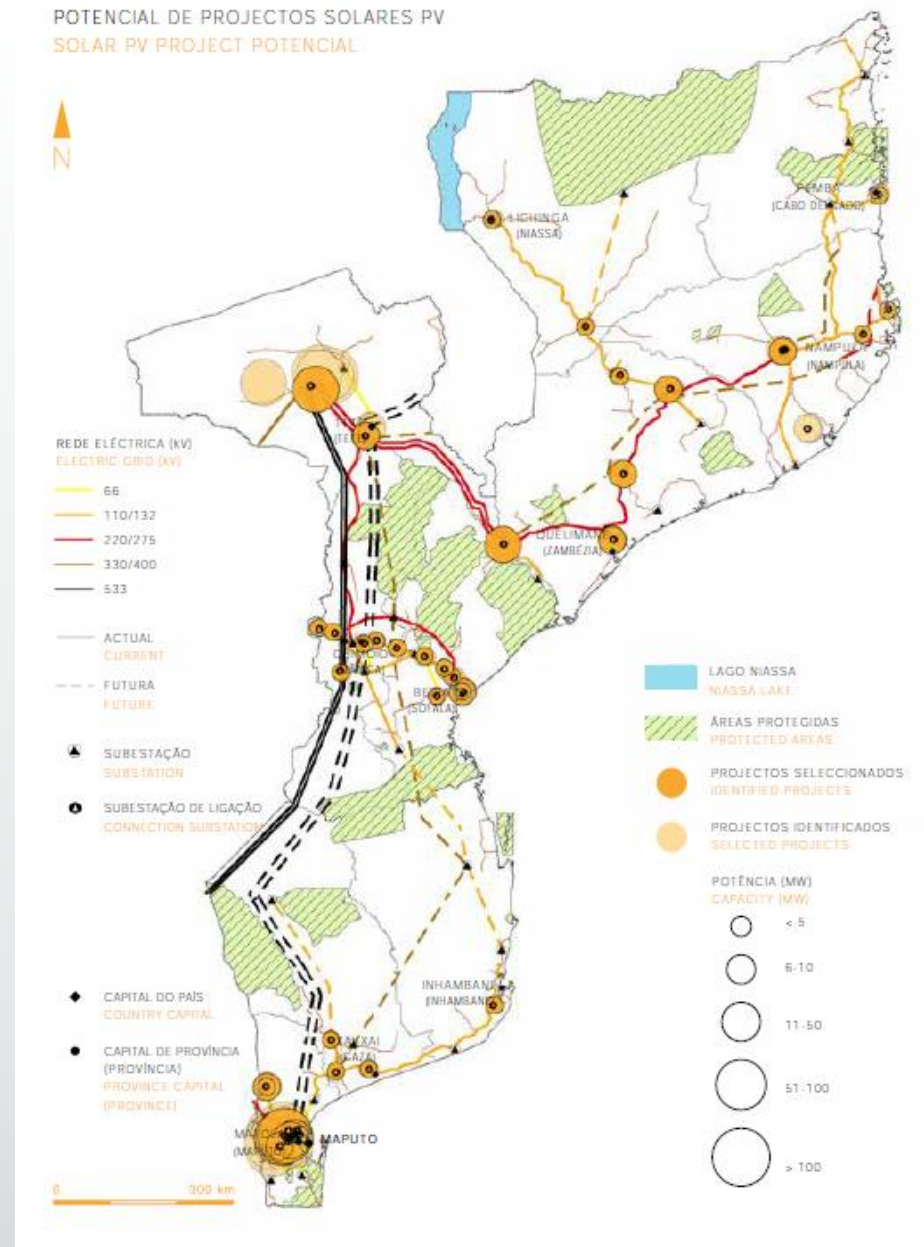
Source: RENEWABLE ENERGY ATLAS OF MOZAMBIQUE - RESOURCES AND PROJECTS FOR POWER GENERATION.

Solar Radiation Benchmark



Source: RENEWABLE ENERGY ATLAS OF MOZAMBIQUE - RESOURCES AND PROJECTS FOR POWER GENERATION.

Solar PV Project Potential



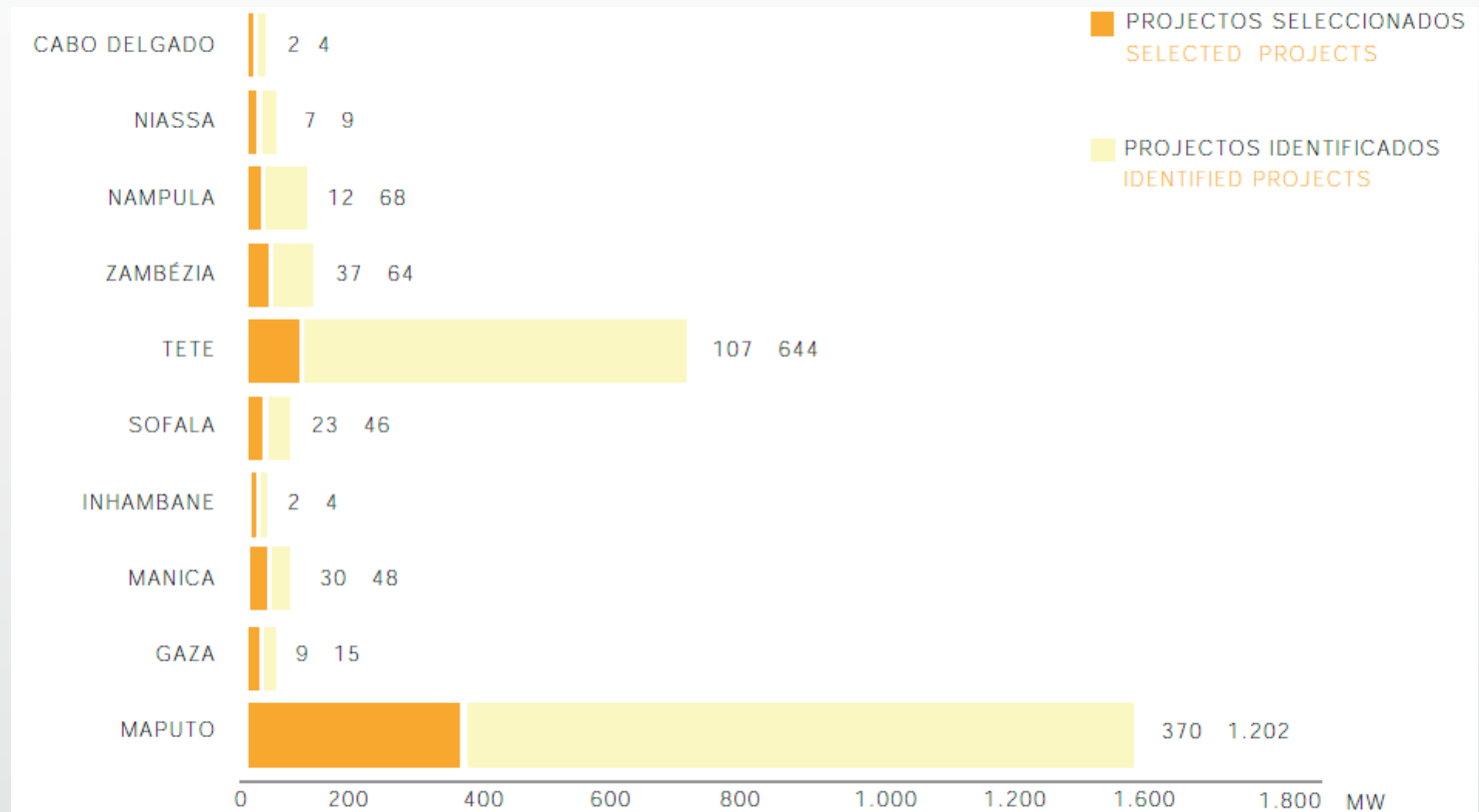
Source: RENEWABLE ENERGY ATLAS OF MOZAMBIQUE - RESOURCES AND PROJECTS FOR POWER GENERATION.

Solar PV Project Potential

The outcome from the report:

- 600 MW

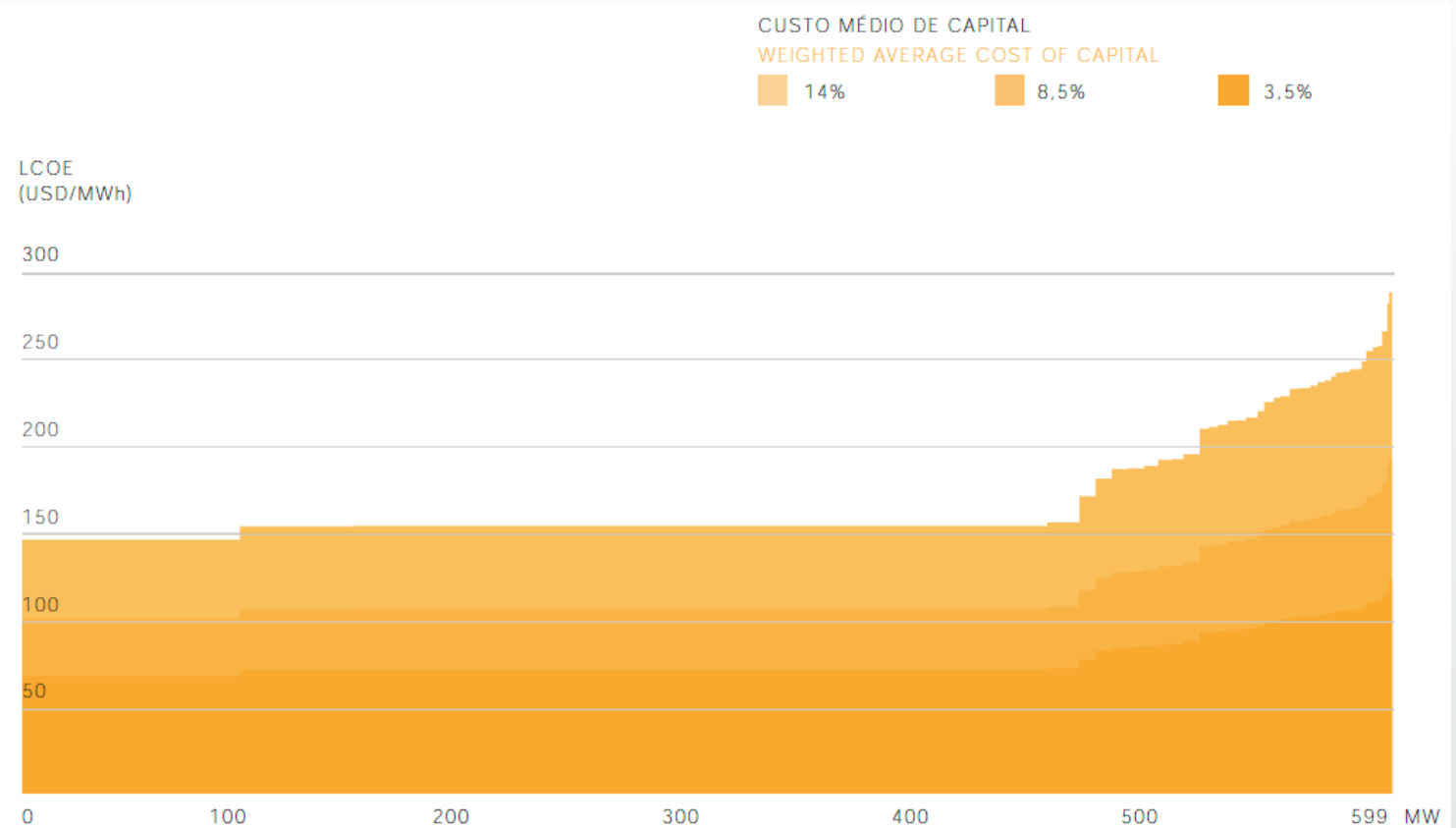
- 43 projects



Source: RENEWABLE ENERGY ATLAS OF MOZAMBIQUE - RESOURCES AND PROJECTS FOR POWER GENERATION.

Levelised Cost of Energy

Solar Photovoltaics in Mozambique



Nota: Sem impostos.
Note: Without taxes.

Source: RENEWABLE ENERGY ATLAS OF MOZAMBIQUE - RESOURCES AND PROJECTS FOR POWER GENERATION.

Mozambique's first large scale solar plant

Mocuba Solar Farm

- 40,5 MW Solar PV project
- Energy output – 77.000 MWh (175.000 homes)
- Located in Zambézia Province (center zone)
- Norwegian investment
- Expected investment USD 80 million
- Construction completed mid 2018

Financing structure - Mezzanine

Mocuba Solar Farm

- **EQUITY:**

Scatec Solar (52,5%)

Norfund (22,5%)

EdM (25%)

- **DEBT** - USD 55 million:

International Finance Corporation (IFC) - USD 19 million

Climate Investment Funds – USD 19 million

Syndicated loan – USD 17 million

- **Viability Gap Funding Grant**

Private Infrastructure Development Group (multi-donor funded institution) – USD 7 million

- **Fund Mobiliser:** Emerging Africa Infrastructure Fund

Financing structure - PPA

Mocuba Solar Farm

POWER PURCHASE AGREEMENT (PPA)

- ENERGY OFF-TAKER: EdM (State owned utility)
- 25 years
- Price (not disclosed)
- Annual index update – inflation linked ?

Titimane Project – Clean Energy Mini-Grid



- Promoted by EdP (Portuguese Utility)
- Titimane Niassa Province (NW zone)
- Village with 4.000 population
- Local economy focused on cotton cultivation
- Rural electrification project – hybrid technologies

Financing structure - Mezzanine

Titimane Clean Energy Mini-Grid

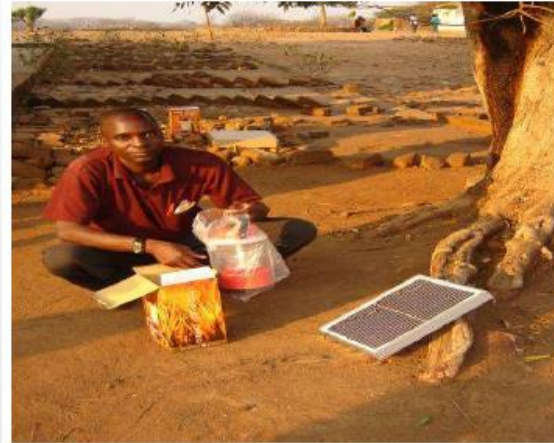
- Edp (Portuguese Utility)
- UNEP SE4ALL
- Governmental Entities of Mozambique
- FUNAE (Energy Fund)
- EdM (Moz Utility)
- SAN-JFS (Cotton company)
- EEP (Energy and Environment Partnership)
- OFID (OPEC Fund for International Partnership)
- ARE (Alliance for Rural Electrification)
- Clinton Global Initiative

Business Model

Titimane Clean Energy Mini-Grid

- Mini-utility
- Fee-for-service
- Prepaid

Rural electrification and Off-grid – Main reality



Closing Remarks

On-grid solar investment
opportunities in Mozambique

- High electrification needs
- Solar will have a key role in this development
- All scales of development are required (on versus off grid)
- Priority to decentralised generation/rural electrification
- Market for new business models – Solar Paygo, Pico Systems ...
- It's crucial the commitment of international entities such as world bank, UNEP, donors
- Good work has been developed by many entities
- This is just the beginning – many opportunities!

THANK YOU FOR YOUR ATTENTION!

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