



Workshop de Investimento

**Energia Sustentável  
na Guiné-Bissau**

Guinea Bissau Sustainable  
Energy Investment Workshop



# Apresentação da Mini Rede Solar Fotovoltaica de Bambadinca

Presentation of Bambadinca PV Mini-Grid



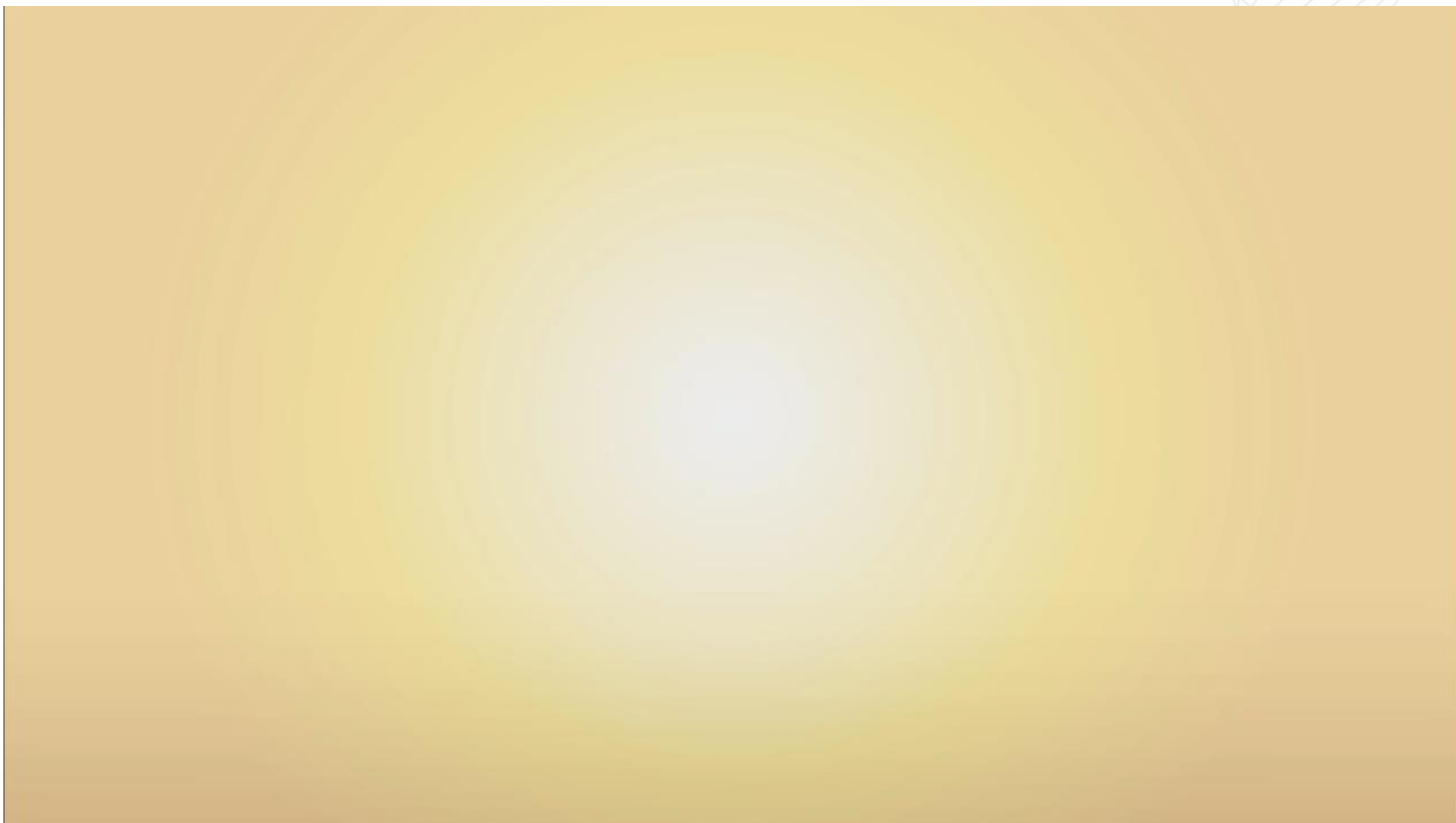
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Coordenador de Projeto**

TESE – Energy Sector Chief /  
Project Coordinator



# General presentation - video



<https://vimeo.com/122013833>

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# Bambadinca context overview

- Located in the region of Bafatá, Bambadinca has an estimated population of 6 500 inhabitants.
- Main economic activities: agriculture and trade
- 70% of the population below the poverty line (<2\$/day).
- Since the decrease of the power capacity of Bafatá plant and theft of network cables, 95% had no access to electricity.
- Main energy sources: candles and batteries.



Bafatá region and Bambadinca maps

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# Bambadinca Sta Claro Project

In order to deal with lack of energy and poverty, based on socioeconomic studies, **TESE** conceived and implemented the **Community Program for Access to Renewable Energy - Bambadinca Sta Claro**, which consisted in creating a community energy service capable to manage a hybrid PV mini-grid.

## *Project identity:*

- Time schedule: October 2011 – March 2015
- Capital providers: European Union (ACP-EU Energy Facility); Portuguese cooperation; UNIDO (GEF project)
- Public Organizations: DGE - National Energy Direction / DREB - Regional Energy Office (GB); UL - University of Lisbon (PT)
- Local Partners: ACDB – Bambadinca Community Development Association; DIVUTEC

## *Main results:*

1. Public-communitarian management model created & implemented
2. Local population aware on Safety and Energy Efficiency
3. Electricity via Decentralized Energy System



Bambadinca  
sta **claro**

Project logo

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# Technical Solution

The mini-grid of Bambadinca is based on a Hybrid Photovoltaic Power Plant, composed by 3 identical groups and using batteries as well as diesel generators, in order to guarantee electricity 24h/day. The main technical characteristics of the power plant are:

- Total power capacity: 312 kWp
- Total genset capacity: 240 kVA
- Battery bank: 1 101 kWh



Hybrid PV power plant

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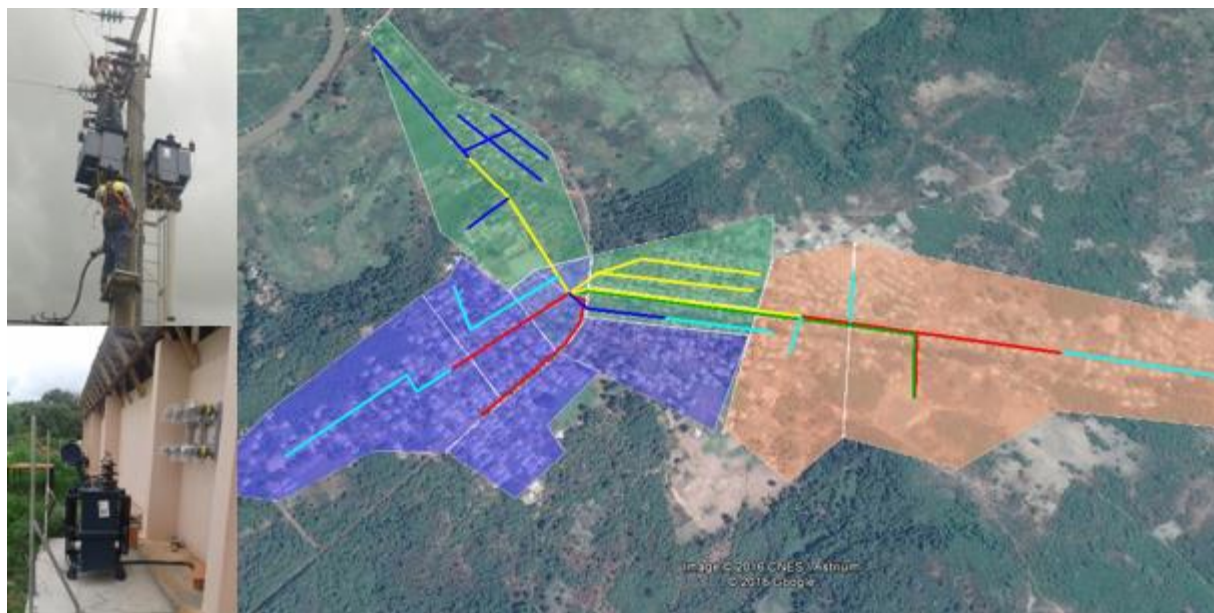




# Technical Solution

The electricity distribution network was restored and expanded in order to cover all main parts of Bambadinca. Each one of the three groups serves a specific area, while the network is composed by LV lines and MV for distant areas.

- Group 1: South (LV)
- Group 2: Northwest (LV, MV)
- Group 3: North (LV, MV)



Network of Bambadinca mini-grid

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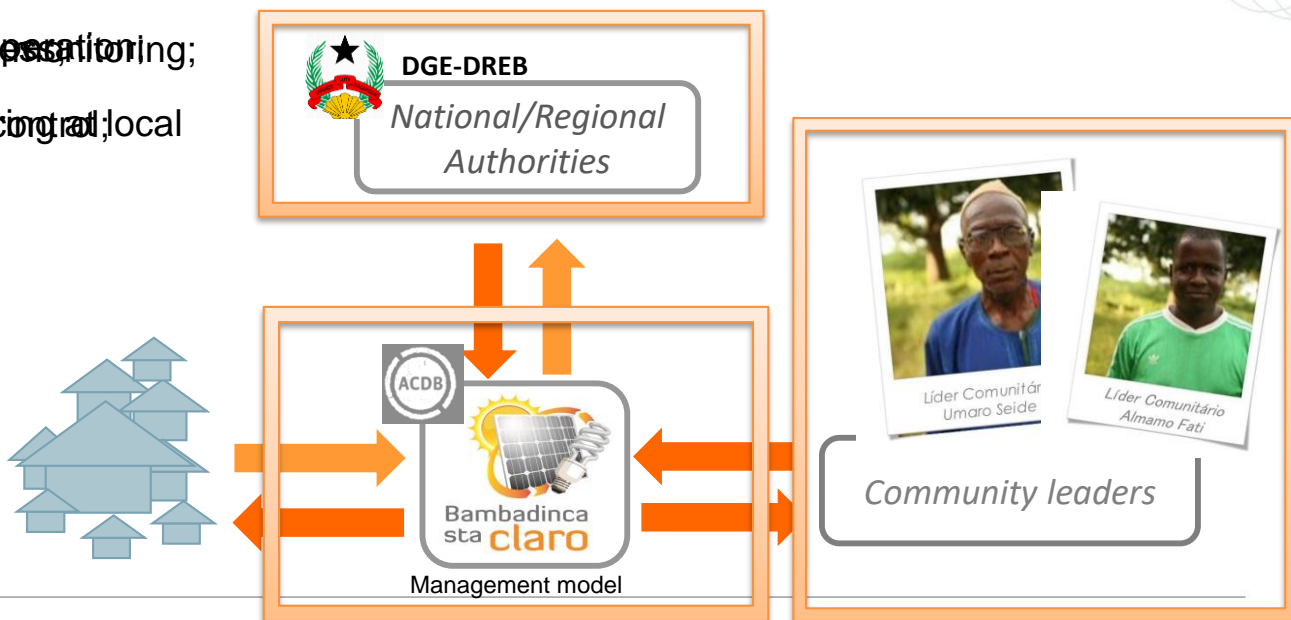


# Management Model

Taking into account the lack of means of the public institutions and the absence of private stakeholders, the selected management model was tripartite **Public-Community Partnership** developed between ACDB, DGE-DREB and local community leaders, with separate responsibilities:

## Public Authority leaders:

- Technical and financial assistance;
- Reporting to authorities at central, local level;
- Technical assistance.



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# Training sessions

During the creation of the utility service and the implementation of the management model, training sessions were organized to enhance technical and institutional capacities of the DRE/DREB and ACDB.

Further training sessions were organized for local electricians and technicians regarding good practices for electricity connections in households and commerce.



Training sessions

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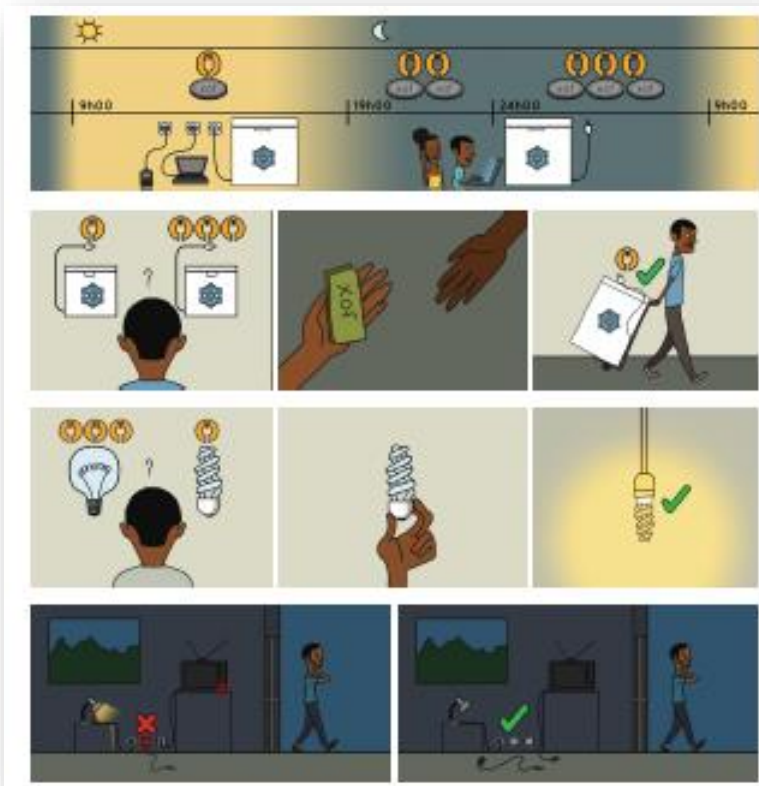




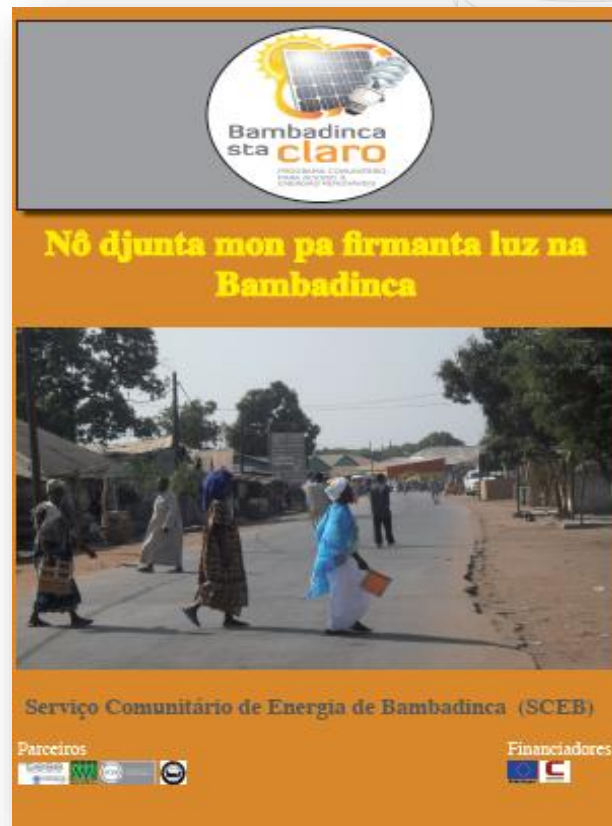


# Raising awareness

To guarantee the sustainability of the project as well as the involvement of the local community, awareness actions were organized about energy efficiency, electricity safety and principle of *customer pays*.



Awareness posters



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## Results and impact

On 2015 the project was completed, being the first PV power plant and the first modern mini-grid infrastructure to be implemented in Guinea-Bissau.

- ✓ 625 actual clients with access to electricity;
- ✓ 650 clients, professors and students trained about energy topics;
- ✓ New income-generating activities have emerged.



Panoramic view of the power plant

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# Challenges

*Bambadinca Sta Claro* was a pilot project in Guinea-Bissau, and various challenges were arisen during it's implementation and it's actual operation.

## *Implementation phase:*

- Political instability (coup of 2012) and duty delays impacted the risk notion of suppliers and the project's timetable.
- The tariff definition process, with public authorities and through participative sessions, was a challenge, taking into account high local expectations, absence of subsidies and price variety between Bissau and the interior.

## *Operating phase:*

- Technical problems impede optimal operation of all groups.
- Internal conflicts stall general operability of the utility.

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# Recommendations

Recommendations are mainly focused on the methodology of implementation and sensitive issues to be considered by project developers:

- Involvement of the community and local authorities;
- Collection of consumption profile and data;
- Dimensioning and selection of an adapted technical solution;
- Definition tariffs taking into account socioeconomic reality;
- Identification of an adapted management model.

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# Replication possibilities

The success of the *Bambadinca Sta Claro* project demonstrated the advantages and benefits of mini-grids for rural electrification in Guinea-Bissau, especially in areas that the future national grid won't reach.

With the support of UNIDO, TESE implemented in 2015 a socioeconomic and technical study in the islands of **Bolama and Bubaque** (Bijagós region) in order to design replication models, of 360 kWp and 651 kWp respectively.



Bolama and Bubaque map

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# Thank you for your attention

## Questions?

### Contact:



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