Social, Sustainable and Rural Energy in Mali

Energy Services for rural areas in Mali

Journée d'études "Le rôle des mini-réseaux dans les réponses territoriales aux enjeux de la transition énergétique" à Champs-sur-Marne – 06/04/2018
YELE Consulting – Company overview

YELE Consulting is a French Consulting company specialized in the energy transition and digital transformation, with extensive experience in leading strategic and operational projects.

YELE is advising clients in several sectors of the E&U ecosystems: EDF, Enedis (French DSO), RTE (RTE), etc. and French local authorities.

YELE Consulting has also operations in West Africa through its subsidiary, CIFED, created in 2013. CIFED is active in consulting, engineering and training in the energy and sustainable development sectors.

<table>
<thead>
<tr>
<th>Headquarters in Mali</th>
<th>Presence in Senegal</th>
<th>Partner in Cameroun, Guinea, Benin and Mauritania</th>
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</table>

In addition, YELE Consulting provides pro-bono assistance to major NGOs working in the energy and sustainable development sectors.

- 53 consultants in France
- 10 experts in Mali and in Sénégal
- 300 students and interns trained

2010

Think SmartGrids Member

4,8 million € in 2017
**Activities and field of expertise**

**YELE Consulting and its subsidiary CIFED have activities in Training, Consulting and Engineering, related to 5 fields of expertise:**

<table>
<thead>
<tr>
<th>Activities</th>
<th>TRAINING</th>
<th>CONSULTING</th>
<th>ENGINEERING</th>
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<tbody>
<tr>
<td><strong>Sustainable Energy Generation</strong></td>
<td>Sizing, designing, installing and O&amp;M Solar or hybrid power systems</td>
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<td><strong>Smart Grids et Renewable Integration into the grid</strong></td>
<td>Transmission or Distribution grids</td>
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<td><strong>Energy efficiency</strong></td>
<td>Energy mix, Energy audits etc.</td>
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<td><strong>Smart Cities, eco-districts and electric mobility</strong></td>
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<tr>
<td><strong>Digital Transformation</strong></td>
<td>Statistics &amp; data science, Information Systems design, IoT, blockchain, cybersecurity</td>
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Birth of a project: a partnership between the HCC and CIFED

Subject of the convention between the HCC and CIFED

- **Finding funding** for projects regarding training and access to energy in rural area
- Helping cities in training their population for energy, and sustainable developments jobs.
- **Implementing projects for access to electricity in rural area** in collaboration with local governments.

Key figures

Rate of access to electricity in Mali: 27.3%
- 51.3% in urban area
- 11.8% in rural area
Municipalities member of the HCC in Mali
Feedback from academic literature and partners

Access to energy micro-grid projects in Africa:
✓ High risk projects
✓ Low return on investment

- Low number of customers
- Low consumptions
- Difficulties in payment collection

Benefits just from electricity sales is often not enough to pay for maintenance or investments

Lessons to be learned for the project:

Engage with local communities
Develop local economic activity

From: Microgrids for Rural Electrification: A critical review of best practices based on seven case studies - UC Berkeley 2014
Chosen solution for the project

MicroGrid solution from a supply partner

Economic activities

- Charging station of electrical devises
- Renting of cooling devises
- Sewing machines
- Computers and IT equipments

Selling excess electricity

- Community building, public lighting
- Water pumps for Agriculture
- Schools
Local communities engagement

**Designing the project**
- Work with the HCC to locate suitable cities with strong local communities involvement.
- Design of the different electricity services that could fit the need of the communities

**Implementing the project**
- Work with local women group to identify people able to help managing the micro-grid with the help and training of CIFED.

**Economical activities**
- Work with women groups to identify local entrepreneurs that could benefit from the project.
- Helping entrepreneurs in putting up their activities (training, finding micro loans etc.)
Expected outcomes of the project

Local job creation

Raise on living standards thanks to sustainable economic activity

Empowerment of women

Electrification of public facilities

Environmental benefits

(Less CO2 emissions from diesel generators)
Pilot projects

Two areas with different characteristics:

- **Niamana**: quite dense area (30k inhabitants) where the economic activity is quite developed
- **Domba**: very low density area (10k inhabitants), low economic activity

In each municipality, 3 villages will have a micro grid during the pilot phase.

6 different micro grids on villages with different local context

Expecting benefits is varying from one village to another.

Thank to the diversity context of the pilot phase micro grids, we hope to get as much feedback as possible to insure the success of the generalisation phase.
Planning

Pilot projects – 1 year

- Administrative
- Technical configuration
- Social, economical, environmental analysis, and impact assessment
- Financing phase

Year 1

Year 2

Commisioning

Replicability

Year 1

Year 2

Year 3

Year 4

Year 5

pilot

Commisioning

Today

Social, Sustainable and Rural Energy in Mali
Economic levers of the project

<table>
<thead>
<tr>
<th>Economy of scale</th>
<th>Crédits carbone</th>
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<tbody>
<tr>
<td>• Administration fees</td>
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<td>• Engineering and transport</td>
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<td>• Unit price of the solution</td>
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<tr>
<td>• Valorization of tonnes of CO2 avoided (€/CO2)</td>
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**Economic Levers**

- • Direct subsidies
- • Response to call of tender
- • Crowdfundings and crowdlending

**Others financing methods**
Thank you for your attention