SUCCESSFUL CASE OF SOLAR ELECTRIFICATION IN MALI

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SUMMARY

POTENTIAL OF RENEWABLE ENERGY IN THE COUNTRY

NATIONAL POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY

OPPORTUNITIES FOR THE DEVELOPMENT OF RENEWABLE ENERGY IN MALI

DISSEMINATION OF RENEWABLE ENERGY EQUIPEMMENTS

INSTITUTIONAL FRAMEWORK

LEGAL AND REGULATORY FRAMEWORK

ELECTRIFICATION OF KIMPARANA VILLAGE BY THE SSD COMPANY "Yeleen KURA"

POTENTIAL OF RENEWABLE ENERGY IN THE COUNTRY

Mali has an enormous potential for renewable energy that is largely untapped :

- Several sites of hydro capacity estimated at 1150 MW with an annual energy yield of 5600 GWh of which only 25% are currently exploited
- The solar radiation is well distributed over the entire national territory : 5 to 7 kWh/m ^{2}/day.
- Wind speed in Saharan an sahelian areas of the country covering 940,000 Km^2 : 3 - 7 m/s in annual average.

NATIONAL POLICY FOR THE DEVELOPMENT OF RENEWABLE ENERGY

Over the past forty years, the country has launched, mostly in rural areas, a proactive development of renewable energy resources (solar, wind, mini / micro hydro, biomass)

Such a policy has firstly played a part in reducing energy dependence of the country and secondly in increasing the level of satisfaction of energy needs of rural populations

In terms of numerical targets, the share of renewable energy in the national electricity production, estimated at less than 1% in 2004 and 6% in 2010, will reach 10% in 2015.

OPPORTUNITIES FOR DEVELOPMENT OF RENEWABLE ENERGY IN MALI

- the commitment of the highest authorities of the country ;
- the availability of several donors to support renewable energy development projects / programs ;
- the motivation of populations for the use of renewable energy at a large scale ;
- recognition of renewable energy as a catalyst for all sustainable socio-economic development ;
- the emergence of a strong private sector and civil society deeply involved in the promotion of renewable energies ;
- refocusing the role and missions of state departments and private and semi-public actors.

DISSEMINATION OF RENEWABLE ENERGY EQUIPMENTS

- more than 700 solar Photo Voltaic (PV) pumps installed for water needs of rural populations ;
- several solar cookers, ten windmills and hundreds of dryers installed ;
- fifty thousand individual functional lighting systems ;
- a capacity of over 750 kWp (kilowatt-peak) installed solar power for telecommunications needs ;
- a significant decline in the price of solar equipment : the peak watt increased from 40 in 1980 to 12 U.S. $ in 2005, down 70% ;
- Technical capacity building enabled a better control of solar pumping, lighting, refrigeration and pumping systems for small wind turbines and wind.

INSTITUTIONAL FRAMEWORK

the National Center for Solar Energy and Renewable Energy (CNESOLER), was established in 1990 to promote renewable energy. A development fund for renewable energy was introduced in 1990 and managed by CNESOLER.

the Malian Agency for the Development of Domestic Energy and Rural Electrification (AMADER) was created in 2003 to develop a better access to electricity from renewable energy for rural people. Several locations have being electrified by the permittee with a solar, wind or jatropha oil source of electricity generation .

National Agency for the Development of Biofuels (ANADEB) was established in 2009 to promote biofuels;

In 2011, a National Agency of Renewable Energies (ANAER) will be created to ensure the promotion and widespread use of renewable energy and enable a sustainable socio-economic development that respects the environment.

LEGAL AND REGULATORY FRAMEWORK

the laws and decrees adopted in 2000 governing the electricity sector, deal precisely with the importance of electricity generation plants using renewable energy sources.

Thus, Articles 13 and 26 of Decree 184 specifically indicates that priority is given to renewable energy sources as part of managing the network and the electricity distribution concessionaire may be imposed the purchase of renewable energy (solar or wind power) at prices they could recover on its average selling price of electricity.

ELECTRIFICATION OF KIMPARA VILLAGE BY THE SSD COMPANY "Yeleen KURA"

Yeleen KURA COMPANY

Yeleen Kura is a private company, established in 1999 following the reforms in the electricity sector from the years 98.

permission was granted to the company by the Minister of Energy to allow it to service the public electricity over 12 years in 52 localities in the cotton area.

The capital of the company is 50% owned by EDF (France) and 50% by the NUON company (Netherlands).

Investments in renewable energy by the SSD Yeleen Kura "from year 2006 totaled $ 4.4 million including a grant from the state through the AMADER, 65%.

Kimparana electrification project from renewable energy was initiated and developed by the company in 2006 and now the service is ensured in the locality.

Locality of Kimparana

Kimparana, a village in the cotton belt of the country is part of the 52 localities in the scope of the SSD "Yeleen Kura."

The population of the locality is about 6400 inhabitants.

The main activities of the town are agriculture and livestock.

For the electrification of the village, the company installed in 2006 a solar PV-diesel hybrid plant and a network of public distribution of electricity.

The Project

The study of Kimparana electrification project was made by the consulting firm TSS (Netherlands).

The supply and installation of production equipment and of distribution of electric power were executed by Yeleen kura.

The production facilities consists of electricity made from solar panels with a total capacity of 72 kWp, battery energy storage of 24.5 KAH (24 500 AH) total capacity, inverters and a generator 100 KVA. The annual energy output of the plant is 145 MWH.

The public distribution of energy, with a total length 7000 m, was achieved at low voltage.

The total number of customers connected to the grid is about 250 clients, 50% of the 500 customers total capacity. The peak power recorded on the network is 26 KW.

PROJECT COST

The total cost of solar panels and accessories (battery, inverter, study cost …) is U.S. $ 656,000, or 65% of the total cost of the project fully funded by the SSD.

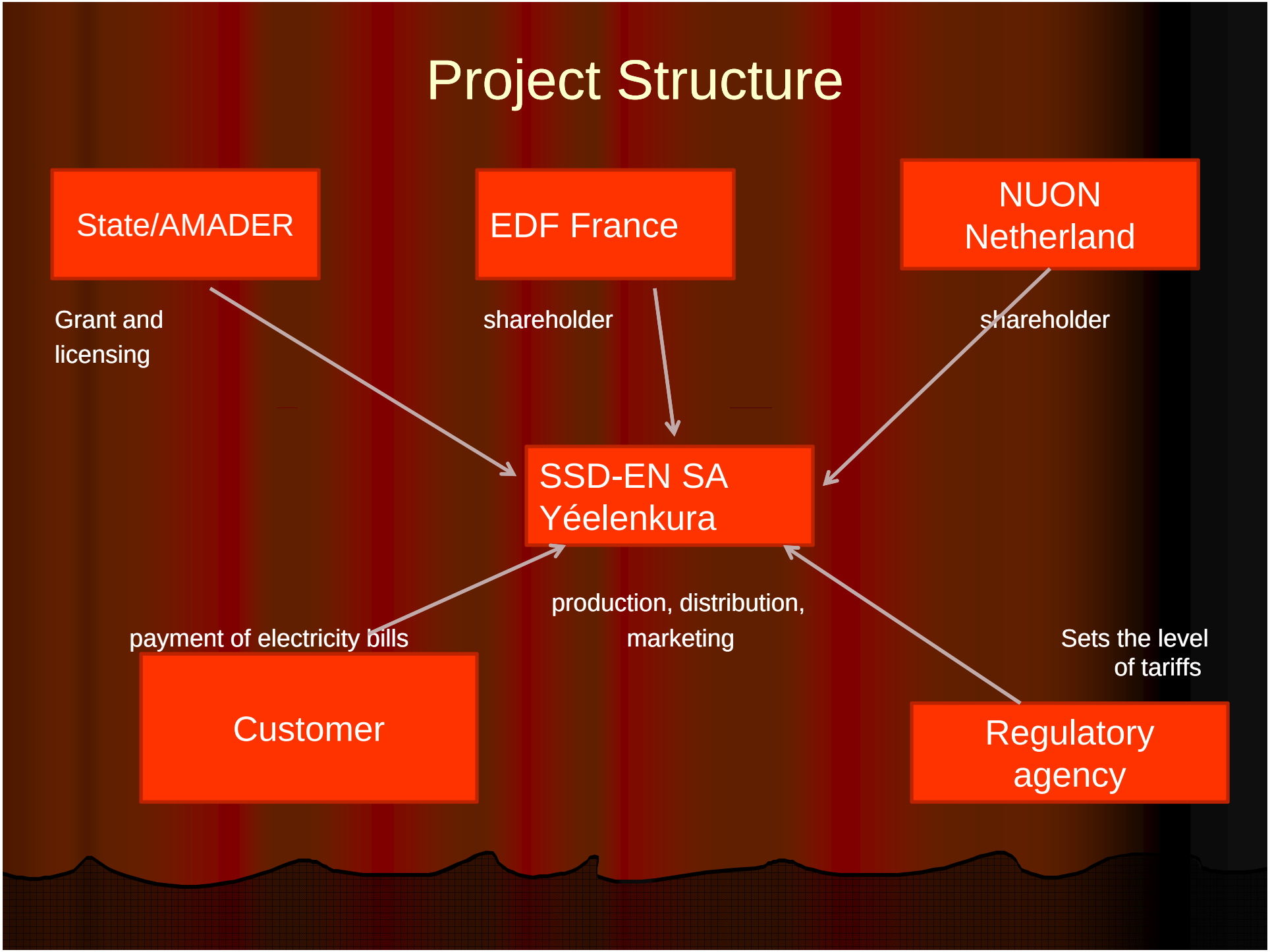
The cost of the generator, distribution network and connection of consumers rises to an amount of U.S. $ 401,600 including a contribution of 65% from AMADER and 35% from SSD Yeleen kura.

The overall cost of the project amounts to a total of U.S. $ 1.057 million.

Applicable tariff

A single sales rate of electricity of 35 cents USD/kWh for all connected customers.

Project Structure



Solar panel field

PROJECT BENEFITS

The solar / diesel hybrid plant project of Kimparana allowed :

- the development of local economy : craftsmanship, trade ;
- promoting access to electricity and quality of service improvement (10 to 24 hours of delivery) ;
- To improve access to basic services : telecommunications, water, health services
- To reduce the use of diesel in power generation and promote renewable energy

INVOLVEMENT OF REGULATOR IN THE PROJECT

During the implementation of this project, the regulator of public electricity service in rural areas has played an important role :

- The setting and approval of electricity selling tariffs applied to populations (the approved price is 35 cUS$/kWh);
- participation in the review and validation of the contract of the operator;
- monitoring the performance of work ;
- Monitoring/control the compliance by the parties to their contractual commitments

RENEWABLE ENERGY REGULATION CHALLENGES

Despite the successful case of electrification of Kimparana and several other localities of the country with renewable energy, the regulator still faces the following challenges:

- The settlement of a much more coherent and precise tariff (in terms ‘negociation of purchasing price of renewable energy’)
- Strengthening technical and financial capacity for better regulation of renewable energy
- Sales prices harmonization in rural areas and between rural and urban areas.

THANK YOU