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# **Structuring and Financing Electrification Investment**

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*Shaping sustainable futures*

# AFD, Financing the Development

- A **public institution** and a **specialised financial institution** subject to banking regulations including a subsidiary dedicated to private-sector financing (PROPARCO) and an entity in charge of training (CEFEB)...

↘ In 90 countries

## ■ 3 financing areas :

- Economic growth
- Poverty reduction
- Global public goods

## ■ Empowered for :

- financing
- enhancing development strategies of countries

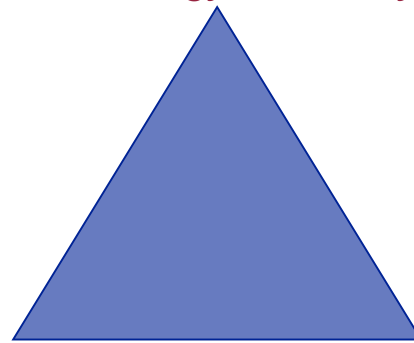


- **7,8 billions euros** committed in 2013

## AFD's energy strategy : organized around 3 PILLARS

### Sustainable Energy:

*Prioritising renewable energy  
and energy efficiency*



### Secure Energy:

*Developing and strengthening  
large energy systems*



### Accessible Energy:

*Reducing the energy fracture and  
improving access in rural and  
suburban areas*

### **A cross-cutting support component**

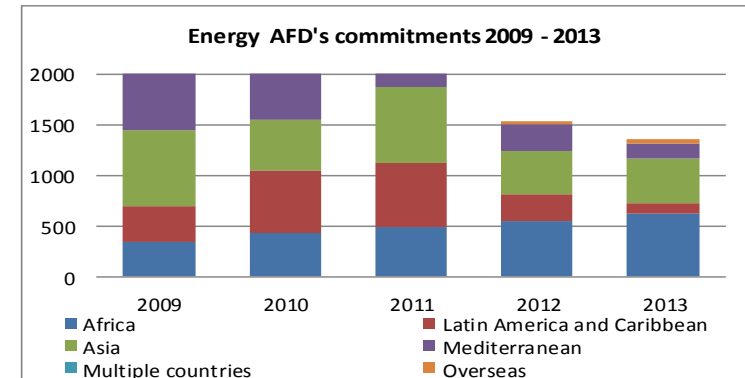
*Strengthen sustainable energy policies and capacity building for stakeholders in the energy sector*

# AFD commitments in the energy sector

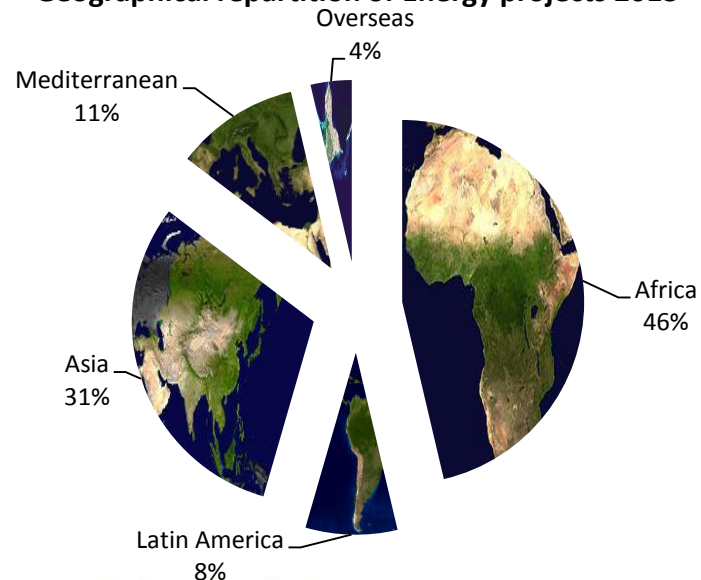
■ About 1.5 billion euros/year on Energy

■ Impacts of 2013 commitments:

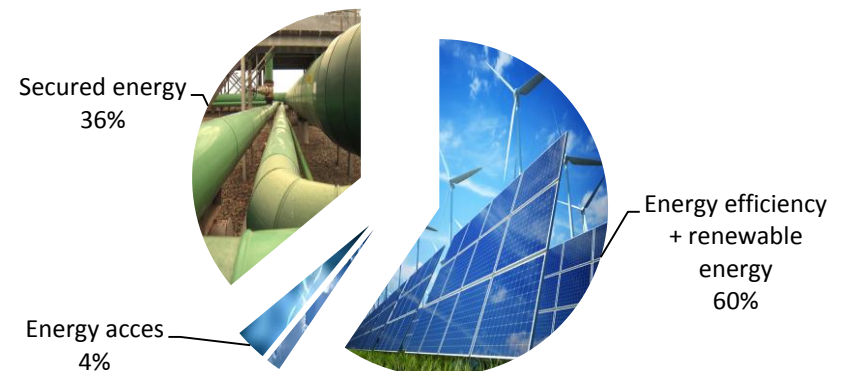
- 60% in sustainable energy
- 527 MW new installed capacity
- 3,7 M tCO<sub>2</sub> /year saved



**Geographical repartition of Energy projects 2013**



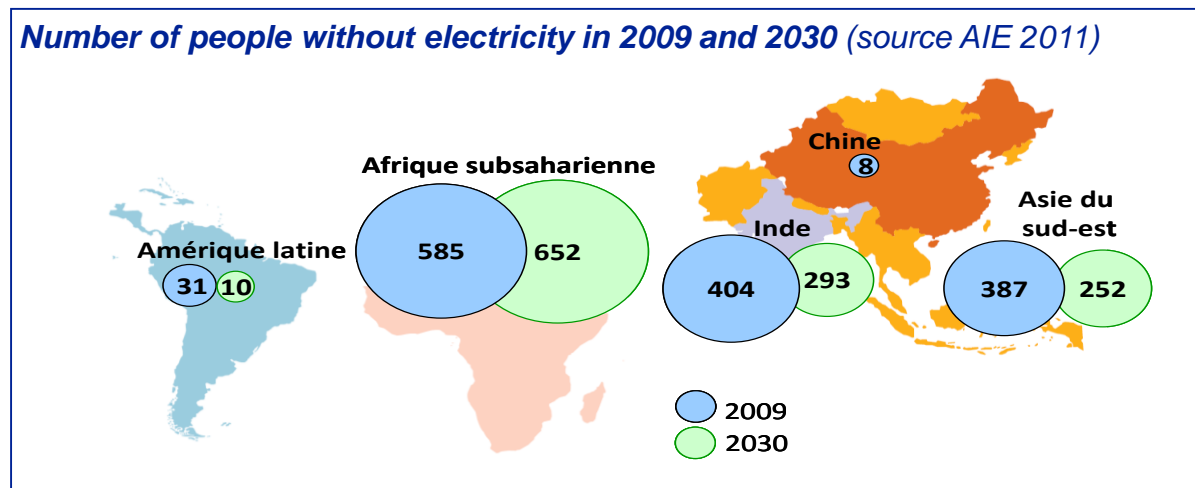
**Strategic axis repartition of projects 2013**



# Focus on the 2<sup>nd</sup> pillar: Reducing the energy fracture and improving electricity access in rural and suburban areas

## ■ Rural and suburban electrification

- 1.3 Bn people in the world do not have access to electricity (electrification rate in Africa 31%, 14% in rural areas)



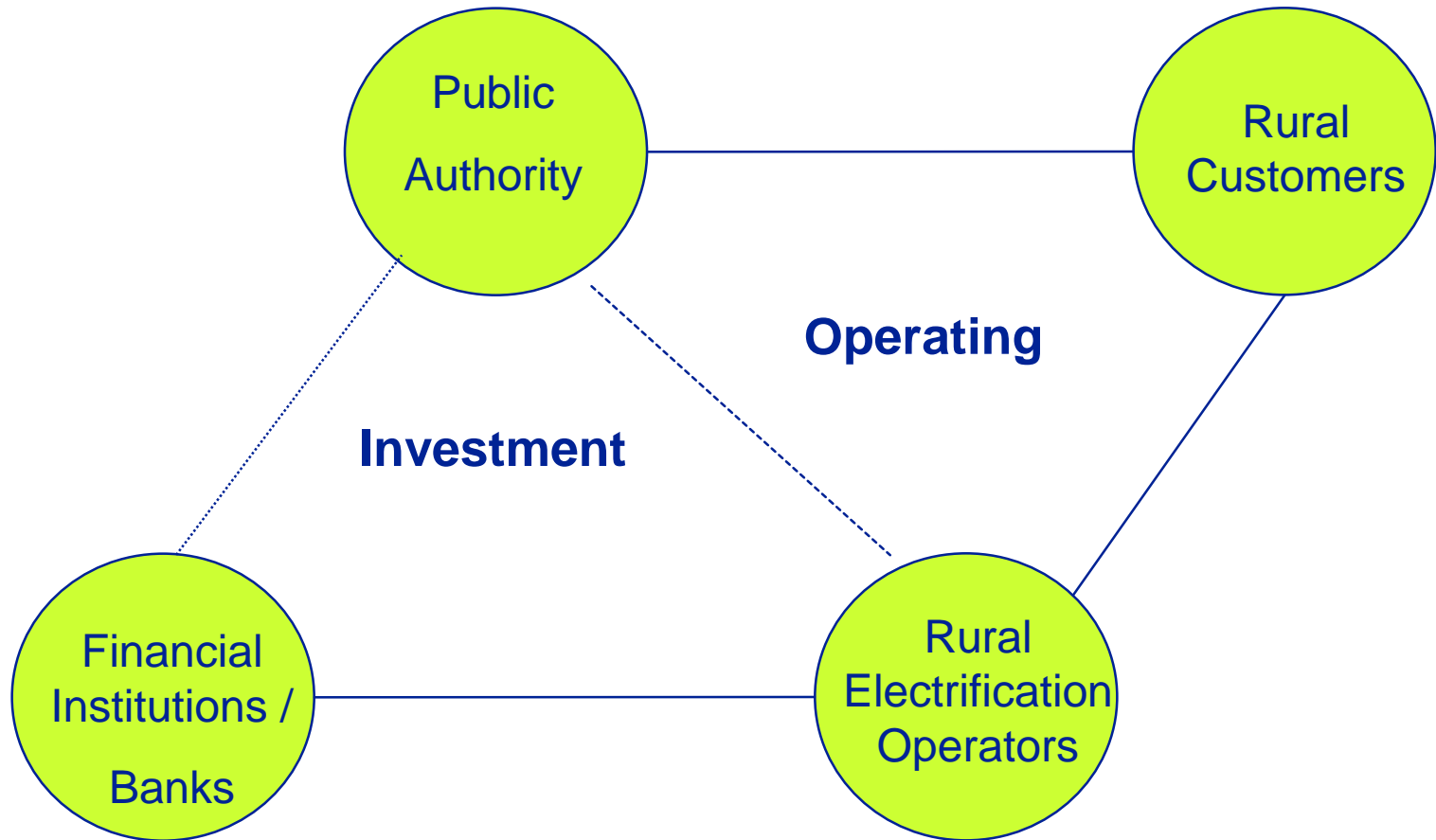
## ■ Traditional domestic fuels

- 2.7 Bn people use traditional biomass for cooking
- Actions focused on the management of natural forests and the value chain of cooking fuels wood in large urban centres

## ■ Production of bioelectricity and biofuels associated with rural plantations.

- The primary objective being to create value for small-scale rural farmers

# The « Quadripole » of Rural Electrification as a « public good » (Investment + Operating)



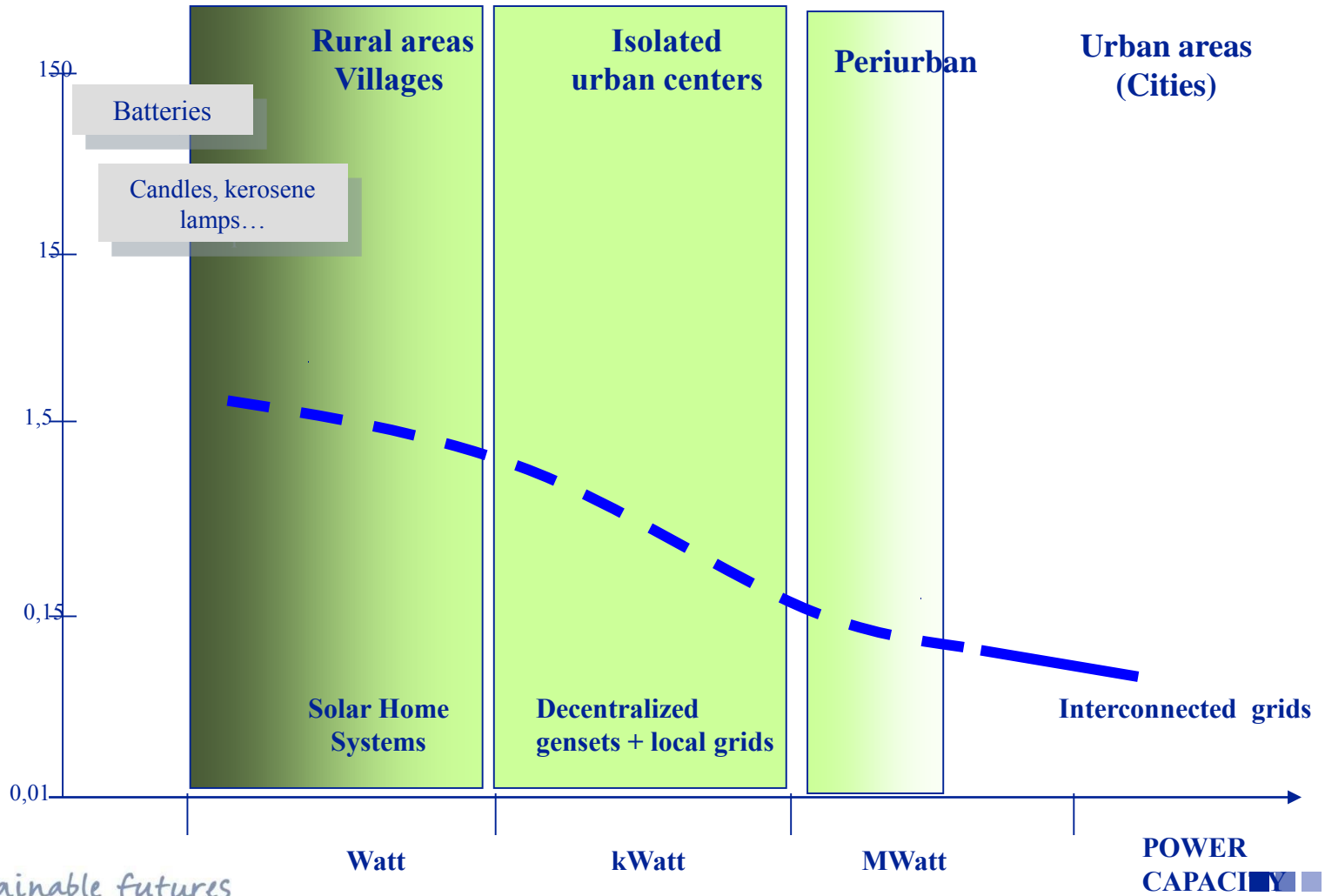
# Urban, suburban and rural electricity : different systems and wide range of costs

TRADITIONNAL SYSTEMS

ELECTRICAL SYSTEMS TO BE DEVELOPED

CONVENTIONAL  
POWER SYSTEMS

ELECTRICITY  
COSTS  
\$/kWh





## Cost recovery: three levels

- LEVEL 1      « MINIMAL COST RECOVERY »
  - . Day to day operations / Operating costs
  
- LEVEL 2      « OPERATING COST RECOVERY »
  - . Level 1
  - +      . Medium term replacement (<10 years) and heavy maintenance
  
- LEVEL 3      « GLOBAL COST RECOVERY »
  - . Level 1
  - . Level 2
  - +      . Depreciation / Amortization (incl. financial costs)

# Morocco Global Rural Electrification Program (Grid supply + Decentralized Solar PV)

## Financing

Type : **Access to electricity**

Country : **Morocco**

Project total: **2.000 M€**,  
(**100 M€ on solar PV systems**)

AFD's participation: **240 M€**  
(**sovereign loans, 1995 -2009**) +  
**French GEF grant = 1.5 M€**

Owner: **Office Nationale de  
l'Electricité (ONE)**

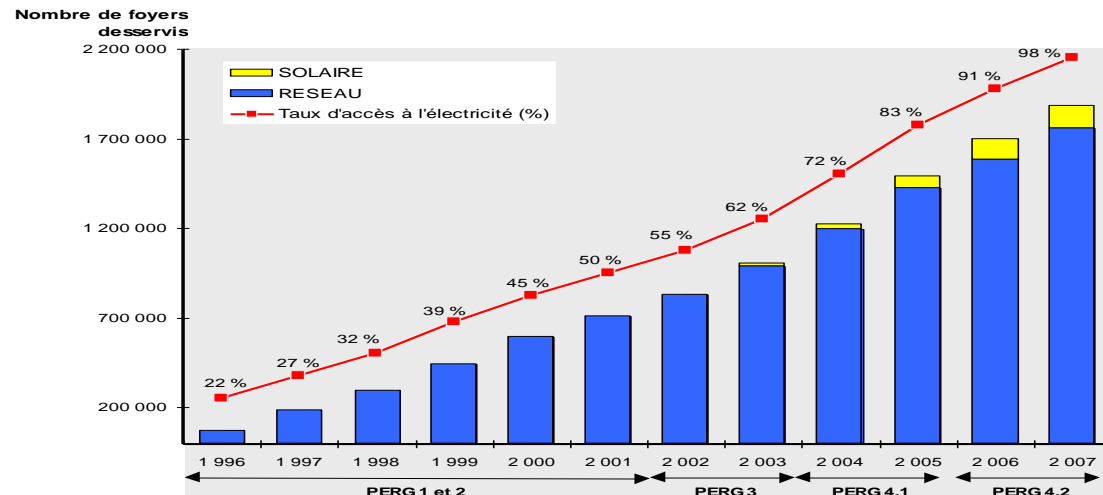
## Key facts

1995: Start of the "Programme  
d'Electrification Rurale Global  
(PERG)

**Electrification rate :**  
**from 20 % in 1996**  
**to 98% in 2007**

## Objective

- Providing access to electricity in Morocco, using the best economical solution, adapted to the geography of the target area:
  - Connection to the national grid
  - PV kits scheme
  
- Nearly 2 million household gained access to electricity



# Sénégal Rural Electrification Program

## Financing

Type : **Access to electricity**

Country : **Senegal**

Year : **2007**

Project total: **12 M€**

AFD's participation: **8M€ subsidy.**  
**Final beneficiary : ASER**

## Key facts

**Electrification rate** : 48% (18% in rural areas)

High connection costs

Population spread over vast areas

## Objective

- Supporting the national rural electrification strategy:
  - 13 concessions – Agence Senegalese d'Electrification rurale (ASER) in charge
  - involvement of the private sector through thirteen 25-year rural electrification concessions, selected by bidding process
- AFD provides a EUR 8 million grant for the Kaffrine-Tambacounda-Kédougou concession,
  - awarded in September 2011 to EDF-MATFORCE
  - with a commitment of 18,000 connections (electrification rate from 2.5% to 40%)
  - Using hybrid mini-grid or PV kits



# Kiffa project - Mauritania

## Access to power

Type : **Access to electricity / Mini grid**

Country : **Mauritania**

Year : **2012**

Project total: **24M€**

Afd's participation: **19M€**  
**Concessional sovereign loan**

**+ 5M€ subsidy (from EU pooling mechanism ) for new connection**

Main sponsor: **SOMELEC**

## Project

- Hybrid solution for isolated local grid with the objective to increase electricity access in the region of Kiffa (3rd city of Mauritania, 600 kms of Nouakchott)
- Global project composed of 3 components:
  1. Hybrid solar PV (1,3 MWp) / thermal power plant (4,8 MW)
  2. Transmission line between Kiffa and Guerou to interconnect the 2 cities as well as the villages on the way
  3. Distribution network + new connections

## Objectives / Impacts

- To increase access in the region of Kiffa-Guerou (semi urban/rural areas)
  - Access to electricity for potentially 26 500 inhabitants (5 300 households)
  - Improved access for potentially 58 000 inhabitants (11 600 households)
- To prove the technical and financial viability of Hybrid solar /diesel plant for isolated grid through a project that could be replicated to other isolated cities of Mauritania
  - First hybrid solution of such size for isolated grids
  - 30% reduction of production costs for Somelec (compared to diesel costs)

# Revolving Fund in Kenya

## Financing

Type : **Access to power**

Country : **Kenya**

Year : **2011**

Project total: **58M€**

Afd's participation: **51M€**  
**sovereign loan to GoK +**  
**5M€ subsidy (from EU**  
**pooling mechanism)**

Main sponsor: **Kenya Power**

- Past AFD's project for access in Kenya up to 63 m EUR

## Objective

- Reducing the cost of access to electricity for low-income households, and improve access to electricity in three complementary components:
  - Support the connection of 300,000 customers within 5 years essentially in rural and peri-urban areas
  - CFLs distribution to low-income customers to (i) reduce the electricity bill for low-income customers and (ii) manage the electricity peak demand
  - Extension of the distribution network by increasing the density of transformers

## The revolving fund

- Pre-finance 70% of the connection costs (30% to be finance by the client). To be reimburse within 2 years; interest rate 3 %).
- First 10 months, the fund enabled the connection of 12,000 households, (90% using less than 50kWh/month)
- Reimbursement rate : stil to be improved (65 to 70%)
- .



# Financing the private sector ?

- Supporting “negative concession” introduced by the Gvt and or national electricity company(ex. Morocco, Senegal)
- Financial intermediation through banks, for small and medium size Renewable Energy projects (autogeneration) + local grid
  - Opportunity for private local industries to finance small hydel or bioenergy projects and sell power to a local grid operator (Cameroon)
- Dedicated rural electrification credit line
  - For private operators ready to invest on rural electrification scheme, if appropriate tariff egulated by national entity (Project in Cambodia)



## Structuring and financing rural electrification investment

- Proposing a **diversified offer**, depending on geographical areas and needs: grid extension, local isolated grids, individual systems
- Building a **financial structure** based on cross-subsidies and long term soft loans
- Defining a **balanced tariff structure** (connection costs / energy service payments)
- Implementing a **contractual service scheme** (bill collection efficiency, locally-based service, adapted to companies and the customers)
- Creating an effective **multi-stakeholders regulatory model**.



**Thanks,  
questions & answers,...**

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