



# **AFD's experience in financing renewable energy and energy efficiency**

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Brussels  
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*développeur d'avenirs durables*



# 1. Presentation of the French Agency for Development (AFD)



## 1.1 AFD: who we are

- **French development bank and central operator for bilateral ODA**
  - Group structure: AFD, PROPARCO, FFEM
  - Created in 1942, active in overseas France and 70+ countries
  - Fully publicly owned, not for profit
- **Three main missions**
  - Reducing poverty and inequalities
  - Promoting sustainable economic growth
  - Preserving Global Public Goods (climate, biodiversity, global public health, ...)
- **Interventions in:**
  - **Developing countries...**
    - *Supporting local governments' social priorities (health, education, etc)*
    - *Developing infrastructure (energy, water and sanitation, transport, etc)*
    - *Promoting financial markets and the private sector*
  - **...and emerging countries**
    - *Preserving Global Public Goods, Green and Inclusive Growth*
- **Overview of AFD Group's activity in 2013:**
  - 7,8Bln € committed for development

## 1.2 A wide range of clients and products

- **AFD Group provides funding / support to:**
  - **Governments**
  - **Public enterprises and entities**
  - **Local authorities**
  - **Commercial and public banks**
  - **Private enterprises and entities**
  - **NGOs**
  
- **Using a wide range of financial tools:**
  - **Grants: mainly for projects carried out in the least developed countries**
  - **Loans:**
    - *Subsidized loans or market-rate loans;*
    - *Sovereign loans or direct loans to public entities without the state guarantee*
    - *Senior or subordinated debt*
  - **Guarantees on locally raised financing (through banks and/or capital markets) & minority equity**



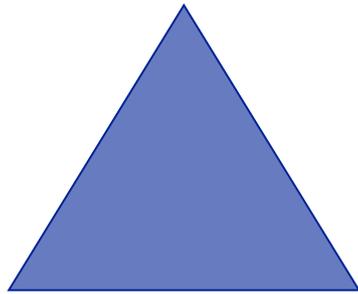
## **2. AFD's energy strategy**



## 2.1 AFD's strategy and activities in the energy sector

### 3 axis

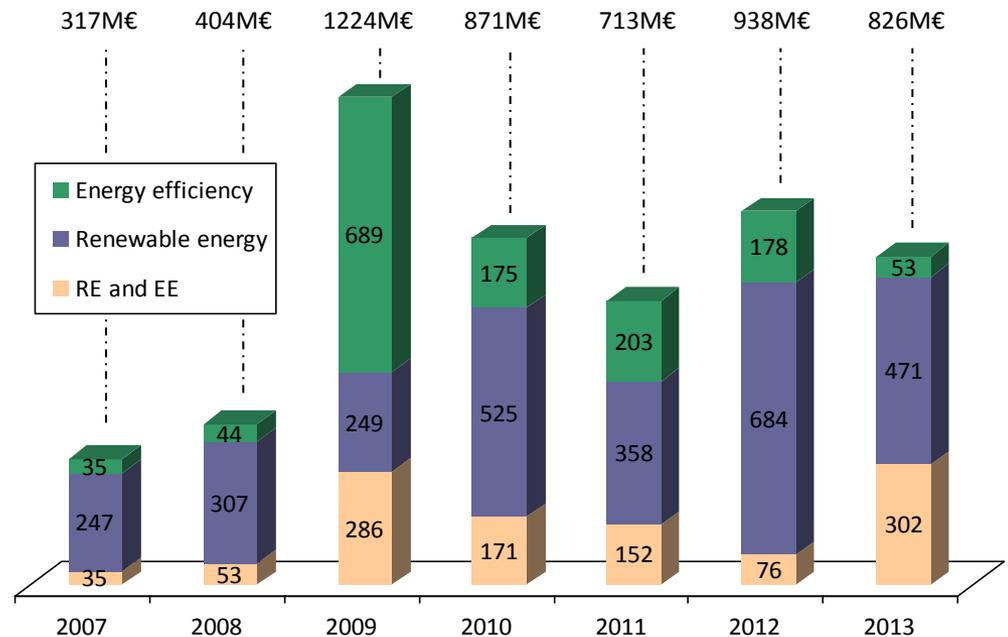
**Sustainable energy**  
(renewable, efficient and low carbon)



**Energy security**  
(transmission)

**Access to energy**

### Sustainable energy financing (2007-2013)

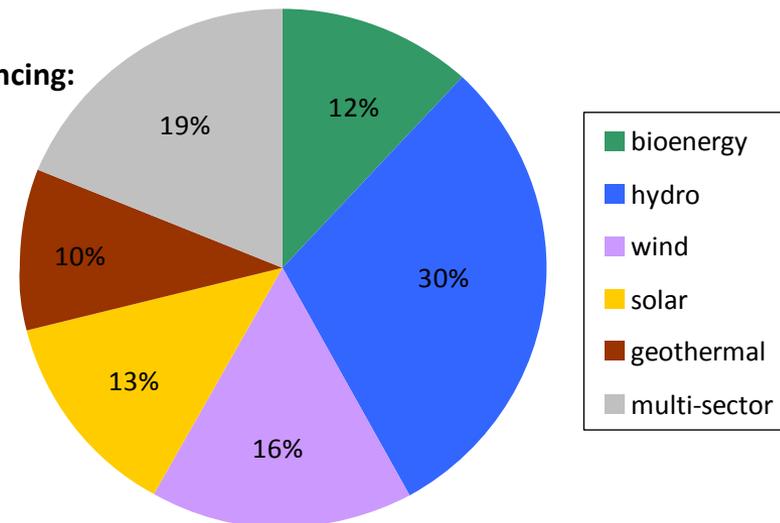


→ Between 2007 and 2013: more than € 2.8bn and 3.7 GW of renewable energy production capacity financed.

## 2.2 Sustainable energy: our priority

- Sustainable energy: 824 million € in 2013
- Rationale for investing in renewable energy:
  - Priority to the optimization of local renewable energy sources in order to promote local economy
  - Secure the energy system by diversifying the energy mix
  - Reduce consumption of fossil fuels to reduce GHG emission and promote energy resilience
- The context is gradually improving:
  - Geothermal, hydro, wind and biomass power are already competitive compared to other sources of energy
  - PV and CSP costs are fast decreasing and getting close to competitiveness

Renewable energy financing:  
€2,8 bn (2007-2013)





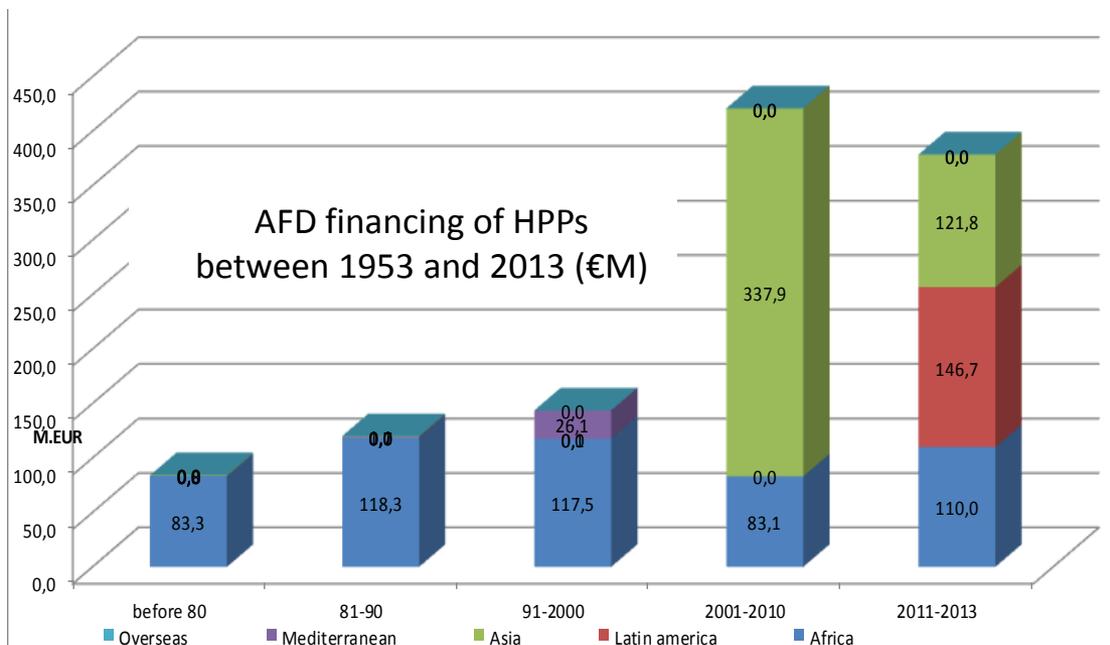
## **3. Sector specific focus: hydropower, wind, solar and biomass**



## 3.1 AFD and hydropower: 60 years of financing

### ■ AFD's priorities and rationale for intervention

- Strong environmental and social due diligences and procedures
  - *Aligned with the best international practices and norms such as IFC Performance Standards*
  - *Currently financing study on the impact of HPPs on mitigation and adaptation to climate change*
- Small and medium hydropower plants, as they represent the high remaining capacities to be developed and require moderate capital investment
- Retrofit of existing HPP to secure their long-term production



■ Between 2007 and 2013: €849 M committed for the financing of 34 projects

■ A diversified portfolio:

- New HPPs
- Retrofit
- Associate with interconnections
- Projects on all continents

# Construction of a 48MW Hydropower plant in Jaggran



## Project

**Sector:** Renewable energy/  
Hydroelectricity

**Country:** Pakistan

**Year:** 2010

**Project cost:**  
EUR 68 Million

**Partner:** Hydro-Electric Board

## Context

- **Energy crisis:** 16,000 MW installed op. capacity, **gap of 3 to 6,000 MW**. Black-out of 6 to 20 hours per day. Severe economic impact: -2 to -3% of GDP, -400,000 jobs/year
- Need to increase production and make it **affordable**.
- **Significant hydropower potential** currently underexploited

## Content and financing

- **Construction of a 48MW hydropower plant (Jaggran II)**
- **68M€** sovereign loan to the Islamic Republic of Pakistan

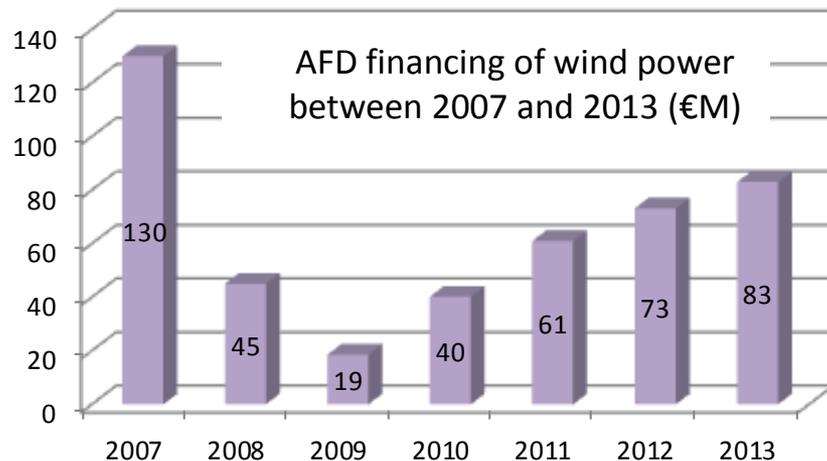
## Impacts

- Securing and diversifying electricity generation in the Muzaffarabad area
- **Local and competitive hydroelectricity** that support economic development of Pakistan and improve life conditions of 1,2M people
- **100 000 tons of CO2 avoided every year** using hydropower from this plant

## 3.2 Wind power

### ■ AFD's priorities and rationale for intervention

- Support countries willing to kick-start development of wind power, with good wind resources
- Focus on the first and innovative projects as a demonstration that wind power is financially viable and operational
- Support the development of private sector through IPPs, especially through Proparco



■ Between 2007 and 2013: €450 M committed for the financing of 17 projects

■ 370MW installed capacity

# Dali Farmland Wind Power Project (Yunnan - China)



## Project

**Sector:** Renewable energy /  
Wind

**Country:** China

**Year:** 2008

**Project cost:**

39M€

**Partner:** Sinohydro Bureau 14

## Context

- China is **one of the main GHG emitters in the world** due to the predominance of coal in its energy mix
- **Wind power and hydropower** are considered as two important clean energies that China will support in order to develop the part of renewable energies in the national production. **The two energies' production is expected to account for 15% of GNP by 2020.**
- The National Development and Reform Commission (NDRC) has adopted an ambitious program to develop the wind power sector, with a purpose of an **installed capacity of 5,000MW by 2010 and 30,000 MW by 2020.**

## Content and financing

- Financing of a **30,6 MW wind power plant on the outstanding hills of Dali city**, by using the wind energy from the wind corridors.
- AFD: **sovereign loan of 30M€**

## Impacts

- **First wind power project in southwest of China.**
- **This project will be a supplement to hydropower in dry season and also meet the increasing demand of electricity in Dali city in 2010.**
- **GHG avoided emissions of approx. 50 000 tCO<sub>2</sub>eq per year**

## 3.3 Solar power

- Solar PV power plants almost at grid parity
  - Public institutional financings are still needed to bridge the financial gap mostly due to the high capital required in solar power.
  - Different financings depending on local context (LCOE, existence of FIT, regulatory framework...)
  - Particularly relevant to produce off-grid electricity in substitution to local diesel gensets
- CSP : promotion of innovative large size CSP projects
- *Broad range of capital costs:*
  - *PV 11 – 50 US cts/kWh*
  - *CSP 18 - 30 US cts/kWh*
- **AFD commitments : 364 M€** between 2007-2013
  - *21 projects*
  - *164 MW of installed capacity (ex-ante) in 2013*

# T-Solar : Solar farm in Peru



## Project

**Sector:** Energy/ Solar

**Country:** Peru

**Year:** 2010

**Project Cost:**  
156 MUSD

**Length of the concession:**  
20 years

**Partner:**  
Isolux

## Context

- First solar project with 100% private financing in Latin America
- Fast increasing energy demand - anticipated production gap
- Significant potential: strong sunshine (6-6,5 KWh/m<sup>2</sup>/d)

## Content and Financing

- Financing of two 20MW PV plants
- Subordinated 15-year loan of 7 MUSD
- Cofinancing with FMO, OPIC is the senior lender

## Impacts

- First project –catalytic effect expected
- Reduction of CO<sub>2</sub> emissions
- Diversification of the energy mix with an increase of the share of renewable energy

- AFD's priorities and rationale for intervention
  - Promotion of under-used local resources
  - Substitution to fossil fuels and reduction to fossil fuel dependency
  - Support the development of sustainable bio-fuels
  - Support the modernization and sustainability of biomass traditional sectors
    - *Technical assistance*
    - *Cogeneration*
  
- Between 2007 and 2013: €331 M committed for the financing of 15 projects

# Biomass cogeneration power plant in China



## Project

**Sector:** Renewable energy/  
biomass

**Country:** China

**Year:** 2013

**Project cost:**

EUR 50,7 Million

**Partner:** Yichun NRDC

## Context

- Strong **increase in energy demand** and **use of fossil fuels** (coal mainly) in China
- Increase in **atmospheric pollution** and **GHG emissions**
- Large **unused biomass resources** in rural areas: crop and forest residues
- Recent **public policies** to support the development of biomass-to-energy (feed-in-tariff) in order to increase biomass production capacity to **20GW in 2020**

## Content and financing

- Construction of a **30MW biomass cogeneration power plant** + upstream / downstream equipments):
  - **Feedstock** = 80% forest residues and 20% crop residues (190 000 t/year)
  - Development of a **biomass collection / transport / preparation system**, in an area of 60km around the plant
  - Retrofit of the **district heating network**, serving 650 000 m<sup>2</sup> of dwellings
- EUR 50,7 million, with a **loan from AFD** (EUR 35M), **Yichun NRDC** (8.7 M€) and **Bank of China** (7M€)

## Impacts

- Increase **economic use of local biomass** otherwise wasted (burnt on the field / abandoned in forests)
- **Additional revenues for the forest workers**
- **300 000 tCO<sub>2</sub> avoided every year and 2500 tSO<sub>2</sub> pers year** due to the discarding of the existing coal boilers for district heating

### China

- 20 millions euro loan to finance the works of energy efficiency retrofit on about 20 buildings in the city of Wuhan
- International technical assistance co-financed by AFD and Ademe





## **4. AFD and renewable energy / energy efficiency in Central Asia**



- AFD has been authorized to work in Kazakhstan and Uzbekistan since 2012
- Mandate: promoting a green and inclusive growth
- Renewable energy and Energy efficiency are two of the main sectors of operation targeted by AFD in Central Asia
- Main financing tools:
  - Long-term loans
  - Providing of technical assistance
- Prospects
  - Uzbekistan:
    - *Modernization of the low-voltage distribution networks*
    - *Smart metering Phase 2*
  - Kazakhstan (sovereign financing):
    - *Renewable energy projects : small hydropower, wind and solar farms*
    - *Improvement of energy efficiency in official buildings and industry*



**Thank you for your attention**

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