



AFD's experience in financing renewable energy and energy efficiency

Brussels
November 6th, 2014

développeur d'avenir 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**



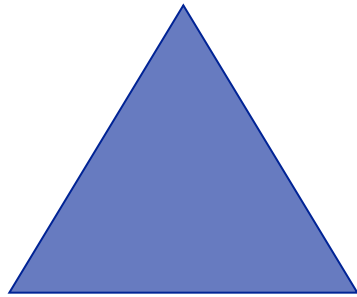
2. AFD's energy strategy



2.1 AFD's strategy and activities in the energy sector

3 axis

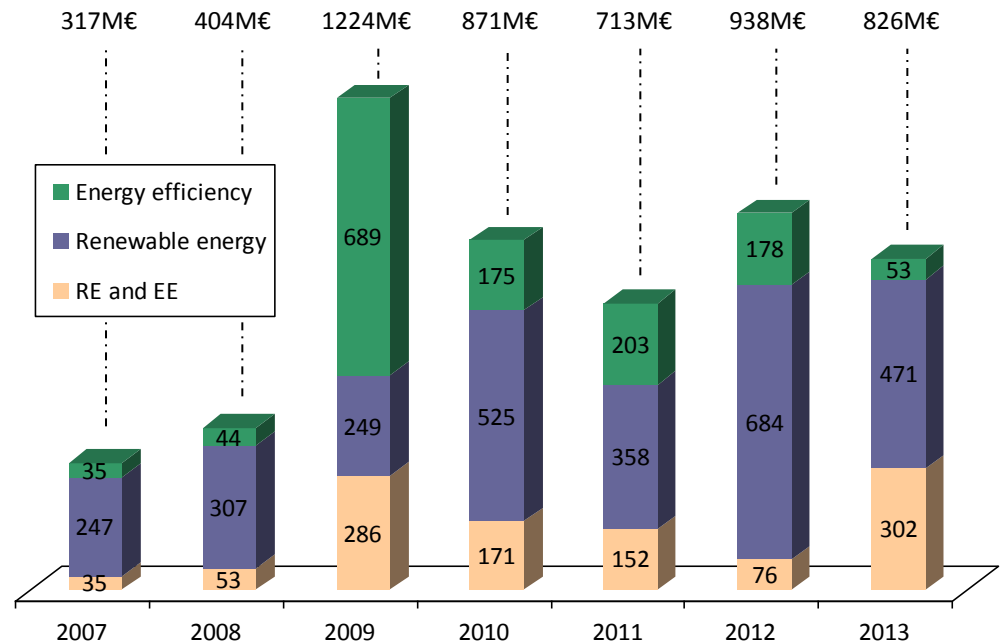
Sustainable energy
(renewable, efficient and low carbon)



Energy security
(transmission)

Access to energy

Sustainable energy financing (2007-2013)

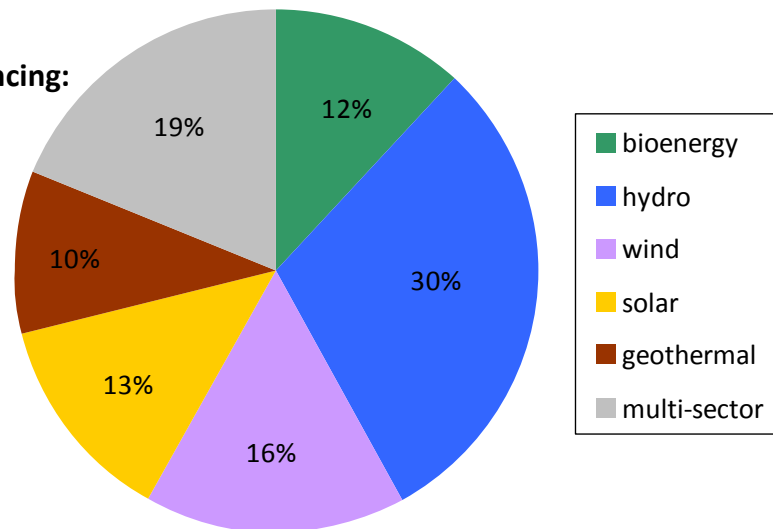


→ Between 2007 and 2013: more than € 2.8bn and 3.7 GW of renewable energy production capacity financed.

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)





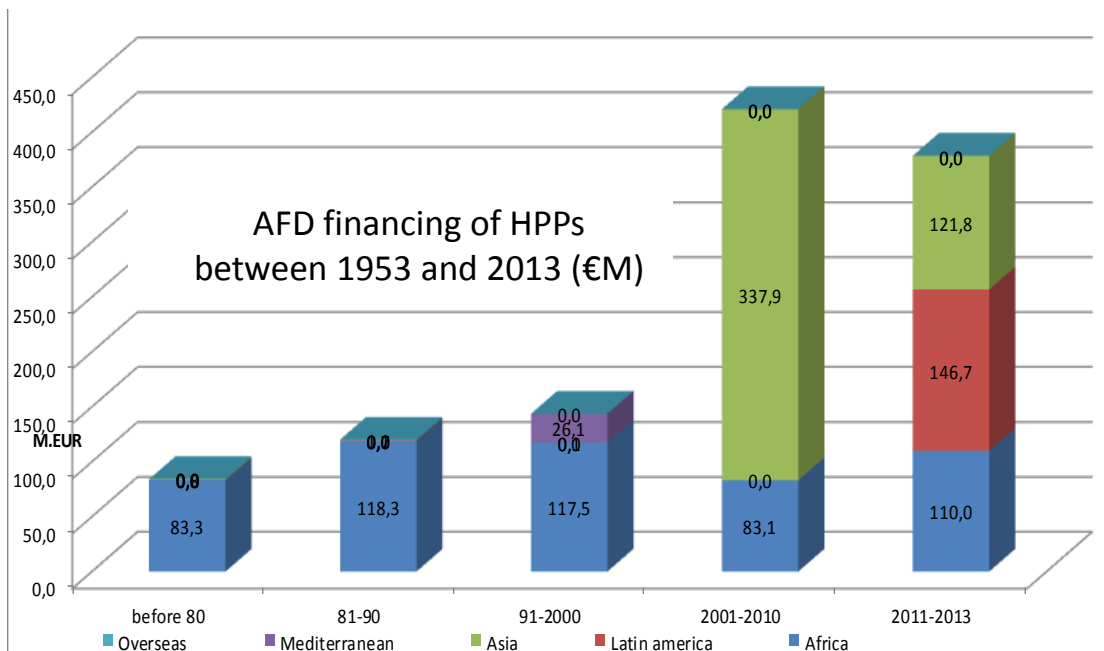
3. Sector specific focus: hydropower, wind, solar and biomass



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

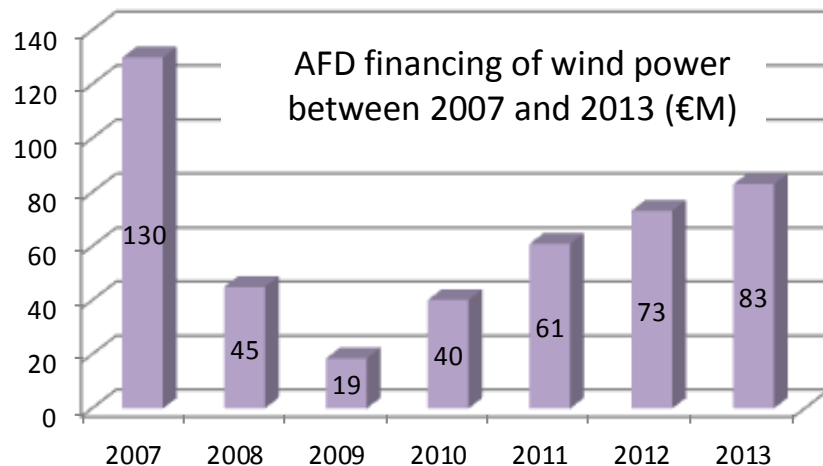
Impacts

- 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 tCO₂eq 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



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/m2/d)

Project

Sector: Energy/ Solar

Country: Peru

Year: 2010

Project Cost:

156 MUSD

Length of the concession:

20 years

Partner:

Isolux

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 CO2 emissions
- Diversification of the energy mix with an increase of the share of renewable energy

3.4

Biomass

- 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 m² 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 tCO₂ avoided every year and 2500 tSO₂ 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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