Early Lessons from Analysis of the AFD/FFEM Renewable Energies and Energy Efficiency Portfolio

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Objectives of the paper

- To provide feedback on a "renewable energies and energy efficiency" project portfolio that is growing very quickly
- To compare and contrast the experiences of the Agence Française de Développement (AFD), a specialised financial institution, its subsidiary Proparco and the Fonds Français pour l'Environnement Mondial (FFEM)
- To address specific evaluation issues selected according to their operational utility for the AFD

Approach

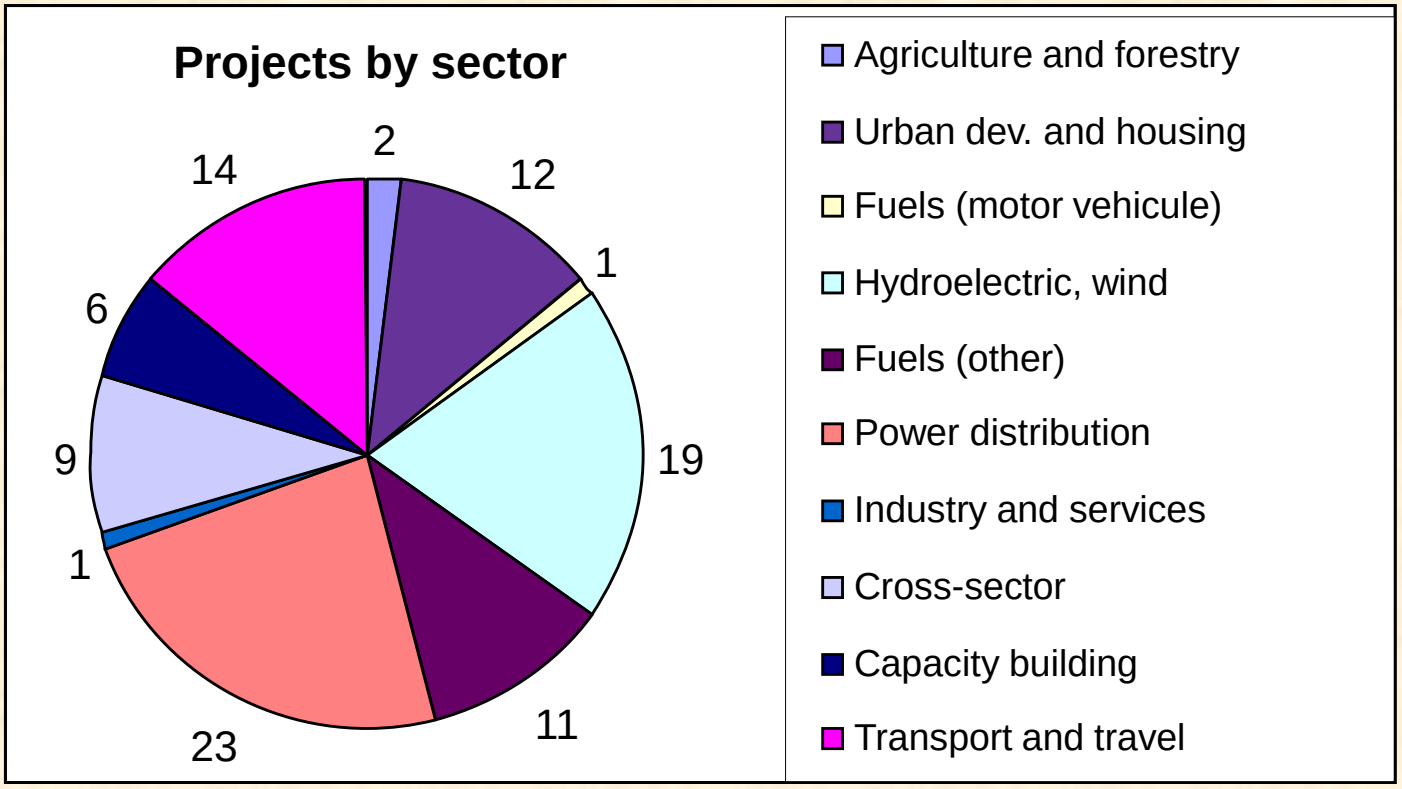
- Mapping of the energy efficiency and renewable energy projects of the AFD Group and the FFEM
  - by technical sector
  - for all projects for which a financing decision was taken between 1994 and 2006, at various stages of progress

- Early lessons concerning:
  - conditions required for project start-up
  - project financing terms
  - measuring climate impact

Mapping of the energy efficiency and renewable energy projects of the AFD Group and the FFEM

Mapping of projects

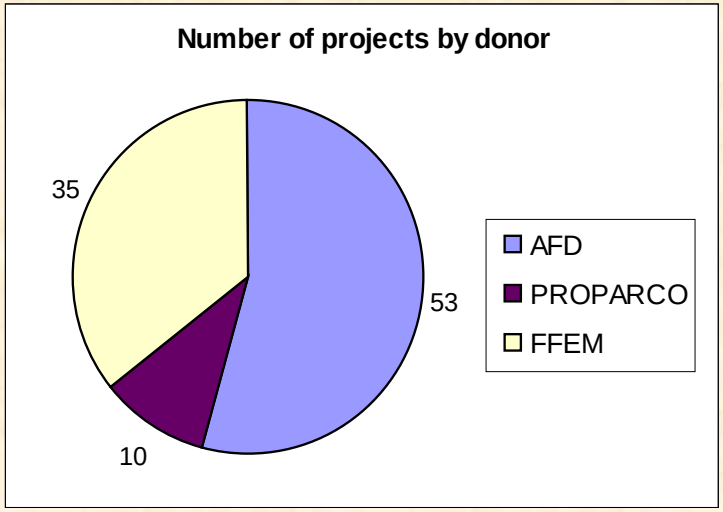
- 98 projects spread over very different sectors

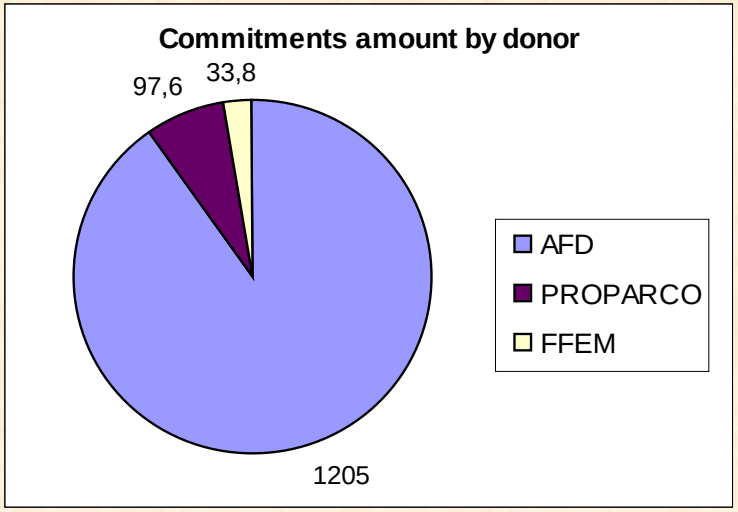


Principal sectors: power distribution, hydroelectric and wind power, transport and travel

Mapping of projects

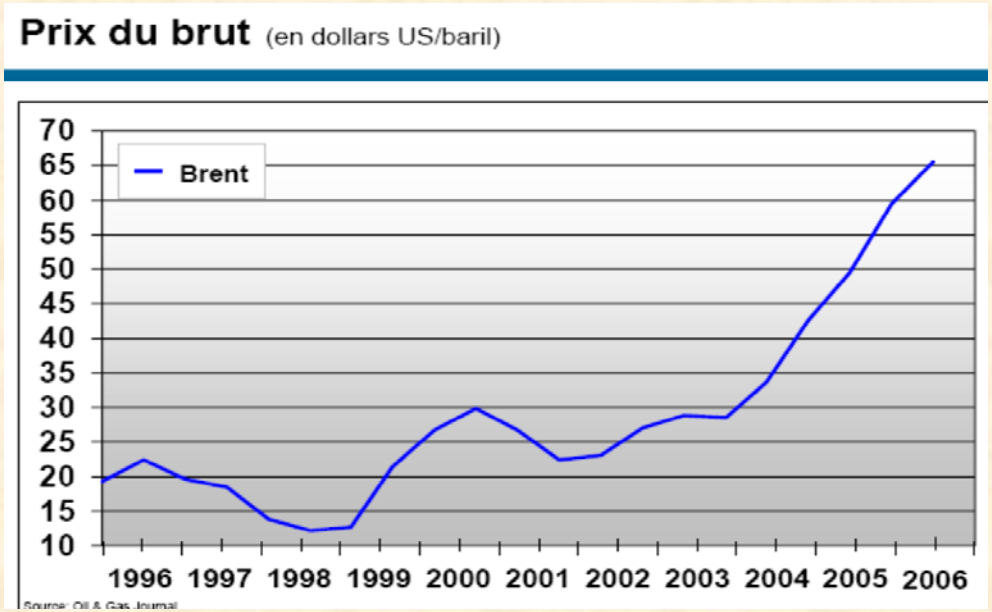
- **Breakdown by donor**

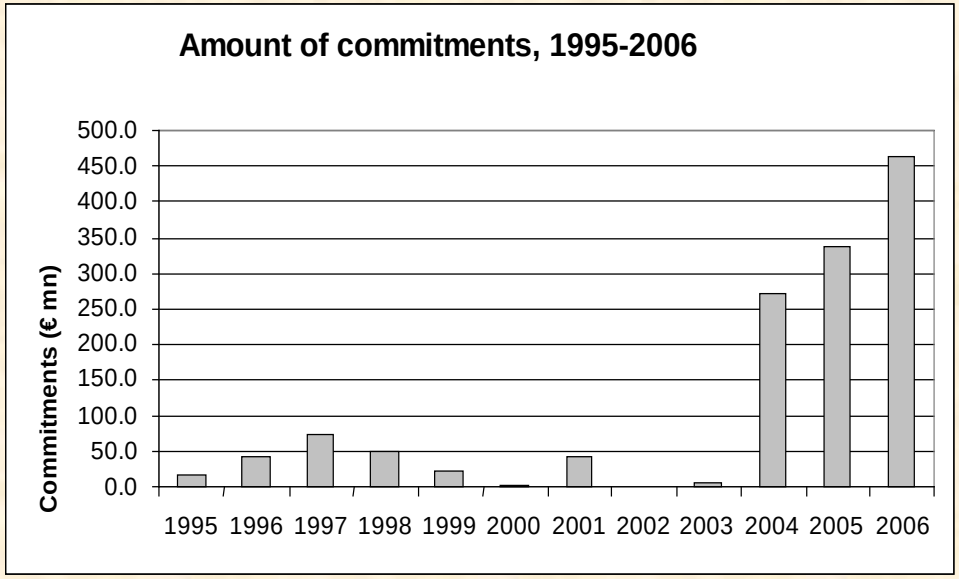




- €1.3 billion in commitments

Mapping of projects





- **Trend over time**

⇒ Rapid growth of commitments in a favourable international context.

Early lessons concerning the conditions required for project start-up

Introduction

What were the conditions that allowed the projects financed to get off the ground?

- Combination of three factors:
  - Political will and adequate legislative framework
  - Existence of local technical capacity
  - Appropriate financing

Political and regulatory factors

1st factor favouring the emergence of projects: an appropriate national context

- Regulations: are they applicable in the country context?

⇒ Often necessary to engage in capacity building (for engineering firms, business, inspectors etc.)

⇒ Labels can be useful for gradual implementation

- Pricing and tax aspects

⇒ Essential to have i) an obligation for a solvent company to purchase power generated from renewable sources and ii) incentive prices

- Political will

⇒ Implementation of a comprehensive, coherent national programme that generates synergies between energy saving programmes (e.g. coordinated communication campaigns)

Technical and financial factors

2nd factor favouring emergence of projects: local technical capacities

- Knowledge of technical sectors on the part of project promoters

⇒ Utility of pilot projects

- Development of specialised energy saving service companies: ESCOs

3rd factor favouring emergence of projects: appropriate financing

- Clean Development Mechanism (CDM)

⇒ Additional funding source influencing the decision to invest

- Financial instruments having an appropriate term, corresponding to depreciation of installations (e.g. a term of 20 years or more for small hydroelectric dams)

- Finance provided at appropriate interest rates

⇒ Aspect discussed in the next section (a key point for AFD operational staff)

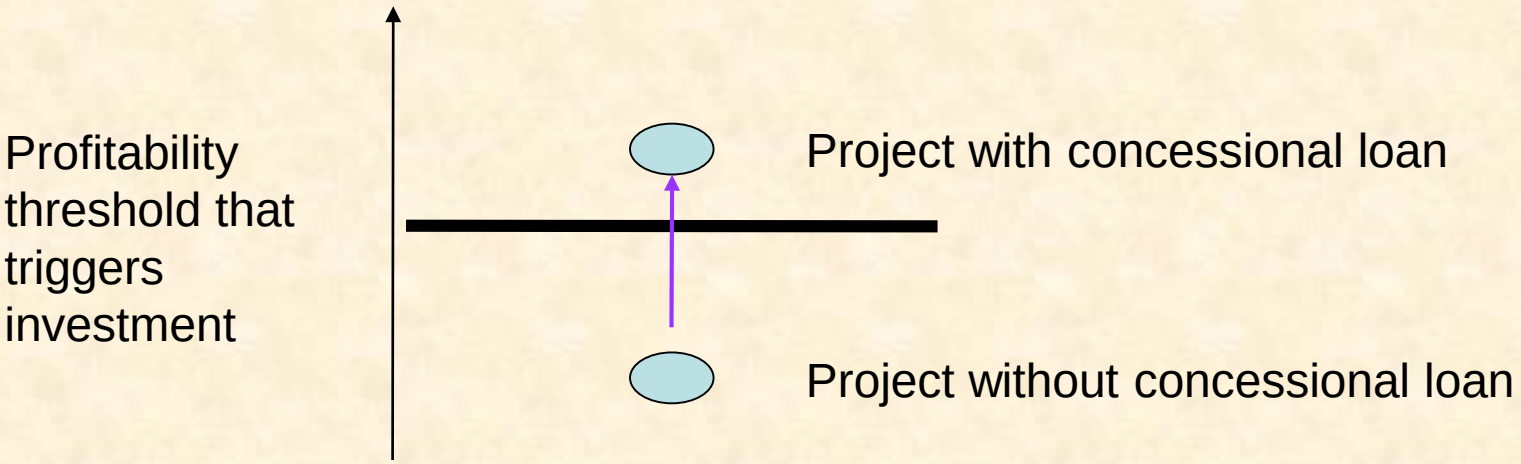
Early lessons concerning project financing terms

Introduction

Why concessional loans in the energy efficiency and renewable energy sector when an increasing number of projects are financed on market terms?

- Three operational approaches leading to different practices and appraisal standards:
  - Financial approach: enhancing project profitability
  - Innovative operations
  - Sector of activity

First operational approach: enhancing project profitability



- **Several difficulties**:
  - Determining the profitability threshold
  - Windfall effects for projects with revenues indexed to skyrocketing energy prices

First operational approach: enhancing project profitability

- **Well suited to:**
  - situations in which the return on investment is the deciding factor (e.g. wind farm coupled with a diesel power plant instead of a diesel plant alone)
  - projects with easily identified supplementary costs arising from tangible factors (e.g. isolation of the site): concessional financing offsets these costs
  - monopolistic projects for poor or isolated population groups having access only to expensive energy (e.g. decentralised rural electrification using photovoltaic generation)

Second operational approach: financing innovative operations

Concessional loans should give operators incentive to undertake innovative or high-risk projects

- **Suitable for projects that**:
  - Are subject to technical uncertainties
  - Are pioneering in their geographical area
  - Entail intangible supplementary costs (e.g. learning process due to a change of technology)

- **Little used:**
  - Loan application: the technical risk must be under control.
  - Pilot project: technical uncertainty is accepted from the outset

⇒ **Easier to support an innovative project through subsidies or equity investment than through concessional loans**

Third operational approach: financing operations on a sectoral basis

- The concessional loan is used to provide incentives to improve the energy or environmental performance of a given sector

Examples of sectors: wind farms, CHP plants, biofuels production, installation of solar water heaters, energy-saving plant and equipment in industry

- Concerns all projects in the target sector

  $\Rightarrow$ Windfall effects accepted from the outset: effort to minimise them

- Requirements:
  - Need for prior market research
  - Ex post evaluation of the additionality actually generated

Early lessons concerning measurement of climate impact

Introduction

- Why evaluate projects' impact on climate?
  - Ex ante evaluation to justify financing
  - Ex post evaluation to assess project impacts

- Objective of this section:
  - Identify practices used by the AFD Group and the FFEM
  - Lessons and recommendations on improving project selection

Practices and initiatives of the AFD Group and the FFEM

- **Relative carbon inventory:** measures avoided emissions compared to a baseline scenario in which the project is not undertaken.

  → The only type of inventory currently taken by the AFD/FFEM

- **Absolute carbon inventory:** total emissions during the construction and operating phases
  - Virtually all projects emit GHGs into the atmosphere, the exception being carbon sequestration projects

  → This type of inventory is under development at the AFD

Example: gas-fired CHP plant (e.g. plant in Hankou, China)

Baseline scenario: "traditional" coal-fired plant

Substantial emission reductions (400,000 tonnes CO_2 eq./yr) but also substantial absolute emissions (690,000 tonnes CO_2 eq./yr).

Lessons and recommendations

- How should climate impact be measured?
  - The ratio between the two inventories can be used to reconcile the two approaches to the carbon inventory:

$$\frac{tonnes\ of\ \ avoided\ CO_2\ emissions}{tonnes\ of\ \ absolute\ CO_2\ emissions}$$

- Another factor plays a crucial role: project inertia.
  - Depends on the lifetime of the investment
  - Any investment not made today will make future emission reductions much more costly.

Lessons and recommendations

- No single indicator will suffice for assessing the climate impact of a project: the 4 indicators recommended are indispensable (though additional ones may be used as well) for projects aimed at reducing CO_2 emissions.