



Presentation of Morocco Project Base

Abdelali DAKKINA

Director of CIEDE

Brussels, April 19-20, 2004

PROJECT 1: SIMPLIFIED PROJECT DESIGN DOCUMENT FOR CLINKER SUBSTITUTION BY FLYING ASHES AT THE JORF LASFAR THERMAL PLANT

1. Project Title :

Projet de substitution du clinker par des cendres volantes de la centrale thermique de Jorf Lasfar

2. Project Developer : Association Professionnelle des Cimentiers (APC)

Contact Details : APC

3. Short Project Description:

The project is located at Jorf Lasfar. The project consists of substituting 60% of the clinker by flying ashes. The use of flying ash is less energy intensive than the clinker. The purpose of the project is to avoid significant levels of fuel oil consumption, and associated carbon emissions.

Clinker Gain : 370 000 T/yr

Estimated investment : 90 MDH (10 MEuros)

avoided Emissions : 375 000 kT CO₂/yr

**PROJECT 2: SIMPLIFIED PROJECT DESIGN DOCUMENT FOR
10 MW WIND FARM AT LAFARGE'S CEMENT PLANT AT TETOUAN**

1. Project Title

Projet de parc éolien de Lafarge à Tétouan (10 MW)

2. Project Developer : LAFARGE - MAROC

Contact Details : Mr.Rachid Amor

Lafarge-Maroc Cement factory, Casablanca

E-mail : Mohamed-rachid.amor@lafarge-maroc.com ; Fax : + 212 22 50 45 06

P = 10 MW

Expected production = 42 330 MWh/year

Total investment cost : US\$ 9.6 millions

The project would avoid 950 000 tons of carbon over its 25 years life.

**PROJET 3: SIMPLIFIED PROJECT DESIGN DOCUMENT FOR
WASTE USE IN CEMENT KILNS AT APC'S PLANTS**

1. Project Title

Utilisation des déchets dans les fours à cimenteries de la Société
HOLCIM

2. Project Developer : APC (HOLCIM ...)

**Contact Details: APC; Mr Rachid SEFFAR, Directeur AFR/
Holcim**

3. Short Project Description:

Projet d'utilisation des déchets (pneus déchiquetés, déchets
ménagers, industriels...) comme combustible dans les fours à
cimenteries (APC...)

**PROJECT 4: SIMPLIFIED PROJECT DESIGN DOCUMENT FOR ENERGY EFFICIENCY
IMPROVEMENT OF THE WOOD FUEL BURNING FOR HAMMAMS**

1. Project Title

Project of improvement of the energy efficiency of the wood combustion for the Hammams (bains maures)

2. Project Developer : CDER (technical assessment), FNH (project promoter)

Contact Details : CDER

Rue El Machaar El Haram, Issil BP: 509 , Marrakech

Tel : +212 44 30 98 14 / Fax : +212 44 30 97 95

E-mail : cder@menara.ma

Project 4 (suite)

3. Short Project Description:

An improved boiler is developed and sold, with a demonstration phase (GTZ) completed and a pilot phase starting with support of FFEM and AFD. The project consists in generalising, via 250 units.

There are approximately **5,000** of these facilities in Morocco, distributed throughout urban areas, which are large consumers of wood-fuel (about **1.25 million tons per year**).

In 1998, a study led by the CDER in a project funded by the GTZ showed that the thermal output of traditional hammam furnaces was very low, typically between **28% and 42%**. The study also showed that it was possible to achieve efficiencies of up to **78%** through changes in water circulation, steam management and improved furnace.

4. Size of the Project:

The average installed cost for a replacement high efficiency furnace is **7,100 EUR** (compared to **3,300 EUR** for a traditional furnace). For the **4,750** hammams, this corresponds to an incremental cost of **21.66 mioEUR**.

5. Expected baseline acceptance by the EB (state the main issues)

The baseline against which the proposed project is compared is the average current wood-fuel consumption level at hammams.

For the 4,750 hammams in Morocco, total wood-fuel savings would total 0.3264 million tones per year. Hence, the corresponding biogenic carbon dioxide savings for the 4,750 hammams is 3.91 millions tones over the 10-year life of the project.

**PROJET 5 : SIMPLIFIED PROJECT DESIGN DOCUMENT FOR
10 MW DESSALINATION WIND FARM AT TANTAN**

1. Project Title

Project of a pilot wind parc of 10 MW for desalination sea water at Tan-Tan site

2. Project Developer : CDER - ONEP

Contact Details : CDER

3. Short Project Description:

Pilots wind farm project **10 MW** for the desalination of the sea water in the region of Tan-Tan (Sidi El Garn and Sahb El Harcha) in collaboration with the ONEP.

With average annual wind speeds at 40 m from the ground of around 6.43 m/s, the wind farm would produce around **19 GWh yearly** of electricity (capacity factor of 19%) that would be used for desalination (reverse osmosis) in the range of 2 million m³/year of salty water (33-35 g/litre).

4. Size of the Project:

The whole desalination project costs are around 240 mioDH (24 mioEUR) of which 10 mioEUR for the wind farm, giving yearly savings on petrol of 4.200 tones (30.800 barrels of petrol per year) equivalent to 7,7 mioDH/an (25 EUR/barrel).

This project should avoid 14,500 tonnes CO₂ / year and as well : 123 tones SO₂, 85 tonnes NO_x and 24 tones chlorhyde acid.

Project 6:
**Project of collective solar thermal plant
for the production of sanitary hot water**



Program for Developing the Use of Solar Water Heaters in Morocco

➤ **OBJECTIVE**

- Install SWH to substitute conventional resources in collective use
- Help reduce the costs of access to SWH and to increase its financial appeal
- Generate carbon credits for transfer to an Annex 1 countries
- Lessen the pressure on electricity demand



Program for Developing the Use of Solar Water Heaters in Morocco

➤ **CONTRIBUTION TO SUSTAINABLE DEVELOPMENT**

- Energy sector Impacts
- Technological Impacts
- Social and Economic Impacts



Program for Developing the Use of Solar Water Heaters in Morocco

➤ ADDITIONALITY

- Investment ⇒ High up-front cost of the SWH
- Technological ⇒ Technology transfer
- Financial ⇒ No official development aid
- Environmental ⇒ Zero emission



Program for Developing the Use of Solar Water Heaters in Morocco

➤ BASELINE (1)

- Simplified baseline = electricity consumption x benchmark emission factor
- Benchmark emission factor = National average performance = $0,766 \text{ tCO}_{2\text{eq}}/\text{MWh}$
- The average specific emission factor include the projected operating plant until 2014.



Program for Developing the Use of Solar Water Heaters in Morocco

➤ Details of baseline

- **SWH:** Average energy production is **700 KWh/m².year**
- **Moroccan context for heat water:**
 - gas propane 30%;
 - heavy fuel 30%;
 - domestic fuel 35%;
 - electricity 5%.



Program for Developing the Use of Solar Water Heaters in Morocco

➤ Details of baseline:

For electricity :

1kg CO₂ is generated by 1 KWh_{electric} that is generated by 3 KWh_{thermal}

For DF: 450 gCO₂ → 1 KWh_{electric} → 1,66 KWh_{thermal}

For HF: 468 gCO₂ → 1 KWh_{electric} → 1,66 KWh_{thermal}

For gas propane: 273 gCO₂ → 1 KWh_{electric} → 1,33 KWh_{thermal}



Program for Developing the Use of Solar Water Heaters in Morocco

➤ MONITORING: OBJECTIVE

- Maintain the energy generated by the installed equipment
- Quality control of equipments
- Procedure for the periodic calculation of GHG emission reductions
- Assigning monitoring responsibilities to personnel
- Data storage and filing
- Preparing for the requirements of an independent auditor/verifier



Program for Developing the Use of Solar Water Heaters in Morocco

➤ MONITORING

- “Guaranty of Solar Results” or GRS
- Signed contract in which the installer will guaranty the annual solar-thermal quantity of energy delivered
- A system of electronic surveillance
- Instrumentation ⇒ measurements
- Data Acquisition ⇒ Collect information thru internet connection



Program for Developing the Use of Solar Water Heaters in Morocco

➤ SUMMARY

- Installed capacity = 200 000 m²
- Estimated Cost = € 80 000 000 Euros
- Total anticipated emission reduction = 790 875 TCO_{2eq}/10 years
- On the basis of €10/ton,
the total benefit from carbon credits = € 7 908 750 /10 years
(10% of investment).



Template of Risk Analysis related to CDM project and CERs

Risques / facteurs	impacts Potentiels	Evaluation du risque	Outils d'atténuation possibles
Ratification du Protocole de Kyoto Ratification du Pays hôte			
Autorité Nationale Désignée (procédures et critères d'approbation)			
Agrément du pat hôte pour le transfert des RECs Capacité des acteurs locaux Approbation du Conseil Exécutif MDP			
Risque au niveau de l'approbation de l'acheteur de CERs			
Approbation du scénario de base			
Protocole de vérification			
Risque lié à l'ERPA (Emission reduction purchase agreement)			
Accord de l'achat de la réduction des émissions Risque lié au marché du Carbone			



SYNERGY IRIS



Thank you for your attention