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CARBON FINANCE ASSESSMENT MEMORANDUM

ON A

PROPOSED CARBON FUND EMISSION REDUCTION PURCHASE AGREEMENT

IN THE AMOUNT OF A MAXIMUM OF 4.5 MILLION TONS OF CO2-EQUIVALENT

TO

THE KINGDOM OF MOROCCO

FOR A

MUNICIPAL SOLID WASTE CARBON FINANCE PROGRAM

May 1, 2013

Urban and Social Development Unit
Sustainable Development Department
North Africa and Middle East Region

MOROCCO - GOVERNMENT FISCAL YEAR

January 1st–December 31st

CURRENCY EQUIVALENTS

(Exchange Rate Effective as of February1st, 2012)

Currency Unit	Moroccan Dirham
US$1.00	MAD 8.2096

WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS AND ACRONYMS

CADF	Carbon Asset Development Fund
CARs	Corrective Action Requests
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CLs	Clarification Requests
CN-PNDM	National Commission for the National Municipal Solid Waste Management Program
CPA	CDM Project Activity
CPF	Carbon Partnership Facility
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	CDM Executive Board
ER	Emission Reduction
ERPA	Emissions Reductions Purchase Agreement
EIA	Environmental Impact Assessment
ESA	Environmental and Social Audit
ESIA	Environmental and Social Impact Assessment
FEC	*Fonds d'Equipement Communal*
GHG	Greenhouse Gas
GoM	Government of Morocco
IRR	Internal Rate of Return
LFG	Landfill Gas
LG	Local Government
MAD	Moroccan Dirham
MoEF	Ministry of Economy and Finance
MoI	Ministry of Interior
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
PIN	Program Idea Note
PNDM	National Municipal Solid Waste Management Program
PoA	Program of Activity
PoA-DD	Program of Activity Design Document
PSP	Private Sector Participation
MEMEE	Ministry of Energy, Mines, Water and Environment
SWM	Solid Waste Management
tCO_2e	Tons of CO_2-equivalent

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KINGDOM OF MOROCCO

MUNICIPAL SOLID WASTE CARBON FINANCE PROGRAM

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and Sector Background

1. ***Most Moroccan cities feature high population densities and rapid growth and suffer from several forms of environmental degradation***. Out of a total population of 30 million, 18 million Moroccans live in urban areas. With the urban population growing at 2.85 percent per year coupled with increasing consumption per capita, Municipal Solid Waste Management (MSWM) has become one of the most serious environmental challenges in urban areas, with adverse effects on the quality of life, human health, environmental and natural resources, and economic and social development. Morocco produces about 5 million tons of Municipal Solid Waste (MSW) per year and this is expected to reach 6.2 million tons in 2020.

2. ***Prior to the program of reforms, Morocco's MSW services were defined only in terms of "cleanliness," with very limited attention and resources allocated to waste disposal or treatment.*** The MSW reform in Morocco has been supported by the Bank through a programmatic series of two DPLs delivered respectively in March 2009 and December 2010. Before the reform, the resulting impacts on the quality of life, public health, environmental and natural resources, and vital economic activities such as tourism, were huge. Major issues and challenges in the sector prior to formulation of reform program included: (i) poor sector policy focused mainly on "cleanliness" with very limited attention to waste disposal or treatment; (ii) weak legal and institutional framework, which constrained effective strategic planning and governance; (iii) ad-hoc fiscal transfers to municipalities and uncertain financial sustainability; (iv) poor cost-effective private sector participation mainly due to limited competition, lack of transparency, and low accountability; and (v) huge impacts on the quality of life, public health, local and global environment, and social and economic development.

3. ***Recognizing the urgent need for leadership and partnership in addressing the very serious issues in MSW, the Government of Morocco has begun to take vigorous actions toward the development and reform of the sector***. The Government initiated the MSW reform program later in 2006 with the enactment of the first Solid Waste Law. This Law 28-00 established the fundamental principles and key rules that will govern MSW in Morocco and formed the foundation for the national policy for the sector with two key objectives: (i) establish integrated and affordable Solid Waste (SW) management systems, and (ii) mitigate negative impacts of the sector on public health and the environment. More specifically, the new law: (i) establishes the institutional framework for MSWM; (ii) requires the development of SW master-plans at the national, regional, and municipal level; (iii) establishes cost recovery principles, including the "polluter pays" principle and user fees (*redevances*); (iv) introduces sanitary landfills as the standard for final waste disposal and requiring regulations establishing landfill norms and standards; (v) introduces regulations for hazardous waste management; and (vi) establishes a system to monitor compliance with the law.

4. ***The Government developed and approved a national MSWM program*** (*Programme National de Déchets Ménagers et Assimilés*, PNDM). A 15-year 3-phase program has been launched in 2008 and set out objectives for the modernization of MSWM, in particular: i) expand

and professionalize collection services; ii) enhance disposal practices; and iii) promote recycling activities, all in an environmentally and socially sustainable manner. The program includes specific targets for MSWM, including:

- Collection coverage increasing from 70 percent to 90 percent by 2021;
- 100 percent use of sanitary landfills in urban areas by 2021;
- Closure and/or rehabilitation of 300 open dumps; and
- Sorting of 20 percent of recyclable materials.

5. ***Since 2009, with the support of the Bank, the overall reform has focused on three main areas***: (i) improve governance of the sector through additional legal, regulatory, and institutional measures designed to establish a clear framework for the sector, and eliminate overlap and/or gaps in the policy-making, regulatory, and operational structure; (ii) improve the sustainability of the sector through the introduction of financial mechanisms and incentives for municipalities to improve MSWM systems; and (iii) mainstream social and environmental considerations into the planning, implementation, and operations of MSW services and investments.

6. ***MSWM in Morocco is currently based on landfills, which produce vast quantities of methane***. Capturing and flaring the methane produced by the decaying organic portion of the municipal solid waste can lead to significant greenhouse gas (GHG) emissions reductions (ERs) and generate additional sources of revenues through the Clean Development Mechanism (CDM) of the Kyoto Protocol. In addition, by using captured landfill gas (LFG) to generate electricity, additional ERs can be achieved from the displacement of fossil-fuel based power generation. The Government identified CDM as a source of additional revenues to municipalities.

7. ***The reform also supports cities for contributing to the climate mitigation agenda.*** Morocco is committed to promoting projects and activities to reduce GHG emissions, particularly through the MSW sector, while making sure that additional CDM revenues are leveraged. Thanks to Bank-funded technical assistance, the Municipal Development Fund (*Fonds d'Equipement Communal*, FEC), a public development bank providing financial support (loans) to municipalities' infrastructure projects, is now playing a key role in supporting local authorities gaining access to the international carbon market and developing CDM projects in the municipal solid waste area.

8. ***There are, however, untapped opportunities in the MSW sector to support the global climate mitigation agenda and to mobilize additional financial resources for the sector from the carbon market.*** Morocco, as a developing country (non-Annex B party) that has ratified the Kyoto Protocol, is eligible to participate in the flexible mechanisms enabled under the Kyoto Protocol, such as the Clean Development Mechanism (CDM). MSW disposed in landfills generates gases typically composed of 50 percent methane (a greenhouse gas – GHG), which can be captured and flared, and/or used to produce electricity. Emission Reductions (ERs) from the flaring of methane contained in landfill gas (LFG) can be sold to Annex-B countries (most industrialized nations and some central European economies in transition) entities to generate revenue for the improvement of current MSWM practices in Morocco. At present, there are only few projects with LFG capturing systems in place in Morocco, which results not only in global

environmental impacts linked to the emission of greenhouse gases, but also in financial losses, in terms of foregone revenues from the sale of carbon emissions reductions under the CDM.

9. In an effort to scale up CDM activities and reduce transaction costs, the CDM Executive Board (EB) at its 32nd meeting in June 2007, adopted procedures for the registration of Programme of Activities (PoAs) as a single CDM project activity. This approach is aimed at enabling carbon finance to support partner country initiatives in support of low-carbon investments. Although the preparation and approval of PoA proved to be complex and challenging, it was still seen, in the case of Morocco SWM program, as the most appropriate approach in order to benefit from the CDM.

10. ***Per the request of the Government of Morocco, the proposed Carbon Finance program was developed in parallel with the above programmatic DPL series, and will provide equal opportunities to municipalities in gaining access to the carbon market***. This program is demand-driven and will provide a framework under which any interested municipality, or group of municipalities, will be able to develop a CDM project in the municipal solid waste management sector, as long as it meets the eligibility criteria established by the CDM. Moreover, municipalities will be able to develop carbon assets and gain access to the carbon market at a relatively low cost, taking full advantage of economies of scale of the programmatic approach and keeping transaction costs down.

2. Rationale for World Bank involvement and contribution to sustainable development

11. ***The Bank is a leading player in combating Climate Change.*** In October 2008, the World Bank Group adopted a Strategic Framework on Development and Climate Change (SFDCC) in consultation with, and endorsed by, Governments of 185 member countries. The SFDCC guides the Bank's operational response to address the new development challenges of climate change under the principles, policies, and guidelines of the United Nations Framework Convention on Climate Change (UNFCCC) process. Carbon finance is one of the instruments that the Bank uses to leverage new private and public investments in projects which help mitigate climate change impact by reducing GHG.

12. ***Support to the MSW reform program is a key component of the new Country Partnership Strategy (CPS)***. The proposed program together with the two DPLs financed by the Bank will contribute to the achievement of the CPS second and third pillars: (i) support to the improvement in access to, and quality of services; and (ii) sustainable development in a changing climate.

13. ***Combat climate change trough the promotion of carbon finance*** has emerged as a key concern for the World Bank and its clients, especially after the 2005 G8 Summit in Gleneagles. The Bank has been a leader in the field and incorporated these considerations into its development operations. Through its extensive experience gained as Trustee of several carbon funds, the Bank is well positioned to integrate and maximize the potential of carbon finance in the SW sector.

14. ***The Bank is uniquely positioned to support this program because of its extensive experience in carbon finance.*** The Bank has contributed significantly to the development of the

carbon market and currently manages 12 carbon funds and facilities, acting as a trustee on behalf of public and private sector participants. The Carbon Partnership Facility (CPF) is one of the carbon funds managed by the Bank which aims at promoting a programmatic approach. The Bank's Carbon Finance Unit uses funds contributed by governments and companies in OECD/Annex 1 countries to purchase GHG ERs in developing countries and economies in transition under the CDM and Joint Implementation (JI) mechanism in the framework of the Kyoto Protocol, or under alternative emerging schemes. At the end of 2010, contributions by participants in the Bank's carbon funds and facilities reached USD 2.388 billion.

15. ***The proposed program fits into the Carbon Finance Strategy of the Bank.*** Specifically, this Program of Activities (PoA) complies with the following strategic objectives of the Bank's Carbon Finance Unit (ENVCF):

- High-quality ERs to show how project-based GHG emission reduction transactions can promote and contribute to sustainable development and lower the cost of compliance with the Kyoto Protocol;
- Knowledge and dissemination to enable the Parties, the UNFCCC, the private sector, and other interested parties to "learn by doing" in the development of policies, rules and business processes to achieve ERs under the CDM; and
- Consistent with both the requirements set forth by the host country sustainable development strategy and the Bank high standards in terms of public consultation and environmental assessment.

16. ***The proposed program falls into the general framework of MSWM modernization in Morocco.*** Capturing, flaring, and possibly using LFG for energy generation will help bring the best industry and environmental practices in the sector and have considerable environmental benefits at the local level. The program will also support Morocco in its participation to the global efforts for climate change mitigation by contributing to GHG emission reduction. The developed carbon assets will generate additional revenues and contribute to improving the financial sustainability of the sector.

17. ***In recognition of the newly updated national environmental assessment system in Morocco, the Bank and FEC have agreed to carry out the environmental assessment due diligence on the basis of the Moroccan system.*** To that effect, a Safeguards Diagnostic Review (SDR), consistent with OP 4.00 relative to Piloting the Use of Country Systems approach for Safeguards, has been prepared and disclosed in August 2011. This SDR laid out the applicable legal and regulatory framework, as well as the corresponding institutional set up in place. The SDR reviewed how, in practice, the applicable procedures and guidelines are applied in the MSW sector.

B. PROGRAM DESCRIPTION

1. Program Objective and Key Indicators

18. ***The objective of this program*** is to support Moroccan municipalities develop carbon assets in the MSW sector, and access the carbon market.

19. More specifically, the proposed program will i) support the development and registration of CDM program of activities (PoA); and ii) allow the purchase of a maximum of 4,500,000 Certified Emissions Reductions (CERs), labeled in tons of CO_2-equivalent (tCO_2e), through an Emission Reductions Purchase Agreement (ERPA) under the Bank-managed CPF.

20. These ERs will be generated through: (i) the avoidance of methane (CH_4) emissions from MSW landfills in Morocco, by promoting LFG capture and flaring, and/or electricity generation projects, and (ii) the reduction of carbon dioxide (CO_2) emissions through the displacement of fossil fuel-based electrical power generation.

21. ***Key outcome indicators of the program are indicated in table 1 below.***

Table 1: Program indicators

#	*Indicator*	*Baseline*	*Target end-2020*
1	Percentage of total MSW disposed in sanitary landfills for which a CDM project is registered under the Program of Activities	*0*	*30%*
2	Total volume of CERs (or tCO_2e) generated	*0*	*6 million*[1]
3	Total volume of CERs (or tCO_2e) sold to CPF	*0*	4.5 million tCO_2e

2. Scope of the Program and Potential CERs

22. ***The proposed demand driven CF program*** provides a framework under which any interested municipality, or group of municipalities, will be able to i) develop a CDM project in the municipal solid waste management sector according to CDM rules, including eligibility criteria; and ii) sell all or part of generated CERs to the CPF as long as the CDM project meets the Bank safeguards policies. A process of due diligence for inclusion of a CDM in the program is presented in annex 3.

23. ***About 16 landfills in Morocco are expected to join the program.*** Based on the progress made in implementing the PNMD – Landfill component, the proposed CF program will initially target municipalities and sites included in the first phase of the PNDM (2008-2012)[2]**.** It is estimated that up to 16 LFG projects, including those of the main Moroccan municipalities included in the first phase of the PNDM, will join the program. Table 2 details the pipeline of the proposed CF Program.

24. ***The Bank will purchase a maximum of 4.5 million tons of CO_2e generated through 2020.*** The program is expected to cover a total volume of waste of approximately 3.38 million tons per year and representing more than 50% of municipal solid waste collected in urban areas. The

[1] The program with 16 landfills (categories I + II +III, see table 2) is expected to generate 7.5 million tCO_2e over the period 2012-2020. However in the outcome 2, the target end-2020 only takes into account the reasonable scenario (categories I + II) with a total ERs potential of approximately 6 million tCO_2e.

[2] The CDM portfolio was established on the basis of CPA projects identified by FEC during the preparation of the Program Idea Note (PIN) and updated taking into account the commissioning status of new landfills developed under the first phase of the PNDM (2008-2012).

emission reductions are estimated to an average of 838,000 tCO_2e per year, amounting to 7.5 million tCO_2e over nine years (2012-2020)[3]. The proposed ERPA will enable the Bank, as trustee of the Second Tranche of the Carbon Fund of the CPF, to purchase a maximum of 4.5 million tCO_2e, subject to a defined maximum contract value and a maximum and minimum price per ton of CO_2-equivalent. These figures take into consideration only LFG capture and flaring[4].

25. ***The first landfill to be included in the PoA is located in Oum Azza, approximately 15 km from the capital city of Rabat***. This landfill receives on average 1,400 tons of municipal solid waste per day with an annual growth rate of 3 percent. The commissioning of the gas capture component of the project is expected September 2013 and should generate approximately 1 million tCO_2e over the period 2013-2019 (first seven years, equivalent to the first CDM crediting period). Over the period of the program 2013-2020, Oum Azza will generate about 1.5 million tCO_2e.

Table 2: Pipeline of the proposed CF Program and Potential CERs

						ER POTENTIAL (tCO2e)		
#	Project name	Risk category	Start of waste disposal	Expected commissioning date	Waste per year (tons)	Annual average (2012-2020)	First 9 years (2012-2020)	First CP
1	Oum Azza	I	2007	2012	511,000	164,894	1,484,044	1,043,037
2	Akreuch	I	1985	2013	-	14,128	113,028	103,440
3	Agadir	I	2009	2013	200,750	64,739	517,911	429,933
4	Moulay Abdelah	I	2006	2013	60,955	26,941	215,529	181,594
5	Berkane	I	2004	2013	43,800	20,344	162,755	138,307
	Sub-total category I				*816,505*	*277,030*	*2,493,267*	*1,896,311*
6	Al Hoceima	II	2008	2013	29,930	8,894	71,155	60,017
7	Casablanca	II	2011	2014	1,204,500	349,823	2,448,761	2,448,761
8	Nador	II	2011	2014	81,000	23,428	163,993	163,993
9	Mohammedia and Benslimane	II	2011	2014	126,000	31,060	217,420	217,420
10	Béni Mellal	II	2011	2014	160,000	45,324	317,270	317,270
11	Khouribga	II	2012	2015	107,000	32,673	196,037	196,037
12	Safi	II	2012	2015	87,600	24,439	146,634	146,634
	Sub-total category II				*1,796,030*	*395,697*	*3,561,271*	*3,550,133*
13	Oujda	III	2005	2012	98,550	45,558	364,463	259,163
14	Meknès	III	2012	2015	182,500	49,644	297,865	297,865
15	Marrakech	III	2012	2015	262,800	78,255	469,527	469,527
16	Tanger	III	2012	2015	219,000	58,792	352,752	352,752
	Sub-total category III				*762,850*	*164,956*	*1,484,607*	*1,379,307*
	Total				3,375,385	837,683	7,539,145	6,825,751

First CP: first crediting period of seven years, starting from the CDM registration date of each project.

26. With reference to CDM rules, the crediting period (CP) for the PoA is 28 years, starting on 18 December 2012, the date for registration of the program. The crediting period for each CPA under the PoA is seven years, renewable twice. The starting date for the crediting period of each CPA is estimated on the basis of the commissioning date of the waste disposal activities in the

[3] According to the current CPF structure, no commitment on CERs purchasing can be made after end-2020.

[4] The feasibility of the electricity generation option would need validation during flaring stage of the LFG delivery.

new landfills, allowing for at least three years for preparation. This period is required (i) to allow enough waste to pile up and start generating LFG and (ii) to order, construct and install the LFG capture and flaring systems.

3. Alternatives Considered and Reasons for Rejection

27. ***Programmatic vs project-by-project approach.*** Although each municipality could develop their CDM project on a project-by-project basis, the proposed PoA bundling CPAs in a programmatic approach offers several distinct advantages: (i) the DPL operations and carbon finance components complement one another and facilitate the attainment of the PDOs; (ii) the proposed framework is designed to deliver significant economies of scale and provide sustainable and replicable tools for streamlining public and private sector investments that will benefit the waste sector as a whole; and (iii) reduced time and transaction costs for the registration, validation and monitoring of individual CPAs.

28. ***Alternatives to FEC as a Coordinating and Managing Entity.*** Other Moroccan institutions were considered as alternatives to FEC. However, it was determined that FEC had comparative advantages as it is the country's leading financier of municipal infrastructure projects and has extensive experience with private sector financing of municipal activities. Amongst all Moroccan institutions, FEC also benefits from the largest market penetration in municipalities.

C. IMPLEMENTATION

1. Institutional and implementation arrangements

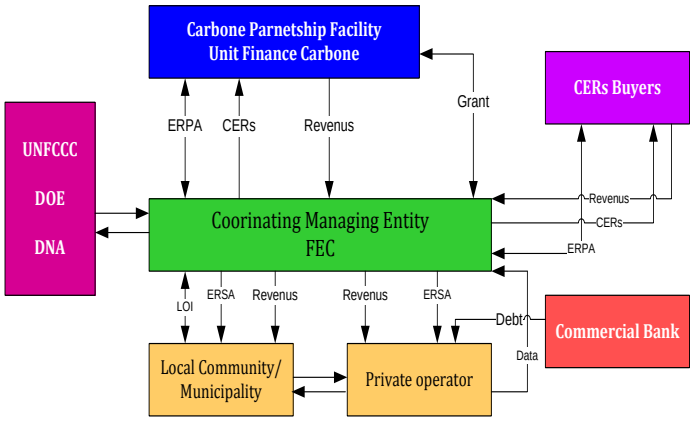
29. ***Since 2008, FEC was mandated by the Government as the institution in charge of assisting and helping the municipalities develop CDM projects and sell ERs.*** FEC is a state-owned bank created in 1959. It is specialized in the financing of investment projects for municipalities and local public institutions. FEC's mission is to support the implementation of national policies for local development with the provision of loans and technical assistance to municipalities. FEC has gained, over the past 50 years, an extensive experience in the financing of local projects and established close cooperation and partnerships with Moroccan municipalities. Capitalizing on this unique experience, FEC is well positioned to understand their concerns and assist them in the implementation of development projects such as the proposed CDM program of activities.

30. As one of the PNDM Partners, during the last few years FEC has been focusing on: (i) solidifying the pipeline of SW-CDM projects in close coordination with the PNDM; (ii) providing municipalities with technical and financial support to help them prepare CDM project documentation and generate carbon assets; and (iii) assisting both private landfill operators and municipalities in bringing ERs to the market, including through an Emissions Reductions Purchase Agreement (ERPA) with the Carbon Partnership Facility (CPF) managed by the Bank. Furthermore, FEC is already supporting the solid waste sector reform and the implementation of the PNDM. In 2008, FEC mobilized and financed four consultancy firms for capacity building of

approximately 30 municipalities in the SWM sector and assisted them in the development of projects included in the PNDM.

31. ***FEC will be the Coordinating/Managing Entity (CME) of the Program.*** As the Coordinating/Managing Entity (CME), FEC will manage the PoA and provide technical, financial and legal expertise to local authorities for the development of their individual CDM project activities (CPAs). More specifically, the Directorate of Sustainable Development and Partnerships (DSDP) within FEC will be responsible for day-to-day management and coordination of the PoA. See figure 1 which shows the business relationships between FEC and other stakeholders.

Figure 1: Business relationship between FEC and other stakeholders



32. **FEC will act as an intermediary to sell the CERs generated by each CPA on behalf of the municipalities.** Accordingly, sub-ERPA agreements for sharing the financial benefits resulting from the sale of ERs will be signed between FEC and the municipalities and/or the private sector operators. These agreements will include provisions to transfer the legal ownership of the CERs from the CPA Implementer(s) to FEC and define the roles and responsibilities of all Parties involved in the implementation of the CDM PoA and individual CPAs.

33. **FEC's capacity to perform its role as the CME for the PoA has been enhanced through technical assistance provided by the CPF team** during the two-year preparation phase of the Program (2010-2011).

34. In addition, **the Bank supports FEC through a CADF grant of US$520,000 to help develop and manage the program**. FEC developed a detailed set of activities to be financed under this grant that will serve to strengthen the capacity required to implement the Program.

The related Grant Agreement was signed on April 28, 2011. The CADF grant will support the following activities: (i) Technical assistance for the preparation of project documents (including the preparation of 10 specific CDM project activity Design Documents (CDM-CPA-DD) and a generic monitoring plan for specific CDM project activities (CPAs); (ii) Technical assistance for the management and coordination of the CDM PoA; (iii) Legal support, including the preparation of a generic sub-ERPA agreement and 10 specific sub-ERPAs; (iv) Support for the implementation of management procedures for the CDM PoA, including the design and set-up of a carbon asset registry and information system, the establishment of CPA monitoring and ER payment procedures, and the establishment of a reporting and data exchange system; (v) Capacity building and training for CPA implementers, organization of thematic workshops in Morocco on the implementation of CDM PoAs and preparation of communication tools. Additional support may be provided by the CADF to help FEC explore other carbon market opportunities, beyond CPF.

35. **Moreover**, **as a Seller Participant in the CPF, FEC has received training provided by the CPF**. An initial two day training session was held in April 2010, focusing on carbon market dynamics, carbon asset pricing and commercial and general terms in emission reduction purchase agreements (ERPAs). Another workshop for Seller Participants was held in October 2010, which addressed CME business arrangements and the CDM process. The workshop focused on key issues in building a PoA, managing delivery risk, and contracting project activities. The key elements of the CDM cycle were addressed, focusing on areas such as monitoring and verification where the CME will have important responsibilities. Additional training on the topics covered at the workshop is being planned over the next year.

2. Critical risks and possible controversial aspects

36. The implementation of the CF program faces four main risks:

37. **CDM registration risk.** The CDM registration process of the CF program has to be completed by end-2012 to meet CPF requirements. This process follows the CDM Executive Board (EB) lengthy procedures including validation of the project by an independent auditor (DOE), review and completeness check by the EB technical review team; and registration by the EB. Delays in registration can jeopardize the whole program. The team and FEC acknowledged such risk since the design phase of the CF program and due attention was paid in the preparation of the PoA package including: the mobilization of experienced team/expertise for the preparation of high quality CDM documents, the development of a strong basis to confirm the additionality of the program; and close monitoring of the preparation planning.

38. The validation of the PoA has been completed. The following steps have been concluded: (i) Stakeholders consultation for the PoA and first CPA; (ii) DNA approval for the PoA and the first CPA; (iii) Start of validation (publication of program documents); and (iv) validation site visit. The request for registration of the PoA and the first CPA was submitted in on 18 December 2012 and, subsequently, the registration of the PoA and the first CPA by the CDM Executive Board was approved on April 2, 2012.

39. **Market risk.** The additional carbon revenues to be generated by the different CDM projects will depend on post-2012 carbon markets in term of demand and prices. For the portion covered by the CF program, the sale of post-2012 ERs and till 2020 will be secured through the proposed ERPA with the CPF. The pricing approach has recently been revised and a variable price will be set up at ERPA signing, to be determined at the time of the delivery of ERs, along with a maximum contract value. The actual volume of ERs subject to the contract will depend on the price paid for each annual batch of ERs generated and delivered to the CPF. The CF program will therefore support FEC's CDM program by securing the sale of the first issued CER within a foreseeable price range. However, ERs to be issued beyond the ERPA maximum value will be sold to the market, with the risks it encompasses. Despite the huge uncertainties on the carbon market trends, especially beyond 2012, there should be a high potential for high quality carbon credits issued in Morocco. The Carbon Finance Unit will continue supporting FEC in exploring further carbon market opportunities. In any case, a CDM project feasibility study including a sound financial analysis will be carried out prior to any investment.

40. **Operational risk.** The ERs will rely on the volume of LFG that will be effectively captured in each landfill, depending on the quality of the capturing systems and landfill management. This is a major delivery risk for any project of this type. Experience shows that there can be significant gaps between projected and actual ERs. This risk is mitigated through very conservative estimate of potential CERs. The ER calculation models for LFG projects have been adjusted downwards significantly according to historical LFG production data observed on similar projects.

41. Regarding the actual delivery, the program will include only sanitary landfills constructed and or being developed under the PNDM as opposed to existing poorly managed dumpsites. Each landfill project included in the program will be implemented in two phases: (i) methane capture and flaring, and (ii) energy generation, once sufficient historical data on the gas flows are available allowing for suitable design. In addition, private firms, contracted on performance basis, operate most of landfills according to international best practices. Finally the technology of gas collection, flaring and electricity production is well-proven with over 1,300 landfills equipped with capture and flaring systems worldwide.

42. **Demand risk.** This is related to the likelihood that the operators of the landfills, and the local authorities owning them, will want to join the program. Indeed, the success of the program relies on the voluntary participation of project owners. The team carefully assesses this risk, which is linked to carbon market conditions at the time of program design, and the perceived ability by the local authorities of the coordinating entity to manage the program. To mitigate this risk, the PNDM financially rewards landfill projects that include CDM component.

43. Regarding the demand risk in the registration of the future underlying projects, municipalities/private operators of sanitary landfills are incentivized to develop CDM components through the following: i) the PNDM rewards the municipalities which develop CDM landfill projects by providing additional financing support; ii) the contracts between the municipalities and the private operators of the sanitary landfills include a CDM incentive clause; and iii) once the program is registered, FEC will scale up its outreach to the municipalities through a strong communication plan, to advocate the development of CDM landfill projects.

44. In addition to the risks above, the table below summarizes specific risks and mitigation measures related to CDM registration process.

Table 3: Summary of risks and mitigation measures related to the CDM registration process

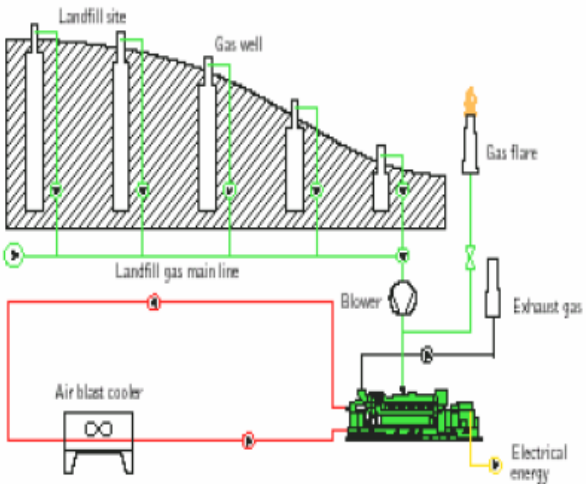
Risk source	Degree	Risk mitigation measures
Country approval risk	Low	Host country letter of approval already obtained from the Designated National Authority (DNA) chaired by MEMEE
CDM additionality risk	Low	The project presents a solid background from the CDM point of view: a) CDM projects promoted as part of the sector reform; b) early consideration of CDM in the design of ***s***anitary landfill, and c) low return on investment as compared to benchmark IRR for CDM eligibility. In addition, there is no LFG mandatory management in Morocco.
Monitoring, verification and issuance risk	Low	Mobilization of expertise to assist LFG operators to develop and implement monitoring plans according to the requirements of the PoA. Centralized monitoring points for Annual monitoring report.
Financial risk	Medium	Strong institutional and financial support from the Government of Morocco through the PNDM. Possibility of financing the project through a FEC loan if required.

D. APPRAISAL SUMMARY

1. Technical Analysis

45. ***A typical CDM Program Activity (CPA) consists of LFG capture and flaring, and/or use for electrical and/or thermal power generation at a specific landfill site.*** A typical CPA (see figure 2) consists in (i) capturing LFG at eligible landfills in Morocco; (ii) flaring the captured LFG to eliminate the landfill methane emissions; and/or (iii) using the captured LFG as a fuel to generate electricity or thermal power. The electricity generated can be used for own usage of the municipality/operator or sold to the national utility ONE. In both cases, it will substitute electricity from the national grid. The captured LFG could also be used to generate heat for boilers or air heaters applications, but it is not envisaged in the context of this program in Morocco. Considering the activities envisioned, a typical CPA is confined to the physical boundary of the targeted landfill and the LFG valorization site. In case of export of electricity to the grid, the national electricity grid will also be included in the CPA's scope.

Figure 2: Typical system for LFG capture, flaring and/or use to generate electricity



46. A typical landfill gas collection and flaring system consists of the following components: (i) wells network; (ii) capture piping system; (iii) condensate extraction and storage systems located at low network points; (iv) blower to create the required vacuum in the collection network to extract the LFG; (v) gas pre-treatment; and (vi) flaring station of LFG. For the purpose of electricity generation, the main equipment consists in an LFG-based power station, transmission lines and transformer.

47. Both LFG-to-electricity and LFG– collection and flaring projects are technically sound and any CPA related investment will be selected based on a comprehensive feasibility study. Over the past 30 years the technology for extraction and utilization of LFG has developed to the point where today there are more than 1,300 plants worldwide in operation. Approximately 750 of these plants have been established in Europe and 425 in the United States. The technology to be used for each CDM project will be selected from well-proven technologies and their design, implementation and operation will be carried out by experienced private firms.

48. The details of the main technical characteristics of the equipment used for each CPA will depend on the characteristics of each landfill. They are described in detail in a CPA Design Document (CPA-DD). In addition to the main equipment required to capture and flare LFG, and/or generate electricity, equipment to measure temperature, pressure, electricity produced, gas quality and flows will be used to monitor the emissions reductions according to the latest CDM Executive Board directives and procedures and the Monitoring Plan established in the CPA-DD.

49. Operations and management of the projects will be optimized with the following activities: i) adoption of best practices for landfill operations and management, including design and construction of cells to minimize leachate generation and provide surface water controls; ii) development of a site development plan for disposal and optimization of gas production; iii)

installation of landfill gas capture and treatment systems with current landfill development and operational plans to ensure efficient site operation; iv) implementation of appropriate systems for leachate collection and treatment and maximization of LFG capture.

2. Program Readiness

50. Table 4 summarizes the current status of the different projects included in the proposed CF Program. To assess the readiness of the program, CDM projects are sorted in three categories:

(i) low risk (category I);
(ii) medium risk (category II); and
(iii) high risk (category III).

Table 4: Status of potential CPAs (CDM projects)

Category	Projects	Risk	Observations
I	Oum Azza	Low	1st CPA - Landfill commissioned - LoI signed - CPA-DD in validation (expected registration: June 2012)
	Akreuch	Low	Closed - EoI received - LoI signed - Procurement for CPA-DD preparation
	Agadir	Low	Landfill commissioned - EoI received - LoI in final stage of negotiation - Procurement for CPA-DD preparation
	Moulay Abdelah	Low	Landfill commissioned - EoI received - LoI negotiations finalized, signature procedure ongoing - Procurement for CPA-DD preparation
	Berkane	Low	Landfill commissioned - EoI expected
II	Al Hoceima	Medium	Landfill commissioned - EoI expected - Financial risk
	Casablanca	Medium	Landfill under construction
	Nador	Medium	Landfill construction completed
	Mohammedia & Benslimane	Medium	Landfill under construction
	Béni Mellal	Medium	Landfill under construction (completion expected in 2012)
	Khouribga	Medium	Landfill under construction (completion expected in 2012)
	Safi	Medium	Landfill under construction
III	Oujda	High	EoI received - CPA-DD in validation - Additionality risk
	Meknes	High	Early discussions
	Marrakech	High	In preparation (ongoing procurement procedure for the design and construction of the landfill)
	Tanger	High	Early discussions

51. Three scenarios are envisaged for the development of the portfolio and the delivery of ERs according to the implementation status and risk level of each CDM project:

(a) a conservative scenario, which includes only category-I (low risk) CPAs;
(b) a reasonable scenario, which includes category-I-and-II (low and medium risk) CPAs; and
(c) an optimistic scenario, which includes all the identified CPAs (low, medium and high risk).

52. In the reasonable scenario, 12 landfills are expected to join the program, including the main municipalities included in the first phase of the National Municipal Solid Waste Management Program (PNDM). This would represent a total volume of incoming waste of 2.6 million tons per year and emissions reductions amounting to approximately 6 million tCO2e over the first nine years of the PoA (2012-2020), of which the sale of a maximum of 4.5 million tCO2e would be secured through the ERPA with the CPF.

3. Financial Analysis

53. To check the overall CDM additionality of the Program, FEC developed a basic financial analysis for the 16 landfills of the program, based on estimated ERs generation and benchmark investment and O&M costs for both options (capture and flaring, and generation of electricity). The investment analysis prepared for the first CPA confirms that LFG projects in Morocco are not financially attractive without CDM revenues.

54. Under flaring only option, the bankability of each project is quite sensitive to the CER price as the sale of carbon credits is the only source of revenue. For each CPA, a financial analysis will need to be made, based on the terms agreed to in the ERPA between FEC and the CPF, to verify that the viability of the project is secured, guaranteeing minimum revenue to cover the investment.

55. Under "Flaring and electricity generation" option, an estimated total investment of approximately US$ 120 million will be required over the program lifetime to finance the identified CPAs. While revenues from the sale of electricity provide more "stability" to the projects (i.e., their financial viability is less dependent on ER prices), the current purchase price for renewable electricity offered by ONE[5] (through the EnergiPro initiative) is low compared to regional benchmarks. Thus, as commented for the "flaring only" option, a detailed financial analysis of each CPA will be conducted prior to any investment decision, as is done for Oum Azza, the first project under the program.

4. Environmental and Social Safeguards

Environmental Safeguards

56. ***Over the past few years the Government of Morocco has improved significantly its institutional and regulatory capacity.*** Some of these improvements were a direct consequence of the dialogue between the Moroccan authorities (in particular the State Secretary for Water and Environment) and the World Bank as part of the preparation and implementation of the programmatic series of two DPLs in the solid waste management sector. Specifically the improvements pertained to the regulatory, administrative, technical, and managerial deficiencies of the previous Environmental Impact Assessment (EIA) system that was lagging in terms of consistency with internationally recognized EIA principles and processes. The Government has published decrees completing the legal and regulatory framework for the EIA system, including

[5] ONE (Office National de l'Electricité) is the state-owned national power utility.

regulations related to public consultation, and a decentralized EIA review and validation. The Government has also established and operationalized regional EIA committees throughout the Kingdom. All 16 regional committees have now been established and are operating. These regional committees are now responsible for approving EIAs related to local projects with investments below a MAD 200 million threshold. This has facilitated the involvement of local stakeholders in the management of the EIA system and should reduce delays in the review and approval of EIAs.

Piloting the Use of Country Systems. In recognition of the amended and enhanced EIA system in Morocco, the Bank and the Government have agreed to use the Moroccan EIA system[6] for the purposes of the Project. To that effect, a Safeguards Diagnostic Review (SDR), has been prepared and disclosed consistent with the requirements of OP 4.00 on Piloting the Use of Country Systems for Environmental and Social Safeguards. The SDR encompasses: (i) an equivalence analysis, (ii) acceptability assessment of the Moroccan system and (iii) agreed gap filling measures. In fact, the SDR describes in details the applicable legal and regulatory framework, as well as the existing corresponding institutional framework for EIA implementation, monitoring and enforcement applied in the solid waste sector. Minor differences and gaps with internationally accepted principles and practices, as further defined in Table A.1 of OP 4.00 have been identified and adequate gap filling measures agreed upon between the Bank and the Moroccan regulatory authority (i.e., the Ministry of Energy, Mines, Water and Environment, or MEMEE, and the Program coordinating and managing entity, FEC). On June 29, 2011, a consultation workshop was organized with interested and affected stakeholders whose feedback and comments were reflected in the SDR. The final SDR was disclosed and made available to the public at large on FEC's website on August 19, 2011, and on the Bank Information Centre on August 26, 2011.

Table 5: Safeguard policies triggered

Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)		X
Natural Habitats (OP/BP 4.04)		X
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)		X
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)		X
Safety of Dams (OP/BP 4.37)		X
Projects on International Waterways (OP/BP 7.50)		X
Projects in Disputed Areas (OP/BP 7.60)		X
Piloting the Use of Borrower Systems to Address Environmental Issues in Bank-Supported Projects (OP/BP 4.00)	X	

57. ***Equivalence of the Moroccan system with OP 4.00.*** The SDR prepared for this program analyzed in details the legislation for environmental impacts, and confirmed the conclusions of

[6] This review was also facilitated considering that the Bank had already a good knowledge of the Moroccan system through the preparation of an SDR in 2009-2010 in the context of the Oum Errbia Sanitation project.

the previous SDR prepared and discussed with Moroccan stakeholders for the Oum Er Rbia Sanitation Project. The SDR prepared for this program highlighted a substantial qualitative shift of the Moroccan system. Furthermore, for the MSW landfill projects included in the program, the MEMEE has developed comprehensive EIA guidelines and made significant progress towards enhancing the public consultation process. In order to fulfill the requirements of OP 4.00, and ensure the equivalence between the Bank safeguards 'requirements as defined in Table A.1 of OP 4.00 and the Moroccan EIA system for this program, MEMEE has been asked to approve the EIA guidelines for MSW landfill projects and improve the procedures for public consultation. The Bank reviewed these guidelines in April 2011 and found them appropriate for the purposes of the program. In order to improve them further, and achieve the full equivalence, the Bank required MEMEE to elaborate on the conditions of their implementation. Moreover, the Bank required MEMEE to ensure that the EIA of each MSW landfill should document the public consultation process implemented during EIA preparation and their outcomes and before its approval by the competent authorities. EIA Report must also be further disclosed and be made accessible to the public and affected persons.

58. ***Acceptability of the Moroccan system with OP 4.00.*** The SDR included a detailed analysis of the regulatory and institutional framework for EIA in the SW sector. Most of this framework has been successfully enhanced following the approval of the PNDM. Results to date are significant and are certainly due to a clear and strong commitment of the Government, supported by the Bank through a programmatic series of two SW DPLs. The challenge for the near future is to ensure the sustainability of such improved framework as well as a robust practice. The SDR identified minor gaps to ensur***e*** such sustainability and described suitable gap filling measures. Such measures are related mainly to the need of improving public consultation and adopting sound procedures to monitor environmental impacts.

59. ***Gap filling measures.*** The measures to fill the gaps identified in the SDR are fully integrated in the program. FEC, as the implementing agency of the program, will have the responsibility to ensure their implementation and to report on a regular basis to the Bank within the framework of the ERPA signed with the CPF.

60. The gap-filling measures identified in the SDR,a*g*reed upon by the MEMEE and the Bank and to be applied to the all program, include:

Measures to attain and maintain the equivalence of the Moroccan system with the requirements of OP 4.00.

(i) MEMEE will approve the guidelines to prepare the EIAs for the MSW landfill projects included in the program, as specified in the SDR; and
(ii) The final EIA report for each MSW landfill project will document the public consultation process undertaken both during EIA preparation and before its approval by the competent authorities.

Measures to achieve and maintain the acceptability of the Moroccan system with the requirements of OP 4.00.

(i) The operator of the Oum Azza landfill shall prepare a study, complementary to the EIA, , detailing the impact of the projected collection and flaring of landfill gas [a full EIA will be

prepared as soon as the project developer will decide to proceed with electricity generation using the landfill gas collected]. Such study should be evaluated by the EIA national committee;

(ii) Cover the social dimension of each project, both in general terms as well as with specific reference to the CDM component (methane capture and flaring or use to energy generation), analyzing the impact on the quality of life of potentially affected groups (e.g., local residents, workers, waste pickers);

(iii) FEC adopts a formal procedure to review CDM project applications, regarding the compliance of these applications with the requirements of the Moroccan EIA system. Moreover, FEC should set up an in-house service to assist the applicants (municipality or operator) ensuring they have addressed regulatory requirements as well as above gap filling measures, as applicable, through the EIAs they will submit; and

(iv) MEMEE should adopt a formal procedure to track and monitor the impacts in each landfill project, based on the format described in the SDR.

61. The gap-filling measures identified in the SDR and agreed upon by both the Department and Environment (DoE) and the FEC were filled satisfactorily as follows:

a. MEMEE has adopted on January 9, 2012, the Directive on the EIA for MSW landfills;
b. The Directive under (a) above include guidelines on public consultation and inclusion of the outcomes of the consultation in the final EIA report;
c. The operator of the Oum Azza landfill has: (i) prepared a study, complementary to the EIA, detailing the impact of the projected collection and flaring of landfill gas, (ii) submitted the study to the EIA National Committee, and (iii) the study was reviewed by the National Committee on EIA who documented its review and satisfaction in Minutes of the review meeting;
d. The FEC has adopted a procedure to review CDM project applications, regarding the compliance with the requirements of the Moroccan EIA system. This procedure will be included in the Operational Manual which describes the assistance to be provided by the FEC to municipalities or operator, as the case may be, to ensure they meet all regulatory requirements as well as those described in the Directive mentioned above;
e. MEMEE is preparing an Environment Police Unit which will be fully operational by May 2012 to monitor compliance with EIA and EMP requirements, and FEC has adopted a specific form describing monitoring and supervision requirements for all MSW landfills; this form is fully consistent with the provisions of the Directive on EIA for MSW landfills mentioned below; and
f. The Directive on EIA for MSW landfills and CDM Project Application to FEC cover the social dimension of each project, both in general terms as well as with specific reference to the CDM component (methane capture and flaring or use to energy generation) and require an analysis of the social impacts, notably those that affect the quality of life of potentially affected groups (e.g., local residents, workers, waste pickers).

Social Safeguards

62. The projects to be considered in this program do not have a direct social dimension because they will take place on sites or facilities that will have satisfied screening criteria as set forth in the PNDM program. For instance, the landfill projects likely to benefit from this carbon finance program are the projects that would have been supported by the PNDM program and, as such, that would have satisfied the following pre-conditions:

- Submission of a full EIA, based on ToRs that have been reviewed by the Bank and that include, in particular, proper consultation with concerned stakeholders
- Submission of a social inclusion plan to ensure that the fate of workers previously working in the solid waste management department of the municipalities as well as waste pickers would be taken into account.

63. As an illustration of how these aspects are taken into consideration, the example of the Rabat Oum Azza Landfill is useful. This landfill, managed by the company Pizzorno, has established a partnership with a group of waste pickers who used to operate under very appalling conditions in the old landfill of Akreutch. This partnership, established through the intermediation of an NGO, has allowed the waste pickers to organize themselves as a cooperative and operate a sorting facility provided to them by the company Pizzorno and located in the premises of the new landfill. The waste pickers have, so far, been able to improve significantly their revenue and hence their overall quality of life.

64. Moreover, the proposed CF program will include only CDM projects for which no land acquisition is required.

65. Consequently, none of the social safeguards policies of the Bank was triggered including O.P. 4.12 on Involuntary Resettlement.

E. EXPECTED MAIN ERPA AND SUB-ERPA TERMS AND CONDITIONS

1. ERPA Terms and Conditions

Item in the ERPA term sheet	FEC Program
1. Buyer of Emission Reductions	IBRD as Trustee of the Second Tranche of the Carbon Fund of the CPF
2. Seller	Fonds d'Equipement Communal
3. Parties	Buyer and Seller
4. Type of Emission Reductions	Certified Emission Reductions Other types of Emission Reductions if (i) they are accepted as compliance assets by the EU ETS or (ii) if they result from the amendment, extension or successor international agreement to the Kyoto Protocol or any other international

	agreement implementing the UNFCCC up to and beyond 2012.
5a. Contract Amount (Contract CERs)	The first 4.5 million CERs, subject to a maximum contract value.
5b. Maximum Contract Value (Euro)	xxx Euro If, after two (2) years following the date of Registration of the Program, the Program Entity has not entered into Sub-Project Agreements in respect of at least 2,250,000 contract CERs, then the Trustee shall reduce and adjust the maximum contract value and the contract CER amount, as appropriate, by the difference between such terms as set out in the agreement and the number of CERs for which the Program Entity has executed Sub-Project Agreements.
6. Unit Price	xxx Euro/tCO_2e The Unit Price shall be calculated each year based on the simple average of a series of daily closing prices for spot CERs published in the applicable index (as defined in the contract). The Unit Price shall be subject to a maximum and a minimum per contract CER.
7. Conditions to Effectiveness of Sale and Purchase	Execution by the Program Entity of one or more Sub-Project Agreements capable of generating at least six hundred seventy five thousand (675,000) CERs for the Program. If this condition has not been either satisfied or waived by the Trustee within six months from the date of the contract, the Trustee may terminate the ERPA by written notice to the Program Entity.
9. Delivery and Payment	The Seller will deliver the first ERs generated by the CPAs in the Program until all Contract ERs have been delivered or until the maximum value has been reached. In any event, delivery will occur upon issuance into the pending account. Payment will be made within 30 days of delivery. Legal title to the Contract CERs will pass at the time of payment in accordance with the ERPA.
10. Seller Contribution Credit	The Seller Contribution Credit (SCC) shall be

	deducted by the Trustee from any payment due (i.e. the gross amount before any other deductions are applied, if any). The SCC shall be 2 percent of any payment due to Seller.
12. Term of the ERPA	ERPA will be effective on the date of execution by both Parties until December 31, 2021.

2. Sub-ERPA Terms and Conditions

66. The ERPA lays out the basic elements of the sub-project agreement ("Sub- ERPA") to be used in the sale and purchase of CERs for the CPF to be entered into by the Seller, acting as a Coordinating/Managing Entity for the PoA, and each CPA Implementer. While the terms and conditions will be open for discussion and may be negotiated between the Parties, the final Sub-ERPAs will be subject to the World Bank's approval.

Annex 1: Pipeline of Landfills in the Morocco Municipal Solid Waste Carbon Finance Program

Site	Waste amount				Landfill	Operator	Start	Closure	Contract		Remarks
	t/day	t/year	Rate	Annual growth	Type		Year	Year	Starting year	Period	
1. Oum Azza	1400	511,000	14.6%	3.0%	Sanitary	Groupe Pizzorno	2007	2027	2007	20	In operation
2. Oujda	270	98,550	2.8%	3.6%	Sanitary	CSD & CRB	2005	2020-2025	2005	15-20	In operation
3. Moulay Abdelah	167	60,955	1.7%	4.0%	Sanitary	Groupe Pizzorno	2006	2021	2006	15	In operation
4. Akreuch		98,100	2.8%		Uncontrolled (dump)	Groupe Pizzorno	1985	2006	2007	-	In operation
5. Al Hoceima	82	29,930	0.9%	3.0%	Sanitary	Groupe Pizzorno	2008	2023	2008	15	In operation
6. Berkane	120	43,800	1.3%	3.0%	Sanitary	Véolia	2004	2024	2007	10	In operation
7. Agadir	550	200,750	5.7%	3.5%	Sanitary	Tecmed	2009	2034	2008	25	In operation
8. Casablanca	3300	1,204,500	34.4%	3.0%	Sanitary	Ecomed	2011	2026	2011	15	Under construction
9. Nador	222	81,000	2.3%	3.0%	Sanitary	-	*2011*	-	-	-	Construction of first cell completed. Procurement for operation in progress.
10. Mohammedia and Benslimane	293	107,000	3.1%	3.0%	Sanitary	-	*2011*	-	-	-	Construction of first cell completed. Procurement for operation in progress.
11. Béni Mellal	438	160,000	4.6%	3.0%	Sanitary	-	*2011*	-	-	-	The works starting up is in progress.
12. Khouribga	345	126,000	3.6%	3.0%	Sanitary	-	*2012*	-	-	-	Construction of first cell completed.
13.Safi	244	89,000	2.5%	3.0%	Sanitary	-	*2012*	-	-	-	Construction of first cell in progress.
14. Meknès	500	182,500	5.2%	4.5%	Sanitary	-	*2012*	-	-	-	
15. Marrakech	795	290,000	8.3%	3.0%	Sanitary	-	*2012*	-	-	-	Procurement for rehabilitation and extension of the landfill in progress
16. Tanger	600	219,000	6.3%	4.5%	Sanitary	-	*2012*	-	-	-	

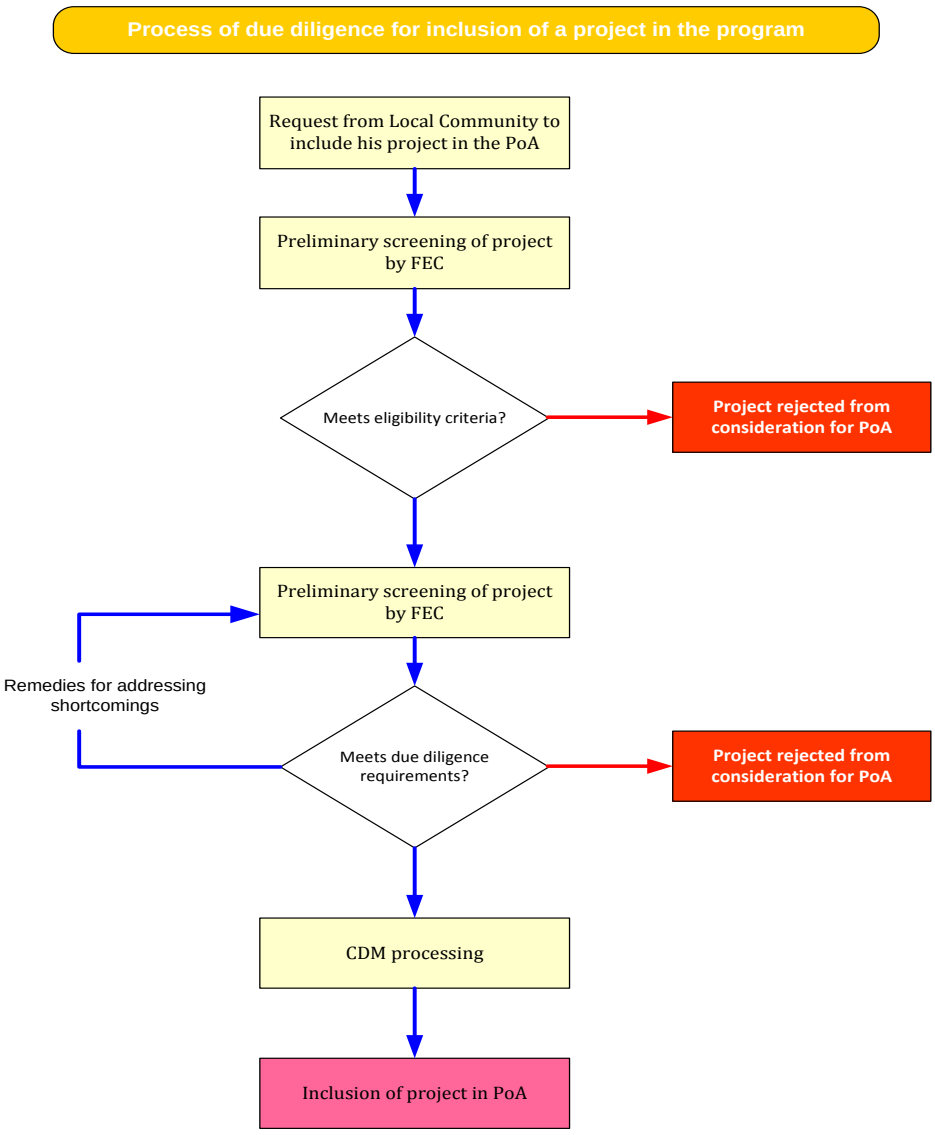
Annex 2. Program Delivery Schedule

Four "mitigation measures" are proposed to reduce the risk of under-delivery and follow a conservative approach. Accordingly, the projected delivery schedule will consider:

- Only 60 to 70 percent of the total ER generation potential estimated in the CPA-DDs;
- Only ERs generated over the first crediting period of each CPA (or less if the latter extends beyond 2020), to avoid any crediting period renewal risk;
- Only ERs that would be obtained through the collection and flaring of landfill gas, thereby excluding less certain ERs that would be obtained through the generation of electricity and the displacement of fossil fuel; and
- Only ERs from the low-to-medium-risk CPAs (i.e., the reasonable scenario outlined in paragraph 37, which includes category-I and category-II CPAs) to mitigate the risk that some potential CPA implementers may decide not to join the PoA.

In addition, for conservative purposes, the delivery schedule will take into account potential delays in the commissioning of the landfill gas system (beyond the three years required for preparation), and "postpone" the start of ER delivery by one year. Indeed, experience has shown that operators need some time to finalize the installation of the LFG system and make adjustments to reach optimal gas extraction levels.

Annex 3: Process of due diligence for inclusion of a CPA in the program[7]



[7] The above procedures are documented in a consolidated PoA Operations Management Manual that will be used by FEC for the management and coordination of the PoA.

Annex 4: Safeguards Diagnostic Report – Executive summary

The SDR prepared for the purpose of the Program provides an equivalence and acceptability (E&A) assessment of Morocco's environmental assessment (EA) system, in accordance with the World Bank's operational policy OP/BP 4.00 entitled "Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects," and, in particular, with the operational principles and objectives set forth in Table A1 of OP 4.00.

Morocco is one of the countries best positioned to undertake a pilot operation involving the use of country systems for environmental and social safeguards, owing to the progress made with the establishment of a comprehensive environmental assessment system that conforms substantially to international good practices including the Objectives and Operational Principles described in Table A.1 of OP 4.00. Furthermore, Morocco has demonstrated the desire to continuously develop its institutional and regulatory capacities and performance, as corroborated by several World Bank studies on the subject, and has prepared an ambitious plan to strengthen environmental protection management at both the national and local levels.

The municipal waste management sector was selected to be considered for implementation under the Moroccan EIA system because of Morocco's recent but nonetheless solid experience in municipal solid waste management sector assisted by, among other development partners, the World Bank under two recent sectoral policy development programs implemented in 2010 and 2011. The program, which is assessed in this report, will be implemented by the Municipal Equipment Fund [Fonds de l'Equipement Communal FEC].

This assessment covers a major program launched by the Moroccan authorities with the assistance of the World Bank and, in particular, its Carbon Finance Unit. This program entails the development of a program to assist municipalities with application of the programmatic approach authorized by the Kyoto Protocol's Clean Development Mechanism (CDM). The signing of an agreement to purchase carbon credits is expected to take place during the second half of 2011. This assessment is based on independent comparative studies of the Moroccan system and other environmental assessment systems in place in the Middle East and North Africa (MENA) and on environmental impact assessments of municipal landfills, which have been reviewed and approved by the World Bank and other development partners and donors. The SDR covers only the use of the Moroccan country system for environmental impact studies and draws conclusions related to the conditions for its use for all landfill projects for which funding is sought under the CDM. It is projected that these landfills will be established on State or local government land (in the public or private sphere) and that the expropriation of land is not being considered. If, during the course of execution of the program, the establishment of a landfill facility gives rise to the issue of land acquisition via expropriation for reasons of public interest and World Bank funding will be sought for this facility, the World Bank will provide the Moroccan Government with proposed amendments to this report so as to include in it the Bank's policy requirements on land acquisition and involuntary resettlement.

I. Contribution of the Project to Morocco's Development

Most Moroccan cities are characterized by high population density and rapid growth and are plagued by various forms of environmental degradation. Of Morocco's 30 million citizens, approximately 18 million live in urban areas. With an urban population growth rate of roughly 2.85 percent per year and a steady rise in per capita consumption, solid waste management is one of the most pressing challenges in urban areas and is negatively impacting the quality of life, public health, and socioeconomic development. Morocco produces roughly 5 million metric tons of solid municipal waste per year. This amount is projected to climb to 6.2 million metric tons by 2020.

Although solid waste management is the primary responsibility of municipalities in Morocco, these municipalities have struggled for a long time with limited administrative and technical management capacity, which has compromised the quality of the service provided. As a result, despite the important role played by the private sector in this area (70 percent of municipal waste management expenditure goes to private operators through a public-private partnership), improving the effectiveness of municipal waste management is essential if only because it accounts for the biggest expenditure item of municipalities. Total recurrent expenditure in this area amounted to DH 1.3 billion in 2007 or 10.5 percent of the municipal budget in urban areas. Of this amount, DH 1.1 billion (85 percent) is allocated to the collection and transport of waste. In 2008, the waste disposal category was negligible, accounting for less than DH 200 million in monetary terms. This is in part attributable to the fact that municipalities had few political, economic, and regulatory incentives to properly address waste disposal.

Prior to the launch of the Bank-supported reform program through two programmatic loans granted in December 2009 and December 2010, the focus of municipal waste management services in Morocco was on cleanliness, with limited attention and resources being channeled toward waste disposal or treatment. The impact on the quality of life, public health, natural resources, and a number of economic activities such as tourism was very significant. The main problems and challenges associated with the pre-reform situation were as follows: (i) sectoral policies that focused on cleanliness, with little attention being paid to the problem of waste disposal; (ii) a legal and institutional framework that did not allow for strategic planning and efficient governance of the sector; (iii) ad hoc tax transfers to municipalities that did not take into account the need for the sustainability of investments; (iv); a PPP approach with limited cost effectiveness owing to inadequate competition, a lack of transparency, and insufficient clarity with respect to the distribution of responsibilities; and (v) significant effects on the quality of life, public health, the overall environment, and socioeconomic development.

Since 2009, the overall reforms undertaken by the Moroccan authorities with World Bank support have placed emphasis on the following three areas: (i) improving governance in the sector by instituting a legal, regulatory, and institutional framework designed to eliminate the inefficiencies that impede the development of the sector; (ii) enhancing the sustainability of measures taken to improve the sector by instituting mechanisms and incentives that should enable municipalities to improve waste management systems; and (iii) internalizing the

environmental and social components of the processes of planning, implementation, and operation of waste management services and related investments.

The program covered in this document seeks to provide municipalities with an opportunity to gain access to the carbon credit market. This program, which is coordinated and managed by the Municipal Equipment Fund, will provide the framework for any interested municipalities or groups of municipalities to develop and benefit from a CDM project related to municipal waste management, in conformity with the criteria and procedures established by the Executive Board of the CDM. The potential revenue generated from the sale of emission credits resulting from improved municipal waste management practices will be factored into the planning processes for all future waste management projects.

II. Objectives of the Proposed Program

The main objective of the proposed program is to facilitate the development of carbon assets by Moroccan municipalities in the area of waste management, as well as access to the carbon market. More specifically, this CDM program of activities is seeking the purchase of a maximum of 4.5 million Certified Emission Reductions (CERs), measured in metric tons of carbon dioxide, by the Carbon Partnership Facility managed by the World Bank.

These CERs will be created by (i) avoiding the generation of methane emissions from municipal landfills in Morocco by installing a collection and flaring system or using these gases in electricity generation plants; and (ii) reducing carbon dioxide (CO2) emissions through the replacement of the equivalent amount of fossil fuels used in standard electricity generation plants.

The CDM program of activities will generate additional revenue through the sale of CERs in the CDM framework. This additional revenue will help cover a portion of municipal waste disposal expenses while guaranteeing that disposal processes are technically and environmentally sound.

III. Description of the Program

The proposed program of activities (POA) provides a framework in which interested municipalities or groups of municipalities will be able to develop a CDM project in the municipal waste sector, in compliance with CDM rules and procedures. Grouping similar projects under a common program will allow municipalities to develop their CDM projects at lower cost by benefiting from economies of scale and minimizing transaction costs.

Landfill gas CDM projects will be voluntarily implemented by the municipalities, which can establish or operate projects themselves or hire a private enterprise in the context of a public-private partnership. The FEC will act as the coordinating agent, will provide the assistance necessary to prepare CDM projects, and will handle CER sales to the Carbon Partnership Facility managed by the World Bank.

The program could include roughly ten municipal landfill projects, including those receiving assistance under the National Municipal Waste Management Program [*Programme National de Déchets Ménagers et Assimilés,* PNDM]. This corresponds to waste on the order of 2.9

million metric tons per year and a reduction in emissions of 838,000 tCO2e per year or 8.38 million tCO2e over a ten-year period, a maximum of 4.5 million tCO2e of which will be covered by an ERPA with the Carbon Partnership Facility. These amounts are based on a scenario of gas collection followed by flaring.

The initial focus of the CDM program will be on the municipalities and sites included in the first phase (2008-2012) of the PNDM. The first landfill to be included in the PoA is located in Oum Azza, approximately 15 km from the capital city of Rabat. This landfill receives on average 1,400 tons of waste per day with an annual growth rate of 3 percent. The commissioning of the gas capture component of the project is expected in early 2012 and should generate approximately 1 million tCO_2e over the period 2012-2018 (first seven years, equivalent to the first CDM crediting period). Four other potential landfills are to generate 0.8 million tCO_2e over their first crediting period (2013-2019) and should be commissioned in 2013. Seven additional projects are expected to be commissioned in the period 2013-2015 and generate approximately 3.5 million tCO_2e over their respective first crediting period.

IV. Summary of the Assessment of the Equivalence of the Moroccan Environmental Assessment System with respect to the Objectives and Principles of World Bank Operational Policy OP 4.008

The foregoing assessment corroborates the findings of the previous Safeguard Diagnostic Review (SDR) prepared and discussed with Moroccan stakeholders with regard to the needs of the Oum Er Rbia sanitation project from a legislative standpoint and, in general, the environmental impact assessment system. However, this SDR represents a qualitative step forward given that, for all landfill projects, the Ministry of Energy, Mines, Water and Environment (MEMEE) has prepared and is getting ready to adopt a general EIA Directive and work is being done to clarify the consultation process with the affected parties.

Consequently, to achieve virtually full equivalence between the operational principles set forth in Table A 1 of World Bank Operational Policy 4.00 and the Moroccan EIA system with respect to the needs of the CDM programmatic project for the management of municipal waste landfills, the MEMEE needs to approve and disseminate the Directive for carrying out an environmental impact assessment of a municipal waste landfill project, the April 2011 draft of which was reviewed by the World Bank and judged satisfactory with respect to the basic points covered by this Directive. However, and in order to supplement the aforementioned equivalence,[9] steps must also be taken to ensure that the public consultation process conducted during preparation and prior to approval of the EIA by the relevant authority has been documented for every EIA related to a municipal waste landfill.

[8] World Bank Operational Policy 4.0 is attached to this Safeguard Diagnostic Review (SDR). See Annex 1.

[9] The World Bank has provided feedback on the draft Directive with the aim of clarifying, among other things, its practical implementation procedures. This feedback is included in the acceptability assessment that follows. Consideration of this feedback will help clear up ambiguities in the application of the Directive.

V. Summary of the Acceptability Assessment of the Moroccan Environmental Assessment System with respect to the Objectives and Principles of World Bank Operational Policy OP 4.00

This report contains a detailed assessment of the aspects related to implementation of the EIA regulatory and institutional framework for the solid waste management sector. A significant part of this framework was established recently as a result of the acceleration of efforts to upgrade the Moroccan EIA system, as well as the household waste management sector, through adoption of the National Municipal Waste Management Program (PNDM). Noteworthy results have been registered to date, which are attributable to the important work done by the public authorities. The challenge currently faced is one of firmly linking this enhanced framework to robust and sustainable practices. This report recommends simple measures to eliminate the gaps noted herein. These measures are, in particular, associated with the problem of public consultations and the establishment of mechanisms for tracking and monitoring environmental compliance.

VI. Measure to Fill the Gaps and Enhance the Sustainability of these Measures

The measures necessary to fill the gaps are defined as an integral part of the execution measures of the proposed project. The implementing agency, namely the FEC, will be responsible for ensuring the implementation of these measures and providing periodic reports in this regard, in the context of the Emissions Reduction Purchase Agreement to be concluded with the World Bank in its capacity as trustee of the Carbon Partnership Facility, and are outlined below.

Consequently, and with the aim of filling the equivalence and acceptability gaps during the project (in this case corresponding to the World Bank procurement period for the CREs generated by the program), the FEC, (the Government of Morocco) has (have) agreed to adopt the measures below.

A. <u>Equivalence of the Country Environmental Assessment (EA) System</u>

Based on the equivalence assessment, the main gaps or differences between the legal EIA framework in Morocco (in the area of the construction of landfills) and OP 4.00 principles, as well as the corresponding corrective measures are essentially the following:

- The MEMEE should approve the Directive to conduct an environmental impact assessment for all municipal landfill construction projects (along with the World Bank feedback mentioned in paragraph 104 of this report), which will serve as a guide for the preparation and content of all environmental impact assessments (EIA) for all landfills for which funding is sought under the program; and

- The final report for each EIA must document the public consultation process conducted during preparation and prior to approval of the EIA by the relevant authority.

B. Acceptability of the Country Environmental Assessment (EA) System

The gaps and corresponding corrective measures identified based on the acceptability assessment are as follows:

- The need for the operator of the Oum Azza landfill to prepare a supplementary note to the initial EIA providing details on the collection and gas flaring portion and for review of this note by the National EIA Committee (for the purpose of obtaining a technical opinion rather than issuance of environmental acceptability).

- The need to address appropriately the social component associated with the landfill project in general and the CDM component in particular (gas collection and flaring or the generation of electricity) and the impact on the income and quality of life of potentially affected groups (residents, waste pickers, etc.).

- The need for the FEC to formally adopt a procedure for processing CDM projects submitted to it, particularly with respect to the conformity of these projects with the conditions and procedures stipulated in Moroccan EIA regulations and the development of the capacity within the FEC to provide advice to project developers (municipalities) with the aim of improving the quality of their EIAs.

- The need for the SEEE to formally adopt a procedure to track and monitor the impact of landfills.

2. **Addressing gaps:** The MEMEE and FEC have taken bold steps to address the gaps identified in the SDR and described above and prepared and adopted the needed instruments to fill them accordingly. The gap-filling measures adopted are as follows:

   - MEMEE has adopted on January 9, 2012, the Directive on the EIA for MSW landfills.
   - The Directive above includes guidelines on public consultation and inclusion of the outcomes of the consultation in the final EIA report.
   - The operator of the Oum Azza landfill has: (i) prepared a study, complementary to the EIA, detailing the impact of the projected collection and flaring of landfill gas, and (ii) submitted the study to the EIA National Committee. The study was reviewed by the National Committee on EIA who documented its review and satisfaction in Minutes of the review meeting.
   - The FEC has adopted a procedure to review CDM project applications, regarding the compliance with the requirements of the Moroccan EIA system. This procedure will be included in the Operational Manual which describes the assistance to be provided by the FEC to municipalities or operator, as the case may be, to ensure they meet all regulatory requirements as well as those described in the Directive mentioned above.

- FEC has adopted a specific form describing monitoring and supervision requirements for all MSW landfills; this form is fully consistent with the provision of the Directive on EIA for MSW landfills described below, and
- The Directive on EIA for MSW landfills and CDM Project Application to FEC cover the social dimension of each project, both in general terms as well as with specific reference to the CDM component (methane capture and flaring or use to energy generation) and require an analysis of the social impacts, notably those that affect the quality of life of potentially affected groups (e.g., local residents, workers, waste pickers).

Annex 5: Project Preparation and Supervision

The proposed schedule of preparation activities for this carbon finance transaction is as follows:

Date	**Project Preparation**
22 March 2011	PCN Review Meeting
End June 2011	Program Pre-Appraisal
February 7-10, 2012	Program Appraisal
May 2012-January 2013	Negotiations
May 2013	ERPA Signature

Bank Staff Team:

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Flavia Rosembuj	Senior Counsel
Renaud Paubelle	Infrastructure specialist
Sylvie Pittman	Program Assistant

Annex 6: Documents in the Project File

- Project Concept Note
- Project Information Document
- Project Concept Note Data Sheet
- Integrated Safeguards Data Sheet
- Safeguard Diagnostic Review
- Carbon Finance Assessment Memorandum