

CDM/JI Initiative

Country Study

Tunisia

**Stock-Taking Report and Assessment of the CDM Progress Status
in Tunisia**

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Deutsche Gesellschaft fuer
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Postfach 51 80
D – 65726 Eschborn
T +49 6196 79-4103
F +49 6196 79-804103
E holger.liptow@gtz.de
www.gtz.de

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Compiled by:



ZI, Béja Nord
9000 Béja
TUNISIE

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Foreword

The country report presented here is part of the CDM/JI Initiative launched by the German Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) to encourage the participation of German companies in the flexible mechanisms established under the Kyoto Protocol. At the same time, the Initiative aims to intensify bilateral co-operation with governments and institutions in the host countries for CDM and JI in order to support their respective national climate policies.

The initiative will help market players to maximize their use of the opportunities presented by the Clean Development Mechanism (CDM) and Joint Implementation (JI). It particularly targets small and medium-sized enterprises (SMEs) that participate in the EU emission trading scheme in Germany, but also technology providers. The SMEs often lack information about CDM and JI project implementation and relevant networks in host countries, which are needed to leverage investments for projects and to complete emissions-trading agreements. The activities conducted as part of the initiative take a long-term approach and pursue a clear objective of continuing cooperation efforts when the first Kyoto Protocol commitment period ends in 2012. Innovative instruments like the programmatic approach, with the potential to scale up the flexible mechanisms and to tap new sectors, are therefore also part of the scope of the Initiative.

On behalf of the BMU, GTZ aims to develop portfolios of CDM projects in India, China and Brazil that can be implemented before 2012. CDM projects in these countries operate in a very competitive environment, and specific market information provided by GTZ can facilitate the successful implementation of CDM projects. Other countries to be prioritized by the Initiative are in the Middle East and North Africa (MENA) Region, which has numerous sectors with considerable CDM potential.

As an initial step in its country activities, GTZ was assigned to prepare six CDM country studies in Brazil, China and India, as well as Egypt, Morocco and Tunisia in the MENA region.

The aim of the country studies is to identify information gaps and offer suggestions for overcoming these. The studies first present an overview of the national CDM market by analysing the CDM projects that have been submitted, approved and processed to date, together with the methodologies used. National institutions, international organisations and other relevant actors are taken into account, thereby providing a detailed picture of the national CDM market. Secondly, the study identifies untapped sectors and new potential for CDM projects. The studies provide a basis for developing a project portfolio that focuses particularly on high quality, innovative projects which still need support in order to gain market access.

We hope the reader finds this and the other five reports useful as an orientation for the CDM in the countries concerned.



Franzjosef Schafhausen

Directorate Environment and Energy
Federal Ministry for the Environment,
Nature Conservation and Nuclear Safety

Holger Liptow



GTZ Coordinator of the CDM-Initiative

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List of Acronyms and Abbreviations

MEDD	Ministry of the Environment and Sustainable Development
DNA	Designated National Authority
MIEPME	Ministry of Industry, Energy and SMEs
UNFCCC	United Nations Framework Convention on Climate Change
ANME	National Agency for Energy Efficiency
CIEDE	Information Centre on Sustainable Energy and the Environment
ANGeD	National Agency for Waste Management
ONAS	National Sanitation Utility
STEG	Tunisian Electricity and Gas Utility
CPG	Gafsa Phosphate Company
CNCC	National Committee for Climate Change
CO ₂	Carbon Dioxide
CoP	Conference of the Parties
SICA	Spanish International Cooperation Agency
EE	Energy Efficiency
RE	Renewable Energies
DOE	Designated Operational Entity
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
GTZ	German Technical Cooperation
MEDREC	Mediterranean Renewable Energies Centre
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
GCT	Tunisian Chemical Group
ETAP	Tunisian Petroleum Activities Company
TAHK	Tunisian-German Chamber of Commerce
kT-CO ₂ e	1000 Tons Carbon Dioxide Equivalent
PV	Photovoltaic
CDM	Clean Development Mechanism
EC	Energy Conservation
LCB	Low-Consumption Bulbs
PIN	Project Information Note
PDD	Project Design Document
CERs	Certificate of Emission Reductions
SAGES	GHG Mitigation Strategy
T- CO ₂ e	Ton Carbon Dioxide Equivalent
TOE	Ton of Oil Equivalent

1. INTRODUCTION

1.1 GENERAL CONTEXT

The entry into force of the Kyoto Protocol on 16 February 2005 helped operationalise the Clean Development Mechanism (CDM), as being one of the three flexibility mechanisms provided under the Protocol, namely: joint implementation, exchange of emissions permits and the CDM itself.

The CDM is, actually, a mechanism based on an approach of partnership and strengthening of cooperation between industrialised countries and developing countries, while helping the latter achieve a sustainable development. It was set up to help industrialised countries respect their binding commitments under the Kyoto Protocol (Article 3) by investing in GHG reduction projects in developing countries. It represents for the latter countries an additional financing source towards a clean technology transfer to them, as well as a contribution to the sustainable development of recipient countries.

Tunisia, as a developing country, has no GHG reduction binding commitment under the Kyoto Protocol. However, it has a significant GHG mitigation potential which it can mobilise via CDM projects. By enhancing the financial performance of the projects, the revenue obtained from CERs, generated by CDM projects, represents for Tunisia an additional boost to national investments.

For this reason, Tunisia being eligible to the CDM, has been active for a few years now, since the establishment of its Designated National Authority (DNA) in December 2004, in participating to the international effort to combat climate change. This has been made via the initiation of GHG reduction projects, which also contribute in Tunisia's sustainable development.

Tunisia has taken, in this regard, several measures towards promoting the set-up of CDM projects, notably through:

- Identification of GHG emissions reduction potential in the relevant sectors;
- Building national capacity in matter of set-up of CDM projects;
- Development of several CDM projects portfolios, of which the most recent have been formulated in the current year, that is 2008 (a portfolio of projects dedicated to the energy sector, conducted by ANME under UNDP financing, and a portfolio of projects dedicated to non energy projects, conducted by MEDD under GTZ financing);
- Conducting two strategic studies related to CDM;
- Mobilising international cooperation resources to initiate CDM projects by assisting project holders in the preparation of PIN, PDD and the registration of their projects;
- Setting up, in December 2005, of a „CDM Task Force“, based at the Ministry of Industry, Energy and SMEs, with a view to optimising the contribution of energy conservation in the reduction of carbon emissions and assisting the identified project holders to implement their projects. The energy sector alone accounts, in fact, for about 60 % of GHG emissions in Tunisia.

These measures have helped initiate, recently, a significant number of CDM projects, such as:

- Projects of recovery of methane in controlled landfills, of which 2 projects already registered and 9 others in registration process;
- Programme of promotion of the private solar water-heater „PROSOL“, in process of registration, according to the programmatic approach, with support by GTZ;
- Project of extension of the wind energy park of Sidi Daoud (34 MW), in process of registration by the Carbon Fund of the World Bank;
- Project of solar dewatering (drying) of phosphate in the Gafsa Phosphate Company (CPG);
- Project of dissemination of Low-Consumption Bulbs (LCB);
- Programme of electrification and water supply based on Photovoltaic (PV) solar energy, etc.

This national effort has often been sustained by support granted by funding agencies and multi-lateral and bilateral cooperation entities. In this regard, it is worth underscoring the German cooperation contribution in matter of political support, capacity building and launching of pilot projects in fields allowing reduction of emissions in Tunisia. Of such projects, the following are particularly worth mentioning:

- The project „Support to the Implementation of the UNFCCC“, by GTZ, with a CDM component;
- The project „Promotion of Renewable Energies and Rational Energy Use«, by GTZ;
- The dynamic role played by the Tunisian AHK in strengthening relations between German and Tunisian investors, notably in the field of energy conservation.

This dynamics is attested by:

- The BMU-MEDD memorandum on promotion of the CDM, signed in March 2007,
- The DENA-ANME memorandum on promotion of energy conservation, signed in March 2007.

1.2 SCOPE AND OBJECTIVES OF THE MISSION

Within the same framework, the German Ministry for the Environment, Conservation of Nature and Nuclear Safety (BMU), has recently launched a „**BMU CDM/JI initiative**“ aimed at helping German companies fulfil their obligations related GHG emissions reductions, via the purchase of Certificates of Emissions Reductions (CERs) in certain flagship countries, such as China, Brazil, India and in the MENA region (Morocco, Tunisia and Egypt).

The operationalisation of this initiative has been entrusted to GTZ, which bases its action in part on its agencies on the level of each country, by enlisting-in particular-projects in process of implementation and related to the relevant field. Thus, as regards Tunisia, the Head of Mission of the GTZ/CCC project will be the CDM/JI „Country Manager“ who will be the focal point of GTZ Eschborn and BMU, under this initiative.

The approach of this initiative is focused on facilitating contact between the CDM project holders and German companies, as potential CERs buyers, but also as investors allowing clean technology transfer to Tunisia. This mission would need to be entrusted to an „Operations Manager“ whose mission will be to explore the country's CDM potential and seek to promote „business to business“ relations between the interested Tunisian and German companies, via the preparation and promotion of a CDM projects portfolio that is interesting to both parties.

This mission belongs in the framework of the preparatory works to the operational launch of the initiative in Tunisia, by providing German institutions and companies with a clear and synthetic vision of the opportunities of purchase of CERs offered by Tunisia.

More particularly, this country-study aims basically at a stock-taking of CDM and an assessment of the present situation and future prospects of the carbon market in Tunisia, in the medium term (2008-2012) and in the long term (post 2012). (Cf. Terms of Reference in Annex 4).

This document, prepared based on a review of the documentation and information available in Tunisia on the CDM, comprises four major sections:

- Study of the GHG mitigation potential in Tunisia, as well as an evaluation of the CDM potential in Tunisia;
- Stock-taking of the institutional and regulatory framework governing the CDM in Tunisia;
- A review of the CDM status in Tunisia;
- Prospects of development of the CDM market in the medium and long term.

2. CDM Potential IN TUNISIA

2.1 NATIONAL INVENTORY OF GHG EMISSIONS

The early works of the national inventory of GHG emissions were conducted within the framework of the preparation of the National Communication and have related to the 1994 emissions. This inventory, updated in 1997, reveals that the gross emissions amounted to 32 MT-CO₂e, that is a unit emission of 3.4 T-CO₂e per inhabitant.

The figures below present the total GHG emissions for 1997 as per emission source and per type of gas. They highlight the prevalence of the energy sector, with over 53 % of the total emissions, followed by agriculture, standing at 20 %, forests and land allocation changes (LAC), standing at 12 %, industrial process, standing at 10 % and wastes, accounting for 4 %. The breakdown of GHG emissions as per type of gas reveals the prevalence of carbon dioxide (CO₂) with 72 %, followed by methane (CH₄), standing at 14 % and by nitrous oxide (N₂O) accounting for 14 %.

In view of their weight in the emissions structure, the energy sector and that of industrial processes sector represent a priority in Tunisia. This priority is justified, in addition, by the weight that these sectors represent in the national energy conservation and industrial de-pollution programmes.

Breakdown of gross GHG emissions in 1997

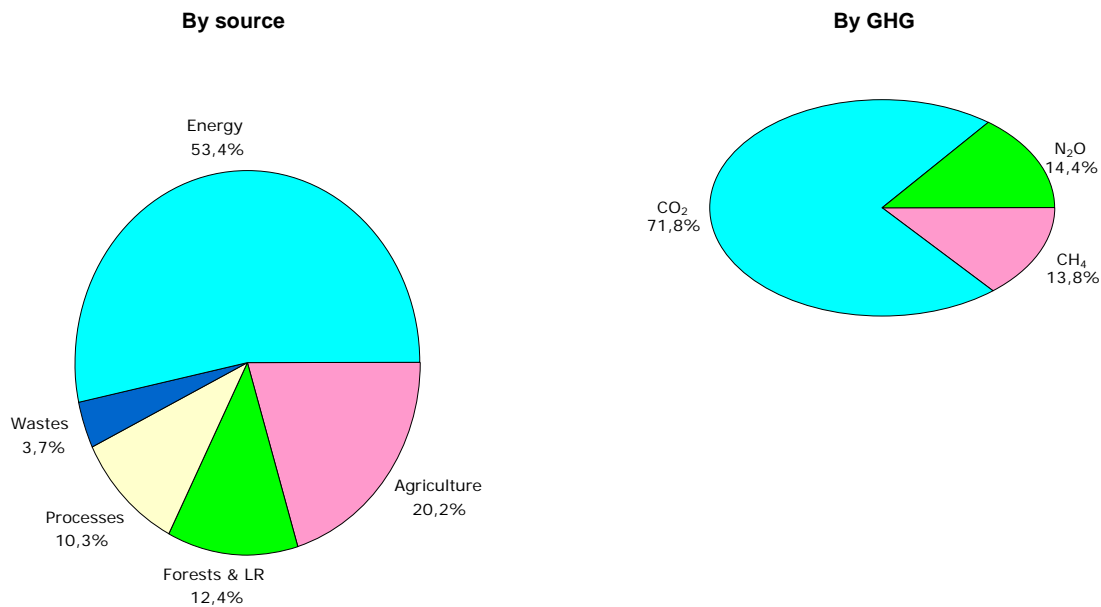


Figure 1: Breakdown of gross GHG emissions as per source and per type

Besides, the major share of CO₂ emissions due to combustion is generated by the energy industry (especially the power production sector) and transport. Irrespective of all developments, energy industry remains the chief sector in matter of GHG emissions generated by energy combustion.

Composition of GHG emissions due to energy combustion 2007

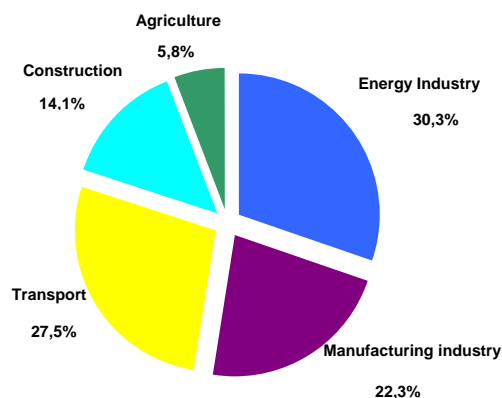


Figure 2: Breakdown of the GHG emissions due to energy combustion (2007)

It emerges from the above that Tunisia holds a significant mitigation potential which can be tapped (mobilised) by CDM projects. In order to tap this potential, Tunisia has set up a mitigation action plan promoting the set-up of CDM projects, even on top of the entry into force of the Kyoto Protocol in February 2005.

2.2 IDENTIFICATION OF GHG MITIGATION OPTIONS

The GHG mitigation potential is identified based on the GHG inventory conducted within the framework of the United Nations Framework Convention on Climate Change (UNFCCC).

According to the GHG inventories in 1994 and 1997, gross GHG emissions passed from 29 million T-CO₂e in 1994, to 32 million T-CO₂e in 1997,¹ that is, a growth of over 3 % per year. Assuming a continuation of trends, emissions would report a steady increase, reaching 55 million T-CO₂e, in 2010, and 79 million T-CO₂e, in 2020, that is, more than doubling up between 1997 and 2020, which represents an annual increase by over 4 %, though lower, however, than GDP growth, which would be, according to publications, of about 6 % per year. This confirms, therefore, Tunisia's underlying trend towards a „less carbon-intensive“ economy.

The GHG mitigation study conducted within the framework of preparation of Tunisia's Initial Communication to the UNFCCC, extending between 1999 and 2000, had covered the impacts over the period 2001-2020.

According to the said study, the GHG mitigation action plan has comprised **47 distinct mitigation options**, with a majority (**33 options, that is 70 %**) in the energy sector, 6 mitigation options in the forestry and land allocation changes (LAC), 4 mitigation options in the agricultural sector, and 4 other actions in the wastes sector.

The analysis of the mitigation action plan reveals that the implementation of the 47 options would help avoid emissions in the order of **190 million T-CO₂e**, over the period 2001-2020, on the one hand, and to absorb about **50 million T-CO₂e**, on the other hand. The net result of the GHG mitigation programme would reach about **240 million T-CO₂e**, over the study period, that is 2001-2020.

2.3 GHG EMISSIONS MITIGATION POTENTIAL IN THE SHORT AND MEDIUM TERM

The inventories and studies of mitigation of GHG emissions conducted in Tunisia, namely by CIEDE/ANME, have led to the conclusion that there is a quite significant mitigation potential offered by various sectors, such as energy conservation, transport, management of wastes, industrial processes and forestation/reforestation. This potential is estimated as over **3 million T-CO₂e/year** for the time frame 2011 and would amount to about 33 million Tunisian dinars (≈ 19 million €).

The potential sectors identified for the implementation of GHG mitigation projects correspond to fields of activities eligible to the CDM, as identified and issued by the CDM Executive Board (Sectoral scopes).

¹ Cf. „Communication Initiale de la Tunisie à la CCNUCC“ (*Tunisia's Initial Communication to the UNFCCC*), Ministry of the Environment and Land Use Planning (MEAT), October 2001.

The table below presents a breakdown of this potential according to the identified fields of activity:

Sector/Source	Time frame 2011		Aggregate over the period 2006 - 2011		Aggregate over the period 2012 - 2016	
	1000 T-CO ₂ e	1000 TND*	1000 T-CO ₂ e	1000 TND	1000 T-CO ₂ e	1000 TND
Energy	1 328	13 810	5 371	55 863	8 428	109 564
Wastes	1 455	15 128	5 593	58 163	5 982	77 772
Forestry	63	653	145	1 507	430	5 588
Industrial processes	333	3 465	1 597	16 613	2 100	27 303
TOTAL	3 178	33 056	12 706	132 147	16 940	220 227

* TND: Tunisian dinars

Table 1: Sectoral breakdown of the potential of t-CO₂e avoided and CDM revenues over the period 2006-2011

Sources: *MEDD-stratégie nationale pour la mise en œuvre du CDM en Tunisie (National Strategy for CDM implementation in Tunisia)*
 Site web: www.mdptunisie.tn

Based on the data given for the time frame 2011, it emerges that the energy and wastes sectors alone account for 88 % of the mitigation potential, with the share of energy being 48 %. If we were to add the industrial processes field, this rate would be as high as 98 %.

As for the forestry sector, it accounts for a mere 2 %. The low rate for this potential is due to:

- The limitation of admissibility of CDM projects for forestation/reforestation;
- The fairly long periods which would be required by such projects to generate significant carbon storage quantities.

The aggregate over the period 2012-2016 reveals that the energy sector would rank first, with 50 % of the aggregate potential; when we add the field of industrial processes, this rate would amount to over 62 %.

This potential may quite possibly vary over time according to the orientations of the sectoral programmes, since other projects or fields may come to strengthen the Tunisia's CDM potential, as the production of bio-fuels and the reduction of flare gases on oilfield sites.

2.4 CDM POTENTIAL IN TUNISIA

The CDM potential consists of targeted projects which contribute to the reduction of emissions of greenhouse gases (GHG) eligible to the CDM and compliant with the national and international CDM procedures. These projects belong in the potential sectors already identified for the development of the CDM in Tunisia:

- Energy sector (energy efficiency, renewable energies, fuel switching (energy substitution, flare gases in oilfields . . .));
- Industrial processes sector (N₂O elimination, . . .);
- Wastes sector (biogas flare, . . .);
- Transport sector (infrastructure and fuel switching);
- Agricultural and forestry sector (bio-fuels, forestation/ reforestation...etc).

Since 2005, several CDM projects portfolios have been developed, but have remained, for the major part, in concept phase.

As at end of 2007, the portfolio was composed of 25 projects being at various CDM cycle stages, of which 18 related to the energy sector, 3 to the wastes sector, 2 to the agriculture/ forestry sector, one to the transport sector and one to the industrial processes sector.

In total, if all projects are implemented, this CDM portfolio will help avoid 2.7 MT-CO₂e of emissions in annual average, and an aggregate of 42 MT-CO₂e over the projects' total crediting period.

It is worth pointing out again that the projects related to the energy, wastes and industrial processes sectors account for 88 % of the portfolio, with

- i) energy, standing at 72 %,
- ii) wastes, standing at 12 % and
- iii) industrial processes, standing at 4 %.

Recognising the need to prepare a change of scale in matter of development of CDM projects, MEDD and the DNA launched, in 2008, with support by the GTZ/CCC project, two studies aimed at:

- Designing a national strategy and an action plan for the promotion of the CDM in Tunisia;
- Developing an exhaustive portfolio of CDM projects in Tunisia.

The objective of these studies is to boost the CDM market in Tunisia, identify all possibilities of formulation of CDM projects in Tunisia, and present them in a „exhaustive portfolio“ intended for a large-scale dissemination, not only on national, but also on international, level.

This national CDM projects portfolio is in finalisation phase; it covers the five sectors mentioned above and comprises about **140 projects** eligible to the CDM, which would help avoid **244 MT-CO₂e** over the projects' total crediting period (the energy and industry sectors accounting for 44 % of them).

An analysis of the portfolio, according to its sectoral composition, the priority of the sectors and its progress status in the CDM projects cycle, will be presented further down.

3. INSTITUTIONAL AND REGULATORY ASPECTS OF THE CDM IN TUNISIA

Since its ratification of the UNFCCC, then its signing of the Kyoto Protocol in 2004, Tunisia has not ceased to invest effort towards establishing an institutional and legal framework which would enable it to maximize the opportunities offered by the CDM and to, thus, contribute to the world effort in combating climate change.

These efforts have made it possible, slowly but steadily, to better organize the actors and provide the CDM projects holders with a clear administrative and procedural framework for the implementation of their CDM projects.

3.1 CDM ACTORS IN TUNISIA

Generally speaking, the actors involved in the process of CDM development in Tunisia belong to three groups:

- i) project holders
- ii) regulation actors and
- iii) support actors.

3.1.1 *Project Holders: Concept Initiators*

The CDM is, above all, a market mechanism whose main actors are the economic operators of a traditional market. The initiation of a process of implementation of CDM projects requires a project holder which undertakes the inception of the project and the outlaying of the investment, and which implements the project on its own account. Generally, it is the project holder which engages the CDM process with, often, the backup of the support actors. In Tunisia and elsewhere, these operators are of two types:

Public Holders: They are the State operators, STEG, GCT, ANME, ETAP... which, as part of their investment programmes, can have recourse to the CDM to access clean and innovative technologies while optimising the emissions avoided under the form of certified emission reductions (CERs). These operators generally have to comply with more or less complex procedures for the transfer of CERs, especially in the absence of a legal framework dedicated to CDM transactions.

Private Holders: They are the private operators who can have recourse to the CDM in order to implement their eligible investment projects while benefiting from the financial support generated by the CERs proceeds (revenue), this action being likely to enhance the opportunities of return on investment. Ultimately, it is this target which would constitute the base for a CDM market.

3.1.2 *Regulation Actors*

❖ *The National Committee on Climate Change/ Focal Agency (CNCC)*

Established in 1996 and reorganised in 2001, this Committee is based at the Ministry of the Environment and Sustainable Development (MEDD), its main mission being to coordinate climate change related works.

The committee was created in the frame of the capacity building programme supported by GEF-UNDP, lunched 1995. Its mission was, earlier, limited to the coordination between involved actors to prepare Tunisian position in the COP (conference of parties). Now, it has not been operational since few years.

Further information may be obtained from the MEDD web site at the following address: www.environnement.nat.tn.

❖ *Designated National Authority (AND)*

Designated and established in December 2004, upon ordinance by the Minister of the Environment and Sustainable Development (MEDD), within the framework of implementation of the Kyoto Protocol, the Tunisian DNA is an interdepartmental committee initially made up

of the representatives of 6 ministries, subsequently enlarged to other ministries and public and private companies in late 2005. The DNA is, in fact, assisted by a Secretariat, the CDM National Office, under the authority of the Directorate-General for the Environment and Quality, based at MEDD. The list of the DNA members is given in *Annex 1*.

The DNA is currently fully operational and has its statutes and project approval procedures.² It holds regular meetings, particularly for the review and approval of the projects submitted to it.

The DNA web site address is: www.mdptunisie.tn.

3.1.3 Support Actors

❖ Information Centre on Sustainable Energy and the Environment (CIEDE)

Established in 2001 and based at ANME, the CIEDE's main mission is to help towards the implementation of Article 6 of the UNFCCC via activities of awareness raising, information, training and education related to climate change. Its activities have helped in raising political awareness as to the aspects related to Tunisia's joining in the global effort of combating climate change.

For further information, consult the CIEDE web site: www.changementsclimatiques.tn.

❖ The CDM Task Force of MIESMEs (Ministry of Industry, Energy and SMEs)

Established in December 2005, the main mission of the CDM Task Force consists in fostering the set-up of CDM projects in such a way as to contribute to the mobilisation of the GHG reduction potential in the industry and energy sectors, as well as to facilitate the implementation of the CDM projects selected within the framework of the four-year programme of energy conservation 2008-2011.

The activities of the "CDM Task Force" are focused on the following five areas:

- Identification of CDM projects with the project holders;
- Development of a CDM projects portfolio in the industry and energy sectors,
- Development of Project Information Notes (PIN) and submission to the DNA for approval;
- Mobilization of the financial resources necessary to ensure the technical assistance intended for coaching the projects throughout the CDM project cycle, particularly in the preparation of the Project Design Document (PDD), the choice of the Designated Operational Entity (DOE) for validation of the PDD, registration of project with the CDM Executive Board, and selection of DOE for the certification of the emissions avoided;
- Assisting the CDM project holders in the sale of the CERs.

❖ Cooperation Agencies

The mission of cooperation agencies and programmes is to provide support to institutional development and the promotion of technology transfer. These agencies can assist the State institutions and the economic operators to promote the CDM in their sectors in concerted action with the DNA.

² „Règlements internes de l'AND Tunisie et Procédures d'approbation des projets CDM", Document de synthèse 2, Août 2006. (*DNA Tunisia statutes and CDM projects approval procedures, Synthesis document 2, August 2006*). Projet "Appui à la mise en œuvre de la Convention Cadre des Nations Unies sur les Changements Climatiques" (*Project „Support to the implementation of the UNFCCC"*); GTZ-MEDD/APEX Consultants.

Among such agencies and programmes, one may mention for instance: UNDP/CIEDE, GTZ/MEDD, UNEP/MEDREC, SICA/STEG/ANME...etc.

The German Cooperation Agency, via its GTZ projects in Tunisia, of which in particular the project "Support to the Implementation of the UNFCCC", conducted in partnership with the Ministry of the Environment and Sustainable Development (MEDD), has been, for a few years now, extending support to CDM actors in Tunisia towards the establishment of an institutional and regulatory framework that is conducive to CDM development.

During the first phase of the GTZ/CCC project over the period 2006-2008, significant support and assistance activities have been engaged in favour of Tunisian actors and operators. For the sake of illustration, the following main actions may be mentioned:

- Building national capacity in the field of the CDM, in particular the capacity of the DNA, the project holders and the consultancies;
- Study on CDM regulations in Tunisia;
- Strategic study on promotion of the CDM in Tunisia;
- Development and support to the management of the DNA web site;
- Development of a guidebook for the set-up of CDM projects in Tunisia... etc.

❖ **Consultancy Firms**

The development of CDM projects requires specialized expertise for the implementation of the various phases of such projects. The project holders often need external expertise to bring their projects to a successful conclusion, unless they actually have an in-house capacity capable of conducting such phases; but this is the case, probably, of multinational corporations.

In this regard, Tunisia currently has a body of experts who can contribute in developing CDM projects, both on the level of preparation of PIN and PDD and on the level of participation in the missions of screening and validation of projects to be entrusted to the DOE.

However, if Tunisia were to seek a change of scale on the level of the CDM projects market, it would be necessary to consider a strengthening and build-up of the national expertise in this field.

For further information on national expertise, consult the web site: www.mdptunisie.tn and www.pagesvertestunisie.com.

❖ **Trade Banks**

Trade banks have a key role to play in the financing of the investments necessary for the implementation of the CDM projects. To facilitate access by CDM project holders to bank funding, it is useful to inform the funding agencies and coach them with regard to the rigorous process of implementation of CDM projects, and this, in order to emphasize the credibility of the CDM approach and CDM projects among trade banks.

Indeed, the nature of CDM project set-up and the commitment of the actors towards a project offer sufficient guarantees of success and enormously reduce the levels of risks for a CDM project. The banks involved in the management of the credit lines dedicated to the environment or / and energy conservation can play a significant role in terms of financing CDM projects, if they are well informed.

3.2 NATIONAL PROCEDURE OF IMPLEMENTATION OF CDM PROJECTS

The CDM project cycle requires, first of all, the approval of the project on national level; this approval is given by the DNA if the project meets the sustainable development criteria set by the DNA for the evaluation of CDM projects. These prerequisites for CDM access are focused on 4 main components:

- Objective of a CDM project,
- Targeted gases and targeted sectors,
- Basic eligibility principles,
- Contribution to sustainable development.

A project proposed within the framework of the CDM generally goes through the two following phases:

- **Project Introduction Phase:** It comprises the preparation of the Project Information Note (PIN) and its submission to the DNA for acceptance in conformity with the criteria of evaluation of CDM project.
- **Project Approval Phase:** This occurs after acceptance of the project by the DNA and comprises the preparation of the Project Design Document (PDD) and its transfer to the DNA for approval; this phase leads to notification of the project holder of DNA approval.

It is worth mentioning, at this point, that the procedure and sustainable development criteria of evaluation of CDM projects have not been endorsed by government decision, but constitute DNA internal instruments. The procedure applied is illustrated by the following diagram:

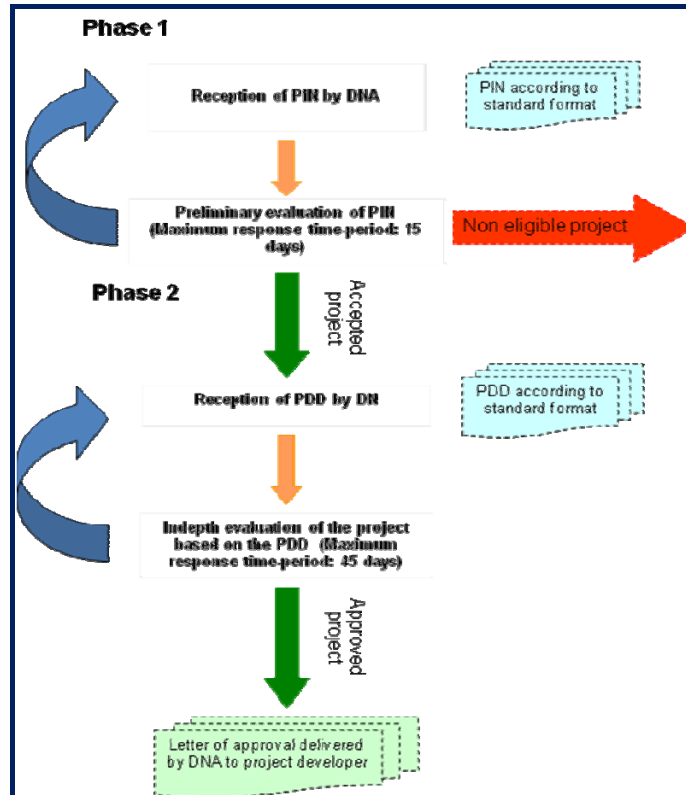


Figure 3: Procedure of processing a CDM project in Tunisia

Sources: DNA Secretariat and Web site: www.mdptunisie.tn

4. STOCK-TAKING AND REVIEW OF CDM STATUS IN TUNISIA

As party to the Kyoto Protocol, Tunisia has undertaken several works aimed at developing CDM projects. The preparation of the first CDM projects portfolio in the energy sector dates back to November 2001. Afterwards, other portfolios were initiated in the transport, wastes and forestry sectors. However, these portfolios comprise much more project concepts (ideas) than veritable, concrete projects eligible to the CDM.

4.1 ASSESSMENT OF ACHIEVEMENTS

The actions undertaken have involved, for the major part, activities of initialization of the CDM in Tunisia, via the implementation of a whole range of integrated measures aimed at preparing an environment conducive to the development of the CDM in Tunisia. These actions have led to laying the foundations for promoting the CDM in the country, thus allowing a convenient position on the global carbon market. The main achievements in this regard may be listed as follows:

4.1.1 *Development of a CDM Projects Portfolio*

In this phase of the process, a further step has been taken from the concept of mitigation options or action plan to GHG mitigation **projects portfolio** (or CDM projects portfolio) which presents project ideas.

In this regard, one may mention the main initiatives that have sought to bring together GHG mitigation projects, with or without reference to the CDM:

- **One** portfolio of GHG mitigation projects in the energy sector (2001): this portfolio was prepared within the framework of the Maghrebi project on climate change, with support by UNDP-GEF, and comprised eight projects dedicated to the energy sector. This portfolio was presented to the 7th Conference of the Parties held in Marrakech, in November 2001, and was also the subject of a presentation to the Maghrebi Forum of CDM funding agencies, held in Marrakech in January 2002;
- **Three** portfolios of CDM projects, in the forestry, wastes and transport sectors, respectively: these three portfolios were prepared in 2003 within the framework of the Tunisian project of climate change eligibility activities, with support by UNDP-GEF;
- **Two** portfolios of CDM projects (2006): Conducted by ANME with UNDP support, within the framework of the identification of projects eligible to the CDM and thus likely to be introduced in the CDM projects cycle.

Besides, the works undertaken within the framework of the project "Strategy of GHG Mitigation in Tunisia (SAGES)", implemented jointly by ANME and the Quebec Energy Efficiency Agency (AEE Quebec), have contributed, as from 2004, in preparing the ground for the process of set-up of CDM projects in the energy sector. These works have led to:

- The evaluation of the GHG mitigation potential based on energy conservation and the development of a mitigation action plan in this field;

- Selection of sustainable development criteria for the evaluation of CDM projects CDM and the adoption of a methodology for the rating and evaluation of the contribution of CDM projects to sustainable development;
- A portfolio of acceptable projects to the CDM (2004): This study which comprised a proposal of about thirty CDM projects in the energy sector had been initiated by ANME, with support by the Canadian Fund for Climate Change.

Since the establishment of DNA in December 2004 by the Ministry of the Environment and Sustainable Development (MEDD), the GTZ/CCC project entity in 2005 and the "CDM Task Force" in December 2005 by the Ministry of Industry, Energy and SMEs (MIEPME), a new dynamics was incepted towards a more active mobilization of the GHG reduction potential and promoting the set-up of CDM projects. This dynamic has led to the update of the exhaustive CDM portfolios in 2008 (Industry/Energy, Solid Waste, Wastewater treatment, Agriculture and Transport).

4.1.2 Preparation of Procedures and Initiation of the Process

The DNA has benefited, in particular, from the support of the German Cooperation Agency (GTZ), especially within the framework of the project "Support to the Implementation of the UNFCCC", conducted in partnership with the Ministry of the Environment and Sustainable Development (MEDD). This objective set for this project is to build Tunisia's action capacity in matter of climate change and, more particularly, in relation to the Clean Development Mechanism (CDM).

The main actions conducted by the DNA and the GTZ/CCC project were as follows:

- Selection of the criteria of evaluation of CDM projects in terms of contribution to the sustainable development of the whole sectors concerned;
- Setting up the procedures of evaluation and approval of CDM projects;
- Adoption of statutes for the operation of the DNA;
- Design of a PIN standard format;
- Organization of a few training sessions related to the CDM for project holders;
- Setting up a CDM dedicated web site in Tunisia;
- Coaching of certain projects during the stages preliminary to their registration with the CDM Executive Board. This involved, for instance, the registration of the Programme of Dissemination of Solar Water-Heaters (PROSOL) in Tunisia;
- Publication of a manual on the set-up of CDM projects in Tunisia, in December 2007;
- Development of a strategy and an action plan for the promotion of the CDM in Tunisia over the period 2008-2011.

4.2 TUNISIA'S PRIORITIES IN MATTER OF CDM DEVELOPMENT

The national programmes of energy conservation, management of solid wastes and industrial de-pollution constitute a priority of the national development plans; thus, the energy, industrial processes and solid wastes sectors, accounting for 92 % of the mitigation potential, rise-normally-to the rank of top priority in CDM programming in Tunisia. Their breakdown by sector is as follows: i) energy 48 %, ii) solid wastes 40 % and iii) industrial processes 4 %.

From this same perspective, the establishment of the "CDM Task Force", in late 2005, by the Ministry of Industry, Energy and SMEs (MIEPME), was aimed at promoting the mechanism and fostering the development of CDM projects in the energy and industry sectors. The main actions carried out by this "Task Force" are as follows:

- Organization of information circles for the identification of CDM projects in various industrial sectors;
- Training of project holders in CDM methodological aspects;
- Submission of the PIN of priority projects to the DNA for approval;
- Elaboration of a CDM projects portfolio in the energy sector (2008);
- Coaching of certain projects during the pre-registration phases, particularly through the preparation of PIN and PDD.

4.3 PROGRESS STATUS OF CDM PROJECTS IN TUNISIA

The CDM national strategy, such as defined in December 2005, set itself the objective of accelerating and promoting the CDM process towards a positioning on the international carbon market, in particular with regard to certain priority sectors, such as energy, waste management, transport, industrial processes, etc.

The quantitative objective set by the action plan issuing from the strategy is to mobilize, via CDM projects, 25 % of the mitigation potential over the Tunisian territory, which would correspond to 12.7 million tons of CO₂ equivalent over the period 2006-2011, that is, an equivalent estimated as 115 million TND in terms of possible revenue from the sale of CDM credits.

As at end of June 2008, the projects inventoried at various stages of the CDM process amount to **25 projects**, as shown by the following table:

Sector/Project name	Project holder	Progress status
ENERGY		
1) Co-generation: Installation of co-generation at the pasta making plant	RANDA	PIN approved by DNA PDD in preparation phase
2) Street-lighting (dimmer switches)	Caisse des Prêts et de Soutien des Collectivités Locales (Loans and Support Fund to Local Government) (CPSCL)/ANME	PIN approved by DNA
3) Solar water-heater (residential) Change of scale	ANME	PIN approved PDD completed Sales transaction ongoing
4) Installation of wind turbines for power production at SCG	SCG (Gabès Cement Company)	PIN approved by DNA PDD in preparation phase
5) Installation of wind turbines for power production at the Cement plant of Oum Kéïlil (CIOK)	CIOK	PIN approved by DNA
6) Rural electrification and water supply by solar PV energy in Tunisia	ANME	PIN approved by DNA Sales transaction ongoing
7) Enhancement of energy efficiency via the dissemination of 2 million Low Consumption Bulbs	Tunisian Trade Authority (OCT)	PIN approved by DNA Sales transaction ongoing
8)-10) Substitution of petroleum products by natural gas (Project Gafsa, Jammel/Zeramdine & Menzel Hayett)	STEG/GCT	PIN approved by DNA
	STEG/ Industrialists in the Jammel/Zeramdine zone	PIN approved by DNA
	STEG/Ind in Menzel Hayett zone	PIN approved by DNA
11) Phosphate dewatering (drying) project	CP Gafsa/ANME	PIN approved by DNA
12) Installation of wind turbines for power production at Win farm Sidi Daoud (35 MW)	STEG	PIN approved by DNA
13) Flare gas recovery projects at Maamoura oilfield site	ETAP	PIN approved by DNA Sales transaction ongoing
14) Flare gas recovery projects at Djebel Grouz oilfield site	ETAP	PIN approved by DNA
15) Installation of co-generation at paper industry (10 Mw)	SOTIPAPIER	PIN approved by DNA
16) Installation of co-generation at 5 enterprises of Poulina Group (SNA, Al Mazra, TEC T'PAP, STIBOIS, GIPA) (11,5 MW)	POULINA Group	PIN approved by DNA
17) Installation of co-generation at 5 enterprises of Poulina Group (Ceramique Sfax, Complexe Sidi Saleh, MDF, STIBOIS-Bir Kasaa, Couvoirs Cédria) (13,5 Mw)	POULINA Group	PIN approved by DNA
18) Power production from olive cake (olive solid waste) - Biomass Power Generation (40 Mw)	AGRIMED	PIN approved by DNA
19) Wind farm of Bizerte (120 Mw)	STEG	PIN approved by DNA
20) Bio-fuels - Jatropha	Ministry of Agriculture	PIN approved by DNA
21) forestation (Pin Pignon and Eucalyptus) on a surface of 15 440 ha	Ministry of Agriculture	PIN approuvé par l'AND
WASTES		
22) Controlled landfill of Djebel Chakir	ANGeD/MEDD	REGISTERED BY THE EB
23) 9 regional controlled landfills	ANGeD/MEDD	REGISTERED BY THE EB
24) 3 regional controlled landfills Tozeur-Mahdia-Zaghouan	ANGeD/MEDD	PIN approved by DNA
TRANSPORT		
25) Project RFR et other - urbain zone Tunis city	Ministry of Transport	PIN approved by DNA

Table 3: Tunisian CDM projects Portfolio (situation June 2008)

Source: DNA Secretariat, 2008

A reading of the table above helps bring out the following observations:

- **Only two projects** belonging to the same sector are registered; these are the Djebel Chakir controlled landfill and the 9 regional controlled landfills. Their registration is, for the major part, fostered by the CERs buyer (the World Bank Carbon Fund).
- **Only one project** is in phase of validation by a DOE: the PROSOL-Residential, whose PDD has been prepared based on support by the GTZ/CCC project.
- **Two projects** are in PDD preparation phase: these are the installation of cogeneration at the pasta making plant (RANDA) and the installation of wind turbines for power production at the Cement plant of Gabès.
- **Twenty projects** identified are at "PIN approved by DNA" stage; they await the preparation of their PDD. These projects belong all to the energy sector (wind, Photovoltaic, solar drying, bio-fuels, dissemination of LCB and energy efficiency in street lighting).

4.4 WEAKNESSES OBSERVED

The analysis of this portfolio, based on considering the nature of the CDM projects, their progress status and the profile of their holders, leads to the following conclusions:

- **Limited number of registered projects:** It is worth emphasizing that, so far, the number of registered projects has been small; besides, all three CDM projects being at an advanced stage (registered or in registration process) have been launched and financed by international funding agencies, either multilateral co-operation (the World Bank for the landfill projects), or bilateral co-operation (German Cooperation Agency for PROSOL) and that no project has really been initiated or taken in charge by a national actor.
- **Limited number of explored/targeted sectors:** The indicator of weakness does not lie only in the number of registered projects, but also in the nature of these projects. All these projects belong to the only two fields of energy and wastes and are initiated by the public sector (ANGeD and ANME).
- **Predominance of projects held by the public administration:** Out of the 25 projects, only five are held by private entities (Pasta products Randa, Poulina group, AGRIMED and Cement Company of Gabès); the public sector, which holds the remainder of the projects, is bound to apply its administrative procedures throughout the various phases of the respective projects, hence the risk of not upholding market rules (procedures, deadlines...).
- **Lack of motivation of the private sector:** The CDM is still perceived by the private sector as a theoretical concept whose implementation is too complex compared to its requirements of efficiency and profitability. The three registered projects were held by the public administration (ANPE/ANGeD and ANME), and not even by public economic operators. The public operators, just like the private operators, do not seem as yet to believe in the opportunities offered by the CDM. The result is due to the lack of sensitization activities gone in for project developer particularly from private sector.

These gaps are the outcome of the absence of a consistent strategy of development of the CDM in Tunisia, as well as the obvious lack of financial means allocated, and human

resources assigned, to the promotion of this field. Although several actions of capacity building, information and coaching have been undertaken in the past few years by various actors (GTZ, UNDP, ANME, MEDREC, etc), they remain insufficient, often badly structured and little consistent between them.

Thus, it appears clearly that the actions undertaken so far, although they are appreciable, have remained insufficient to induce a real change of scale in terms of development of CDM projects in the country. In particular, the current state of development of the CDM does not allow a real positioning of Tunisia on the international carbon market and to compete with certain developing countries which monopolize today most of the CDM market (China, India, Latin America, Asia, etc).

In sum, the weaknesses identified as of now are primarily of an institutional, legal and promotional nature.

The institutional weaknesses relate especially to the following aspects:

- The institutional link between the DNA and the MEDD, as regards the promotion of the CDM, needs to be further clarified. The MEDD, which serves as DNA Secretariat and signs, accordingly, the approval as its presidency, should not substitute for the latter. It is important to further specify the role and mandate of the DNA and its members by an official document.
- The human and material means of the AND permanent Secretariat need to be reinforced in order to allow better operation of the DNA and ensure a broader promotion of the CDM projects.
- Coming from various origins and sectors, the level of representativeness to the DNA is not homogeneous and the DNA members do not all have the necessary level of expertise in the field of climate change and of the CDM in particular. Thus, the act of endorsing, possibly, the members of the DNA by an official text could improve the composition of the DNA.

The legal weaknesses relate especially to the following aspects:

- The procedures of evaluation of the projects are clear, their application is in need for further clarification towards more transparency and effectiveness in order to better attract funding agencies in this field.
- The composition and functions of the DNA, as well as its methods of operation or action plan to promote the CDM (drafted in 2005 then updated in 2008) have not been ratified by a government decision.
- There does not exist today a legal, fiscal and regulatory framework dedicated to carbon transactions in Tunisia. In particular, for public companies, the application of public procurement regulations can significantly slow down the dynamics of putting on sale the CERs generated by CDM projects for these project holders.

The weaknesses of promotion per se, the observations made in this field have brought the following aspects:

- There is a significant lack of actions of promotion of already developed Tunisian projects portfolios, on international level; except for the very few actions conducted, of which the following may be mentioned:

- Drafting of agreements with Italy and the Principality of Monaco for the development of some projects within the CDM energy portfolio;
 - Conducting a mission by Tunisian CDM project holders (field of energy) in Germany for the promotion of the projects to the German institutions interested in carbon purchase.
- It must be mentioned, however, that this weakness is also due to the fact that Tunisia has only recently started to have portfolios going beyond the mere compiling of project concepts (ideas), but comprising concrete projects with real investment intentions.
 - The DNA web site in Tunisia seems to be little focused on the promotion of the portfolio of Tunisian projects. Beyond the preparation of the various portfolios, it could constitute an interesting and least costly promotion vector if it were better optimised (more frequent updating, better presentation of the projects and of the CDM framework, links with known international sites, etc).
 - In the same sense, no special event (side event, forum, etc) has been organized on an international scale to promote the identified CDM projects. This role should naturally belong in the DNA or the support entities. It must be observed that, so far, the DNA has not played its role in the promotion of CDM projects.
 - One notices a clear lack of involvement and motivation of the project holders, in both public and private sectors. Today, very few private sector projects are at an advanced stage of the CDM process. This group is not sufficiently targeted by the communication and sensitising actions.

Local capacity weaknesses (professional environment): Except for three training cycles organized in cooperation with GTZ on contractual aspects of the sale of CERs, and with UNDP and MEDREC on the cycle of a CDM project and the preparation of PIN and PDD, one notices an absence of targeted programmes for the training of the actors in this field.

It is also worth noting that the training sessions organised, thanks to GTZ contribution, for Consultancies, project holders, members of the DNA and for ANME have helped build up a body of expertise capable of sustaining the operationalisation of the MDP strategy in Tunisia.

Today, the "CDM Task Force" is endeavouring to organize training and information workshops for its members and for CDM project holders in order to sensitise them about the financial potential offered by the CDM set-up, the methods of development of CDM projects, the concept of baseline, the tools of additionality and the methodologies of monitoring. Consultation circles are also held with public and private operators of the energy and industry sectors with a view to identifying other projects eligible to the CDM. Building the capacity of the actors concerned on this subject is essential at this stage of development of the CDM in Tunisia.

It is worth pointing out that all these efforts have not been channelled and have not been coordinated between the actors (MEDD, ANME, DNA . . .). Thus, they did not help achieve the objectives sought by the strategy for the development of the CDM in Tunisia, all the more so as one cannot see the scaling up of CDM projects being initiated. The operationalisation of the updated national strategy for the promotion of the CDM in Tunisia over the period 2008-2012 has become necessary. The updated strategy and its action plan, elaborated by DNA with the support of GTZ/CCC, would make up a more consistent framework allowing, inter alia, to ensure the building of national capacity.

5. ANALYSIS OF CDM MARKET AND DEVELOPMENT PROSPECTS IN TUNISIA

5.1 MEDIUM TERM MARKET (PERIOD 2008-2012)

The MEDD, in partnership with GTZ, has initiated, via the Project "Support to the Implementation of the UNFCCC", the conducting, in 2008, of a study whose objective is to define *the strategic axes as well as an action plan for the promotion of the CDM* in Tunisia over the period 2008-2011.

Besides, taking into account the importance of the priority sectors in the mitigation potential, the energy and industrial processes sectors were granted a dedicated consideration. Indeed, two portfolios of CDM projects have been prepared, in 2008, at different stages,

- i) the first covers the energy and industry sectors, conducted by the "CDM Task Force" and ANME with UNDP support: it comprises **76 projects** identified as eligible to the CDM and whose launching is envisaged over the period 2008-2011. This batch is distributed over five fields and GHG emission sources:
 - Energy efficiency
 - Renewable energies
 - Fuel shifting (energy substitution)
 - Other energy projects (including flare gas recovery)
 - Industrial processes
- ii) The second, conducted by MEDD with support by the GTZ/CCC project, comprises all the other projects identified, exclusive of the energy and industry sectors; it led to identifying **63 projects**, in five main GHG emission sources:
 - Management of solid wastes;
 - Treatment of wastewater;
 - Forestry;
 - Agriculture;
 - Transport.

The two documents are will be combined to constitute the exhaustive national portfolio of CDM projects which identifies in total **139 CDM projects**; this document will lead to the following total results:

Sector/ Field	Number of projects	KT.CO ₂ e avoided over the crediting period	Percentage
Energy and Industry sectors	76	107 000	44 %
Sectors other than Energy and Industry	63	137 000	56 %
Total	139	244 000	100 %

Table 4: GHG mitigation potential via CDM projects

Source: CDM Projects Portfolio - 2008

In the following part of this document, we will conduct an analysis of these two portfolios one by one.

5.1.1 The CDM Market in the Energy and Industry Sectors

Over the period 2008-2012, the energy and industry sectors have the most significant potential of GHG reduction, since they account for more than 60 % of the national emissions.

Recognising this potential, the opportunities offered by the CDM and the stakes related thereto, Tunisia has taken several steps to promote the set-up of CDM projects in these priority sectors.

The development of a portfolio of CDM projects constitutes a component of this process. It has been based on an exhaustive approach, with a focus, however, on projects whose implementation is due over the period 2007-2011. In view of this approach, the portfolio groups **76 projects** at various "maturity" stages, whose common point lies in the contribution that carbon finance can bring to ensuring their economic feasibility, enhancing their financial performance, if not helping them, quite simply, to emerge.

This portfolio comprises a wide spectrum of projects, ranging from projects already underway to projects at concept (idea) phase, through projects in initiation of set-up, if not identification, phase.

Besides, the projects included in the portfolio are also at various stages of the CDM project cycle. Thus, a quarter of these projects (about twenty) have already received DNA approval, based on the PIN. A good number of these projects are going also to start the process of preparation of the PDD (about ten), while some are in phase of launching the transactions for sale of the CERs (three).

On the whole, assuming the implementation of all the identified projects, the aggregate portfolio of CDM projects, for the five fields of the energy and industry sector, would help generate approximately **107 million T-CO₂e** of avoided emissions, covering the totality of the projects' crediting periods (from 2007 to 2031). Approximately **27 million T-CO₂e** of these avoided emissions, that is, a quarter of the CERs potential, would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

We propose hereafter a synthesis of CDM projects portfolio in the energy and industry sectors in Tunisia, such as prepared by the "CDM Task Force" and the ANME, with UNDP support:

Table 5: Synthesis of the CDM projects portfolio in the energy and industry sectors in Tunisia
Source: *Portefeuille de projets CDM dans les secteurs de l'énergie et de l'industrie en Tunisie (2008)/CDM Projects Portfolio in the Energy and Industry Sectors in Tunisia (2008)*

Project designation	Number of projects	Emissions avoided per year (Kt-CO ₂ e)	Emissions avoided over crediting period (Kt-CO ₂ e)
ENERGY EFFICIENCY	37	609	34 662
<i>Efficient lighting projects</i>	3	272	2 638
<i>Co-generation projects</i>	19	197	4 529
<i>Electrical household appliances projects</i>	2	140	1 395
<i>Other energy efficiency projects</i>	13	1 355	26 099
RENEWABLE ENERGIES	20	736	13 714
<i>Solar energy projects</i>	5	104	1 395
<i>Wind energy projects</i>	10	355	7 445
<i>Biomass & Bio-fuels projects</i>	5	277	4 874
FUEL SHIFTING (Energy Substitution)	3	94	944
<i>Fuel shifting projects</i>	3	94	944
OTHER ENERGY PROJECTS	14	1 765	40 296
<i>Flare gas recovery projects</i>	13	1 742	40 062
<i>Other projects</i>	1	23	234
INDUSTRIAL PROCESSES	2	1 799	17 985
<i>Industrial processes projects</i>	2	1 799	17 985
TOTAL	76	4 304	107 600

“Emission Sources” Focused Analysis

As the synthesis table above shows, the "Other Energy Projects" portfolio alone accounts for over **37 %** of the CERs potential of the CDM portfolio. Thus, 14 projects would generate, approximately, **40 million T-CO₂e** over the projects' lifetime (2009-2029). The prevalence of this field is due mainly to the presence of 13 flare gas recovery projects in this group, whose contributions in terms of emissions reduction are considerable. This confirms the significant role that may be played by flare gas recovery³ as a source of GHG emissions reduction, but above all the interest that must be granted to systematising the recovery of the gases, especially if such projects were to be eligible to the CDM, in order to benefit from the contribution of carbon finance.

³ By export to the gas network or by power production or by gas re-injection.

With a potential of **35 millions T-CO₂e** avoidable over the duration of the CDM projects' crediting period (2007-2030), the 37 identified energy efficiency projects rank second, accounting for **32 %** of the portfolio's potential CERs.

Industrial processes, with only two projects, rank third, with **18 million T-CO₂e** avoidable over the duration of the CDM projects' crediting period (2009-2018); that is, **17 %** of the total emissions avoided of the portfolio. Then we find, in fourth position, renewable energies, with about **14 million T-CO₂e** avoided over the period 2007-2031; thus accounting for about **13 %** of the portfolio's contribution in terms of GHG emissions reduction.

Fuel shifting (energy substitution) ranks last, with about **1 million T-CO₂e** over the period 2010-2020; that is hardly **1 %** of the portfolio's contribution in terms of GHG emissions reduction.

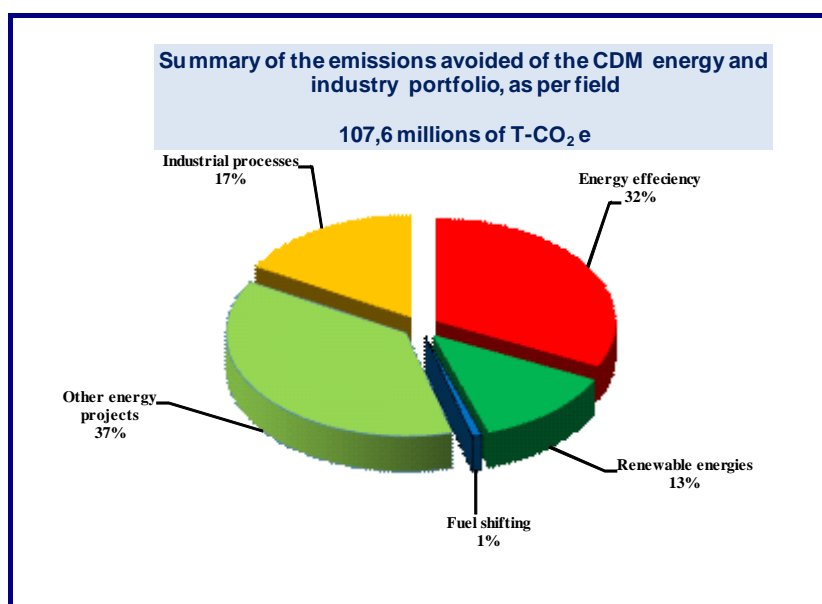


Figure 4: Breakdown of the emissions avoided of the CDM energy and industry portfolio, as per field (%)
Source: CDM Projects Portfolio in the Energy and Industry Sectors in Tunisia

“Project Holders” Focused Analysis

The 2008 CDM Projects Portfolio in the Energy and Industry sectors is marked by a strong involvement of the private sector. Unlike in the previous portfolio, the increase in private sector participation is revealed by the following table:

Emission source	Number of projects	Crediting period	Private project holders	Public project holders
Energy efficiency	37	7 to 21 years	21	16
Renewable energies	20	10 to 21 years	6	14
Fuel shifting (energy substitution)	3	10 years	0	3
Other energy projects	14	10 to 21 years	ETAP, in partnership with other oil companies	
Industrial processes	2	10 years	1	1

Table 6: Sectoral breakdown of CDM projects as per type of project holder

Apart from the "other energy projects" which are almost totally projects of flare gas recovery, and which count 14 projects shared between ETAP and multinational partner oil companies,

the portfolio is distributed almost equally between the private and public sectors. However, referring to the portfolio data, the private sector holds 40 % (about **1000 KT-CO₂e** per year) of the total GHG mitigation potential and the CERs generated by the CDM projects. Tunisian private holders would constitute, accordingly, a privileged target for CERs international buyers.

It seems that, in the absence of a legal framework dedicated to the CDM in Tunisia, sales of CERs generated by projects held by public entities will be done based on calls to bid. This is the case of the three projects having formed the subject of an international tender, issued by ANME, on *19 July 2008*, for the sale of CERs generated by the "PROSOL" programme, the programme of dissemination of 10 million "LCB" and the "PV" programme for rural electrification and water supply. On the other hand, the private sector, which would be belonging within logic of a freer market, has the option of undertaking direct transaction with the interested CERs buyers.

“Project Typology” Focused Analysis

Two project typologies are considered

- i) traditional CDM projects and
- ii) CDM action programmes, or programmatic CDM, introduced by the CoP in 2005.

In view of Tunisia's economic structure, consisting mainly of SMEs, and the size of the projects considered, generally of small size, there exists a large number of small size projects which have a great effect on the country's sustainable development, but which do not of the country, but which are not interesting enough for potential CERs buyers, as they reduce GHG emissions only minimally.

Today, it is possible to group small projects to make up a project of a fair scale, likely to interest CERs buyers on the CDM market or buyers of "Verified Emissions Reductions" (VERs) on the voluntary market.

The portfolio comprises ten small projects which can be grouped and developed under the CDM programmatic approach; these projects belong in particular to the following fields:

- Electrification by individual PV kits,
- Dissemination of solar water-heaters,
- Dissemination of LCB,
- Small-scale co-generation,
- Replacement of used refrigerators by high performance ones, etc.

“Project Progress Status” Focused Analysis

❖ Energy Efficiency Projects

Thirty seven (37) individual CDM projects divided into 4 topics have been identified: 3 efficient lighting projects, 1 cogeneration project, 2 electric household appliances project, and 13 other energy efficiency projects. These projects will be developed according to the CDM programmatic approach.

The projects were considered for quite variable crediting periods, ranging from 7 years to 21 years (7 years x 3). One project has formed the subject of call for tender, issued by ANME as a holder in July 2008, for the sale of CERs (Dissemination of LCB).

If the projects are all implemented, the emissions avoided by the latter would be about 34 million T-CO₂e over the period 2007-2030. Approximately, 10 %, only that is 3 million T-CO₂e of these avoided emissions would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

On annual average, the potential of avoided emissions would amount to 609 KT-CO₂e of aggregate annual average for the whole energy efficiency projects, thus representing an average potential of approximately 16.500 T-CO₂e per project per year.

The progress status of these projects is quite variable:

- i) 3 projects with PDD completed or under preparation (representing 212 KT-CO₂e per year of avoided emissions);
- ii) 4 projects with PIN already approved by the DNA (representing 133 KT-CO₂e per year of reduced emissions);
- iii) the 30 remaining projects are in a premature stage of project idea (concept) or of PIN in preparation phase.

“Renewable Energies” Projects

This portfolio comprises 20 RE projects divided into 3 fields: **i)** 5 solar thermal projects **ii)** 10 wind energy projects wind for power production and **iii)** 5 biomass and bio-fuels projects. The crediting periods range from 10 to 21 years, if not 30 years for the idea of a project of 1000 ha of Jatropha.

These projects could generate up to 13 700 KT-CO₂e over the whole crediting period 2007-2031, that is, about 740 KT-CO₂e per year and 37 000 KT-CO₂e per project per year.

The 20 projects have all initiated the CDM cycle, and are with different stages:

- i) 1 project at stage of validation of the PDD by a DOE: this the solar programme (residential),
- ii) 1 project with PDD completed: this the project of 14 MW wind energy capacity of CIOK,
- iii) 4 solar thermal and wind projects whose PDD is under preparation,
- iv) 3 power production projects based on wind energy or oil cake (olive solid waste), with PIN has been approved by the DNA,
- v) the 11 remaining projects are at PIN preparation stage.

❖ “Fuel Shifting” (Energy Substitution) Projects

The portfolio comprises 3 projects of development of natural gas to replace petroleum products. These three projects would help avoid 944 KT-CO₂e over the crediting period, set as 10 years (2010-2020), which represents annually 94 KT-CO₂e of emissions reduced. For the time frame 2012, the avoided emissions would reach 254 KT-CO₂e.

The three projects, whose development is conducted by STEG with economic partners, are currently at the stage of PIN approved by the AND.

❖ “Other Energy Projects”

The portfolio comprises 14 projects, 13 among which related to the recovery of flare gases on oilfield sites and 1 project related to transport of petroleum products; the 14 projects are

likely to help avoid annually 1 765 KT-CO₂e and 40 062 KT-CO₂e over the crediting period 2009-2029. The crediting period ranges between 10 and 21 years (3 x 7 years).

Two projects are beyond PIN preparation and approval phase; these are:

- Recovery of flare gases at the oilfield of Djebel Grouz for export on the STEG network, developed by ETAP and ENI;
- Recovery of flare gases at the oilfields of Maamoura and Baraka for export on the STEG network, developed by ETAP and ENI.

All the other projects are at the PIN preparation stage, of which 5 projects are not as yet notified of the date of initiation of the crediting period.

❖ “Industrial Processes” Projects

This portfolio comprises 1 project of recovery and elimination of N₂O at the nitrous acid plant of the Tunisian Chemical Group (GCT) and 1 project of change of composition of masonry cements; the latter is still at concept (idea) phase.

These two projects should help avoid approximately 18 000 KT-CO₂e over the crediting period, set as 10 years, but whose initiation date has not been specified yet, which represents annually 1 800 KT-CO₂e of emissions reduced.

The two projects, whose development is ensured by the GCT and Cement-manufacturers, are currently at the approved PIN stage.

5.1.2 The CDM Market in Sectors Other than Energy and Industry

The portfolio preparation works have led to the identification of **63 CDM projects**, in five main GHG emissions sources:

- Management of solid wastes;
- Treatment of wastewater;
- Forestry;
- Agriculture;
- Transport.

In total, assuming the implementation of all the identified projects, the aggregate CDM projects portfolio for the five emission sources mentioned above would help generate approximately **137 million T-CO₂e** of emissions avoided, over a period of 32 years, covering the total crediting periods of all projects (2008-2039). The aggregate CDM portfolio would thus represent an annual potential of **4.3 million T-CO₂e** of emissions avoided on average, and thus as many CERs likely to be offered on the international carbon market each year. About **11.6 million T-CO₂e** of these avoided emissions would be completed by the end of the first commitment period under the Kyoto Protocol (2012).

Considering an average price of 10 € per CER, the implementation of the whole CDM portfolio would thus generate for Tunisia currency financing in the order of 1.37 billion € (2.47 billion TND), that is, an annual amount of incomes of 43 million € (77 million TND) generated by the sale of CERs. Over the first commitment period under the Kyoto Protocol (2012), about 120 million € (210 TND) would be realised, representing 29 million € in average annual income over the period 2008-2011 (52 TND per year).

The CDM could thus have a very significant contribution in support to Tunisia’s sustainable development programmes. In this regard, it is self-evident that one needs to tap all possibilities of set-up of CDM projects, in order to benefit from the contribution of carbon finance. The synthesis of the CDM projects portfolio for projects other than in the industry and energy sectors is given in the following table:

Table 7: Synthesis of the CDM projects portfolio in Tunisia

Source/sector	Number of projects	Agregate portfolio period	carbon component			Breakdown of emissions avoided as per source (%)
			T-CO2e/Crediting period	1000 T-CO2e by 2012	Average annual emissions avoided (T-CO2e)	
Landfills portfolio	15	2008-2033	44 850 081	4 089 271	1 725 003	32,7%
WWTP portfolio*	19	2009-2023	5 904 806	1 513 879	393 654	4,3%
Forestry portfolio	11	2009-2039	74 971 514	4 612 349	2 418 436	54,7%
Agriculture portfolio	9	2009-2023	5 180 791	1 359 804	345 386	3,8%
Transport portfolio	9	2011-2035	6 094 898	83 909	243 796	4,4%
TOTAL	63	2008-2039	137 002 090	11 659 212	4 281 315	100%

* WWTP: Water Waste Treatment Plants portfolio

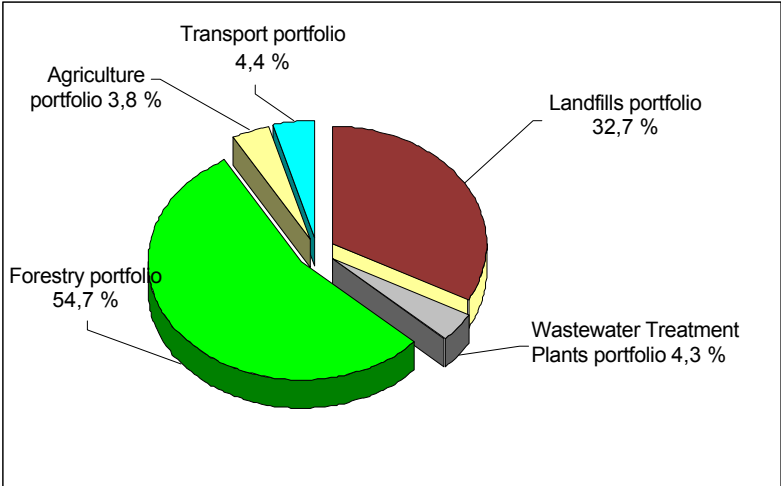


Figure 5: Breakdown of the emissions avoided of the CDM, as per source (%)

The forestry portfolio accounts, alone, for over 50 % of the CERs potential of the CDM portfolio. Thus, 9 projects would generate about **75 million T-CO₂e**, over all the whole lifetime of the projects (2009-2039). The prevalence of the forestry sector is due in particular to the length of crediting periods of most of the projects (30 years for 6 out of the 9 projects), and by the projects of production of bio-fuels (Jatropha). This confirms the significant role that this sector can play, as a source of carbon trapping, but especially the interest which must be granted to the systematisation of CDM applications for eligible projects, in order to be able to benefit from the contributions of carbon finance.

With a potential of **45 million T-CO₂e** likely to be avoided over all the total crediting period of the CDM projects (2008-2033), the 15 projects envisaged for the management of solid wastes come in second position with approximately 33 % of the portfolio's CERs potential.

The three other CO₂ reduction sources-Transport, Wastewater Treatment Plants (STEP) and Agriculture-present almost the same CERs potential, with about 4 % of the portfolio for each one of these sectors.

In this group, transport comes in first position, with a potential of **6.1 million T-CO₂e** over the period 2011-2035, generated by 9 projects. In this regard, it is worth pointing out that out of these 9 projects identified for this sector, only 3 projects could be the subject of estimates of reduced emissions. Thus, 6 projects could not be evaluated in terms of potential of reduction of GHG emissions, given the progress status of their studies and their scheduling for the next development plans; for this reason, it is not possible to specify an initiation date and estimates of avoided emissions. The emissions reduction potential of the transport portfolio is much more consistent, and could thus be largely enhanced as soon as the studies are completed, and the projects definitively validated and scheduled.

Then comes the WWPT (Wastewater Treatment Plants) portfolio, which comprises 19 projects, likely to generate **5.9 million T-CO₂e** over period that is shorter, however (2009-2023).

Then lastly comes the agricultural sector, with **5.2 million T-CO₂e** over the same period 2009-2023, ranking in fifth position. In this regard, too, it is worth pointing out that out of the 9 projects identified; only 4 projects could be the subject of estimates of reduced emissions. Thus, 5 projects could not be evaluated in terms of potential of reduction of GHG emissions, for lack of information on planning and precise prospects for the development of these projects in Tunisia. The emissions reduction potential of the agriculture portfolio will thus certainly be much more significant, as soon as of such information becomes available.

❖ **The Solid Wastes Portfolio**

The solid wastes portfolio has led to grouping 22 domestic waste landfills and 7 olive oil residue landfills into 15 distinct CDM projects, according to the CDM programmatic approach.

The CDM projects were considered for quite variable crediting periods, ranging from 10 years to 21 years (7 years x 3). Two of these projects have already been registered (Djebel Chekir I and Nine Landfills I), and have actually been incepted, with a half of their avoided emissions having been already transferred to the World Bank Carbon Fund.

If all the projects of this portfolio are implemented, there could be generated about **45 million T-CO₂e** of emissions avoided over the period 2008-2033, representing an average of **3 million T-CO₂e** per project over all the duration of the portfolio.

About **4 million T-CO₂e** of these avoided emissions would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

In annual terms, the potential of avoided emissions would amount to **1.7 MT-CO₂e** of aggregate annual average for the whole solid wastes portfolio, thus representing an average potential of approximately **115 KT-CO₂e** per project per year.

❖ **The Wastewater Treatment Portfolio (Wastewater Treatment Plants - WWTP)**

The WWTP portfolio has made it possible to target 80 distinct operations. However, taking into account the small scale of these operations and of the high transaction costs of the CDM projects, these operations were grouped into 19 CDM projects, according to the CDM programmatic approach.

In most cases, the CDM projects were considered for a crediting period of 7 years, renewable once (that is a total of 14 years), except for four projects whose proposed crediting periods are of 10 years non renewable.

If it is implemented in full, the WWTP portfolio could generate approximately **6 million T-CO₂e** of emissions avoided over the period 2009-2023, representing an average of **310 KT-CO₂e** per project over the total duration of the portfolio. Approximately **1.5 million T-CO₂e** of these avoided emissions would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

In annual terms, the potential of avoided emissions would amount to **393 KT-CO₂e** of aggregate annual average for the entire WWTP portfolio, thus representing an average potential of approximately **21 KT-CO₂e** per project per year.

❖ **The Forestry Portfolio**

The portfolio of CDM projects, related to the forestry sector, made it possible to identify 11 projects. All the projects are at identification stage, and are not, therefore, as yet part of the CDM project cycle, except for two projects, which have already formed the subject of a PIN approved by the DNA, without, however, making any progress beyond this stage in the CDM projects cycle.

CDM projects were considered mainly for crediting periods of 30 years, except for three projects whose woody products are intended for energy uses and, thus, programmed for respectively 21 years and 10 years.

If it is fully implemented, the forestry portfolio would generate approximately **75 million T-CO₂e** of emissions avoided over the period 2009-2039; that is to say an average of **6.8 million T-CO₂e** per project over the whole duration of the portfolio. The contribution of the CDM thus appears to be considerable for the forestry sector, but it is significant to note that 85 % of the avoided emissions of the portfolio are achieved mainly by three projects, of which a 35 000 ha forestation project in northern Tunisia, and the programme covering 100 000 ha of *Jatropha*. Approximately **4.6 million T-CO₂e** of these avoided emissions, that is only 6 % of the potential of the forestry projects, would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

❖ **The Agriculture Portfolio**

The set-up of a CDM projects portfolio, related to the agriculture sector, made it possible to compile 9 projects. All the projects are at identification stage, and none them has as yet entered the CDM project cycle.

In this group of nine projects, four only could form the subject of estimates of the avoidable emissions. The synthesis thus relates to these four projects exclusively. If these are implemented, the agriculture portfolio could generate **5.2 million T-CO₂e** of emissions

avoided over the period 2009-2023; representing an average of **1.3 million T-CO₂e** per project over the whole duration of the portfolio. Approximately **1.4 million T-CO₂e** of these avoided emissions would be achieved by the end of the first commitment period under the Kyoto Protocol (2012).

In most cases, the CDM projects were considered for a crediting period of 7 years, renewable once (that is a total of 14 years), except for an only one project for which the crediting period proposed is 10 years.

❖ **The Transport Portfolio**

The CDM projects portfolio, related to the transport sector, made it possible to identify eleven projects. Out of these projects, three only have formed the subject of estimates of the GHG emissions reduction potential: this is the project of the first section of RFR (29 km), the project of the second section of RFR (56 km), and the project of protected site bus.

Among these projects, only one project, related to the first section of 29 km of the RFR programme, was approved by the DNA in 2007, but it does not report progress in the CDM cycle since its acceptance.

The three CDM projects having been the subject of estimates, were considered mainly for crediting periods of seven years, renewable twice (that is, a total of 21 years).

It is worth noting that the transport projects are targeted, in the majority of the cases, at infrastructure programmes whose times of reflection, maturation and programming are very long. Thus, one among the nine identified projects is under study, five projects will form the subject of detailed design during the period 2008-2011, one project will be studied only during the period 2012-2016, and the studies related to one of the listed projects have not as yet been scheduled. This implies that the actual scheduling of most of these projects and their budgeting will be done probably only during the 12th Plan (2012-2016), which explains why it was not possible to integrate information such as inception date, and potential of avoidance of emissions for these projects.

Based on the three evaluated projects, the transport portfolio could generate approximately **6 million T-CO₂e** of emissions avoided over the period 2011-2035; that is, an average of **2 million T-CO₂e** per project over the whole duration of the portfolio. Only **84 KT-CO₂e** would be avoided by the end of the first commitment period under the Kyoto Protocol (2012).

In annual terms, the aggregate potential of emissions avoided of the transport portfolio (for the three projects evaluated) would amount to **244 KT-CO₂e** in annual average; thus representing an average potential of about **80 KT-CO₂e** per project per year.

The CDM contribution may thus appear to be fairly significant for the transport sector, and it is of primary importance to integrate the CDM component right at the early phases (reflections, preliminary studies), insofar as this component could bring additional assets, allowing to better justify the economic feasibility, if not facilitate the financing of the programmes.

5.1.3 Sale and Marketing of CERs

Pursuant to decision by the Inter-departmental Council held on 8 February 2008, the Tunisian Government agreed to set up sectoral commissions for the sale of MDP projects emissions reductions in the identified sectors, namely:

- The environment (wastes and wastewater projects, etc);
- Energy and industry (projects of energy conservation, flare gases, and N₂O...etc);
- Transport (infrastructure and protected site buses);
- Agriculture (forestry, reforestation, Jatropha,etc).

These commissions are composed of:

- Permanent members representing the MEDD, ANME and the oversight Ministry of the project holder entity,
- As well as invited members such as the expenditure inspector “contrôleur des dépenses” and the project holder entity.

The mandate of these sectoral commissions is specified as follows:

- Approval of the Specifications Documents and of the Call for tender related to the sale of the CERs prepared by the project holder entity;
- Monitoring the CERs sale transactions (opening and examination of the bids);
- Decision on assignment of the sales (selection of CERs buyer).

Once this stage is over, the project holder entity will draft the sale contract according to the requirements of the Specifications Document, the regulations in force and, taking into account, the available and relevant ERPA model.

5.2 POST-2012 CDM DEVELOPMENT PROSPECTS

5.2.1 Trends in International Negotiations

The IPCC 4th report issued in November 2007 and the Bali roadmap adopted in December 2007 have confirmed the need to put in place a new international agreement for a post-2012 climate system. This agreement must be based on the following three principles:

- Joint, but differentiated, responsibility;
- Pursuing the commitments of GHG reduction by industrialised countries;
- Involvement of developing countries in combating climate change via GHG reduction proactive policies.

Thus, the international community has engaged in a negotiations cycle which should lead to a new international treaty before December 2009. These negotiations relate to the main following topics:

- Financing: setting up a financial package based on a set of various instruments of which in particular reform of the CDM and of the GEF;
- Technology transfer: development of a carbon market based on a sectoral approach;
- Mitigation of GHG emissions: Involving developing countries based on measurable and quantifiable efforts.

It is with respect to this new international context that Tunisia would need to formulate its GHG mitigation strategy and, more particularly, that of development of the carbon market. Many opportunities of funding and technology transfer are already taking shape over the coming decade in fields related to climate change.

5.2.2 Trends of the Carbon Market in Tunisia

Irrespective of the outcome of the global negotiations on the post-2012 situation, the examination of the national CDM projects portfolio, developed in 2008, reveals clearly the importance of the long term potential. The aggregate mitigation potential over the period 2012-2016 highlights the energy sector as holding top position with 50 % of the aggregate potential; when the industrial processes sector is added, this rate would be over 62 %.

The energy and industry sectors constitute priority sectors not only for the first accounting period but also for the post 2012 period.

5.2.3 CDM Prospects in Tunisia Beyond 2012

For the post-2012 period, the sectors identified as priority ones will still have the same importance. The **BMU JI-CDM initiative** which will be operational during the first period up to 2012, will gain impetus to better position the German buyers on the post-2012, and this, based on:

- The synergy between the German-Tunisian cooperation actors (investment, technology transfer, technical assistance, etc . . .);
- The multiplication of contacts between German investors and Tunisian project holders;
- The capitalization and dissemination of best practices and approaches.

5.3 SUGGESTED RECOMMENDATIONS FOR A CHANGE OF SCALE IN THE CDM MARKET IN TUNISIA

In view of the review conducted and of the strategic objectives considered, we believe that the development of the CDM market would require the implementation of a set of promotion tools. Suggested recommendations need to be considered for the coming phase:

5.3.1 Increase the Role of the DNA in the Promotion of CDM Projects

Apart from its official legal functions consisting in the evaluation and approval of projects, the DNA is called upon to take the initiative of carrying out additional tasks to allow Tunisia to fully benefit from the CDM. The additional activities most often undertaken are those related to the information and sensitisation of the actors as well as the promotion of CDM projects on the carbon market.

It is important that the DNA should undertake to disseminate the relevant and necessary information to the actors concerned: decision makers, potential developers, etc. The DNA should also conduct promotion of the projects and seek to enhance its own visibility in order to encourage foreign investors to finance new projects there.

The DNA can, inter alia, extend support to the project holders in the sale of the CERs generated by their projects. Even though such services do not belong in the official functions of the DNA, the latter can largely facilitate the entry of Tunisia in the carbon market via networking effort and the promotion of Tunisian projects on international level.

5.3.2 Ensure Information and Sensitisation of the Actors on the Evolution of CDM Aspects

So far, several information actions have taken place in Tunisia on the CDM. However, although essential, this information has remained of a general nature, focusing mainly on basic CDM concepts, such as additionality, baseline, project cycle, etc.

It is advisable today to extend the spectrum of information to finer and more topical aspects of the CDM. By way of illustration and without being exhaustive, this would relate to such topics as programmatic approach, the dynamics of the carbon market and its actors, the methods of contracting and sale of CERs, etc.

Similar actions need to be sustained by the “**BMU JI-CDM initiative**” with a view to fostering, as soon as possible, concrete CDM projects likely to be beneficial to the German companies participating in this initiative.

5.3.3 Target Private Sector Operators as a Priority

So far, the information and sensitisation effort has focused mainly on the official bodies of the public administration and, to a lesser extent, on major industrialists, in particular those of the public sector.

It is advisable that the “**BMU JI-CDM initiative**” should target, as a matter of priority, the operators of the private sector, in particular the SMEs which constitute the larger part of the GHG mitigation potential in Tunisia, taking into account the structure of the Tunisian industrial fabric and the cumbersome character of the Tender procedures governing the sale of CERs by public operators. This should help foster the emergence of private sector CDM projects.

5.3.4 Create a CDM Help Desk in Tunisia

Managed by the DNA within the framework of reinforcement of its position and its intervention tools and means, this tool will serve at the same time as one stop shop for project holders and potential buyers of credits, as well as a reliable and credible source of relevant and updated information. For so doing, the DNA or a relay structure must be reinforced via the provision of human means necessary.

The mission of this CDM Help Desk would consist, in particular, in:

- Keeping the one stop shop as tool for facilitating access to the information and procedures applicable in Tunisia;
- Updating and improving the CDM web site in Tunisia and making it more useful in matter of promotion of projects;
- Prepare and publish periodically CDM news in Tunisia (Tunisia-CDM News).

This Help Desk could constitute a precious tool facilitating the operational implementation of the “**BMU JI-CDM initiative**” by providing a one stop shop for the German companies interested in the Tunisian market.

5.3.5 Promote a Sectoral Approach to CDM Promotion

The examination of the progress status of the projects submitted to the DNA shows an absolute predominance of the energy sector (9 projects out of 11 projects). Admittedly, energy structurally constitutes the largest share in the mitigation potential in Tunisia and, more generally, in the world. However, this should not lead to a marginalisation of the other sectors, in particular industrial processes, solid wastes and agriculture.

Thus, the strategy to be adopted should promote a sectoral approach which consists in targeting in a specific way each of the potential sectors targeted by the mitigation objectives. This targeting will translate into information and sensitisation actions dedicated to each sector.

On the institutional level, this sectoral approach should result in the creation of relay entities to the DNA in the sectors, like the "CDM Task Force " created by the Ministry of Industry, Energy and SMEs (MIEPME) to identify and foster the emergence of CDM projects in the field of energy.

In this regard, it is recommended that the "**BMU JI-CDM initiative**" focus its effort on priority and/or preferred sectors for the German companies interested in the carbon market in Tunisia.

5.3.6 Choose the Proper Channels for the Promotion of Projects Portfolios on International Level

The actions of promotion of the Tunisian CDM projects among potential international buyers are still timid by comparison with other countries, such as those of Latin America and Asia, or even Morocco.

One of the strategic axes is to intensify the actions of promotion of Tunisian via the various channels available: participation in international forums and events, organization of investors' forums in Tunisia, publication of projects on international web sites, etc.

However, the choice of the promotion method and channels must take into account the specific characteristics of the CDM projects portfolio in Tunisia. Indeed, in view of the structure of the Tunisian economy characterized by the prevalence of small and medium size economic operators, the major part of the GHG mitigation potential can be mobilized only through small scale projects.

In this regard, it is worth emphasizing the need to focus the promotion effort on two segments of the carbon market which seem to us to be the most suitable for the promotion of small scale CDM projects, namely:

- **Bilateral co-operation:** This involves, for instance, carbon funds created by certain northern countries or bilateral initiatives. The "**BMU JI-CDM initiative**" fits perfectly in this perspective.
- **The voluntary market:** The buyers of carbon credit on this market are in general companies or individuals who seek to compensate for or neutralize the impact of their activities on the climate, for ethical reasons or for purposes of environmental marketing. The emissions reductions are governed by independent, more flexible and less costly methods and procedures than those of the CDM, without regulatory authority. This

market, which develops alongside the regulated markets, constitutes an opportunity, in particular, for small scale projects. It is strongly recommended that the “**BMU JI-CDM initiative**” should take into consideration these opportunities by setting up the appropriate tools for tapping this potential market segment.

5.3.7 Establish an Appropriate Legal Framework to Clarify the DNA Mandate

It is, therefore, recommended to adopt a regulation clarifying the respective mandate of the DNA, the National CDM Office and the MEDD, as well as the institutional framework governing the promotion and approval of CDM projects, and this, in order to enshrine the authority of the DNA on the institutional and legal level. This would also make it possible to confer legal capacity upon the MEDD to sign, instead and on behalf of the DNA, the letter of approval as a legally binding deed opposable to project developers as well as to the international bodies with oversight on the CDM, in particular the CDM Executive Board.

This specific legal framework can help improve the administrative practices and the conditions under which the decisions are made. The regulation formalizes and makes legally opposable the methods of CDM implementation, while clarifying the responsibilities and specifying the legal effects of the decisions taken by the various institutions involved, among them and as regards third parties.

5.3.8 Setting up a Legal and Fiscal Framework for Credit Trade

This framework should help qualify the legal nature of CDM credits under Tunisian law and identify their owner (the project developer, for instance), thus helping the Ministry of Finance to clarify the accounting and tax processing of the revenue generated by the sale of CERs by the Tunisian companies involved in the projects. It will possibly help envisage economic or tax instruments likely to further to promote CDM investments or attract credit buyers, including the promotion of sectors considered as priority ones, such as like industry and energy (of which, for example, exemption from corporate tax for income derived from credit sales).

A clear legal and fiscal framework can only attract CDM investors to Tunisia, namely the German companies participating in the “**BMU JI-CDM Initiative**”.

6. SYNTHESIS AND CONCLUSIONS

Tunisia, as a developing country, does not have a GHG reduction commitment with respect to the Kyoto Protocol; however, it has a significant mitigation potential which it endeavours to mobilize via its commitment in combating climate change in an active way. To this end, it has prepared a mitigation strategy and an action plan which it could implement through CDM projects, since it has met all requirements for eligibility to this mechanism. Recognising the opportunities offered by the CDM not only on the level of improvement of the financial performance of the projects, but also on the level of the promotion of the transfer of clean technologies, and in order to promote its CDM potential, Tunisia has taken several measures to initiate the set-up and implementation of CDM projects, such as the development of project portfolios and national capacity building.

The latest portfolio, prepared in 2008 by the MEDD with the support of the GTZ/CCC project, comprises 139 CDM eligible projects distributed over about ten sectors representing the emission sources. The implementation of all the projects of the portfolio should make it possible to avoid approximately **244 000 KT-CO₂e** over the whole crediting period extending from 2007 to 2039, which would amount to over 2.4 billion €, based on an average price of 10 € per CER, that is 73 million € (127 million TND) of annual income generated by the sale of CERs.

The CDM could thus have a very significant contribution in sustaining Tunisia's sustainable development programmes (transfer of clean technologies and contribution of additional financing). Accordingly, it is advisable that Tunisia should tap all possibilities of set-up of CDM projects, in order to benefit from this contribution of carbon finance. It is within this perspective that the new national CDM projects portfolio has been prepared.

The analysis of this portfolio shows that it is characterized by a predominance of the energy and industry sectors, which account for over 60 % of the national emissions, according to the GHG inventories for the period 1990-2003, and which hold more than 40 % of the GHG mitigation potential of the whole portfolio, that is, **107 000 KT-CO₂e**. The wastes sector, with 15 identified projects, also accounts, alone, for over 18 % of the total potential of the portfolio. In view of this situation, these sectors are regarded as priority sectors for Tunisia on the short and medium term, as they help generate together nearly 60 % of the portfolio's mitigation potential.

Considering the maturity of the projects identified, out of a total of **244 000 KT-CO₂e** of emissions avoided over the whole projects' crediting period, approximately **39 000 KT-CO₂e** of these avoided emissions, that is, 16 % of the CERs potential, would be achieved by the end of the first commitment period under the Kyoto Protocol (2008-2012), which would represent 39 million € (68 million TND) in revenue generated by the sale of CERs.

For the first accounting period, the energy and industry sectors portfolio would help generate 27 million **T-CO₂e**, which would account for 70 % of the total potential identified by the national portfolio for the period 2008-2012.

Besides, to date, two projects belonging to the wastes sector have been registered with the CDM Executive Board: these are the controlled landfill of Djebel Chakir and the 9 regional landfills, whose CERs were transferred to the World Bank Carbon Fund by ANGeD as project holder. Three other projects, pertaining to the energy sector, are at an advanced stage of the process: these are the solar water-heater dissemination programme "PROSOL-residential" (**710.7 KT-CO₂e**), the programme of dissemination of 10 million LCB (**1 975 KT-CO₂e**) and the electrification and water supply programme based on solar PV energy (**35.7 KT-CO₂e**), for which ANME has launched, as a project holder, a call for tender for the sale of CERs in July 2008.

Other CDM projects, having at least initiated a phase of the CDM project cycle, are at various stages: these are 20 projects at the stage of PIN approved by the DNA, of which 15 relate to the energy sector, 1 to the wastes sector, 2 to the agriculture / forestry sectors, 1 to the transport sector, and 1 to the industrial processes sector. On the whole, the 25 projects will help generate **2.7 MT-CO₂e** of emissions avoided on annual average, and a total aggregate of **42 MT-CO₂e** over all the projects' crediting period.

Besides, the five engaged CDM projects are initiated by project holders belonging to the public sector (ANGeD and ANME); this situation shows that the phase of initialisation of CDM projects is easier among the public operators, in view of the easily mobilisable resources. The private project holders, whose levels of knowledge and expertise remain short of that of the public sector, are at a limited involvement stage, in spite of the significant potential that they hold.

The promotion of the CDM market in Tunisia in the short and medium term requires, in our opinion, the following:

- Stepping up the effort of registering the CDM projects already initiated by public and private project holders (20 projects with PIN approved), and this, by drawing upon the experience acquired and by strengthening the CDM Task Force set up by MIEPME to introduce a dynamics in the national energy conservation programme, while benefiting from the contribution of carbon finance;
- Strengthening the role of the DNA as an indispensable developer of CDM projects in Tunisia, this requiring the activation of the action plan issuing from the CDM promotion strategy developed in 2008;
- Fostering the participation of the private sector in the promotion of the CDM, in order to sustain the voluntary market which would hold an increasingly significant place, this requiring the establishment of a dedicated action plan aimed at promoting the role of this target in the Tunisian carbon market;
- Reinforcement of the current regulatory framework in order to establish an appropriate legal framework making it possible:
 - ▶ To formalise and clarify the relationship between MEDD and DNA, on the one hand, and between the DNA, the project holders and the credit buyers, on the other hand, as well as institutionalise the approach to processing CDM projects within the DNA: the composition and the means of the DNA, together with the procedures and the criteria of evaluation of the projects, must be endorsed by a government decision;
 - ▶ To set up a consistent framework for the sale of CERs: the procedures and positions must be clarified, taking into consideration the typologies of the projects, the status of the project holder and the CDM projects' implementation deadlines (speediness);
 - ▶ To establish a legal and tax framework for the carbon market in Tunisia, with possibility of setting up incentive advantages aimed at making the Tunisian market more attractive to international investors and buyers;
 - ▶ To build partnership relations in terms of bilateral and multilateral cooperation for the implementation of CDM projects and step up the organisation of thematic meetings and workshops for the promotion of investment opportunities in CDM projects in Tunisia.

Lastly, the prospects of evolution of the carbon market in Tunisia would combine the CDM projects development approaches:

- the classical CDM project approach, for which the reduced emissions must be real, measurable, verifiable and additional to those which would have taken place in the absence of the project;
- the CDM programmatic approach which relates to the activities listed in the framework of a national, regional or local programme, subject to using approved methodologies and that the limits of the activity be defined and the leakages calculated.

At this point, it is worth pointing out that the new international standard ISO 50001, related to the establishment and certification of an energy management system (EMS), under development by the ISO editorial board, would constitute a good base for the preparation, implementation and verification of the activities of the programmatic CDM. This standard which will come into force in 2010 should help organise the process of the projects registered within the framework of the programmatic CDM.

Indeed, this international standard is an approach of validation of the quantitative measurements of the impact of the energy conservation actions within the framework of the Energy Management System. Validation has to be decided every year by a certification authority as part of the system's monitoring audits.

It must be noted that recognition of ISO 50001 standards and the CDM Executive Board requirements would open great prospects for the development of CDM small scale projects within the framework of the programmatic approach.

Finally, the operationalisation of the “**BMU JI-CDM Initiative**” in Tunisia requires an immediate phase aimed at the short term positioning of German buyers on the potential available. As at early 2008, the DNA had already approved some twenty CDM projects in the energy and industry sectors, submitted by the CDM Task Force. These projects are likely to generate about **200 million Euros** over the projects' lifetime⁴, which could be integrated in their financing.

Among the latter, some require heavy investments requiring the intervention of international funding agencies. These projects, which generate considerable CDM revenues, belong in the energy efficiency, renewable energies, industrial processes, flare gas recovery and energy substitution (fuel shifting) sectors.

Of such sectors, it is worth mentioning in particular:

- Wind energy self-production: 2 MT-CO₂e (public and private project holders);
- Co-generation: 4.5 MT-CO₂e (private project holders);
- Flare gas recovery: 40 MT-CO₂e (ETAP and other operators);
- Wind energy connected to the network: 5 MT-CO₂e (STEG mostly);
- Substitution by natural gas: 1 MT-CO₂e (STEG with operators).

The marketing and sale of CERs are made, for the major part, by means of Call for Tender, via sectoral commissions set up to approve the whole sale process.

Lastly, the materialisation of the Calls for Tender for the sale of CERs, launched by the “CDM Task Force”, should allow Tunisia a familiarity with the contractual aspects and, more particularly, the design of ERPAs. Such familiarization will benefit the “**BMU JI-CDM Initiative**” by facilitating the contracting of CERs sales between Tunisian project holders and German companies.

⁴ Based on 10 Euros/T-CO₂e.

7. ANNEXES

7.1 ANNEX 1: DNA COMPOSITION

The Tunisian DNA is an interdepartmental committee initially made up of the representatives of 6 ministries, subsequently enlarged to other ministries and public and private companies in late 2005. The DNA is, in fact, assisted by a Secretariat, the CDM National Office, under the authority of the Directorate-General for the Environment and Quality, based at MEDD. The list of the DNA members is composed by representatives of the institutions and organisms given below:

- Ministry of Environment and sustainable Development (Ministère de l'Environnement et du Développement Durable-MEDD)
- Ministry of Foreign Affairs (Ministère des Affaires Etrangères-MAE)
- Ministry of Development and International Cooperation (Ministère du Développement et de la Coopération Internationale-MDCI)
- Ministry of Finances (Ministère des Finances-MF)
- Ministry of Agriculture and Water Ressources (Ministère de l'Agriculture et des Ressources Hydrauliques-MARH)
- Ministry of Interior and Local Development (Ministère de l'intérieur et du Développement Local-MIDL)
- Ministry of Transport (Ministère du Transport-MT)
- Ministry of Industry, Energy and SME (Ministère de l'Industrie, de l'Energie et des Petites et moyennes Entreprises-MIEPME)
- Ministry of Commerce and Artisanat (Ministère du Commerce et de l'Artisanat-MCA)
- Central Bank of Tunisia (Banque Centrale de Tunisie-BCT)
- Tunisian Chimical Group (Groupe Chimique Tunisien-GCT)
- Tunisian Company for Electricity and Gas (Société Tunisienne d'Electricité et du Gaz-STEG)
- National Agency for Energy Conservantion (Agence Nationale pour la Maitrise de l'Energie-ANME)
- Tunisian Union of Industry, Commerce and Artisanat (Union Tunisien de l'Industrie, du Commerce et de l'Artisanat-UTICA)
- Tunisian Union for Agriculture (Union Tunisien de l'Agriculture et de la Pêche-UTAP)

7.2 ANNEX 2: ANALYSIS OF THE CDM PROJECTS PORTFOLIO AS AT END 2007

The wallet projects portfolio developed in 2007 shows that this objective is theoretically quite plausible, considering the identified potential. This portfolio has helped identify 25 projects, of which 18 in the energy sector, 3 in the wastes sector, 2 in the agricultural sector, one in the industrial processes sector, and one in the transport sector. In total, this portfolio will help avoid an annual average of 2.7 MT-CO₂e of emissions, and an aggregate total of 42 MT-CO₂e over all the whole duration of the projects' crediting period. A more detailed analysis of this portfolio is given bellow.

The following table presents the breakdown of potential by sector and shows in particular the relative importance of the energy and industry sector.

SECTOR	Number of projects	T-CO ₂ e /year	T-CO ₂ e /life time duration
ENERGY	18	1 101 948	15 058 648
WASTES	3	735 192	7 875 730
AGRICULTURE/FORESTRY	2	540 585	16 217 561
TRANSPORT	1	44 800	448 000
INDUSTRIAL PROCESSES	1	247 000	2 470 000
TOTAL	25	2 669 526	42 069 939

Table 7: Impt of the current CDM projects portfolio

In spite of this potential, the development of the CDM in Tunisia has remained well short of the potential offered. This is attested by the small number of registered projects. Indeed, as at end of 2007, only two wastes projects were registered with the CDM Executive Board and three programmes, accepted and approved by the DNA, are in process of validation by a Designated Operational Entity (DOE): these are the programme of dissemination the solar water-heater in the residential sector (PROSOL-residential), the programme of dissemination of low-consumption bulbs (LCB) and the programme of rural electrification and water supply by solar photovoltaic energy (PV).

Other projects, accepted by the DNA, are either in PDD preparation phase, as the programme PROSOL-Tertiary sector or the wind energy project of the cement factory of Gabès, or else in fund raising phase towards preparation of their PDD and due to be submitted shortly to the DNA for official approval.

Energy Sector: with 18 projects which cover energy efficiency (as co-generation, LCB, efficient lighting projects, etc.), recovery of flare gas on oilfield sites and energy switching, as well as renewable energy projects (solar water heating, wind energy, photovoltaic). These 18 projects will allow to avoid 1,1 MT-CO₂e per year, and a total of **15 MT-CO₂** for all the credit period.

Solid waste sector with 3 projects: landfill project of Djebel Chekir, 9 regional landfill which are registered by the EB, and the 3 regional landfill of Tozeur-Mahdia-Zaghouan which is at the step of the PIN approved by DNA. The 3 projects will help avoid 0,7 MT-CO_{2e} per year and a total of about **8 MT-CO_{2e}** for all the credit period.

Agriculture and forestry sectors with 2 forestry projects: i) Bio-fuel project of Jatropha and ii) reforestation project (Pin d'Alep, Pin pignon and Eucalyptus). These 2 projects which have their PIN approved by the DNA, will allow to avoid 0,54 MT-CO_{2e} per year, and a total cumulated of **16 MT-CO_{2e}** for all the credit period.

Transport sector in which one project was identified; it is the first step of RFR project at the region of Tunis City. This project will help avoid 45.000 of T-CO_{2e} per year and a total of **0,45 MT-CO_{2e}** for all the credit period.

At last, the industrial processes sector with only one project (N₂O destruction at the nitric acid factory in Gabes). This project, whether it is realized will help avoid 247.000 T-CO_{2e}/year and a total of **2,5 MtéCO₂** for all the credit period.

It is important to note that the CDM project portfolio CDM was established thanks to the support of cooperation organisms such as GTZ, PNUD, MEDREC...etc., and the identification of the projects was essentially realized in the frame of two principal national programmes:

- The national programme of energy conservation.
- The national programme of solid waste management.

7.3 ANNEX 3: REFERENCE

- Mettre en place une AND pour le CDM : Pourquoi et comment?
Publication de l'IEPF-Centre Hélios 2005
- Synthèse du plan d'action d'atténuation des émissions de GES par la maîtrise de l'énergie
ANME-AEE Québec- ACDI Juin 2005
- Stratégie d'atténuation des émissions de GES par la maîtrise de l'énergie in Tunisia
ANME-AEE Québec-ACDI publication CIEDE Février 2005
- Evolution des émissions de GES dues à l'énergie in Tunisia 1990-2003
ANME-PNUD publication CIEDE Décembre 2005
- Guide d'information sur le CDM in Tunisia
ANME-PNUD publication CIEDE Septembre 2004
- Guide pratique pour le montage de projets CDM in Tunisia
MEDD-GTZ publication de l'AND Novembre 2007
- Portefeuille de projets CDM dans les secteurs de l'énergie et de l'industrie in Tunisia
ANME-PNUD publication CIEDE-Task force CDM Septembre 2008
- Portefeuille de projets CDM in Tunisia
MEDD-GTZ publication de l'AND Version préliminaire Mai 2008
- Etude relative à l'élaboration d'une stratégie et d'un plan d'action pour la promotion du
CDM in Tunisia
MEDD-GTZ publication de l'AND Mai 2008
- Etude sur le coût d'un scénario énergétique à faible contenu en carbone pour la Tunisie
PNUE-Plan bleu réalisé par Alcor Avril 2008
- Etude comparative de législations nationales relatives au CDM
MEDD-GTZ réalisée par Climate Focus Décembre 2007
- Site Web CDM in Tunisia : www.mdptunisie.tn