

Executive Summary

Introduction: The CDM and the National Strategy Studies Program

The increasing use of coal, oil products and other fossil fuels in power generation, industry, transport, residential sectors as well as land use change leads to the emission of large amounts of greenhouse gases (GHG), in particular from the industrialized countries. This increases the “insulation” property of the atmospheric cover of the earth and results in the increase of mean surface temperatures. Climate change might cause more extreme weather conditions such as drought, hurricanes and flooding all over the world.

To mitigate climate change, most of the industrialized countries (the so called “Annex I countries”) under the Kyoto Protocol of December 1997 are committed to a quantified reduction of their GHG emissions. To comply with their Kyoto targets, these countries may reduce emissions either domestically or in other countries because the greenhouse effect is of a global nature. Costs to reduce GHG emissions are often lower in developing (Non-Annex I) countries because the mitigation measures per ton of carbon dioxide reduced may vary substantially from country-to-country.

One of the mechanisms for international GHG abatement is the Clean Development Mechanism (CDM): In short, an Annex-I country (or firm) pays for GHG mitigation in a developing country through projects such as a wind power plant or other renewable energy, or with energy efficiency or afforestation projects, and then purchases the resulting measurable reduction of GHG emission in the host country. A CDM project must comply with the criteria set by the Kyoto Protocol and must be approved by the host and investor countries. The investing country obtains certified emission reductions, which it can then use to comply with its commitment to the Kyoto Protocol.

To be able to host CDM projects and take part in the trading of certified emission reductions, a country such as Egypt has to develop the necessary institutional, financial and technical capacities. In order to enable developing countries and countries with economies in transition to participate and benefit from the Clean Development Mechanism (CDM) and other Kyoto flexible mechanisms, the Government of Switzerland and the World Bank launched in 1997 the National Strategy Studies Program (NSS Program). At present, the NSS Program targets nearly 30 of the World Bank's client countries. The present NSS in Egypt is financed largely by the Government of Switzerland, and co-financed by the Government of Egypt and the World Bank.

Objective of the National Strategy Study in Egypt

The objective of the NSS in Egypt is to develop options and opportunities presented by potential international markets for GHG emission reductions through the Clean Development Mechanism (CDM) of the Kyoto Protocol and to identify the institutional prerequisites needed to participate in the CDM.

In order to achieve these objectives, the present study provides:

- An overview on existing work and earlier initiatives in GHG emission abatement and the CDM in Egypt;
- An assessment of the potential for CDM projects in Egypt in the energy, industry, transportation, solid waste management and forestry sectors;

- An assessment of the demand, size and prices in the international market for emission reductions from CDM projects and the identification of Egypt's opportunities in the market;
- Options and recommendations for the development of the institutional framework and the identification of key capacity building needs that will enable Egypt's participation in the CDM;
- A portfolio of possible CDM projects to facilitate prompt start of the CDM in Egypt.

As an important additional result of the study, numerous decision makers and experts from the involved institutions, including ministries, governmental agencies, private companies, energy and industry associations, universities, civil organization and consulting firms have been informed and trained in CDM issues. A robust network of institutions and individuals has been established, from which future CDM activities in Egypt will be able to rely on.

Benefits from the Clean Development Mechanism for Stakeholders in Egypt

The CDM gives a value to the reduction of GHG emissions in developing countries. With this, additional hard currency investments are generated to promote clean technologies and sustainable development. This results in the following benefits for the stakeholders in Egypt:

- Increased project profitability from clean technology projects to the beneficiaries in the private and public sectors because the resulting certified emission reductions will generate additional revenues in foreign currency.
- Potential to increase foreign investment and sources of foreign currency for Egypt. Successful CDM projects may become a point-of-departure for other foreign investments, strengthening the Egyptian economy.
- Additional business opportunities for companies providing clean technologies in Egypt.
- Renewal of important infrastructures such as power stations, transport systems, sewage treatment plants etc., which improves the reliability and quality of public services and sectoral programs.
- Transfer of appropriate, environmentally clean, and reliable technology:
 - Reduces costs, and improves equipment, and thereby strengthens the competitiveness of the Egyptian industry.
 - Contributes to the improvement of local air quality by emissions reduction.
 - Contributes to capacity building.
- CDM activities for land use, land use change, and forestry (LULUCF) will support the current afforestation efforts to limit desertification in Egypt.
- An attractive mechanism to facilitate financing of clean technology projects from local banks because the regular (hard currency) payment for Certified Emission Reductions (CERs) may be used for the repayment of loans.
- CDM investments create employment opportunities for local labor and contribute to welfare.

In order to secure these CDM benefits for the country, Egypt must develop an efficient institutional setting for the marketing, approval, and overseeing of the CDM projects, which on the one hand, ensures the above mentioned benefits, and on the other hand, creates an attractive environment for international CDM investors.

The International Market for GHG Emission Reductions

In order to investigate the position of Egypt within the international GHG emission reduction market, a spreadsheet model of supply and demand in the market has been applied (CERT-model). The analysis is based on an assessment of the market after the COP-7 decisions, taking into account the US withdrawal from the Kyoto Protocol. The results indicate that Certified Emission Reductions generated by CDM projects (CERs) will be traded as low as US\$ 2.10 per ton of CO₂eq (7.8 US\$/tCeq) at a traded volume of 1.4 billion tons of CO₂eq globally (0.39 GtCeq).

However, CDM projects face considerable barriers, which have not been taken into account fully in the CERT modeling and which reduce the number of projects that could be implemented and then the global supply until 2012 significantly. Also, a substantial demand for GHG reductions (outside the Kyoto Protocol) from the United States private sector may be assumed, which is not included in the present analysis.

Therefore, the US\$ 2.1 per ton of CO₂eq may be regarded rather as a lower boundary. Actual estimates, e.g. from the Prototype Carbon Fund indicate somewhat higher prices in the range of US\$ 3-4 per ton of CO₂eq (11-14 US\$/tCeq).

Nevertheless, it should be noted that considerable uncertainties regarding the future supply and demand of emission reductions on the international market remain. The international market will determine the price paid for CERs in Egypt. To be competitive, Egypt should offer attractive and cost effective CDM projects, and take measures to minimize transaction costs for the administration, certification and issuance of CERs and to reduce uncertainties and risks for investors.

At present, the main buyers of CERs include the carbon finance initiatives of the World Bank (Prototype Carbon Fund, Community Development Fund, and BioFund), the Dutch CER tender program CERUPT, as well as other various countries' initiatives (Finland, Japan, the Netherlands, Canada etc.). Investment by private companies or funds is still rather limited. With the implementation of the Kyoto Protocol, it is expected that the demand from private sector will take over the role of the classical donor institutions.

Egypt's Potential for CDM Projects

The sectors with the highest GHG emissions are the main target for reduction measures and the implementation of CDM projects. The main emitters of GHG in Egypt are fuel combustion in the energy sector (22%), in industry (21%), and in the transport sector (18%). Other important contributors are agriculture (15%), small combustion (9%), non-combustion emissions in industry (9%), and waste (5%). In total, energy-related emissions are responsible for 71% of the GHG emissions.

The analysis of the future development of GHG emissions in Egypt indicates that they may reach more than three times 1990 levels by 2017; whereby the energy related emissions remain by far the major source for GHG emissions in the future. Energy emissions are expected to increase its share with the highest growth rate. This underlines the urgency of Egypt to use the CDM as an instrument to promote transfer of state-of-the-art technologies for energy related GHG emissions mitigation in the country.

An extensive survey for identifying projects in the targeted promising sectors and technologies has been carried out, and resulted in the following list of proposed CDM project types for Egypt:

- Co-generation in textile, chemicals, food and beverage, metals, buildings, and hotel sectors.
- Energy efficiency in textile, chemicals, food and beverage, metals, buildings, and hotel sectors.
- Fuel switching to natural gas in industry and transportation.
- Wind energy.
- Organic waste management and municipal solid waste methane utilization.
- Afforestation projects.

Other project types may promote significant sustainable development in Egypt, but due to their high costs (more than 10 US\$/t CO₂eq) they are less qualified for implementation under the CDM than under classical development aid schemes. They are mainly:

- Integrated solar-fossil fuel combined cycle power station and solar pumps.
- Extension and electrification of railways and underground lines.
- Extension of waterways transportation infrastructure.

The list is based on the available information at the time of NSS preparation and is therefore rather indicative and not exhaustive. Sectors and technologies that have not been considered in this study include oil and petroleum sector, power transmission losses and energy from agricultural residues.

The list represents possible supply options for Egypt from the CDM market in the Year 2010. For each project type the overall reduction potential is estimated depending on the replication potential within the same project type until the year 2010. The overall GHG emission reduction is calculated in a bottom-up, or project-based, approach together with the calculation of the average cost of saved carbon.

Assuming an international price of Certified Emission Reductions from the analysis using the rate of 2.1 US\$/CO₂eq (as demonstrated by the market analysis), the identified project types represent a total trade volume of 9.5 million tons of abated carbon dioxide per year. The total receipts resulting from CERs could equal as much as 20 million US\$ annually.

This estimated CDM potential in Egypt is based on a limited list of projects that have been proposed by the stakeholders for implementation and for which data was available. Also, the replication potentials are restricted to specific applications proposed by the project proponents and not based on a comprehensive assessment of the fields of application. Therefore, the presented potential serves mainly to illustrate some of the most interesting options for CDM in the country; it may be assumed that the actual potential for CDM projects in Egypt is higher.

The study shows that the implementation of the CDM projects will promote many of the development plans of the Egyptian government, such as the National Energy Strategy, the development of natural gas and renewable energy utilization, and the plans in the transport, waste and forestry sectors. On the other hand, the analysis indicates that the existing subsidies on fuel and power, bureaucratic hurdles as well as custom duties and taxes limit to some extent the attractiveness and potential of the CDM in the country.

Activating Egypt's CDM Potential

The conditions to activate the CDM potential in Egypt are relatively good. Egypt provides a comparably favorable investment climate and overall stability, and has a broad range of existing governmental and non-governmental institutions and companies with relevant technical, financial and organizational skills necessary for the implementation of CDM projects. On the other hand, the study identifies a number of areas, where Egypt needs capacity building to prepare both public and private sectors and governmental institutions to be able to compete in the international emission reductions market.

In preparing Egypt for the CDM, associated specific costs have to be taken into consideration to achieve the potential expected benefits. For example, in order to be able to register, evaluate, and approve efficiently some of the several hundred projects comprising of Egypt's CDM potential as identified in this study, an adequate institutional capacity has to be put into place by the government. The proposed CDM strategy therefore suggests to the Egyptian government to follow a moderately proactive approach, which includes establishing an institutional environment that enables and promotes the CDM in the country. Constant monitoring of the Kyoto process and of the international market of emission reductions allows for this pro-active approach to be flexible, enabling the government to detect changes in the market and to adapt its CDM strategy accordingly. Such an approach will reflect minimal costs to the Egyptian government in activating the CDM potential.

Preparing Egypt for the CDM builds on three pillars:

- Institutional building.
- Capacity building.
- Project development.

Regarding institutional building, a National Committee for the CDM needs to be formed with key representatives from relevant ministries. Its main tasks are to promote, coordinate and facilitate the CDM; to define transparent national criteria for CDM projects, to decide on the approval of proposed CDM projects, and to secure that the CDM contributes to the sustainable development of the country. The Committee will be the policy-making body for the CDM in Egypt and will also be responsible for the design and implementation of the National CDM Action Plan (see below). A CDM Unit should be created within EEAA to serve as the executive secretariat to the National Committee, supporting it operationally.

To build the necessary capacity in relevant public and private institutions such as ministries, NGO's, project hosts, technology providers, banks and universities, a capacity building strategy needs to be designed that clearly defines objectives, activities, targeted audiences, executing institutions, schedules and budgets. Capacity building within the government will strengthen Egypt's position in international negotiations within the Kyoto Process and helps to assess the impact of its policies and regulations on the CDM potential.

Finally, the experience in other countries shows that learning by doing, i.e. the actual implementation of a CDM project is the most efficient way to prepare the relevant stakeholders and to pave the way for the CDM in a country. It is therefore proposed that running parallel to the institutional and capacity building initiatives, the government should promote the implementation of one or more CDM pilot projects. As a basis for the identification of CDM projects, the study proposes a set of indicators to evaluate and

rank candidate projects and presents seven candidated projects in the areas of co-generation and energy efficiency in industry, fuel switching in transportation, wind energy, waste digestion and afforestation for further implementation.

Making It Happen: Implementing the Proposed Action Plan

In order to implement the results of the study, an Action Plan for the CDM in Egypt is proposed, using 9 Modules of necessary activities in institutional building, capacity building and project development for the next 2-3 years:

Table (ES.1): Modules for the Proposed CDM Action Plan

Module	Type of Activity
1. Building up of Institutional Setting	Institutional Building
2. Establishment of Transparent National Criteria for CDM Projects	Institutional Building
3. Program of Awareness Raising	Capacity Building
4. Technical Capacity Building	Capacity Building
5. Investor Relations and Monitoring of International Offset Market	Institutional Building
6. Project Package Preparation	Project Development
7. Project Pipe-Line and National Registration	Institutional Building
8. CDM Handbook for Egypt	Capacity Building
9. Evaluation / Feedback / Corrections	Institutional Building

The present study is meant to facilitate the design of the final CDM Action Plan by the National Committee on CDM. Its implementation will be coordinated by the CDM Unit under the guidance of the Committee, and should rely on existing institutions and experts in both public and private sectors.

In order to finance the Action Plan, the Egyptian government can seek assistance from the recent UNEP initiative on institutional building, from the forthcoming CF-Assist initiative established by the World Bank for project-level capacity building, and from other multilateral or bilateral donors.

The international CDM market is evolving steadily. With a clear commitment from the Egyptian government regarding the CDM, and a timely and efficient implementation of the Action Plan, Egypt will be able to benefit from the significant existing experiences and resources and to profit from the CDM for sustainable development of the country.