Assessment of the Activities, Operations, and Areas of Improvement for the CDM Awareness & Promotion Unit (CDM APU)

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ERNST & YOUNG
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Abbreviations

CCRMP	Climate Change Risk Management Programme
CDM	Clean Development Mechanism
CDM APU	CDM Awareness and Promotion Unit
CCU	Climate Change Unit
CSR	Corporate Social Responsibility
CER	Certified Emission Reduction
COP-MOP	The Conference of the Parties serving as the meeting of the Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
EPF	Environmental Protection Fund
EEAA	Egyptian Environmental Affairs Agency
EC-CDM	Egypt's CDM Council
EB-CDM	Egypt's CDM Bureau
EIA	Environmental Impact Assessment
ERPA	Emission Reduction Purchase Agreement
GHG	Greenhouse Gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HFO	Heavy Fuel Oil (Mazout)
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
KCERs	1000 Certified Emission Reductions
LoA	Letter of Approval
MSEA	Minister of State for Environmental Affairs
MDG	Millennium Development Goals
MW	Mega Watt
NEAP	National Environmental Action Plan
NAMA	Nationally Appropriate Mitigation Actions
NOx	Nitrogen Oxides
NREA	New & Renewable Energy Authority
N2O	Nitrous Oxide
PPAs	power purchase agreements
PoA	Programme of Activity
PIN	Project Idea Note
PDD	Project Design Document
SOx	Sulfur Oxides
tCO2e	Tonne Carbon Dioxide Equivalent
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
VOCs	Volatile Organic Compounds

1. Executive summary

STUDY OBJECTIVE AND METHODOLOGY

This study aims at reviewing the achievements and shortcoming of the current objective and institutional structure of the Clean Development Mechanism Awareness and Promotion Unit (CDM APU) in an effort to align with the global trend towards integrated sustainability and effectively integrating major social, environmental, and economic challenges into the Unit's strategy, and operations.

The review was based on documenting the Unit's previous and current activities, operations, achievements, and indentifying areas of improvement. In addition, the current status of Clean Development Mechanism (CDM) Projects in Egypt was analyzed as compared to the period before establishment of the CDM APU in May 2009, highlighting the Unit's impact.

The methodology applied in this report utilizes both desk study review and data collection through personal interviews with many stake holders including CDM APU staff, clients, consultants, DOEs, the Egyptian DNA, CDM project developers as well as other governmnetal entities representatives to catpure their feedback and identify their concerns and expectations.

An assessment of the CDM APU activities, operations, achievements, and areas of improvement was conducted to analyze the current status of CDM in Egypt compared to its status before the CDM APU establishment in May 2009 and to Identify and highlight the Unit's impact on the CDM status in Egypt and any other achievements of the Unit's operations. In addition, the assessment included a SWOT analysis for the unit's

- Existing capacities and structure
- Activities undertaken
- Training provided
- Achievements including the impact on CDM status in Egypt
- Areas of improvement
- Challenges faced

The following approach was adopted to meet the study objectives:

1. Data collection including
    - CDM APU organisational structure and its interaction with EEAA and other Ministries/ agencies i.e., Energy Efficiency Unit, Cleaner Production Centre, etc.
    - Current CDM APU mandates and the ongoing activities
    - List of CDM projects in Egypt and those being supported by CDM APU and status of the projects
    - Current CDM APU Staff and the techncial and financial expertise in supporting the CDM projects
    - Workshops and training undertaken to create awareness on CDM
    - Barriers encountered by the Unit in achieving the objectives
2. Information regarding existing organizational structure and interaction between CDM APU and other concerned parties within EEAA and within other Ministries i.e., Energy Efficiency Unit, Cleaner Production Center, etc.
3. Analyzed the current status of CDM in Egypt compared to its status before the CDM APU establishment in May 2009 including:
    - CDM Institutional Framework in Egypt;
    - National strategies and plans;
    - Current and previous CDM portfolio in Egypt;

- Barriers to expansion of CDM market in Egypt;
- Benchmark against regional CDM practices

4. Analyzed and highlighted success stories of CDM projects facilitated by the Unit while addressing the barriers, actions taken by the unit to overcome those barriers, baseline status of these projects, and the contribution to sustainable development

5. Stake holder engagement through personal interviews and questionnaire survey/ including CDM APU staff, clients, consultants, DOEs, the Egyptian DNA, CDM project developers as well as other governmental entities representatives, capturing feedback on the CDM APU achievements and identifying their concerns and expectations.

6. Identification of new opportunities for CDM APU through SWOT analysis.

BACKGROUND

The Climate Change Risk Management Programme (CCRMP) is a national cross-cutting programme implemented across multiple ministries and sectors, targeting both adaptation and mitigation. The program comprises four components, each equipped with relevant government institutions and UN partners, and tasked with the responsibility of implementing either mitigation or adaptation efforts, CDM being one of the focus areas.

The CDM institutional framework in Egypt was previewed while highlighting the CDM APU's structure and connection to different functions. The CDM institutional structure in Egypt can be grouped according to three distinctive functions: policy formulation and regulation, operational, and promotional.

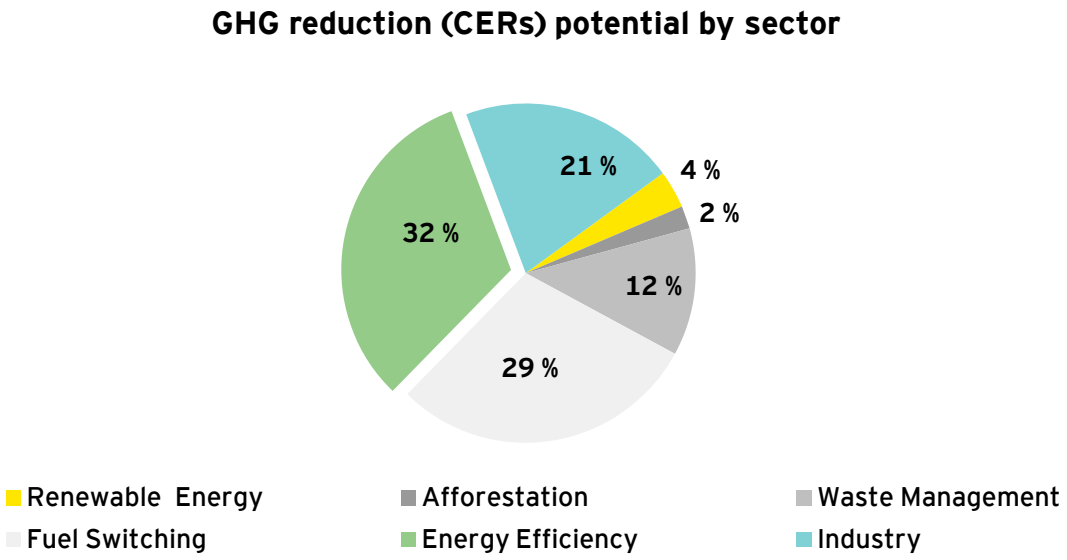
CDM AWARENESS AND PROMOTION UNIT (CDM APU) PROJECTS AND ACTIVITIES

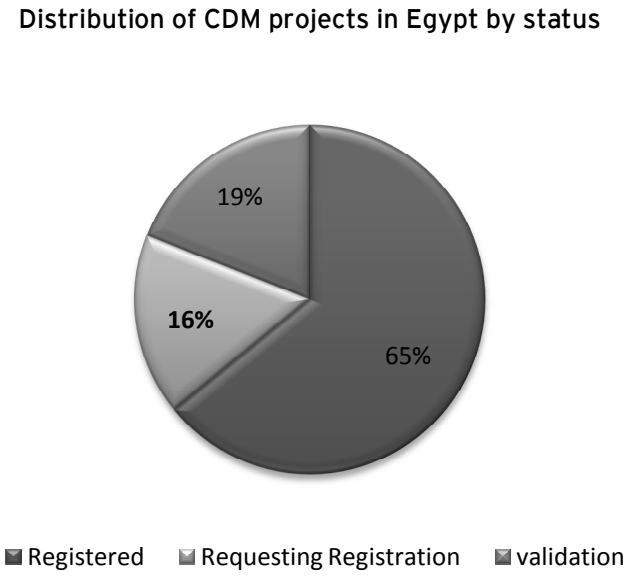
The Clean Development Mechanism Awareness and Promotion Unit (CDM APU) has been established since May 2009, under the activities CDM Component of the Joint Program of Climate Change Risk Management in Egypt (CCRMP) as a unit within the Egyptian Environmental Affairs Agency (EEAA). The CDM APU main role was to foster and promote CDM project development.

The mandate of the CDM APU falls under five main categories as follows:

- Building CDM National Capacity
- Provide Technical Assistance "CDM Helpdesk"
- Financial and Legal Support for CDM Projects
- Setting Mechanisms for Cooperation
- Support CDM Policy Making and Regulatory Organizations

The CDM APU has been successful in spreading CDM awareness and in promoting CDM projects. With only 4 registered projects till the year 2009, the CDM APU started pursuing the projects under CDM cycle and also identified several new opportunities through the awareness and promotion program. As a result, currently there are around 50 CDM projects in the CDM APU pipeline. Up to date, 17 projects have been registered and another 8 are under requested for registration. The CDM APU also identified four projects that could be considered under CDM program of Activities (PoAs). One of the PoAs already requested registration under the UNFCCC while other three are either in validation or PDD development stages. The CDM APU has assisted these projects by carrying out technical assistance including Project Idea Note (PIN) preparation, obtaining letters of no objection and letters of approval, PDDs preparation, validation, registration, and verification support. Once implemented, these projects are expected to achieve annual Greenhouse Gases (GHG) emission reductions of approximately 4.7 million tCO2e. The charts below present the GHG reductions potential by sector as well as the distribution of CDM projects in Egypt by status.





CDM APU arranged several workshops and training sessions for more than 250 CDM stakeholders under the MDG-F & GIZ program. The CDM APU also participated and promoted the Egyptian CDM portfolio in the 7 major CDM forums. In addition, more than 10 Awareness Workshops were conducted by the CDM APU team. The main objective for these workshops was to create awareness, build capacity, and identify CDM Opportunities in different sectors.

CDM APU SUCCESS STORIES

Six success stories for projects that were supported or both identified and supported by the CDM APU were presented in this report. The success stories selected had received logistical, technical, and financial support from the CDM APU without which these projects wouldn't have been implemented. The six success stories are presented in details in the report and summarized below.

CASE-1: THREE N2O ABATEMENT PROJECTS (KIMA, DELTA, AND SEMADCO FERTILIZERS)

The three projects aimed at reducing N2O emissions through thermal decomposition of N2O as well as to reducing NO_X emissions. KIMA, Delta, and Semadco N2O projects were on hold because they signed contracts with the CDM developer/investor in 2008. However, the developers were not interested in pursuing the projects since they were not convinced with projects feasibility. The CDM APU restudied the project technically and financially and concluded that the projects were feasible using different technologies. Further technical and logistical assistance was provided to the projects through preparing RFPs, evaluating proposals, and renegotiating the offered deals. The CDM APU also assisted the consultant in data collection, national approvals, PIN &PDD preparation, and validation/registration support. The projects are estimated to reduce GHG emissions by 560,000 tCO2/year.

CASE-2: WASTE HEAT RECOVERY FROM GAS TURBINE GENERATORS PROJECT (ELNG)

This project aims to reduce the GHGs generated from the fuel gas burning in the hot oil heaters by partially stopping oil heaters (heat generators) operations and utilizing the heat generated from the flue gases of GTGs to heat the hot oil instead in order to obtain the heat duties required by heat consumers.

The CDM APU support to the project involved studying the project technically and financially, providing capacity building for the company staff, establishing a work group between CDM APU and ELNG to develop the project design document, assisting ELNG to hire an international expert to revise the PDD, providing support for conducting a pre-validation exercise, and providing support during validation. GHG emissions reduction due to the project is estimated at 68,000 tCO2/year.

CASE-3: GAS RECOVERY PROJECT (SOPC)

The project involves recovery and utilization of waste gas currently flared in the SOPC refinery. The project is the first of its kind in Egypt. Consequently, the company faced a lot of problems finding the suitable technology and convincing SOPC management with developing the project. CDM APU supported the project with the following:

- Studied the project technically and financially
- Capacity building for the SOPC staff
- Developed the project Idea Note
- Promoted the project to the CDM investors
- Supported the company to select competent technical and financial proposals from the investors
- Supported the company in the contracting phase
- Supported the CDM investor in the PDD writing
- Provided validation and registration support

The project successfully submitted request for registration and expected to be registered by April 2013. GHG emissions reduction due to the project is estimated at 128,000 tCO2/year.

CASE-4: CHARCOAL PROGRAMME OF ACTIVITIES (VARIOUS KILN OWNERS)

The proposed Programme aimed at reducing methane emissions by controlling the gases generated during the charcoal carbonization process. The project will lead to numerous positive environmental, social, and economic impacts. GHG emissions reduction due to the project is estimated at 200,000 tCO2e/year. The support provided by CDM APU involved the following:

- Supervised two technical and economic feasibility studies for the project
- Analyzed local and international charcoal kiln suppliers and identified the most economic kilns that comply with local pollutants regulations
- Coordinated with the cabinet of ministers for the selection of the best pilot kiln location within the charcoal intensive governorates

- Availed the capital cost for the pilot kiln through sale of credits from N2O Abatement CDM projects
- Supervised and funded the necessary environmental compliance measurements of the pilot kiln
- Set up the financial mechanism to fund the project through the Environmental Protection Fund (EPF) and Egyptian National Banks in coordination with EEAA.
- Supervised and funded the CDM cycle development of the PoA. Currently, the project design document is being finalized

CASE-5: FUEL SWITCHING FROM MAZOUT TO NATURAL GAS IN PULP & PAPER INDUSTRY (QENA PAPER INDUSTRY CO./ADFOU PAPER INDUSTRY CO.)

The two projects aim at Fuel switch from Heavy fuel (HFO) to Natural gas in the exciting boilers. The major challenge faced by this project was that both companies didn't have any knowledge about the CDM procedures and needed incentives to finance the projects. GHG emissions reduction due to the project is estimated at 90,000 tCO2/year. The CDM APU provided the following support to both projects:

- Restudied the projects technically and financially
- Convinced the companies' management to proceed with CDM cycle again
- Prepared the RFP for the two projects
- Assisted the companies in the evaluation of the proposals and contracting with the qualified consultant
- Re-negotiated the deal between the plants and the CDM developer in order to cover CDM cycle costs
- Assisted the consultant in data collection, national approvals, PIN &PDD preparation, and validation/registration support

CASE-6: INTRODUCTION OF HOT DIRECT REDUCED IRON (DRI) INTO ELECTRIC ARC FURNACE (SUEZ STEEL COMPANY)

The project aims at reducing the specific energy and the corresponding GHG emissions of the EAF by introducing a hot DRI charging system in order to retain the sensible heat content of hot DRI from the Direct Reduction process. The project is estimated to reduce GHG emissions by 106,000 tCO2/year.

SSC didn't have any knowledge about the CDM procedures and there was no applicable Methodology for the project. The CDM APU. The CDM APU restudied the project technically and financially; convinced the company's management to proceed with CDM project; assisted the company in selecting a qualified CDM consultantp; and assisted the consultant in data collection, national approvals, PIN preparation, New Methodology development, PDD preparation, and validation support.

SSC successfully registered the new Methodology under the UNFCCC and the project is currently under validation.

CDM APU ACHIEVED MANDATES

Mandate objective	Execution of the mandate
The Promotion, and marketing for CDM projects	More than 10 awareness workshops delivered Participated and promoted the Egyptian CDM portfolio in the 7 major CDM forums Initiated more than 5 campaigns with potential CDM clients and investors
Providing technical assistance "CDM Helpdesk"	Capacity building for more than 250 representatives from major CDM stakeholders Contributed to the qualifications and professionalism of the DNA team through continuous support and training CDM technical assistance for more than 50 CDM projects
Facilitator for all CDM players	Facilitate CDM cycle development for more than 36 CDM developers and project participants through support in obtaining required national approvals Introduced CDM project investors to potential projects
Financial and legal support for CDM projects	Availed funding for 4 PoAs Fund raising for more than 10 struggling projects through international investors and donor organizations Reviewed more than 15 Emission Reduction Purchase Agreements (ERPAs) signed between project proponents and developers/investors
Setting mechanisms for cooperation	Set cooperation mechanisms between EEAA, donor organizations, and international and national banks

Mandate objective	Execution of the mandate
Support CDM policy making	Supported the restructuring of the Egyptian DNA Participated in the solar water heating, and large scale wind farms mitigation action plans with the Ministries of Electricity and Housing etc.
Follow-up the implementation of CDM projects that were ongoing when CDM APU was established	Continuous follow up for all CDM projects in various CDM cycle phases including about 20 projects during validation and 3 registered projects until CERs generation

SOCIOECONOMIC IMPACT OF CDM APU PROJECTS

The CDM APU has helped to develop and expand projects that support an energy efficient economy and the use of Egypt's renewable energy potential. This contribution would help the Egyptian economy to partially survive the current energy crisis by reducing the energy demand burden. Furthermore, promoting energy / carbon efficient technologies lead to availing huge investments, saving the government's energy subsidies, and created a lot of job opportunities. Estimations for the socioeconomic impacts of CDM projects in different CDM cycle stages including registered, requesting registration, and validation as well as an estimation for equivalent annual savings from energy subsidies cost based on current national and international energy prices is presented in the report.

The projects analyzed in this section of the report are the ones clearly impacted by the CDM APU activities and also are in advanced CDM cycle stages. The total emission reductions achieved from all such projects mount to approximately 3.12 M ton CO2e / year. The average value for these emission reductions is approximately 15.6 M US $ at average CER price of 5 US $. Total projects costs including CDM cycle costs are estimated at 577 M US $. Annual energy subsidies savings are estimated at approximately 249 M US $. These estimations were based on available information in the PDDs, official DNA projects portfolio, and interviews with project developers.

IMPACT OF GHG EMISSION REDUCTION IN EGYPT DUE TO CDM PROJECTS

To analyze the impact of CDM projects on Egypt's emissions, three scenarios were considered. The total impact for all three scenarios has been measured in terms of GHG emissions reduction as well as the equivalent number of passenger cars taken off the road.

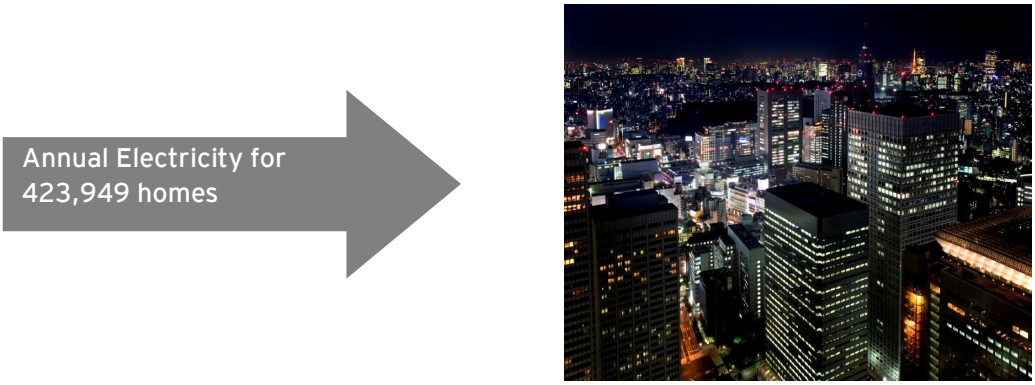
Scenario 1: All CDM APU projects are executed

Assuming all 50 projects that were initiated and supported by the CDM APU were executed successfully, Egypt can expect to see a total reduction of 4,702,863 tCO2e. These projects are in different stages of CDM cycle including registered, requesting registration, validation, PDD development, and Letter of No Objection as presented in Table 2 section 4.4.1. This scenario will reduce Egypt's total current emissions by approximately: 2.24%. This figure is equivalent to emissions from 888,826 passenger cars and equivalent to emissions due to annual electricity consumption of 638,977 homes.

888,826 cars taken off the road per year

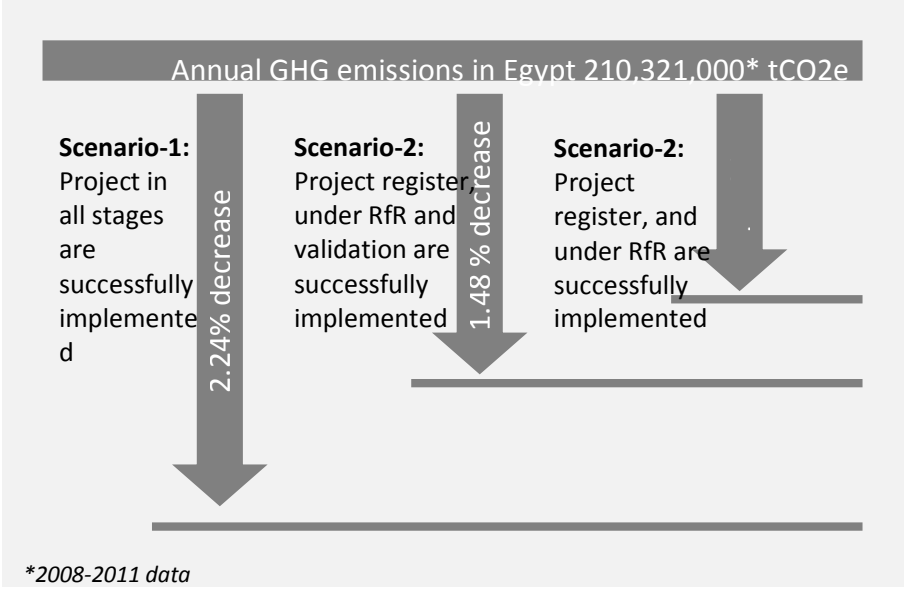
Scenario 2: Registered projects, projects requesting registration, and projects under validation are executed

In this scenario, it's assumed that only advanced CDM cycle projects will be executed. Advanced CDM cycle stages include projects that were registered, projects requesting registration, and projects under validation. This assumption is more realistic since the projects that are in early CDM cycle stages might not make to registration. Out of the 50 projects identified and pursued by the CDM APU, 17 were registered, 8 are currently requesting registration, and 19 projects are under validation. Assuming only these 35 projects were implemented, the total CO2 emissions reduction will be 3,121,722 tCO2e (1,793,620 tCO2e from registered projects, 853,455 tCO2e from projects requesting registration, and 474,647 tCO2e from projects under validation). This scenario will reduce Egypt's total current emissions by approximately: 1.48%. This figure is equivalent to emissions from 589,996 passenger cars and equivalent to emissions due to annual electricity consumption of 423,949 homes.



Scenario 3: Only registered projects and projects requesting registration are executed

In this scenario, it's assumed that only registered projects and projects that have already submitted a request for registration will be executed. The probability of this scenario to be real is even higher than the previous two because it's very likely that registered projects and projects requesting registration will be implemented. The total number of projects in this scenario is 25 projects (17 Registered and 8 Requesting registrations). The total CO2 emissions reduction will be 2,647,075 tCO2e (1,793,620 tCO2e from registered projects and 853,455 tCO2e from projects requesting registration). This scenario will reduce Egypt's total current emissions by approximately: 1.26%. This figure is equivalent to emissions from 500,289 passenger cars and equivalent to emissions due to annual electricity consumption of 359,489 homes.



CDM IN EGYPT AS COMPARED WITH THE MENA REGION

As per UNEP RISO Centre, Egypt's total estimated emission reductions was 15,844 KCERs in June 2012, which is the highest emission reduction achieved that year in the MENA region. This is not surprising owning to its vast potential in terms of geography and resources. The table below presents a snapshot of the number of CDM projects in the MENA region and the associated emissions reduction potential. This table suggests Egypt as having the highest emissions reductions through CDM projects; however, Egypt does not have the highest number of CDM registered projects in the region. Since 2010, the number of CDM projects in Egypt has increased from 32 to 50 projects until February 2013, 17 of which have been registered including PoAs.

Country	Number of projects in advance stages	Registered projects	2012 K tonne CERs
Algeria	2	2	107
Egypt	27	13	15,844
Iran	20	12	4,572
Iraq	3	0	0
Jordan	4	4	2,354
Kuwait	3	0	0
Lebanon	6	0	5
Libya	2	1	0
Morocco	19	8	3,423
Oman	2	0	300
Qatar	2	1	14,004
Saudi Arabia	5	1	207
Syria	4	3	646
Tunisia	8	4	4,286
UAE	17	10	964
Yemen	2	0	924
MENA total	**126**	**59**	**47,636**

SWOT ANALYSIS

A SWOT analysis has been carried out assessing the CDM APU's activities, operations, capacity, challenges, and achievements and shortcomings to identify the areas that need to be strengthened as the Unit is aiming for a bigger role in supporting the country in achieving Sustainable Development. The analysis findings are presented below.

Strengths	Weaknesses
► Well established presence in the Egyptian Carbon Market ► Provide support to the CDM project developers resulting in increase of the number of CDM projects and emission reductions in Egypt ► Existence of a well organized and qualified staff within EEAA ► Mandate and capacity to create awareness among various stakeholders in different sectors ► Significantly increased foreign investment in Egyptian CDM projects ► Provide coordination with the national and international Organizations ► Centralized technical support within the Government	► Small Scale scattered Projects with low GHG reduction potential ► Low salaries leads to high employee turnover ► Limited technical resources and know-how ► Non-availability of proper data for identification of feasible/applicable CDM projects ► Less involvement of key Ministries, top management and executive level in CDM workshops and promotional activities ► Inefficient technical studies for analyzing real CDM potential in different sectors ► Insufficient media and marketing ► Lack of local banks/private equity CDM project financing and high reliance on foreign funding
Opportunities	**Threats**
► Attract international donors to finance CDM projects and/or provide technical training and grants ► Experience and technical knowledge can be exploited by other opportunities ► Replicable Milestones ► Positive socio-economic Impact of successful projects can be used as a promotional tool to attract investors and stakeholders ► Partnerships with other entities (Government, private, and International Organizations) working on promoting sustainability and other objectives in-line with the CDM APU mandates ► Clustering Small Scale projects and PoAs and promoting them accordingly ► Lessons learnt from other countries having higher number of successful CDM projects	► Financial Sustainability of the CDM APU ► Uncertainty of the future of CDM and the huge drop in carbon prices ► Vagueness in CDM APU Role ► High Transactional Cost associated with CDM project proposals ► Market Resistance and tendency for business as usual ► Low price of fossil fuels in Egypt providing low incentive to energy efficiency/GHG abatement projects ► Strict criteria and long complex project cycles for registration by the UNFCCC ► High CDM costs with high risk of no access discourages investors and promoters ► Awareness of CDM projects is lacking ► CDM APUs promotional tools don't always reach potentially interested parties ► Institutional and Legislative Barriers ► Insufficient Technical Capacity at local level

2. Introduction

2.1 Background[1]

Egypt is among the leading countries in the Arab States region in terms of the number of registered CDM projects and a developed pipeline of prospective projects. Nevertheless, the number of registered projects and the size and scope of the portfolio, however, are far below the country's overall potential for CDM projects in energy and industry sectors. Egyptian Environmental Affairs Agency (EEAA) participated in UNEP's Capacity Building for Clean Development Mechanism (CD4CDM) project (2002-2005), receiving support in establishing its DNA in March 2005, developing a national CDM strategy and a portfolio of potential CDM projects. Since then, responsible authorities organized a series of sector specific workshops for different targeted groups including the banking sector, investment and industrial companies and the petroleum sector.

As emphasized in Egypt's Initial National Communication (INC) to the UNFCCC, UNDP Global Human Development Report 2006 and the IPCC Fourth Report, Egypt has proven to be highly vulnerable to climate change impacts. Climate projections make it clear that current and future changes in climatic conditions constitute a major environmental risk that may jeopardize Egypt's development gains and poverty reduction. Climate Change threats would inflict serious damage to human settlements. Furthermore, it would also affect access to water and food associated with deterioration in health conditions on the national level. The serious predicted impacts on human activities are likely to affect both men and women alike and would dramatically hamper Egypt's progress towards achieving all eight MDGs and in specific Goal 7, Target 8 on the integration of sustainable development principles into national policies.

2.2 Climate Change Risk Management Program (CCRMP)[2]

The Climate Change Risk Management Program (CCRMP) was established in October 2008 under EEAA. The program is a comprehensive effort to help achieve the Millennium Development Goals, eliminate poverty and support environmental sustainability.

The Climate Change Risk Management Programme (CCRMP) is a national cross-cutting programme implemented across multiple ministries and sectors, targeting both adaptation and mitigation.
The adaptation programme assists in providing tools to assist in making strategic decisions, to strengthen the development of the institutional capacity and to implement national strategies in the water resources, agricultural, and other sectors. The mitigation programme assists in policies to help mitigate Egypt's contribution to emissions. This is achieved by providing an enabling environment and incentive schemes to promote financing of renewable energy and energy efficiency initiatives as well as taking advantage of the Clean Development Mechanism (CDM).

The program comprises four components, each equipped with relevant government institutions and UN partners, and tasked with the responsibility of implementing either mitigation or adaptation efforts, CDM being one of the focus areas:

Component One: Mitigating Climate Change threats while Boosting Economic Development

In its early involvement in supporting the Supreme Energy Council (SEC), a high level Ministerial body linked to the Cabinet of Ministers and headed by the Prime Minister, the CCRMP provided senior support to the Energy Efficiency Unit (EEU) and began to assess the technical needs of the SEC Secretariat and understand the strategic priorities of the Council in order to ensure that the program objectives are aligned with the Government priorities. The CCRM aims to provide assistance in the key areas of facilitating 'policy dialogue' across all the energy market stakeholders, as well as defining the capacities of the SEC's Technical Secretariat to be a source for initiating ideas and market analyses in support of policy

[1] **Existing CDM Potential and Perspectives for Carbon Finance in RCREEE (Expand this) Member States Beyond 2012**
[2] **(**http://www.ccrmp.org/**, December 2012)**

making, through development of policy reform in key areas such as liberalization of the energy sector, attraction of private sector investment in energy efficiency and renewable energy, and the phase out of less efficient energy consuming measures.

Component Two: Clean Development Mechanism (CDM)

The goal of the Clean Development Mechanism is to develop and expand efforts to reduce GHG emissions and incorporate clean technology into development plans. By expanding the CDM market, Egypt will be better equipped with the know-how and the infrastructure to implement national energy policies and support economic growth within the context of climate change.

The CDM component has helped to develop and expand projects that support an energy efficient economy and the use of Egypt's renewable energy potential. The Egyptian Environmental Affairs Agency (EEAA) and the Environmental Quality Unit are contributing to this component, and are helping to expand CDM markets and pilot projects that support GHG reduction. The United Nations contributing agencies, UNIDO, UNEP and UNDP, liaised with the CDM, and other interested groups, to further expand the market for clean development.

Prior to project initiation, the current status of CDM in Egypt was assessed in order to understand the potential for the CCRMP to succeed. Project consultants determined that Egyptians are currently underutilizing alternative sources of energy. Earlier studies rarely based policy recommendations on a realistic capacity to transform ideas into visible outcomes. Thus, the CDM component of the CCRMP seeks to provide practical solutions that are sustainable and visible and that depend on local expertise and existing capacities. The program aimed at supporting projects in areas related to energy efficiency, solid waste management, transportation, etc...

Component Three: Forecasting and Integrated Water Resources Management Component

Available models predict that Climate Change could potentially affect the annual flow of the Nile River posing serious threat on the land available for agriculture, food security, and the economy at large.

A collaborative project was initiated between CCRMP, the Egyptian Government, and the United Nations, funded by the Millennium Development Goals-Fund (MDG-F), with the object to help the country mitigate and adapt to climate change. One of key focus of this project is to protect natural resources (land and water).

The Forecasting, and Integrated Water Resources Management (F & IRWM) component has been collaborating with the Ministry of Water Resources and Irrigation (MWRI), the National Water Research Center (NWRC), and UN agencies (UNDP, UNEP and UNESCO) to spearhead water adaptation efforts. These partners have supported the building of a Regional Circulation Model (RCM) for the River Nile to predict the impact of climate change on rainfall patterns and Nile flood. The Nile Ministerial Committee has approved the development of the RCM and the Nile Basin Initiative (NBI) is coordinating to develop a Water Resources Management Model and a Decision Support System for the river.

Component Four: Vulnerability and Adaptation of the Agricultural Sector Component

Several field experiments are studying the impact of water deficit on agricultural production of main cereal crops. The goal of those experiments is to expand agricultural capacity by informing farmers of more efficient resource use and protecting food security. With this knowledge, land available for cultivation can be expanded using crops that require the least amount of water for optimal yield by using the same water quantity; thus, we can conserve water, and expand agricultural space area. In addition, the Central Laboratory for Agricultural Climate uses advanced mathematical models to simulate the conditions of climate change and study the behavior of different plant varieties under different climate change scenarios. The results from this experiment will help to determine which crop varieties are most adaptable to higher temperatures.

The Climate Change Risk Management Program in Egypt supports these experiments, and the development of agricultural methods that ensure efficient use of land and water resources. Adaptation efforts are significantly important for eradicating poverty and ensuring environmental sustainability, two of the main millennium development goals. Consequently, we would manage the risks of climate change, conserve resource supply, and guarantee food security for our rising population.

3. Clean development mechanism in Egypt

The Egyptian government signed the Kyoto Protocol on the 15th of March 1999 and ratified it on the 12th of January 2005. As a signatory of the United Nations Framework Convention on Climate Change (UNFCCC), Egypt was and is still obliged to incorporate the actions of the UNFCCC within the actions of the NEAP. Also, due to the high vulnerability of Egypt to climate change, the country needed to address these issues seriously and sought the support of the international community to mitigate the impacts of climate change.

One of the mechanisms that emerged under the Kyoto Protocol was the Clean Development Mechanism (CDM). The goal of the Clean Development Mechanism is to develop and expand efforts to reduce GHG emissions and incorporate clean technology into development plans in developing countries. By expanding the CDM market, Egypt will be better equipped with the know-how and the infrastructure to implement national energy policies and support economic growth within the context of climate change.

The CDM component under the CCRMP began its operation with the establishment of the CDM Awareness and Promotion Unit (CDM APU). The CDM APU has helped to develop and expand projects that support an energy efficient economy and the use of Egypt's renewable energy potential. The EEAA contributed to this unit, and helped to expand CDM markets and pilot projects that support GHG abatement. The United Nations contributing agencies, UNIDO, UNEP and UNDP, liaised with the CDM APU, and other interested groups, to further expand the CDM market. The CDM APU provided practical solutions that are sustainable and visible and that depend on local expertise and existing capacities. The unit supported projects in areas related to industrial processes, energy efficiency, solid waste management, etc.

3.1 CDM institutional framework

The CDM institutional structure in Egypt can be grouped according to three distinctive functions: policy formulation and regulation, operational, and promotional as defined below:

3.1.1 Policy formulation and regulation function

The National Committee for Climate Change, Climate Change Unit, and the Egyptian Designated National Authority (CDM DNA) assume the policy formulation and regulation follow-up role. The National Committee for Climate Change was originally established in 1997. The committee is responsible for coordination, establishment, and communication of national policy on climate change. The Climate Change Unit was established in December 1999 under EEAA. The unit acts as the national focal point for coordination with UNFCCC of all climate change related activities and the development of the National Climate Change Action Plan in Egypt.

CDM Designated National Authority (DNA)

The Egyptian DNA was established by a decree issued by the Minister of State for Environmental Affairs on March 14, 2005 (Ministerial Decree No. 42 on 14/3/05). It is the entity responsible for all related CDM activities in Egypt. The main DNA tasks are as follows:

- Setting regulations for project evaluation and approval;
- Approve conformity of the project activity to CDM rules (the project is voluntary, satisfies additionally and contributes to Egypt sustainable development);
- Follow up on CDM project implementation and contact with Designated Operational Entity (DOE);
- Issuances of letters of no objection and approval for CDM projects.

The DNA is composed of dual structured unit

I. The Egyptian Council for CDM (EC-CDM) and

II. Egyptian Bureau for CDM (EB-CDM).

Figure 1 Egypt DNA Organizational Structure

The Egyptian Council for CDM (EC-CDM) comprises 13 permanent members representing all relevant Ministries and NGOs. The council is headed by the Minister of State for Environmental Affairs (MSEA). The primary role of the Egyptian CDM Council (EC-CDM) is to set national plans and policies, supervises the implementation of CDM process in Egypt, and suggests legislations and decisions to the government and official authorities. Internationally, it is the official counterpart to the CDM Executive Board and is the link agency with any potential international CDM stakeholders.

3.1.2 Operational function

The regulatory function is mandatory to comply with international regulations and is a prerequisite for CDM projects validation and certification processes. This regulatory function focuses on the evaluation and approval process of CDM projects and includes the annual reporting of activities. In Egypt, the Egyptian CDM Bureau of the Designated National Authority is located at the Climate Change Unit (CCU) in EEAA and acts as the Permanent Secretariat of the EC-CDM.

3.1.3 Promotional function

The promotional function is mainly related to CDM capacity building, marketing, and technical support.

Egypt's DNA previously was responsible to perform both the regulatory and promotional roles. However the CDM APU, an independent unit not located under the same organizational structure of Egypt DNA, was established in year 2009 in order to strengthen this role further.

4. CDM Awareness & Promotion Unit

4.1 Background

The Clean Development Mechanism Awareness and Promotion Unit (CDM APU) has been established since May 2009, under the activities CDM Component of the Joint Program of Climate Change Risk Management in Egypt (CCRMP) as a unit within the Egyptian Environmental Affairs Agency (EEAA). CCRMP has been receiving support of the UNDP-Spain Millennium Development Goals (MDG) Achievement Fund.

4.2 CDM APU mandate:

The CDM APU main role was to foster and promote CDM project development. The mandate of the CDM APU falls under five main categories as follows:

4.2.1 Building CDM National Capacity

I. To strengthen national CDM capacity through workshops and training programs to build local understanding of CDM projects identification and development, methodological issues, legal and contracting matters, monitoring procedures, and carbon finance options ;

II. Establishment of a comprehensive library that could feed into the development of the CDM-related clearing house (i.e., guidelines, manuals, fact sheets, success stories, audit reports, compliance action plans, pollution abatement action plans, and training material);

III. Development of technical capacity for CDM project development, screening, and evaluation;

IV. Development of the technical capacity required to assess project viability and conduct technical reviews of project proposals for governmental institutions and industries;

V. To keep CDM actors updated on international developments relating to CDM or affecting CDM.

4.2.2 Provide Technical Assistance "CDM Helpdesk"

I. To provide technical support to government offices and project proponents through all stages of the CDM project cycle from identification till monitoring stage;

II. To provide technical support for the development and promotion of at least 3 program of activities (PoAs) including identification of targeted sectors, establishment of the program and supporting the coordinating entity throughout the program;

III. To provide support for the development of technical documentation for newly identified projects and CDM projects that were listed in the investment portfolio, primarily approved by the DNA but in need of technical support;

IV. Review and assess the quality of CDM project documents, in particular the CDM PIN and Project Design Documents,;

V. To identify the country's CDM reduction potential through detailed feasibility studies in the energy, industry, waste, and transport sectors ;

VI. Define national baseline data to unify information utilized by project proponents (i.e., national electricity grid factor).

4.2.3 Financial and Legal Support for CDM Projects

I. Identify, develop and maintain relationships with third party financing institutions which may invest in carbon projects;

II. To include CDM opportunities in the 'National Investment Plan' and in its national promotion strategy design;

III. Develop and maintain guidance tools, financial models, templates and procedures for the financial due diligence of carbon projects;

IV. Engage directly with the financial and business aspects of project development work, including overseeing and guiding carbon projects on their financial modeling and business planning;

V. Identify innovative mechanisms for sharing project development costs and to use the carbon contract as a vehicle to obtain financing for CDM projects;

VI. Liaise with the Ministry of Investment to provide assistance and respond to requests of foreign and local investors and developers involved in the identification and development of project proposals;

VII. Coordinate with other institutions to obtain funds for capacity building and awareness activities.

4.2.4 Setting Mechanisms for Cooperation

I. To create and administer a national database with relevant information about project portfolio and partner information (i.e., investors, CER buyers, project developers, DOE, capacity building institutions, status of international negotiations, etc.);

II. Set the internal mechanisms for cooperation and coordination in the related EEAA departments as they are essential for information exchange and for joint planning activities in the future.

4.2.5 Support CDM Policy Making and Regulatory Organizations

I. Support liaison with other agencies, permits and licensing authorities to facilitate approval procedures for project proponents (i.e., EEAA for EIA approval, DNA for host country letter of approval, etc.);

II. To provide inputs to the formulation of the CDM policy, action plan, and marketing strategy on the request from Egypt CDM Council EC-CDM (i.e., assessment of needs for capacity building and assessment of CDM potential);

III. To assist Egypt CDM Bureau (EB-CDM) in monitoring the implementation of CDM projects after the host country approval has been given;

IV. To assist the Egypt CDM Bureau (EB-CDM) in updating CDM portfolio and project activities in the national website;

V. Internal reporting to Egypt CDM Council EC-CDM on performance assessment of the CDM APU to evaluate the effectiveness of each CDM intervention;

VI. Coordinating with line ministries and governmental agencies to support the Egypt CDM Council EC-CDM in the preparation of position papers for Egypt on CDM (COP/MOP) and representing Egypt in international meetings and conferences in this field.

4.3 CDM APU organizational structure

CDM Awareness and Promotion Unit (CDM APU) was established in 2008 within the Environmental Quality department of the Egyptian Environmental Affairs Agency (EEAA) as illustrated in Figure 2 below.

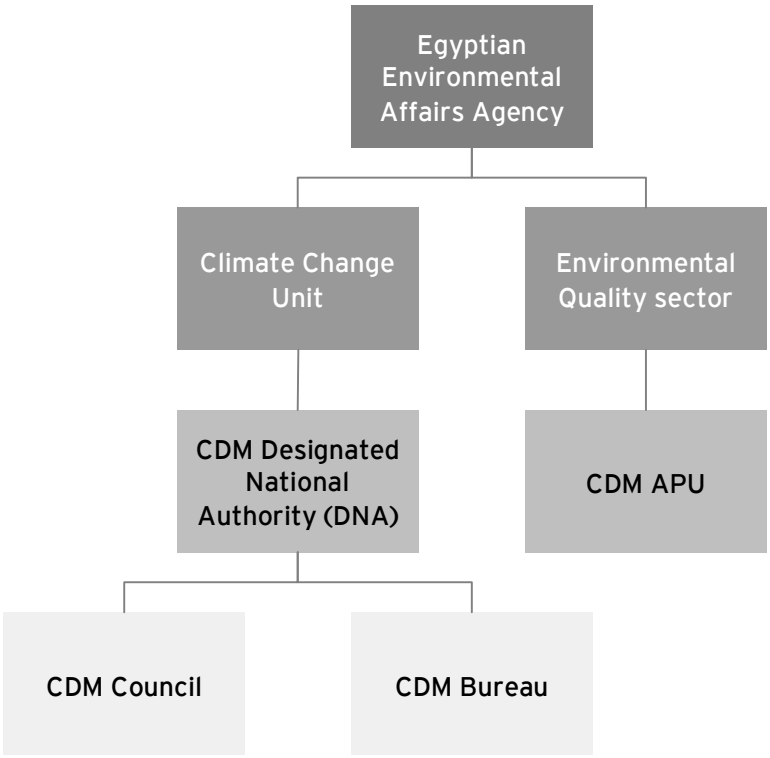


Figure 2 CDM APU within EEAA

The CDM APU is supported by the MDG programme as the implementing arm of the CDM component of the program. It is supervised by the Programme Management Committee headed by EEAA CEO as shown in Figure 3 below.

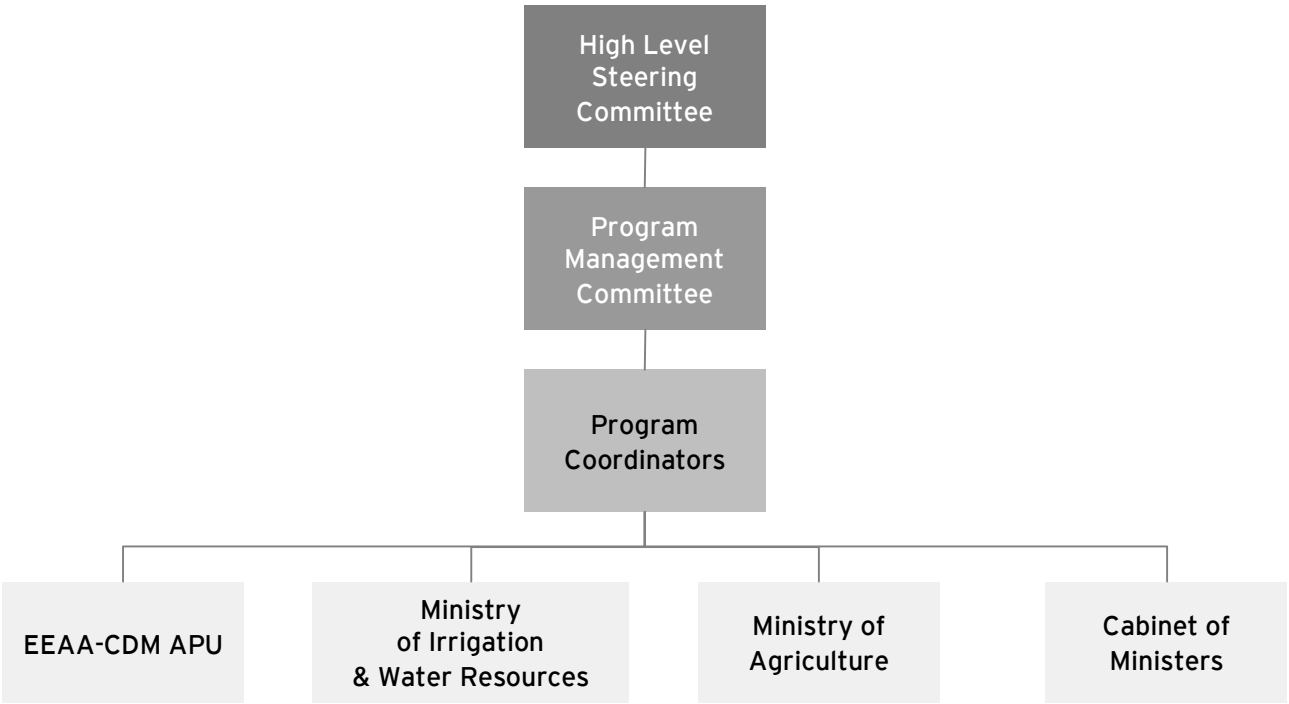


Figure 3 CDM APU within CCRMP

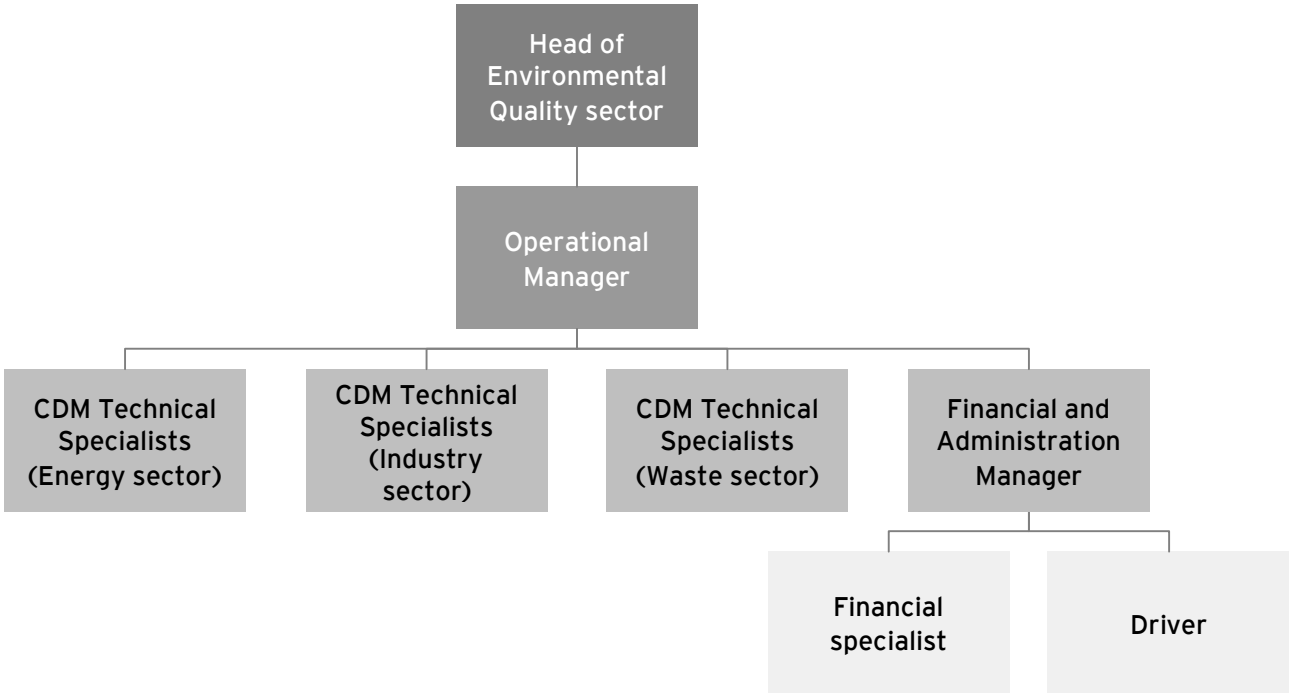


Figure 4 CDM APU Structure

4.3.1.1 Roles and responsibilities of the CDM APU Staff

Operational Manager (OM)

General description: The operational manager is responsible for managing the CDM APU promotional activities.

Key responsibilities:

I. Providing strategic direction for the CDM APU, managing activities throughout various stages of the project cycle, high-level liaison, monitoring and evaluation and managing the CDM APU team.
II. Manage budgets for program work under your direction.
III. Track expenses and allocate staff time against available resources.
IV. Ensure that deliverables are finalized and delivered on deadline.
V. Set goals and conduct performance reviews.

CDM technical Specialists (Energy, Industrial and waste sectors)

General description: As a key member of the CDM APU Technical Team, he is responsible for technically evaluating and developing CDM project opportunities for targeted sectors (Energy, Industry, Waste, or Transportation) to achieve the unit goals. In this role he performs CDM technical evaluations and follow-up the processes to get UNFCCC approval and the overall successful registration and certification of CDM projects in Egypt.

Key responsibilities:

I. Compilation of technical reports and the associated documents
II. Evaluation of technical proposals
III. Estimation of emission reductions, project economics, and other technical calculations
IV. Conduct project preliminary evaluation and screening
V. Carry out the necessary procedures to support project owners to obtain governmental approvals.
VI. Keep in constant contact with project owners during project development.

VII. Preparation of technical presentations, present work, and face to face discussions with CDM stakeholders.

VIII. Provide necessary support and follow up of assigned projects or tasks.

Financial and administration Manager (FM)

General description: The FM is responsible for Administer and manages the unit Budget.

Key responsibilities:

I. Prepare and submit all the statements/reports required in respect of the project by UNIDO, UNEP and UNDP

II. Consolidation of the monthly actual expenditure

III. Comparison of the budgeted and actual expenditure on quarterly basis

IV. Prepare the arrangements needed for organizing seminars

V. Responsible for all the administration issues

Financial specialist

General description: The Financial specialist is responsible for assisting CDM APU team in their day-to-day administrative and financial activities.

Key responsibilities:

I. Helping in the administration of the office works,

II. Assisting in the preparation and revision of financial issues,

III. Giving a hand in the preparation of workshops and trainings

4.4 CDM APU Activities and Projects

One of the CDM APU mandates is to provide technical assistance to project proponents through all stages of the CDM project cycle. The CDM APU technical staff provided this technical support for new projects, project in validation and also registered projects.

The CDM APU has assisted more than 50 projects by carrying out technical assistance including Project Idea Note (PIN) preparation, obtaining letters of no objection and letters of approval, PDDs preparation, validation, registration, and verification support. Once implemented, these projects are expected to achieve annual GHG emission reductions of approximately 4.7 million tCO2e. The CDM projects portfolio is included in Annex I. Figure 5 below provided share of GHG reduction (or CERs) by sectors through the CDM APU supported CDM projects.

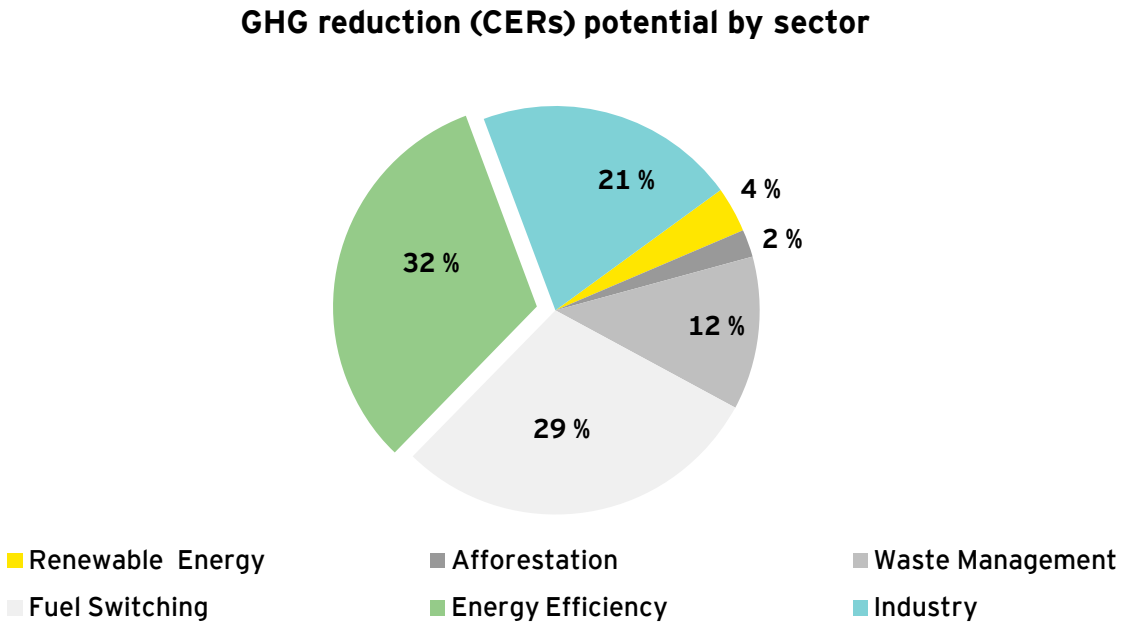


Figure 5 GHG reduction (or CERs) percentage by sector from CDM APU supported CDM Projects

4.4.1 Status of CDM projects prior to CDM APU establishment

- When the CDM APU was established in May 2009, around 13 projects were in the CDM process, hanging in the validation stage for a long time due to various barriers / problems.
- The CDM- APU followed up and assisted these projects to get registered and also has supported these projects in monitoring and verification stages. For example, CDM APU coordinated with the Egyptian DNA to accelerate registration of the Egyptian Brick Factories GHG Reduction Project by resolving the disputes between the project parties and send a supporting letter to the UNFCCC in order to support project registration
- CDM APU supported CEMEX in CDM project monitoring by training the staff on monitoring and verification issues
- As a result of CDM APU support, seven of the projects were registered in the period from 2010 to 2012 with total annual emission reductions potential of about 3 million tCO2e/year.
- Two of the projects are under validation and other two have been canceled for not meeting the CDM requirements.

4.4.2 Standalone projects

The CDM APU has been successful in spreading CDM awareness and in promoting CDM projects. With only 4 registered projects till the year 2009, the CDM APU started pursuing the projects under CDM cycle and also identified several new opportunities through the awareness and promotion program. As a result, currently there are around 50 CDM projects in the CDM APU pipeline, out of which, 17 projects have been registered, as listed in Table 1 below and another 8 requested registration as presented in Table 2. Since these 8 projects have requested registration before 31 December 2012, the resulting emission reductions will be eligible for trading under the EU Emissions Trading Scheme (EU-ETS). Table 3 presents CDM projects that are currently under validation. The projects include both standalone projects and programme of activities. These figures clearly state the CDM APU's positive impact on the CDM status in Egypt.

Table 1 Registered CDM Projects

No	Project	Registration Date	Expected emission reduction (K tCO2e/year)
1	Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.	07 Oct 06	1065
2	Onyx Alexandria Landfill Gas Capture and Flaring Project	15 Dec 06	370
3	Zafarana Wind Power Plant Project	22 Jun 07	248
4	Waste Gas-based Cogeneration Project at Alexandria Carbon Black Co., Egypt	26 Jul 08	109
5	Zafarana KfW IV Wind Farm Project 80 MW (NREA-Germany)	2 March 2010	171
6	Egyptian Brick Factory GHG Reduction Project	14 July 2010	430
7	Zafarana 8 - Wind Power Plant Project, Arab Republic of Egypt 120 MW (NREA-Denmark	23 Sept. 2010	209
8	Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues in CEMEX Assuit Cement Plant	17 Jan 2011	416
9	Fuel Switching from Mazout to Natural Gas in Misr Fine Spinning & Weaving and Misr Beida Dyers at Kafr El Dawar	19 Jan 2011	45
10	Zafarana 85 MW Wind Power Plant Project	8 Aug 2011	170
11	Egypt Vehicle Scrapping and Recycling Program	30 Jan 2011	0.02
12	Al-Sindian 13 MW Natural Gas based Cogeneration Package Project.	10 Feb 12	25
13	Reduction of N2O emissions from the new nitric acid plant of Egypt Hydrocarbon Corporation at Ain Sokhna	18 Oct 12	251
14	Programme for Grid Connected Renewable Energy in the Mediterranean Region	29 Oct 12	NA
15	Land Filling and Processing Services for Southern Zone in Cairo	29 Oct 12	76.6
16	International water purification programme	16 Nov 12	NA
17	N2O and NOX Abatement Project at KIMA Fertilizer Plant in Aswan	20 Dec 12	120.6
Total			3706.22

Source: UNFCCC, February 2013

Table 2 CDM Projects Requesting Registration

No	Project	Expected emission reduction (tCO2e/year)
1	N2O Abatement at Semadco (Egypt)	211,341
2	Gas Flare Recovery at Suez oil processing company, Egypt	128,447
3	Partial Fuel Switching to Agricultural Wastes & Refuse Derived Fuel (RDF) at Kattameya cement plant	30,748
4	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF) at Helwan cement plant	39,753
5	Fuel Switching from Mazout to Natural Gas in Quena Paper Industry Co. (QPIC)	59,003
6	Fuel Switching from Mazout to Natural Gas in Misr Edfu Pulp, Writing & Printing Paper Co. (MEPPCO)	31,749
7	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF) at Arabian cement plant	66,602
8	N2O and NOX Abatement Project at Delta-ASMEDA Fertilizer Plant in Al Mansoura (Egypt)	176,132
9	PoA for fuel switching at micro and small-sized enterprises in Egypt	155
Total		743,930

Source: UNFCCC, February 2013

Table 3 Projects under Validation

No	Project	Expected emission reduction (tCO2e/year)
1	Naga Hammadi Barrage Small Hydropower Project	183,138
2	Naga Hammadi Barrage Hydropower Project	249,867
3	Waste heat recovery based Cogeneration project at Abu Zaabal Fertilizers and Chemicals Company	54,679
4	Fuel Switching at the National Cement Company (NCC), Tebbin, Egypt	306,481
5	Abu Zabal Landfill Gas Recovery and Flaring/Destruction Project	94,819
6	Waste Heat Recovery projects for gas turbine generators	64,810
7	Reduce the Share of Clinker in the Production of a Blended Cement Type at the National Cement Company (NCC)	66,197
8	Network Energy Optimization	7,976
9	Advanced Energy Solutions for Buildings. Programme of Activities (PoA)	NA
10	Programme for Grid Connected Renewable Energy in the Mediterranean Region	NA
11	Renewable Power Advancement Programme	NA
12	Small-Scale Renewable Electricity Advancement Programme	NA
13	Renewable Energy Programme of Activities in Middle East and North Africa	NA
14	Energy Optimization Solutions for Industries in Pakistan, UAE and Egypt – Program of Activities	NA
15	PoA for small scale renewable energy development in Egypt	47
16	PoA for Water Pumping Efficiency Improvement and Rehabilitation for Egyptian Pumping Stations	8,610
17	For Stoves Programme of Activities	NA
18	EcoProfitableTM Lighting Africa by ENERCAP SAS	NA
Total		1,036,624

Source: CDM APU, February 2013

The CDM APU has identified and supported 50 successful standalone CDM projects. These projects were initiated and pursued by the CDM APU team for 36 different companies. These projects are considered the bulk achievement of the CDM APU efforts since its establishment.

Table 4 below presents these projects along with the projects status, company name, and the CDM APU role in each project.

Table 4 CDM APU Standalone Projects

SN	Company name	Project title	Project status	CDM APU role
1	The Egyptian Chemical Industries Company(KIMA)	N2O abatement	Registered	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing ► Validation and registration support
2	Arab Abu Saad Brick factories.	Egyptian Brick Factory GHG Reduction Project	Registered	► Registration support

SN	Company name	Project title	Project status	CDM APU role
3	CEMEX Assuit Cement Plant	Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues	Registered	► Registration support ► Monitoring and verification support ► Support in CERs marketing. ►
4	Misr Fine Spinning & Weaving and Misr Beida Dyers at Kafr El Dawar	Fuel Switching from Mazout to Natural Gas	Registered	► Validation and registration support ►
5	Ministry of Finance	Egypt Vehicle Scrapping and Recycling Program	Registered	► Registration support ► Monitoring and verification support
6	New & Renewable Energy Authority (NREA)	Zafarana 85 MW Wind Power Plant Project	Registered	► Support with CERs marketing.
7	Delta fertilizer	N2O abatement	Requesting registration	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing ► Validation and registration support
8	Qena paper company	Fuel switch from Heavy Fuel Oil (HFO) to Natural Gas	Requesting registration	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing ► Validation and registration support
9	Misr Adfou paper company	Fuel switch from Heavy Fuel Oil (HFO) to Natural Gas in Misr Adfou paper.	Requesting registration	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company with the contracting phase ► Support the CDM investor with the PDD writing ► Validation and registration support
10	Kattameya cement plant	Partial Fuel Switching to Agricultural Wastes & Refuse Derived Fuel (RDF)	Requesting registration	► Validation and registration support
11	Helwan cement plant	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF)	Requesting registration	► Validation and registration support
12	Arabian cement plant	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF)	Requesting registration	► Validation and registration support

SN	Company name	Project title	Project status	CDM APU role
13	Suez Petroleum Company	Flare Gas recovery	Requesting registration	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing ► Validation and registration support
14	El Nasr Company for Fertilizers & Chemical Industries(SEMADCO)	N2O abatement	Validation	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing ► Validation and registration support
15	Egyptian liquefied Natural gas (ELNG)	Waste Heat Recovery in gas turbine generator	Validation	► PIN preparation ► Capacity building for company staff ► PDD writing support ► Validation and registration support
16	Suez steel	Introduction of Hot Direct Reduced Iron (DRI) into Electric Arc Furnace (EAF)	Validation	► PIN preparation ► New methodology preparation support ► Validation support
17	Hydro Power Plants Executive Authority (HPPEA), Kreditanstalt für Wiederaufbau (KfW)	New Assiut Barrage and Hydropower Plant Project	Validation	► PIN preparation ► Validation support
18	Sugar and integrated Industries	Fuel switch from Heavy Fuel Oil (HFO) to Natural Gas in 7 factories.	Letter of no objection, PDD writing	► Prepared 7 PINs ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors ► Support the company in the contracting phase ► Support the CDM investor in the PDD writing
19	Sinai White Cement	Waste Heat Recovery project	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors ► Support the company to choose the suitable technical and financial offers from the investors
20	Lafarge Cement Egypt	Fuel switch from Natural Gas to Biomass	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
21	PepsiCo Egypt	Fuel switch from Natural Gas to Biomass in (7 factories)	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
22	Arab Organization for Industrialization.	Electricity generation from solar power	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors

SN	Company name	Project title	Project status	CDM APU role
23	Khalda Petroleum Company	Waste Heat Recovery	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
24	Greater Cairo Drinking-Water Co	Energy Efficiency Consumption in 7 pumping station	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
25	Egyptian iron and Steel Company	Rehabilitation for Blast Furnace	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
26	Egyptian iron and Steel Company	Rehabilitation for Sinter Plant	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
27	Amerya Cement	Fuel switch from Natural Gas to Biomass	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
28	El Nasr for batteries	Fuel switch from Heavy Fuel Oil (HFO) to Natural Gas	Letter of no objection	► PIN preparation
29	UOSCO	Electricity generation from Biomass in El Sadat city	Letter of no objection	► PIN preparation
30	Egyptian Environmental Affairs Agency	Greening of 14 Km around the Ring Road	Letter of no objection	► PIN preparation
31	International City Cleaning Co.(ICC)	Methane capture from ICC landfill in Zagazig	Letter of no objection	► PIN preparation ► Promote and propagate for the projects to the CDM investors
32	ANRPC Petroleum Company	Flare Gas recovery	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
33	Arab Organization for Industrialization.	Electricity generation from wind farm	Letter of no objection, Feasibility study	► PIN preparation ► Promote and propagate for the projects to the CDM investors
34	Waste Water Treatment Plant in Alexandria.	Anaerobic Digestion of Sludge	Letter of no objection	► PIN preparation ► Promote and propagate for the projects to the CDM investors.
35	Elkharafy Group	Electricity generation from wind farm in Marsa Allam	Letter of no objection, Feasibility study	► PIN preparation
36	AMA Arab	Methane capture from Kattamyia Landfill	Letter of no objection	► PIN preparation ► Promote and propagate for the projects to the CDM investors

4.4.3 Projects under Program of Activities (PoAs)

The CDM APU mandate includes developing, at least, three Programmes of Activities (PoAs) to support the small scale project developers. The activities included identification of targeted sectors, establishment of the programs and supporting the coordinating entities throughout the programs. In this regard CDM APU has engaged six short term national consultants under the supervision of an international consultant to carry out rapid survey of the key sectors in Egypt with the aim of facilitating the assessment of the potential for CDM project activities in the following sectors including Industries, water sanitation and irrigation, municipal waste, agricultural wastes, oil gas and petrochemicals and Green buildings.

The CDM APU identified four projects that could be considered under CDM program of Activities. One of the PoAs already requested registration under the UNFCCC while other three are either in validation or PDD development stages. These projects are presented in Table 5 below:

Table 5 Projects under Program of Activities (PoAs)

SN	Project title	Coordinating and Managing Entity (CME)	Project status	CDM APU role
1	Shifting from Traditional Open-Pit Method to Mechanized in Charcoal production in Egypt.	CDM APU	PDD writing	► Supervised two technical and economic feasibility studies for the project ► Supervised and funded the CDM cycle development of the PoA. Currently, the project design document is being finalized ► Overcome one of the CDM project barriers by purchasing a laboratory kiln for measuring the methane emission factor as per the CDM methodology requirements
2	PoA for Small-scale Renewable Energy Development in Egypt	CDM APU and ERCCC (private Entity)	Validation	► Supervised and funded the CDM cycle development of the PoA
3	PoA for Water Pumping Efficiency Improvement and Rehabilitation for Egyptian Pumping Stations.	CDM APU and Mechanical & Electrical Department under the ministry of irrigation.	Validation	► Supervised and funded the CDM cycle development of the PoA
4	PoA for Fuel Switching at Small and Medium Enterprises (SMEs) in Egypt	CDM APU	Requesting registration	► Supervised and funded the CDM cycle development of the PoA

4.5 Capacity building and training activities:

4.5.1 Capacity building workshops

In order to enable the CDM APU to deliver the intended outputs, several workshops and training sessions were conducted for more than 250 CDM stakeholders under the MDG-F & GIZ program. CDM APU provided the logistical support for the programs including sending invitations, arranging the venue and other related administrative arrangements. In addition, the CDM APU developed and distributed the training material which included electronic versions of the presentations and other corresponding training materials. Table 6 below presents the training courses facilitated by the CDM APU as well as the content covered in each workshop. The details of major training programs and workshops are provided in Annexure-II.

Table 6 Training courses facilitated by the CDM APU

Course name	Number of attendees	Topics covered
PIN Preparation according to the criteria adopted at the National Office of Clean Development Mechanism	12	► An Introduction to CDM APU and its activities ► Vehicle Scrapping and Recycling Program ► Description of the Small-Scale Program of Activities (PoA) ► Monitoring of the Vehicle Scrapping and Recycling Program ► Description of the monitoring plan ► Sampling Plan ► Procedures for Administering Data Collection ► Other Monitoring Activities
Advanced training on CDM and PDD preparation	10	► Introduction to CDM; Potential CDM Opportunities in Cement Sector; Description of the monitoring plan ► Procedures for Administering Data Collection; Other Monitoring Activities; Verification methodology

Course name	Number of attendees	Topics covered
Certified Energy Manager	18	► The Needs for Energy Management; Energy Sources & Norms; Fuel types and Rate Structure; Conducting an Energy Audit; Economic Analysis and LCC; Electric System & Motors; Lighting Basics & Lighting System Improvements; Insulation; HVAC Basics and HVAC System Efficiency Improvements; Boiler & Thermal Systems Improvements ► Waste Heat Recovery & Cogeneration; Maintenance ► Controls; CEM Examination Sample Questions
Contracting and other legal issues in the CDM cycle	10	► CDM project cycle from a legal perspective; The Actors – Roles of the key entities involved in a CDM project and how they are interlinked; Legal issues related to interaction of these stakeholders; Structuring and financing a CDM project; Domestic Legal Issues to be considered; Contracting Perspective; The ERPA terms
Introduction to NAMAS	10	► NAMA concept; Emission reduction potential; NAMA boundaries and MRV; Source of Finance; ODA lesson learnt; From PoA to NAMA; Group work- Egyptian NAMA
GHG Auditor Training Course	15	► General Aspects of climate Change; Basic knowledge Kyoto/JI/CDM; EU ETS Emission Trading Scheme; Validation Process; Project Design Document; UNFCCC website (interactive); Baseline Assessment; Additionality; Financial Analysis model (CF) ; Monitoring Plan; Verification Process ; Monitoring Report Template ; Validation Report; Verification Report; Self study – Working with PDD; Program of Activities; GHG Audit Techniques ► Information sources for CDM; TN Ethical Standards; ISO 14064 Awareness
Estimation and Methodologies of GHG emissions in industrial sector	18	► Greenhouse Gas Emissions Inventory; Inventory of GHGs from the Industrial Processes and Product Use (IPPU); Utilization of the GHGs Emission factors database (EFDB), IPCC; Overview of the Methodologies for developing GHGs inventories; Common methodologies and tools for identifying/assessment of CDM projects in industrial sector; Case study on estimating GHGs emissions from the cement production
Estimation and Methodologies of GHG missions in Waste sector	25	► Overview of Waste types generation and management data in Egypt; Level and trends in GHG emissions from Waste sector in Egypt; Emissions from landfills; Solid waste disposal; Utilization of the GHGs Emission factors database (EFDB), IPCC; Overview of the Baseline and Monitoring Methodologies in waste sector; Case studies
GHG Accounting and Carbon Footprint Reporting	9	► Basic concept of climate change and greenhouse gases ► Business implication of climate change (Case Studies) ► International actions on climate change – Carbon Markets ► New Market Mechanisms and NAMAs ► Greenhouse gas accounting and reporting approach ► Organizational level accounting ► Product level accounting ► Low carbon transformation ► Basics of Energy Management Systems as per ISO 50001

4.5.2 Awareness workshops for CDM projects:

In addition, more than 10 Awareness Workshops were conducted by the CDM APU team to identify CDM opportunities covering different sectors including cement, fertilizer, oil and gas, petrochemicals, food and beverage, pulp and paper, municipal solid waste, iron and steel, spinning and weaving, aviation and co-generation in industrial sector.

The main objective for the awareness workshops was to create awareness, build capacity, and identify CDM Opportunities in different sectors. Therefore, participants from various entities were invited to attend these training workshops. The participants included more than 350 delegates representing the following entities:

Table 7 Workshops Participants and Topics

Entities participating in the awareness workshops	Key topics covered in the workshops
► CDM APU ► CDM General Department/DNA ► Federation of Egyptian Industries – Environmental Compliance Office ► EEAA ► National cleaner production centre ► Ministry of Electricity ► New and Renewable Energy Authority (NREA) ► Private and public companies ► Ministry of petroleum ► Ministry of transport ► Ministry of Aviation ► Ministry of Industry; ► Ministry of investment ► National and International Consultants ► Governorates ► International donors	a. CDM Opportunities in each Sector: ► CDM Overview ► GHG gases ► Kyoto Protocol three flexible mechanism ► CDM project cycle ► CDM eligibility criteria ► Additionality b. GHG Sources in different sectors c. CDM Methodologies in each sector d. Case Studies

4.5.3 Participation in international forums:

1. Africa Carbon Forum, Republic of Kenya- Morocco in March 2010 and July 2011:

The CDM APU represented Egypt in Africa Carbon Forum. Their role included matchmaking and deal facilitation sessions that enabled potential CDM project participants and developers to showcase their projects to interested parties, including investors and carbon buyers.

2. Carbon Expo World Forum, Germany- Spain in May 2010, June 2011and June 2012:

Carbon Expo World Forum was a global trade fair and knowledge-sharing platform on current and future carbon investments. It was a meeting place for large and small companies operating in the CO2 market, as well as government representatives and climate experts interested in the latest CO2 projects and climate developments.

The CDM APU made a great effort to show the Egypt is a pioneer in the African and Middle East region for the CDM activity. It also worked to identify possible investors, buyers or developers for CDM projects.

Also, since the CDM APU is keen to increase the number of registered projects in Egypt's portfolio, it played a vital role in aiding private and public companies to participate in the forum. By aiding them in their CDM projects, facilitate finding investors and aiding in the communications process. Some of these companies include the Egyptian Liquefied Natural Gas Company (ELNG), CEMEX, NREA, and Egyptian General Petroleum Corporation (EGPC), etc.

3. Kick-off Workshop for the capacity Building in PoA in the MENA region, Morocco, October 2010:

Egypt is a leading country in terms of PoA Projects in different sectors in the MENA region. The CDM APU participated in this Workshop to highlight Egypt's unique projects in scrapping and recycling greater Cairo taxies POA project.

The CDM APU cooperated with the Ministry of Finance to show Egypt's active role in validating and registering that projects as well as Egypt's willingness to guarantee the sustainable development of such project.

The MENA Region countries took this event as a kickoff for upcoming workshops to utilize each other's experiences in PoA projects.

4. Workshop on Programme of Activities under the CDM: Challenges and the Road Ahead", at Bonn, May 2011

The CDM APU Participated in this event to clarify and present some information about Egypt's Vehicle Scrapping and Recycling project as a programme of activity (PoA) project.

The CDM APUs presentations contributed significantly to persuade the UNFCCC Executive Board regarding the importance of the project and how this project contributed towards the sustainable development of Egypt. This then lead to the registration of the project.

4.6 Success stories

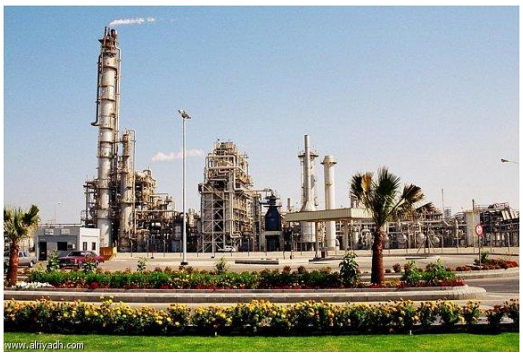
This section provides the details of few successful cases where CDM APU has supported in closing the CDM cycle and in implementation of the projects.

CASE-1: Three N2O abatement projects

Project owner: KIMA/Delta Fertilizers/Semadco Fertilizers

Project objective: The three projects aimed at reducing N2O emissions through thermal decomposition of N_2O as well as to reducing NO_X emissions.

Project description:



The fertilizer plants operated by Kima, Delta, and Semadco produce nitrogenous fertilizers. The plants emit around 1,500 tons of N2O during 7,920 hours of operation annually (with daily nitric acid production capacity of 1,100 tonnes).

Also, the current NO_X emissions in KIMA and Delta were more than twice the allowable concentration by the Egyptian regulations. The project involved installing a special type of Regenerative Thermal Oxidizer (RTO). This RTO has been designed by CTP, the technology provider, to facilitate the thermal decomposition of N2O. The chemical reaction takes place in the combustion chamber, where high temperatures destroy all volatile organic compounds (VOC) as well as N2O emissions. It's worth mentioning that the reaction takes place without any catalyst, hence not affecting the quality of fertilizers.

- Emission reductions: 560,000 tCO2/year
- Total Estimated Investment: 12 million US$

Contribution to sustainable development:

Environmental benefits: Significant reduction in the emissions of Greenhouse Gases, particularly potent greenhouse gas N2O, and reduction of harmful NOX emissions.

Social benefits: Additional income from carbon credits will be utilized for the improvement of work conditions at the plant.

Economic benefits: Fertilizers production cost reduction through additional income from carbon credits

Technology benefits: The technology applied is considered a state of art technology which is introduced to the industry in Egypt for the first time.

Challenges faced by the companies: KIMA, Delta, and Semadco projects were on hold because they signed contracts with the CDM developer/investor in 2008. However, the developers were not interested in pursuing the projects since they were not convinced with projects feasibility.

Support from CDM APU:

- Restudied the project technically and financially and concluded that the projects were feasible using different technologies
- Convincing the companies' administration to proceed with CDM cycle again. The main reason behind the companies approval to proceed with the project was that the new technology will not involve any catalyst or process diversion in the plants
- Prepared the RFP for the N2O project
- Assisted the companies in the evaluation of the proposals and contracting with the qualified consultant
- Re-negotiated the deal between the plants and both the CDM developer and technology supplier in order to cover all equipment and CDM cycle costs
- Assisted the consultant in data collection, national approvals, PIN &PDD preparation, and validation/registration support

Current status of the project:

Kima project has been registered and Deta fertilizer project successfully submitted request for registration and expected to be registered by March 2013, while semadco project still in validation.

CASE-2: Waste heat recovery from gas turbine generators (GTG) project

Project owner: Egyptian Liquefied Natural Gas (ELNG)

Project objective: The project aims to reduce the GHGs generated from the fuel gas burning in the hot oil heaters by partially stopping oil heaters (heat generators) operations and utilizing the heat generated from the flue gases of GTGs to heat the hot oil instead in order to obtain the heat duties required by heat consumers.

Project description:

Hot oil system is a closed loop circulation system designed to supply the process heating duties. The System contains two parallel hot oil heaters, each heater is designed to provide 50 % of the production train duty, the fuel gas is provided to the heaters from low pressure fuel gas system. Hot oil is heated in the heaters from an inlet temperature 131 C to outlet temperature 246 C. Outlet hot oil temperature is controlled by the fuel gas supply. ELNG electric power generation system consists of four gas turbine generators (GTGs). Each GTG is rated at 14.5 MW with exhaust gas flow is around 63 kg/s while the exhaust gases temperature is around 356 C.

New Waste heat recovery units will be installed in the exhaust gases from the four GTGs to heat up the hot oil to the required temperature. After new project operation; there will be saving in the energy lost with GTGs' exhaust gases that will lead to increase plant thermal Efficiency and reduce emission from burning of fuel for the oil heaters operations.

- Estimated emission reductions: 68,000 tCO2/year
- Total Estimated Investment: 8 million USD

Contribution to sustainable development:

Environmental benefits: The project saves fossil fuel and thus reduces GHGs emissions as compared to baseline. Further by recovering waste heat, thermal pollution at the vicinity of the plant is avoided.

Economic benefits: The project will reduce fuel consumption which maximizes the quantity of gas liquefied and reduce the time to liquefy the contracted amount of gas along the project life time.

Social benefits: The project helps to improve the livelihood of local people by creating new job opportunities, establishment of new public gardens, completing the solid waste management system in Idku, and upgrading the youth centers.

Support from CDM APU:

- Studied the project technically and financially
- Provided capacity building for ELNG staff
- Establishing a work group between CDM APU and ELNG to develop the project design document
- Assisted ELNG to hire an international expert to revise the PDD
- Provided support for conducting a pre-validation exercise
- Support during validation and registration

Current status of the project: The project is currently under validation and expected to be registered by May 2013

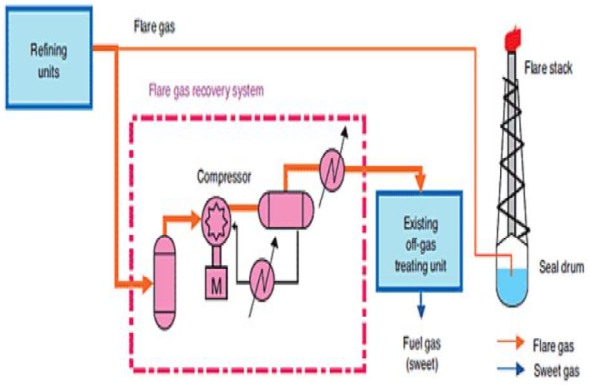
CASE-3: Flare gas recovery project

Project owner: Suez Oil Processing Company (SOPC)

Project objective: Recovery and utilization of waste gas currently flared in the SOPC refinery.

Project description:

The SOPC refinery is operating since 1921 producing petroleum products. In normal operating practices the off gases are flared in two flare headers, one from distillation and lube oil section and other from the Coker and reformer section. The flow of flared gases is approximately 10 tons/hr. In the project activity, flared fuel gases will be recovered and used as fuel in the fuel gas system. The project activity will save the fossil fuel which would have been used leading to consequent GHGs reduction.



- Total Estimated investment: 5 million USD
- Estimated emission reductions: 128,000 tCO2/year

Contribution to sustainable development:

Environmental benefits: The waste gas recovery system leads to decreasing the flaring process and most importantly decreasing in the use of fossil fuels. Consequently, the project reduces NOx and SOx, which are directly related to local air quality. The project also implies a significant consideration for environmentally sound operations, and might improve awareness and management of other pollutants.

Economic benefits: The project reduces the demand for natural gas and other fossil fuels leading to natural resources preservation.

Social benefits: The project has positive impact on the living conditions of employees residing close to the plant area. Furthermore, reduced local air pollution is expected to have a positive impact on animal life in the plant area.

Technological benefits: The project is the first of its kind in Egypt which will help spreading the new technology in other refineries

Challenges faced by the company: The project is the first of its kind in Egypt. Consequently, the company faced a lot of problems finding the suitable technology and convincing SOPC management with developing the project.

Support from CDM APU:

- Studied the project technically and financially
- Capacity building for the SOPC staff
- Developed the project Idea Note
- Promoted the project to the CDM investors
- Supported the company to select competent technical and financial proposals from the investors
- Supported the company in the contracting phase
- Supported the CDM investor in the PDD writing
- Provided validation and registration support

Current status of the project: The project successfully submitted request for registration and expected to be registered by April 2013.

CASE-4: Charcoal programme of activities

Project owner: Various kiln owners

Project objective: The proposed Programme aimed at reducing methane emissions by controlling the gases generated during the charcoal carbonization process. This is achieved by shifting from traditional open-pits production process to mechanized process by installing mechanized controlled kilns. The mechanized charcoal kilns involve refuelling the carbonization gases, which includes methane, to be Combusted as a fuel in the controlled kilns. According to the applicable UNFCCC methodology AMS III-K, other gas utilization and/or Destruction alternatives like flaring and electricity generation are also valid options. About 900 Traditional kilns will be replaced by mechanized ones.

Project description:

Currently, there are around 942 open charcoaling pits (Traditional Open Pits – TOPs) operating in Egypt. Operation of these TOPs leads to the situation when many harmful pollutants are being emitted to the atmosphere: methane (CH4), carbon monoxide (CO), nitrogen oxides (NOx), solid particles, tar, formaldehyde, phenols, hydrocarbons, and volatile organic compounds. In addition, emissions resulting from the TOPs operation are considered one of the main contributors to the "black cloud episodes" during the autumn seasons in Great Cairo region.

Through one of the initiatives, Government of Egypt is aiming at replacement of the existing traditional "open pit" charcoaling process by the mechanized kilns. This initiative provides financial support from the government including, the contribution from the CDM component, subject to the project registration and development under UNFCCC CDM rules. In addition, the CDM APU assisted the EEAA to introduce another financial mechanism through the Environmental Protection Fund (EPF) and Egyptian National Banks.

- Estimated emission reductions: 200,000 tCO2e/year
- Total Estimated Cost: The kiln cost is approximately 45,000 US$. Approximately 900 Kilns will be replaced. Therefore, total project cost is estimated at 40,500,000 US$.

Contribution to sustainable development:

Environmental benefits: The project will lead to reduction in methane (CH4) emissions generated as a result of the charcoal carbonization process. Also, refuelling the carbonization gases in the charcoal kilns will help reduce methane, (CH4), carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), tar, formaldehyde, phenols, hydrocarbons, and volatile organic compounds (VOCs).

Economic benefits: The charcoal productivity increases substantially by applying the new technology as it will increase charcoal production per ton of wood feedstock (from 20% to 35%). In addition, it will improve the quality of product and reduce the time consumed for production. Due to the polluting nature, the EEAA has prohibited open-pits production during the fall season therefore, shifting to the mechanized kilns will allow charcoal producers to work throughout the year without stopping for four months each year.

Social benefits: The health risks associated with open-pits production are severe. Earth-pit labor as well as residents in the vicinity suffers from the consequences of exposure to such severe health risks. Despite earth-pits are usually located nearby side roads, they are not safely covered and sometimes are not even noticeable for people, consequently, may lead to fatal human accidents. The project will also achieve many positive social effects on the local community in Egypt. The project will generate employment and improve the occupational health and safety conditions of the labor. In addition, the new technology will offer training for workers and contribution to the rural development objectives by providing skilled employment to the local population.

Support from CDM APU:

- Supervised two technical and economic feasibility studies for the project
- Analyzed local and international charcoal kiln suppliers and identified the most economic kilns that comply with local pollutants regulations
- Coordinated with the cabinet of ministers for the selection of the best pilot kiln location within the charcoal intensive governorates
- Availed the capital cost for the pilot kiln through sale of credits from N2O Abatement CDM projects
- Supervised and funded the necessary environmental compliance measurements of the pilot kiln
- Set up the financial mechanism to fund the project through the Environmental Protection Fund (EPF) and Egyptian National Banks in coordination with EEAA.
- Supervised and funded the CDM cycle development of the PoA. Currently, the project design document is being finalized

► Overcome one of the CDM project barriers by purchasing a laboratory kiln for measuring the methane emission factor as per the CDM methodology requirements
Current status of the project: The project is currently in the PDD preparation stage and expected to be validated by 2013

CASE-5: Fuel switch from Mazout to Natural gas in pulp & paper industry

Project owner: QENA Paper Industry co./ADFOU Paper Industry co.

Project objective: The two projects aim at Fuel switch from Heavy fuel (HFO) to Natural gas in the exciting boilers.

Project description:

The projects reduce greenhouse gas (GHG) emissions at Qena and Adfou factories through switching the fuel in the power boiler from HFO to NG. The closest NG pipeline is located west of the Nile. There are currently no existing connections to Quena and Adfou (east of the Nile) where QENA Paper Industry co.and ADFOU Paper Industry co are located.

The power boilers have a dual-fuel burner, which are capable of burning HFO and NG. The projects activities includes construction of the external NG network to bring NG to the plant, a pressure reduction station, the internal NG network, installing new piping system for the flow of NG, as well as adjusting an additional backup energy system for NG.

- Estimated emission reductions: 90,000 tCO2/year
- Total estimated Costs: 20 million US$

Contribution to sustainable development:

Environmental benefits: Fuel switching from HFO to NG will reduce SOx emissions considerably as well as reduce large portion of NOx and PMs. The project activity also reduces the risk of water contamination caused by possible HFO leakage during transportation and will reduce pollution from tankers that are currently used for transporting the fuel.

Social benefits: Decreased air pollutants will in general improve the health conditions. Potential skin contact risks during maintenance and handling of HFO as well as fire and explosion risks of HFO tankers and storage tanks will be prevented.

Economic benefits: The projects will create the first NG connection to the towns by financing the extension of the NG grid to the east of the Nile in Adfou and Qena cities. The projects make would make it possible for smaller industries in the area to switch to NG and, eventually, residential households.

Challenges faced by the company: Both companies didn't have any knowledge about the CDM procedures and needed incentives to finance the projects.

Support from CDM APU:

- Restudied the projects technically and financially
- Convinced the companies' management to proceed with CDM cycle again
- Prepared the RFP for the two projects
- Assisted the companies in the evaluation of the proposals and contracting with the qualified consultant
- Re-negotiated the deal between the plants and the CDM developer in order to cover CDM cycle costs
- Assisted the consultant in data collection, national approvals, PIN &PDD preparation, and validation/registration support

Current status of the project: The two projects successfully submitted request for registration and expected to be registered by March 2013

CASE-6: Introduction of hot Direct Reduced Iron (DRI) into Electric Arc Furnace

Project owner: Suez Steel Company (SSC)

Project objective: The project aims at reducing the specific energy and the corresponding GHG emissions of the EAF by introducing a hot DRI charging system in order to retain the sensible heat content of hot DRI from the Direct Reduction process.

Project description:

A "HYTEMP" direct hotlink system will be introduced between the new direct reduction plant (DRP) and the steel melting shop at SSC, where the hot DRI will be transported pneumatically directly from the DRP to the EAF for the production of steel. The hot link pneumatic transport system is designed in an enclosed unit, which is operated by a transport gas compressor. Nitrogen acts as a carrier gas to extract hot DRI from the outlet of the direct reduction (DR) reactor at 700°C, and transport it to the SMP in piping by an elevated bridge in order to feed the hot DRI to the EAF at around 600°C. At the surge bins of the EAF, the carrier gas and the hot DRI are disjointed, where the hot DRI is charged into the EAF by gravity, whilst the carrier gas leaving the bins and passing through corresponding quenching and scrubbing equipments for cooling and cleaning. The cold and clean carrier gas is then recycled back to the pneumatic transport gas circuit. This system allows the energy content of hot DRI to be retained and utilized in the EAF in the steel melting shop, resulting in the reduction of the heat requirement of the EAF system, and hence reducing the energy consumption of the EAF and the corresponding GHG emissions. Expected annual reduction of electricity consumption is around 186 GWh.

- Estimated emission reductions: 106,000 tCO2/year
- Total Estimated Costs: 24 million US$

Contribution to sustainable development:

Environmental benefits: The project would reduce energy consumption and its corresponding GHGs emissions in the EAFs. Also, the project would reduce the dust emissions and air pollution in the surrounding local area, as the HYTEMP system is operated in completely sealed environment.

Social benefits: Direct and indirect employment opportunities will be provided to the local communities during the phases of commissioning, operation and maintenance of the project.

Economic benefits: The project activity will lead to lower energy consumption of the steelmaking process, which is mainly powered by electricity supplied from the Egyptian National Grid. It will also lead to conservation of non-renewable energy sources and reduce associated GHG emissions at the grid and will significantly reduce the demand from the grid availing electricity for other purposes.

Technological benefits: The project activity is the first of its kind in the steel industry in Egypt. The success of the project would facilitate spreading the technology and would introduce more energy efficient practices in the steel sector in Egypt.

Challenges faced by the company: SSC didn't have any knowledge about the CDM procedures and there was no applicable Methodology for the project.

Support from CDM APU:

- Restudied the project technically and financially
- Convinced the company's management to proceed with CDM project
- Assisted the company in selecting a qualified CDM consultant
- Assisted the consultant in data collection, national approvals, PIN preparation, New Methodology development, PDD preparation, and validation support

Current status of the project: SSC successfully registered the new Methodology under the UNFCCC. The methodology title is AM109: Introduction of hot supply of Direct Reduced Iron in Electric Arc Furnaces. The project is currently under validation.

4.7 CDM APU achieved mandates

Table 8 presents the mandates objectives that were achieved by the CDM APU throughout the program duration.

Table 8 CDM APU Achieved Mandates

Mandate objective	Execution of the mandate
The Promotion, and marketing for CDM projects	More than 10 awareness workshops delivered Participated and promoted the Egyptian CDM portfolio in the 10 major CDM forums Initiated more than 5 campaigns with potential CDM clients and investors
Providing technical assistance "CDM Helpdesk"	Capacity building for more than 250 representatives from major CDM stakeholders Contributed to the qualifications and professionalism of the DNA team through continuous support and training CDM technical assistance for more than 50 CDM projects
Facilitator for all CDM players	Facilitate CDM cycle development for more than 36 CDM developers and project participants through support in obtaining required national approvals Introduced CDM project investors to potential projects
Financial and legal support for CDM projects	Availed funding for 4 PoAs Fund raising for more than 10 struggling projects through international investors and donor organizations Reviewed more than 15 Emission Reduction Purchase Agreements (ERPAs) signed between project proponents and developers/investors
Setting mechanisms for cooperation	Set cooperation mechanisms between EEAA, donor organizations, and international and national banks
Support CDM policy making	Supported the restructuring of the Egyptian DNA Participated in the solar water heating, and large scale wind farms mitigation action plans with the Ministries of Electricity and Housing etc.

Mandate objective	Execution of the mandate
Follow-up the implementation of CDM projects that were ongoing when CDM APU was established	Continuous follow up for all CDM projects in various CDM cycle phases including about 20 projects during validation and 3 registered projects until CERs generation

4.8 Socioeconomic Impact of CDM APU Projects

The CDM APU provided significant support to sector-wide efforts to 'decarbonise' the Egyptian economy. The CCRMP through its Clean Development Mechanism component has provided a comprehensive and focused effort to help Egypt steer the direction of development and economic growth. The CDM APU has helped to develop and expand projects that support an energy efficient economy and the use of Egypt's renewable energy potential. This contribution would help the Egyptian economy to partially survive the current energy crisis by reducing the energy demand burden.

Furthermore, promoting energy / carbon efficient technologies lead to availing huge investments, saving the government's energy subsidies, and created a lot of job opportunities. Table 9 as well as tablesTable 16 and Table 17 in the annexure presents estimation for the socioeconomic impacts of CDM projects in different CDM cycle stages including registered, requesting registration, and validation as well as an estimation for equivalent annual savings from energy subsidies cost based on current national and international energy prices.

The projects analyzed below are the ones clearly impacted by the CDM APU activities and also are in advanced CDM cycle stages. The total emission reductions achieved from all CDM APU projects mount to approximately 3.12 M ton CO2e / year. The average value for these emission reductions is approximately 15.6 M US $ at average CER price of 5 US $. Total projects costs including CDM cycle costs are estimated at 577 M US $. Annual energy subsidies savings are estimated at approximately 249 M US $. These estimations were based on available information in the PDDs, official DNA projects portfolio, and interviews with project developers. However, actual projects' impacts may vary due to probable discrepancies between project design documents or DNA portfolio estimations and actual implantation conditions of each project. Also, energy prices might change as well.

Table 9 Socioeconomic Impact of CDM APU Projects

N°	Project Name	Status	Expected Emission Reductions (1000 tCO2e/year)	Project Cost (US $)	Estimated Annual Energy savings (GWh / Fuel Unit)
1	Zafarana KfW IV Wind Farm Project 80 MW (NREA-Germany)	Registered	171	122,000,000	300 GWh
2	Egyptian Brick Factory GHG Reduction Project	Registered	430	23,300,000	542,000 ton Mazout
3	Zafarana 8 - Wind Power Plant Project, Arab Republic of Egypt 120 MW (NREA-Denmark	Registered	209	170,000,000	401 GWh
4	Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues in CEMEX Assuit Cement Plant	Registered	416	10,000,000	147,000 ton Mazout

N°	Project Name	Status	Expected Emission Reductions (1000 tCO2e/year)	Project Cost (US $)	Estimated Annual Energy savings (GWh / Fuel Unit)
5	Fuel Switching from Mazout to Natural Gas in Misr Fine Spinning & Weaving and Misr Beida Dyers at Kafr El Dawar	Registered	45	4,300,000	52,000 ton Mazout
6	Zafarana 85 MW Wind Power Plant Project	Registered	170	93,700,000	327 GWh
7	Egypt Vehicle Scrapping and Recycling Program	Registered	0.02 per1st CPA	34,200,000 for all the PoA	NA
8	Al-Sindian 13 MW Natural Gas based Cogeneration Package Project.	Registered	25	6,400,000	74 GWh
9	Reduction of N2O emissions from the new nitric acid plant of Egypt Hydrocarbon Corporation at Ain Sokhna	Registered	251	NA	NA
10	Programme for Grid Connected Renewable Energy in the Mediterranean Region	Registered	NA	NA	NA
11	Land Filling and Processing Services for Southern Zone in Cairo	Registered	76.6	1,570,000	NA
12	International water purification programme (regional PoA but the first CPA isn't in Egypt)	Registered	NA	NA	NA
13	N2O Abatement at Semadco (Egypt)	Validation	211.3	3,160,000	NA
14	Gas Flare Recovery at Suez oil processing company, Egypt	Requesting Registration	128.4	15,000,000	72,000 ton NG
15	Partial Fuel Switching to Agricultural Wastes & Refuse Derived Fuel (RDF) at Kattameya cement plant	Requesting Registration	30.7	4,000,000	17,000,000 m3 NG
16	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF) at Helwan cement plant	Requesting Registration	39.7	4,000,000	25,000,000 m3 NG
17	Fuel Switching from Mazout to Natural Gas in Quena Paper Industry Co. (QPIC)	Requesting Registration	59	5,000,000	69,000 ton Mazout

N°	Project Name	Status	Expected Emission Reductions (1000 tCO2e/year)	Project Cost (US $)	Estimated Annual Energy savings (GWh / Fuel Unit)
18	Fuel Switching from Mazout to Natural Gas in Misr Edfu Pulp, Writing & Printing Paper Co. (MEPPCO)	Requesting Registration	31.7	16,800,000	37,000 ton Mazout
19	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refuse Derived Fuel (RDF) at Arabian cement plant	Requesting Registration	66.6	9,700,000	31,650,000 m3 NG
20	N2O and NOX Abatement Project at Delta-ASMEDA Fertilizer Plant in Al Mansoura (Egypt)	Requesting Registration	176	3,000,000	NA
21	N2O and NOX Abatement Project at KIMA Fertilizer Plant in Aswan (Egypt)	Registered	109.9	2,800,000	NA
22	PoA for fuel switching at micro and small-sized enterprises in Egypt	Requesting Registration	0.155 per 1st CPA	10,000 per 1st CPA	183 ton Diesel per 1st CPA
23	Fuel Switching at the National Cement Company (NCC), Tebbin, Egypt	Validation	306.4	35,000,000	54,000
24	Abu Zabal Landfill Gas Recovery and Flaring/Destruction Project	Validation	94.8	1,000,000	-
25	Waste Heat Recovery projects for gas turbine generators	Validation	64.8	8,000,000	1.7 MMSCFD
26	Advanced Energy Solutions for Building. Programme of Activities (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
27	Programme for Grid Connected Renewable Energy in the Mediterranean Region (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
28	Renewable Power Advancement Programme (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA

N°	Project Name	Status	Expected Emission Reductions (1000 tCO2e/year)	Project Cost (US $)	Estimated Annual Energy savings (GWh / Fuel Unit)
29	Small-Scale Renewable Electricity Advancement Programme (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
30	Renewable Energy Programme of Activities in Middle East and North Africa (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
31	Energy Optimization Solutions for Industries in Pakistan, UAE and Egypt – Program of Activities (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
32	PoA for small scale renewable energy development in Egypt	Validation	0.047 per 1st CPA	2000 per 1st CPA	0.008 GWh per 1st CPA
33	PoA for Water Pumping Efficiency Improvement and Rehabilitation for Egyptian Pumping Stations	Validation	8.6	4,000,000	15 GWh
34	For Stoves Programme of Activities (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA
35	EcoProfitableTM Lighting Africa by ENERCAP SAS (regional PoA but the first CPA isn't in Egypt)	Validation	NA	NA	NA

http://cdm.unfccc.int/Projects/projsearch.html
The Egyptian DNA - Official Egyptian CDM Projects Portfolio
Interviews with projects' developers

5. Comparison with CDM status in similar countries

5.1 Impact of GHG emission reduction in Egypt due to CDM projects

As mentioned earlier, currently there are around 50 projects as identified by CDM APU are under CDM cycle, 17 of which are registered and another 8 are under request for registration. According to World Bank data, Egypt's current GHG emissions are 210,321,000 tCO2e[3]. The CO2 per capita emissions measured (2008-2011) in Egypt is 2.7% up from the last measurement of 2.6 %, (2002-2007)[4]. To analyze the impact of CDM projects on Egypt's emissions, three scenarios were considered. The total impact for all three scenarios has been measured in terms of GHG emissions reduction as well as the equivalent number of passenger cars taken off the road. The estimated number of passenger cars that can be taken off the road, has been calculated using the United States Environmental Protection Agency website.[5]

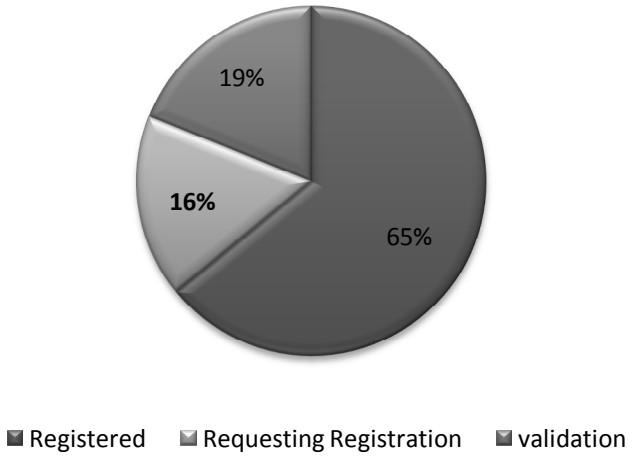


Figure 6 Distribution of CDM projects in Egypt by status

Scenario 1: All CDM APU projects are executed

Assuming all 50 projects that were initiated and supported by the CDM APU were executed successfully, Egypt can expect to see a total reduction of 4,702,863 tCO2e. These projects are in different stages of CDM cycle including registered, requesting registration, validation, PDD development, and Letter of No Objection as presented in Table 2 section 4.4.1. This scenario will reduce Egypt's total current emissions by approximately: 2.24%. This figure is equivalent to emissions from 888,826 passenger cars and equivalent to emissions due to annual electricity consumption of 638,977 homes.

[3] http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749
[4] http://data.worldbank.org/indicator/EN.ATM.CO2E.PC?cid=GPD_27
[5] http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results

888,826 cars taken off the road per year

Annual electricity for 638,977 homes

Figure 7 CDM APU Impact on CO2 Emissions in Egypt – All Projects

Scenario 2: Registered projects, projects requesting registration, and projects under validation are executed

In this scenario, it's assumed that only advanced CDM cycle projects will be executed. Advanced CDM cycle stages include projects that were registered, projects requesting registration, and projects under validation. This assumption is more realistic since the projects that are in early CDM cycle stages might not make to registration. Out of the 50 projects identified and pursued by the CDM APU, 17 were registered, 8 are currently requesting registration, and 19 projects are under validation. Assuming only these 35 projects were implemented, the total CO2 emissions reduction will be 3,121,722 tCO2e (1,793,620 tCO2e from registered projects, 853,455 tCO2e from projects requesting registration, and 474,647 tCO2e from projects under validation). This scenario will reduce Egypt's total current emissions by approximately: 1.48%. This figure is equivalent to emissions from 589,996 passenger cars and equivalent to emissions due to annual electricity consumption of 423,949 homes.

589,996 cars taken off the road per year

Figure 8 CDM APU Impact on CO2 Emissions in Egypt – Registered, Requesting Registration, and Validation

Scenario 3: Only registered projects and projects requesting registration are executed

In this scenario, it's assumed that only registered projects and projects that have already submitted a request for registration will be executed. The probability of this scenario to be real is even higher than the previous two because it's very likely that registered projects and projects requesting registration will be implemented. The total number of projects in this scenario is 25 projects (17 Registered and 8 Requesting registrations). The total CO2 emissions reduction will be 2,647,075 tCO2e (1,793,620 tCO2e from registered projects and 853,455 tCO2e from projects requesting registration). This scenario will reduce Egypt's total current emissions by approximately: 1.26%. This figure is equivalent to emissions from 500,289 passenger cars and equivalent to emissions due to annual electricity consumption of 359,489 homes.

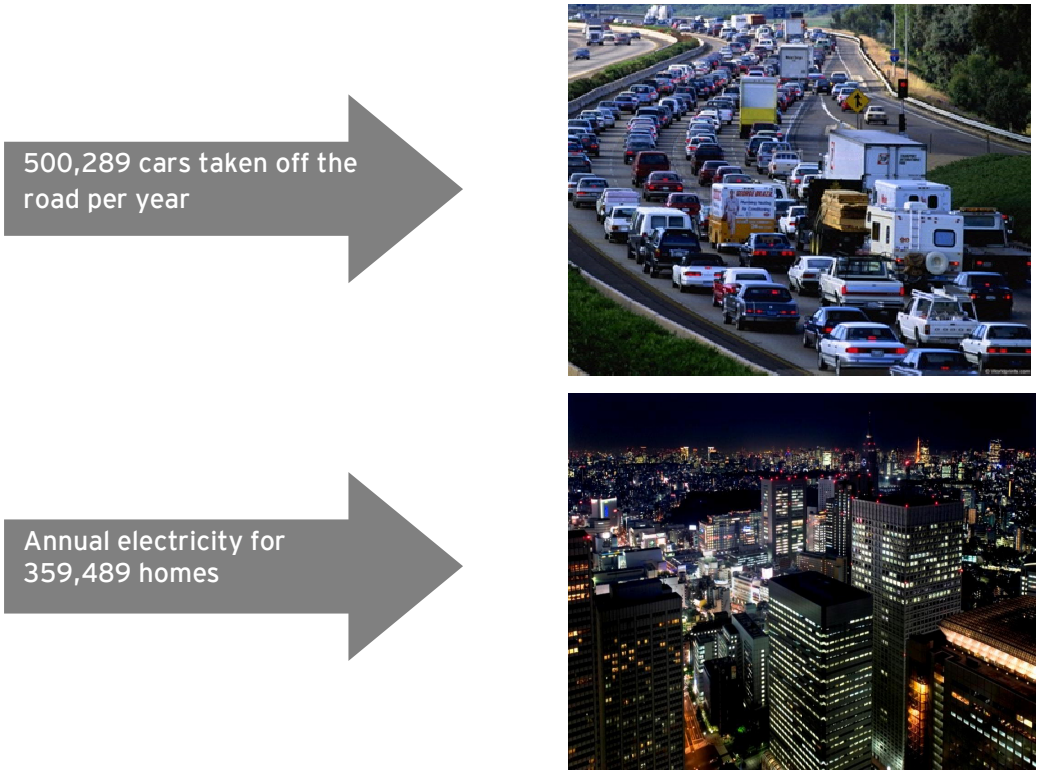


Figure 9 CDM APU Impact on CO2 Emissions in Egypt – Registered and Requesting Registration

Accordingly, the impact of three scenarios on the GHG reduction in Egypt is summarized as below:

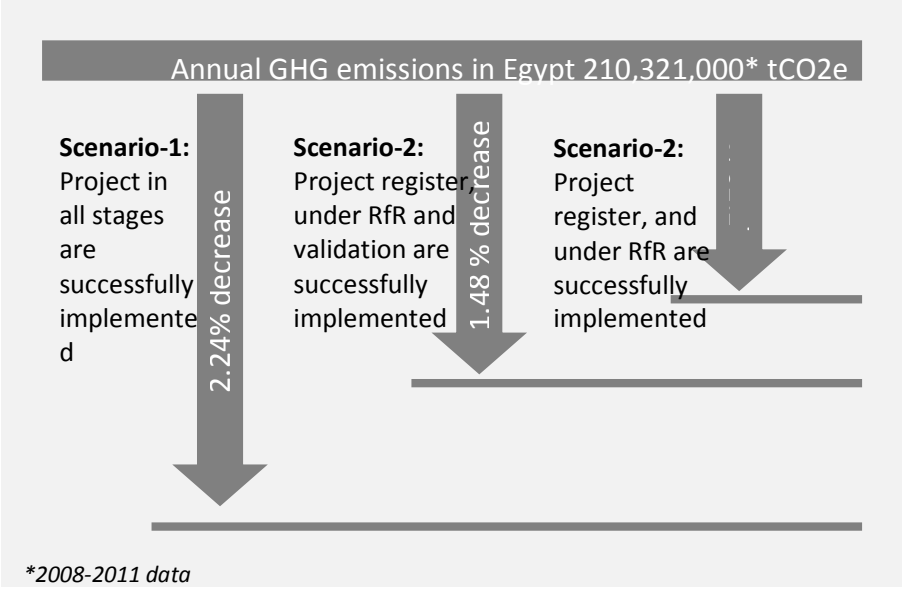


Figure 10 Annual GHG Emissions in Egypt

Above analysis suggest that it is imperative for the CDM APU to keep providing technical as well as administrative support to the project developers so that the projects in the initial stages of the CDM cycle are taken through the registration process. Also the Unit shall ensure that the CDM registered projects are implemented and are generating expected amount of GHG emissions reduction. Also, the projects that do not qualify under CDM can be considered under other voluntary mechanisms available for the GHG abatement projects to earn carbon credits.

5.2 CDM in Egypt as compared with the MENA region and globally

It is important to understand CDM presence in other countries in order to compare the achievements in Egypt. In the MENA region, Tunisia, Morocco and Algeria were chosen to compare with as they are located within the same geographic area and share similar economic/social characteristics as well as type and size of CDM projects. Worldwide, Brazil and South Africa were chosen because of they are emerging economies with comparable but advanced CDM status.

5.2.1 CDM in Egypt as compared with the MENA region

The MENA region meets 98% of its primary energy needs through oil and gas. Oil consumption in the Middle East keeps rising at an astounding rate, faster than in any other region of the world, except China.

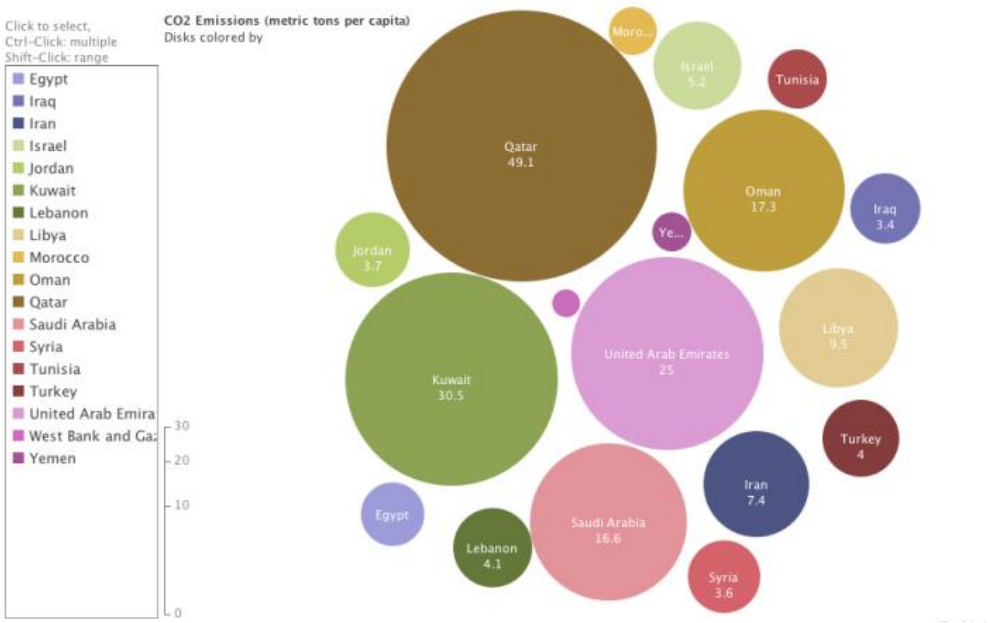


Figure 11 CO_2 emissions per capita (Tons/Capita)

Abundant energy resources coupled with government subsidies on energy prices make energy consumption the cheapest across the world. Consequently, the region is one of the highest per capita carbon dioxide emitters worldwide. The MENA region's high energy intensity and sole-dependence on hydrocarbons has resulted in excessive CO_2 emissions. This is one of the main barriers to entry for CDM in the region.

As per UNEP RISO Centre, Egypt's total estimated emission reductions was 15,844 KCERs in June 2012, which is the highest emission reduction achieved that year in the MENA region. This is not surprising owning to its vast potential in terms of geography and resources.

Table 10, below presents a snapshot of the number of CDM projects in the MENA region and the associated emissions reduction potential. This table suggests Egypt as having the highest emissions reductions through CDM projects; however, Egypt does not have the highest number of CDM registered projects in the region. Since 2010, the number of CDM projects in Egypt has increased from 32 to 50 projects until February 2013, 17 of which have been registered including PoAs.

Table 10 CDM Projects in MENA Region – June 2012

Country	Number of projects in advance stages	Registered projects	2012 K tonne CERs
Algeria	2	2	107
Egypt	27	13	15,844
Iran	20	12	4,572
Iraq	3	0	0
Jordan	4	4	2,354
Kuwait	3	0	0
Lebanon	6	0	5
Libya	2	1	0
Morocco	19	8	3,423

Oman	2	0	300
Qatar	2	1	14,004
Saudi Arabia	5	1	207
Syria	4	3	646
Tunisia	8	4	4,286
UAE	17	10	964
Yemen	2	0	924
MENA total	**126**	**59**	**47,636**

Source: UNEP RISO Centre 6, 7

Error! Reference source not found. below compares different CDM projects in Egypt with that of Tunisia, Morocco and Algeria and their emissions impact. From this table it is clear that Egypt has a higher maturity level in terms of CDM projects and their emissions impact than that of all three other countries. However, it it's still possible for CDM in Egypt to further expand in renewable energy projects. For example, Photovoltaic kits and solar water heaters can provide much needed benefits to Egypt. Constant blackouts and lack of electricity services in general in rural areas make such projects necessary.

Table 11 Comparison of CDM Projects by type

Project type	Egypt (emissions reduction per Project type) (K tCO2e/year)	Tunisia (emissions reduction per project type) (K tCO2e/year)	Morocco (emissions reduction per project type) (K tCO2e/year)	Algeria (emissions reduction per project type) (K tCO2e/year)
Catalytic N2O destruction project in the tail gas of Nitric Acid Plant.	1065	N/A	N/A	640
Landfill Gas Capture and Flaring Project	370	687.6	321	N/A
Wind Power Plant Project	248	N/A	490	N/A
Waste Gas-based Cogeneration Project	109	N/A		N/A
Wind Farm Project	380	346	426	N/A
Brick Factory GHG Reduction Project	430	N/A	N/A	N/A
Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues	416	N/A	N/A	N/A
Fuel Switching to Natural Gas	45	N/A	N/A	N/A
85 MW Wind Power Plant Project	170	N/A	N/A	N/A
Vehicle Scrapping and Recycling Program	0.02	N/A	N/A	N/A
Natural Gas based Cogeneration Package Project.	25	N/A	N/A	N/A
Reduction of N2O emissions from Hydrocarbon plant Corporation	251	N/A	N/A	N/A

[6] http://cd4cdm.org/CDMJIpipeline.htm

[7] http://middleeastlondon.wordpress.com/2012/03/14/virtually-visualising-the-mena-region/

Photovoltaic kits to light up rural households"	N/A	N/A	38	N/A
Thermal Energy	N/A	N/A	31	N/A
Solar Water heaters	N/A	7.2	N/A	N/A
Total Emission Reduction	3509	1041	1306	640

5.2.2 CDM in Brazil and South Africa

5.2.2.1 CDM in South Africa

As of 2012 there are 22 registered projects in South Africa, 17 of which were registered before 2010[8]. The anticipated emission reductions from this amount to 2.96 m tCO_2e. The four industrial Gas projects are the major emissions reducers accounting for over half the emissions reduced in South Africa. However compared with the international market it remains a rather small number, mainly, due to its very high emissions from coal-fired power generation[9].

Table 12 CDM Projects in South Africa

Project category	Number of projects	Estimated annual emission reductions up to 2012 (K t CO2e)
Industrial gases (N2O)	4	1,816
Landfill gas	4	626
Renewable energies	3	275
Fuel switch	2	120
Energy efficiency	2	62
Methane gas avoidance (waste water and manure)	2	63
Total	**17**	**2,962**

Egypt's CDM N2O Abatement project in Abu Qir has resulted in 4,800 tonnes of N2O emissions avoided per year, equivalent to 1.5 million tonnes CO2 per year almost as much as all four of South Africa's biggest emissions reducing projects. [10]

5.2.2.2 Brazil

As of 2012, Brazil has 227 registered projects. The highest number of CDM projects registered in Latin America. Renewable energy projects make up the highest percentage of project in the region with over 179 projects registered as renewable projects in Brazil Alone[11]. Brazil has a much higher CDM presence than that of Egypt and is more established. However, Egypt's substantial potential in renewable energy projects as well as its N2O abatement projects, can increase Egypt's visibility to attract global investment in CDM projects. Figure 12 below presents the volume of CERs in Latin American by Sector until 2012.

[8] http://www.cdmpipeline.org/cdm-projects-region.htm#2
[9] http://www.jiko-bmu.de/files/english/application/pdf/cdm-markt-suedafrika-english.pdf
[10] http://www.rwe.com/web/cms/mediablob/de/359274/data/346364/4/rwe-power-ag/innovationen/cdm-ji/CDM-N2O-ABATEMENT-PROJECT-ABU-QIR-EGYPT.pdf
[11] **http://www.cdmpipeline.org/cdm-projects-region.htm#2**

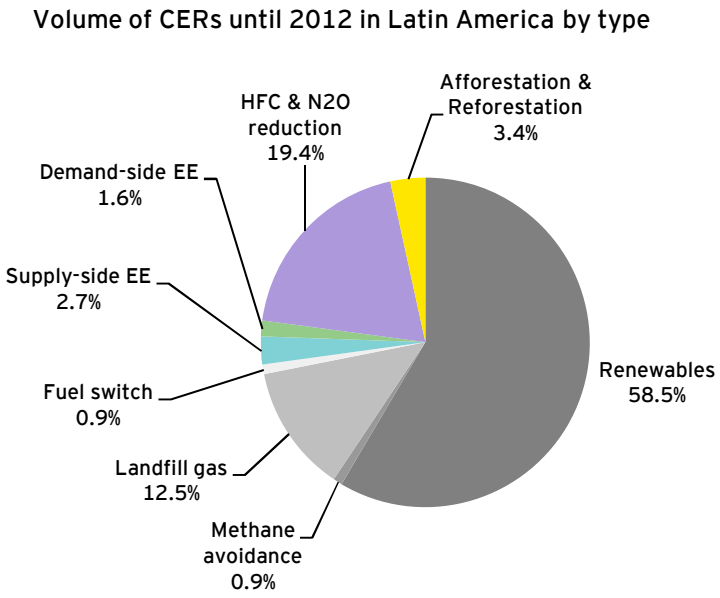


Figure 12 Volume of CERs until 2012 in Latin America by sector

It is evident that there is big gap between the CDM status of Brazil as compared with Egypt. However, CDM APU can certainly aim to reach that level through persistent efforts on creating awareness and providing support to the project developers in ironing out the challenges towards implementation of GHG abatement projects.

6. SWOT Analysis

A SWOT analysis has been carried out assessing the CDM APU's activities, operations, capacity, challenges, and achievements and shortcomings to identify the areas that need to be strengthened as the Unit is aiming for a bigger role in supporting the country in achieving Sustainable Development. The analysis findings are presented below.

Strengths	Weaknesses
► Well established presence in the Egyptian Carbon Market ► Provide support to the CDM project developers resulting in increase of the number of CDM projects and emission reductions in Egypt ► Existence of a well organized and qualified staff within EEAA ► Mandate and capacity to create awareness among various stakeholders in different sectors ► Significantly increased foreign investment in Egyptian CDM projects ► Provide coordination with the national and international Organizations ► Centralized technical support within the Government	► Small Scale scattered Projects with low GHG reduction potential ► Low salaries leads to high employee turnover ► Limited technical resources and know-how ► Non-availability of proper data for identification of feasible/applicable CDM projects ► Less involvement of key Ministries, top management and executive level in CDM workshops and promotional activities ► Inefficient technical studies for analyzing real CDM potential in different sectors ► Insufficient media and marketing ► Lack of local banks/private equity CDM project financing and high reliance on foreign funding
Opportunities	**Threats**
► Attract international donors to finance CDM projects and/or provide technical training and grants ► Experience and technical knowledge can be exploited by other opportunities ► Replicable Milestones ► Positive socio-economic Impact of successful projects can be used as a promotional tool to attract investors and stakeholders ► Partnerships with other entities (Government, private, and International Organizations) working on promoting sustainability and other objectives in-line with the CDM APU mandates ► Clustering Small Scale projects and PoAs and promoting them accordingly ► Lessons learnt from other countries having higher number of successful CDM projects	► Financial Sustainability of the CDM APU ► Uncertainty of the future of CDM and the huge drop in carbon prices ► Vagueness in CDM APU Role ► High Transactional Cost associated with CDM project proposals ► Market Resistance and tendency for business as usual ► Low price of fossil fuels in Egypt providing low incentive to energy efficiency/GHG abatement projects ► Strict criteria and long complex project cycles for registration by the UNFCCC ► High CDM costs with high risk of no access discourages investors and promoters ► Awareness of CDM projects is lacking ► CDM APUs promotional tools don't always reach potentially interested parties ► Institutional and Legislative Barriers ► Insufficient Technical Capacity at local level

6.1 Strengths

6.1.1 Well established presence in the Egyptian carbon market

During the last three years, CDM APU has been actively engaged in relationships with all key players and stakeholders including government entities, authorities, international organizations, CDM developers and investors, NGOs, and public and private sector firms ensuring participation and promotion of CDM projects and activities. The Unit has also conducted many workshops and training courses both on the national and international levels in order to expand the limited boundaries of CDM knowledge in the country particularly within the public sector.

The CDM APU has successfully established strong partnerships in the carbon market that have had an impact on the success of a number of projects. The unit's proactive involvement in the CDM market during the past three years well placed its team as the single point of contact for CDM project proponents. The enthusiasm with which the unit started and continued its operations with had supported many companies, developers, DOEs, and investors in reaching out to their counterparties and finally achieving their targets. This success has also encouraged others to take significant steps towards carbon reduction opportunities. This established presence will be a significant asset to the future development and sustainability of the carbon market in Egypt.

6.1.2 Provide support to the CDM project developers resulting in increase of the number of CDM projects and emission reductions in Egypt

The CDM APU has been active in Egypt since 2009. The number of registered CDM projects in Egypt has increased from 4 projects (prior to 2009) to 17 projects in addition to another 8 currently requesting registration, all of which CDM APU has played a vital role in. Furthermore, assuming all the 50 projects that CDM APU contributed to are executed, then the total emissions reductions is estimated at 4.7 million tCO2e annually mounting the total emission reductions from projects in Egypt to more than 10.5 million tCO2e annually. CDM APU has successfully participated and delivered many projects that would not have seen the light if it were not for the unit's logistical, financial, and technical assistance. Some have been highlighted in the previous section. These projects include the N2O abatement projects, the flare gas recovery project and the Charcoal Programme of activities as well as many others outlined above.

6.1.3 Existence of a well organized and qualified staff within EEAA

The staff structure is well integrated and has been functioning within the Egyptian Environmental Affairs Agency since 2009. The existence of a well defined structure and highly qualified team enabled the CDM APU to adapt quickly to the fast changing requirements of CDM and to provide the required technical support to the clients. In addition, the unit's structure, being located within EEAA, enabled working closely and liaising with the DNA, other agencies, as well as with permits and licensing authorities which, consequently, facilitated approval procedures for project proponents (i.e., EEAA for EIA approval, DNA for letters of objection, and letters of approval, etc). Furthermore, the CDM APU managed to accelerate the national approvals process by introducing modifications to the program management committee authority enabling it to grant the letter of no objection rather than waiting for the CDM council monthly meetings. Finally, all this contributed to the trust CDM APU gained by CDM stakeholders.

6.1.4 Mandate and capacity to create awareness among various stakeholders in different sectors

The CDM APU played an active role in the above mentioned success stories as well as many promotional activities leading to the significant increase in the market awareness and consequently increased number of CDM projects. This in return supported the development of the CDM consultancy services and helped introducing several national and international consulting firms to the carbon market. Also, there was an interest from government agencies and local NGOs to support and engage with CDM activities. This was entirely due to the successful promotion and communication strategy executed by the CDM APU

6.1.5 Significantly increased foreign investment in Egyptian CDM projects

The business model of many CDM projects is by nature associated with foreign investments. Many of these projects were facilitated by the CDM APU leading to attracting significant foreign investments. For example, the three N2O Abatement CDM projects and the flare gas recovery project attracted approximately 20 Million US$ investments to the Egyptian market.

6.1.6 Provide coordination with the national and international organizations

The CDM APU succeeded in coordinating and collaborating with both the national context it worked in "EEAA" as well as with the international donor organizations managing the Climate Change Risk Management Program. Also, the same success was achieved in collaborating with the previous Minister of state for environmental affairs (HE, Maged George) as well as with the CCRMP management. This was a key factor for driving government sponsorship and vision towards the potential benefits of CDM for the country and helped empowering the CDM APU towards achieving its objectives especially within the government and public sector. However, this was not maintained afterwards following the implications of the 25th January uprising and consequent Government instability.

6.1.7 Centralized technical support within the government

One of the most valuable strengths of the CDM APU is their ability to coordinate national level programs within the government. Having access to government entities as well as the required technical knowledge, CDM APU was able to coordinate and manage national level programs like PoAs. Energy efficient and clean energy national initiatives would never see the light if centralized technical support like the CDM APU does not exist within the government. One of the successful achievements of the CDM APU in this area is the Taxi scrapping and recycling program. After three years in the registration process, the CDM Awareness and Promotion Unit succeeded to register the programme with the UNFCCC as a carbon credit initiative, which was the first CDM registered transport project worldwide. The CDM APU succeeded in coordinating the project with the involved ministries and provided the technical assistance required for project registration.

6.2 Weaknesses

6.2.1 Small Scale scattered Projects with low GHG reduction potential

Many potential CDM projects are developed within small or medium scale businesses. These are usually not organized in a manner that can help develop projects in an integrated way. The scattered nature of potential CDM projects and the absence of setup funding that can act as an umbrella for owners of these projects, can be a main barrier in the success of a CDM market project in Egypt. Also, less attention was given to replicating international CDM success stories in countries with similar economic and cultural conditions especially in sectors with high potential impact in Egypt i.e., energy and renewable Energy, agriculture, and waste sectors.

6.2.2 Low salaries leads to high employee turnover

Due to budget constraints, the salaries and incentives provided to the CDM APU employees were restricted. Consequently, this has been a major factor in high employee turnover as well as the reduction in talent attraction and retention.

6.2.3 Limited technical resources and know-how

The limited number of the technical resources did not allow specialization of qualified resources in their respective areas of knowledge because the number of resources was limited and they had to cover all the sectors and specialization areas.

6.2.4 Non-availability of proper data for identification of feasible/applicable CDM projects

At the start of its operation, the CDM APU did not put much attention in verifying the data received from project proponents. This lead to wasting time and effort in projects that was not feasible or applicable. However, this was mainly due to the team's enthusiasm at the programme start-up in order to include as many projects as possible in the CDM portfolio but it was realized later with the maturity and knowledge of technical CDM pitfalls.

6.2.5 Less involvement of key Ministries, top management and executive level in CDM workshops and promotional activities

Less attention was given to involving decision makers and top management level in the awareness workshops and promotional activities compared to focusing on technical and medium level management. Although, coordinating and organizing events that would include senior management participants could be challenging but this was crucial for accelerating CDM decision making, especially in the government and public sector.

6.2.6 Inefficient technical studies for analyzing real CDM potential in different sectors

Although some sectoral studies were coordinated by the CDM APU at the start up but the value delivered from these studies was not as expected. This lead to spending more time by the unit's technical resources on identifying feasible opportunities in different sectors rather than focusing on developing the projects once identified.

6.2.7 Insufficient media and marketing

Insufficient media and marketing for the CDM APU operations and activities did not help realizing the full benefit of the unit's activities if proper marketing and communications was done. If a proper marketing campaign was undertaken more projects could have been identified and pursued.

6.2.8 Lack of local banks/private equity CDM project financing and high reliance on foreign funding

Local banks and private equity firms in Egypt have not yet been involved in CDM financing. Local banks have no knowledge of CDM or its potential. CDM APU had been lacking promoting CDM projects to target local financing opportunities.

6.3 Opportunities

6.3.1 Attract international donors to finance CDM projects and/or provide technical training and grants

As stated previously, there is significant potential for CDM development in the MENA region and thus there is interest from many international donors. Technical Assistance is also available; however, the challenges faced in achieving partnerships stems mainly from aligning the right project with the right source as well as having the technical capacity to submit a well defined proposal.

6.3.2 Experience and technical knowledge can be exploited by other opportunities

Egypt's CDM APU team has been involved in a number of successful projects, understanding the strengths of this team and exploiting their qualifications strategically is an opportunity that is well within the capabilities of the organization. During achieving the previous mandate, the unit's resources acquired essential knowledge that would enable them to tackle new sustainability opportunities efficiently.

6.3.3 Replicable milestones

There are many successful implementations that CDM APU can replicate in the future. These include:

a. Workshops: Many of the workshop curriculums have already been established. These can be replicated and reproduced on a national level

b. Projects: Projects such as the Charcoal PoA and the flair gas recovery project can be replicated to include other sites. Highlighting these projects successfully will ensure by-in from the community and other stake-holders.

c. International participation: Successful participation on an international level had been a part of CDM APUs outcome this far. Continued participation will not only highlight CDM success but will also highlight Egypt's commitment to emissions reduction.

6.3.4 Positive socio-economic impact of successful projects can be used as a promotional tool to attract investors and stakeholders

The positive socio-economic impact of the projects that were identified and pursued by the CDM APU is a substantial tool to be used in the promotion and attraction of stakeholders and investors alike. The CDM APU has many successful projects with measurable impact that can be utilized in this manner.

6.3.5 Partnerships with other entities (Government, private, and International Organizations) working on promoting sustainability and other objectives in-line with the CDM APU mandates

There are other entities within the Egyptian government that have been playing a vital role in promoting sustainability and GHGs emissions reduction. Identifying these entities and their objectives can lead to a cross promotional capacity that the CDM APU can utilize. In addition, working closely with the private sector and international organizations that has an effective sustainability agenda can open new areas of influence and utilization of the existing CDM APU capabilities.

6.3.6 Clustering small scale projects and PoAs and promoting them accordingly

Although the CDM APU already promotes its projects in clusters, there is still room for improvement. For example, the projects can be clustered and promoted to target a specific funding source or to attract local bank funding.

6.3.7 Lessons learnt from other countries having higher number of successful CDM projects

Many lessons and case studies can be replicated from CDM experiences of countries like India, China, and Brazil. Success in implementing nationwide support and sponsorship of CDM projects is an important lesson without which CDM development will always suffer. Some of the possible factors that helped these countries achieve such success are listed below:

- Incentives procided by the Government for CDM projects implementation
- CDM is utilized by the government as a tool to promote Clean Economuc development
- High emissions levels and availability of various sectors to prob CDM applicability within
- Acceleration of renewable energy / energy efficiency projects' implememtation using CDM incentives
- Efficient projects approval process by the DNA
- Rigorous approval process increase the credebility of CDM projects and minimze the time lost in projects that might fail in later CDM cycle stages
- Early involvement in CDM activities and broad nationwide awareness of CDM and Climate Change
- Government sponsership
- Strong knowledge about CDM among developers

- Early and systematic identification of opportunities

6.4 Threats

6.4.1 Financial sustainability of the CDM APU

After the program closure, the CDM APU should seek independent financial resources to sustain operation. Based on interviewed stakeholders, utilizing a percentage of revenue from the deducted percentage of CERs could provide financial support for the unit in addition to the contribution from EEAA's regular budget. Also, expanding the horizons of the unit's objectives towards different sustainability opportunities can provide another financial support. For instance, supporting existing Corporate Social Responsibility (CSR) initiatives can provide diversified financial support that would be more sustainable in the future.

6.4.2 Uncertainty of the future of CDM and the huge drop in carbon prices

This is considered a major threat for CDM in general. As the closure of opportunities by the UNFCC becomes solidified and the uncertainty facing CDM is clear, it is apparent that many potential interests have halted registration due to this issue. In addition, one of the major drivers for CDM used to be the attractive prices of carbon credits. Now that the carbon market prices have significantly dropped, it will be even harder to promote CDM projects. Further implications on the prices were introduced after the EU Emissions Trading Scheme (EU-ETS) decision to stop the trading of CERs resulting from CDM projects that were not registered under the UNFCCC before 31 December 2012. While the EU-ETS was the most vigorous carbon market worldwide, this decision affected CERs prices worldwide although the Kyoto Protocol was officially extended to a second commitment period.

6.4.3 Vagueness in CDM APU role

The role of the CDM APU is sometimes not clear for potential project proponents being concerned about a non-profit organization like the CDM APU trying to promote the reduction of GHGs which are not regulated in the country's environmental compliance law. This fact makes it more difficult for the unit team to perform efficiently trying to create new opportunities and follow up on existing ones. The scepticism about the unit's role is primarily because companies are not used to this kind of free technical assistance from a government entity.

6.4.4 High transactional cost associated with CDM project proposals

The high transaction cost associated with the development and registration of a CDM project is another threat in many cases. A CDM project cycle cost ranges from US$ 100,000 to US$ 150,000 including consulting, validation and registration fees. The cost depends on the complexity of the project and whether it is a small or large scale project. CDM APU has no control over the transactional cost and thus even after creating buy-in from local entities it is difficult to overcome the financial barrier.

6.4.5 Market resistance and tendency for business as usual

Many local companies don't trust new technologies/opportunities and tend to rely on conventional techniques that would seem more stable for their operations. For example, continuous processes like the cement industry can't afford the impact of a temporary shutdown or the impact of a reduced product quality. Having the perception that any new technology might affect their operations, they tend to avoid any modifications to their conventional processes even though it might have direct energy and cost savings. However, while the Government policy is moving towards liberation of energy prices and cutting subsidies, intensive energy consumers won't be able to resist cleaner and less energy consuming practices for long.

6.4.6 Low price of fossil fuels in Egypt providing low incentive to energy efficiency/GHG abatement projects

The low cost of fossil fuels is a driving factor in general for the slow migration to adopt CDM. The MENA Region countries are heavily dependent on oil and gas to meet their domestic energy demand. Oil contributes more than half of the total energy demand in the Middle East while the rest is contributed by natural gas.[12]

6.4.7 Strict criteria and long complex project cycles for registration by the UNFCCC

The long complex CDM project cycle as well as the substantial cost is a major deterrent to register a CDM project. Even if the CDM APU establishes buy-in from prospective organizations, the strict criterion of the UNFCCC is a major barrier to entry.

6.4.8 High CDM costs with high risk of no access discourages investors and promoters

The lengthy CDM cycle is also an important barrier facing CDM projects in Egypt. As the CDM cycle becomes lengthier (can reach up to 2 years), the projects become less economically attractive. The length of the cycle makes the process less economically feasible for investors. The existence of long term and complicated CDM project cycle mentioned above and the risk attached to the CDM costs with no success guaranteed are considered a major barrier in promoting CDM.

6.4.9 Awareness of CDM projects is lacking.

The lack of awareness of the CDM concepts and process among the project participants is a reason for less CDM projects in Egypt. Usually, unless the company is associated with a foreign partner, it is very difficult for an entity to understand or have enough knowledge to participate in any CDM opportunities.

Many Egyptian entities tend to gain knowledge about CDM from consulting firms that approach these entities for business opportunities (mainly international firms) causing further mistrust in the process. In return, this has resulted in slow decision-making to develop CDM project due to the uncertainties and unclear procedures that the project owners need to understand. Even with CDM APUs push for promoting CDM, there is still rampant lack of knowledge about CDM in general.

6.4.10 CDM APUs promotional tools don't always reach potentially interested parties

Due to the restrictions both logistically and financially it is difficult for the DCM APU to analyze the market segments and thus dispense promotional materials in a strategic manner. Despite these barriers, CDM APU has been successful in implementing a marketing and dissemination program using their limited resources to promote CDM projects.

6.4.11 Institutional and legislative barriers

The subsidy on fossil fuels in Egypt is an important barrier which hinders renewable energy and energy efficiency projects. The subsidies make renewable energy projects very difficult to compete with conventional power plants. Moreover, while calculating the economic feasibility for an energy efficiency project, it might turn out non-feasible due to the diminished savings achieved even considering the revenue from the CDM. Independent power producers in Egypt face uncertainty regarding the development/approval of power purchase agreements (PPAs) by the Government. Although there is a huge potential for wind energy projects, such potential cannot be fully utilized since there is currently no legislation that allows independent power producers to sell their electricity to the grid. Thus, the power producers have no means to study the economic feasibility of their projects if they are unaware of the price at which they will sell their product. Currently, such barrier is being tackled by a new law, which is under consideration by the government.

[12] http://www.booz.com/media/uploads/Climate_Change_after_the_Kyoto_Protocol_MENA.pdf

Another legislative barrier is that the Egyptian laws are not well adapted to CDM projects. Particularly in the Public Sector, tendering rules require a bid bond and a representative in Egypt which causes delays in the process.

6.4.12 Insufficient technical capacity at local level

Many companies do not have the capacity of on-board qualified personnel to evaluate CDM projects and there are very few project developers (consultants) in Egypt who can assist in the development and submission of CDM projects. Also, due to the lack of awareness and difficulty of the CDM cycle, many companies don't have the budget to hire consultants so as to aid with the CDM cycle and process of submission. There is also not enough experience regarding legal issues or the preparation of tending documents related to CDM within Egyptian entities. Furthermore, the DNA employees need more capacity building programmes and new qualified staff members to accomplish their tasks effectively and efficiently.

As a result, many avoid the participation and/or application to a CDM projects due to high transactional costs and lack of technical capacity.

7. Annexes

7.1 Annex I: projects identified by CDM APU

Table 13 Projects Identified by CDM APU

No.	Project	Total CERs/Year
Renewable energy		
1	18 MW Wind Power Generation at El-Zafarana area by Arab Organization for Industrialization (AOI)	33,000
2	Assuit Barrage Hydropower Project	134,330
Afforestation and Reforestation		
3	Greater Cairo Ring Road Afforestation Project	100,000
Waste management		
4	Capture of Landfill Gas (LFG) from the Sanitary Landfill, Proposed by International City Cleaning Co.	100,000
5	Landfill Gas Capturing and Flaring in El-Kattamia Landfill, proposed by Ama Arab Environment Company	100,000
6	Biogas Generation from Waste Water Treatment and Utilization for Heat Generation by Indorama Organics (Egypt) Co. S.A.E. in Beni Suef, Egypt	20,000
7	Anaerobic Digesion of Sludge in El-Gharbia WWTP -Alexandria Sewage Company	346,378
Fuel switching		
8	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Co. at Abu Kurkas Factory	57,200
9	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (6 October Factory)	2,585
10	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Alexandria Factory)	1,747.09
11	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Sohag Factory)	1,620.14
12	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Port Said Factory)	3,662.21
13	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Cairo Factory)	3,662.21
14	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Elmenia Factory)	2,157.79
15	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Tanta Factory)	3,662.21
16	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Kom Ombo Factory Project	21,513
17	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Guirga Factory Project	11,187
18	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Naga Hammadi Factory Project	7,314
19	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Deshna Factory Project	27,536
20	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Qus Factory Project	44,747
21	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Armant Factory Project	30,118
22	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIS)/Idfu Factory Project	27,536
23	Fuel Switching from Mazot to Alternative Fuels (Partial) at Amreyah Cement Company	57,414
24	Fuel Switching from Mazout to Natural Gas proposed by Quena Paper Industrial Co. QPIC	77,000
25	"Fuel Switching from Mazout to Natural Gas", proposed by Misr Edfu Pulp Writing and Printing Paper Company (MEPPCO)	49,000
26	Fuel Switch from Heavy Fuel Oil (Mazout) to Natural Gas in Misr Cement/Qena plant	108,000

No.	Project	Total CERs/Year
27	Biomass Bases Steam and Power Generation by Indorama Organics (Egypt) Co. S.A.E. in Beni Suef, Egypt	70,000
28	CO2 Emissions Reduction Through Partial Substitution of Fossil Fuel by Biomass (Rice Straw) from Agricultural Waste	640,646
29	Recovery of CO2 from Tail Gas in ECHEM facility to substitute the use of fossil fuels for production of CO2	59,000
30	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refused Derived Fuel (RDF) at Arabian Cement Plant	67,273
Energy efficiency		
31	Waste Heat Recovery for Gas Turbine Generators Project	31,096
32	Egypt Household CFL Project	223,000
33	Energy efficiency measures at MRI-Mansoura unit	4000
34	Energy Efficiency in Water Pumping Systems Project at Greater Cairo Drinking Water Company	69,915
35	Energy Efficiency and Heat Recovery Project at Sinai White Cement Company	8,500
36	Natural Gas Leaks Reduction on Gas Distribution Networks of the Ministry of Petroleum of the Arab Republic of Egypt submitted by Ministry of Petroleum	300,000
37	Gas Flare Recovery in Suez Oil Processing Company	120,000
38	Street Lighting Project – North Cairo Electricity Distribution Company	75,000
39	Rehabilitation for Blast Furnace submitted by the Egyptian Iron & Steel Company (EISCO)	227,000
40	Rehabilitation for Sinter Plant submitted by the Egyptian Iron & Steel Company (EISCO)	196,193
41	Waste Heat Recovery and Utilization for Power Generation at the TITAN Cement Plant in Beni Suef	
42	Waste Heat Recovery Projects for Gas Turbine Generators proposed by KHALDA Petroleum Co.	73,000
43	Gas Flare Recovery in Alexandria National Refining & Petrochemical Company (ANRPC)	50,000
44	Power Generation from Waste Heat Recovered from Flue Gases at CEMEX plant	112,000
Industry		
45	N2O and NOX Abatement Project at Delta-ASMEDA Fertilizer Plant in Al Mansoura (Egypt)	176,000
46	Semadco Fertilizers N20 Abatement	275,265
47	N2O abatement at KIMA	115,553
48	Reduction of N2O Emissions from the New Nitric Acid Plant of Egypt Hydrocarbon Corporation at Ain Sokhna	248,852
49	Producing Liquefied CO2 With Production Capacity of 2.5 ton/hour	43,200
50	Introduction of Hot Direct reduced Iron (DRI) into Electric ARC Furnace (EAF)	106,000
Total		**4,584,863**

7.2 ANNEX II: Capacity building and training

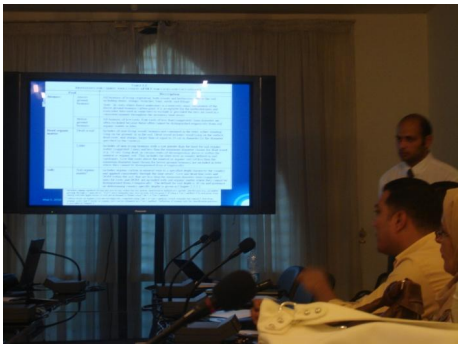
Project Idea Note (PIN) preparation according to the criteria adopted at the National Office for Clean Development Mechanism	
Venue: Cairo House	**Trainer:** Environmental Management Centre, India
Attendance: The participants included 12 delegates representing the following entities: ► CDM APU ► CDM General Department/DNA ► Environmental protection Fund(EPF) ► Environmental compliance Office & Sustainable Development Federation of Egyptian Industries (FEI,ECO) ► National Cleaner production center 	**Training Topics:** ► CDM project cycle ► Project design and formulation ► PIN structure ► Pitfalls PIN preparation ► Case study 

Advanced training on CDM and PDD preparation	
Venue: Cairo House	**Trainer:** INTEGRAL, Egypt
Attendance: The participants included 10 delegates representing the following entities: ► CDM APU ► CDM General Department/DNA; ► Egyptian Liquefied Natural gas company(Private sector); ► FEI,ECO ► Ministry of Investment 	**Training Topics:** ► CDM Modalities & Procedures ► Additionality tests for CDM project Activities ► Development of Baselines ► Procedures for Small Scale CDM ► CDM Project development process ► Key elements of PDD ► Validation, Verification & Certification ► CER trading options and opportunities ► Group works and case studies 

Estimation and Methodologies of GHG emissions in industrial sector	
Venue: Cairo House	**Trainer:** Samir Mwafi, Egypt
Attendance: 18 delegates ► CDM APU ► CDM General Department/DNA ► FEI,ECO ► Ministry of Investment ► National Cleaner production center ► Department of Environmental Impact Assessment ► Egyptian Pollution Abatement Project ► EPF 	**Training Topics:** ► Inventory of GHGs from the Industrial Processes and Product Use (IPPU) ► Utilization of the GHGs Emission factors database (EFDB), IPCC ► Common methodologies and tools for identifying/assessment of CDM projects in industrial sector ► Case study on estimating GHGs emissions from the cement production 

Estimation and Methodologies of GHG emissions in Waste sector	
Venue: Cairo House	**Trainer:** Amr Osama and Nader Raghieb
Attendance: 25 delegates ► CDM APU ► CDM General Department/DNA ► Department of Environmental Impact Assessment ► EPF ► Municipalities and Services companies ► Governorates representatives ► Waste department/EEAA 	**Training Topics:** ► Overview of Waste types generation and management data in Egypt ► Level and trends in GHG emissions from Waste sector in Egypt ► Emissions from landfills ► Solid waste disposal ► Utilization of the GHGs Emission factors database (EFDB), IPCC ► Overview of the baseline and monitoring methodologies in waste sector 

Estimation and Methodologies of GHG emissions in energy sector	
Venue: Cairo House	**Trainer:** Samir Mwafi, Egypt
Attendance: 11 delegates ► CDM APU ► CDM General Department/DNA ► FEI,ECO ► Ministry of Investment ► National Cleaner production center ► Department of Environmental Impact Assessment ► Egyptian Pollution Abatement Project ► EPF 	**Training Topics:** ► An Introduction to Energy Statistics and Consumption ► Overview of energy statistics and energy consumption in Egypt ► Level and trend of GHG emissions from the energy sector in Egypt ► GHG emissions from Energy sector ► GHG emissions from Stationary Sources ► GHG emissions from Mobile Sources ► CDM Projects in Energy Sector ► Case studies

Estimation and Methodologies of GHG emissions in Agriculture sector	
Venue: Cairo House	**Trainer:** Omar Hesham, Egypt
Attendance: 15 delegates ► CDM APU ► CDM General Department/DNA ► Agriculture department/EEAA ► Desert Research Institute ► EPAP II ► Waste department/EEAA 	**Training Topics:** ► An Introduction to IPCC and GHG inventory ► Egypt GHG inventory ► Generic Methodologies for Multiple Land Use Categories ► Introduction to CDM ► CDM Projects and methodologies of Agriculture sector ► Case studies 

Monitoring of Vehicle Replacement and Scrapping Program	
Venue: Cairo House	**Trainer:** Samir Mwafi, Egypt
Attendance: 10 delegates ► CDM APU ► CDM General Department/DNA ► Ministry of Finance 	**Training Topics:** ► An Introduction to CDM APU and its activities ► Vehicle Scrapping and Recycling Program ► Description of the Small-Scale Program of Activities (PoA) ► Monitoring of the Vehicle Scrapping and Recycling Program ► Description of the monitoring plan ► Sampling Plan ► Procedures for Administering Data Collection ► Other Monitoring Activities

Monitoring plans in CEMEX Assiut Cement Company	
Venue: CEMEX, Assiut	**Trainer:** Integral, TUV NORD Egypt
Attendance: 20 delegates ► CDM APU ► CDM General Department/DNA ► CEMEX staff 	**Training Topics:** ► Introduction to CDM ► Potential CDM Opportunities in Cement Sector ► Description of the monitoring plan ► Procedures for Administering Data Collection ► Other Monitoring Activities ► Verification methodology

Certified Energy Manager	
Venue: Cairo House	**Trainer:** Khaled Elfaraa, Ayman Elasaka, Egypt
Attendance: 10 delegates ► CDM APU ► CDM General Department/DNA ► EPAP II ► PEPSI ► ELNG	**Training Topics:** ► The Needs for Energy Management ► Energy Sources & Norms ► Fuel types and Rate Structure ► Conducting an Energy Audit ► Economic Analysis and LCC ► Electric System & Motors ► Lighting Basics & Lighting System Improvements ► Insulation ► HVAC Basics and HVAC System Efficiency Improvements ► Boiler & Thermal Systems Improvements ► Waste Heat Recovery & Cogeneration ► Maintenance ► Controls ► CEM Examination Sample Questions

Contracting and other legal issues in the CDM cycle	
Venue: Sofitel, Cairo	**Trainer:** First Climate, Germany
Attendance: 10 delegates ► CDM APU ► CDM General Department/DNA ► Ministry of Electricity ► New & Renewable Energy Authority (NREA) ► Private companies	**Training Topics:** ► CDM project cycle from a legal perspective ► The Actors - Roles of the key entities involved in a CDM project and how they are interlinked ► Legal issues related to interaction of these stakeholders ► Structuring and financing a CDM project ► Domestic Legal Issues to be considered ► Contracting Perspective ► The ERPA terms

Introduction to NAMAS	
Venue: Sofitel, Cairo	**Trainer:** First Climate, Germany
Attendance: 10 delegates ► CDM APU ► CDM General Department/DNA ► Ministry of Electricity ► New & Renewable Energy Authority (NREA) ► Private companies ► Ministry of petroleum ► Ministry of transport 	**Training Topics:** ► NAMA concept ► Emission reduction potential ► NAMA boundaries and MRV ► Source of Finance ► ODA lesson learnt ► From PoA to NAMA ► Group work- Egyptian NAMA

GHG Auditor Training Course	
Venue: Essen, Germany	**Trainer:** TUV NORD, Germany
Attendance: 12 delegates ► CDM APU ► CDM General Department/DNA ► Ministry of Electricity ► New & Renewable Energy Authority (NREA) ► National Consultants ► Ministry of petroleum ► FEI-ECO 	**Training Topics:** ► General aspects of climate Change ► Basic knowledge Kyoto/JI/CDM ► EU ETS Emission Trading Scheme ► Validation Process ► Project Design Document ► Baseline Assessment ► Additionality ► Financial Analysis model (CF) ► Monitoring Plan ► Verification Process ► Monitoring Report Template ► Validation Report ► Verification Report ► Self study -Working with PDD ► Program of Activities ► GHG Audit Techniques ► Information sources for CDM ► TN Ethical Standards ► ISO 14064 Awareness

<table>
<tr><th colspan="2">Training Workshop on GHG Accounting, Carbon Footprint Reporting, GHG abatement strategies, NMMs, and Energy Management</th></tr>
<tr><td>Venue: Ernst & Young Office, Cairo, Egypt</td><td>Trainer: Ernst & Young</td></tr>
<tr><td>Attendance: 9 delegates
CDM APU
EEAA
National Consultants  </td><td>Training Topics:
Basic concept of climate change and greenhouse gases
Business implication of climate change (Case Studies)
International actions on climate change – Carbon Markets
New Market Mechanisms and NAMAs
Greenhouse gas accounting and reporting approach
Organizational level accounting
Product level accounting
Low carbon transformation
Basics of Energy Management Systems as per ISO 50001</td></tr>
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7.3 ANNEX III: Previous and current Egyptian CDM portfolio

Previous CDM portfolio in Egypt

In February 2009, the Egyptian DNA issued Letters of No Objection for 32 CDM projects. However, only 4 projects were registration and 8 projects were under validation. Other projects in the portfolio were facing various barriers hindering the progress of CDM cycle. A summary of the status of these projects is presented below.

Table 14 Previous CDM projects portfolio in Egypt

No.	Project	Status
1.	Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.	Registered 07 Oct 06
2.	Onyx Alexandria Landfill Gas Capture and Flaring Project	Registered 15 Dec 06
3.	Zafarana 120 MW Wind Power Plant Project	Registered 22 Jun 07
4.	Waste Gas-based Cogeneration Project at Alexandria Carbon Black Co., Egypt	Registered 26 Jul 08
5.	Egyptian Brick Factory GHG Reduction Project	Corrections requested (minor)
6.	Al-Sindian 13 MW Natural Gas based Cogeneration Package Project, Egypt	At validation
7.	Naga Hammadi Barrage Hydropower Project	At validation
8.	Land Filling and Processing Services for Southern Zone in Cairo	At validation
9.	Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues in CEMEX Assuit Cement Plant	At validation
10.	Zafarana 80 MW KfW IV Wind Farm Project, Arab Republic of Egypt	At validation
11	Waste heat recovery based Cogeneration project at Abu Zaabal Fertilizers and Chemicals Company	At validation
12.	Zafarana 85 MW Wind Power Plant Project in the Arab Republic of Egypt	At validation
13.	Damietta Barrage Small Hydropower Project	Letter of no objection
14.	Assiut Barrage Hydropower Project	Letter of no objection
15.	Tourah Plants Fuel Switching Project	Letter of no objection
16	Sinai Cement (Grey Plant) Fuel Switching Project	Letter of no objection
17.	Line 3 Greater Cairo Metro Network -Phase 1 & 2 Project	Letter of no objection
18.	Greater Cairo Ring Road Afforestation Project	Letter of no objection
19.	Reduction in Nitric Acid Unit at Elnasser for Coke and Chemicals	Letter of no objection
20.	Equipment Replacement and Fuel Switching Dyeing Materials & Chemicals (ISMADYE) Company	Letter of no objection
21	Perflurocarbon's Emissions Reduction at the Aluminum Company of Egypt	Letter of no objection
22.	Fuel Switching in Boilers, Dryers and Furnaces of Alexandria for Oil & Soap Company	Letter of no objection
23.	Fuel Switching for Electricity Generation and Industrial Processes, Misr Fine Spinning & Weaving Company	Letter of no objection
24.	Fuel Switching for Electricity Generation and Industrial Processes, Misr Beida Dyers company	Letter of no objection
25.	Nitrous Oxide Abatement CDM Project at Nitric Acid Plant at El- Delta Company for Fertilizer and Chemical Industries	Letter of no objection
26.	Nitrous Oxide Abatement CDM Project at Nitric Acid Plant at El-Nasr Company for Fertilizer and Chemical Industries (SEMADCO)	Letter of no objection
27.	Nitrous Oxide Abatement CDM Project at Nitric Acid Plant at Egyptian Chemical Industries Company (KIMA)	Letter of no objection
28	Fuel Switching & Reduction of Clinker Content at National Cement Company	Letter of no objection
29.	Fuel Switching for Industrial Processes in Delta Steel Company	Letter of no objection
30	Equipment Replacement and Fuel Switching at El-Mex Salinas Company – Alexandria	Letter of no objection
31.	Zafarana 120 MW Wind Power Plant Project	Letter of no objection

No.	Project	Status
32.	Partial Fuel switching to Alternative fuels in Helwan and Kattameya Cement Plants	Letter of no objection

Current CDM portfolio in Egypt

The Egyptian DNA has issued Letters of No Objection for 105 CDM projects. However, only 13 projects in addition to 3 PoAs were registered under the UNFCCC. Also, 20 projects and 11 PoA are either on-going validation or have requested registration. Other projects in the portfolio are facing various barriers hindering the progress of CDM cycle. A summary of the status of these projects is presented below.

Table 15 Current CDM projects portfolio in Egypt

No.	Project	Status
1.	Zafarana Wind Power Plant Project 120 MW (NREA – Japan)	Registered
2.	Zafarana 8 - Wind Power Plant Project, Arab Republic of Egypt 120 MW (NREA-Denmark)	Registered
3.	Zafarana 85 MW Wind Power Plant Project in the Arab Republic of Egypt (NREA – Spain)	Registered
4.	Zafarana KfW IV Wind Farm Project 80 MW (NREA-Germany)	Registered
5.	Gulf El Zeit Wind Power Farm Project 120 MW (up to 400 MW) – Italgen Egypt	Letter of no objection
6.	200 MW Wind Farm at the Gulf of El Zayt (NREA- Germany – EC – EIB)	Letter of no objection
7.	Egypt Wind POA (First CPA)	Letter of approval
8.	18 MW Wind Power Generation at El-Zafarana area by Arab Organization for Industrialization (AOI)	Letter of No Objection
9.	POA for Small Scale Renewable Energy Development in Egypt	Validation
10.	Small-Scale Renewable Electricity Advancement Programme, proposed by Balderrie Energies GmbH	Letter of no objection
11.	Renewable Power Advancement Programme, proposed by Balderrie Energies GmbH	Letter of no objection
12.	Installation of Solar Water Heaters Programme in Egypt - POA	Letter of no objection
13.	Demitta Barrage Small Hydropower Project	Letter of no objection
14.	Assuit Barrage Hydropower Project	Letter of no objection
15.	Programme for Grid Connected Renewable Energy in the Mediterranean Region	Registered
16.	Greater Cairo Ring Road Afforestation Project	Letter of no objection
17.	Jatropha Luxor Project – submitted by JatroSolutions GmbH – Private sector/consulting firm	Letter of no objection
18.	Soli Organic Carbon Sequestration With Agriculture	Letter of no objection
19.	Impact of Roof Gardens on Global Warming in Urban Areas	Letter of no objection
20.	Onyx Alexandria Landfill Gas Capture and Flaring Project	Registered
21.	Land Filling and Processing Services for Southern Zone in Cairo	Registered
22.	Abu Zabal Landfill Gas Recovery and Flaring/Destruction	Validation
23.	Methane Capture and Flaring in Belbis Landfill	Letter of no objection
24.	Methane reduction by composting in Khatatba landfill	Letter of no objection
25.	Capture of Landfill Gas (LFG) from the Sanitary Landfill, Proposed by International City Cleaning Co.	Letter of no objection
26.	Landfill Gas Capturing and Flaring in El-Kattamia Landfill, proposed by Ama Arab Environment Company	Letter of no objection
27.	Biogas Generation from Waste Water Treatment and Utilization for Heat Generation by Indorama Organics (Egypt) Co.S.A.E. in Beni Suef, Egypt	Letter of no objection
28.	Anaerobic Digesion of Sludge in El-Gharbia WWTP -Alexandria Sewage Company	Letter of no objection
29.	Develop Agriculture Wastes Management for Reducing Gas Emission	Letter of no objection
30.	Scrapping and Replacement Program of Two-Stroke Motor Cycle in Egypt (PoA)	Letter of no objection
31.	Egypt Vehicle Scrapping and Recycling (POA)	Registered

No.	Project	Status
32.	Line 3 Greater Cairo Metro Network Phase 1 &2 Project	Letter of no objection
33.	Emissions reduction through partial substitution of fossil fuels with renewable plantation biomass and biomass residues in CEMEX Assuit Cement Plant	Registered
34.	Egyptian Brick Factory GHG Reduction Project	Registered
35.	Sinai for Cement	Letter of no objection
36.	Equipment Replacement & Fuel Switching, Dyeing Material & Chemicals (ISMADYE) Co.	Letter of no objection
37.	Fuel Switching in Boilers, Dryers and Fumaces of (OASC)	Letter of no objection
38.	Fuel Switching from Mazout to Natural Gas in Misr Fine Spinning & Weaving and Misr Beida	Registered
39.	Fuel Switching at the National Cement Co. (NCC), Egypt	Validation
40.	Reduce the Share of Clinker in the Production of a blended Cement type at the National Cement Co. (NCC)	Validation
41.	Fuel Switching from Heavy Oil to Natural Gas in Dakahlia Spinning & Weaving Co.	Letter of no objection
42.	Fuel Switching from Light Oil and Cookoven Gas to Natural Gas in El-Nasr Forging Industry Co.	Letter of no objection
43.	Fuel Switching from Light Oil to Natural Gas in Damietta Spinning & Weaving Co.	Letter of no objection
44.	Equipment Replacement and Fuel Switching at El-Mex Salinas Co.	Letter of no objection
45.	Reduction of Sodium Carbonate Content in Nile Oil & Detergent Co.	Letter of no objection
46.	Carbon Dioxide Emissions Reductions in Misr Oil & Soap Co.	Letter of no objection
47.	Fuel Switching from Mazout to Natural Gas in General Co. for Paper Industry (RAKTA)	Letter of no objection
48.	Fuel Switching to Cleaner Fuel in Middle East for Paper (SIMO) Manufacturing Co.	Letter of no objection
49.	Fuel Switching to Cleaner Fuel in the Egyptian Starch & Glucose Manufacturing Co. (Tourah Plant)	Letter of no objection
50.	Partial Fuel Switching to Agricultural Wastes & Refuse Derived Fuel (RDF) at Helwan Cement Plant	Requesting registration
51.	Partial Fuel Switching to Agricultural Wastes & Refuse Derived Fuel (RDF) at Kattameya Cement Plant	Requesting registration
52.	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Co. at Abu Kurkas Factory	Letter of no objection
53.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (6 October Factory)	Letter of no objection
54.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Alexandria Factory)	Letter of no objection
55.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Sohag Factory)	Letter of no objection
56.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Port Said Factory)	Letter of no objection
57.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Cairo Factory)	Letter of no objection
58.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Elmenya Factory)	Letter of no objection
59.	Fuel Switch from Natural Gas to Biomass Project in Pepsi Cola Egypt (Tanta Factory)	Letter of no objection
60.	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Kom Ombo Factory Project	Letter of no objection
61	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Guirga Factory Project	Letter of no objection
62.	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Naga Hammadi Factory Project	Letter of no objection
63.	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Deshna Factory Project	Letter of no objection
64.	Fuel Switching from Mazout to Natural Gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Qus Factory Project	Letter of no objection
65.	Fuel switching from Mazout to natural gas in the Egyptian Sugar and Integrated Industries Company (ESIIC)/Armant Factory Project	Letter of no objection
66.	Fuel switching from Mazout to natural Gas IN the Egyptian Sugar and Integrated Industries Company (ESIIC)/Idfu Factory Project	Letter of no objection
67.	Fuel switching from Mazot to alternative fuels (Partial) at Amreyah Cement Company	Letter of no objection

No.	Project	Status
68.	Fuel switching from Mazout to natural gas proposed by Quena Paper Industrial Co. QPIC	Requesting registration
69.	"Fuel switching from Mazout to natural gas", proposed by Misr Edfu Pulp Writing and Printing Paper Company (MEPPCO)	Requesting registration
70.	Fuel switch from heavy fuel oil (Mazout) to natural gas in Misr Cement/Qena plant	Letter of no objection
71.	Biomass Bases Steam and Power Generation by Indorama Organics (Egypt) Co.S.A.E. in Beni Suef, Egypt	Letter of no objection
72.	CO2 emissions Reduction Through Partial Substitution of Fossil Fuel by Biomass (Rice Straw) from Agricultural Waste	Letter of no objection
73.	PoA for Fuel Switching at SMEs (small and medium-sized enterprises) in Egypt	Requesting registration
74.	Recovery of CO2 from Tail Gas in ECHEM facility to substitute the use of fossil fuels for production of CO2	Letter of no objection
75.	Partial Fuel Switching to Agricultural Wastes, Sewage Sludge & Refused Derived Fuel (RDF) at Arabian Cement Plant	Requesting registration
76.	Al-Sindian 13 MW Natural Gas based Cogeneration Package Project, Egypt	Registered
77.	Waste Gas-based Cogeneration Project at Alexandria Carbon Black Co., Egypt	Registered
78.	Waste heat recovery based Cogeneration project at Abu Zaabal Fertilizers and Chemicals Company	Validation
79.	Waste Heat Recovery in Delta Steel Co.	Letter of no objection
80.	Waste Heat Recovery for Gas Turbine Generators Project	Validation
81.	Egypt Household CFL Project	Letter of no objection
82	Power Generation by Utilizing Coke Oven Gas of Al-Nasr Co. for Coke & Chemicals	Letter of no objection
83.	Energy efficiency measures at MRI-Mansoura unit	Letter of no objection
84.	Energy Efficiency in Water Pumping Systems Project at Greater Cairo Drinking Water Company	Letter of no objection
85.	Energy Efficiency and Heat Recovery Project at Sinai White Cement Co.	Letter of no objection
86.	Natural Gas Leaks Reduction on Gas Distribution Networks of the Ministry of Petroleum of the Arab Republic of Egypt submitted by Oneliria Trading LTD. Co.	Pipeline
87.	Gas Flare Recovery in Suez Oil Processing Company	Requesting registration
88.	Street Lighting Project – North Cairo Electricity Distribution Company	Letter of no objection
89.	Rehabilitation for Blast Furnace submitted by the Egyptian Iron & Steel Company (EISCO)	Pipeline
90.	Rehabilitation for Sinter Plant submitted by the Egyptian Iron & Steel Company (EISCO)	Pipeline
91.	Waste Heat Recovery and Utilization for Power Generation at the TITAN Cement Plant in Beni Suef	Pipeline
92.	Waste Heat Recovery Projects for Gas Turbine Generators proposed by KHALDA Petroleum Co.	Letter of no objection
93.	Gas Flare Recovery in Alexandria National Refining & Petrochemical Company (ANRPC)	Letter of no objection
94.	Power Generation from Waste Heat Recovered from Flue Gases at CEMEX plant	Letter of no objection
95.	PoA for Water Pumping Efficiency improvement by Rehabilitation for Egyptian pumping stations	Validation
96.	International water purification programme	Registered
97.	Catalytic N2O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.	Registered
98.	N2O and NOX Abatement Project at Delta-ASMEDA Fertilizer	Requesting registration
99.	Semadco Fertilizers N20 Abatement	Validation
100.	N2O abatement at KIMA	Registered
101.	Flared Gas Recovery System	Letter of no objection
102.	Reduction of N2O Emissions from the New Nitric Acid Plant of Egypt Hydrocarbon Corporation at Ain Sokhna	Registered
103.	Producing Liquefied CO2 With Production Capacity of 2.5 ton/hour	Letter of No Objection

No.	Project	Status
104.	Shifting from Traditional Open-Pit Method to Mechanized Charcoal Production Program in Egypt, EEAA	Letter of Approval
105.	Introduction of Hot Direct reduced Iron (DRI) into Electric ARC Furnace (EAF)	Validation

7.4 ANNEX IV: Socioeconomic Impact Estimation of CDM APU Projects

Table 16 Total Annual Energy and Subsidies Savings from CDM APU Projects

Energy Category	National Price ($)	International Price ($)	Government Subsidies per unit fuel ($)	Total Annual Energy Savings	Estimated Annual Subsidies Savings ($)
Mazout (ton)	147	382	235	831,000 ton	196,000,000
NG (MBTU)	2.86	5.7	2.84	6,950,000 MBTU	20,000,000
Electricity (kWh)	0.03	0.06	0.03	1,117,000,000 kWh	33,000,000
Total Subsidies Savings					249,000,000

Table 17 Summary of Socioeconomic Impact from CDM APU Projects

Total Annual Emission Reductions (tCO2e/year)	Average CERs Price (US $ / CER)	Total Annual Revenue from CERs (US $)	Total Projects Cost (US $)	Estimated Annual Subsidies Savings (US $)
3,120,000	5	15,600,000	577,000,000	249,000,000

7.5 ANNEX V: Disclaimer

Ernst & Young ("EY" or "We") was engaged on the instructions of the UNIDO to review the objective and operation of CDM APU ("Project"), in accordance with the engagement scope signed between UNIDO and EY in 2012.

The report analyzing CDM APU's operation and its effectiveness is provided by EY on an "as is" and "as available" basis. The contents of this Report are based on a combination of quantitative data and qualitative comments and hence provide a subjective assessment of the CDM APU operations and its effectiveness. All quantitative comments are based on information provided by the CDM APU team wherever possible. Where reliable data was not available, qualitative comments were made which may or may not reflect the true state of affairs.

Information has been assimilated from secondary sources, including published country, industry and institutional information, and primary sources, in the form of interviews with industry executives. EY takes no responsibility for any incorrect information supplied by market participants (including CDM APU team). We are not expressing any assurance on the accuracy or completeness of the information obtained and also on any of the inferences made by analyzing the information.

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