

Arab Republic of Egypt
Ministry of Electricity and Energy
NEW AND RENEWABLE ENERGY AUTHORITY
(NREA)

Terms of Reference

Environmental and Social Impact Assessment (ESIA)

For

100 MWe Kom Ombo Concentrated Solar Power (CSP)
Project

April 2011

**Arab Republic of Egypt
Ministry of Electricity and Energy
New and Renewable Energy Authority
(NREA)**

TERMS OF REFERENCE

Environmental and Social Impact Assessment

FOR

Kom Ombo Concentrated Solar Power (CSP) Project

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For
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1. INTRODUCTION

1.1 The Purpose of the ESIA Study

In order to obtain the “Environmental Permits” and “Funding Approvals” of construction for the Kom Ombo Concentrated Solar Power (CSP) Project with 100 MWe capacity, the New and Renewable Energy Authority (NREA), under the Ministry of Electricity and Energy, has to carry out an Environmental and Social Impact Assessment (ESIA), which will have to comply with the environmental procedures of the Egyptian Environmental Affairs Agency (EEAA) and with the environmental guidelines of the financing institutions, World Bank (WB) and African Development Bank (AfDB).

1.2 Environmental and Social Aspects

The construction and operation of any power plant produces certain impacts on the environment. Some of these impacts may be negative or adverse, while others may be positive or beneficial. The major aspects of the Kom Ombo Concentrated Solar Power (CSP) Project that are expected to impact the environment include the following:

- Temporary disturbance of the land surface during construction of the power plant and offsite facilities.
- Occupation of the land surface with permanent power plant structures and offsite facilities.
- Temporary disturbance of the bottom of the Nile River during the construction of cooling water intake and discharge structures and during any maintenance dredging that may be required for the intake and discharge.
- Occupation of a small portion of the bottom of the Nile River with permanent intake and discharge structures.
- Withdrawal of substantial quantities of water from the Nile River for cooling and other plant uses, and the return of most of this water with an increased temperature.
- Handling and combustion of natural gas.
- Emission of exhaust gases containing combustion products into atmosphere.
- Ambient air quality concentration levels due to flue gases from the stacks.
- Employment (and attraction into the local site area) of substantial numbers of workers for power plant construction and operation.

The nature and significance of the environmental and social impacts expected to result from these aspects of the Project are to be discussed in the ESIA report. This TOR outlines the scope of the Environmental and Social Impact Assessment Study to be carried out and utilized in the process of obtaining Environmental Permits and Funding Approvals.

The aim is to supply relevant data concerning the environmental and social impacts of the project, and to assess and compare the impacts in relation to relevant national and

international requirements and guidelines.

According to past experience, a typical summary for the Environmental and Social Impact Assessment Report (see Terms of Reference) is defined which should comply with standardized requirements and World Bank guidelines and AfDB environmental and social assessment procedures (ESAP).

According to the AfDB's ESAP, this project is classified as category 1. It is also classified as Category A according to the World Bank's Operational Policy OP4.01 on Environmental Assessment. The ESIA will, therefore, have to be prepared with all the requirements for category 1 of the AfDB and WB's "Category A" projects, in terms of rigor of analysis, analysis of alternatives, extent of consultation, details of environmental and social management plan, and public disclosure.

1.3 Environmental and Social Impact Assessment Requirements

These requirements will be identified including any regulations and guidelines which will govern the conduct of the assessment. The Environmental impact assessment is to be guided by:

- National laws and/or regulations on environmental reviews and impact assessments;
- World Bank Operational Policy (OP4.01) on *Environmental Assessment* and other pertinent Guidelines;
- World Bank's *Pollution Prevention and Abatement Handbook*;
- AfDB's *Environmental and Social Assessment Procedures* (June 2001),
- *Environmental Policy* (February 2004), and related documents; and
- Environmental assessment regulations of other financing organizations involved in the project.

In addition to OP 4.01 on Environmental Assessment, the project may also - if it results in resettlement, land acquisition or loss of income - trigger OP 4.12 on Involuntary Resettlement and AfDB's Involuntary Resettlement Policy (November 2003). As indicated in Section 3.4, this would require the preparation of separate documentation – which should be prepared in parallel with the ESIA.

The consultant should review the WB's 10 safeguard operational policies and determine which ones are triggered by this project. The consultant should identify the impacts and provide mitigating measures for each applicable safeguard policy. Details on the triggering of the safeguard policies are available in World Bank's Guidebooks.

1.4 The Consultant will have to:

1. integrate a specialized team of experts required to undertake the ESIA study.
2. conduct several visits, with the team of experts, to the site for carrying out site reconnaissance and data collection, in conjunction with the concerned authorities.
3. conduct, using the specialized team of experts, several baseline studies, covering the all spectrum of analysis and modeling relevant to the construction and operation of the power projects.

4. assess the environmental and social impacts of the construction and operation activities; and develop an environmental management and monitoring plan for to manage these impacts.
5. compile, edit and prepare for final print a Draft Final Environmental and Social Impact Assessment (ESIA) Report containing standardized parts of the study Report.
6. carry out a Quantitative Risk Assessment (QRA), and describe the preventive measures and actions to be taken in the event of a safety problem and the associated health risks. This is a requirement by the Egyptian Environmental Affairs Agency for power projects.

2. BACKGROUND

2.1 Electricity Demand

Egypt has a rapidly expanding economy that is dependent on the availability of reliable and low cost electric power. The annual average rate of growth of electricity demand in Egypt is expected to range between 7.5-6.5% up to 2011/2012. Peak demand is expected to rise from 17,300 MWe in 2005/2006 to 25,110 MWe by 2011/2012 and installed capacity is expected to increase from 20,452 MWe to 30,372 MWe during the same period.

In 2005/2006, about 98.5% of the population was served by the Egyptian electricity grid. Of a total demand of 103.37 TWh on the interconnected system, about 11.7% was met by hydropower, principally the High Dam and Aswan 1 & 2, and the remaining was met with thermal plants, of which around 80% were supplied from natural gas and 20% heavy fuel oil.

In order to meet the forecasted demand, the Ministry of Electricity & Energy estimates that an addition of thousands megawatts of new generating capacity will be required during the next ten years.

2.2 The Project

The project will support the construction and initial operation of the proposed 100 MWe Kom Ombo CSP plant in upper Egypt. The plant is proposed as a public sector project to be implemented by NREA, which leads the implementation of donor financed public sector renewable energy projects in Egypt.

The approach being adopted by the Government in scale-up of CSP is to go with plant configurations that can provide reliable power supply, preferably with increasing levels of dispatchability as compared to wind power, the other new renewable energy technology that is being aggressively pursued by the Government.

Different technology configurations are being considered for the project including a solar only option, a molten salt thermal storage option, and a solar plant with an auxiliary heating option that would allow buffering for cloud passage, reduce start-up time, etc. For the solar field, parabolic trough with thermo oil as the heat transfer fluid is proposed in view of the level of maturity of this technology at the proposed plant size. The GOE has stressed its preference for

a commercially proven technology to the extent possible to minimize risk. The final selection of the technology configuration will be made based on a comprehensive technical, economic, environmental and social evaluation of these options as part of the feasibility study.

The development of the Kom Ombo project has been led by NREA and is being supported by KfW, the African Development Bank and the World Bank. These development partners are also interested in financing the project with European partners led by KfW/Neighborhood Investment Facility (NIF) but including European Investment Bank (EIB) and the AFD/NIF. The GoE also expects additional EU grant financing under the National Indicative Programming (NIP) for the current period.

In order to document the basis for the detailed assessment of environmental and social impacts, the following plant design information will be provided:

- General description of the plant layout, buildings, and facilities.
- Detailed description of the location and design of cooling water intake and discharge structures.
- Detailed description of wastewater treatment facilities and other pollution control equipment.
- Detailed water balance diagram and estimates of wastewater discharge quantities, temperature, and composition.
- Detailed description of facilities and practices for the disposal of water treatment sludge, used paints and solvents, and other wastes.
- Detailed description of facilities and practices for the storage and handling of oil and chemicals.
- Detailed description of the stack design (location, height, number of flues, flue diameter, liner material, etc.).
- Detailed data on flue gas emissions (flow rate; exit velocity and temperature; emissions of sulfur dioxide, nitrogen oxides, and total particulate matter in milligrams per cubic meter of flue gas and in nanograms per joule of heat input).
- Detailed data on noise levels at various distances from operating plant equipment.
- Detailed description of equipment and provisions for monitoring air pollution emissions, wastewater discharges, and noise during plant operation.
- Detailed description of the location and design of any offsite facilities or connections to be constructed.
- Detailed description of the practices that will be used to control noise, dust, erosion, and other adverse environmental impacts during construction of the power plant and any offsite facilities.
- Detailed description of the facilities (housing, transportation, drinking water, sanitation, etc.) that will be provided for workers involved in the construction of the power plant and offsite facilities.
- Summary of the expected construction schedule and manpower requirements throughout the construction period.

3. SCOPE OF WORK

The performance of the scope of work described hereinafter will provide an Environmental and Social Impact Assessment for the Kom Ombo Concentrated Solar Power (CSP) Project. This scope addresses the AfDB as well as the World Bank Environmental and Social Guidelines as they will relate to this project.

The major focus will be directed to the point source emission standards and environmental and social assessment will necessarily study ambient air and water quality impacts, noise impacts, solid waste and socio-economic impacts.

This scope is presented to clearly describe the relationship between the activities and the work products that comprise the ESIA report.

3.1 Scoping and Consultation

According to the requirements of the World Bank's OP 4.01 on Environmental Assessment, and since this is a Category A project, **two well advertised consultation meetings are required: one at scoping and one when a draft ESIA is available.**

These two consultation meetings will be well advertised, at least a week in advance of each meeting, in a widely distributed daily newspaper. The meetings should include among other concerned parties, the Egyptian Environmental Affairs Authority, and other government Ministries and Agencies that have concerns with such power plant project. The meeting will also include representatives from academia, national research centers, civil society organizations, and the media. Local government level officials from communities near the proposed site will be contacted for information as a part of the ESIA procedures. **Every effort should be taken to include broad representation from all economic and social sectors, especially the potentially marginalized groups such as women, lower socioeconomic standard, etc.** Furthermore, every effort should be made to accurately and thoroughly document the meeting attendees, their affiliation, gender, socio-economic level, views and concerns. Draft materials will be available to the public before the two consultation meetings to allow the public to understand the project components, scope, and impacts.

This process at scoping will provide a basis for reviewing the issues that should be considered in the ESIA. It is expected that the issues will include fuel delivery systems, air emissions and ambient concentrations, impacts on water quality and quantity, development of the land surrounding the site and in the general area. The changes in the project in terms of the project environmental and social mitigation plan and how this plan will be implemented will be discussed. The process, at the draft ESIA report stage, will allow the consultants to provide a more concrete response to the public's comments, and how they were incorporated in the design and operation of the project.

3.2 Data Collection

Coincident with the scoping for the environmental and social impact assessment, a data gathering task will be undertaken. One activity is a site visit to confirm site conditions and the level of development of the surrounding area. The second is to gather input data to analyze the environmental and social issues as determined from the scoping process.

3.3 Analysis

Subsequent to gathering of data, the environmental and social issues will be addressed in terms of the environmental and social risks associated with the construction of the power plant and the routine and non-routine operation of the facilities.

The ESIA will address the issue of alternatives by summarizing and referencing the alternatives in a manner consistent with national and international guidance.

Mathematical models where appropriate will be used. **Mathematical models will be mainly required for modeling the air quality impact of the stack, water impacts on the Nile related to cooling water intake and discharge structures and operations, including shoreline equilibrium, shoreline morphology, and three dimensional thermal plume, and noise impact on the nearby community.** The methods of analysis for the environmental issues not utilizing mathematical model will follow the basic good engineering principles.

Based on practices to date, the issues to be addressed will cover, as a minimum, the following elements:

- Noise impact assessment.
- Air quality impact assessment.
- Wastewater effluent assessment.
- Solid waste assessment.
- Site location and local conditions.
- Socio-economic impact assessment.
- Proposed environmental/social monitoring.

3.4 Specific focus of the study shall include points listed below:

Noise

- Classification of site environment.
- Establish present background noise level.
- Applicable noise limits and location of boundary.
- Describe mitigation measures envisaged.
- Assessment of future expected noise level.

Air Quality

- Classification on site environment.
- Establish present background air pollutants. Measurements if necessary
- Applicable ambient air quality limits for the area.
- Recommended stack height and local dimensioning practice.
- Assessment of future expected air quality.

Wastewater & Solid Waste

- Map local disposal options and associated quality requirements.
- List expected types of waste and treatment envisaged/recommended.
- Comparison and assessment.

Site Location

- Assess the suitability of the sitting from an environmental and social point of view.

Socio-economic Issues

- The project may trigger the social safeguard policy on involuntary Resettlement (OP 4.12) and if so a Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP) or an Abbreviated Resettlement Action Plan in accordance with the AfDB's Involuntary Resettlement Policy will have to be prepared as a separate document. See Annex 4 for a typical outline of a RAP. Any required OP 4.12 documentation on resettlement and/or land acquisition should be prepared in parallel with the ESIA and an expert on resettlement/land acquisition should be included in the team. OP 4.12 is triggered if:
 - a) the project will require labor camps/temporary resettlement during construction;
 - b) if anyone may lose income as a (direct) result of the project, (probably not likely); and
 - c) if additional infrastructure, e.g. water connections will result in the acquisition of private land.
- The early findings of the ESIA should indicate any subsequent studies that may be necessary if there are social safeguard issues to be addressed in particular dealing with land acquisition and any effect on livelihoods as a result of the use and impacts of the Nile water on populations.
- Other social impacts that have to be considered are the effects on the existing population of a considerable influx of additional workers; during the construction period that could entail problems of housing, water usage and solid waste disposal. Specific impacts should be indicated and mitigation measures defined both for the existing population and for incoming workers.
- Gender considerations will have to be considered to ensure that no particular gender group is disadvantaged or hampered by implementation of this project, the AfDB's Gender Policy (June 2001) and guidelines should be followed.
- OP 4.01: According to this document an environmental assessment takes into account the nature, environment, human health and safety, social aspects and global environments, aspects. ESIA considers natural and social aspects in an integrated way. All these issues will be addressed in accordance with appropriate guidelines, particular those of the EEAA, the World Bank and AfDB.

The analysis will explicitly consider the mitigation measures that are considered necessary including the effect of these measures on the operation of the power plant and most importantly the environmental benefits. Environmental mitigation plans will also be discussed in terms of the requirements for implementation including procedures and staff. The requirement for. And duties of, a pollution control units at the plants, if necessary, will be addressed.

3.5 Environmental and Social Impact Assessment Report

An environmental and social impact assessment report for the power plant project will be developed in a manner complying with the requirements of the Egyptian Environmental Affairs Agency and the World Bank, as well as international regulations. This report will rely

on the work completed in the previously described stages and the description of the project from NREA or their consultant.

The environmental assessment report will be concise and limited to significant environmental issues. The main text will focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. Detailed data will be presented in appendices or a separate volume. Typical contents for the ESIA report are presented in Annex 2, hereafter.

The ESIA Report shall describe the scientific approach adopted to carry out the studies. In particular, the models, methods and criteria used in the studies shall be presented and explained. The Report shall also include maps and drawings at the appropriate scale and refer to all consulted documents.

The detailed ESIA Report shall be prepared in English. The ESIA Executive Summary shall, however, be written in English and Arabic. To be useful for consultations, the ESIA Executive Summary shall be concise and written in a non-technical language.

A draft report will be issued for review and comment by NREA and the financing institutions (World Bank and African Development Bank) after which a final report will be issued.

3.6 Quantitative Risk Assessment Report

A Quantitative Risk Assessment (QRA) report for the project, per the requirement of the Egyptian Environmental Affairs Agency (EEAA). Terms of reference for this work is included in Annex 1.

3.7 Environmental and Social Impact Assessment Requirements

These requirements will be identified including any regulations and guidelines which will govern the conduct of the assessment. The Environmental impact assessment is to be guided by:

- World Bank Operational Policy OP4.01 on Environmental Assessment and other pertinent Guidelines;
- World Bank's Pollution Prevention and Abatement Handbook;
- National laws and/or regulations on environmental reviews and impact assessments.

4. TEAM OF EXPERTS

The team of selected experts will cover the following areas of specialization:

- Air Quality Measurements.
- Air Quality Modeling.
- Soils, Geology, Hydrogeology and Topography.
- Water Quality Measurements.
- Aquatic Environment Modeling (thermal pollution).
- Flora & Fauna.
- Traffic Impact Analysis.

- Noise Measurements and Noise Impact Modeling and Analysis.
- Socio-economic Analysis.
- Archaeological, Historic and Cultural Heritage.
- Landscape and Visual Impacts.
- Land acquisition specialist (if RPF/RAP process to be implemented).
- Solid Waste and Hazardous Materials and Wastes.
- Climate & Meteorology.
- Resettlement/land acquisition
- Quantitative Risk Assessment

5. ACTIVITIES, DELIVERABLES AND TIME SCHEDULE

The ESIA Study Report shall be finalized and the Draft Final Report shall be prepared within 6 (six) months from study start date. Similarly, the QRA report would be available at the same time as that of the ESIA report. Although the QRA would be presented as a separate document, the main findings of the QRA will be included in the ESIA report and its executive summary. If necessary, documentation on resettlement/land acquisition will be prepared in parallel with the ESIA.

The following chart in the Table depicts the required time and activities for carrying out the ESIA Study and the output deliverables that will result accordingly.

ESIA Preparation Schedule

No	Activities	Deliverable	Months						7	8	9	10
			1	2	3	4	5	6				
1.	Site Reconnaissance	ESIA Draft Final Report	■									
2.	Baseline Data		■	■	■	■	■					
3.	Scoping Session		■									
4.	Description of the Project (by Project Engineer)			■								
5.	Impact Identification and Prediction (incl. OP 4.12)				■	■	■	■				
6.	Mitigation/Environmental Management						■	■				
7.	Environmental Monitoring and Annexes						■	■				
8.	Draft Final Report					■	■	■				
9.	Draft Quantitative Risk Assessment Report		QRA Draft Final Report	■	■	■	■	■	■			
10.	Public Consultation Process (ESIA/QRA and if necessary RAP/RPF)	Final Report		■				■				
11.	Final Report							■				
12.	World Bank and AfDB Disclosure							■	■	■	■	
13.	World Bank and AfDB Approval (120 days following disclosure)										■	

Annex 1: Terms of Reference for Quantitative Risk Assessment (QRA)

Scope of work – Introduction

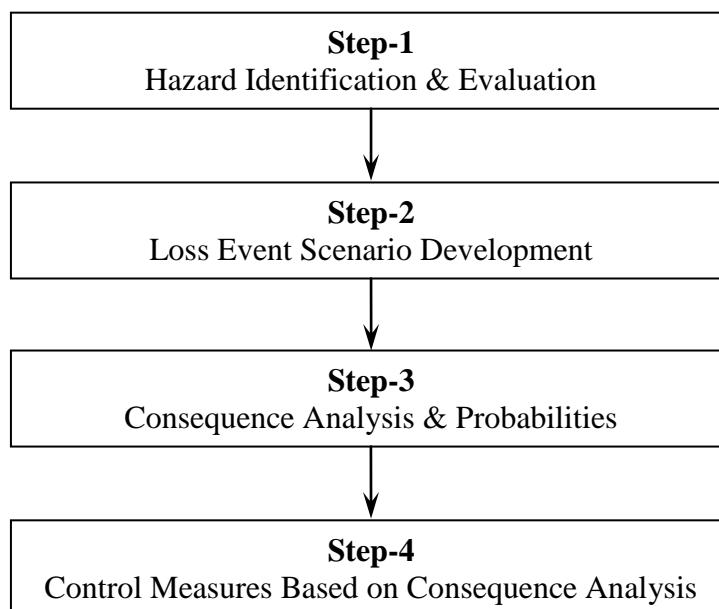
QRA is a technique that is used to identify major hazards such as fires, explosions and flammable or toxic gas releases to determine whether the risks associated with these hazards are tolerable.

The ultimate aim is to eliminate or minimize major risks to a level that is as low as reasonably practicable – ALARP. The key output from the QRA is a graphical presentation of consequence analysis results in the form of risk contours. This assists to determine the benefit of implementing additional controls as required. The following items would be covered as part of the QRA:

- Physical surveys of plant areas.
- Define possible accident scenarios and events.
- Full consequence analysis and probabilities.
- Propose additional control measures to reduce the risk as necessary.

Methodology

The assessment can help to identify the uncertainty that exists concerning the probability of accidental events, the magnitude of their consequences, and the determination of cost-effective risk reduction and mitigating measures might be required. The risk assessment will be conducted in a structured steps approach and as follows:



These Steps are based on the quantitative risk assessment - QRA steps developed by the American Institute of Chemical Engineers - (AIChE).

Step (1) : Hazard Identification and Evaluation

The general tasks associated with hazard identification and evaluation consists of:

- **Physical Survey**
 - Site visit and survey will determine the selected major items that possibly create major events that can be quantitatively analyzed.

- **Gathering Technical Information which includes but not limited to the following:**
 - Layouts and Maps drawn to scale
 - Process Flow Diagrams “PFD’s”
 - Piping & Instrumentation Diagrams “P & ID’s”
 - Operating and design conditions.
 - Design criteria - Spacing clearance.
 - Operating philosophy and control.
 - Accumulated storage of hazardous materials (inventories).
 - Emergency Plan & Procedures
 - Public Buildings in close proximity
 -

- **Evaluation of Potential Hazards**
 - Process review to identify weaknesses in the design, operation and protection of facilities that could lead to releases, fires, or explosions.
 - Evaluation of the significance of potential hazards events associated with the pipeline and related facilities to allow categorization of the consequences.

Step (2) : Loss Event Scenarios Development

Structuring credible release and fire and explosion loss scenarios is an important aspect of the risk estimation process. The primary components that would be evaluated in fire and explosion loss scenario development include: Initiating Failure Events; Propagating Factors and Mitigating Factors.

Step (3) : Consequence Analysis and Probabilities

Consequence modeling is the quantitative evaluation of expected possible consequences or potential effects that could result if the hazard is released or control limits are exceeded. Consequences or effects are logical and credible outcomes of scenarios starting with the top event which follow different escalation sequences according to the availability and effectiveness of recovery measures.

The consequence assessment involves evaluating two offsetting issues:

- 1- The susceptibility or vulnerability of people or damage to targets (structures, equipment, property, etc.).
- 2- The rate of development of a hazardous environment (intensity, distance within the boundaries of the predicted hazardous event - gas dispersion, fire, explosion, BLEVE).

Step (4) : Control Measures Based on Consequence Analysis

QRA will identify the main risk contributors to the overall potential for loss of life and or property damage that may require input from management to further develop control measures to lower potential loss. QRA provides transparency in the form of documented and numeric material to assist decision making. This would provide decision support in prioritizing recommended actions required and obtaining approval for risk reduction improvements.

The final task in this study would be to prepare a study report covering the findings of the

complete risk assessment and including interpretation of the key findings. This would include a detailed set of recommendations relating to the application of practicable risk controls.

Annex 2: Typical Contents of an Environmental and Social Impact Assessment Report

The typical contents of an ESIA Report are presented hereafter. It shall be noted that the presentation of the Report may be adapted pending on the nature and specific requirements of the project.

Executive Summary

This section shall present in a non-technical language a concise summary of the ESIA Report with a particular attention on the processes and procedures used; baseline conditions; the alternatives considered; mitigation/enhancement measures; monitoring program; consultations with stakeholders; capabilities of environmental and social units and actions to strengthen those capacities; and cost implications. This Executive Summary shall be written in English and Arabic language for public consultations.

Introduction

The Introduction shall indicate the purpose of the ESIA, present an overview of the proposed project to be assessed, as well as the project's purpose and needs. This section identifies the project sponsor and the consultant assigned to carry out the ESIA. It shall also briefly mention the contents of the ESIA Report and the methods adopted to complete the assessment.

Chapter 1. Policy, Legislative, Regulatory and Administrative Considerations

This chapter will describe the pertinent policies, legal, administrative, regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc., at international, national, regional and local levels.

This chapter will also include an assessment of the 10 World Bank Safeguard Operational Policies, identifying which of these should be triggered. The results should be presented in a tabular format, showing each of the ten policies, status of triggering, and rationale for triggering or not. Details on the triggering of the safeguard polices are available in World Bank's Guidebooks.

Special concern will be given to the revised Egyptian EIA guidelines, which became effective on 1 July 2010, as well as the revised Executive Regulations of the Law 4, which were published in October 2006, and which include modified standards that have been issued by the EEAA on background air quality and the use of some types of fuels in urban and residential areas.

Chapter 2. Analysis of Alternatives to the Proposed Project

This section will describe alternatives that were examined in the course of developing the proposed project and identify other alternatives which would achieve the same objectives, including the "without project option". The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. It will compare alternatives in terms of potential environmental impacts and suitability under local conditions.

On the alternatives part, in other words, the analysis should include an analysis of reasonable alternatives to meet the ultimate objectives of the power plant. Such alternatives should include, e.g., alternative ways of meeting the electricity demand including the “no action” alternative, alternative technologies, alternative fuels, alternative heat rejection systems, alternative water supply/intake, engineering and pollution control equipment alternatives, alternative sites, etc.

For each of the alternatives, the environmental and social impacts shall be quantified as possible, including their economic values where feasible. The selected alternative shall be the most environmentally and socially sustainable, taking into account the technical and economical feasibility.

Chapter 3. Description of the Proposed Project and Justification

This chapter will provide a brief description of the relevant parts of the project, using maps (at appropriate scale) where necessary, and including the following information: location; general layout; size, capacity, etc.; pre-construction activities; construction activities; schedule; staffing and support; facilities and services; operation and maintenance activities; required off-site facilities; and life span. Information included in this task will be provided by NREA or their consultant.

This section shall determine and characterize the anticipated liquid, solid and gaseous discharges from the processes, as well as the sources of nuisance such as noise, odors, visual nuisances, etc. It shall indicate the need for any resettlement plan or vulnerable groups development plan. It shall at least include a map showing the project location and area of influence.

The project justification should be based on combined economic, environmental and social assessments. To this end, this chapter shall describe the current situation in the sector, explain the problems or the needs to be satisfied by the project and present the constraints associated with the project implementation.

Chapter 4. Description of the Project Environment and Social Context

This chapter will evaluate and present baseline data on the relevant environmental characteristics of the study area. It will include information on any changes anticipated before the project commences.

- Physical environment: geology; topography; soils; climate and meteorology; ambient air quality; surface and groundwater hydrology; existing sources of air emissions; existing water pollution discharges; and receiving water quality.
- Biological environment: flora; fauna; rare or endangered species; sensitive habitats, including parks or preserves, significant natural sites, etc.; species of commercial importance; and species with potential to become nuisances, vectors or dangerous.
- Socio-cultural environment (include both present and projected where appropriate): population; land use; planned development activities; community structure; employment; distribution of income, goods and services; recreation; public health;

cultural prosperities; tribal peoples; and customs, aspirations and attitudes.

The analysis will be relevant and commensurate with the project.

Chapter 5. Potential Impacts of the Proposed Project

This chapter will distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts during construction and operation phases indicating their importance level and their probability of occurrence. It will identify impacts which are unavoidable or irreversible. Wherever possible, it will describe impacts quantitatively. Cumulative effects shall also be addressed taking into account other projects or actions planned in the study area. This shall include the social – economic impact assessment.

Social issues as per the World Bank OP 4.01 (3), in particular questions such as whether the project site is located on territories inhabited by indigenous peoples and if the project leads to involuntary resettlement need to be included, will be addressed.

Chapter 6. Environmental and Social Management Plan (ESMP)

This chapter will provide details on the management initiatives and on the measures to be implemented during both the construction and operational phases of the project. A more detailed description of the content of the ESMP is presented in Annex 3.

Special attention will be given to the Involuntary Resettlement Policy in accordance with the requirements of the World Bank OP 4.12 and the Involuntary Resettlement Policy (November 2003) of the AfDB.

The ESMP will have three main components:

1. Environmental and Social Mitigation Measures

This section will list the potential impacts, and will propose the necessary mitigation measures. Also presented will be the roles and responsibilities for implementation and for supervision, monitoring measures to ensure implementation, and cost estimates. Such mitigation measures will be presented for both the construction and operation phases of the project.

(ii) Monitoring Program

This section will prepare a detailed plan to monitor the implementation of mitigating measures and continuously monitor the impacts of the project during construction and operation. Details on the parameters to be monitored, monitoring locations, and frequency will be provided; as well as the roles and responsibilities for implementation and supervision, and cost estimate.

The standards, guidelines or targets for performance measurement for the monitoring program should be specified as well. This may include social economic measurements in cases where re-settlement is required. Performance standards are typically based on national legislation and the guidelines contained in the World Bank's *Pollution Prevention and Abatement Handbook*.

(iii) Institutional Arrangements

This section will review the authority and capability of institutions at local, regional, and national levels and recommend steps to strengthen or expand them so that the management and monitoring

plans in the environmental and social assessment can be implemented. This may include hiring of staff, training and capacity building programs, and hiring of consultants. The costs and sources of funds for the proposed measures and any training requirements for capacity building in the field of environmental and social safeguards should be specified.

It is expected that the consultant will present the environmental and social management plan in a tabular format similar to the following:

A. Mitigation

Project Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Institutional Responsibilities (Implementation AND Supervision)	Cost Estimates	Comments (e.g. secondary impacts)
Pre-Construction Phase					
Construction Phase					
Operation and Maintenance Phase					

B. Monitoring

Proposed Mitigation Measure	Parameters to be monitored	Location	Measurements (Incl. methods & equipment)	Frequency of Measurement	Responsibilities (Incl. review and reporting)	Cost (equipment & individuals)
Pre-Construction Phase						
Construction Phase						
O&M Phase						

C. Institutional Strengthening and Training for Implementation

Institutional Strengthening Activity	Position(s)	Scheduling	Responsibilit(ies)	Cost Estimates	
Training Activity	Participants	Types of Training	Content (modules, etc.)	Scheduling	Cost Estimates

Chapter 7. Inter-Agency Coordination and Public/NGO Participation

This chapter shall summarize the actions undertaken to consult the groups affected by the project, as well as other concerned key stakeholders including Civil Society Organizations. This will describe the process that will result in coordinating the environmental and social impact assessment with other government agencies, obtaining the views of local NGOs and affected groups. The detailed record of the consultation meetings shall be presented in annex to the ESIA Report. The first consultation will be a scoping session that will help address particular subjects of interest to the concerned public. Every effort should be taken to include broad representation from all economic and social sectors, especially the potentially marginalized groups such as women, lower socioeconomic standard, etc.

The Consultant will initiate such consultations as early as possible. For Category A projects, the Consultant, on behalf of NREA, will consult these groups at least twice (a) during environmental scoping, as stated in Section 3.1, and before the terms of reference for the ESIA are finalized; and (b) once a draft ESIA report is prepared. (OP 4.0.1)

Each of the two public consultation meetings will be advertised, in the national newspaper(s), and the Consultant should include in his financial offer the cost of two newspaper announcements, and two venues for the meetings.

Serious consultations with the people in the project area and others that may be affected is an essential part of the ESIA and should be documented in the report.

The process of consultation will cope with the requirements of the World Bank OP 4.01 (15) and the AfDB's *Handbook on Stakeholder Consultations and Participation in ADB Operations* (2001), and *Cooperation with Civil Society Organizations: Policy and Guidelines* (2001).

Chapter 8. Safety Measures during Operation

The analysis will include a review the existing codes of practice and procedure used by NREA, and check for their consistency with the World Bank guidelines and internationally recognized codes of practices for similar projects. The consultant will also propose measures to bridge gaps with the existing codes applied in Egypt. The consultant will therefore carry out a Quantitative Risk Assessment (QRA) study to:

- Identify safety procedures based on a) existing practices and standards in NREA and b) additional recommendation.
- Conduct a risk assessment for the project to assess the probability and consequence of incidents.
- Describe the preventive measures and actions to be taken in the event of a safety problem and the associated health risks.

All these issues will be addressed in accordance with appropriate guidelines, particularly those of the national environmental authorities, mainly the Egyptian Environmental Affairs Agency and other national authorities concerned with safety, and the World Bank.

The analysis will explicitly consider the mitigation measures that either exist or are

considered necessary including the effect of these measures on the project and the associated environmental and social benefits. Environmental mitigation plans will also be discussed in terms of the requirements for implementation including procedures and staff.

Annex 1 presents the TOR for the QRA study.

Chapter 9. Conclusion

This chapter shall specify the environmental and social acceptability of the project, taking into account the impacts and measures identified during the assessment process. It shall also identify any other conditions or external requirements for ensuring the success of the project.

Annexes

- List of the professionals and organizations having contributed to the preparation of the ESIA Report
- List of consulted documents, including project-related reports
- Baseline data referred to in the Report
- Record of consultation meetings with primary and secondary stakeholders.

Annex 3: Generic Contents Of An Environmental And Social Management Plan

The purpose of the Environmental and Social Management Plan (ESMP) is to define and reach an agreement with the project sponsor concerning mitigation/enhancement, monitoring, consultative and institutional strengthening measures to be undertaken during project implementation and operations.

The ESMP format shall be flexible to ensure the integration of project specific mitigating, enhancing and monitoring requirements. For instance, the ESMP shall integrate or at least refer to any initiatives, such as resettlement plans, that contribute to enhance the project environmental or social performance but may be prepared separately or as part of the ESIA Report. In addition, the ESMP format shall permit adjustments and revisions to reflect new developments and findings along project implementation and operations.

The ESMP's scope and level of details shall be proportional to the number and complexity of the measures required to ensure the project's environmental and social sustainability. The following components constitute the minimal contents of an ESMP.

General Information

- Estimated Starting date of implementation
- Project completion date
- Date of operation
- Period covered by the plan

Objectives of the ESMP

This section shall specify that the ESMP aims to bring the project into compliance with applicable national environmental and social legal requirements and international organizations' environmental and social policies. Other objective of the ESMP is to outline the mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts. It shall also address capacity building requirements to strengthen environmental and social capacities if necessary.

Context

The ESMP shall briefly describe project activities and major environmental and social components that will likely be affected positively or negatively by the project. The information provided shall be concise as the ESIA Report covers in detail this topic. In fact, for this section, cross-references to the ESIA Report are recommended. Moreover, the context section shall outline existing interrelations between ecological and social processes. These interrelations among components shall be mentioned to be taken into account in the impact assessment and the development of mitigation/enhancement measures.

Beneficial and Adverse Impacts

This section shall focus on beneficial impacts that can be enhanced to improve the project

environmental and social performance as well as on adverse impacts that require mitigation measures to be minimized or compensated. The impact description in the ESMP shall be brief and refer to the ESIA Report for further details.

Enhancement and Mitigation Program

This section shall propose feasible and cost effective measures to address the impacts previously defined, in order to accrue project benefits (enhancement measures) or to reduce potentially adverse environmental and social impacts to acceptable levels (mitigation measures). Each measure shall be described in detail, providing all technical information required for its implementation (design, equipment description and operating procedures, as appropriate).

Monitoring Program

A monitoring program aims to ensure that mitigation and enhancement measures are implemented, that they generate intended results and that they are modified, ceased or replaced when inappropriate. Moreover, it allows to assess compliance with national environmental and social policies and standards as well as with the international policies and guidelines. A monitoring program shall include two parts: surveillance and monitoring activities.

Surveillance activities

The surveillance aims to ensure that the proposed mitigation and enhancement measures are effectively implemented during the construction phase.

Monitoring activities

These activities consist in measuring and evaluating the project impacts on some environmental and social components of concern and to implement remedial measures, if necessary.

The program shall define as clearly as possible the indicators to be used to monitor the mitigation and enhancement measures that need to be assessed during project implementation and/or operation. The monitoring program shall also provide technical details on monitoring activities such as methods to be used, sampling locations, frequency of measurements, detection limits, and definition of thresholds that will signal the need for corrective actions.

Monitoring should address both emission and ambient levels of pollutants where these may be detrimental to human health. World Bank guidelines presents general ambient quality standards, however the figures presented are ambient guidelines only and in no way substitute for a country's quality standards. (see *Thermal Power; Guidelines for New Plants, from the World Bank Pollution Prevention and Abatement Handbook*).

Consultations

The implementation and monitoring of some mitigation or enhancement measures may require that consultative mechanisms be used. In such cases, the ESMP shall first identify for which measures consultations will be undertaken as well as the goals and expected outcomes of these

consultations. Then the ESMP shall specify the target groups, appropriate consultative processes, consultation frequency, reporting methods and result disclosure procedures.

Complementary Initiatives

The ESMP shall integrate or at least refer to all initiatives that are proposed to improve the project environmental or social performance. As the ESIA Report may include such initiatives, these shall be briefly presented in this section. Moreover, these complementary initiatives shall be taken into account in determining the responsibilities, institutional arrangements, cost estimates and implementation schedule.

Responsibilities and Institutional Arrangements

The implementation of enhancement and mitigation measures as well as the completion of the monitoring program require to clearly establish responsibilities among the various organizations involved in project implementation and operation. Ultimately the project sponsor is responsible for monitoring and reporting on achieved results, but it may need to be assisted in the implementation of the ESMP by the project team and external consultants.

Consequently, the ESMP shall identify the responsibilities of the financier, the sponsor, the implementing agencies and other stakeholders in applying the ESMP, particularly the monitoring program. In addition, the ESMP shall propose support to the organizations that may have insufficient capacities to fulfill their obligations. This support could be provided through various means including technical assistance, training and/or procurement.

Estimated Cost

This section estimates the capital and recurrent cost associated with the various proposed measures (enhancement and mitigation), the monitoring program, consultations, complementary initiatives and institutional arrangements. Although financing for implementing the ESMP shall be part of project financing, it might not always be possible. In such cases, this section shall discuss potential sources of funding.

Implementation Schedule and Reporting

The ESMP shall include an implementation schedule taking into account all activities related to the proposed measures (enhancement and mitigation), the monitoring program, consultations, complementary initiatives and institutional arrangements. Moreover, the implementation schedule shall be developed by phases and in co-ordination with the overall project implementation plan.

To ensure early detection of critical environmental and social conditions and to provide information on the mitigation progress and results, reporting deadlines shall be specified in the implementation schedule and reporting procedures shall be presented in this section.

Annex 4: Outline of a Typical Full Resettlement Plan

1. Description of the project, project area and area of influence

General description of the project and the area of influence.

2. Potential Impacts

Description of the project components or activities that would give rise to resettlement, zone of impact of such activities, and the alternatives considered to avoid or minimize resettlement.

3. Organizational Responsibility

The institutional arrangements within the executing agency and provision of adequate resources to this institution should be discussed and all inter-agency coordination should be described. The capacity and commitment of the institution to carry out the resettlement plan should also be evaluated. If necessary, strengthening of this institution should be considered and the steps that will be taken, together with a timetable and budget, should be described at the project preparation phase. There should be considerable scope for involving the local people and NGOs in planning, implementing and monitoring resettlement.

4. Community participation

A description of the consultation and participation of the displaced and hosts communities in the design and implementation of the resettlement activities including a summary of the views expressed and how these views were taken into account in preparing the resettlement plan.

A review of the resettlement alternatives presented and choices made by displaced persons, including choices related to forms of compensation and resettlement assistance, to relocating as individual families or as part of pre-existing communities, and to retaining access to cultural property (e.g., places of worship, cemeteries, etc.).

Description of procedures for redress of grievances by people affected to project authorities throughout the planning and implementation.

5. Integration with host communities

Consultations with host communities and local governments and arrangements for prompt tendering of any payments due to the hosts for land or other assets should be provided to resettlers. Arrangements for addressing any conflict that may arise between the resettlers and host communities should also be made.

Appropriate measures should be taken to augment public services (e.g. education, water, health, and production) in host communities to make them comparable to services provided to resettlers.

6. Socio-economic studies

- (a) A population census covering current occupants of the affected area, including the description of the production systems, household organisation, baseline information on livelihoods and standards of living of the displaced population;
- (b) An inventory of assets of displaced households; the magnitude of the expected loss – total or partial for individual or group assets, and the extent of physical and economic displacement;
- (c) Information on disadvantaged groups or persons for whom special provisions may have to be made;
- (d) Provisions to update information on the displaced people's livelihoods and standards of living at regular intervals so that the latest information is available at the time of their displacement;
- (d) Description of land tenure systems, including common property and non-title based land ownership or allocation system recognized locally and related issues;
- (e) Public infrastructure and social services that will be affected; and
- (f) Social and cultural characteristics of displaced communities.

7. Legal framework including mechanisms for conflicts resolution and appeals

- (a) The applicable legal and administrative procedures, including a description of the remedies available to displaced persons in the judicial process, and the normal time frame for such procedures; and available alternative dispute resolution mechanisms that may be relevant to the project ;
- (b) Laws and regulations relating to the agencies responsible for implementing resettlement activities; and
- (c) Any legal steps necessary to ensure the effective implementation of resettlement activities, including a process for recognizing claims to legal rights to land – including claims that derive from customary and traditional law and usage.

8. Institutional Framework

- (a) The identification of agencies responsible for resettlement activities and NGOs that may have a role in project implementation; and
- (b) An assessment of the institutional capacity of such agencies and NGOs.

9. Eligibility

Definition of displaced persons and criteria for determining their eligibility for

compensation and other resettlement assistance, including relevant cut-off dates.

10. Valuation of and compensation for losses

- (a) The methodology to be used in valuing losses to determine their replacement cost; a description of the proposed types and levels of compensation under local laws and such supplementary measures to achieve replacement cost for lost assets; and
- (b) A description of the packages of compensation and other resettlement measures that will assist each category of eligible displaced persons to achieve the objectives of this policy.

11. Identification of alternative sites and selection of resettlement site(s), site preparation, and relocation.

- (a) Institutional and technical arrangements for identifying and preparing relocation sites, for which a combination of productive potential, locational advantages, and other factors is at least comparable to the ancillary resources ;
- (b) Procedures for physical relocation under the project, including timetables for site preparation and transfer;
- (c) Any measures to prevent influx of ineligible persons at the selected sites; and
- (d) Legal arrangements for regularizing tenure and transferring titles to resettlers.

12. Shelter, infrastructure, and social services

Plans to provide or finance housing, infrastructure (e.g. roads, water supply, etc.) and social services (schools, health services); plans to ensure comparable services to host populations; and any necessary site development.

13. Environmental protection

An assessment of the environmental impacts of the proposed resettlement and measures to mitigate and manage the impacts.

14. Implementation schedules

An implementation schedule covering all resettlement activities from preparation through implementation, including target dates for achievement of expected benefits to resettlers and hosts and terminating the various forms of assistance.

15. Costs and budget

Tables indicating breakdown of cost estimates for all resettlement activities, including allowances for inflation and other contingencies; timetable for expenditures; sources of funds; and arrangements for timely flow of funds.

16. **Monitoring and evaluation**

Arrangements for monitoring of resettlement activities by the implementing agency; supplemented by independent monitors as appropriate, to ensure complete and objective information; performance monitoring indicators to measure inputs, outputs, and outcomes for resettlement activities; evaluation of the impacts of resettlement for a reasonable period of time after the resettlement activities have been complete.

Annotated Table of Contents for a Resettlement Policy Framework

The development of the RPF will come as part of the social management plan. It is a set of measures to eliminate the negative social and economic impact of involuntary resettlement on Project Affected Persons (PAPs). The RPF will include the following sections:

Executive Summary

An executive summary will be prepared to be used as a stand-alone document in a manner that can be accessible to non-technical readers both in English and Arabic languages.

Chapter One: The Project

This Chapter sheds the light on the project, the objectives of the RPF and develop initial estimations for the number of the vulnerable groups. Chapter One will include the following sub-sections:

- The project and the role of the RPF
- Project's broader context
- Estimated vulnerable population

Chapter Two: RPF Purpose and Objectives

This Chapter presents the main objectives of the framework corresponding to those of World Bank's policy on involuntary resettlement and the methodology that has been used in the preparation of the RPF. Chapter Two will include the following sub-sections:

- RPF framework
- Objectives of the RPF framework
- RPF preparation

Chapter Three: Legislative Framework for the Resettlement in Egypt

This Chapter presents summary about the key relevant laws in relation to the land ownership, expropriation, transfer of ownership and compensation issues. It also presents the main administrative and institutional framework for the issue related to land management and resettlement in Egypt.

The Chapter also presents other specific issues related to resettlement and compensation, most importantly, methods of valuation of affected assets and compensation, grievance and redress mechanisms and the legal requirements for disclosure. This Chapter presents the details about the legal issues related to the temporary acquisition of agriculture land including crop compensation system and the various aspects related to valuation and compensation.

- Institutional arrangements
- Government of Egypt relevant legislation:
 - Property Rights within the Egyptian Constitution (Articles 29 of the Constitution of 1971)

- Land Tenure and Related Laws to Land and Structures Expropriation (Articles 34 of the Constitution of 1971 and Civil Code Article No. 131 of 1948)
- Egyptian Civil Code (Articles 802-805)
- Administrative Authority's Decision Making Responsibilities including Physical Planning Law (Law3/1982), Law 3 of 1982, Prime Ministerial Decree No. 160 of 1991, Prime Ministerial Decree No. 2166 of 1994, Law 557/54, and Law 252/60 and Law 13/62, Law No. 27 of 1956a and Law 10/1990 on Expropriation of Ownership for Public Interest.
- Legal and Administrative Procedures for Transfer of Ownership and Compensation regulated by Article 1 of Law 252/60 amended by Law 577/54, Article 2 of Law 27/1956, Article 25: Law No. 577 of 1954, and Article 7: Law No. 27 of 1956.
- Disputes as regulated by Article 26: Law No. 577 of 1954, Article 11: Law No. 11 of 1954 and Law No. 11 of 1956
- Temporary Expropriation of Real Estate, including Law No. 577 of 1954, Law No. 27 of 1956, and the new Law No. 10 of 1990
- Introduction of New Articles to the Law on Property Expropriation for Public Benefit Law No. 10 of 1990
- Valuation and compensation methods
- Grievance & redress procedures
- Administrative mechanisms and appeal to court
- Legal requirements for disclosure
- Crop compensation system
 - Crop compensations
 - Valuation and compensation methods
 - Grievance & redress procedures
 - Legal requirements for disclosure

Chapter Four: The World Bank Safeguard Policies

OP 4.12 on involuntary resettlement is the key safeguard policy for the World Bank. This Chapter of the RPF presents in details the various principles related to this safeguard policy including, but not limited to, the resettlement instruments, scope and coverage of the RPF, RAP preparation and approval, Project affected persons and the vulnerable groups, the eligibility procedures and criteria, valuation of assets, implementation procedures, grievance and redress mechanism, budget and funding, disclosure requirements and the WB resettlement document, consultation and implementation process and monitoring and evaluation. The following is the proposed structure for this Chapter:

- Resettlement instruments
- Policy objective and principles
- Scope and coverage of RPF
- RAP preparation and approval process
- Categories of project affected persons (PAPs)
- Vulnerable groups
- Eligibility procedures and criteria

- Valuation of assets
- Implementation procedures
- Grievance and redress mechanisms
- Budget and funding
- Disclosure requirements for bank resettlement documents
- Consultation & implementation process
- Monitoring and evaluation

Chapter Five: Gaps Between Egyptian Regulation and the World Bank Policies

This chapter aims to present the gaps between the WB safeguard policy on involuntary resettlement and the Egyptian Legislations. It also aims to present some measures and recommendations to bridge the gap between the two sources of legislations.

- Overview
- Comparison and contrast
 - Property Valuation/compensation
 - Temporary acquisition of land
 - Temporary occupation of structure
 - Temporary loss of business
 - The right of squatters
 - Resettlement in a new site
 - Resettlement assistance
 - Disturbance allowance
 - Asset value increased due to previous public interest project
 - Vulnerable groups
 - Access to timely and relevant information
 - Grievances & redress mechanisms
 - Monitoring and Evaluation
- Identified gaps
- Gaps and measures to be considered
- Legal and regulatory gaps
- Recommendations

Annexes

The RPF annexes could include:

- The Eligibility criteria for the PAPs
- Method of valuating of affected assets and compensation
- Entitlement matrix
- Resettlement and compensation planning
- Budgeting and sources of funding for the PAPs