

Government of Lebanon¹

Environmental and Social Assessment (ESA) of the Lebanon Pollution Abatement Project (LEPAP)

Beirut, Lebanon – July 2013
Final draft after consultation and QER

¹ LEPAP is a joint project of the Ministries of Finance and Environment and Banque du Liban

Contents

List of Tables	iii
List of Figures	iii
List of Acronyms and Abbreviations	iii
Executive Summary	v
1. Introduction	1
2. LEPAP Objective, Components and Eligibility Criteria	2
2.1 LEPAP Funding Flow and Eligibility Criteria.....	2
2.2 LEPAP Project Management.....	3
2.3 Programs Parallel to LEPAP	6
3. Institutional Capacity and Legal Framework Assessment	7
3.1 Institutional Assessment.....	7
3.2 Assessment of the Legislative Framework.....	12
3.3 Proposed Corrective Actions	14
4. Environmental and Social Management Framework	17
4.1 Potential Projects to be implemented under LEPAP.....	18
4.2 Negative and Positive Impacts of Potential LEPAP interventions.....	20
4.3 The Environmental and Social Screening Process	23
4.4 ESIA Requirements for Category I Projects.....	26
4.5 ESIA Requirements for Category II Projects	33
4.6 Typical Impacts and Mitigation for LEPAP Projects	34
4.7 Monitoring and Follow-up	41
4.8 Enforcement	41
4.9 Capacity Building and Training Needs	41
4.10 Budget	42
4.11 Public Consultation	42
References	47
Appendix A Draft TOR for the Preparation of a Compliance Action Plan (CAP)	50
Appendix B Summary of Relevant Legislation and Standards to LEPAP	55
Appendix C Summary of EFL Technical Assistance for Environmental Compliance in 2013	68

Appendix D	List of Pre-Qualified National Environmental Consultants (December 2012)	70
Appendix E	General Environmental Baseline Conditions in Lebanon relevant to LEPAP	72
Appendix F	Suggested Job Description of the ESMS Officer for Financial Institutions (FI)	80
Appendix G	List of Participants and Photographs from the Public Consultation Meeting (March 27, 2013)	81
Appendix H	List of ESMF Preparers	84

List of Tables

Table 3-1.	Institutional and Legal Assessment Checklist	7
Table 3-2.	Environmental Assessment Procedures as per Lebanese EIA Decree (8633/2012).....	10
Table 3-3.	Proposed Action Plan to address Institutional and Legal Gaps.....	15
Table 4-1	Potential Enterprises for LEPAP	18
Table 4-2.	Environmental Assessment Requirements of Potential LEPAP Sub-projects	25
Table 4-3.	Identification of Possible impacts and Generic Mitigation Measures for Potential Sub-projects.....	35
Table 4-4.	Generic Monitoring Measures for Potential Sub-projects	37
Table 4-4.	Identified Capacity Building and Training Requirements.....	41
Table 4-5.	ESMF Implementation Budget.....	42
Table 4-6.	Institutions Represented in the LEPAP Public Consultation Meeting	42
Table 4-7.	Issues Raised during the Public Participation Meeting	43

List of Figures

Figure 2-1.	LEPAP Application Process.....	5
Figure 4-1.	Schematic Diagram of the Environmental and Social Assessment Process for LEPAP....	17

List of Acronyms and Abbreviations

ALI	Association of Lebanese Industrialists
BdL	Banque du Liban
BOD	Biological Oxygen Demand
CAP	Compliance Action Plan
CDR	Council for Development and Reconstruction
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
E&S	Environmental and Social
EFL	Environmental Fund for Lebanon
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment

ELARD	Earth Link and Advanced Resources Development
EPA	Environment Protection Agency
EMP	Environment Management Plan
ESA	Environmental and Social Assessment
ESIAR	Environmental and Social Impact Assessment Report
LESIAR	Limited Environmental and Social Impact Assessment Report
FI	Financial Intermediary
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German International Cooperation)
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IEE	Initial Environmental Examination
IFC	International Finance Corporation
LBS	Land-Based Sources
LEPAP	Lebanon Pollution Abatement Project
MoE	Ministry of Environment
MoEW	Ministry of Electricity and Water
MoF	Ministry of Finance
Mol	Ministry of Industry
MoPH	Ministry of Public Health
NSEQ	National Standards for Environmental Quality
OP	Operational Policy
PM	Particulate Matter
PMU	Project Management Unit
SOER	State of the Environment Report
SPA	Specially Protected Areas
STP	Sewage Treatment Plant
TA	Technical Assistance
TOC	Total Organic Carbon
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
UNDP	United Nations Development Programme
WB	World Bank
WHO	World Health Organisation

Development of the Environmental and Social Assessment (EA) of the Lebanon Pollution Abatement Project (LEPAP)

Executive Summary

Introduction

The Environmental and Social Assessment (ESA) of the Lebanon Environmental Pollution Abatement Project (LEPAP) constitutes the basis for the development of the actions required to comply with the World Bank's Environmental and Social policies and assist in the implementation of LEPAP. This document was prepared with the support of the Environmental Fund for Lebanon (EFL), a program financed by the German Government through GIZ, upon the request of the Ministry of Environment (MoE). The consulting firm ELARD has been called upon to prepare this study.

LEPAP was classified under the Category Financial Intermediary (FI) in accordance with the World Bank's operational policy OP 4.01 because the World Bank loan of US\$ 15 million will be channeled through Banque du Liban (BdL) acting as an Apex Bank for on-lending to selected national participating banks to provide sub-loans to industrial enterprises. Furthermore, LEPAP is expected to finance a total of 20 to 25 sub-projects, which many of them are unknown during project preparation and would be proposed by potential enterprises over the course of implementation. Under such conditions, the responsibility for environmental screening, environmental and social assessment (ESA) review, monitoring and compliance with World Bank policies is devolved to the project proponent². It is also the proponent's responsibility to ensure that the sub-borrowers carry out appropriate ESA, including the appropriate Environmental Management Plan (EMP) for each sub-project.

A project classified as FI should conduct the following:

- An ESA of the LEPAP prior to the World Bank's appraisal of the project. This includes a full assessment of the institutional capacity of the BdL and the MoE to ensure that the program follows the World Bank's environmental and social safeguards as well as relevant national environmental legislation;
- An ESA at the sub-project level, according to the environmental screening and management procedures to be established on the basis of the ESA of LEPAP. This will be in the form of an environment and social management framework (ESMF) that will be used as a manual by the Proponent for environmental and social assessment of LEPAP sub-projects. This framework indicates how to identify and assess the social and environmental risks and impacts of sub-projects, both beneficial and adverse; to determine the necessary mitigation measures; and to elaborate the necessary management plans to ensure that impacts are dealt with, mitigation measures are followed, and the entire program is monitored and evaluated.

The present document consists therefore of an institutional and legal assessment as well as an environment and social management framework.#

The Project triggers only one safeguard policy namely OP4.01 (Environment Assessment). All pollution control activities will be within the industrial enterprises themselves. Physical or economical dis-

² LEPAP is a joint project of the Ministries of Finance and Environment and Banque du Liban

placement and lack of access to designated areas are not envisaged. The World Bank safeguard policy OP 4.01 will apply and would prevail in case the national environmental policies are not consistent with the World Bank safeguard policies.

Objective and Components of LEPAP

The development objective of LEPAP is to reduce industrial pollution in targeted industrial enterprises and strengthen the monitoring and enforcement capabilities of the MoE through technical assistance and through establishing a financial mechanism for supporting pollution abatement investments.

The Project, with a total cost of US\$ 19.5 million, will consist of two components as follows:

- (i) **Component 1: Technical Assistance in the amount of US\$ 3.0 million which will be parallel financed by the Italian Cooperation.** The objective of this component is to strengthen the capacity of MoE and other key stakeholders on environment assessment, monitoring and enforcement. It will also provide technical support to selected polluting enterprises to prepare their environmental audits and compliance action plans, and conduct environmental awareness and communication campaigns. A project management Unit will also be established to assist in the implementation of this component;
- (ii) **Component 2: The Pollution Abatement Investment in the amount of US\$ 16.5 million of which US\$ 15.0 million will be financed by IBRD and US\$ 1.5 million from the enterprises.** The objective of this component is to introduce a market mechanism for pollution control for an estimated 20 to 25 public and private enterprises to bring their effluent discharges and/or air emissions towards compliance with national environmental standards in a cost-effective manner. The sub-projects could include waste minimization, pollution prevention, resource recovery, clean technology adoption, fuel substitution, or end-of-pipe environmental control where no other alternatives are available. This component will provide, on a first-come, first-serve basis, sub-loans and sub-grants through selected local participating banks.

BdL will manage the World Bank funds from the financial management point of view and in accordance with the World Bank's policies on financial management. A Project Management Unit (PMU), responsible for all administrative, technical, procurement, environmental and social requirements and in accordance with the fiduciary, environment and social safeguard requirements of the World Bank, will be hosted at the MoE.

Based on the World Bank's Environmental and Social safeguards policies, OP 4.01 is the only one triggered. All activities under this project will be confined within the boundaries of existing industrial enterprises within the boundaries of existing industrial enterprises (intra-muros). **It is not expected that LEPAP sub-projects will cause any physical or economical displacement or lack of access to designated parks, therefore the Involuntary Resettlement Policy OP 4.12 would not be triggered in this project.**

The Legal and Institutional framework in Lebanon

The project would comply with Lebanese laws and regulations. The legal basis for the EIA system is established in the Environment Protection Law No. 444/2002, Law No. 690/2005 and Decree No. 2275/2009 on the reorganization of the MoE and the EIA decree No. 8633/2012 and its annexes. The EIA decree and its annexes include all the requirements for screening, preparation of the environmen-

tal assessment and the supervision of the environmental assessment process including consultation and disclosure. The decree requires that the project proponent would hire a national consulting firm among the pre-qualified consulting firms of CDR (MoE Decision No. 7/1/ 2003) to conduct either an EIA study for a project belonging to a positive list in Annex I and similar to Category A projects of the World Bank's operational policy OP 4.01 or an Initial Environmental Examination (IEE) belonging to the projects in a positive list in Annex II of the decree and similar to Category B projects in OP 4.01. Annex III also states that projects located in sensitive areas such as coastal areas or near protected areas are also subject to environmental assessment. MoE's position regarding an EIA is a prerequisite for any subsequent license or permit by any or all other relevant authorities that may be required prior to construction.

The MoE is endowed with a competent team consisting of 70 administrative/technical staff in all the major environment themes, complemented by about 30 staff working in the context of internationally funded/managed projects. This staff has the technical capacity to understand Lebanon's environmental issues and the administration of the EIA system is handled by the Environmental Technology Service within the MoE, in coordination with the various technical services - about 20 staff, all knowledgeable about the national EIA system and the World Bank Safeguards for which they received substantial training. Furthermore, the MoE is committed to reinforce the compliance and enforcement system by strengthening the capacities of the respective teams in charge of EIA, compliance, as well as monitoring and enforcement. The Ministry of Industry has established six Inter-Ministerial Permitting Committees (IPCs) (of which the MoE is a member) headed by the Ministry of Industry (Mol). The IPCs are responsible to provide industrial permits for the construction and operation facilities. MoE's commitment to the establishment of an industrial pollution management system will be spelled out in a policy statement in LEPAP.

Institutional Capacity and Legal Assessment

The capacity of BdL and the MoE to implement and manage the Environment Management System (environmental screening, assessment, mitigation, review, monitoring, and reporting) at the project and sub-project level was assessed. The national legal and regulatory framework of Lebanon is assessed and compared with the safeguard policies of the World Bank. Mechanisms for harmonizing World Bank policies and guidelines with those of the host country are formulated. Plans for meeting deficiencies, including specialized training and identification of local or international consultants available for support, are proposed and will be financed in the first component of the project as well as by the two parallel programs namely the 8 million Euro EU -financed project on Environment Governance (StREG) which is due to start in 2013 and will last for three years and the German Government grant of 8.5 million Euro for the Environmental Fund for Lebanon which will close in December 31, 2013.

The institutional assessment showed that BDL has a strong commitment to environment through the provision in its portfolio of environmental loans for rural development and environment, energy efficiency and energy conservation. BdL is also committed to provide concessionary loans for controlling pollution in the industrial sectors through providing a one-time subsidy on interest rates to environmental projects and exemptions on compulsory reserves to stimulate commercial banks to grant concessionary loans to the energy and environment sectors.

The MoE has also prepared a series of strategic documents that guided the environmental policies

highlighted in successive Council of Ministers (CoM) Policy Statements. The Environment Strategy Framework (1996); State of the Environment Reports (SOER) (1995, 2001, 2010); the United Nations Johannesburg Summit Lebanon Country Profile (2002) and Rio+20 Country Report (2012), the draft National Environment Action Plan (NEAP, 2006), the Country Environment Analysis (CEA, 2011), and the draft updated Environmental Strategy Framework (2013) have all articulated Lebanon's major environmental issues and challenges.

The legal assessment showed that Lebanon has a plethora of environmental laws and regulations as well as other legislations related to the environment. Most importantly is the Environment Protection Law No. 444/2002 which included all the principles of the Rio Declaration on Environment and Development (1992), the Strategic Environment Assessment decree No. 8213/2012 (the first SEA enacted decree in the Middle East and North Africa Region), the Environmental Impact Assessment (EIA) decree No. 8633/2012; and the Environmental Compliance for Establishments decree No. 8471/2012 that will regulate all activities from classified establishments (such as industrial ones) that may cause harmful pollution and environmental degradation.

The Country Environmental Analysis of Lebanon (CEA)³ conducted an assessment of the national EIA system and determined the similarities and difference between the national EIA system and the World Bank operational policy OP 4.01 on environmental assessment. The assessment showed that the features of the Lebanese EIA system are compatible with most of the World Bank EA Policy (OP 4.01) with the exception of the major gaps namely (a) the lack of standard TOR and sector guidelines for specific sectors to be provided to the project proponent for the preparation of the EIA or IEE reports; (b) lack of consultation with stakeholders for projects listed under Annex II (similar to Category B projects in the World Bank OP 4.01); and (c) the lack of disclosure of the EIA summary and Initial Environment Examination (IEE) to the public as required by articles 13 and 14 of the Environment Protection Law – noting that Article 13 of the EIA decree calls for Information Publication⁴. Gaps filling measures were identified and will be implemented in LEPAP.

The main impediments to effective and meaningful implementation and enforcement of environmental and environment-related laws are due to the fragmentation among regulatory institutions, licensing agencies, and police authorities among others, at both the national and local levels of government, to the effect that no single institution can take enforcement actions effectively. This lack of human resources and fragmentation of responsibilities necessitate the strengthening of monitoring and enforcement as a first institutional priority. LEPAP is designed to support the MoE in establishing a mechanism that would support the industrial enterprises in their compliance to the stipulations of Decree No. 8471/2012 and create a mechanism to foster pollution abatement investments from technical and financial standpoints. The interested industrial enterprise will be asked to carry an environmental audit and set a compliance action plan (CAP) at the facility level (as required by Decree No. 8471/2012) to be eligible to submit their pollution abatement project for concessionary financing.

³ The Country Environmental Analysis (CEA) of Lebanon, the World Bank, April 2011

⁴ **Article 12: Information Publication**

The public and the parties involved have the right to see the final EIA report or the initial environmental examination report and the relevant report of the Ministry of Environment, but this right does not include access to information relating to intellectual or industrial property or to any details of the finances of the project.

The institutional capacity and legal assessment has identified gaps and proposed corrective actions which are summarized in Table 3-3 of the ESA report.

Implementation of an Environmental and Social Management Framework

Since the subprojects could not be specified prior to appraisal, the Proponent prepared an environment and social management framework (ESMF) instead of an Environmental and Social Management Plan (ESMP). The ESMF, whose implementation rests with the project partners (PMU, participating banks and industrial enterprises), includes specific procedures for environmental assessment applied to activities and sub projects planned, according to the importance of their environmental impacts and in accordance with the safeguard policies of the World Bank, taking also into consideration the national EIA decree no. 8633 of 2012.

The aim of the ESMF is to provide the necessary guidelines and procedures, in the form of an ESA manual, to the FI, so that it can properly manage the environmental impacts and risks related to LEPAP investments and satisfy the World Bank's Environmental and Social Safeguards. The different steps are summarized below.

During project preparation, a pipeline of 13 projects was identified in the following sectors that could potentially be candidates for LEPAP. These sectors were the mineral, food, paper, plastic, metal products and chemicals sectors.. These projects provide major benefits to the environment (improved air quality, reduction of pollution loads) as well as economic benefits (particularly in the case of energy efficiency projects) with minor negative impacts to the environment.

Table 4-1 in the ESA report shows a partial list of enterprises that participated in EFL's technical assistance to LEPAP but did not commit yet to borrow. The list clearly indicates that potential types of interventions (pollution abatement projects) are likely to include:

- ✓ Industrial wastewater treatment plants
- ✓ Water re-use
- ✓ Industrial waste management

Other types of potential projects include air emissions reduction and control interventions, cleaner production and energy efficiency projects. These projects typically offer substantial positive impacts by reducing pollution loads while offering economic gains (especially in the case of energy efficiency projects), and their implementation poses limited negative impacts.

The positive impacts of treating industrial wastewater are improvement of public, occupational health and safety, reduction of pollution loads and removal of trace metals and heavy metals from industries (with a positive impact on coastal wastewater treatment plants whenever located downstream to industrial discharges), improvement of surface water and groundwater quality and provision of reliable source of water supply to farmers and to communities. Water reuse in industrial enterprises would lead to the reduction of water demands at the plant level, the provision of additional water resources for the ecosystem and for irrigation/agriculture purposes; the reduction of pollution in its discharge of the water bodies; and saving energy whenever the local source is groundwater and energy is required to pump the water to the surface. Minimizing industrial waste through process treatment or recycling will have also positive impacts on the physical environment by reducing air pollution; saving energy and hazardous and non-hazardous waste could be used as a fuel in cement kilns; diminishing health by preventing burning of plastics, rubbers, and chemicals; and reducing landfill use (hence leading to an increase in landfill lifetime).

The negative impacts of industrial waste water which in Lebanon is discharged either into the ecosystem or in the network of municipal waste water, are: a risk to human health, degradation of soil resources with heavy metals, salinity and water logging, pollution of groundwater through percolation; creating of imbalances in water bodies and in the plans and reduction of biodiversity and causing damages in the operation of municipal waste water treatment plants. The adverse impacts of not reusing water in industry would lead to an increase in the consumption of water and energy, and continuing discharge of pollutants into the ecosystem. Furthermore, poor and/or lack of treatment of industrial solid waste have negative impacts on soil pollution, groundwater pollution due the percolation of leachate and air pollution to burning of hazardous and non-hazardous waste.

Cumulative and long-term impacts are difficult to estimate at this stage given the absence of precise information on the number and characteristics of sub-projects, which will be known only during the project implementation (number, size, implementation areas). However, the ultimate risks they may cause to the environment can be easily mastered by the implementation of appropriate mitigations measures concerning the application of environmental conditions relating to construction activities, waste water and solid waste management, compliance with permitting procedures, operations, maintenance, and monitoring.

The methodology adopted is to conduct the environmental assessment in consultation with stakeholders and following the steps below:

A. Screening Process : The screening application form

The sub-project proponent is required to prepare a project screening form as attached in Annex 4 of the EIA decree and submit it to the PMU.

B. Screening Analysis

The application form is reviewed by the PMU and forwarded to the Service of Environmental Technology of the Ministry of the Environment. An Environment Screening Team composed of two staff members will be selected according to the nature of the project, and taking into account the relevant education and experience of the staff.

The category of the subprojects will be based on the analysis of impacts consistent with OP 4.01 (see below) taking into consideration the two positive screening lists attached as Annexes I and II in decree 8633/2012 and will consist of the following three categories:

Category I: includes the list of sub-projects corresponding to Annex I of the national EIA decree # 8633/2012 for which a detailed Environment and Social Impact Assessment Report (ESIAR) is mandatory; such projects are similar to Category A projects in the World Bank OP 4.01 Environment Assessment. Sub-projects falling in this category would have by their magnitude and severity, potential significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented. Few LEPAP sub-projects will belong to this category namely: waste to energy projects and industrial waste water containing hazardous chemicals, or industrial solid waste management projects involving hazardous materials or significant transportation requirements for wastes.

Category II: includes a list of sub-projects in Annex II of the national EIA decree for which a Limited Environment and Social Assessment Report (LESAR) is required. Sub-Projects in this category will have by their magnitude and severity, potential limited adverse social or environmental impacts that are few in number, site-specific, largely reversible, and readily addressed through mitigation measures. The majority of LEPAP sub-projects will belong to this category, namely small and medium size industrial waste water treatment plants containing non-hazardous chemicals, industrial solid waste projects containing non-hazardous materials, and water recycling projects.

Category III: consist of sub-projects in which relevant health, safety and working conditions are only required. Projects in this category will have minimal or no adverse social or environmental impacts. An Environment and Social Assessment report is not required. These sub-projects include energy efficiency projects, installation of air pollution control equipment and the like.

Given that some inconsistencies may occur between screening of the LEPAP subprojects on the basis of impacts as required in OP 4.01, and the screening using positive lists as used in the Annexes I and II of national EIA decree # 8633/2012, the following screening will be applied in LEPAP:

- Subprojects that are listed in Annex I and in which industrial facilities would generate hazardous pollutants, and/or discharge of heavy metals or trace metals will be classified in category I requiring the preparation of a comprehensive ESIAR report as described in OP 4.01 and whose content is similar to the report described in the national EIA decree. The ESIAR will be submitted for public consultation and disclosure on the MoE website and the World Bank info-Shop.
- Subprojects that are listed in Annex II and also in Annex I in which industrial facilities would NOT generate hazardous pollutants, and/or discharge of heavy metals or trace metals, will be classified in category II requiring the preparation of the LESIAR. The LESIAR will revolve around the preparation of an environment and social management plan (ESMP) with consultation and disclosure at the level of each subproject. The LESIAR will be submitted for public consultation and disclosure on the MoE website and the World Bank infoShop.
- The World Bank will review all subprojects classified as category I and requiring a full environmental and social impact assessment (ESIA). The World Bank will also review the first 6 sub-projects classified in category II. In case these category II sub-projects would comply with the ESMF, the World Bank will conduct during its regular supervision missions a post review of a sample of sub-projects in this category, else it will continue reviewing the sub-projects until found to satisfactorily comply with the ESMF requirements.

C. Monitoring and Follow up

It shall be PMU's responsibility to follow-up on the subproject specific EMSP implementation (in support to MoE's compliance team). The following levels of reporting are required:

- The sub-project proponent (industrial enterprise) shall submit a bi-annual report on EMSP implementation to the PMU and the MOE compliance team;
- The PMU will submit to the World Bank as part of its semi-annual project report, a report of the implementation of respective EMPs, and overall status of compliance with the ESMF.

D. Enforcement

Enforcement is the responsibility of MoE. The Ministry shall conduct inspections and request further evidence that environmental mitigation and monitoring measures are being followed. In the event of non-compliance, fines may prevail as per the national legislation, and in case of repetition, MOE could proceed with prosecution through the Ministry of Justice.

Training and Capacity Strengthening

The project will finance annual training and capacity strengthening in ESIA management; implementation, monitoring and enforcement of the EMSF and subproject specific EMSP for different target groups, namely the ministries of the environment and industry, BDL and participating banks as well as technical staff in industrial enterprises and local NGOs involved in industrial pollution abatement. The first component of the project includes also support to the Association of Lebanese Industrialists, and the Association of Lebanese Banks to market the program through providing technical assistance for the development of guidelines and training in selecting and evaluating environmental loans. The project will also support in conducting environmental awareness and communication campaigns on pollution prevention and control in coordination with NGOs.

The total costs of preparing ESIA and LESIA reports as well as training and environment awareness and communication was estimated at US\$ 442,000 during the five years of project implementation. This is exclusive from the cost related to the implementation of the mitigation and monitoring measures for each subproject. The later will be part of the investment costs during the engineering design of sub-projects.

Public Consultation on the ESMF

A public consultation meeting was organized at the Ministry of Environment on the 27th of March, 2013 to present the findings of the Environmental and Social Assessment for the LEPAP. A total of 38 participants attended the meeting. They included representatives of the ministries of the environment and industry, CDR, the Banque du Liban, the Association of Lebanese Banks and selected commercial banks, Kafalat, the Association of Lebanese Industrialists and industrial enterprises from the private sector which are considered potential borrowers from LEPAP, NGOs and international organizations.

Findings of the Environmental and Social Assessment of the LEPAP were presented, followed by a discussion session in which questions, comments and inquiries were received. The presentation was divided into two sections: (i) Institutional and Legal Gaps Analysis and Recommended Actions; and (ii) Main Stages of Environmental Assessment of Sub-Projects in which the ESIA process was explained. Forms were distributed to collect written feedback from the attendees.

The discussion at the consultation was very rich in questions and suggestions made by participants. Representatives of the Ministry of Environment as well the staff from the national consulting firm ELARD have provided further clarification on the ESMF and answered various questions. The consultation documents relating to the environmental and social assessment have been reviewed to take into consideration the comments made by participants. The participants expressed their support for the project and their willingness to actively contribute to its success.

تطوير التقييم البيئي والاجتماعي لمشروع مكافحة التلوث في لبنان

ملخص تنفيذي

المقدمة :

تشكل دراسة التقييم البيئي والاجتماعي لمشروع مكافحة التلوث في لبنان اساساً لتنفيذ هذا المشروع كجزء من الاجراءات المطلوبة بحسب السياسات الاجتماعية والبيئية الخاصة بالبنك الدولي.

تم اعداد هذا التقرير، بناء لطلب وزارة البيئة في لبنان وبدعم من صندوق البيئة في لبنان، وهو برنامج ممول من قبل الحكومة الالمانية ومنفذ من قبل الوكالة الالمانية للتعاون الدولي، وقد قام باعداد هذه الدراسة المستشار المحلي لصندوق البيئة في لبنان وهو شركة الأرض للتنمية المتطورة للموارد.

تم تصنيف مشروع مكافحة التلوث في لبنان ضمن فئة "الوساطة المالية" وفقاً للسياسة التنفيذية للبنك الدولي (OP 4,01) وذلك لان القرض، البالغة قيمته ١٥ مليون دولار، سيتم تحويله من خلال مصرف لبنان الى البنوك الوطنية المشاركة التي بدورها ستقوم بتقديم قروض فرعية للمؤسسات الصناعية. كذلك، من المتوقع أن يمول مشروع مكافحة التلوث في لبنان من ٢٠ الى ٢٥ مشروعاً فرعياً سيتم اقتراحهم من قبل المؤسسات الصناعية خلال تنفيذ المشروع علماً ان معظم هذه المشاريع لا تزال غير محددة خلال فترة التحضير للمشروع. في هذه ظروف، تعود مسؤولية التصنيف البيئي، مراجعة ومراقبة التقييم البيئي والاجتماعي والالتزام بسياسات البنك الدولي الى صاحب المشروع الذي يعتبر أيضاً مسؤولاً عن ضمان اجراء التقييم البيئي والاجتماعي المناسب من قبل المقترضين الثانويين بما في ذلك خطة الادارة البيئية المناسبة لكل من المشاريع الفرعية.

نظراً لتصنيف مشروع مكافحة التلوث في لبنان ضمن فئة الوساطة المالية، يجب القيام بما يلي:

- تقييم بيئي واجتماعي لمشروع مكافحة التلوث في لبنان قبل تقييم البنك الدولي والموافقة على المشروع، والذي يتضمن تقييماً شاملاً للقدرات المؤسساتية لمصرف لبنان ووزارة البيئة للتأكد ما اذا كان البرنامج الراهن يتوافق مع الاجراءات الاجتماعية والبيئية المفروضة من قبل البنك الدولي فضلاً عن التشريعات البيئية الوطنية ذات صلة؛
- تقييم بيئي واجتماعي على مستوى المشاريع الفرعية وفقاً لاجراءات التصنيف والادارة البيئية التي سيتم تقريرها استناداً الى التقييم البيئي والاجتماعي لمشروع مكافحة التلوث في لبنان، مما سيشكل اطاراً لادارة البيئية والاجتماعية يستخدمه صاحب المشروع كدليل لتحضير دراسة التقييم البيئي

⁵ ان مشروع مكافحة التلوث في لبنان هو مشروع مشترك بين وزارة المالية ووزارة البيئة ومصرف لبنان

والاجتماعي للمشروع الفرعي. بالتالي فان هذا الاطار، سيقوم بتوضيح كيفية تحديد وتقييم المخاطر والتأثيرات البيئية والاجتماعية الايجابية والسلبية للمشاريع الفرعية، كما سيقوم بتحديد التدابير التخفيفية اضافة الى وضع الخطط الادارية اللازمة من أجل التأكد من معالجة هذه المخاطر ومن اتباع التدابير التخفيفية ومراقبة وتقييم البرنامج بالكامل.

يعتبر التقرير الراهن تقييماً قانونياً ومؤسسياً كما يعتبر اطاراً للإدارة البيئية والاجتماعية. ان مشروع مكافحة التلوث في لبنان سيتبع فقط الإجراءات المنصوص عليها في السياسة التنفيذية للبنك الدولي (OP 4.01) والمتعلقة بالتقييم البيئي. كما ان جميع تدابير مكافحة التلوث ستكون ضمن المؤسسات الصناعية، علماً ان البنك الدولي لا يتحمل اية مسؤولية في موضوع النزوح الاقتصادي والاجتماعي او عدم امكانية الوصول الى مناطق معينة. وسيتم تطبيق سياسة البنك الدولي التنفيذية (OP 4.01) خاصة في حال وجود تعارض بين هذه السياسة والتشريعات البيئية الوطنية.

أهداف وعناصر مشروع مكافحة التلوث في لبنان

يهدف مشروع مكافحة التلوث في لبنان الى الحد من التلوث الصناعي الناتج عن المعامل الصناعية وتعزيز قدرات وزارة البيئة في المراقبة وتنفيذ القوانين والتشريعات البيئية من خلال تقديم الدعم التقني وانشاء آلية مالية لدعم استثمارات الحد من التلوث.

تبلغ ميزانية المشروع ١٧ مليون دولار ويتألف من العنصرين التاليين:

I. العنصر الاول: "الدعم التقني" بميزانية ٢ مليون دولار مقدمة من جهات مانحة دولية. يهدف هذا

العنصر الى تعزيز قدرات وزارة البيئة والشركاء الاساسيين المعنيين بموضوع التقييم البيئي والمراقبة والتطبيق. اضافة الى تأمين الدعم التقني اللازم للمؤسسات الصناعية الملوثة لاجراء دراسات التقييم البيئي وتحضير خطط الالتزام البيئي اضافة الى تنظيم حملات التوعية والتواصل اللازمة. كما سيتم انشاء وحدة لإدارة المشروع للمساعدة في تنفيذ هذا المكون؛

II. العنصر الثاني: "استثمار مكافحة التلوث" بميزانية ١٥ مليون دولار مقدمة من البنك الدولي لإعادة

الإعمار والتنمية. ويهدف هذا العنصر الى تقديم آلية تسويق للحد من التلوث الناتج عن حوالي ٢٠ - ٢٥ مصنعاً خاصاً او عاماً لجعل النفايات السائلة و/أو انبعاثات الهواء مطابقة للمعايير البيئية والوطنية بتكلفة فعالة. يمكن للمشاريع الفرعية ان تتمحور حول المواضيع التالية: التخفيف من النفايات، الوقاية من التلوث، استرداد الموارد واعتماد تكنولوجيا الانتاج الانظف، استبدال الوقود واعتماد تقنية "المراقبة في المراحل النهائية" عند غياب حل بديل. سيُقدم هذا العنصر القروض والمنح على قاعدة "من ياتي أولاً يُخدم أولاً" من خلال المصارف المحلية المشاركة.

سيقوم مصرف لبنان بإدارة التمويل من الناحية المالية بما يتوافق مع سياسات وتوجيهات البنك الدولي حول

الإدارة المالية. كما سيتم انشاء وحدة لإدارة المشروع ضمن وزارة البيئة لتكون المسؤولة عن كافة الإجراءات الإدارية، التقنية، البيئية والاجتماعي وفقاً للمتطلبات الوقائية البيئية والاجتماعية للبنك الدولي.

الإطار القانوني والمؤسسي في لبنان

يجب ان يتوافق المشروع مع القوانين والتشريعات اللبنانية. يستند نظام تقييم الأثر البيئي في لبنان الى قانون حماية البيئة رقم ٤٤٤/٢٠٠٢ والقانون رقم ٦٩٠/٢٠٠٥ والقانون رقم ٢٢٧٥/٢٠٠٩ حول تنظيم الوحدات العاملة في وزارة البيئة والقانون رقم ٨٦٣٣/٢٠١٢ وملحقاته. إن مرسوم تقييم الأثر البيئي وملحقاته يتضمن كل المتطلبات الخاصة بمراحل التصنيف وتحضير دراسات التقييم البيئي والإشراف على إجراءات التقييم البيئي بما في ذلك الاستشارات.

نص المرسوم المذكور على ان يتقدم صاحب العلاقة بدراسة تقييم أثر بيئي للمشاريع الواقعة ضمن القائمة الايجابية في الملحق رقم I والمعادلة للمشاريع المصنفة ضمن القائمة A من السياسة التنفيذية للبنك الدولي (٤,٠١ OP)، أو بتقييم بيئي أولي للمشاريع المصنفة ضمن القائمة الايجابية في الملحق رقم II والمعادلة للمشاريع الواقعة تحت القائمة B من السياسة التنفيذية للبنك الدولي (٤,٠١ OP)، وذلك بالتعاون مع احدى الشركات المصنفة تحت خانة الدراسات البيئية من قبل مجلس الانماء والاعمار استناداً الى قرار وزير البيئة رقم ٢٠١٣/٧/١، كما نص الملحق III من المرسوم على ضرورة تقديم دراسات بيئية للمشاريع التي تقع ضمن مناطق حساسة كالمناطق الساحلية أو مناطق القرية من المحميات الطبيعية. تعتبر موافقة وزارة البيئة على دراسة تقييم الأثر البيئي شرط ملزم للحصول على أي ترخيص من السلطات المعنية الاخرى قبل البدء بعملية البناء.

يتألف فريق عمل وزارة البيئة من ٧٠ اخصائي إداري وفني في جميع المجالات البيئية اضافة الى ٣٠ شخص يعملون ضمن المشاريع الدولية، ويتمتعون جميعهم بالكفاءة لتحديد كافة المشاكل البيئية في لبنان. ان ادارة تقييم الأثر البيئي، وهي من صلاحية مصلحة تكنولوجيا البيئة، تتم بالتعاون مع مصالح فنية اخرى ضمن وزارة البيئة، مع الاشارة الى ان ٢٠ شخص مطلعين على نظام تقييم الأثر البيئي في لبنان إضافة إلى معرفتهم بالمتطلبات البيئية لسياسات البنك الدولي اذ تلقوا تدريباً خاصاً حول هذا الموضوع.

إضافة إلى ذلك، تسعى وزارة البيئة الى تعزيز نظام الالتزام والتطبيق من خلال تقوية قدرات فريق العمل المعني بنظام تقييم الأثر البيئي والالتزام البيئي اضافة الى الفريق المعني بالمراقبة والتطبيق.

انشات وزارة الصناعة ستة لجان تراخيص صناعية تتمثل فيها عدة وزارات منها وزارة البيئة وترأسها وزارة الصناعة، ومهمتها بإعطاء تراخيص الإنشاء والتشغيل للمنشآت.

ستنص السياسة المقترحة ضمن مشروع مكافحة التلوث في لبنان على التزام وزارة البيئة بإنشاء نظام لإدارة

التلوث الصناعي.

القدرة المؤسسية والتقييم القانوني

تم تقييم قدرة مصرف لبنان ووزارة البيئة على تنفيذ وإدارة نظام الإدارة البيئية (التصنيف البيئي، التقييم البيئي، التدابير التخفيفية، المراجعة، المراقبة وتحضير التقارير) على مستوى مشروع مكافحة التلوث في لبنان والمشاريع الفرعية إضافة الى تقييم الإطار القانوني والتنظيمي في لبنان ومقارنته مع سياسات البنك الدولي الخاصة بالاجراءات الوقائية. كما تمت صياغة آليات لجعل سياسات البنك الدولي والمبادئ التوجيهية تتوافق مع سياسات ومبادئ الدولة اللبنانية. كما تم اقتراح خطط لمعالجة النواقص التي تشمل التدريب المتخصص وتحديد المستشارين الاجانب واللبنانيين المستعدين لتقديم الدعم. وسيتم تمويل هذه الخطط عبر العنصر الاول من المشروع إضافة الى برنامجين آخرين هما برنامج الحوكمة البيئية الممول من الاتحاد الأوروبي بمبلغ قدره ٨,٥ مليون يورو والذي من المقرر أن ينطلق في العام ٢٠١٣ ويستمر لثلاث سنوات وبرنامج صندوق البيئة في لبنان الممول من الحكومة الألمانية بمنحة قيمتها ٨,٥ مليون يورو والذي ينتهي في ٣١ كانون الأول ٢٠١٣.

أظهر التقييم المؤسسي التزام مصرف لبنان بالبيئة من خلال قيامه بتقديم قروض بيئية تتعلق بالتنمية الريفية والبيئة، ترشيد استخدام الطاقة والمحافظة عليها .

كما أن مصرف لبنان ملتزم باعطاء قروض ميسرة لمشاريع مراقبة التلوث في القطاع الصناعي من خلال منحه دعماً لمعدلات الفائدة للمشاريع البيئية ومنح استثناءات على الاحتياطات المصرفية لتشجيع المصارف التجارية على اعطاء القروض للمشاريع في قطاعات البيئة والطاقة. كما قامت وزارة البيئة باصدار عدة وثائق استراتيجية لتوجيه السياسات البيئية والتي تمت الاضائة عليها ضمن السياسات المقترحة من قبل مجلس الوزراء.

إن إطار الاستراتيجية البيئية (١٩٩٦)، وتقارير حالة البيئة (١٩٩٥، ٢٠٠١، ٢٠١٠)، والتقارير الوطني اللبناني المقدم إلى قمة الأرض للأمم المتحدة في جوهانسبرغ (٢٠٠٢) وتقارير الربو+٢٠ (٢٠١٢)، ومسودة خطة العمل البيئية الوطنية (٢٠٠٦)، والتحليل البيئي الوطني (CEA, 2022) وتعديل مسودة إطار العمل البيئي الاستراتيجي (٢٠١٣) قد تضمنت أهم التحديات والقضايا البيئية اللبنانية.

أظهر التقييم القانوني أن للبنان عدد كبير من القوانين والأنظمة البيئية فضلاً عن تشريعات اخرى متعلقة بالبيئة. من اهم التشريعات البيئية قانون حماية البيئة رقم ٢٠٠٢/٤٤٤ الذي نص على جميع مبادئ اعلان ريو حول البيئة والتنمية (1992)، ومرسوم التقييم البيئي الاستراتيجي رقم ٢٠١٢/٨٢١٣ (أول مرسوم للتقييم البيئي الاستراتيجي في الشرق الأوسط وشمال أفريقيا)، ومرسوم تقييم الأثر البيئي رقم ٢٠١٢/٨٦٣٣؛ ومرسوم الالتزام البيئي للمنشآت رقم ٢٠١٢/٨٤٧١ والذي من شأنه تنظيم جميع أنشطة المؤسسات المصنفة

(منها المؤسسات الصناعية) التي قد تسبب التلوث الضار والتدهور البيئي.

شملت دراسة التحليل البيئي الخاصة بلبنان تقييماً لنظام تقييم الأثر البيئي في لبنان وحدد أوجه التشابه والاختلاف بينه وبين السياسة التنفيذية للبنك الدولي (OP ٤,٠١) حول التقييم البيئي، حيث تبين أن مواصفات نظام تقييم الأثر البيئي اللبناني تتوافق مع سياسة البنك الدولي المذكورة اعلاه باستثناء ثغرات رئيسية وهي: (أ) عدم وجود نموذج موحد لدفتر الشروط وعدم وجود إرشادات توجيهية حسب القطاعات ليتم تزويدها إلى مقترحي المشروع لإعداد تقييم الأثر البيئي أو التقييم البيئي الأولي، (ب) عدم استشارة الجهات المعنية بالمشاريع المدرجة في المرفق II (على غرار مشاريع الفئة B المدرجة ضمن السياسة التنفيذية للبنك الدولي (OP ٤,٠١)، و (ج) عدم الاعلان عن ملخص تقييم الأثر البيئي والفحص البيئي الأولي (IEE) للعامّة بحسب المادتين ١٣ و ١٤ من قانون حماية البيئة مع الإشارة الى أن المادة ١٣ من مرسوم تقييم الأثر البيئي قد نصت على نشر المعلومات. وقد تم تحديد تدابير لسد هذه الثغرات وسيصار الى تنفيذها في مشروع مكافحة التلوث في لبنان.

العوائق الرئيسية التي تعترض التنفيذ والتطبيق الفعال والهادف لقوانين البيئية والقوانين ذات الصلة هي نتيجة تجزئة الصلاحيات بين المؤسسات التنظيمية، ووكالات منح التراخيص، وأجهزة الشرطة وغيرها، على الصعيدين الوطني والمحلي مما يؤدي الى عدم وجود مؤسسة قادرة على اتخاذ الإجراءات التطبيقية بشكل فعال. ان هذا النقص في الموارد البشرية وتجزؤ المسؤوليات يستلزم تعزيز المراقبة والتنفيذ كأولوية مؤسسية. يهدف مشروع مكافحة التلوث في لبنان الى دعم وزارة البيئة في إنشاء آلية من شأنها أن تدعم المؤسسات الصناعية في التزامها بأحكام المرسوم رقم ٢٠١٢/٨٤٧١ وإنشاء آلية لدعم استثمارات الحد من التلوث من النواحي التقنية والمالية.

يتوجب على المؤسسات الصناعية المهمة اعداد دراسة تدقيق بيئي ووضع خطة عمل للالتزام البيئي للمنشأة (عملاً بموجب المرسوم رقم ٢٠١٢/٨٤٧١) لتكون مؤهلة لتقديم طلب للحصول على قروض ميسرة لمشروعهم الرامي الى الحد من التلوث. وقد حددت القدرة المؤسسية والتقييم القانوني الثغرات والإجراءات التصحيحية المقترحة التي يمكن تلخيصها في الجدول ٣-٣ من تقرير تقييم الأثر البيئي الاجتماعي.

تطبيق اطار الادارة البيئية والاجتماعية

أعد صاحب المشروع إطار للإدارة البيئية والاجتماعية بدلاً من خطة الإدارة البيئية والاجتماعية إذ أنه لا يمكن تحديد المشاريع الفرعية قبل تقييم البنك الدولي. ان إطار الإدارة البيئية والاجتماعية يقع على عاتق الشركاء في المشروع (وحدة ادارة المشروع، المصارف المشاركة والمؤسسات الصناعية) ويتضمن إجراءات محددة

للتقييم البيئي لتطبيقها على الأنشطة والمشاريع الفرعية المخطط لها، وفقاً لأهمية آثارها البيئية تبعاً لسياسات البنك الدولي الوقائية، مع الأخذ في الاعتبار مرسوم تقييم الأثر البيئي رقم 8633/ ٢٠١٢.

ان الهدف من تشكيل إطار للإدارة البيئية والاجتماعية هو تحديد المبادئ التوجيهية والإجراءات اللازمة لمشروع الوساطة المالية على شكل دراسة لتقييم أثر بيئي واجتماعي، بحيث يتمكن من إدارة الآثار البيئية والمخاطر الناتجة عن مشروع مكافحة التلوث في لبنان وتلبية الضمانات البيئية والاجتماعية الخاصة بالبنك الدولي، وسيتم تحديد الخطوات ادناه:

خلال فترة التحضير للمشروع، تم تحديد ١٣ مشروع كمرشحين محتملين لمشروع مكافحة التلوث في لبنان. تنتمي هذه الصناعات الى هذه القطاعات التالية: المعادن (بما فيها قطاع الاسمنت)، الغذاء، الورق، البلاستيك، المنتجات المعدنية والكيماوية. أظهرت هذه المشاريع منافع بيئية (تحسين نوعية الهواء، الحد من التلوث) واقتصادية (خاصة في حالة المشاريع المتعلقة بترشيد استخدام الطاقة) هامة علماً ان تأثيراتها السلبية على البيئة تعتبر ثانوية.

يظهر الجدول ٤,١ لائحة بالمؤسسات التي استفادت من المساعدة التقنية لمشروع مكافحة التلوث في لبنان المقدمة من صندوق البيئة في لبنان الا انها لم تلتزم بطلب القرض حتى تاريخه. يتبين من خلال هذه اللائحة ان مشاريع الحد من التلوث يمكن ان تتضمن:

١- مشاريع معالجة مياه الصرف الصناعي؛

٢- اعادة استخدام المياه؛

٣- إدارة النفايات الصناعية.

كما يوجد مشاريع محتملة اخرى منها: التخفيض والتحكم بالانبعاثات الجوية، مشاريع الانتاج الانظف ومشاريع ترشيد استخدام الطاقة. ان هذه المشاريع تتضمن عادةً تأثيرات إيجابية جوهرية عبر الحد من التلوث وتحقيق مكاسب اقتصادية مهمة، خاصة ان تنفيذها يسبب اثار سلبية محدودة.

الآثار الإيجابية لمعالجة النفايات الصناعية السائلة تتضمن تحسين الصحة العامة والسلامة المهنية، الحد من حجم التلوث وإزالة آثار المعادن والمعادن الثقيلة من المصانع، تحسين نوعية المياه السطحية والمياه الجوفية وتوفير مصدر مياه اضافي يمكن للمزارعين وللمجتمعات المحلية الاعتماد عليه. ان إعادة استخدام المياه في المنشآت الصناعية تؤدي إلى الحد من الطلب على المياه على مستوى المصنع، وتوفير موارد مياه إضافية بالنسبة للنظام البيئي ولغرض الري/الزراعة، الحد من التلوث في تصريف النفايات من المسطحات المائية، وتوفير الطاقة عندما يكون مصدر المياه هو المياه الجوفية والطاقة ضرورية لضخ الماء إلى السطح. كذلك، ان التقليل من النفايات الصناعية من خلال عملية معالجة أو إعادة تدوير لها آثار إيجابية على البيئة

الطبيعية عن طريق الحد من تلوث الهواء؛ كما ان توفير الطاقة والنفايات الخطرة وغير الخطرة التي يمكن أن تستخدم كوقود في أفران الإسمنت؛ تراجع الصحة عن طريق منع حرق البلاستيك، والمطاط، والمواد الكيميائية، والحد من استخدام مكب النفايات.

يمكن تلخيص الآثار السلبية الناتجة عن تصريف النفايات السائلة الصناعية في الطبيعة مباشرة أو داخل شبكة مياه الصرف الصحي المنزلية كما هي الحال في لبنان، كالتالي: خطر على صحة الإنسان، تآكل موارد التربة، تلوث المياه الجوفية من خلال تسرب المعادن الثقيلة؛ اختلال في المسطحات المائية والنباتات والحد من التنوع البيولوجي وإلحاق أضرار بتشغيل محطات معالجة مياه الصرف الصحي المنزلية.

الآثار السلبية الناتجة عن عدم إعادة استخدام المياه في الصناعة يؤدي إلى زيادة في استهلاك المياه والطاقة، وإلى الاستمرار في تصريف الملوثات في النظام البيئي. علاوة على ذلك، ان عدم معالجة النفايات الصناعية الصلبة تؤدي الى تلوث التربة، وتلوث المياه الجوفية وذلك بسبب تسرب السوائل المرشحة وتلوث الهواء نتيجة حرق النفايات الخطرة وغير الخطرة.

يصعب في هذه المرحلة تقدير الآثار التراكمية والطويلة الامد نظراً لعدم وجود معلومات دقيقة عن عدد وخصائص المشاريع الفرعية والتي لا يمكن تحديدها الا خلال فترة تنفيذ المشروع (عدد وحجم ومناطق التنفيذ).

الا ان المخاطر التي قد تنتج عن هذه المشاريع يمكن ان تحدد بسهولة من خلال تطبيق تدابير التخفيف الملائمة فيما يتعلق بتطبيق الشروط البيئية المتعلقة بأنشطة البناء، ومياه الصرف الصحي وإدارة النفايات الصلبة، والتقييد بإجراءات الترخيص وصيانة ومراقبة آبار المياه،... الخ

المنهجية المتبعة ستكون بإجراء تقييم بيئي بعد استشارة الاطراف المعنية اما الخطوات المتبعة فهي كالتالي:

أ- عملية التصنيف : نموذج استمارة التصنيف

يطلب من صاحب المشروع الفرعي تعبئة نموذج استمارة التصنيف كما هو مرفق في الملحق رقم ٤

من مرسوم تقييم الأثر البيئي وتقديمه إلى وحدة إدارة المشروع

ب- تحليل التصنيف

تتم مراجعة استمارة الطلب من قبل وحدة إدارة المشروع ويتم إرسالها إلى مصلحة تكنولوجيا البيئة في وزارة البيئة. يقوم فريق التصنيف البيئي المؤلف من اخصائيين يتم اختيارهما بحسب نوع المشروع، مع الأخذ بعين الاعتبار اختصاص وخبرة الموظفين، بتحديد فئة المشاريع الفرعية استناداً الى السياسة التنفيذية للبنك الدولي (OP ٤,٠١) مع الأخذ بعين الاعتبار قائمتي التصنيف الإيجابيتين المرفقتين كالملحق الأول والثاني في المرسوم ٢٠١٢/٨٦٣٣ وسيكون من الفئات الثلاث التالية:

الفئة الأولى: وتتضمن مجموعة المشاريع الواردة في المرفق الأول من مرسوم تقييم الأثر البيئي رقم

8633/2012 والتي تتطلب تقديم تقرير مفصل عن تقييم الأثر البيئي والاجتماعي. ان هذا النوع من المشاريع يتطابق مع المشاريع المدرجة ضمن الفئة A ضمن السياسة التنفيذية للبنك الدولي الدولي (OP ٤,٠١) حول الدراسات البيئية. يمكن للمشاريع الفرعية في هذه الفئة ان تسبب عدة اضرار اجتماعية أو بيئية جديدة، متنوعة ومبرمة، وذلك بسبب حجمها وخطورتها. المشاريع الفرعية القليلة التي يمكن ان تدخل في اطار هذه الفئة هي التالية: مشاريع الطاقة، النفايات الصناعية السائلة والتي تحتوي على مواد كيميائية خطيرة، النفايات الصلبة الصناعية التي تحتوي على مواد خطيرة اضافة الى المشاريع التي تستوجب احتياجات نقل نفايات هامة.

الفئة الثانية: تتضمن قائمة المشاريع الفرعية الواردة في الملحق الثاني من مرسوم تقييم الأثر البيئي الذي يتطلب تقديم تقرير اثر بيئي واجتماعي محدود. بناءً لحجمها وخطورتها، فإن المشاريع الفرعية في هذه الفئة لديها اضرار بيئية واجتماعية محدودة وفي مواقع محددة، قابلة للعكس إلى حد كبير، ويمكن معالجتها بسهولة من خلال تدابير التخفيف. لذلك، فإن غالبية المشاريع الفرعية في مشروع مكافحة التلوث في لبنان ستنتهي إلى هذه الفئة وستتمحور حول المواضيع التالية: المحطات الصغيرة والمتوسطة الحجم لتكرير النفايات الصناعية السائلة التي لا تحتوي على اية مواد كيميائية خطيرة، مشاريع النفايات الصلبة الصناعية التي لا تحتوي على مواد خطيرة، ومشاريع إعادة تدوير المياه.

الفئة الثالثة: تتألف من المشاريع الفرعية ذات الصلة بالصحة والأمان واطراف العمل فقط. ان المشاريع في هذه الفئة لديها الحد الأدنى من الضرر البيئي والاجتماعي لذلك فهي لا تتطلب تقديم تقرير تقييم اثر بيئي واجتماعي. من هذه المشاريع ترشيد استخدام الطاقة أو تركيب أجهزة تخفيف الانبعاثات وما شابه.

نظراً لامكانية وجود بعض التناقضات بين تصنيف المشاريع الفرعية ضمن مشروع مكافحة التلوث في لبنان على أساس التأثيرات بناءً للسياسة التنفيذية في البنك الدولي الدولي (OP ٤,٠١)، والتصنيف استناداً الى القوائم الإيجابية الواردة في المرفقات الأولى والثانية من مرسوم تقييم الأثر البيئي رقم 8633/2012 لذلك فإن عملية التصنيف خلال المشروع ستتم على الشكل التالي:

- المشاريع الفرعية المذكورة في المرفق الأول والمتعلقة بالمنشآت الصناعية التي تولد الملوثات الخطرة، أو إفرازات من المعادن الثقيلة أو المعادن النادرة سيتم تصنيفها ضمن الفئة الأولى التي تتطلب إعداد تقرير تقييم اثر بيئي واجتماعي شامل بحسب ما هو مطلوب في السياسة التنفيذية للبنك الدولي (OP ٤,٠١) اما بالنسبة لمحتواه فهو مشابه للتقرير المنصوص عنه في مرسوم تقييم الأثر البيئي؛

- المشاريع الفرعية الواردة في المرفق الثاني، والمشاريع الواردة في المرفق الأول والمتعلقة بالمنشآت الصناعية التي لا تولد الملوثات الخطرة، أو إفرازات من المعادن الثقيلة أو المعادن النادرة سيتم تصنيفها في الفئة الثانية التي تتطلب إعداد تقرير تقييم اثر بيئي واجتماعي محدود. ان التقرير المذكور يجب ان يتمحور حول إعداد خطة الإدارة البيئية والاجتماعية مع الاستشارات والإعلان على صعيد كل من المشاريع الفرعية؛

- سيقوم البنك الدولي بمراجعة جميع المشاريع الفرعية المصنفة على أنها من الفئة الأولى والتي تتطلب تقييم أثر بيئي واجتماعي كامل. كما سيقوم أيضا بمراجعة اول ستة مشاريع فرعية مصنفة ضمن الفئة الثانية، وفي حال كانت هذه المشاريع ملتزمة ب اطار الادارة البيئية والاجتماعية، سيقوم البنك الدولي بإجراء مراجعة اخرى لعينة من المشاريع الفرعية في هذه الفئة وذلك خلال مهمات الاشراف المنتظمة الخاصة به.

ت- المراقبة والمتابعة

- ان وحدة إدارة المشروع هي الجهة المسؤولة عن متابعة تنفيذ خطة الادارة البيئية والاجتماعية للمشروع الفرعي وذلك لدعم فريق وحدة الالتزام البيئي في وزارة البيئة. اما بالنسبة للتقارير المطلوبة فهي:
- يجب على صاحب المشروع الفرعي اي المؤسسة الصناعي تقديم تقرير عن تنفيذ خطة الإدارة البيئية والاجتماعية إلى وحدة إدارة المشروع وفريق وحدة الالتزام البيئي في وزارة البيئة وذلك كل ستة اشهر؛
 - على وحدة إدارة المشروع ان ترفع إلى البنك الدولي تقرير عن تنفيذها لخطة الإدارة البيئية والاجتماعية، وتحديد وضع الالتزام لاطار الادارة البيئية والاجتماعية وذلك ضمن التقرير الذي يجب اعداده كل ستة اشهر.

ث- تطبيق القانون

- ان تطبيق القوانين هو من مسؤولية وزارة البيئة، اذ يجب عليها إجراء عمليات التفتيش وطلب الأدلة للتأكد من ان المؤسسة تقوم باتباع تدابير التخفيف والمراقبة البيئية. اما في حال عدم الالتزام، تفرض الغرامات وفقاً للتشريعات الوطنية، وفي حالة التكرار، يمكن لوزارة البيئة ان تتابع المقاضاة عبر وزارة العدل.

التدريب وتعزيز القدرات

سيقوم مشروع مكافحة التلوث في لبنان بتمويل مشاريع تدريب وتعزيز القدرات في مجال إدارة تقييم الأثر البيئي الاجتماعي سنوياً، وتنفيذ تطبيق ومراقبة إطار الإدارة البيئية والاجتماعية وخطة الإدارة البيئية والاجتماعية الخاصة بمشاريع فرعية محددة وذلك للجهات المعنية أهمها وزارات البيئة والصناعة ومصرف لبنان والمصارف المشاركة وكذلك الجهاز الفني في المؤسسات الصناعية والمنظمات غير الحكومية المحلية المعنية بموضوع مكافحة التلوث الصناعي.

كما يشمل العنصر الاول من مشروع مكافحة التلوث في لبنان دعم جمعية الصناعيين اللبنانيين، وجمعية المصارف اللبنانية لتسويق البرنامج من خلال توفير المساعدة التقنية من أجل تطوير المبادئ التوجيهية وتنظيم التدريب على اختيار وتقييم القروض البيئية. كما سيدعم المشروع تنظيم حملات التوعية البيئية للوقاية من التلوث ومعالجته بالتنسيق مع المنظمات غير الحكومية.

يقدر مجموع تكاليف إعداد دراسات تقييم الأثر البيئي والاجتماعي الكاملة والمحدودة اضافة الى كلفة التدريب والتوعية بمبلغ 442,000 دولار امريكي خلال السنوات الخمس لتنفيذ المشروع، علماً ان هذا المبلغ لا يلحظ تدابير التخفيف واجراءات المراقبة الخاصة بكل من المشاريع الفرعية والتي ستشكل في وقت لاحق جزءاً من التكاليف الاستثمارية خلال فترة التصميم الهندسي للمشاريع الفرعية.

استشارة العامة بخصوص إطار الإدارة البيئية والاجتماعية

تم تنظيم اجتماع لاستشارة العامة في وزارة البيئة بتاريخ ٢٧ آذار ٢٠١٣ لتقديم نتائج التقييم البيئي والاجتماعي لمشروع مكافحة التلوث في لبنان حيث حضر ٣٨ مشاركاً منهم ممثلين عن وزارات البيئة والصناعة، ومجلس الإنماء والإعمار، مصرف لبنان وجمعية المصارف اللبنانية، مؤسسة كفالات، جمعية الصناعيين اللبنانيين والشركات الصناعية من القطاع الخاص والتي تعتبر من المقترزين المحتملين ضمن مشروع مكافحة التلوث في لبنان اضافة الى المنظمات غير الحكومية والمنظمات الدولية.

تم خلال الاجتماع عرض لنتائج التقييم البيئي والاجتماعي لمشروع مكافحة التلوث في لبنان، وتلتها جلسة مناقشة حيث تم توجيه الأسئلة والتعليقات والاستفسارات. تم تقسيم العرض إلى قسمين: (أ) تحليل الثغرات المؤسسية والقانونية والتدابير المقترحة، و(ب) المراحل الرئيسية للتقييم البيئي للمشاريع الفرعية حيث تم عرض آلية دراسة تقييم الأثر البيئي الاجتماعي.

كما تم توزيع استمارات لجمع ملاحظات خطية من الحضور وقد كانت المناقشة أثناء المشاورات غنية جداً من

خلال الأسئلة والاقتراحات المقدمة من قبل المشاركين. قام ممثلين عن وزارة البيئة وشركة الأرض للتنمية المتطورة للموارد، بتقديم المزيد من التوضيحات عبر الاجابة عن الاسئلة المختلفة التي طرحت حصة في ما يتعلق بإطار الإدارة البيئية والاجتماعية. وقد تمت مراجعة وثائق المشاورات المتعلقة بالتقييم البيئي والاجتماعي آخذين بعين الاعتبار التعليقات التي أدلى بها المشاركون الذين اعربوا عن دعمهم للمشروع واستعدادهم للمساهمة الفعلية في نجاحه.

1. Introduction

The Environmental and Social Assessment (ESA) of the Lebanon Environmental Pollution Abatement Project (LEPAP) constitutes the basis for the development of the actions required to comply with the World Bank's Environmental and Social policies and safeguards. This document was prepared with the technical support of the Environmental Fund for Lebanon (EFL), a program financed by the German International Cooperation (GIZ), and prepared by EFL's technical assistance national consulting firm, ELARD, upon the request of the Lebanese Ministry of Environment (MoE).

LEPAP was classified under the Category Financial Intermediary (FI) in accordance with the World Bank's operational policy OP 4.01 because the World Bank loan will be channeled through Banque du Liban (BdL) acting as an Apex Bank for on-lending to selected national participating banks to provide sub-loans to industrial enterprises. Furthermore, LEPAP is expected to finance a total of 20 to 25 sub-projects, which many of them were not identified during project preparation and would be proposed by potential enterprises over the course of implementation. Under such conditions, the responsibility for environmental screening, environmental and social assessment (ESA) review, monitoring and compliance with Bank policies is devolved to project proponent⁶, supported by a Project Management Unit (PMU). It is also the proponent's responsibility to ensure that the sub-borrowers carry out appropriate ESA, including the preparation of an Environmental Management Plan (EMP) for each sub-project.

The ESA of a project classified as FI, such as LEPAP, is designed to take this into account and therefore takes place at two levels:

- An ESA of the LEPAP prior to the World Bank's appraisal of the project. This includes a full assessment of the institutional capacity of the BdL and the MoE to ensure that the program follows the World Bank's environmental and social safeguards as well as relevant national environmental legislation;
- An ESA at the sub-project level, according to the environmental screening and management procedures to be established on the basis of the ESA of LEPAP. This will be in the form of an environment and social management framework which will be used as a manual by the Proponent for environmental and social assessment of LEPAP sub-projects. This framework indicates how to identify and assess the social and environmental risks and impacts of sub-projects, both beneficial and adverse; to determine the necessary mitigation measures; and to elaborate the necessary management plans to ensure that impacts are dealt with, mitigation measures are followed, and the entire program is monitored and evaluated.

The present document consists therefore of an institutional and legal assessment as well as an environment and social management framework.

⁶ LEPAP is a joint project of the Ministries of Finance and Environment and Banque du Liban

2. LEPAP Objective, Components and Eligibility Criteria

The development objective of LEPAP is to reduce industrial pollution in targeted industrial enterprises and strengthen the monitoring and enforcement capabilities of the MoE through technical assistance and through establishing a financial mechanism for supporting pollution abatement investments.

The Project, with a total cost of US\$ 17.0 million and duration of five years, will consist of two components as follows:

- 1) **Component 1: Technical Assistance**- The objective of this component is to strengthen the capacity of MoE and other key stakeholders and provide project management support through the setting up of a Project Management Unit (PMU). This component consists of :
 - (i) strengthening the environment assessment, monitoring and enforcement capacity in the industrial sector by establishing guidelines for enforcement and on-the-job training at the national and local levels in close coordination with the € 8 million EU-financed Environmental Governance (StREG) program which aims, among other objectives, to strengthen capacity for environmental inspection and enforcement at the Ministerial level;
 - (ii) providing technical support to selected polluting enterprises to prepare their environmental audits and compliance action plans in accordance with the Environmental Compliance Decree (refer to Appendix A for a template of these studies);
 - (iii) working closely with BdL and the Association of Lebanese Industrialists, and the Association of Lebanese Banks to market the program and providing technical assistance for the development of guidelines and training in selecting and evaluating environmental loans; and
 - (iv) conducting environmental awareness and communication campaigns in coordination with NGOs.
- 2) **Component 2: The Pollution Abatement Investment** - The objective of this component is to introduce a market mechanism for pollution control for an estimated 20 to 25 public and private enterprises to bring their effluent discharges and/or air emissions towards compliance with national environmental standards in a cost-effective manner. The sub-projects could include waste minimization, pollution prevention, resource recovery, clean technology adoption, fuel substitution, or end-of-pipe environmental control where no other alternatives are available. This component will provide, on a first-come, first-serve basis, sub-loans and sub-grants through selected local participating banks.

2.1 LEPAP Funding Flow and Eligibility Criteria

The BdL, acting as an Apex Bank, will be the recipient of the World Bank loan of US\$ 15 million that would be made available to selected participating commercial banks. The funds will then be channeled through the participating commercial banks, which will be remunerated through a percentage of the interest rate that will be agreed upon between the World Bank, MoE, and BdL. The beneficiary polluting enterprise will then receive a sub-loan from a participating bank at market rate with a percentage sub-grant (to be determined at project appraisal) freed only after the targeted environmental performance has been achieved.

The eligibility criteria for industrial enterprises to borrow from the participating banks are as follows:

- Enterprises should be creditworthy as determined by the commercial bank;
- Enterprises should bear the loan guarantees by their bank;
- Enterprises should have an industrial license to operate, while all sub-projects financed under the loan shall be in the industrial sector;
- Enterprises should meet all the technical requirements and criteria required to participate in this project, which will be provided free-of-charge. Specific items will include: the preparation of a compliance action plan (for the enterprise as a whole) and environmental audit or Environment Assessment related to the sub-project;
- Enterprises must be willing to commit 10% of the total project costs in the form of in-kind or cash contribution;
- Sub-projects for medical and / or industrial hazardous waste could be considered for financing provided that the borrower will be a private sector entity;
- Preference will be given to change-of-process technology and all clean technology, but also could include end-of-pipe treatment particularly for industrial wastewater;
- The sub-loan should not exceed US\$ 3 Million US\$ without receiving prior authorization from the World Bank; and
- Selection of sub-projects will be made on a first-come, first-serve basis.

2.2 LEPAP Project Management

BdL will manage the World Bank funds from the financial management point of view and in accordance with the World Bank's policies on financial management. A Project Management Unit (PMU), responsible for all administrative, technical, procurement, environmental and social requirements and in accordance with the fiduciary, environment and social safeguard requirements of the World Bank will be established. The PMU will consist of a full time project manager and full time specialists in pollution management, financial management, procurement management and environmental and social safeguards. The PMU will be housed at the MoE, in the Minister's office, so that it can maintain its independence but allow it to interface with the different services of the MoE.

The responsibility of the BdL as a Financial Intermediary and the PMU will be to:

- Ensure that the participating banks assess the creditworthiness of the sub-borrower (polluting enterprise) in accordance with their internal regulation;
- Provide technical support for safeguard screening to sub-borrowers from the participating banks;
- Review sub-loan application packages for technical requirements and safeguard documentation including the environmental assessment, and/or environmental audit / compliance action plans;
- Arrange and finance through the first component of the project, the Environmental and Social Assessment (ESA), if required as a result of the screening process, and the Environmental audit/Compliance Action Plan that are to be prepared by a prequalified independent consultant (refer to Appendix A for the draft ToRs for the preparation of the CAP);

- Maintain safeguard documents for all sub-projects as well as for the selection of consulting firms to conduct the ESA and/or environment audit/CAP;
- Monitor sub-project compliance with mitigation plans; and
- Verify that pollution control equipment were installed and are performing in accordance with the required specifications and national standards.

The responsibility of the World Bank is to:

- Supervise the implementation of the Bank's environment and social safeguards through the implementation of environmental and social management framework described in this document;
- Review and clear ESA/EMP studies for at least 5 sub-projects to ensure that the review process of ESA system is acceptable; conduct subsequently post review of sub-project specific ESA/EMPs thereafter to ensure system is adequately implemented;
- Provide technical support to the PMU as required to ensure a satisfactory implementation of the Banks' safeguards.

The responsibility of the participating banks is to:

- Sign a participating bank agreement with BdL for managing the funds in accordance with the World Bank policies and regulations;
- Review and approve the credit-worthiness of the polluting enterprise;
- Liaise and follow up with the PMU so that the sub-borrower meets all the technical and safeguard requirements;
- Negotiate and sign with the sub borrower, the sub-loan and technical agreements, while ensuring that mitigation and monitoring measures listed in ESA/EMPs, if applicable, are duly integrated in the sub-loan agreement; and
- Exercise due diligence with the BdL /PMU at various stages of the process to ensure (i) project viability, (ii) investment costs are based on true pro-format invoices, (iii) goods have been effectively delivered, and (iv) payments are made directly to the supplier.

The responsibility of the borrowing enterprises is to:

- Submit sub-project concept to the participating banks;
- Obtain approval of the ESA/EMP, if such study is required based on the screening process presented in this document, in coordination with the PMU;
- Obtain required permits/licenses;
- Negotiate and sign the sub-loan agreement with the participating bank;
- Ensure (i) project viability, (ii) investment costs are based on true pro-format invoices, (iii) goods have been effectively delivered, and (iv) payments are made directly to the supplier;
- Install equipment and ensure their operation and maintenance;
- Implement established environmental and social management plans; and
- Maintain files documenting the safeguard process.

The responsibility of the MoE is to:

- Review and clear sub-projects according to national EIA decree and WB safeguard policies;
- Issue approval of the ESA/EMP and the environment compliance certificate;
- Monitor and enforce the mitigation and monitoring measures in the sub-project specific environmental and social management plan.

The Application Process is summarized in Figure 2-1.

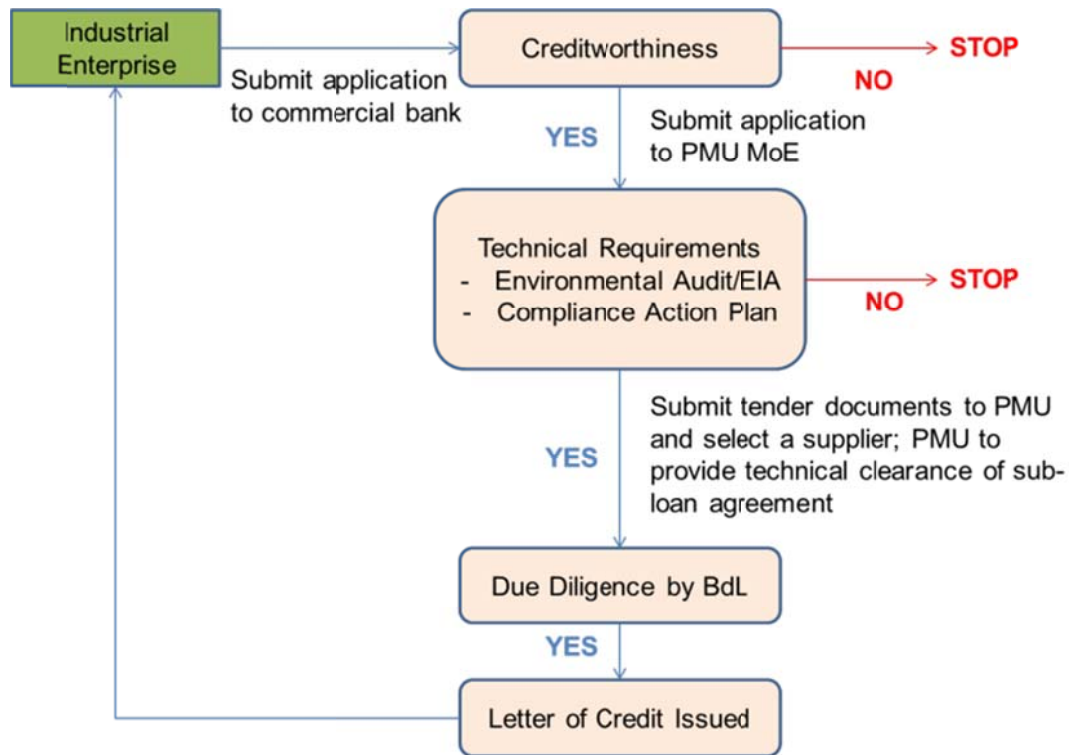


Figure 2-1. LEPAP Application Process

2.3 Programs Parallel to LEPAP

Two programs are directly relevant to LEPAP:

- 1) The EU's €8.0 million StREG program, whose overall objective is to improve the environmental performance of the Lebanese public sector through environmental governance reforms. The program's specific objective is to build effective capacity within MoE to plan and execute environmental policy, including mainstreaming enforcement within key line-ministries. LEPAP will build on the St-REG program as the latter will (a) provide monitoring stations, (b) prepare a national environmental action plan to cover major sectors that would affect the economy, as well as (c) strengthen the environmental capacity of other sector ministries. This program will be initiated in 2013 and will be implemented during three years; as such, the results of this program will contribute to LEPAP's achievements.
- 2) The €8.5 million Environmental Fund for Lebanon (EFL), which is financed by the German Government through GIZ as a grant, and aims at reducing environmental risks and economic impacts of the 2006 war and of underserved areas in Lebanon. As part of EFL's Second Call for Proposals (launched in 2010), 6 industrial enterprises have benefited from this fund and have reduced their wastewater pollution by acquiring needed equipment and technical assistance. Since 2012, EFL has provided additional technical assistance to over 15 industrial enterprises in Lebanon for the preparation of environmental investment plans which would form the basis for acquiring financial support from LEPAP. EFL will continue to provide needed technical assistance to industrial enterprises till December 2013 and will contribute to the technical assistance component of LEPAP in 2013.

3. Institutional Capacity and Legal Framework Assessment

The capacity of BdL and the MoE to implement and manage the Environment Management System (environmental screening, assessment, mitigation, review, monitoring, and reporting) at the project and sub-project level has been assessed based on the checklist shown in Table 3-1. The national legal and regulatory framework of Lebanon is assessed and compared with the safeguard policies of the World Bank. Mechanisms for harmonizing World Bank policies and guidelines with those of the host country are formulated. Plans for meeting deficiencies, including specialized training and identification of local or international consultants available for support, are proposed and will be financed in the first component of the project as well as by the two parallel programs namely the StREG and EFL programs.

Table 3-1. Institutional and Legal Assessment Checklist

Checklist

FI Capacity

- Senior management commitment to addressing and managing environmental issues
- Existence of environmental management unit
- Technical capacity of staff for understanding environmental and related issues and effective screening and review
- Adequate resources provided by management
- Established roles and responsibilities vis a vis the national environmental agencies
- Provision of written guidelines for environmental screening, preparation of EA and supervision of environmental mitigation and monitoring plan

Legislative Framework

- Assessment of local relevant laws and decrees with respect to the World Bank EA policy in OP 4.01
- Existence of ambient quality norms as well as limitations on pollution load discharges
- Availability of mechanisms for enforcement

Corrective Action Plan

- Determine gaps in institutional and legal framework; and
- Prepare an action plan with the necessary budget to mitigate gaps in the institutional and legal framework.

3.1 Institutional Assessment

The result of the institutional assessment showed the following:

Commitment to environment issues: The BdL has translated its strong commitment to environment protection through the provision of concessionary loans with (a) the establishment of a credit line for rural development and environment, (b) a credit line for energy efficiency for small and medium enterprises financed by the EU, and recently (c) a credit line for energy efficiency and energy conservation in the electricity, industrial and commercial sectors to be co-financed by the European Investment Bank (EIB) and by the Agence Francaise de Développement (Afd). In acting as an Apex Bank for LEPAP, BdL is also committed to provide concessionary loans for controlling pollution in the industrial sectors. BdL is providing a subsidy on interest rates to environmental projects and exemptions on compulsory reserves to stimulate commercial banks to grant concessionary loans to the energy and

environment sectors. The MoE has also prepared a series of strategic documents that guided the environmental policies highlighted in successive Council of Ministers (CoM) Policy Statements. The Environment Strategy Framework (1996); State of the Environment Reports (SOER) (1995, 2001, 2010); the United Nations Johannesburg Summit Lebanon Country Profile (2002) and Rio+20 Country Report (2012), the draft National Environment Action Plan (NEAP, 2006), the Country Environment Analysis (CEA, 2011), and the draft updated Environment Strategy Framework (2013) have all articulated Lebanon's major environmental issues and challenges. MoE's commitment to the establishment of an industrial pollution management system will be spelled out in a policy statement which is under preparation.

Establishment of a PMU: As stated above, a PMU will be established with full-time staff recruited on a competitive basis, to be responsible on behalf of the Proponent of the administrative, procurement, financial and environment and social safeguards and for which TOR will be prepared as part of the operational manual of LEPAP. The MoE has implemented a number of project grants, in partnership with development partners, and with the technical assistance of individual consultants, consulting firms and universities. It has therefore a successful track record of establishing PMUs for its projects and programs financed by the EC Life Third-Countries Program, GIZ, the GEF, the Montreal Protocol and the UNDP. There is clear evidence that the private sector possesses the skills for continuing to provide effective environmental services. The latest PMU was established by GIZ under the Environment Fund for Lebanon (EFL), which is housed at the Council of Development and Reconstruction (CDR) but works closely with the MoE and the Ministry of Industry. The PMU staff is very competent in managing this pollution control project. It consists of a project manager; field coordinator, and project assistant as well as core team of short-term specialists. The EFL PMU will act as the LEPAP PMU during the first year of project implementation but will be supplemented by full-time environment and procurement management specialists who would receive training.

Technical capacity of staff in understanding environmental issues and environmental safeguards. The BdL has in its financing unit, the head and three staff who are familiar with Lebanon's environmental issues by the fact that this unit is managing the BdL funds for rural development, environment and energy efficiency. MoE is endowed with a competent team consisting of 70 administrative/technical staff in all the major environment themes, complemented by about 30 staff working in the context of internationally funded/managed projects. This staff has the technical capacity to understand Lebanon's environmental issues. The EIA system, which was established with the assistance of the Mediterranean Environment Technical Assistance Program (METAP) of the World Bank, is managed by the Environmental Technology Service of the MoE, in coordination with the various technical services – about twenty staff, all knowledgeable about the national EIA system and the World Bank Safeguards for which they received substantial training. These staff serve as part-time environmental reviewers of the EIA reports including team members from International Projects working at the MoE who also participate in the review process whenever necessary.

Adequate Resources provided by Management. There are no pre-allocated resources within the MoE to advise, review and follow up on the EIA. However the EIA decree requires the payment of a fee for the review of the EIA reports, which became operational as of the beginning of 2013. In the first component of the LEPAP project, funds will be allocated for the preparation and follow up of the EIA reports.

Established roles and responsibilities vis-a-vis the MoE. The roles and responsibilities of the different parties involved in LEPAP have been described above. Furthermore, the MoE is committed to reinforce the compliance and enforcement system by strengthening the capacities of the respective teams in charge of EIA, compliance, as well as monitoring and enforcement. The separation of the enforcement from compliance will enable the staff of the compliance unit to act as a user friendly industrial office for the enterprises and provide technical support on pollution control technologies to the industry. The enforcement team will ensure the application of the Environment Protection Law and the compliance with the environmental standards. The first component of LEPAP will strengthen the capacity of the EIA and compliance teams. The EU-financed StREG program will strengthen capacity for environmental inspection and enforcement at the MoE level.

Provision of written guidelines for environmental screening, preparation of EA and supervision. The legal basis for the EIA system is established in the Environment Protection Law No. 444/2002 and Law No. 690/2005 and Decree No. 2275/2009 on the reorganization of the MoE and the EIA decree No. 8633/2012 and its annexes. The EIA decree and its annexes include all the requirements for screening, preparation of the environmental assessment and the supervision of the environmental assessment process. The decree requires that the project proponent would hire a national consulting firm among the pre-qualified consulting firms of CDR (MoE Decision No. 7/1/ 2003) to conduct either an EIA study for a project belonging to a positive list in Annex I and similar to Category A projects of the World Bank's operational policy OP 4.01 or an Initial Environmental Examination (IEE) belonging to the projects in a positive list in Annex II of the decree and similar to Category B projects in OP 4.01. Annex III also states that projects located in sensitive areas such as coastal areas or near protected areas are also subject to environmental assessment. The law and the decree also assign full authority to the MoE through its Service of Environmental Technology to arrange for screening, review, control and follow up on the EIA process and its implementation. MoE's position regarding an EIA is a pre-requisite for any subsequent license or permit by any or all other relevant authorities that may be required prior to construction. The essential elements of the Lebanese EIA procedures are summarized in Table 3-2 and are further detailed in Section 4.

Table 3-2. Environmental Assessment Procedures⁷ as per Lebanese EIA Decree (8633/2012)

Stage	Activity
Initial Filing and Screening	<ol style="list-style-type: none"> 1) Proponent completes a Project Screening Form (PSF) of the intended project in accordance to Annex 4 of the EIA decree for submission to the Ministry of the Environment for screening. 2) Screening is made through the Service of Environmental Technology based on two positive lists of projects in Annexes I and II, as well as Annex III (which takes into account the sensitivity of the project's location). The service determines if the project is among: <ul style="list-style-type: none"> • Annex I projects for which an EIA report is required • Annex II projects for which only an Initial Environment Examination is required -an Annex II project located in an Annex III location would require an EIA; • If not listed in Annex I or Annex II, no further Environment Analysis is required, unless located in an Annex III area, in which case an IEE would be required. 3) Duration of the MoE response is 15 days; if no response within this period is issued by MoE, the project proponent may proceed on the basis of the above screening rules.
Scoping	<ol style="list-style-type: none"> 1) Scoping is required for projects subject to an EIA study; no scoping is required for projects requiring an IEE; 2) The proponent is required to inform the stakeholders, concerned ministries and NGOs of the preparation of an EIA report and the municipality should post on its bulletin board, an announcement to that effect during 15 days and requesting comments from the public. MoE could also receive comments from the public or stakeholders for a duration of one month from the publication of the announcement. 3) The project proponent is required to submit a report on any EIA consultations and meetings with stakeholders. 4) The scoping report is available for consultation at the MoE by the public or by the concerned institutions. 5) MoE should provide its official comments on the scoping report within 15 days from its registration at the Ministry; if no answer is obtained within this period, the proponent can proceed with the preparation of the EIA report on the basis of the scoping report.
Technical Evaluation	<ol style="list-style-type: none"> 1) A technical committee comprising 3 to 5 members of various background and expertise from the different services of the MoE is responsible for the review of the EIA and IEE studies. If need be, experts not available at the MoE can be subcontracted to assist with the review of the EIA studies. The PMU shall provide support to MoE in the review of submitted reports and may form part of the committee. 2) The technical committee uses the methodology set in the MoE's decisions 229/1-230/1 of 2012 (similar to the the "MNA Guide for the Preparation and Review of EA reports of the World Bank" under section 4 part B "reviewing EA reports."). The methodology is based on 'Review Checklists' with corresponding scores (A-F). A total score of C is considered to be satisfactory despite omissions and/or inadequacies.
Decision and Approval	<ol style="list-style-type: none"> 1) The Minister reviews the Committee's report and notifies its decision to the Proponent and publishes it within two months for an EIA report and within 30 days for an IEE report. This decision is transmitted to the concerned institutions and should be published on the municipality bulletin board during 15 days. The decision could be acceptance of the EIA report, conditional acceptance or rejection. 2) In case no response is obtained from MoE within the stipulated review periods; than the proponent can consider the EIA or IEE reports, whichever applicable, approved, and can proceed with the project on the basis of the Environmental Management Plans (EMPs) included in the reports. PMU shall closely monitor the review process to ensure that review deadlines are not exceeded. 3) In case of conditional acceptance or rejection, objections and complaints from the proponent can be submitted to the MoE within 15days from the announcement of its decision and a reply should be provided within 15days from receiving the complaints.

⁷Adapted from Lebanon : Country Environment Analysis, the World Bank, April 2011

Stage	Activity
Integration of Results	1) Environmental Management Plans of approved EIA/IEE studies should be integrated in project design. Notably, costs of the EMP should be taken into consideration in the project's feasibility study and mitigation and monitoring measures should be integral parts of the project design.
Disclosure of EIA	1) Article 12 of the EIA decree states that the EIA and IEE are to be available for examination at the MoE..
Monitoring and Reporting	1) The MOE will monitor the implementation of sub-project specific EMP and the Project proponent should report implementation of EMP regularly to MoE
Enforcement	1) MoE shall be responsible for enforcement and will exercise site inspections as needed to ensure projects follow EMP requirements and meet relevant standards.
Penalties	1) Article 58 of the Environment Protection Law No. 444 states that shall be punishable by imprisonment from one month to a year and to a fine ranging between LP 50.0 million (US\$ 34,000) and LP 200.0 million (US\$ 134,000) or either of these two sanctions, every person who (a) did not prepare an EIA or IEE; (b) implemented a project contrary to the EIA or IEE approved by the MoE; (c) executed a project for which EIA/IEE is not required but is not conformed to the national standards; and/or (d) opposes or obstructs the measures of control, inspection and analysis provided in the Environment Protection Law.

3.2 Assessment of the Legislative Framework

Assessment of local relevant laws and decrees with respect to the World Bank EA policy in OP 4.01

Lebanon has a plethora of environmental laws and regulations as well as other legislations related to the environment. Most importantly is the Environment Protection Law No. 444/2002 which included all the principles of the Rio Declaration on Environment and Development (1992). Law 444 has included in its article 4, the principles of the Rio Declaration on Environment and Development (1992), on public participation (principle 10), enacting effective environmental standards (principle 11), compensation for pollution and environmental damage (principle 13), precautionary principle (principle 15), internalization of environmental costs (principle 16), and environmental impact assessment (principle 17). Lebanon has also enacted three major decrees, namely the Strategic Environment Assessment decree No. 8213/2012 (the first SEA enacted decree in the Middle East and North Africa Region) to incorporate the environmental considerations at the early stage of the decision making process of policies, programs and plans; the Environmental Impact Assessment (EIA) decree No. 8633/2012 which is a prevention tool for predicting and mitigating adverse impacts in projects and the Environmental Compliance for Establishments decree No. 8471/2012 that will regulate all activities from classified establishments (such as industrial ones) that may cause harmful pollution and environmental degradation. All enterprises are required to apply for an environmental compliance certificate every three years as part of a construction or operation permit.

The Country Environmental Analysis of Lebanon (CEA)⁸ conducted an assessment of the national EIA system and determined the similarities and difference between the national EIA system and the World Bank operational policy OP 4.01 on environmental assessment and the European Commission (EC) EIA Regulations no. 97/11. The assessment showed that the features of the Lebanese EIA system are compatible with most of the World Bank EA Policy (OP 4.01) and the EC EIA regulations. These features are in: (i) screening; (ii) scoping; (iii) the EIA report content; (iv) the content of the environment management plan; (v) provisions for appeal; and (vi) requirements for monitoring and follow up. There are however gaps in the national EIA system namely:

- Three significant gaps are related to (a) the lack of standard TOR and sector guidelines for specific sectors to be provided to the project proponent for the preparation of the EIA or IEE reports; (b) lack of consultation with stakeholders for projects listed under Annex II (similar to Category B projects in the World Bank OP 4.01); and (c) the lack of disclosure of the EIA summary and Initial Environment Examination (IEE) to the public as required by articles 13 and 14 of the Environment Protection Law – noting that Article 13 of the EIA decree calls for Information Publication⁹..

These gaps are addressed in this EA by providing guidance to the preparation of LEPAP sub-projects EA, by specifically requiring consultation for IEE projects as well as explicitly requiring that EIA and IEE summaries be subject to disclosure as part of the manual.

⁸ The Country Environment Analysis (CEA) of Lebanon, the World Bank, April 2011

⁹ **Article 12: Information Publication**

The public and the parties involved have the right to see the final EIA report or the initial environmental examination report and the relevant report of the Ministry of Environment, but this right does not include access to information relating to intellectual or industrial property or to any details of the finances of the project.

- Two moderate gaps are related to the: (a) explicit requirements in the environmental regulations that the cost of environmental measures should be included in the feasibility study of the project¹⁰; and (b) national standards and guidelines do not explicitly reflect international good practice (such as the World Bank's Pollution Prevention and Abatement Handbook).

These gaps are addressed in this document by specifically requiring integration of costs in feasibility study and sub-project loans.

Existence of ambient quality norms as well as limitations on pollution load discharges

All development projects, regardless of EIA classification, must adhere to the environment quality standards for air, water and soil (MoE ministerial decision No. 52/1/1996) as well as air emission standards and wastewater discharge (MoE ministerial decision No. 8/1/2001). Several environmental standards were developed under the *Strengthening the Permitting & Auditing System for Industries-project (SPASI)*¹¹. These emission limit values are valid for all industrial plants as long as no specific regulations for single branches are given. Emission standards are given as mass flows and as concentrations. Appendix B provides relevant ambient and emission standards to the LEPAP project, mainly related to air emissions/ambient air quality and wastewater discharges/ambient water quality. These standards provide the basis to monitor the results of the LEPAP and its support to industries to comply with prevailing standards. Relevant international standards (particularly from IFC) are also provided, and can be useful in case certain gaps in the national standards are encountered.

Availability of mechanisms for enforcement

Mechanisms for enforcement and their status are summarized:

- The Environment Protection Law No. 444 requires in article 42 that self-monitoring and auto control be established by polluting enterprises. This is not being applied with the exception of monitoring air emissions from cement industries and the treatment of infectious medical waste. Article 53 is related to the provision of an insurance policy against all risks threatening the environment by "every person exploiting a classified institution or using chemical products, harmful and/or dangerous is not being applied or monitored". Penalties of infringement in accordance to the law (articles 59-62) include one month to one year in prison and a fine ranging between LP 2.0 million (US\$ 1,400) and LP 10 million (US\$ 7,000), are not being applied.
- Guidelines and standards were introduced by SPASI in which detailed procedures were prepared for carrying out environmental audits.
- The Environmental Compliance Decree (Decree No. 8471/2012) was adopted by the Council of Ministers in March 2012 (published in the Official Gazette on 12th July 2012). The decree specifies that every industrial enterprise is to obtain an environmental certificate within a time period to be determined by the MoE. In the interim, application of Decree No. 8471/2012 will be made on a voluntary basis by offering incentives to industrial enterprises to reduce or treat their discharges. In the event that the voluntary mechanism is not effective, the MoE plans to enforce the application of the environmental compliance decree.

¹⁰ Annexes 6-8 of the EIA decree state that the estimated cost of the EMP implementation is to be included in the EIA/IEE reports

¹¹ Financed under EC-Life Third countries Program, managed by UNDP and implemented by MoE

- In January 2012, the Council of Ministers approved a draft law submitted by the MoE to establish an environmental prosecutor and forwarded it to the Parliament. Adoption of this draft law is still pending; same for the draft decree to introduce an 'environmental police' which might not be cleared by line agencies (e.g.: the Ministry of Interior and Municipalities) prior to the adoption of the Environmental Prosecutor law.

The main impediments to effective and meaningful implementation and enforcement of environmental and environment-related laws are due to the fragmentation among regulatory institutions, licensing agencies, and police authorities among others, at both the national and local levels of government, to the effect that no single institution can take enforcement actions effectively. At MoE, for example, there are only about 15 inspectors that perform thematic and spot check inspections with limited equipment and instrumentation. This lack of human resources and fragmentation of responsibilities necessitate the strengthening of monitoring and enforcement as a first institutional priority.

LEPAP is designed to support the MoE in establishing a mechanism that would support the industrial enterprises in their compliance to the stipulations of Decree No. 8471/2012 and create a mechanism to foster pollution abatement investments from technical and financial standpoints. The interested industrial enterprise will be asked to carry an environmental audit and set a compliance action plan (CAP) at the facility level (as required by Decree No. 8471/2012) to be eligible to submit their pollution abatement project for concessionary financing. In parallel, the EC financed StREG will strengthen the environmental inspection and enforcement through the identification of weaknesses of the current system, drafting of new inspection and enforcement procedures, training of key stakeholders as well as the procurement of required environmental (air and water quality) monitoring equipment, and assistance in the first phase of implementation of the new procedures.

3.3 Proposed Corrective Actions

Identified gaps and proposed corrective actions are summarized in Table 3-3.

Table 3-3. Proposed Action Plan to address Institutional and Legal Gaps

Elements	Gaps	Corrective Actions	Proposed International/national support
Senior Management Commitment	Absence of policy statement on industrial pollution control	MoE to prepare a policy statement highlighting proposed actions for establishing an industrial pollution management system.	EFL
Establishment of a PMU	BdL does not have technical staff to manage the technical assistance component of LEPAP	PMU will be established with staff and resources.	EFL during 2013 (refer to Appendix C) and PMU subsequently
Technical capacity of staff	EIA teams understaffed and specific TOR for EIA in specific sectors is not available. Major risk related to delays in review process since EIA decree stipulates fixed deadlines for MoE to issue official responses to applications, otherwise reports are considered acceptable.	Additional staff to be provided on a part-time basis from other services and administrative process to be streamlined to avoid delays in review process (particularly delay between registration of application and submission to MoE review committee).	MoE
		Training to be provided.	LEPAP and StREG
		Specific sector EIA guidelines to be prepared.	LEPAP Environmental and Social Management Framework and StREG
Allocation of resources	No allocated resources are provided for EA review, monitoring and follow up of EMP implementation.	Resources to be provided under the TA components of LEPAP and StREG, as well as from MoE budget	LEPAP and StREG MoE
Division of roles and responsibilities	Roles are unclear concerning the functions of compliance, monitoring and enforcement.	Strengthening the capacity of the compliance team.	LEPAP
		Strengthening the capacity of the monitoring and enforcement team.	StREG
Provision of written guidelines	No guidelines are available for a Category FI	Guidelines to be prepared prior to project appraisal.	EFL (LEPAP Environmental and Social Management Framework)
Harmonization of the national EIA system with those of the WB and EC	Lack of explicit disclosure of the EIA summary and Initial Environment Examination (IEE) to the public (public has the right to access the reports but the reports are not made openly available for review) Lack of consultation with stakeholders for IEE projects	Consultation and Disclosure to be mandatory for all projects in Annexes I and II of the national EIA system.	LEPAP environmental and social management framework
		Review of national standards and guidelines	Air and water quality (ambient and emission/discharges) to be reviewed.

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Elements	Gaps	Corrective Actions	Proposed International/national support
Mechanism of enforcement	Weak track record on monitoring and enforcement.	Procedures and Guidelines for Compliance Action Plans	LEPAP and EFL
		Procedures and Guidelines for inspection and enforcement	St REG

4. Environmental and Social Management Framework

The aim of this section is to provide the necessary guidelines and procedures, in the form of an ESA manual, to the FI, so that it can effectively manage the environmental risks related to LEPAP investments and satisfy the World Bank’s Environmental and Social safeguards for which OP 4.01 is only triggered. **It is not expected that LEPAP sub-projects will cause any physical or economical displacement or lack of access to designated parks, therefore the Involuntary Resettlement Policy OP 4.12 would not be triggered in this project.** An overview of the different steps required to ensure compliance with OP 4.01 and the national regulatory system is illustrated in Figure 4-1. The different steps are further described in this chapter with emphasis on providing sufficient guidance to the FI to manage the process.

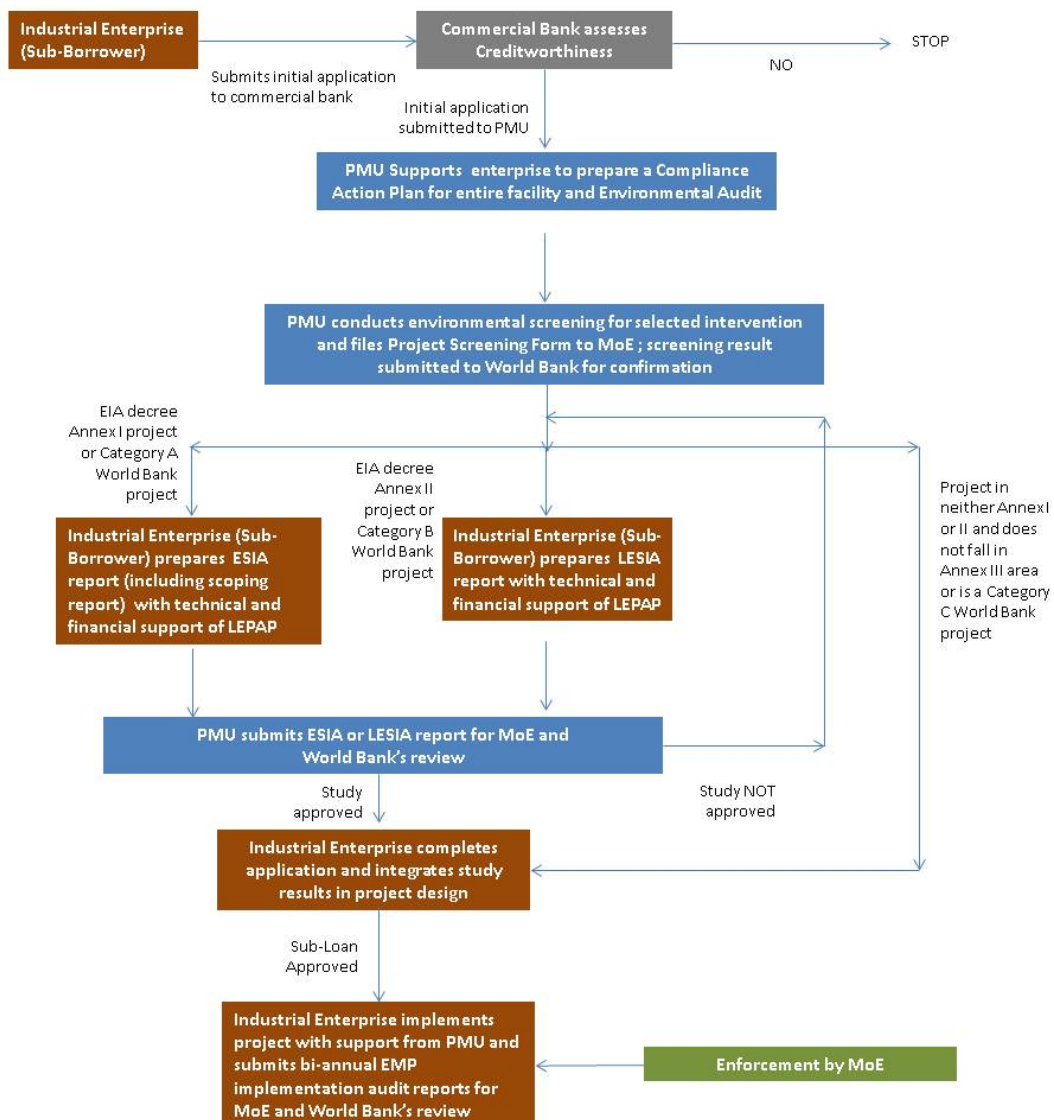


Figure 4-1. Schematic Diagram of the Environmental and Social Assessment Process for LEPAP

4.1 Potential Projects to be implemented under LEPAP

During project preparation, a pipeline of 13 projects was preliminary identified in the following sectors to be candidates for LEPAP. These sectors are namely the mineral, food, paper, plastic, metal products and chemicals sectors. Table 4-1 shows a partial list of enterprises that participated in EFL's technical assistance to LEPAP but did not commit yet to borrow from LEPAP. The list clearly indicates that potential types of interventions (pollution abatement projects) are likely to include:

- ✓ Industrial wastewater treatment plants
- ✓ Water re-use
- ✓ Industrial waste management

Other types of potential projects include air emissions reduction and control interventions, cleaner production and energy efficiency projects. These projects provide major benefits to the environment (improved air quality, reduction of pollution loads) as well as economic benefits (particularly in the case of energy efficiency projects) with minor negative impacts to the environment.

Table 4-1 Potential Enterprises for LEPAP

No.	Sector	Enterprise Name	Sub-sector	Location	Pollution Abatement Demand	Main Pollutant(s)	Proposed Technical Solution
1	Food	Delta trading SAL	Chips and tortilla	Zahlé	Wastewater Treatment	Starch, wastewater from washing raw and sliced potatoes. Wash water from floor and machinery cleaning (soil, grit, BOD, COD, pH)	Physical-chemical treatment, biological treatment
2		Wilco PM	Meat processing	Chekka-Koura	Waste Treatment	Chicken manure	Anaerobic waste treatment with biogas/energy production
3		Dirani Group/Ahmad M.S. Al Dirani & Bros.	Mixed pickles	Qassarna-ba- Baalbeck	Wastewater Treatment	Wastewater	Physical pre-treatment including biological treatment (type Bioart)
4		Levant Beverage and Dairy Industries SAL	Dairy	Kfarchima-Baabda	Wastewater Treatment	Wash water, whey (BOD, COD, TSS, NH ₄ -N, PO ₄ , pH)	Physical and biological wastewater treatment
5		Al Manara Dairy Factory	Dairy	Al Manara-West Bekaa	Waste Treatment	Wash water, whey (BOD, COD, TSS, NH ₄ -N, PO ₄ , pH)	Physical, chemical, biological treatment and sludge dewatering

No.	Sector	Enterprise Name	Sub-sector	Location	Pollution Abatement Demand	Main Pollutant(s)	Proposed Technical Solution
6		Qaa el Rim Dairy Industries	Dairy	Kaa El Rim- Zahlé	Wastewater Treatment	Wash water, whey (BOD, COD, TSS, NH ₄ -N, PO ₄ , pH)	Physical then biological treatment
7		Marble and Cement Products SAL	Marble and stone	Taanayel-Zahlé	Wastewater Treatment	Wastewater; solid waste (debris)	Physical-chemical treatment
8	Mineral	Kamico Marble and Granite	Shaped and finished stones	Bahsas-Tripoli	Water reuse	Wastewater, Crushed Stone, Mulch	Flocculation, settling, and sludge dewatering system
9		GAF Marble and Granite	Marble and stones	Nahr Ibrahim - Jbeil	Water reuse	Wastewater, Crushed Stone, Mulch	Flocculation, settling, and sludge dewatering system
10		Ets. George Ibrahim	Stone	Mesreh - Batroun	Water reuse	Wastewater, Crushed Stone, Mulch	Flocculation, settling and filter press for sludge dewatering
11	Paper	SOLICAR SAL	Cardboard production	Wadi Chahrour-Baabda	Wastewater Treatment	Wastewater	Physical flotation and settling
12		Gemayel Frères SAL	Packaging cardboard	Bikfaya-Metn	Steam system	Not available	Wastewater treatment plant and steam system upgrade
13	Furniture	LiBrasil	Mattresses	Soultan Yaacoub-West Bekaa	Waste Treatment	Foam waste with very low density	Foam recycling

Source: Adapted from MoE/CDR/EFL, 2012b

4.2 Negative and Positive Impacts of Potential LEPAP interventions

The following negative and positive impacts are identified for each type of Intervention:

A. Industrial waste water

In Lebanon untreated industrial waste water is discharged either in the ecosystem (wadis, water channel or via percolation) or in the municipal waste water network. In many instances, untreated municipal and industrial waste water are mixed together and are being used for irrigation and agriculture. Industrial waste water includes many pollutants that when discharged into the environment can result in changes in its physical and chemical characteristics such as coloration, biological condition and can lead to disruption of the ecosystem.

More specifically the negative impacts of such industrial waste water discharge practices are:

- a) Human health: the waste water contains trace elements, heavy metals and other pollutants that pose a risk to human health with the degree of risk that vary among age groups.
- b) Soil resources: as industrial waste may add nutrients, dissolved solids and heavy metals into the soil, some of these accumulate in the root zone with possible adverse impacts on soil. Long term use of industrial waste water result in salinity and water logging leading to the overall reduction of the productive capacity of soils and lowering crop yields.
- c) Groundwater: industrial waste water could percolate and pollute ground water resources. Percolation of pollutants through the soil may cause degradation of the quality of groundwater resources which in Lebanon is used for drinking, irrigation and industrial use.
- d) Ecology: whenever untreated industrial waste water drains into the surface water, pollutants could cause negative effects to biodiversity.
- e) Operation of municipal waste water treatment plants: Lebanon is implementing an investment program of up to 28 primary and secondary treatment plants for municipal waste water. Untreated industrial waste water containing chemicals can negatively affect the treatment plants. The recent waste water strategy of Lebanon has requested that industrial waste water be pre- treated at the plant level before discharging into the municipal waste water network or into the municipal waste water treatment plant.

The positive impacts of treated industrial waste water are as follows:

- a) Improvement of public, occupational health and safety.
- b) Reduction of pollution loads of TSS, BOD, COD and reduction of trace metals and heavy metals concentrations from industrial wastewater streams.
- c) Improvement of surface water and groundwater quality and provision of a reliable source of water supply to farmers and to communities.
- d) Preservation of the quality of aquatic habitats and ecological components and protection of biodiversity from inadequate wastewater disposal and management and accidental discharges to surface water bodies.
- e) Low cost method for sanitary disposal of municipal waste water and ensuring the proper operation and maintenance of the municipal waste water treatment plants.

B. Water Re-Use:

Water reuse in an industrial facility involves taking back water in various uses on the process. This involves evaporation which means increasing concentration of salt; or reuse cooling tower which require chemical corrosion inhibitors and water softening agents. Lebanon uses 60 million m³/year out of a total of 965 million m³/year for industrial purposes¹². This water is discharged after its use either to the municipal waste water network or in the ecosystem. Few industrial facilities in Lebanon recycle water used for cooling or heating processes or can reuse this water after being treated in situ at the plant level. The adverse impacts of not re-using water would be an increase in:

- a) consumption of water and energy
- b) salinity levels leading to effluent toxicity;
- c) discharges of pollutants into the ecosystem.

Re-use of water has several benefits namely

- a) Reduction of water demand at the plant level as long as its treatment is adequate to ensure appropriate water quality for non-potable purposes
- b) Provision of additional water resources for the ecosystem and for irrigation/agriculture purposes
- c) Reduction and preventing pollution as the pollution loadings are decreased in its discharge of the water bodies
- d) Saving energy whenever the local source is groundwater and energy is required to pump the water to the surface
- e) Reducing costs of water bills

C. Industrial solid waste management

Industrial solid waste (hazardous and non-hazardous) generated at industrial facilities is mixed with municipal solid waste and is either abandoned in dump sites or possibly landfilled in the only two sanitary landfills in Lebanon. There is not yet any physical and chemical treatment facility or hazardous waste landfills in Lebanon. The major negative impacts related to the inadequate disposal of industrial wastes are:

- a) Surface Water and soil pollution due to the mixture of the industrial chemicals with water and soil.
- b) Groundwater pollution due to the percolation of the leachate deep into the ground.
- c) Air pollution due to burning of hazardous and non-hazardous waste.
- d) Harm to the health of communities living nearby the dump sites.

Minimizing waste through process or recycling existing waste will have positive impacts on:

- a) Saving energy: hazardous and non-hazardous waste can be burned as fuel in cement kilns reducing energy requirements in many manufacturing processes and lowering also the carbon foot print.

¹² Fadi Comair, 2011, l'efficience d'utilisation de l'eau et approche économique, Plan Bleu

- b) Reducing landfill uses by collecting solid waste materials with high calorific value.
- c) Protection of the environment by avoiding the inappropriate disposal of industrial wastes in the ecosystem.

Cumulative and long-term impacts are difficult to estimate at this stage given the absence of precise information on the number and characteristics of sub-projects, which will be known only during the project implementation (number, size, implementation areas). However, the ultimate risks they may cause to the environment can be easily mastered by the implementation of appropriate mitigations measures concerning the application of environmental conditions relating to construction activities, waste water and solid waste management, compliance with permitting procedures, operations, maintenance, and monitoring.

Table 4-3 provides an overview of potential impacts associated with different types of sub-projects above. The ESIA studies should confirm whether such impacts are applicable and propose relevant mitigation measures to manage the identified impacts

<i>Potential Interventions</i>		<i>Potential Impacts on...</i>						
		Surface Water Quality	Soil & Ground water	Ecology & Habitats	Air Quality & Noise	Socio-economy	Occupational Health & Safety	
Sub-project Components	Wastewater Treatment and water reuse	Physical, chemical and/or biological wastewater treatment; Flocculation, settling, and sludge dewatering	X	X	X	X	-	X
	Waste Treatment	Anaerobic waste treatment with biogas/energy production	-	X	X	X	X	X
		Waste to energy (gasification) system						
		Sludge dewatering	X	X	X	X	-	X
		Recycling	-	-	-	X	X	-
Air emissions control			-	-	-	X	X	X

4.3 The Environmental and Social Screening Process

Screening of LEPAP subprojects is a process by which a decision is taken on whether or not ESIA is required. The classification of the subproject depends on the nature, type, location, as well as the nature and magnitude of its potential impacts.

1. Project Screening Form

The sub-project proponent is required to prepare a project screening form as attached in Annex 4 of the EIA decree and submit it to the PMU which will review it and transmit it to the Service of Environment Technology of the MOE which is responsible for the EIA process. The application form should be submitted at the sub-project concept stage and before the proponent starts any project development.

2. Screening Analysis

The application form is reviewed by the PMU and forwarded to the Service of Environmental Technology of the Ministry of the Environment. An Environment Screening Team composed of two staff members will be selected according to the nature of the project, and taking into account the relevant education and experience of the staff.

3. Screening Categories

The category of the subproject will be based on the analysis of impacts consistent with OP 4.01 (see below) taking into consideration the two positive screening lists attached as Annexes I and II in decree 8633/2012 and will consist of the following three categories:

Category I: includes the list of sub-projects corresponding to Annex I of the national EIA decree# 8633/2012 for which a detailed Environment and Social Impact Assessment Report (ESIAR) (which is similar to category A projects in the World Bank OP 4.01 environment assessment) is mandatory. Sub-projects falling in this category would have by their magnitude and severity, potential significant adverse social or environmental impacts that are diverse, irreversible, or unprecedented. Few LEPAP sub-projects will belong to this category namely: waste to energy projects and industrial waste water containing hazardous chemicals and management of industrial solid waste containing hazardous materials.

Category II: includes a list of sub-projects in Annex II of the national EIA decree for which a Limited Environment and Social Assessment Report (LESAR) is required. Sub-Projects in this category will have by their magnitude and severity, potential limited adverse social or environmental impacts that are few in number, site-specific, largely reversible, and readily addressed through mitigation measures. The majority of LEPAP sub-projects will belong to this category, namely small and medium size industrial waste water treatment plants containing non-hazardous chemicals, industrial solid waste projects containing non-hazardous materials, and water recycling.

Category III: Projects in this category will have minimal or no adverse social or environmental impacts. An Environment and Social Assessment report is not required. Sub-projects involving installation of air pollution control equipment, cleaner production and energy efficiency projects would fall under this category.

Whenever the project is located in a sensitive area (the areas considered sensitive and listed in Annex III of the national EIA decree), the project that was initially classified in a specific category (II or III) would be reclassified into a higher category (i.e. if the project was initially classified in Category III, it would be reclassified in category II, or if the project was initially classified in category II, it would be reclassified in Category I).

4. Scope of the Screening:

The above classification applies to all new projects as well as to existing facilities. Existing facilities will be also screened whenever there are:

- a) **Expansions in capacity:** The expansion will have the same category as the existing facility unless the facility has prepared an ESIA report. In that case, the expansion of the same activity will have a less strict category given there is no change in the surrounding environmental conditions (example category II in case of an expansion in a category III facility that has prepared an ESIA report).
- b) **A new component of the project:** The component will be classified based on the three-screening lists as if it is a new project.
- c) **Changing the production:** the change will be considered as a new project and will be classified on the basis of the three screening lists.
- d) **In-process modification (changing the production pattern of machines or units) and in-plant modifications (any modifications in buildings, infrastructure)** will have a less strict category if such modification will improve the environmental conditions of the plant and would reduce its water and air emissions accordingly. Otherwise such in process modification will have the same category as the original facility for which an ESIAR or a LESIAR report was prepared.

5. Screening Limitations

There are difference in the screening process between the Lebanese EIA system as dictated in the decree # 8633/2012 which relies on positive check lists as the sole basis of classifying projects, and the one included in the World Bank OP 4.01 which relies on screening criteria related to magnitude, severity, reversibility, site location, setting of the project and its scale and only illustrative examples of projects are included as part of the classification. The national decree requesting the use of positive checklists is simple to apply, at least for the category of projects that require a full and comprehensive ESIA. However for LEPAP, project lists should be used cautiously and with due regard to their weaknesses. Some applicants may change the design of a project to stay below the predetermined size of the threshold for a category I or II project, automatic application of the screening list would require also that any project that finance an industrial waste water treatment plant should be in a category I (as required in Annex I of the decree # 8633/2012) irrespective of the size of the plant, and the type of pollutants generated by the facility. Based on analysis of criteria, an industrial waste water treatment plant can be classified by the World Bank in category II in case the discharges do not include heavy or trace metals and/or hazardous materials.

6. Screening Process in LEPAP

All LEPAP projects will consist of either pollution abatement investments for end of pipe treatment within the existing the facility or the rehabilitation of the technology and management process as part of the adoption of cleaner technology within the facility.

ESIA notification

Once the screening process is completed by the Service of Environment technology, the PMU and the sub-project proponent (industrial enterprise) will be notified **in writing within 15 days** from the submission of the proponent's screening form. The letter will also inform the proponent of the possibility of appealing MOE decision within seven working days of receipt of the notification with accompanying justification. In case the MOE receives an objection in writing, the PMU on behalf of the proponent will ask for a meeting with the service of environment technology team to consider the proponent's objections. In case new elements are presented by the proponent, a final decision should be reached during the meeting and confirmed by letter from the MOE.

In case the Service of Environment Technology does not receive an appeal within the seven days, the classification is considered final. The PMU will publish the report of the environment screening team on the LEPAP website.

4.4 ESIA Requirements for Category I Projects

A. Introduction

Category I projects will follow the requirements of the decree No 8633/2012 concerning projects listed in Annex I and summarized and supplemented also in the following sections which require the following documentation:

- a) Preparation of terms of reference for the ESIA report
- b) Scoping report including consultation
- c) Revised terms of reference on the basis of the scoping report
- d) Draft Environment and Social Impact Assessment Report including public consultation and disclosure
- e) Final EIA report after its review by the MOE
- f) Grievance and Appeal
- g) Disclosure of the ESIA report
- h) Self-monitoring Report on Construction and Operation

B. Responsibilities

1. The responsibilities for preparing and reviewing the above documentation are as follows:

(1) The Service of the Environment Technology/MOE will be responsible for:

- a) Preparing terms of reference for the ESIA report and sector guidelines in consultation with the PMU
- b) Conducting field visit for siting
- c) Review of the scoping report
- d) Approval of the final TOR after the scoping report
- e) Review of the draft ESIA report
- f) Examination and decision of the Appeal by the Proponent
- g) Supervision of the implementation of the Environment and Social management plan

(2) The Proponent (industrial enterprises) will be responsible for:

- a) Hiring the services of independent prequalified consulting firms
- b) Conducting project scoping including consultation with the project affected people and stakeholders
- c) Submitting the scoping report to MOE for approval
- d) Revising the TOR based on the results of the scoping report
- e) Conducting the ESIA process based on the revised TOR and including public consultation and disclosure

- f) Preparing and submitting to the MOE the self - monitoring report
 - g) Implementing the conditions the Environmental Compliance Certificate
- (3) The PMU will have the responsibility for:
- a) Reviewing the screening form prepared by the proponent before it being submitted to the MOE
 - b) Acting as a facilitator between the proponent, the MOE and the World Bank during the ESIA preparation
 - c) Assist in the selection of the independent consultant, if required by the proponent
 - d) Finance from the LEPAP budget the preparation of the ESIAR
 - e) Review the ESIAR prior to its submission to the MOE
 - f) Ensure that the ESIA report is disclosed on the LEPAP and MOE websites prior to final approval of the investments of the sub-project
 - g) Ensure that the environment and social management plan is included as part of the contract for civil work or the purchase and installation of the equipment
 - h) Monitor the implementation of the environment and social management plan during project construction and operation and include a report on the ESMP implementation as part of the bi annual report to the World Bank

C. Preparation of the terms of reference (TOR)

After the project was screened and classified as a Category I, the Service of Environment Technology with assistance from the PMU will be required to provide to the proponent the standard terms of reference (TOR) regarding the preparation of the ESIA report. The terms of reference (TOR) document defines all aspects of how an independent consultant firm (the Consultant) will conduct an ESIA. It describes the objectives and the scope of the ESIA, outlines the responsibilities of the Consultant and provides a clear description of the administrative, logistic and time schedule and level of efforts of resources available to conduct the study. Preparing a well-defined TOR is essential in preparing a high-quality ESIA and ensuring that the proponent and its Consultant will meet the requirements for the MOE approval. The specific content and format for a TOR will vary from one project to the other and from one sector to another. However, the content of the TOR should include:

- a) *Background Information and Rationale*, by briefly stating the purpose and potential outcome of the ESIA report
- b) *Scope of the services for the ESIA*. This section will define the scope of work required. This scope of work will be based in the sector guidelines to be developed by the MOE with the assistance of the PMU
- c) *Approach and methodology*. This section should highlight the approach and methodology in line with the prescribed scope of services
- d) *Professional Qualifications*: The team skills and experience will depend on the scope and methodology of the evaluation
- e) *Level of Effort and Budget*.

The scoping phase:

Scoping is an interactive process to identify the content, extent and relevance of the environment information to be submitted to the MOE as part of the ESIA procedure. Such interactive process should be between the proponent (industrial enterprise), the local administration AND the project affected people and stakeholders (local NGOs, media) of the project. The results of the scoping process are documented in a scoping report.

The Scoping Process:

After being notified by the MOE of the classification of the project, the Consultant selected by the proponent in consultation with the PMU will start the scoping process by (a) translating the TORs or its summary in Arabic; (b) identifying and subsequently sending a copy of the TOR to relevant departments, project affected people and stakeholders and (c) scheduling a consultation meeting in which it will make a presentation of the project, its area of influence, the significant environmental issues, as well as the potential direct, indirect and cumulative impacts to be examined.

The proponent through the PMU will submit to MOE within **15 working days from receiving the screening notification** a scoping report of which contents are detailed in Annex 7 of the decree 8633/2012 with the following contents:

- A Non-Technical Summary in English and Arabic
- Description of the project, its cost and its implementation schedule
- Description of the project alternatives with “a no-project base option” considered
- Description of the physical environment and the area of influence likely to be affected by the project
- Description of the likely significant impacts (short term and long terms, positive or negative, negative and positive, direct, indirect and cumulative impact including the impacts on global environment) of the project
- Description of the framework for the mitigating and monitoring measures
- Summary of the public consultation including the remarks and feedback obtained from the public
- Revised TOR for the ESIA
- Indication of the time-frame, costs and resources needed to carry out the ESIA

Review of the Scoping Report

Once received by the MOE through the PMU which will also review it for consistency, the screening team will review the scoping report and will convene a meeting which will include the service of environment technology, the PMU, the proponent and its Consultant. The latter will be requested to make a presentation on the content of the scoping report and will address all the remarks and issues raised by the MOE. MOE should issue its official position on the scoping report within 15 days from registration of the scoping report by the proponent.

In case the scoping report is approved, the proponent will be required to proceed with the preparation of the ESIA report on the basis of the revised TOR and no additional or subsequent requirements will be provided by the MOE as the TOR will be considered final.

In case the scoping report is conditionally approved, the Consultant take into consideration the remarks of the meeting after which the TOR will be considered final and no additional requirements will be provided by the MOE.

D. The Environment and Social Impact Assessment (ESIA) Phase

The ESIA phase will start after that the proponent and/or its Consultant will receive the official approval from the MOE and will build on the scoping report. The purpose of the ESIA process is:

- Identify and analyze potential environment and social impacts and issues, both adverse and beneficial, associated the proposed project.
- Identify measures to avoid, minimize, mitigate, or offset/compensate for adverse impacts on workers, affected communities, and the environment.
- Design an Environmental and Social Management Plan (ESMP) to address the mitigation, and monitoring of these adverse measures, as well as propose institutional measures to manage and monitor the adverse impacts and their remedial measures as needed.
- Ensure that the project affected people (PAP) and stakeholders are kept informed about the ESIA process and are consulted privately and publicly about the content of the ESIA report prior of its finalization.
- Identify specific self-monitoring reporting that the proponent would submit to the PMU and the MOE for the construction and operation phase of the investment project.
- Ensure that the investment contracts (civil works, purchase and installation of equipment) agreements) include appropriate, clauses to obligate the suppliers or contractors to comply with the associated elements of the ESMP and submit also progress reports as part of their contractual obligations.
- Disclose to the public the ESIA report and the executive summary which should be in English and Arabic languages.

The outcome of the ESIA phase is an ESIA report which **should be submitted within 30 working days from the approval of the scoping report**. This report should be concise and to the point addressing only major environmental issues. The main text should focus on investigation results, the conclusion, practical recommendations supported by summaries of the gathered information, and any approved references to explain and interpret such information. The detailed or unclear information is not appropriate in the main text, and should be presented in the annexes or in a separate document. The same applies to unpublished documents used in the ESIA study and they should be grouped in an annex.

The ESIA report which is further elaborated in Annex 8 of the decree # 8633/2012 must include the following:

- a) Non Technical Executive Summary in English and Arabic
- b) Table of contents
- c) Introduction
- d) Policy, legal and administrative framework
- e) Public participation
- f) Description of the proposed project
- g) Description of the base line of the surrounding environment of the project and its area of influence
- h) Limitation of the study
- i) Potential environmental and social impacts of the project
- j) Analysis of project alternatives
- k) Environmental and Social Management plan as described below
- l) Self reporting requirements during the construction and operational phases of the project
- m) Conclusion
- n) Annexes – minutes of public participation sessions

- o) Summary of project documents
- p) Tables and information statements
- q) List of relevant reports
- r) List of scientific and non scientific references used
- s) List of the names of those who prepared the ESIA report (individuals and institutions)

Content of the ESMP:

As part of an ESIA report and the ESA Report, ESMPs provide a critical link between measures to mitigate adverse impacts and the integration of such measures during the implementation and operation of projects. They summarize the anticipated impacts of projects and provide details on the measures, responsibilities and scheduling to mitigate these impacts, costs of mitigation and monitoring and supervision. The ESMP should include:

- Summary of impacts: Predicted adverse environmental impacts and their relationship to social impacts (and any uncertainties about their effects) for which mitigation is necessary should be identified and summarized.
- Description of mitigation measures: Each measure should be briefly described in relation to the impact(s) and conditions under which it is required. These should be accompanied by, or referenced to, designs, development activities (including equipment descriptions) and operating procedures and implementation responsibilities. Public consultation should be clearly described and justified.
- Description of monitoring program: The ESMP identifies monitoring objectives and specifies the type of monitoring required; it also describes environmental performance indicators which provide linkages between impacts and mitigation measures identified in the ESIA report - parameters to be measured, methods to be used, sampling location and frequency of measurements, detection limits (as appropriate) and definition of thresholds to signal the need for corrective actions. Monitoring and supervision arrangements should ensure timely detection of conditions requiring remedial measures in keeping with good practice; furnish information and the progress and results of mitigation and institutional strengthening measures; and, assess compliance with national and Bank safeguard policies. Such arrangements should be clearly specified in the project implementation/operations manual to reinforce project supervision.
- For projects involving rehabilitation, upgrading, expansion, or privatization of existing facilities, remediation of existing environmental problems may be more important than mitigation and monitoring of expected impacts. For such projects, the management plan focuses on cost-effective measures to remediate and manage these problems.
- Legal requirements and bidding and contract documents: The incorporation of detailed mitigation, monitoring and supervision arrangements into legal conditions and covenants is essential. It is good practice to ensure that implementation of major environmental requirements is linked to disbursement conditions. It is important to translate ESMP requirements into bidding and contract documents to ensure that obligations are clearly communicated to contractors.
- Institutional arrangements: Responsibilities for mitigation and monitoring should be defined along with arrangements for information flow, especially for coordination between agencies responsible for mitigation. This is especially important for projects requiring cross-sectoral integration. In particular, the ESMP specifies who is responsible for undertaking the mitigating and monitoring measures, e.g., for enforcement of remedial actions, monitoring of implementation, training, financing, and reporting. Institutional arrangements should also be crafted to maintain support for agreed enforcement measures for environmental protection. Where necessary, the ESMP should propose strengthening the relevant agencies through such actions as: establishment of appropriate organizational arrangements; training; appointment of key staff and consultants; and, arrangements for counterpart funding and on-lending. For projects having significant environmental implications, it is particularly important that there be in the implementing ministry

or agency an in-house environmental unit with adequate budget and professional staffing strong in expertise relevant to the project.

- **Implementation schedule:** The timing, frequency and duration of mitigation measures and monitoring should be included in an implementation schedule, showing phasing and coordination with procedures in the overall project implementation /operations manual. Linkages should be specified where implementation of mitigation measures is tied to institutional strengthening and to the project legal agreements, e.g. as conditions for loan effectiveness or disbursement.
- **Reporting:** Procedures for providing information on the progress and results of mitigation and monitoring measures should also be clearly stated. Recipients of such information should include those with responsibility for ensuring timely implementation of mitigation measures and for undertaking remedial actions. In addition, the structure, content and timing of reporting to the Bank should be designed to facilitate supervision and should establish arrangements for the timely receipt of monitoring reports and their forwarding to the Bank's environment specialists for review and comment.
- **Cost estimates:** These should be specified for both the initial investment and recurring expenses for implementing all measures defined in the ESMP, integrated into the total project costs and factored into financing negotiations. As mitigating costs may occur at points during project implementation or operations, indications of cash flow should be provided. It is important to capture all costs – including administrative, design and consultancy, and operational and maintenance costs – resulting from meeting required standards or modifying project design.

E. Public Consultation

The final draft ESIA report will be subject of public consultation. The PMU is responsible for the organisation of the public consultation in collaboration with the Proponent's Consultant.

The methodology and parties to be involved in the public consultation in the scoping phase should be the same for the consultation of the ESIA report.

The following will be presented at the Consultation meeting:

- An Executive summary in Arabic of the ESIA report which includes also the ESMP
- A power point presentation in Arabic of the results of the different sections of the ESIA report
- A table to include all aspects and issues that have been raised during the public consultation meetings at the scoping phase and how ESIA report has addressed these aspects
- The methodology that will be followed by the project proponent to ensure the continuity of the consultation process during the construction and operation phases of the project
- The concrete actions and activities that the proponent will follow to improve the environment quality of the surroundings and the neighboring communities
- The self- monitoring program that the proponent will establish to ensure that the adverse impacts will be mitigated and monitored
- A summary of the issues and proposed solutions that were raised during the consultation meeting on the ESIA report.

F. Review of the ESIA report

The objective of the review is to verify whether the ESIA report meets the requirements of the scoping report, and thereby contains sufficient information to enable the MOE to make an informed decision on the acceptance of the ESIA report.

The ESIA report will be reviewed by the MOE using the World Bank guidelines for the preparation and review of the ESIA report. The World Bank will in parallel review the ESIA report and will communicate to the MOE its no objection or comments to be taken into consideration for its final no objection.

Three possible recommendations could be provided:

- a) **An approval of the ESIA report:** In this case the MoE will inform the PMU and the proponent of its approval
- b) **A conditional approval of the ESIA report:** In this case, the MOE through the PMU will inform in writing the proponent of the additional information (that was missing from the scoping report). The MOE could also convene a meeting with the proponent to present the ESIA report and share their comments
- c) **A disapproval of the ESIA report: In this case the MOE will communicate in writing the substantive justification that lead to the rejection of the ESIA report with the provision that the proponent could appeal this decision to MOE within 15 working days from receiving the letter of disapproval.**

G. Final conclusions and recommendations

Taking into account the appeal, the Service of the Environment Technology will prepare for the signature of H.E. the Minister of the Environment the final conclusions and recommendation to the PMU and the proponent.

H. Disclosure

After the ESIA process is completed, the ESIA report will be stored electronically at the MOE's website. The executive summary in English and Arabic will be made available at the MOE internet website and the LEPAP website that should be open to the public. Prior to disclosure, the proponent should indicate the section of the ESIA report and the executive summary that should not be disclosed because of national security, patents rights, intellectual property and proprietary technology, if applicable.

I. Appeal and Grievance System

The proponent has the right to appeal in writing within 15 working days against the MOE final decision in case the ESIA report is rejected. The proponent's letter will include the reasons for the appeal as well as the legal, scientific and technical reply to the objections raised by the MOE. H.E. the Minister of the Environment will appoint a MOE appeal committee which may request additional assistance of any specialized experts when carrying out its functions.

The appeal committee will review the facts and justification leading to MOE's rejection as well as the new evidence and additional explanation provided by the Proponent to respond to the objections of MOE. The committee will submit its report to H.E, the Minister of the Environment **within 15 working days**.

4.5 ESIA Requirements for Category II Projects

A. Introduction

Whenever a LEPAP subproject is classified in a category II, a Limited Environment and Social Assessment (LESIA) is only required. Typically, a LESIA is a relatively low-cost analysis that makes use of information already available. It is carried out using ESIA procedures and methods, which are scaled to purpose.

The following elements of the ESIA process are limited and include:

- a) The institutional and legal framework should be briefly described and focus primarily on the legal and institutional aspects related to the project
- b) A formal scoping is not required
- c) Base line data should be limited only to the necessary pollution parameters which significantly affect the environment within the project. This can be done through a survey on the site to obtain current environmental information
- d) Key environmental issues can be identified by a rapid exercise, based on consultation with local people and agencies
- e) Analysis of alternatives will be limited to technical alternatives

An LESIA is therefore a simplified ESIA which will:

- describe the project and the environmental setting;
- consider technical alternatives to improve the environmental benefits;
- address the concerns of the local community;
- identify the potential environmental impacts;
- identify measures to mitigate adverse impacts; and
- describe the environmental monitoring and management plans.
- describe the consultation process

B. Preparation of the LESIA report

Once the proponent receives a copy of the TOR as well as its approval of the selection of the Proponent's Consultant, the Consultant will prepare within 45 working days the LESIA report whose content is summarized below and explained in Annex 6 of the national EIA decree.

The LESIA report will include:

- a) A non- technical executive summary in English and Arabic
- b) A short description of the project
- c) A concise description of the institutional and legal framework
- d) Analysis of the technical alternatives
- e) Identification of Key Environmental and Social Issues
- f) Analysis (qualitatively and semi quantitatively) of the environment and social impacts
- g) An Environment and Social Management Plan (ESMP) by adapting/supplementing the mitigating measures
- h) Minutes of Public Consultation
- i) Conclusion

C. Content of the ESMP

The ESMP will follow the content described in the section of the ESIA requirements for category I above, however because it is expected that the impacts of the sub-projects by their severity and magnitude will be less significant than sub-projects in category I, generic mitigation measures can be adopted (refer to section 4.6). They will be adapted and if necessary supplemented by specific mitigating measures pertaining to the subproject. The LESIA would confirm whether these impacts are applicable and would supplement relevant mitigation measures to manage the identified impacts.

D. Review of the LESIA report

The MOE review process which was described for category I sub-projects will apply for category II subprojects with the exception that the World Bank will be prior reviewing the first six sub-projects to ensure that the ESMF is being followed. Post review of a sample of subsequent projects will be conducted by the World Bank during its regular supervision missions.

E. Consultation, disclosure and appeal and grievance systems

The process for consultation, disclosure and appeal and grievance which were developed for category I subprojects will apply to the category II subprojects.

4.6 Typical Impacts and Mitigation for LEPAP Projects

Table 4-3 describes anticipated impacts from typical LEPAP projects as well as mitigation and monitoring measures that can be used as a guidance when developing the ESIA or LESIA studies for identified LEPAP projects. Table 4-4 includes generic environmental monitoring requirements that can use for guidance when developing sub-projects environmental monitoring plans.

Table 4-3. Identification of Possible impacts and Generic Mitigation Measures for Potential Sub-projects

Sub-project Components	Potential Impacts	Mitigation Measures	Responsibility
Industrial Wastewater Treatment and Water Reuse			
Physical, chemical and/or biological wastewater treatment; Flocculation, settling, and sludge dewatering	<ul style="list-style-type: none"> Improved quality of discharged effluents Potential leakage of wastewater and soil and water pollution from temporary failure of the treatment plant Generation of industrial sludge which if improperly disposed of, could lead to soil and water pollution Increase in ambient noise levels at nearby locations Transportation, use, disposal or accidental spill of hazardous materials during the operation and maintenance could result in potential harmful exposure to hazardous materials 	<ul style="list-style-type: none"> Ensure that the effluent quality is compliant with standards corresponding to the final disposal route by conducting regular monitoring Conduct regular inspection and maintenance Seek disposal of industrial sludge in local cement kilns and adopt technologies, as far as possible, that minimise sludge generation Ensure that final sludge disposal method to be approved by MoE (separate EIA study for sludge disposal method may be required unless covered in main EA study) Include a training plan for operators as part of loan agreement to ensure adequate capacity is available to operate the plant; a 6-month or 1-year operation contract with supplier may be envisaged Develop a spill prevention and management plan on a specific project-by-project basis to minimise water and soil quality degradation associated with accidental spills Train personnel and employees on occupational safety procedures and EMP implementation 	Sub-Project Proponent Facility
Industrial Waste Treatment			
Anaerobic waste treatment with biogas/energy production; Waste to energy (gasification); projects aiming at using waste as an alternative source of fuel	<ul style="list-style-type: none"> Positive impact by providing a management option for otherwise problematic wastes to be disposed of Offset of power costs Emissions of criteria air pollutants at levels that could substantially contribute to a potential violation of applicable air quality standards Emissions of GHGs Emissions of odours Increase in ambient noise levels at nearby locations Generation of by-products (such as ash or sludge) which would require further disposal 	<ul style="list-style-type: none"> Ensure that drainage from feedstock loading, unloading and storage areas is contained onsite Train employees involved in feedstock handling so as to discourage, avoid and minimise the release of feedstock or trash during operations Develop a spill prevention and management plan on a specific project-by-project basis to minimise water and soil quality degradation associated with accidental spills Prepare an Odour Management Plan (OMP) that incorporates equivalent odour reduction controls for digester operations on a specific project-by-project basis Prepare a fire management plan on a specific project-by-project basis Ensure that EIA study considers management and disposal of by-products, 	Sub-Project Proponent

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Sub-project Components	Potential Impacts	Mitigation Measures	Responsibility
	<ul style="list-style-type: none"> Increase in the risk of fire hazards due to the potential release of biogas (in the case of anaerobic systems) Transportation, use, disposal or accidental spill of hazardous materials during the operation and maintenance could result in potential harmful exposure to hazardous materials 	<p>if any, and these are approved by MoE</p> <ul style="list-style-type: none"> Train personnel and employees on occupational safety procedures and EMP implementation Include a training plan for operators as part of loan agreement to ensure adequate capacity is available to operate the plant; a 6-month or 1-year operation contract with supplier may be envisaged 	
Sludge dewatering	<ul style="list-style-type: none"> Generation of sludge which if improperly disposed of, could lead to soil and water pollution Deterioration of surface and groundwater resources quality if the water from the process of sludge dewatering is not properly disposed of Emissions of odours Transportation, use, disposal or accidental spill of hazardous materials during the operation and maintenance could result in potential harmful exposure to hazardous materials 	<ul style="list-style-type: none"> Seek disposal of industrial sludge in local cement kilns and adopt technologies, as far as possible, that minimise sludge generation Ensure final sludge disposal method to be approved by MoE (separate EIA study for sludge disposal method may be required unless covered in main EA study) Ensure that the effluent quality is compliant with standards corresponding to the final disposal route Prepare an Odour Management Plan (OMP) that incorporates equivalent odour reduction controls for digester operations on a specific project-by-project basis Train personnel and employees on occupational safety procedures and EMP implementation 	Sub-project Proponent
Recycling	<ul style="list-style-type: none"> Emissions of noise Generation of waste residues and increased load on infrastructure 	<ul style="list-style-type: none"> Conduct noise monitoring on a specific project-by-project basis to ensure that noise levels are compliant with national standards Conduct regular inspection and maintenance Ensure that the waste residues disposal route is approved by the MoE Train personnel and employees on occupational safety procedures and EMP implementation 	Sub-project Proponent
Air Quality			
Air emissions control	<ul style="list-style-type: none"> Potential exceedance of national standards due to temporary system failure Potential disturbance from chronic exposure of sensitive receptors to certain air contaminants 	<ul style="list-style-type: none"> Ensure that the BAT techniques are used to reduce and control emissions Conduct regular inspection and maintenance Train personnel and employees on occupational safety procedures and EMP implementation 	Sub-project Proponent

Table 4-4. Generic Monitoring Measures for Potential Sub-projects

<i>Monitoring Parameter</i>	<i>Frequency</i>	
<i>Monitoring at Effluent Outfall</i>	Frequency dependent on characteristics of effluent and treatment prior to discharge, as well as dilution, dispersion, sensitivity and downstream use of receiving environment (i.e., water or land).	
pH		
Biological Oxygen Demand (BOD)		
Chemical Oxygen Demand (COD)		
Oil and grease		
Total Suspended Solids (TSS),		Refer to Table B 8 in the Annex
Heavy metals (total and specific)		
Ammonia		
Coliform		
Cyanide, free		
Cyanide, total		
Nitrate		
Fluoride		
Chlorine, total residual		
Phenols		
Phosphorous		
Sulfide		
Temperature, at edge of initial mixing zone		
Effluent flow, l/second		
<i>Downstream Monitoring of Receiving Waters (additional parameters for measurement)</i>		
Dissolved Oxygen (DO ₂), mg/l		

General monitoring plan for sewage sludge use

Frequency of monitoring	
The monitoring of sewage sludge for pathogen reduction or vector attraction reduction should be based on the amount of sewage sludge applied to the land by a generator or preparer.	
Amount of Sewage sludge (Dry Tons)	Minimum frequency
Greater than zero but less than 319	Once per year
Equal to or greater than 319 but less than 1,650	Once per quarter (4 times per year)
Equal to or greater than 1,650 but less than 16,500	Once per 60 days (6 times per year)
Equal to or greater than 16,500	Once per month (12 times per year)

Source: Guidelines for Agricultural and Reclamation Utilization of Sewage Sludge under the Waste Regulations of the Department of Environmental Protection Commonwealth of Pennsylvania, <http://www.dep.state.pa.us/dep/biosolids/362-2192-003.pdf>

General monitoring plan for air pollution control (refer to ambient air quality standards in Annex Tables B4 and B5)

Item	Monitoring Parameters:	Sampling Frequency:	Monitoring Locations:
Baseline			
A baseline monitoring program may be required if existing data is insufficient for decision making; such a program may be more rigorous than the construction and operation monitoring programs.			
Construction Phase			
Air Quality	Particulate matter	Every 2 to 4 weeks	4 locations minimum: at nearest residences and site boundary
Noise	Decibels (dB)	Weekly	6 locations minimum: at nearest residences
Vibration		Weekly	
Operations Phase			
Air Quality	PM 10r Sulfur dioxide Nitrogen dioxide Metals (in soils)	Continuous and/or 24 hour average Continuous and/or passive samples every 2/4 weeks Continuous and/or passive samples Every 2/4 weeks Survey every 1-5 years	1 km Upwind and downwind 2 continuous / 10 passive 2 continuous / 10 passive 10 -15 soil samples

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Item	Monitoring Parameters:	Sampling Frequency:	Monitoring Locations:
Noise		Bi-annually to annually	6-10 sites at nearest residences around the plant

4.7 Monitoring and Follow-up

It shall be PMU's responsibility to follow-up on the subproject specific EMSP implementation (in support to MoE's compliance team). The following levels of reporting are required:

- The Proponent (industrial enterprise) shall submit a bi-annual report on EMSP implementation to the PMU and the MOE compliance unit
- The PMU will submit to the World Bank as part of its semi-annual project report, a report on the implementation of respective ESMPs, and overall status of compliance with the ESMF

4.8 Enforcement

Enforcement is the responsibility of MoE. The Ministry shall conduct inspections and request further evidence that environmental mitigation and monitoring measures are being followed. In the event of non-compliance, fines may prevail as per the national legislation described in Table 3-2.

4.9 Capacity Building and Training Needs

Capacity building and training needs have been identified to ensure that all elements and recommendations of this ESMF can be implemented. These are summarized in Table 4-5 and include a budgetary estimate and proposed party to cover the training costs.

Table 4-5. Identified Capacity Building and Training Requirements

Identified capacity/training gap	Recommendations	Budget	Proposed Implementation Party
Capacity of PMU to administer requirements of this ESA Capacity of participating commercial banks in administering requirements of this EA	Ensure PMU environmental expert is qualified to supervise implementation of the ESMF .A job description is recommended in Appendix F. Conduct a training session to BdL staff, PMU and participating commercial banks on the requirements of the ESMF. Environmental NGOs shall be invited to participate in training sessions.	USD 10,000/year	LEPAP
Capacity of sub-borrower to implement EMSP requirements	PMU to provide training to sub staff of the industrial enterprises responsible on EMSP implementation.	Included in PMU costs	LEPAP
Capacity of MoE to inspect projects for compliance	Training of MoE staff on environmental sampling procedures.	USD 10,000/year	LEPAP

4.10 Budget

The budget for implementation of this ESMF is summarized in Table 4-6.

Table 4-6. ESMF Implementation Budget

Element	Quantity	Budget	Proposed Financing Party/Mechanism
Preparation of ESIA/LESIA/ or audits	25	350,000	EFL (year 1) LEPAP Component 1 (subsequent years)
Training and capacity building costs	5	36,000	LEPAP Component 1
Awareness campaigns	10	USD 56,000	LEPAP Component 1
	TOTAL	USD 442,000	

The above budget is exclusive from the mitigation and monitoring measures for each subproject. The later will be part of the investment costs during the engineering design of sub-projects

4.11 Public Consultation

A public consultation meeting was organized at the Ministry of Environment on the 27th of March, 2013 to present findings of the Environmental and Social Assessment for the LEPAP. A total of 38 participants attended the meetings and included representatives of the ministries of the environment and industry, and CDR, the Banque du Liban, the Association of Lebanese Banks and selected commercial banks; Kafalat; the Association of Lebanese Industrialists and industrial enterprises from the private sector which are considered potential borrowers from LEPAP, NGOs and international organizations as shown in Table 4-7. The names and affiliation of the attendees are included in Appendix G.

Table 4-7. Institutions Represented in the LEPAP Public Consultation Meeting

Category	Name of Institution
Public sector	Ministry of Environment Ministry of Industry Council for Development and Reconstruction
Banking/Financial Sector	Banque du Liban (FI) Association of Lebanese Banks Banque Libano-Française BLC Bank KAFALAT
Private Sector (industrial enter-	Association of Lebanese Industrialists

Category	Name of Institution
prises/associations)	Ciment de Sibline Cimenterie Nationale Dirani Group Gemayel Freres Holcim LeBrasil Marble and Cement Products Mimosa Wilco PM
NGOs	Lebanese Environment Forum (coalition of 42 NGOs across Lebanon) Araya Environmental Association - Lebanon Eco Movement (coalition of 60 NGOs across Lebanon) Window to Environment
International Organizations	EFL, UNDP

Findings of the Environmental and Social Assessment of the LEPAP were presented, followed by a discussion session in which questions, comments and inquiries were received. The presentation was divided into two sections: (i) Institutional and Legal Gaps Analysis and Recommended Actions; and (ii) Main Stages of Environmental Assessment of Sub-Projects.

Forms were distributed to collect written feedback from the attendees. Concerns raised during the public participation meetings and responses are summarized in Table 4-8.

The ESA document reflects the comments and issues raised during the public consultation meeting.

Table 4-8. Issues Raised during the Public Participation Meeting

Organization	Questions/ Issues Raised	Response
Section 1: Institutional and Legal Gaps Analysis and Recommended Actions		
Ministry of Industry	MoI should have a role in the environmental compliance of industries since it is responsible to issue the industrial permits	Ultimate responsibility for environmental compliance lies with MoE. MoE shall liaise and coordinate with all parties, including MoI during the implementation of the project.
LEF	There is a lack of expertise in Lebanon in the field of preparation of environmental studies such as EIAs/IEEs and Environmental Audits	<ul style="list-style-type: none"> - There are several qualified national companies that operate according to international standards that are prequalified to conduct such studies - The Ministry of Environment is also preparing a separate prequalification process for

Organization	Questions/ Issues Raised	Response
		environmental consultants
Lebanon Eco Mouvement	How can the role of environmental police be enhanced?	An EU project (StREG) will be implemented soon and aims at supporting the MoE in the “Inspection and Enforcement” of the environmental laws and regulations
Ministry of Industry	The MoE is passive – the priority should be to prepare a list of the polluting industries mainly the unlicensed ones	The Compliance Decree was recently approved and the MoE is working on the preparation of a roadmap in order to implement the decree
LEF	Will the project promote environmental awareness and involve NGOs?	This is one of the objectives of Component 1 of the LEPAP project
Section 2: Main Stages of Environmental Assessment of Sub-Projects		
Ministry of Environment	The screening step should not include the preparation of an EIA but rather an Environmental Audit to: <ul style="list-style-type: none"> – Identify all the existing environmental problems; and – Define what sub-projects should be selected based on the priorities of the MoE even if they do not match the priorities of the industry 	<ul style="list-style-type: none"> – Once the sub-project is identified, environmental studies should be submitted based on the type of sub-projects, i.e the construction of a wastewater treatment plant requires the submission of an EIA or IEE to the MoE depending on screening result – The compliance decree refers to the preparation of an environmental audit and not an EIA which will be required at a later stage – The revised document clarifies the difference between the different required studies
Ministry of Environment	The compliance action plan should be based on the environmental impacts of the industrial activity and the industries should abide by MoE’s priorities	<ul style="list-style-type: none"> – ELARD: Each industry will prepare a compliance action plan defining all the existing environmental problems and an environmental audit focusing on the priority issue to be tackled. – MoE: the industry should cooperate with MoE to define its priorities – MoI: industrialists should not be frightened or driven away – ELARD: The PMU will support the industries in preparing the environmental audit and the CAP. Once the priorities are defined, the PMU will help the industry in choosing the sub-project, knowing what type of studies to submit to MoE and preparing the loan application – CDR: the different stakeholders should be represented in the PMU – EFL: the PMU will be a structure at the MoE that will work in close coordination with the Service of Urban Environment and the staff will consist of technical experts and not representatives of the ministries. Before the loan application, several steps are needed, preliminary assessment, technical and finan-

Organization	Questions/ Issues Raised	Response
		<p>cial feasibility, and preparation of a CAP/.environmental audit is obligatory to get the approval of the World Bank. The CAP will point out the priorities and the industry will choose the project(s) to implement through the loan.</p> <ul style="list-style-type: none"> – ELARD: The recommendations of the environmental assessment should be included as conditions in the sub-loan. The industry should submit a progress report twice per year to the PMU, and PMU will present an annual report to World Bank about all the projects
Ministry of Industry	<p>Will LEPAP finance several industries facing the same pollution problems? Can the municipalities apply for such projects?</p>	<p>Groups of industries and municipalities are encouraged to participate to reduce the industrial pollution The ministry is still at a trial period of the implementation of the compliance decree</p>
Ciment de Sibline	<ul style="list-style-type: none"> – The time scale should be reviewed: no Lebanese institute can perform the sampling and testing needed for the completion of the EIA – There are some industries which cannot afford to take the loan, yet they are the most polluting, how can this issue be resolved? 	<p>ELARD: there are only few stack emissions monitoring parameters that can not be conducted using Lebanese resources; these services, if required, may need to be outsourced from international laboratories/companies; however for most projects, resources are available in Lebanon.</p> <p>LEPAP is one of the first major steps towards promoting environmental compliance of the industrial sector in Lebanon; the project may investigate means to address the pollution of companies that are not financially strong as part of its Component 1.</p>
Ministry of Industry Ministry of Environment	<ul style="list-style-type: none"> – The Mol is trying to deal with the environmental impacts after 40 years of war. – The political interference is preventing the enforcement of laws and regulations. The industries should not be penalized when the impact is not very harmful, – The treatment/solution might need a long time and the infrastructure does not exist, it is not always the industries' fault – Time is needed and the work should be done step by step 	<p>There is a long way to go to address environmental compliance of the industrial sector in Lebanon. LEPAP is only a first step towards achieving this goal.</p>
Written comments		

Organization	Questions/ Issues Raised	Response
Marble and Cement Products	<ul style="list-style-type: none"> - A study of each region should be prepared in co-operation with the municipalities - The project needs amendments after consultation with the concerned institutions and NGOs - Priorities need to be clarified 	In parallel to LEPAP, MoE will be working on a road map for implementation of the compliance decree.
Lebanese Environmental Forum	<ul style="list-style-type: none"> - The project should take into consideration the concerns of the industrialists and the capacity of the MoE in order to guarantee the success of the project 	The institutional assessment considered MoE's capacity and identified gaps to be filled and actions to fill these gaps. Component 1 of LEPAP shall work closely with industrialists to address their concerns and support them in implementation of their projects.
Lebanese Environmental Forum	<ul style="list-style-type: none"> - Priorities need to be clarified - The modalities of initiation of the project need to be clarified - The document needs to be updated after taking into consideration the comments raised during the meeting 	Differences among the different environmental studies that may be required as part of the implementation of sub-projects are clarified in the revised document as well as their chronology in the project preparation phase..
Gemayel Freres	<ul style="list-style-type: none"> - If an environmental audit was submitted along with the application, will the industry be penalised in case the application was rejected? In this case, what options does the industry have to finance its sub-project? 	Industries should be concerned with the submission of environmental audits to MoE. Every file will be treated confidentially and for the purpose of LEPAP project.
Not specified	<ul style="list-style-type: none"> - Organisation of workshops on EIAs for the environmental NGOs - There should be representatives of the environmental NGOs in the PMU - Enhance the role of the environmental police as soon as possible - Encourage the municipalities to participate in the enforcement of the environmental laws 	NGOs shall be invited to participate in the trainings to be prepared in the framework of the LEPAP project. EU StReg project shall focus on the strengthening of environmental enforcement in Lebanon.

References

- Afif, C., Chélala, C., Borbon, A., Abboud, M., Adjizian-Gérard, J., Farah, W., Jambert, C., Zaarour, R., Badaro Saliba, N., Perros, P.E., & Rizk, T. (2008). SO₂ in Beirut: air quality implication and effects of local emissions and long-range transport. *Air Quality, Atmosphere & Health*, 1(3), 167-178.
- Afif, C., Dutot, A.L., Jambert, C., Abboud, M., Adjizian-Gérard, J., Farah, W., Perros, P.E., & Rizk, T. (2009). Statistical approach for the characterization of NO₂ concentrations in Beirut. *Air Quality, Atmosphere & Health*, 2(2), 57-67.
- BAMAS. (2005a). Technical Survey Report, Summer Conditions, DAI, United States Agency for International Development, Beirut, Lebanon.
- BAMAS. (2005b). Technical Survey Report, Winter Conditions DAI, United States Agency for International Development, Beirut, Lebanon.
- Chen, J., & Seng, S. (2006). Chapter 7: Soft Drink Waste Treatment. In *Waste treatment in the food processing industry* (pp.255-270). CRC Press.
- El-Fadel, M., Abi-Esber, L., & Ayash, T. (2009). Managing emissions from highly industrialized areas: Regulatory compliance under uncertainty. *Atmospheric Environment*, 43(32), 5015-5026.
- Hamze, M., Hassan, S., Thomas, R.L., Khawlie, M., & Kawass, I. (2005). Bacterial indicators of faecal pollution in the waters of the El-Kabir River and Akkar watershed in Syria and Lebanon. *Lakes & Reservoirs: Research and Management*, 10(2), 117-125.
- Houri, A., & El Jebrawi, S.W. (2007). Water quality assessment of Lebanese coastal rivers during dry season and pollution load into the Mediterranean Sea. *Journal of Water and Health*, 5(4), 615-23.
- International Finance Corporation. (IFC). (2007). Environmental, Health and Safety Guidelines. General EHS Guidelines, Washington, p.4.
- International Finance Corporation. (IFC). (2008). Environmental and Social Management System 101: A Framework for Environmental and Social Risk Management. December 2008. Available at: <http://firstforsustainability.org/documents/IFC%20ESMS%20101%20Presentation.pdf> and <http://firstforsustainability.org/documents/IFC%20ESMS%20101%20Outline.docx>
- International Finance Corporation. (IFC). (2013). Implementing IFC Environmental and Social Requirements. Available at: <http://firstforsustainability.org/risk-management/ifc-environmental-and-social-requirements.php>. Accessed on: 28 January 2013.
- Karam, G., & Tabbara, M. (2004). Air Quality Management and Estimated Health Impact of Pollutants in Urban and Industrial Areas: Chekka and Koura Region. Lebanese American University and USAID.

- Kfoury, A., Ledoux, F., El Khoury, B., El Nakat, H., Nouali, H., Cazier, F., et al. (2009). A Study of the Inorganic Chemical Composition of Atmospheric Particulate Matter in the Region of Chekka, North Lebanon. *Lebanese Science Journal*, 10(2), 3-16.
- Kouyoumdjian, H., & Saliba, N.A. (2006). Mass concentration and ion composition of coarse and fine particles in an urban area in Beirut: Effect of calcium carbonate on the absorption of nitric and sulfuric acids and the depletion of chloride. *Atmospheric Chemistry and Physics*, 6(7), 1865-1877.
- LRA, (2007-2010). Water quality monitoring program: 2007 to 2010 results.
- MoE/CDR/EFL (2012a). A policy paper on industrial wastewater management and compliance prepared by EFL, in coordination with MoE and the Council for Development and Reconstruction (CDR).
- MoE/CDR/EFL (2012b). Technical assistance in support of Lebanon's Pollution Abatement Project (LEPAP). Identification, selection, assessment and cost-estimation of bankable pollution abatement projects prepared by EFL, in coordination with MoE and the Council for Development and Reconstruction (CDR).
- MoE/UNDP/ECODIT (2011). State and Trends of the Lebanese Environment 2010.
- MoE/UNDP/ELARD (2011). Business Plan for Combatting Pollution of the Qaraoun Lake. Main Report submitted to the United Nations Development Program (UNDP).
- Ministry of Energy and Water - Lebanon. (MoEW). (2010). National Water Sector Strategy: Supply/Demand Forecasts, Available at http://www.energyandwater.gov.lb/adminpages/page/DownloadPageFile.asp?PageFile_ID=433
- Moussa, S.G., El-Fadel, M., & Saliba, N.A. (2006). Seasonal, diurnal and nocturnal behaviors of lower carbonyl compounds in the urban environment of Beirut, Lebanon. *Atmospheric Environment*, 40(14), 2459-2468.
- Pierson, J.A., & Pavlostathis, S.G. (2000). Real-Time Monitoring and Control of Sequencing Batch Reactors for Secondary Treatment of a Poultry Processing Wastewater. *Water Environment Research*, 72(5), 585-592.
- Roš, M., & Vrtovšek, J. (2001). Pre-Fermentation of a Low-Strength Meat-Processing Wastewater in an Upflow Sludge Blanket Reactor. *Water Environment Research*, 73(2), 142-145.
- Saliba, N.A., Kouyoumdjian, H., & Roumié, M. (2007). Effect of local and long-range transport emissions on the elemental composition of PM_{10-2.5} and PM_{2.5} in Beirut. *Atmospheric Environment*, 41(31), 6497-6509.
- Saliba, N.A., Moussa, S., Salame, H., & El-Fadel, M. (2006). Variation of selected air quality indicators

over the city of Beirut, Lebanon: Assessment of emission sources. *Atmospheric Environment*, 40(18), 3263-3268.

Shaka', H., & Saliba, N.A. (2004). Concentration measurements and chemical composition of PM_{10-2.5} and PM_{2.5} at a coastal site in Beirut, Lebanon. *Atmospheric Environment*, 38(4), 523-531.

World Bank. (2002). "Financial Intermediary Lending and Environmental Assessment." Environmental Assessment Sourcebook Update. Number 27. Environment Department. The World Bank, Washington, D.C. June 2002.

World Bank. (2004). Cost of Environmental Degradation — The Case of Lebanon and Tunisia. World Bank Environment Department

World Bank. (2010). World Bank, Water Sector: Public Expenditure Report. Available at: <http://openknowledge.worldbank.org/>

World Bank. (2011). Lebanon. Retrieved from website: <http://data.worldbank.org/country/lebanon>

World Bank. (2012). World Bank Operational Manual: OP 4.01 Environmental Assessment. Available at: <http://go.worldbank.org/W4YNVZJ50>. Accessed on 28 January 2013.

Yamine, P., Kfoury, A., El-Khoury, B., Nouali, H., El-Nakat, F., Ledoux, F., Cazier, F., Courcot, D., & Aboukaïs, A. (2010). A Preliminary Evaluation of the Inorganic Chemical Composition of Atmospheric TSP in the Selaata Region, North Lebanon. *Lebanese Science Journal*, 11(1), 13-29.

Appendices

Appendix A Draft TOR for the Preparation of a Compliance Action Plan (CAP)

DRAFT FOR DISCUSSION- DATED MAY 2013

I. Background

The Government of Lebanon has requested the World Bank assistance in designing the Lebanon Pollution Abatement Project. LEPAP will be providing technical assistance and financial facilities, through selected commercial banks, to public and/or private enterprises to bring their effluent discharges and/or their air emissions towards compliance with the Environment Protection Law 444 and national environmental standards in a cost effective manner, including Decree No. 8471/2012 on "Environmental Compliance for Establishments". Based on the Environmental Compliance Decree No. 8471/2012, industrial enterprises should submit an Environmental Audit (EA) prepared by an approved consulting firm to MoE in order to obtain their Environment Compliance Certificate (ECC). The Decree also requires enterprises to prepare a Self-Environmental Audit (according to Article 6 of the Decree) for the renewal of the ECC every 3 years.

A comprehensive audit is prepared of the whole enterprise irrespective of whether the facility or part or all of its line of production/ processes is in compliance with the national environmental standards and regulations.. Its major purpose is to improve the performance and the production of the industrial enterprise so that it can save money and remain competitive in the market.

A Compliance Action plan is prepared following "a rapid or walk in audit" but focuses primarily on part of the processes or the environment medium which is not in compliance with the national environmental standards and guidelines . Its purpose is mainly environmental and is usually required by the national environmental institution to ensure that the overall facility moves towards compliance with the environmental law and regulations. The proposed action plan in terms of actions and sub-projects should be commensurate with the budget and capital investment of the enterprise. A CAP is also a negotiable instrument between the national environmental institution and the managers of the plant and will be translated into a binding agreement.

In Lebanon, the CAP is introduced in the Lebanon Pollution Abatement Project as an instrument to (a) assist the enterprise to plan its investments that are not compliant with the Lebanese environmental standards and regulations and (b) also apply for financial assistance in a form of incentive to invest in a subproject which is considered to be the first and/or second in its plan of investments. Contrary to a full audit, the cost of preparing a CAP is less expensive than a comprehensive audit .Since the CAP was introduced by LEPAP, it will be financed by the project as part of an incentive package to encourage industrial enterprises to apply for a LEPAP sub-loan for pollution control.

The purpose of the CAP is to (a) contribute to the overall environmental performance of an enterprise; and (b) enable the enterprise to move towards compliance with the Lebanese Environmental regulations.

LEPAP will introduce a market mechanism for pollution control for an estimated 20 to 25 public and private enterprises to bring their effluent discharges and/or air emissions towards compliance with national environmental standards in a cost-effective manner. The sub-projects could include waste minimization, pollution prevention, resource recovery, clean technology adoption, fuel substitution, or end-of-pipe environmental control where no other alternatives are available. LEPAP will provide, on a first-come, first-serve basis, sub-loans through selected local participating banks. Enterprises seeking fund will have to provide at least 10% of the amount borrowed to cover civil works as IBRD will only

cover the cost of equipment, prepare a detailed audit of the subproject and a CAP for the facility or part of the facility that is not compliant with the environmental standards and guidelines

Thirteen enterprises have already expressed to the GIZ financed Environmental Fund of Lebanon (EFL)¹³ which participated in the LEPAP project preparation, strong interest in requesting further feasibility studies/audits/CAPs during project preparation. These 13 enterprises cover the following sectors: 6 food; 4 minerals; 2 papers and 1 furniture. These industries are specifically interested in reducing their wastewater and/or improve their solid waste management as they see: economic benefits accruing from the intervention such as energy savings, water reuse and/or waste reuse; and/or improvement of their environmental standing.

Of these 13, 5 enterprises (4 from the food sector and one from the furniture sector) have expressed strong interest borrowing from LEPAP subject to the completion of the environment and social requirements and prefeasibility studies, and reaching agreement with the selected participating banks on the lending terms and conditions. The terms and conditions will be finalized during appraisal. The proposed investments were estimated at about US\$ 5.3 million (net of the civil works that will be borne by end-users) and could constitute the first pipeline of projects that could benefit from LEPAP financing.

The remaining eight enterprises have already expressed strong interest in requesting further feasibility studies/audits/CAPs during project preparation before deciding to borrow from LEPAP.

The Purpose of this assignment is to prepare with industrial enterprises a compliance action plan so that they can have access to LEPAP financing

II. Terms of Reference

The Consultant shall perform but not limited to, the following tasks:

Task A. Enterprise Identification

- a) In consultation with the PMU, identify the candidates for which CAP should be prepared
- b) Review as available studies, reports, environment audits and EFL technical sheets if any for the candidate enterprise
- c) Assess the interest of the management of the enterprises in preparing a CAP as a requirement for LEPAP financing and obtaining the environmental compliance certificate

Task B: Rapid Environmental audit

- a) Conduct 1-2 days screening at the selected facilities selected on the basis of methodology to be developed by the Consultant.
- b) Based on the result of the screening, determine which part of the production process is compliant or not compliant with the national environmental standards and regulations.
- c) Seek agreement with the management of the industrial enterprise on the findings of the screening and on the preparation of a CAP.

¹³Environmental Fund for Lebanon (EFL) is a 8.5 million euro ~~grant~~ ~~grant is~~ financed by the German Government through GIZ. This program aims at reducing environment risks and economic impacts of the 2006 war and of undeserved areas in Lebanon.

Task C. CAP analysis and preparation

On the basis of screening of the industrial enterprise, the Consultant will focus on the part of the facility or the environment medium that is not compliant with the Lebanese environmental standards and guidelines. The consultant will

- a) Estimate levels of emissions into air and water based on available data, mass balances and emission factors, and amounts and composition of wastes produced in the plants.
- b) Describe the processes used in part (s) of the facility and the sources of different air and water pollutants and formation of wastes.
- c) Give advice on different technical options to reduce releases to air and water, reduce deposited amounts of wastes either by process changes, recycling, reuse and/or end of pipe control.
- d) Estimate the resulting releases of air and /or water pollutants and wastes after the possible control options,
- e) Estimate the costs for the different pollution mitigation options and implementation schedule.
- f) Determine the financial (if any) and economic pay back of the environmental investments.
- g) Order rank the priority sub-projects/ activity and management actions reflecting the costs, the source of financing as well as time schedule for implementation

Task D. CAP negotiation and approval

- a) prepare the CAP report and submit to the enterprise management and the PMU for review
- b) Assist the enterprise management in negotiating the CAP technical terms and conditions with the MOE
- c) On the basis of the priority list of sub-projects, recommend to enterprise management and the LEPAP PMU with appropriate justification, the LEPAP sub-project that would qualify for LEPAP financing.

III. Schedule and Reports.

It is expected that each CAP will require 15-20 working days to complete. Given that LEPAP is still at the appraisal stage, it is expected that the project elements be changed or modified pending the development and progress to be reached during the preparation phase. The Consultant should show flexibility and be prepared to adapt to the changing events surrounding the preparation of this project.

The consultant will be required to submit 3 hard copies in English and one electronic copy for the following:

- Progress report: The consultant will prepare bi-monthly report reflecting the progress to-date in the assignment, delays if any, as well as problems encountered
- Draft CAP: The Consultant will prepare the CAP using the following format:
 - A Description of the Facility Production as taken from the Plant Engineering Department
 - A Description to the extent possible quantitatively (using emission factors or actual measurements if available) of the environmental situation related to air, water, waste water, waste, soil contamination, noise, hazardous and non hazardous liquid and solid waste, and the workplace

- Characterization and Disposal of emissions and effluents as determined by an environmental “walk in” audit
- An Environmental Management Plan (EMP) which will consist of:
 - Proposed mitigating measures (short, medium and long term) in the form of activities, sub-projects with cost, return on the investment, time schedule
 - Proposed Measures for self monitoring the CAP
 - Proposed Institutional arrangements at the level of the Facility for implementation and follow up of the CAP
- Brief description of the LEPAP subproject and how it will contribute to the pollution abatement of the facility production.
- Results of discussions and agreement reached between the enterprise and the MOE
- Final Report: Soon after the review and negotiation with the MOE, the Consultant will submit a final CAP including the comments and recommendations resulting from the negotiations with MOE.

Appendix B Summary of Relevant Legislation and Standards to LEPAP

Overview of the Legal Framework in Lebanon

The Lebanese Constitution represents the highest-order legislative text in Lebanon and when in contradiction with the Constitution, proposed legislation(s) cannot be issued. International treaties and agreements ratified by Lebanon have the second priority in the Lebanese legislative framework.

Table B.1. Categories of Legislation in Lebanon

Type of Legislation	Organisation and Description
Laws	Laws are passed by the Lebanese Parliament. The Council of Ministers or Member of Parliament can propose a project of law that should pass through the appropriate parliamentary committee. The committee reviews, assesses and presents the law, with the amendments it introduces, for final approval by the Parliament.
Decree Laws	The Parliament has empowered the Council of Ministers to issue decree-laws without the prior approval or supervision of the Parliament. Decree laws have the same legal standing and powers as laws.
Decrees	The Council of Ministers issues decrees that have the power of law provided they do not contravene existing laws. The Council of State should be consulted before the issuance of a decree.
Resolutions/ Decisions	Ministers issue resolutions or ministerial decisions without the pre-approval of the Council of Ministers. Resolutions have the power of law provided they do not breach existing laws. The Council of State should be consulted before the issuance of a resolution or ministerial decision.

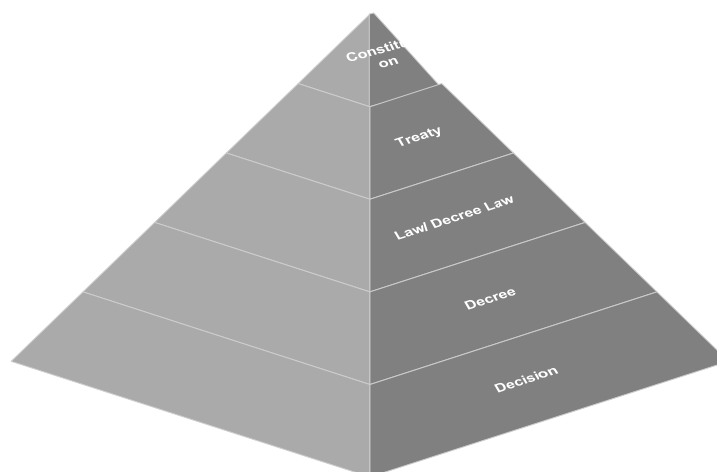


Figure B.1. Hierarchy of Legislation in Lebanon

Synopsis of the Legislative Framework for Environmental Protection

The environmental legal framework of Lebanon has steadily developed since the creation of the Ministry of Environment (MoE) in 1993. In 2002, the Lebanese Parliament issued Law No. 444, which is the framework law for protection of the environment of Lebanon. The MoE has since developed several draft decrees and laws to activate the implementation of the clauses of Law No. 444. Some of these decrees were recently approved by the Council of Ministers for implementation; including the Environmental Impact Assessment (EIA) Decree No. 8633/2012 and the Environmental Compliance Decree No. 8471/2012. Mechanisms to activate other decrees which create incentives for investments in

pollution abatement and promote enforcement of environmental legislation such as Decree No. 7841/2012 as well as the draft law establishing an environmental prosecutor (approved by the Council of Ministers in January 2012 and forwarded to the Parliament) and a draft decree to introduce an 'environmental police.

A summary listing of the main environmental legislation relevant to the LEPAP is presented in Table B.2.

Table B.2. Overview of the Lebanese Legislative Framework Relevant to the Project

Year	Law / Decree / Decision	Relevant Provisions
2013	BdL Intermediate Circular No. 313(Decision No. 11329)	Sets financial incentives targeted at encouraging commercial banks and lending institutions to offer loans at low interest rates for private enterprises seeking to reduce their environmental footprint.
2013	MoE circular 1/1	Procedures for payment of fees related to EIA and IEE reports
2012	MoE Decisions 229 and 230	Procedures for review of IEE and EIA reports
2012	Decree No. 8471 (Environmental Compliance)	Requires that every industrial enterprise obtains an environmental certificate within a time period to be determined by the MoE.
2012	Decree No. 8633 (Environmental Impact Assessment)	Defines the scope and stages of the national Environmental Impact Assessment process.
2012	MoI Decision No. 30/1	For the industries established and licensed before issuance of Decree No. 8018/2002, environmental restrictions can be introduced to their license terms when industries require a permit certificate or modification.
2012	MoI Decision No. 14/1	Provides general requirements for industrial permitting including adoption of water conservation measures in industrial processes.
2012	Decree No. 7841	Forwards to the Parliament a draft law that institutionalises the environmental prosecutor
2010	MoE Decisions No. 100/1,101/1 and 102/1	Define environmental limit values for waste from the olive oil industry, as well as environmental guidelines for using treated OMW in irrigation.
2010	MoEW Decision No. 118	Development of procedures for licensing new wells and disclosing illegal wells.
2005	Decree No. 14597	Water provided by Lebanon's regional Water and Wastewater Establishment to industries is limited and competes with other uses of water including domestic (Article 30).
2002	Law No. 444	Framework Law for the Protection of the Environment.
2002	Decree No. 8018	Establishes procedures and guidelines for the establishment and operation of industrial institutions/facilities and distance requirements from water resources according to industry classification.
2001	Decree No. 5243	Amends Decree No. 4917/1994 where it defines a new classification system for industrial establishments that relies on several environmental criteria (e.g., impact on water, air and soil, environmental risk, odour, and noise) to set the degree of environmental threat.
2001	MoE Decision No. 8/1	Sets "Emission Standards for Air Pollutants And Wastewater Discharges from Classified Establishments and Wastewater Treatment Plants".
1999	Decree No. 1039	Establishes drinking water standards.
1997	Law No. 623	Implementation of penalties for vandalism of water, telephone and electricity infrastructure.
1996	MoE Decision No. 52/1	Specification of the National Standards for Environmental Quality (NSEQ) and the Environmental Limit Values (ELVs) for Air and Water.
1996	MoE Decision No. 40/1	Amendment of Decision No. 22/1/1995.

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Year	Law / Decree / Decision	Relevant Provisions
1995	MoE Decision No. 22/1	Enforcement of Environmental Standards for Industries.
1994	Decree No. 5509	Organisation and general rules for the storage of oil products, cisterns and fuel stations.
1994	Decree No. 4917	Classification of establishments in Lebanon; amended by Decree No. 5243/2001.
1990	Law No. 14	Protection of the Sea and the Coast.
1988	Law No. 64	Environmental protection against hazardous waste that could harm air, water, biodiversity, soil and humans.
1977	Decree No. 118	Municipal act, taking preventive measures against fires.
1972	MoPH Decision No. 67	Methodology for bacteriological analysis of water.
1968	Decree No. 11541	Organisation of the body responsible for monitoring the coast within the Internal Security Forces.
1966	Decree No. 4809	Regulation of the Lebanese Coastal Zone.
1950	Law No. 63	Protection of the Marine Fauna and Flora.
1936	Decision No. 6/1 T	Stipulates general industrial health criteria and specifications for the storage of fuel.
1933	Decree No. 2761	Provides guidelines related to wastewater management and disposal.
1932	Decree Law No. 16 L	Based on Decision No. 320/1/1926, it mandates the establishment of buffer zones for the protection of all surface and groundwater resources from any type of activity/potential source of pollution. Requirements for buffering are found in Decision No. 320/1/1926.
1926	Decision No. 320/1	Addresses the conservation of public water and its use. It prohibits blocking the free flow of public water or the performance of some works such as drilling for underground or artesian water without obtaining the proper permit from the relevant administration.

National Environmental Standards

National emission and discharge standards were established by the MoE in Decision No. 52/1/1996 and in the MoE Decision No. 8/1/2001. The main legislative texts that specify environmental standards in Lebanon are listed in Table B.3.

Table B.3. Relevant National Environmental Standards

Legal Text No.	Date	Contents
Ministerial Decision No. 52/1, MoE	29/07/1996	Environmental Quality Standards & Criteria for Air, Noise, Water and Soil
Ministerial Decision No. 8/1, MoE	30/01/2001	National Standards for Environmental Quality (NSEQ) related to air contaminants and liquid waste emitted from classified establishments into receiving water bodies.

Air Quality

Ambient Air Contaminants

The maximum allowable concentrations of ambient air contaminants (MoE Decision No. 52/1/1996) are presented in the following table.

**Table B.4. Maximum Allowable Concentrationsof Ambient Air Contaminants
(MoE Decision No. 52/1/1996)**

Pollutant	Maximum Allowable Concentration (in $\mu\text{g}/\text{m}^3$)	Averaging Period
Sulphur Dioxide (SO ₂)	350	1 hour
	120	24 hours
	80	1 year
Nitrogen Dioxide (NO ₂)	200	1 hour
	150	24 hours
	100	1 year
Ozone (O ₃)	150	1 hour
	100	8 hours
Carbon Monoxide (CO)	30,000	1 hour
	10,000	8 hours
Total Suspended Particulate (TSP)	120	24 hours
Particulate Matter (PM ₁₀)	80	24 hours
Lead	1	1 year
Benzene	5 ppb	1 year

Discharge and Emission Standards

The emission limit values are specified in Decision No. 8/1/2001. These emission limit values are valid for all industrial plants as long as no specific regulations for single branches are given.

Emission standards are given as mass flows and as concentrations. For mass flows lower than those provided in column 3 of Table B.5, no concentration emission limit value exists. If the mass flows appearing in column 3 are exceeded, the concentration emission limit values of column 2 apply.

Table B.5. Maximum Emission Limits of Air Contaminants (MoE Decision No. 8/1/2001)

Parameter ¹	Emission Limit Value	Remark
Dust	200 mg/m ³ (for new facilities) 500 mg/m ³ (for existing facilities)	None containing hazardous compounds
Particulate Inorganic Pollutants		
Group I	1 mg/m ³	Mass flow > 5g/h
Group II	10 mg/m ³	Mass flow > 25g/h
Group III	30 mg/m ³	Mass flow > 50g/h
Gaseous Inorganic Pollutants		
Group I	1mg/m ³	Mass flow > 50g/h
Group II	5mg/m ³	Mass flow > 300g/h
Group III	30mg/m ³	Mass flow > 1,000g/h
Group IV	500mg/m ³	Mass flow > 10,000g/h
Gaseous Organic Pollutants		

Parameter ¹	Emission Limit Value	Remark
Group I	20mg/m ³	Mass flow > 500g/h
Group II	100mg/m ³	Mass flow > 4,000g/h
Group III	200mg/m ³	Mass flow > 6,000g/h
Cancer Causing Pollutants		
Group I	0.2mg/m ³	Mass flow > 5g/h
Group II	2mg/m ³	Mass flow > 10g/h
Group III	10mg/m ³	Mass flow > 50g/h

Notes:

1: The types of inorganic and organic pollutants within the groups are listed in detail in MoE Decision No. 8/1/2001.

Minimum Stack Height Approach for Generators (MoE Decision No. 8/1/2001)

As per MoE Decision 8/1/2001, ELVs or a minimum stack height apply for the case of release of exhaust gases. This method can be used instead of applying the ELVs for generators. This means that an operator of a plant can choose whether s/he meets the ELVs on one hand or installs a capacity correlated stack height on the other hand to fulfil the demands on the necessary dilution of the emissions. The formula for the determination of the stack height is:

$$H = h + 0.2\sqrt{kVA}$$

Where:

H = Total stack height in metres

h = Height of neighbouring building in metres

kVA = Total generator capacity of the set in kVA = kW, i.e. the total capacity which is determined by the maximum fuel (energy) input

The minimum stack height is related to the following conditions:

- Area of applicability: > 500 total generator capacity [kVA = kW];
- Minimum height: 1 m + height of neighbouring buildings in [m] (inside 50m diameter from the stack or the average building height in the neighbourhood);
- Minimum exhaust gas velocity: 15 m/s;
- More than one generator: total capacity; and
- < 500 total generator capacity [kVA=kW]: 1 m + height of installation hall.

Noise

The national maximum allowable noise level and the permissible noise exposure standards as per MoE Decision No. 52/1/1996 are presented in the following tables. As per MoE Decision No. 52/1/1996, the maximum instantaneous noise level (Lmax) should not exceed 134 dB(A).

Table B.6. Permissible Ambient Noise Levels in Selected Regions

Region Type	Limit for Noise Level dB(A)		
	Day Time (07:00-18:00)	Evening Time (18:00-22:00)	Night Time (22:00-07:00)
Residential areas with some construction sites or commercial activities or located near a road	50-60	45-55	40-50

Region Type	Limit for Noise Level dB(A)		
	Day Time (07:00-18:00)	Evening Time (18:00-22:00)	Night Time (22:00-07:00)
Urban residential areas	45-55	40-50	35-45
Industrial areas	60-70	55-65	50-60
Rural residential areas, hospitals and gardens	35-45	30-40	25-35

Table B.7. National Occupational Noise Exposure Standards in Work Areas

Duration per Day (hrs)	Sound Level dB(A)
8	90
4	95
2	100
1	105
½	110
¼	115

Water Quality

Standards for wastewater discharge into receiving water bodies (also referred to as ELVs) are set out in MoE Decision No. 8/1/2001 and are shown below. The Decision also refers to the required studies for the design of sea outfalls. The outlet of the pipeline for coastal outfalls, its length and depth should be designed according to:

- Sea bed data:
 - Sea bed levels;
 - Sea bed soils; and
 - Sea bed stability or movements.
- Environmental data:
 - Wind speed frequencies and direction;
 - Local topography and effects on currents, winds and waves; and
 - Shipping, dredging, fishing, shell fishery, bathing and other activities.
- Effluent data; and
- Receiving water characteristics:
 - Time for bacteria to die;
 - Horizontal and lateral dispersion coefficients;
 - Vertical dispersion coefficient; and
 - Temperature, salinity and density profiles.

Table B.8. Maximum Limits (ELVs) for Wastewater Discharge into the Receiving Water Bodies and Public Sewers (MoE Decision No. 8/1/2001)

Parameter	Maximum Allowable Limits for Receiving Water Bodies		
	Public Sewers	Surface Water (Inland)	Sea
Colour	none	none	none
pH	6-9	6-9	6-9
Temperature	35°C	30°C	35°C
BOD (5 day, 20°C)	125 mg/L	25 mg/L	25 mg/L
COD (dichromate method)	500 mg/L	125 mg/L	125 mg/L
Total Phosphorus	10 mg/L	10 mg/L	10 mg/L
Total Nitrogen ¹	60 mg/L	30 mg/L	30 mg/L
Suspended solids	600 mg/L	60 mg/L	60 mg/L
AOX	5	5	5
Detergents	-	3 mg/L	3 mg/L
Coliform Bacteria 370 C in 100 mL ²	-	2,000	2,000
Salmonellae	Absence	Absence	Absence
Hydrocarbons	20 mg/L	20 mg/L	20 mg/L
Phenol Index	5 mg/L	0.3 mg/L	0.3 mg/L
Oil and grease	50 mg/L	30 mg/L	30 mg/L
Total Organic Carbon (TOC)	750 mg/L	75 mg/L	75 mg/L
Ammonia (NH ₄ ⁺)	-	10 mg/L	10 mg/L
Silver (Ag)	0.1 mg/L	0.1mg/L	0.1 mg/L
Aluminium (Al)	10 mg/L	10 mg/L	10 mg/L
Arsenic (As)	0.1 mg/L	0.1 mg/L	0.1 mg/L
Barium (Ba)	2 mg/L	2 mg/L	2 mg/L
Cadmium (Cd)	0.2 mg/L	0.2 mg/L	0.2 mg/L
Cobalt (Co)	1 mg/L	0.5 mg/L	0.5 mg/L
Chromium total (Cr)	2 mg/L	2 mg/L	2 mg/L
Hexavalent Chromium (Cr VI ⁺)	0.2 mg/L	0.2 mg/L	0.2 mg/L
Copper total (Cu)	1 mg/L	0.5 mg/L	1.5 mg/L
Iron total (Fe)	5 mg/L	5 mg/L	5 mg/L
Mercury total (Hg)	0.05 mg/L	0.05 mg/L	0.05 mg/L
Manganese (Mn)	1 mg/L	1 mg/L	1 mg/L
Nickel total (Ni)	2 mg/L	0.5 mg/L	0.5 mg/L
Lead total (Pb)	1 mg/L	0.5 mg/L	0.5 mg/L
Antimony (Sb)	0.3mg/L	0.3mg/L	0.3mg/L
Tin total (Sn)	2 mg/L	2 mg/L	2 mg/L

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Parameter	Maximum Allowable Limits for Receiving Water Bodies		
	Public Sewers	Surface Water (Inland)	Sea
Zinc total (Zn)	10 mg/L	5 mg/L	5 mg/L
Active Cl ₂	-	1 mg/L	1 mg/L
Cyanides (CN ⁻)	1 mg/L	0.1mg/L	0.1mg/L
Fluorides (F)	15 mg/L	25 mg/L	25 mg/L
Nitrate (NO ₃ ⁻)	-	90 mg/L	90 mg/L
Phosphate (PO ₄ ³⁻)	-	5 mg/L	5 mg/L
Sulphate (SO ₄ ²⁻)	1,000 mg/L	1,000 mg/L	1,000 mg/L
Sulphide (S ²⁻)	1 mg/L	1 mg/L	1 mg/L

Notes:

1: Sum of Kjeldahl-N (organic N + NH₃), NO₃-N, NO₂-N

2: For discharges in close proximity to bathing water, a stricter environmental limit value could be necessary

Standards and quality requirements for aquatic life and bathing water in sea water, rivers and lakes in Lebanon were established in MoE Decision No. 52/1/1996. Defined guide values and maximum admissible limit values are shown in below.

Table B.9. Guide Values and Maximum Admissible Limit Values for Aquatic Life

Parameter	Guide Value	Maximum Admissible Limit
Temperature	-	Temperature downstream of discharge point (at the edge of the mixing zone) should not exceed the natural temperature by more than 1.5°C)
	-	The temperature of the effluent at the edge of the mixing zone shall not exceed 21.5°C or go below 10°C
DO (mg/L O ₂)	50%>9 100%>7	50%>9
pH	-	6-9
Suspended Solids (mg/L)	<25	-
BOD ₅ (mg/L O ₂)	<3	-
Total Phosphorous (mg/L PO ₄)	-	0.2
Nitrites (mg/L NO ₂)	<0.01	<0.01
Phenolic Compounds	Should not change taste of fish	
Petroleum hydrocarbons	Petroleum products should not be present in water in such quantities to: - Form a visible layer on the surface of the water or deposit in layers at the bottom, - Impart a noticeable taste of oil to fish, or - Produce harmful effects to fish.	
Non-ionized ammoniac (mg/L NH ₃)	<0.005	<0.025
Total ammonium (mg/L NH ₄)	<0.04	<1

Parameter	Guide Value	Maximum Admissible Limit
Residual chlorine (mg/L HOCl)	-	<0.005
Total zinc (mg/L)	-	<0.3
Soluble copper (mg/L)	-	<0.04

Table B.10. Guide Values and Maximum Admissible Limit Values for Bathing Water

Parameter	Guide Value	Maximum Admissible Limit
Microbiological Parameters		
Total coliforms (/100 mL)	500	10,000
Thermotolerant coliforms (/100 mL)	100	2,000
Faecal streptococci (/100 mL)	100	-
Salmonellae (/L)	0	-
Enteroviruses (/10L)	0	-
Physicochemical Parameters		
pH	6-9	-
Colour	No abnormal change in colour	No film visible on the surface of the water and no odour
Mineral oils (mg/L)	<0.3	-

International Guidelines

The LEPAP, similar to other projects considered for financing by the World Bank, is subject to Operational Policy (OP) 4.01 on Environmental Assessment (EA). Therefore, this EA report refers to national legislation and international conventions ratified by Lebanon as well as the World Bank policies and guidelines presented in the Pollution and Prevention Handbook of the World Bank.

The Pollution Prevention and Abatement Handbook sets maximum air emissions and discharge guidelines that apply to World Bank projects in the absence of national standards. The handbook also includes General Environmental Guidelines with emission levels normally acceptable to the World Bank as well as specific industry sector EHS guidelines. The specific guidelines are to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors.

IFC General EHS Guidelines

Ambient Air Quality

The IFC General EHS Guidelines (IFC/WB, 2007) state that in the absence of applicable national ambient air quality standards, internationally recognized standards, such as WHO or EU guidelines that are listed below should be applied. The emissions guidelines are applicable to small combustion process installations operating more than 500 hours per year, and those with an annual capacity utilization of more than 30 percent.

Table B.11. International Ambient Air Quality Standards

Parameter	Averaging Period	EU		WHO Ambient Air Quality Guidelines
		EU Ambient Air Quality Standard ³ (µg/m ³)	EU Permitted Number of Exceedances per Year	WHO Guideline Value (µg/m ³)
Sulphur dioxide (SO ₂)	10 minute	-	-	500 (guideline)
	1-hour	350	24	-
	24 hour	125	3	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
Carbon monoxide (CO)	8-hour	10,000	N/A	-
Nitrogen dioxide (NO ₂)	1-hour	200	18	200 (guideline)
	Annual	40	N/A	40 (guideline)
Ozone (O ₃)	8-hour	120	25	160 (Interim target-1) 100 (guideline)
PM ₁₀ ¹	24-hour	50	35	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
	Annual	40	N/A	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
PM _{2.5} ²	Annual	25	N/A	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	-	-	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)

Notes:

- 1: PM₁₀ denotes particulate matter of less than 10 microns in diameter.
- 2: PM_{2.5} denotes particulate matter of less than 2.5 microns in diameter.
- 3: EU air quality requirements from Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
- 4: World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.
- 5: Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

Table B.12. Small Combustion Facilities Emissions Guidelines (3MWth - 50MWth) – (in mg/Nm³ or as indicated)

Combustion Technology /Fuel	Particulate Matter (PM)	Sulphur Dioxide (SO ₂)	Nitrogen Oxides (NOx)	Dry Gas, Excess O ₂ Content (%)
Engine				
Gas	N/A	N/A	200 (Spark Ignition) 400 (Dual Fuel) 1,600 (Compression Ignition)	15
Liquid	50 or up to 100 if justified by project specific considerations (e.g. Economic feasibility of using lower ash content fuel, or adding secondary treatment to meet 50, and available environmental capacity of the site)	1.5 per cent Sulphur or up to 3.0 per cent Sulphur if justified by project specific considerations (e.g. Economic feasibility of using lower S content fuel, or adding secondary treatment to meet levels of using 1.5 per cent Sulphur, and available environmental capacity of the site)	If bore size diameter [mm] < 400: 1460 (or up to 1,600 if justified to maintain high energy efficiency.) If bore size diameter [mm] > or = 400: 1,850	15
Turbine				
Natural Gas =3MWth to < 15MWth	N/A	N/A	42 ppm (Electric generation) 100 ppm (Mechanical drive)	15
Natural Gas =15MWth to < 50MWth	N/A	N/A	25 ppm	15
Fuels other than Natural Gas =3MWth to < 15MWth	N/A	0.5 per cent Sulphur or lower per cent Sulphur (e.g. 0.2 per cent Sulphur) if commercially available without significant excess fuel cost	96 ppm (Electric generation) 150 ppm (Mechanical drive)	15
Fuels other than Natural Gas =15MWth to < 50MWth	N/A	0.5% S or lower % S (0.2%S) if commercially available without significant excess fuel cost	74 ppm	15
Boiler				
Gas	N/A	N/A	320	3
Liquid	50 or up to 150 if justified by environmental assessment	2,000	460	3
Solid	50 or up to 150 if justified by environmental assessment	2,000	650	6

Notes:

-N/A/ - no emissions guideline; Higher performance levels than these in the Table should be applicable to facilities located in urban / industrial areas with degraded airsheds or close to ecologically sensitive areas where more stringent emissions controls may be needed.; MWth is heat input on HHV basis; Solid fuels include biomass; Nm³ is at one atmosphere pressure, 0°C.; MWth category is to apply to the entire facility consisting of multiple units that are reasonably considered to be emitted from a common stack except for NOx and PM limits for turbines and boilers. Guideline values apply to facilities operating more than 500 hours per year with an annual capacity utilisation factor of more than 30 per cent.

Wastewater

As stated in the IFC General EHS Guidelines(IFC/WB, 2007), sewage from an industrial facility to be discharged to surface water is to be treated to meet national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges shown below.

Table B.13. Indicative Values for Treated Sanitary Sewage Discharge¹

Pollutant	Units	Guideline Value
pH	pH	6-9
BOD	mg/L	30
COD	mg/L	125
Total nitrogen	mg/L	10
Total phosphorus	mg/L	2
Oil and Grease	mg/L	10
Total suspended solids	mg/L	50
Total coliform bacteria	MPN/100mL	400

Notes:

- 1: Not applicable to centralised, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation
- 2: MPN= Most Probable Number

Noise

The maximum permissible ambient noise levels in the different environmental settings set by the IFC guidelines are presented below. The guidelines also state that noise impacts should not result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site (IFC/WB, 2007).

Table B.14. Noise Levels Guidelines

Receptor	One Hour LAeq in dB(A)	
	Day (07:00-22:00)	Night (22:00-07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Specific Industry Sector EHS Guidelines

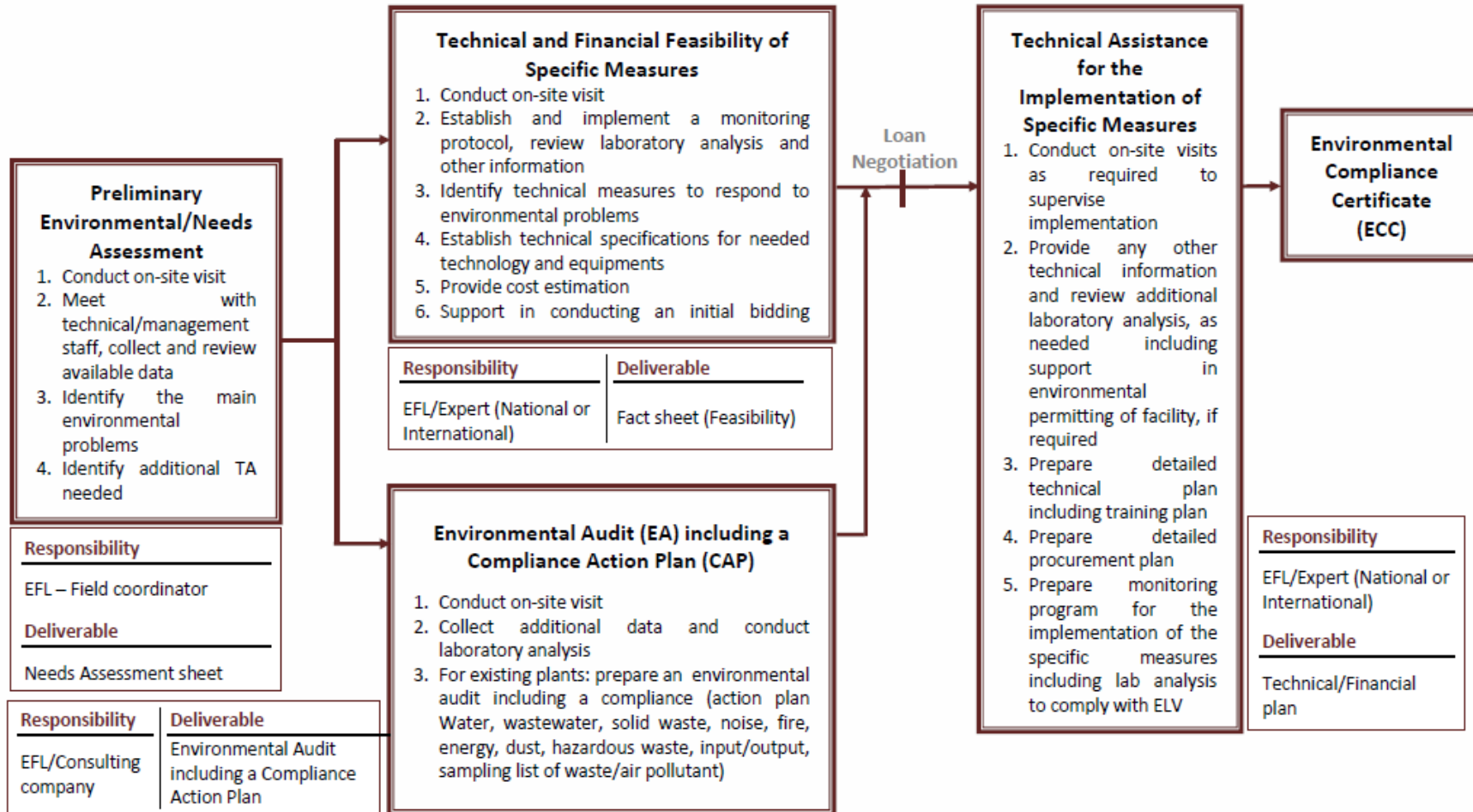
Specific industry sector EHS guidelines relevant to the LEPAP were identified based on the potential applicants as follows:

- EHS guidelines for Pulp and Paper Mills
- EHS guidelines for Mammalian Livestock Production
- EHS guidelines for Poultry Production
- EHS guidelines for Vegetable Oil Processing
- EHS guidelines for Dairy Processing
- EHS guidelines for Meat Processing
- EHS guidelines for Poultry Processing

- EHS guidelines for Breweries
- EHS guidelines for Food and Beverage Processing
- EHS guidelines for Pharmaceuticals and Biotechnology Manufacturing
- EHS guidelines for Phosphate Fertilizer Manufacturing
- EHS guidelines for Pesticides Formulation, Manufacturing and Packaging
- EHS guidelines for Cement and Lime Manufacturing
- EHS guidelines for Ceramic Tile and Sanitary Ware Manufacturing
- EHS guidelines for Glass Manufacturing
- EHS guidelines for Construction Materials Extraction
- EHS guidelines for Textiles Manufacturing
- EHS guidelines for Tanning and Leather Finishing
- EHS guidelines for Printing
- EHS guidelines for Foundries
- EHS guidelines for Base Metal Smelting and Refining
- EHS guidelines for Metal, Plastic, Rubber Products Manufacturing

Appendix C Summary of EFL Technical Assistance for Environmental Compliance in 2013

EFL - TECHNICAL ASSISTANCE FOR ENVIRONMENTAL COMPLIANCE IN 2013
In application of Decree No. 8471/2012 (Environmental Compliance for Establishments)
And in preparation of MoE/WB/LEPAP (Lebanon Pollution Abatement Program)



A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Project Office: CDR, P.O.Box: 116/5351, Tallet al-Serail, Beirut, Lebanon.

Tel: +961 1 981 931. Fax: +961 1 98 12 52/3. www.efl.cdr.gov.lb

**Appendix D List of Pre-Qualified National Environmental Consultants
(December 2012)**

مجلس الإنماء والإعمار
بيروت - لبنان

بيروت في ٢٨/١١/٢٠١٢

الرقم: ١/٦١١٧

معالى وزير البيئة المحترم

وزارة البيئة
١٢٠١٢٠٢٥
٤٨٨٠

الموضوع: لجنة الخبراء البيئية - خلية الدراسات البيئية

المرجع: - كتابكم رقم ٤٥٨٥/ب تاريخ ٢٠١٢/١١/٣ المسجل لدى المجلس تحت الرقم ١٣٨٢٩/ر.م/٢٠ تاريخ ٢٠١٢/١١/٢٠

بالإشارة إلى الموضوع والمرجع المبينين أعلاه،

وعطفا على كتابكم المشار اليه في المرجع أعلاه، المتضمن طلبكم تزويدكم بلائحة المكاتب الهندسية الاستشارية اللبنانية المؤهلة لدى مجلس الإنماء والإعمار لدراسة أو الإشراف على تنفيذ مشاريع في فئة الأعمال الأخرى المختلفة - خلية الدراسات البيئية، نبين أدناه اللائحة المطلوبة:

- ACE - Associated Consulting Engineers
- Al Mouhit Consulting Engineers (MCE)
- Dar Al Handassah (Nazih Taleb & Partners)
- Dar Al Handassah Consultants (Shair & Partners)
- Delta Engineering Studies
- Earth Link & Advanced Resources Development SARM - ELARD
- Ecodit Liban S.A.R.L.
- Engico Consulting Engineers
- Engineer Roger Georges Khalil
- Engineering, Design & Environmental Services - Edessa
- Envirotech Ltd.
- Information International Ltd.
- Issa Consulting
- Jouzy & Partners CEB
- Kabbara & Associates
- Khatib & Alami, Consolidated Engineering Co.

PQListsCsEnvironmentalMinistryOfEnvironment
27/11/12

مجلس الإنماء والإعمار

- Kredo s.a.l.
- Lebanese Arab Co.For Eng. & Consultancy "Laceco"
- Libanconsult AGM
- Matrix Engineers
- Maurice Bonfils Architecte (MBA)
- Mazen Ramadan - Consulting Engineers
- Middle East Engineers and Architects s.a.r.l.
- Mares S. A. R. L.
- Nicolas Gerges & Sons (Sete N.Gerges & Fils)
- Rafik El-Khoury & Partners Consulting Engineers
- S.E.S. Sustainable Environmental Solutions S.A.L
- Touma Engineering SARL-Engineering & Research
- TURBA Ltd

علما بأن هذه اللائحة هي عرضة للتعديل وفق المعطيات التي ترد الى المجلس من قبل المكاتب الهندسية المعنية.

وتفضلوا بقبول فائق الاحترام.

رئيس مجلس الإنماء والإعمار

نبيل عدنان الجسر



Appendix E General Environmental Baseline Conditions in Lebanon relevant to LEPAP

The potential sub-projects vary considerably in type and scale and therefore in their potential impacts on environmental and social aspects, making determination of baseline data rather difficult. As LEPAP is a national project, the baseline section provides an overview of the quality of the environment in Lebanon, while focusing as much as possible, depending on data availability, on industrial areas where sub-projects may be implemented. This section provides an overview of air, water resources and seawater quality, as these are the main media with relevant project interactions. It also presents an overview of wastewater and waste management and the industrial sector in Lebanon.

Ambient Air Quality

Air pollution is defined as the modification of the natural characteristics of the atmosphere by any chemical, physical or biological contaminant such as Particulate Matter (PM), Carbon Monoxide (CO), Ground-Level Ozone (O₃), Nitrogen Dioxide (NO₂) and Sulphur Dioxide (SO₂).

Sources of pressures on ambient air quality in Lebanon can be natural phenomena or anthropogenic activities such as road transportation, energy production (power plants, private generators and gas stations), industrial manufacturing processes, construction, quarries, fireworks, burning tires, open dumping and wars (MoE/UNDP/ECODIT, 2011). The cost of environmental degradation from air pollution related problems in Lebanon was estimated at 170 million USD/year (1.02% of the GDP) (WB, 2004).

Private vehicles are excessively used by the Lebanese population for daily commuting, and the transport sector is one of the leading sources of air pollutant emissions in the country and more specifically in Beirut. The high traffic density in Beirut and its suburbs is causing poor atmospheric quality conditions in this area. Fuels and lubricants used in vehicles are a major source of Particulate Matter (PM), Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), and carbonyls emissions (Afif et al., 2009; Kouyoumjian & Saliba, 2006; Moussa et al., 2006; Saliba et al., 2006, 2007). Those air pollutants are identified for the risk they present through long-term or short-term exposure, for their toxicity, or even for their environmental interference.

The literature review revealed a lack of ambient air quality data for Lebanon. A summary of findings for the urban area of Beirut and the industrial North Lebanon areas is provided below and further discussed below. The results are used as a proxy for the conditions in an urban area and an industrial area of Lebanon.

Atmospheric Pollution in Beirut

NO₂ levels in Beirut are mainly attributed to traffic (Afif et al., 2008). The yearly average of 2005 was recorded to be 67µg/m³. It reached its peak in December with 178µg/m³ and dropped to 17µg/m³ in May (Afif et al., 2008). NO₂ concentrations are generally within the acceptable range of allowable limits for ambient air pollutants (MoE Decision No. 52/1/1996). This is also applicable to the concentrations given in the month of May. However, exposures are significant in the month of December since the average concentration of the month exceeds the permissible exposure over a 24 hour period.

SO₂ levels in Beirut are mainly attributed to traffic and central heating burners (Saliba et al., 2006 & Afif et al., 2008). The monthly average of SO₂ concentration in samples collected from Beirut varied between 13µg/m³ in summer 2004 and 25µg/m³ in winter 2004-2005 (Saliba et al., 2006). Another

study conducted between December 2004 and July 2006 showed a yearly average of 8.11 $\mu\text{g}/\text{m}^3$ (Afif et al., 2008). SO_2 levels measured in Beirut in both studies were below the maximum allowable limits for ambient air pollutants (MoE Decision No. 52/1/1996).

Particulate matter emissions are mainly attributed to natural and anthropogenic activities (Shaka' & Saliba, 2004). Levels of PM_{10} in Beirut varied between 20.8 and 238 $\mu\text{g}/\text{m}^3$ (monthly average) (Shaka' & Saliba, 2004). Exceedance in PM_{10} was noted in March, April and May 2003. $\text{PM}_{2.5}$ annual levels in Beirut were below IFC guideline values.

Atmospheric Pollution in North Lebanon

Air quality studies in North Lebanon are concentrated on the Chekka and Selaata area where cement plants, a fertiliser plant and quarries constitute the main causes of air pollution (Kfoury et al., 2009, Yammine et al., 2010, El Fadel et al., 2009, Karam & Tabbara, 2004). In the Chekka and Koura villages, NO_2 , SO_2 and PM_{10} levels exceeded the national standards set in the MoE Decision No. 52/1/1996 (Karam & Tabbara, 2004).

Table E.1. Review of Literature on Ambient Air Quality in Lebanon

Region	Parameter	Description	Period	Mean concentration ($\mu\text{g}/\text{m}^3$) ¹	Averaging Period	Maximum Allowable Limits for Ambient Air Pollutants ($\mu\text{g}/\text{m}^3$) (MoE Decision No. 52/1) ²	Reference
Beirut							
Beirut	NO_2	Traffic	May 2005	17	Monthly Average	150 (24 hours) 100 (1 year)	Afif et al., 2009
	NO_2	Traffic	2005	67	Annual Average	100	Afif et al., 2009
	NO_2	Traffic	Dec 2005	178	Monthly Average	150 (24 hours) 100 (1 year)	Afif et al., 2009
	SO_2	Traffic	Summer 2004 Winter 2004-2005	13 25	Monthly Average	120 (24 hours) 80(1year)	Saliba et al., 2006
	SO_2	Traffic- central heating burn-ers	Year 2005	8.11	Annual Average	80	Afif et al., 2008
American University of Beirut	$\text{PM}_{2.5}$	Natural and anthropogenic sources of PM	Feb 2003 March 2003 April 2003 May 2003	33.8 25.2 63.7 36.9	Monthly Average	24-hour averaging period: 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) 1-year averaging period: 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)	Shaka' & Saliba, 2004
Bourj Ham-moud	$\text{PM}_{2.5}$	Urban Area	Feb 2004 to Jan 2006	0.039	Annual Average	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)	Saliba et al., 2007
	$\text{PM}_{10+2.5}$	Urban Area	Feb 2004 to Jan 2005	0.065	Annual Average	-	Saliba et al., 2007

Region	Parameter	Description	Period	Mean concentration ($\mu\text{g}/\text{m}^3$) ¹	Averaging Period	Maximum Allowable Limits for Ambient Air Pollutants ($\mu\text{g}/\text{m}^3$) (MoE Decision No. 52/1) ²	Reference
American University of Beirut	PM _{10-2.5}	Natural and anthropogenic Sources of PM	Feb 2003 March 2003 April 2003 May 2003	51.8 20.8 174 68.8	Monthly Average	-	Shaka' & Saliba, 2004
American University of Beirut	PM ₁₀	Natural and anthropogenic Sources of PM	Feb 2003 March 2003 April 2003 May 2003	85.6 46.0 238 106	Monthly Average	80 (24 hours)	Shaka' & Saliba, 2004
Beirut	PM ₁₀	Traffic	Summer 2004 Winter 2004-2005	44 60	Monthly Average		Saliba <i>et al.</i> , 2006
North Lebanon							
Chekka	CO	Industrial Urban Area	Jan, May and Sept 2003	Below 10,000	8 Hour	10,000	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	Jan 2003	Peaks up to 37,600 over more than one week	Annual Average	100	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	May 2003	Below 100	Annual Average	100	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	Sept 2003	Peaks up to 1,880	Annual Average	100	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	Jan and May 2003	Below 360	24 Hour	120 360 (EPA standards)	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	Sept 2003	785 to 1,047	24 Hour	120	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	Jan 2003	Peaks at 250	24 Hour	80	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	May 2003	Between 250 and 450	24 Hour	80	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	Sept 2003	Peaks at 170	24 Hour	80	Karam & Tabbara, 2004
Enfeh	CO	Industrial Urban Area	March 2003	N/A	8 Hour	10,000	Karam & Tabbara, 2004
	CO	Industrial Urban Area	April 2003	Below 10,000	8 Hour	10,000	Karam & Tabbara, 2004
	CO	Industrial Urban Area	Sept 2003	Below 10,000	8 Hour	10,000	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	April - May 2003	Peaks up to 188,140 over one week	Annual Average	100	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	Sept - Oct 2003	Peaks up to 18,800 over one week	Annual Average	100	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	March 2003	N/A	24 Hour	120	Karam & Tabbara, 2004

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Region	Parameter	Description	Period	Mean concentration ($\mu\text{g}/\text{m}^3$) ¹	Averaging Period	Maximum Allowable Limits for Ambient Air Pollutants ($\mu\text{g}/\text{m}^3$) (MoE Decision No. 52/1) ²	Reference
	SO ₂	Industrial Urban Area	April - May 2003	Below 360	24 Hour	120 360 (EPA standards)	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	Sept - Oct 2003	3,926 to 4,712	24 Hour	120	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	March 2003	Between 200 and 300	24 Hour	80	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	April - May 2003	Peaks at 180	24 Hour	80	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	Sept - Oct 2003	Below 150 $\mu\text{g}/\text{m}^3$	24 Hour	80	Karam & Tabbara, 2004
Fih	CO	Industrial Urban Area	June- July 2003	Below 10,000	8 Hour	10000	Karam & Tabbara, 2004
	CO	Industrial Urban Area	Aug - Sept 2003	Below 10,000	8 Hour	10000	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	June - July 2003	Peaks up to 188,140 on a single day	Annual Average	100	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	Aug - Sept 2003	Peaks up to 18,800 over one week	Annual Average	100	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	June - July 2003	Below 360	24 Hour	120 360 (EPA standards)	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	Aug - Sept 2003	3,926 to 4,712	24 Hour	120	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	June - July 2003	Below 150	24 Hour	80 150 (EPA standards)	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	Aug - Sept 2003	Peaks at 150	24 Hour	80	Karam & Tabbara, 2004
Kfar Hazeer	CO	Industrial Urban Area	March 2003	Below 10,000	8 Hour	10,000	Karam & Tabbara, 2004
	CO	Industrial Urban Area	July - Aug 2003	Below 10,000	8 Hour	10,000	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	March 2003	Peaks up to 5,644	Annual Average	100	Karam & Tabbara, 2004
	NO ₂	Industrial Urban Area	July - Aug 2003	Peaks up to 18,800 over one week	Annual Average	100	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	March 2003	Below 360	24 Hour	120 360 (EPA standards)	Karam & Tabbara, 2004
	SO ₂	Industrial Urban Area	July - Aug 2003	Below 360	24 Hour	120 360 (EPA standards)	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	March 2003	Peaks at 250	24 Hour	80	Karam & Tabbara, 2004
	PM ₁₀	Industrial Urban Area	July - Aug 2003	Varies between 130 to 170	24 Hour	80	Karam & Tabbara, 2004

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Region	Parameter	Description	Period	Mean concentration ($\mu\text{g}/\text{m}^3$) ¹	Averaging Period	Maximum Allowable Limits for Ambient Air Pollutants ($\mu\text{g}/\text{m}^3$) (MoE Decision No. 52/1) ²	Reference
--------	-----------	-------------	--------	--	------------------	---	-----------

Notes:

- 1: Concentrations were converted to $\mu\text{g}/\text{m}^3$ unless indicated otherwise in the table.
- 2: Pollutants not regulated under the Lebanese guidelines were assessed according to the WHO guidelines as suggested in the IFC guidance, Environmental Air Emissions and Ambient Air Quality, 2007.

Water Resources

Water pollution is defined as the contamination of water bodies by chemicals or other substances present in concentrations greater than the natural conditions.

Water pollution in Lebanon is affected by many driving sources such as population growth, urbanization, economic growth and climate change. Water resources are subject to many pressures leading to deteriorating water quality. These include pressures from solid wastes, pressures from domestic and industrial wastewater and pressures from agricultural runoff (MoE/UNDP/ELARD, 2011). Raw sewage and other domestic and industrial wastes are still being discharged into water bodies in an unregulated and uncontrolled manner (MoE/UNDP/ECODIT, 2011). Bacteriological contamination is a major pollutant of most water resources in Lebanon.

Surface Water

Lebanon has 16 perennial rivers and 23 seasonal rivers. Surface water analysis shows high levels of *E. Coli* and coliforms indicating a contamination with untreated sewage (Hourri & El Jeblawi, 2007; Hamze et al., 2005, MoE/UNDP/ELARD, 2011). Other pollutants include fertilizers and pesticide residues from agricultural runoff as well as heavy metals and hydrocarbons from urban and industrial wastewater (MoE/UNDP/ECODIT, 2011).

Information on whether the industrial plants are treating their wastewater prior to discharge into the respective receptors is scarce; on site pre-treatment is rare. Elevated concentrations of certain pollutants such as heavy metals and cyanide observed in the surface water bodies can be explained by discharge of industrial wastewater without prior treatment (BAMAS, 2005a, 2005b; LRA, 2007-2010; MoE/UNDP/ELARD, 2011, MoE/UNDP/ECODIT, 2011).

No law-enforcement mechanism has been established to date to assure that all industries comply with their respective discharge requirements under MoE Decision No. 8/1/2001. With the recent enactment of the Environmental Compliance Decree (Decree No. 8471/2012), this situation is likely to improve in the near-to-medium future.

Groundwater

The preponderant Lebanese aquifers are karst limestone structures featured by springs and sinkholes. However, the karst limestone is highly fissured allowing the infiltration and diffusion of pollutants from domestic, industrial and agricultural sources.

Groundwater quality data in Lebanon is fragmented and not centralised. The MoEW and UNDP are currently updating the last national groundwater assessment conducted in 1970, considered comprehensive and accurate at the time. The groundwater project will provide baseline data through field surveys and hydrogeological reconnaissance.

Urban expansion, and the increasing need to irrigate crops as wet periods shorten, has led to an overexploitation of wells in Lebanon. Salinity (i.e. concentrations of sodium and chloride) increases in aquifers that are over extracted. Coastal wells are generally subject to salt water intrusion, and many are being put out of service.

Seawater

As reported in the State of the Environment Report (2010), Lebanese coastal waters receive untreated sewage from at least 53 major sewage outfalls spread along Lebanon's 240 km coastline. Coastal waters receive an estimated 162 Mm³/year of untreated sewage, which is equivalent to 65% of the total sewage load in Lebanon (MoE/UNDP/ECODIT, 2011).

Wastewater Management

Wastewater treatment is still problematic in Lebanon. In 2010, 11 wastewater treatment plants were operating and it was estimated that only 13.4% of the 248.2 Mm³/year of raw wastewater generated, were treated prior to disposal. The remaining 86.6% were discharged into valleys, water courses and the Mediterranean Sea without treatment (World Bank, 2011). Although Lebanon has made progress in building Sewage Treatment Plant (STP) along the coast, none except for the Ghadir plant is operating at design capacity.

The quantity of water used by the industrial sector in Lebanon ranges between 150 and 163 Mm³ per year, equivalent to around 11% of the total annual water demand (MoEW, 2010). The projected industrial water demand in 2030 varies between 9% and 16% of the total water demand based on MoEW and World Bank estimates, respectively (MoEW, 2010; World Bank, 2010).

As per the Policy Paper on Industrial Wastewater Management and Compliance published in 2012, the most common uses of water in the industrial sector are 1) washing and cleaning, 2) cooling, 3) process uses, 4) wet scrubbing (if any) and 4) steam generation (MoE/CDR/EFL, 2012a). There is a lack of information on the quantity of water used and wastewater generated by type of industry. The 2010 SOER estimated the quantity of industrial wastewater that may contain a wide range of toxic organic and inorganic pollutants in Lebanon at 43 Mm³/year (MoE/UNDP/ECODIT, 2011). As reported in the aforementioned Policy Paper, the Ministry of Energy and Water (MoEW) estimated that Lebanon produces around 310 Mm³ of wastewater, 250 Mm³ is municipal/domestic wastewater and around 60 Mm³ is industrial wastewater.

The quality of wastewater generated from the industrial sector varies among manufacturing processes. In general, industrial wastewater may contain suspended, colloidal and dissolved (mineral and organic) solids and may be either excessively acid or alkaline (depending on the process). Industrial wastewater may contain inert, organic or toxic materials and possibly pathogenic bacteria.

Sources of data on industrial water quality include studies and audits focused on selected industrial branches. Wastewater from the food industries is highly loaded with organic compounds; the meat processing industries generate wastewater characterized by high BOD levels, total suspended solids, nitrogen and phosphorus. Beverage industries producing non-alcoholic drinks generate effluents with high BOD, COD and TSS loads. Wastewater generated from foundry processes may contain high levels of total suspended solids and heavy metals (Pierson & Pavlostathis, 2000; Roš & Vrtovšek, 2001; Chen & Seng, 2006; MoE/CDR/EFL, 2012a).

It was estimated that tanneries discharge around 40 tonnes of Chromium into the Mediterranean Sea each year. Untreated wastewater from olive mills is discharged into nearby rivers and streams (wadis) with considerable impact on receiving waters (MoE/CDR/EFL, 2012a).

Solid Waste Management

In June 2006, the Council of Ministers (CoM) approved the Solid Waste Management Plan prepared by the CDR, whereby sites for solid waste treatment, composting and landfilling were selected covering all regions in Lebanon. The plan divided the country into four service areas (regions):

- Service area 1: Beirut - Mount Lebanon;
- Service area 2: North Lebanon;
- Service area 3: Bekaa; and
- Service area 4: South Lebanon.

Waste-to-energy plants (incinerators) for large cities, such as Beirut, Tripoli and Saida were introduced by decree of the CoM (1st September 2010). The 2006 plan remained favorable for other regions, without however restricting the possibility of studying the implementation of waste-to-energy technology for these regions.

The CDR has recently (end of 2010) launched a tender for consultancy services to integrate private international companies in solid waste management. The services consist of street cleaning, as well as collection, transportation, recycling and disposal of solid waste (including sludge) by integrating waste-to-energy through incineration.

A waste-to-energy feasibility study is currently being finalized by the CDR. The purpose of the study is to evaluate the feasibility of implementing waste-to-energy facilities as part of an integrated national solid waste master plan. The main rationale behind the need for such facilities is scarce availability of land and the difficulty to identify suitable and socially acceptable sites for landfilling.

Sludge Management

There is no national sludge management strategy. The feasibility of a national “waste to energy” strategy is being assessed, as discussed above, and if found to be feasible, could accommodate the disposal of sludge from WWTPs.

Industrial Waste Management

A large fraction of the industrial waste stream is non-hazardous (packaging, Styrofoam, wood pallets, food residues). The remaining fraction is potentially hazardous, as defined by the Basel Convention. The composition of Lebanon’s industrial waste is poorly documented and efforts to manage industrial waste are small.

As explained in the State of the Environment Report (2010), the MoE prepared three draft decrees on industrial waste management in 2002: (1) licensing and permitting for industrial facilities to dispose of industrial and hazardous waste, (2) classification and management of industrial and hazardous waste and (3) healthcare waste classification. The first two drafts are not approved yet. Only the third one is approved and enacted by Decree No. 13389/2004 (MoE/UNDP/ECODIT, 2011).

Slaughterhouse Waste

Most of slaughterhouse waste is generated in up to 10 centralised slaughterhouses located in Beirut (Karantina), Bourj Hammoud, Tripoli, Baalbeck, Saida, Sour, Jezzine and Nabatiyeh. These slaughterhouses are usually run by the municipality or by an external operator under contract to the municipality or the governor. The slaughterhouses were either primitively designed or built as temporary facilities and none of them currently provides adequate treatment of their waste (blood, internal organs and bones). The only attempt to manage slaughterhouse waste in Lebanon is in Beirut, where the municipality contracted a Lebanese waste contractor to treat the waste onsite using a double-cycle composting plant which produces an organic substrate.

Lebanon's poultry industry is rather developed, producing slaughterhouse waste and poultry litter. To date, very few large poultry industries are equipped with their own rendering plant to process waste. Smaller poultry farms are not treating their waste but recycle some of the litter onsite (MoE/UNDP/ECODIT, 2011).

Olive Oil Waste

The production of olive oil generates two types of waste: Olive Mill Wastewater (OMW) and pomace (a solid residue also known as olive cake). OMW with high organic and phenolic content is usually disposed of in streams and sewers, affecting water and soil quality during the harvest season. The MoE has made efforts to introduce an integrated system for olive oil waste management in Lebanon through hosting the Integrated Waste Management for the Olive Oil Pressing Industries in Lebanon, Syria and Jordan (2005-2008). The cost of environmental degradation from the olive oil production sector in 2006 was estimated at 13.3 million USD including lost fishing revenues, water treatment costs and damages to natural amenities and landscape. MoE has defined environmental limit values for waste from the olive oil industry, as well as environmental guidelines for using treated OMW in irrigation. The total cost of compliance with the prescribed environmental requirements was estimated at 60,000-275,000 USD per olive mill depending on facility size and technology (MoE/UNDP/ECODIT, 2011).

Appendix F Suggested Job Description of the ESMS Officer for Financial Institutions (FI)

The EMS (Environmental Management System) Officer is expected to be someone from the PMU's senior management, and should have sufficient authority and organisational influence to ensure the EMS is properly implemented. He or she should have reasonable background in both environment and finance and be able to perform the following tasks:

- Oversee the FI/PMU's E&S risk management and implementation of EMS;
- Manage resources (budget and staff) for E&S risk management and training;
- Ensure the coordination and integration of E&S risk management procedures with the FI/PMU's internal review process;
- Report any major E&S issues to MoE/WB and secure the support for and approval of E&S risk management issues by MoE/WB;
- Review and approve the FI/PMU's annual E&S performance report to stakeholders, including WB.

Depending on the FI/PMU's organisational structure and business scope, the EMS officer may be supported by one or more EMS coordinators to review or coordinate the day-to-day E&S tasks performed by other staff (i.e., credit officers, environmental and social specialists, and consultants), according to the staff roles specified in the EMS, including:

- Evaluate environmental compliance of a borrowers/sub-projects with applicable requirements during due diligence, such as site visits, collection of necessary E&S documentation (e.g., certificates and authorisations), and preparation of E&S due diligence reports (or an E&S section of the credit application);
- Ensure that all investment decisions are supported by appropriate due diligence documentation, including, but not limited to, an E&S section in each final Investment Memorandum;
- Ensure that appropriate environmental representations, warranties, and covenants are incorporated in each loan or investment agreement;
- Supervise portfolio projects' on-going compliance with the applicable requirements on a regular basis, which may include:
 - Conducting site visits, monitoring the implementation of E&S action plan (if any) by the borrowers, reviewing borrowers' annual reports, and recording borrowers' E&S on-going performance;
 - Resolving E&S issues in case of non-compliance, and where needed, preparing a time-bound corrective action plan with specific follow-up procedures.
- Prepare the FI/PMU's annual environmental performance report, based on the annual performance reports provided by its borrowers/sub-projects;
- Ensure that these procedures are implemented for each sub-project, and that records of environmental reviews (i.e., appraisal and monitoring) are maintained.

Source: Adapted from IFC (2013)

Appendix G List of Participants and Photographs from the Public Consultation Meeting (March 27, 2013)

Table G-1. List of Attendees

Name	Institution	Telephone	E-mail
Public Sector			
Adel Choueiry	Ministry of Environment	01 - 280058	
Bassam Sabbagh	Ministry of Environment	03- 646171	b.sabbagh@moe.gov.lb
Edmond Esta	Ministry of Environment		
Lara Haidar	Ministry of Environment/UNDP	03 - 024284	l.haidar@moe.gov.lb
Olfat Hamdan	Ministry of Environment	03 - 998334	o.hamdan@moe.gov.lb
Rola Sheikh	Ministry of Environment	71 - 332010	rola.sh@moe.gov.lb
Ali Chheimi	Ministry of Industry	03 - 623648	ali1chehimi@yahoo.com
Chantal Akl	Ministry of Industry	03 - 319438	chantalaki@yahoo.com
Dany Gedeon	Ministry of Industry		generaldirector@industry.gov.lb
Ramzi Shasha	Ministry of Industry	71 - 794522	ramzi_shasha@yahoo.com
Jaoudat Abou Jaoude	Council for Development and Reconstruction	03 - 346890	jawdata@cdr.gov.lb
Banking/Financial Sector			
Fadwa Mansour	Association of Lebanese Banks	01 - 970500	fmansour@abl.org.lb
Mario Khoury	Banque du Liban		melkhoury@bdl.gov.lb
Maurice Iskandar	Banque Libano-Francaise	01 - 791332	maurice.iskandar@eblf.com
Nidal Kassis	BLC Bank	01 - 387000	
Ralph Stephan	Kafalat	71 - 132920	ralph@kafalat.com.lb
Sarkis Saleh	BLC Bank	03 - 365969	sarkis.saleh@blcbank.com
Wael Hamdan	Banque du Liban		
Private Sector			
Elias Saliba	Mimosa	08 - 823600	mimosa@mimosa.com.lb
Fouad Jaafar	Ciment de Sibline	03 - 581241	fjaafar@cimentdesibline.com
Ginane Mechref	Marble and Cement Products	01 - 702150	info@marbleandcement.com
Grace El Azar	Holcim	06 - 546109	grace.elazar@holcim.com
Hassane Houssein	Dirani Group	03 - 722783	
Mohammad Abdouni	LeBrasil	03 - 838370	mohamad_amora@hotmail.com
Rana Tabcharani Sali-	Association of Leba-	03 - 940383	ali@ali.org.lb

A programme assisted by the German Government via the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Name	Institution	Telephone	E-mail
ba	nese Industrialists		
Rima Hayeck	Gemayel Freres s.a.l	04 - 980122	rima.hayek@gemayelfreres.com gf@gemayelfreres.com
Saad Oeini	Association of Lebanese Industrialists	01 - 350280	ali@ali.org.lb
Sami Nicolas	Cimenterie Nationale	70 - 769183	sami.nicolas@cimnat.com.lb
Tony Boutros	Wilco PM	03 - 305407	tony.boutros@wilcopm.com
Wahib Tannoury	Mimosa	08 - 823600	mimosa@mimosa.com.lb
NGOs			
Hiam Kreidieh	Window To Environment	03 - 747800	hiamkreidieh@yahoo.fr
Marie Therese Seif	Lebanese Environment Forum	03 - 814370	mtseif4@hotmail.com
Pauline Irani	Araya Environmental Association - Lebanon Eco Movement	03 - 212102	paulineirani@hotmail.com
Rebecca Baissari	Lebanese Environment Forum	70 -717350	rebeccabaissari@hotmail.com
Facilitators/Organizers			
Angela Akl	Environmental Fund for Lebanon/GIZ	03 - 127944	aakl@cdr.gov.lb
Cynthia Kayem	Environmental Fund for Lebanon/GIZ	76 - 301060	ckayem@cdr.gov.lb
Lamia Mansour	Environmental Fund for Lebanon/GIZ	03 - 777134	lmansour@cdr.gov.lb
Ricardo Khoury	ELARD	01-512121 ext 101	rkhoury@elard-group.com



Figure G-1. Photographs of the Public Consultation Meeting

Appendix H List of ESMF Preparers

The following key personnel from ELARD consultancy contributed to the preparation of this report:

Mr. Ricardo Khoury: Senior Environmental Engineer

Mrs. Hanadi Musharrafiyeh: Environmental specialist

Mrs. Nathalie Medawar: Junior Environmental Specialist