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**CAPACITY BUILDING AND ITS IMPORTANCE FOR
THE DEVELOPMENT OF THE ENERGY
SECTOR IN LEBANON**

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Capacity Building and its Importance for the Development of the Energy Sector in Lebanon

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Lebanon Cross-Sectoral Energy Efficiency and Removal of Barriers to ESCO Operations

UNDP/MEW Project LEB/99/G31

Abstract

The energy sector in Lebanon experiences a number of critical barriers that hinder the formulation, adoption and implementation of end-use energy efficiency and energy conservation initiatives. The proposed project aims at removing these barriers while initiating and setting the stage for follow-on investments. This will be achieved around the establishment of the overall institutional point responsibility for energy conservation and planning issue in Lebanon through the creation of a multi-purpose Lebanese Centre for Energy Conservation and Planning. The Centre, which is expected to be a "soft" and flexible institutional set-up, will simultaneously undertake barrier removal activities and provide energy efficiency services to the public and private sector industries as a set in becoming an independent, commercially viable private corporation.

As the major focus of the project will be the exchange of information through different training modules, sessions, and conferences, it is important to start from the beginning with a clear understanding of the present situation in order to accelerate the preparation "Capacity Building" phase of the project. During the first phase of the project, the core teams will assess the energy country situation and the training needs (institutional and private sectors, EDL and Energy Center teams). Furthermore, in order to reinforce the communication and exchange of information, the "Energy Center" spreading permanently the information between project teams.

This project aims at developing the Energy Center in the MEW. The LCECP proposes to hold all training sessions in the MEW "Energy Center" and in dedicated training MEW center.), in order to multiply its effects within each one of the concerned sub sector, the LCECP proposes an approach by which some training module and the related training sessions would be established as train-the-trainers sessions: each trained staff or administration representative from EDL, "Energy Center", ESCOs, MEW and University will leave the training center with a complete set of training materials (guidebooks in English or French, and slides in Arabic language) and a knowledge that will allow him to replicate this training inside the concerned companies and/or institutions. The project will then have to focus on a precise selection of participants to training sessions (for their training skills abilities). This approach should have a major effect on the spreading of the strategic information during the whole process of the project. Study on Legal and Regulatory Framework for foreign investments in Energy Efficiency, Seminars on energy efficiency and renewable energy are some examples.

1- PROJECT BACKGROUND

In 1992, after the end of 17 years of civil strife, the Government of Lebanon launched an emergency rehabilitation and reconstruction plan for the country. The most prominent component of this plan was the rehabilitation of the country's electricity sector, which to date has consumed 33% of the reconstruction budget. Investments increased power production capacity from 600 MW in 1992 to 1400 MW in 1998 and a target of 2000 MW for the year 2000. However, with an estimated yearly growth rate of 4-6% in energy demand, interest in end-use energy efficiency and conservation are being seen as a viable alternative to meet growth in demand.

Lebanon, however, has no former experience with such endeavours and lacks the mechanism and framework for the definition and undertaking of end-use energy conservation schemes. Consequently, a number of critical barriers exist at present, which could prevent any intentions at end-use energy conservation. For measurable and sustainable energy savings to be achieved a mechanism needs to be established and barriers need to be removed.

The goal of this project is, therefore, to reduce GHG emissions in Lebanon by improving demand side energy efficiency through the creation of a multi-purpose Lebanese Centre for Energy Conservation and Planning. The Centre, which is expected to be a "soft" and flexible institutional set-up, will simultaneously undertake barrier removal activities and provide energy efficiency services to the public and private sector industries as a set in becoming an independent, commercially viable private corporation. There will be a broad range of supporting activities including information dissemination, awareness programmes, and policy analysis and programme design.

The current project will work to strengthen the capacity of the Government of Lebanon to implement and sustain long-term energy efficiency efforts that have a well-documented positive impact on the global as well as the local environment. The proposal is also in line with Lebanon's sustainable development objectives and is being seen as a corner-stone initiative that is vital for the effective re-organization and efficient operation of the energy sector.

2- BARRIERS

The energy sector in Lebanon experiences a number of critical barriers that hinder the formulation, adoption and implementation of end-use energy efficiency and energy conservation initiatives. The proposed project aims at removing these barriers while initiating and setting the stage for follow-on investments. This will be achieved around the establishment of the overall institutional point responsibility for energy conservation and planning issue in Lebanon – a framework that, to-date, has never existed. The barriers that the project addresses are presently the following:

2.1 Information Barriers

- a) Shortage of data on patterns of end-use energy consumption in all the sectors of the economy. In the electric power sector for example, customer load research to identify impact on different end uses on system load profile cannot be determined and as such targeted for efficiency and load management programs.
- b) Lack of documentation regarding the economic, environmental and social implications of end-use energy conservation on a national as well as on a sectoral level.

2.2 Awareness Barriers

- a) Decision maker scepticism about the social, environmental and economic benefits, resulting from the introduction of energy conservation measures and policies.
- b) As a result of lack of institutional point responsibility as well as relatively low energy pricing, a low level of general and specific awareness and motivation exists on the part of both consumers and industrial and commercial managers towards energy efficiency.
- c) No general public awareness of issues pertaining to energy efficiency and conservation.

2.3 Economic and Financial Barriers

- a) Unavailability of financing. There are no dedicated financing schemes or special incentives provided for energy efficiency initiatives. This barrier is especially important due to the high capital investment costs needed of some interventions that require the installation of specialized equipment.
- b) With insufficient financial incentives to invest in energy efficiency equipment, no local market has developed for energy efficient measures and equipment.
- c) No market currently exists for energy efficiency services.

2.4 Institutional Barriers

- a) Absence of institutional focus: there is no entity with the mandate or responsibility to monitor the nation's efficiency and to design policies and programs to improve it.
- b) No explicit national policy currently exists to promote more efficient use of energy.

2.5 Capacity Barriers

- a) Throughout the country, and specifically within MEW, there are very few people who are knowledgeable about energy efficiency. This covers all aspects of efficiency to manufacturing and labelling of efficient products to identifying and implementing potential measures.
- b) Insufficient capacity among relevant Government and private entities to audit, monitor and plan energy efficiency options and interventions.

3 – CAPACITY BUILDING

3.1 Overview of on-going initiatives in the energy sectors in Lebanon

As the major focus of the project will be the exchange of information through different training modules, sessions, and conferences, it is important to start from the beginning with a clear understanding of the present situation in order to accelerate the preparation “Capacity Building” phase of the project. The LCECP has already started to collect updated information on the situation of Energy Sector and Renewable Energy in Lebanon in order to clearly assess the first key issues of the “Capacity Building Programme”.

This rapid overview of the Lebanese Energy situation regarding the Building and Industry sectors shows significant differences in the need of Energy Efficiency actions within each sector and sub sector. The LCECP will then focus its work on developing common approach per sub sector (example: Hotels,

Commercial buildings, Residential Buildings, ...) with interlinked strategies (at macro and micro economic levels) and try to benefit as much as possible from present results of the more advanced countries of the region. On the other hand, as the project is essentially ESCOs company oriented, the focus will be put on a permanent knowledge sharing process for the companies and the Lebanese institutions (EDL, MEW...) through the training sessions, the project web-site, and the thematic conferences.

The overall project approach will be based on a transfer of experience through a train-the-trainer approach with emphasis on maximum exchanges of information and experiences between European, USA and regional as well as Lebanese Experts and companies (realised during training sessions). Furthermore the mobilisation of appropriate international and national capacities will provide key assistance at institutional and technical levels for specific energy efficiency actions (conference, ownerless campaigns).

3.2 Project organization and capacity building programme

Because the policy making issues of the present project will be of major importance, the project will focus on creating a permanent link between the different teams that will work together and the beneficiaries of the project. The overall organization of the project will be organized around:

- The LCECP "Energy Center"(all tasks);
- The Backstopping Agency and medium terms experts and short experts responsible for preparation of actions;
- The Training Teams: composed of medium and short term experts selected, depending on requirements, from a pool of experts.

3.2.1 A set of core teams of key experts assisted by a large in-house pool of experts

During the first phase of the project, the core teams will assess the energy country situation and the training needs (institutional and private sectors, EDL and Energy Center teams). Based on the analysis produced sector by sector, the LCECP with the assistance of the training coordinator will design specific training teams (composed of diagnostic core teams and short term experts chosen for their specific skills). It appears very important that during the whole process a constant link is maintained between all the different expert teams. The Project Manager will be responsible for securing the global process coherence. In addition, the training coordinator will secure the information capitalisation and the transfer of experience from the on-site practical diagnostics to the definition of the more theoretical and practical training modules and guidebooks.

3.2.2 A permanent link with the LCECP "Energy Center"

Furthermore, in order to reinforce the communication and exchange of information, the "Energy Center" spreading permanently the information between project teams.

This web site will provide transparent information of project progress.

3.2.3 A dedicated MEW training center

This project aims at developing the Energy Center in the MEW. The LCECP proposes to hold all training sessions in the MEW "Energy Center" and in dedicated training MEW center.

3.2.4 A train- the-trainers approach

Due to the limited capacities of the project (due to budget constraints), in order to multiply its effects within each one of the concerned sub sector, the LCECP proposes an approach by which some training module and the related training sessions would be established as train-the-trainers sessions: each trained staff

or administration representative from EDL, "Energy Center", ESCOs, MEW and University will leave the training center with a complete set of training materials (guidebooks in English or French, and slides in Arabic language) and a knowledge that will allow him to replicate this training inside the concerned companies and/or institutions. The project will then have to focus on a precise selection of participants to training sessions (for their training skills abilities). This approach should have a major effect on the spreading of the strategic information during the whole process of the project.

a) Preparation of training modules and train-the-trainers sessions

Objectives

- To convert the initial diagnostic into a coherent set of training programmes;
- To integrate into the programme the experience and best practices from USA and European countries and the region.

Common action plan:

- The preparation of training modules will be organized by specialized experts.
- The closing seminar will be organized at the project dedicated training center of MEW.
- The training sessions will be organized on the basis of general sessions covering common themes and smaller workshops covering more specific issues per group of and sectors of activity.
- Each participant will leave the training session with a guidebook (in English or French) allowing him to replicate the training in his institution or company, in order to spread the information received and to multiply at the same time the effects of the present training modules.

b) Study on Legal and Regulatory Framework for foreign investments in Energy Efficiency

Objectives

- Conduct an in-depth study per sector on legal and regulatory framework barriers to foreign investments in Energy Efficiency;
- Propose recommendations to improve the legal frameworks, in order to facilitate new entrants of ESCOs on Energy Audit markets and transfer USA and European "Best practices".

c) Seminars on energy efficiency and renewable energy

Objectives

- Create a major event strengthening the exchanges of information and cooperation between USA, European and local ESCOs;
- Constitution of a favourable institutional context to ESCOs;
- Impulse a dialogue between companies, institutions and political decision makers.

The seminary will include (for example):

- Presentation of study results in USA, Canada and European experience;
- Workshop

3.3 Capacity-building activities for general audiences throughout the country implemented.

Assess the training needs for various targets in the industrial and commercial sectors. The target audiences should include top management, plant managers, plant and building engineers, equipment operators, maintenance and repair personnel, as well as relevant technical and management personnel within the various ministries, such as the Ministry of Industry, Ministry of Planning and the Ministry of Economy.

Based on the assessment, develop a priority list of training courses and an approximate schedule for the courses. An illustrative list of courses might be the following:

- Energy Management for Companies (plant managers, engineers and technicians)
- Energy Management for Executives
- Energy Accounting
- Boiler Efficiency Improvement
- Steam System Efficiency Improvement
- Electric System Efficiency Improvement
 - Lighting Efficiency Improvement
 - Power Factor Improvement
 - Boiler Water Treatment
 - Waste Heat Recovery
 - Energy Efficiency Financing
 - Energy Measurement and Instrumentation
 - Air Conditioning and Refrigeration

Conduct the technical training courses.

Prepare a training evaluation program to reflect on the course effectiveness. Course completion certificates should also be given to each participant. The evaluation should take place at the workplace. Identify study tours at the regional and international levels targeting the concerned government and non-government institutions including the private sector.

The Group training components include:

- Initiation workshop
- Business transformation seminar
- Energy Services and business practices
- Audit training
- DSM training
- Load research training
- Local manufacturers training
- Standards and Labels training
- Customs training
- ESCOs training

4 - CONCLUSION

Following barrier removal, an adequate policy and market environment, as well the needed capability to capture existing and emerging opportunities for cross sectoral energy savings will exist in Lebanon

Skills with regards to energy efficiency and energy planning will have been developed.

Policy recommendations (with high level support) for legislative and other action will have been established.

Targeted information materials and programmes regarding energy efficiency based on documentation of cost-effectiveness of energy conservation options for various sectors and technologies will have become available.

Human capacity to identify and capture energy savings opportunities with technical, financial and policy measures will exist and consumer and policy maker understanding and support for energy conservation will have been established.

In short a national energy conservation plan will exist under the auspices of national energy planning.