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**A Generic Approach for a Comprehensive Capacity Building of a Sustainable Energy Sector**

**Case Study for Lebanon**

Republic of Lebanon  
Office of the Minister of State for Administrative Reform  
Center for Public Sector Projects and Studies  
(C.P.S.P.S.)

***BY***

**Eng. Chafic ABISAID**  
**Energy Consultant**

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### Abbreviations/ Acronyms

CoM	Council of Ministers
D&D	Development & Demonstration
DMS	Demand Side Management
ERB	Energy Regulatory Body
EIRB	Electricity Regulatory Body
ESCos	Energy Services Companies
ESCWA	Economic & Social Commission for Western Asia
EU	European Union
GEF	Global Environmental Facility
IBRD	International Bank for Reconstruction & Development
IEC	International Energy Council
IRP	Integrated Resource Planning
MEW	Ministry of Energy & Water (Lebanon)
MHER	Ministry of Hydraulic & Electrical Resources
MHR	Ministry of Hydraulic Resources
MoE	Ministry of Energy
MoP	Ministry of Petroleum
NEMS	National Energy Modeling System
NGOs	Non Governmental Organizations
OMSAR	State Ministry for Administrative Reforms
RB	Regulatory Body
R&D	Research & Development
RD&D	Research, Development & Demonstration
UNDESA	United Nations Department of Economic & Social Affairs
UNDP	United Nations Development Program
WEA	World Energy Assessment
WEC	World Energy Council
WSS	World Solar Summit

## **1-INTRODUCTION**

The Sustainable Development & Production Department at the ESCWA, within its efforts to move toward a more sustainable energy sector in the ESCWA member countries, is organizing this Expert Group Meeting on "Capacity Building & Regional Integration with respect to the Development of a Sustainable Energy Sector in the ESCWA Member Countries" held in Beirut/ Lebanon during the period of 15-17 October, 2002.

In line with the main objectives of the meeting, my presentation is entitled: "***A Generic Approach for a Comprehensive Capacity Building of a Sustainable Energy Sector - Case Study for Lebanon***".

The paper examines the following elements conducive to a comprehensive capacity building of a sustainable energy sector:

- a) "*Main Institutional prerequisites*" for strengthening national capacity building, specifying the aim and role of each institutional set-up.
- b) The modality of a "*National Energy Master Plan*" to be prepared, based on "specific energy needs", as well as the role of universities & research centers.
- c) Lessons learned and/ to be learned from "*Regional Integration Projects*" on sustainable energy development.

4- Technical and/ or financial "*International Assistance Sources available*."

5- "*Case Study for Lebanon*", exposing present institutional set-up versus institutional proposals.

## **2- Energy Sector Approach**

The energy sector encloses all forms of energies. Energy issues must be approached as a comprehensive entity, within the concept of sustainable development.

An essential step for sound planning is to consider the energy sector, as a whole, and collect, analyze, assess and supply information on the interrelations of the relevant variables with which planners and decision makers need to deal, in order to give them a comprehensive view of the dynamics of the energy system and help them develop energy strategies (1).

The ***National Energy Strategy***, that ought to be developed by every country, should aim at satisfying & optimizing the Supply (Primary & converted) / Demand (End-use) balance of the various sectors of the economy (1).

Electric energy for instance is a by-product of an energy chain, as such; it is chained technically, environmentally, economically and socially to the primary energy with an unbroken link. Hence, it should not be viewed and assessed as an independent sector.

This practice should extend to the national institutions dealing with the energy sector.

An energy law should supersede an electricity law or a fossil fuel law.

An energy ministry should supersede an electricity ministry or a petroleum ministry.

### **3- National Institutions**

Irrespective of whether the energy sector is publicly owned or managed, or privately owned or managed, an “**Energy Ministry**” must be created to deal with the energy system as a whole.

Since the present world trend favors “ privatization of the energy services, namely, electricity, gas and petroleum products, the national institutions in the ESCWA countries should, in my view, center around three main separate institutions:

- I) Energy Ministry.
  - II) Energy Regulatory Body.
  - III) Energy Services Companies (ESCOs).
- I) Energy Ministry (MoE):

The aim of MoE is to secure the availability of all forms of energy (electricity, gas, fossil fuels, renewable energies, ...) all over the country territory, develop energy resources and their uses and preserve natural resources in line with sustainable development principles (2).

The role of MoE is to:

- 1- Collect all necessary information related to all energy components.
- 2- Define and monitor Government energy policies.
- 3- Prepare a “ National energy strategy.
- 4- Establish and operate a computer based “*National energy-economy modeling system (NEMS)* “ of energy markets.
- 5- Enhance & supervise regional cooperation and integration.
- 6- Encourage and support energy services companies (ESCOs).

## II) The Energy Regulatory Body (ERB):

The aim of the ERB, or Higher Energy Council (HEC), is to ensure that the Governments objectives and policies for the development of the sector are met in an orderly and timely manner (3).

The role of the ERB should be defined in an “Energy Law” in each country, namely, the rights and duties of a regulatory agency and its relationships with the government, consumers and the industry it regulates.

An ERB needs to be independent in both principle and practice, impartial & transparent in its dealings.

The energy law normally gives the ERB the authority to issue licenses and to handle consumer protection, consumer service, regulation and impose penalties.

The ERB is, therefore, an independent body to be appointed by the government, for a certain period, to supervise and monitor the entire energy sector, in line with the government sector policy.

## III) Energy Services Companies (ESCos)

Energy Services Companies (ESCos) are private and / or public-private companies.

The aim of (ESCos) is to provide engineering consultancies and implementation services in energy management and energy savings. This aim complies with governments’ policies and strategies.

To sustain this aim, governments tend to develop an adequate policy and market environment for a cross-sectoral energy efficiency and removal of barriers to energy services companies (ESCos). A special department within the premises of the “Energy Ministry”, to support the launching and consolidation of ESCos, is a welcome institutional set-up.

The role of ESCos is:

- 1- The establishment of operational sustainable mechanisms to define end-use energy conservation planning and programs, and the implementation of these mechanisms.
- 2- The activation of market forces to bring about options for cost effective energy savings to all sectors.
- 3- The setting -up of specific financing mechanisms to create incentives for investments in energy interventions and technology .

4- The development of skills with regard to energy efficiency and energy planning (4).

#### **4- National Energy Master Plan**

To thread along the right path, a “Comprehensive national energy master plan”, based on “*Specific Energy Needs*”, must be prepared and constantly updated.

The document should be established, in my view, in the following order:

1) Collect information & data on energy supply/ demand and related activities on a national/ regional level and establish a “Database.

2) Establish a comprehensive “*Energy master plan, comprising:*

2.1) Energy resources (existing & potential) and technological options, stressing renewable energies.

2.2) Energy end-use efficiency/ diversification/ demand side management (DMS) and integrated resource planning (IRP).

2.3) Policies decisions and institutional development.

2.4) National programs and regional energy sharing proposals.

2.5) Capacity building needed and barriers removal requirements.

2.6) Awareness campaigns levels and scope.

2.7) Research & development (RD), as well as development programs required.

The proposed “database” and master plan must be periodically revised and updated.

The preparation and implementation of parts of the “Master Plan” in each country may preconceive expected assistance from local non-governmental sources and external agencies. Needed technological expertise and financial assistance from the developed countries may be sought by the developing countries.

#### **5- Role of Universities & Research Centers**

Research, development and demonstration (RD&D) are essential to accelerate the transition to a sustainable energy system. RD&D can lead to breakthroughs in removing technical bottlenecks (5).

Developed countries have, and continue, to spend a lot of funds, efforts and experiments on research and development (R&D) in the energy sector. The ESCWA countries, being in the development stage and generally limited in surplus funds, should each focus its efforts on its *specific needs* mainly, development and demonstrations (D&D), and profit from the research results and recommendations of the developed countries.

The “Energy Ministry” in each of the ESCWA countries is expected to collaborate and cooperate with universities, universities faculty and national research centers to orient their research themes to each country’s specific needs, namely:

- 5.1) Development and demonstration (D&D) studies.
- 5.2) Capacity building and master plan studies in the totality of the energy sector.
- 5.3) Technology transfer.
- 5.4) Digestion & adaptation of external research to local conditions.

## **6- Regional Integration Projects (Lessons learned/ to be learned)**

Intergovernmental cooperation in the area of energy policy formulation and analysis, research development and demonstration (RD&D), integrated resource planning and sharing, environmental protection and promoting the role of the private sector, as well as commercial cooperation, should be a welcome goal within the ESCWA/ regional countries.

To help formulate and establish the modality of this regional integration, a brief review of regional projects implemented and proposed, as well as a typical example of regional integration carried out by others, follows:

6.1) A pioneering project in regional cooperation started in 1996 and is coming shortly to a close.

This project (RAB/96/005) entitled “Sustainable Energy in the Arab States”, has included a number of activities in the area of renewable energy use, demand-side management and energy efficiency and integrated resource planning for electric utilities. These activities, which sponsored international workshops, have taken the form of UNDP-supported projects in many Arab States and generated considerable enthusiasm for Integrated Resource Planning in the countries of the region (6).

Since then, a number of Middle Eastern countries are collaborating on plans to share energy resources, including electricity generation resources (through construction of additional international power lines) and gas resources (through the use of international gas pipelines). These international infrastructure developments (and potential developments) have, along with national IRP experience in individual countries and international workshops sponsored by the UNDP regional project RAB/96/005 and other initiatives, inspired interest in the countries of the region in collaborating on a “**Regional Integrated Resource Planning**” effort.

There is at present a project proposal, with an overall goal to take IRP to the regional level in the Arab States, to be supported by UNDP and/ or other UN agencies (6).

6.2) The “European Energy Charter” adopted in the concluding document of the Hague conference on the European Energy charter, dated 17 December 1991, followed by the “Energy Charter Protocol” on energy efficiency and related environmental aspects, dated 17 December 1994, and other protocols that came after, aimed at promoting regional integration in the entire “energy cycle” to develop, convert and use energy as economically, efficiently and environmentally soundly as possible and enhance optimal energy policies and foster cooperation (7).

Such a charter should be a prototype to be *adopted and adapted* to regional integration in the energy sector.

Legally binding protocols, along the lines of the European energy protocol, but adapted to the countries specific needs and conditions, is to be elaborated. The proposed protocols should enclose all forms of data and logistic exchange, development and demonstration, cooperation, resource conversion sharing, optimum end-use harmonization and market integration. They should also include modalities of different technical and financial assistance.

It may be useful here to mention, that the European Members established also “ The Council of European Energy Regulators (CEER) for both electricity and gas to foster cooperation between national regulators to achieve competitive European markets in electricity & gas, and help emerge and disseminate the best “regulatory practice”.

## **7 International Assistance Sources**

Demand management, environmental protection and efficient energy supply are global goals requiring common strategies and international cooperation.

International assistance in various forms and from different sources is available to the countries in need.

To mention a few:



a) The “seven major electricity companies ( the E7)<sup>1</sup> signed, in their meeting at James Bay - Quebec, on April 8 & 9 1992, a “Joint Statement”, in which the utilities pledged- among other pledges - to set up a “ joint network of expertise which will improve cooperation between the (E7) utilities, and *act as an ecological, technical and industrial advisory group* for supranational institutions and governments, especially in the developing countries (8).

b) The German Agency for Technical Cooperation (GTZ) affiliated to the German Ministry for Economic Cooperation (BMZ) is another international agency helping in the region.

c) The related United Nations agencies: UNDP, UNDESA, UNESCO and others.

d) The International Bank for Reconstruction & Development (IBRD) and its related agencies, in particular, the Global Environmental Facility (GEF), the International Energy Agency (IEA) and the World Energy Council (WEC).

e) The European Union (EU) through direct protocols or related agencies, such as MEDA.

f) Direct governments assistance and other NGOs.

## **9- Case Study- Lebanon**

### **1)- Present Institutional Set-up:**

a) The law no 247 dated 7/8/2000 canceled:

a.1) The Ministry of Petroleum (MoP), created by the law no 9/73 dated 31/12/1973, and merged the general directorate of petroleum, and its structure and human resources, with a newly created Ministry of Energy & Water (MEW).

a.2) The Ministry of Hydraulic & Electric Resources (MHER), created by the law no 20/66 dated 29/3/1966, and merged the general directorates of water & electric equipment and of tutelage , and their structure and human resources, with a newly created Ministry of Energy & Water (MEW).

b) A draft law to restructure MEW was completed on 10/12/2001 by a joint committee from both the Ministry of State for Administrative Reform (OMSAR) & MEW. The draft law, as it concerns all forms of energy, proposes to:

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<sup>1</sup> The E7 group members are: EDF (France), ENEL (Italy), Hydro-Quebec (Canada), KANSAI (Japan), Ontario Hydro (Canada), RWE (Germany), Southern California Edison (USA) and TEPCO (Japan).

b.1) Cancel the existing three general directorates of petroleum and of water & electric equipment and of tutelage and merge the petroleum, gas, electricity and renewable energies, into a “**Unified General Directorate of Energy (GDE)**”.

b.2) Establish within the GDE three directorates:

- Directorate of electricity (electricity & renewable energies).
- Directorate of petroleum (petroleum & gas).
- Directorate of studies (studies & research, technical specification & safety and protection of natural energy resources).

b.3) Confine the tasks and responsibilities of MEW to collect and establish an energy database, define and follow up the execution of government’s energy policies and establish and operate a national “energy-economy” modeling system (NEMS).

b.4) Provide for the future privatization of any part of the energy sector by the creation of an “*Energy Regulatory Body (ERB)*” to implement, control and monitor government’s policies regarding the energy sector.

c) Ratified a new electricity law (ratified by the Lebanese Parliament on 7/8/ 2002), This law:

c.1) Classifies the electric energy as an economic and strategic product and considers the activities, related to the generation, transmission and distribution functions, each independent from the other functionally, administratively and financially.

c.2) Keeps the transmission function with the public sector, with a possibility of contracting to the private sector to manage or operate or equip the transmission activities.

c.3) Creates an “Electric sector Regulatory Body (EIRB)”, an independent body appointed by the CoM, to reorganize and supervise the electric sector, grant permits and permissions to those, in the public and private sectors, possessing the conditions and requirements fixed by the EIRB.

## **II)- Institutional proposals:**

Lebanon is relatively rich in natural water resources. Numerous water projects need be implemented (Small dams & lakes, water wells, irrigation schemes,...). Water networks must be maintained and expanded, rational use of water requires modern management, technological development and awareness campaigns.

In addition, complex waste water projects and water treatment projects.... are urgently needed.

Lebanon does not possess any petroleum resources. Prospects for natural gas wells are slim. Renewable energies are limited to solar energy, slight wind energy and some man produced biomass.

As such, the following “institutional proposals” are suggested:

- a) Split MEW into two separate Ministries:
  - a) The Ministry of Hydraulic Resources (MHR) and
  - b) The Ministry of Energy (MoE).

B) Review the “*Draft MEW restructuring law*” for both MHR and MoE. As for the Ministry of Energy (MoE):

B.1) To include a **General Directorate of Energy**, whose tasks are to establish energy database, define energy policies & sector strategies and provide a national energy modeling system linking all forms of the energy chain (supply/ conversion/ demand) to the macro-economy.

B.2) To be linked to an Energy Regulatory Body, whose tasks and responsibilities are to implement governments energy policies, control and monitor the entire energy sector.

C) Replace the recently ratified “*new electricity law*” by a **new energy law**”, and the “*Electricity regulatory body (ERIB)*” by an “**Energy regulatory body (ERB)**”, securing the basic link between the electricity energy and the primary energy and ensuring the success of a national energy strategy.

D) Ratify regional cooperation and future energy integration as proposed in (6) above.

E) Prepare an action plan for international assistance as detailed in (6&7) above, if and when needed.

## **9- Results, Conclusions & Recommendations**

Within the framework of a comprehensive outlook for energy, in its various sources, forms, conversions and uses, the paper presents a generic approach for a comprehensive national capacity building of a sustainable energy sector in the ESCWA countries.

The paper outlined the required basic national institutional set-up capable of reaching the desired capacity building, together with the aim and role of each.

The paper stressed the necessity of the preparation of a complete *national energy master plan*, and clarified the cooperative and coordinative role between the Energy Ministry, the universities and research centers in the fields of energy.

Regional integration projects that have been implemented or proposed, as well as typical regional projects implemented in other areas, may be taken as prototypes to be adopted and adapted within the ESCWA countries. Also, promising sources of technical and financial assistance have been advanced.

Lebanon was taken as a case study, where present institutional set-up versus institutional amendments proposed were analyzed.

The paper confirmed the comprehensive and the trend to unite all forms of energy under a single institutional and organizational roof, represented by the *Energy Ministry*, instead of fragmenting it into parts, as for example, the creation of an electricity ministry, and a second for petroleum and a third for gas.

The paper suggests that, in case privatization is adopted, each government must appoint an "Energy regulatory body", and grants it large authority and independence to implement government policies.

To realize government policy in the field of energy efficiency and its rational use, the paper recommends that governments help launch "Energy services companies (ESCOs)", irrespective of whether the ESCOs are private or private-public, and support them.

In spite of the energetic differences within the ESCWA countries, and the variations in their needs and capabilities, the demanded institutional set-up is greatly similar, more so, in case the trend is towards privatization of the sector.

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