

National Energy Efficiency Action Plan
LCEC – Lebanon

Presented by

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Preface

The Arab EE Directive has been developed jointly between the League of Arab States (LAS), MED-EMIP and RCREEE based on the Directive 2006/32/EC of the European commission (EC) on energy end-use efficiency and energy services.

Through the framework of the Arab EE Directive, the Arab countries who are interested in adopting the directive are requested to set EE target and assign an existing or a new public entity to draw or apply a 3 year National Energy Efficiency Action Plan (NEEAP). The public sector should lead by example (exemplary role) and power utilities should provide services or contributing to a fund to implement EE measures. An annual progress report will be submitted to the League of Arab states RCREEE showing the achieved savings..

This document developed jointly by RCREEE and MEDEMIP proposes a template and structure to report the salient features of the first NEEAP. The latter will be prepared for the first three year reporting period 2011-2013 by national entities. The template is not mandatory but a tool to assist the stakeholders to communicate essential measures and impact of their NEEAPs and will also assist RCREEE to summarize and analyze the results to be published on an annual basis by the Arab League.

The objective of this template is to report already ongoing or planned measures to generate, transmit, distribute and use electricity more efficiently in order to meet any indicative national energy efficiency target that may be, or has been already stated for the 1st NEEAP period of three years 2011-2013.

RCREEE, as a regional platform promoting the development and harmonization of energy efficiency policies in the MENA region, with the support of the Arab League, will play an important role in providing technical assistance on the subject area to the Arab member states.

RCREEE will assist the Arab states in drafting their NEAAPs, discussing and assisting them in assessing the impact of national EE targets and supporting them in jointly identifying cost effective EE measures. Moreover, RCREEE will contribute in developing methodologies to measure and quantify the energy saving impact of the NEEAP's according to the recommendations framed in the Arab EE directive. RCREEE will furthermore explore various strategies to monitor progress of implementation of NEEA's, formulating recommendations for effective delivery mechanisms, participating in and providing input to various technical committees.

RCREEE will jointly explore with LAS and entities participating in implementation of the Arab EE Directive to apply and register for nationally appropriate mitigation actions (NAMA) as a basis for international recognition of many meaningful measures under NEEAP, that can be build under the existing Clean Development Mechanism (CDM) and may even fit into a regional program of activity type CDM measure.

List of Symbols

BoL	Central Bank of Lebanon
CDM	Clean Development Mechanism
CDR	Council for Development and Reconstruction
CEDRO	Country Energy Efficiency and Renewable Energy Demonstration Project
CFL	Compact fluorescent lamps
CSP	Concentrated solar power
EDL	Electricite du Liban
ESCO	Energy Services Companies
EU	European Union
GEF	Global Environment Facility
IPP	Independent power producers
IRI	Industrial Research Institute
LAS	League of Arab States
LCEC	Lebanese Center for Energy Conservation
LIBNOR	Lebanese Standards Institution
MED-EMIP	Euro- Mediterranean Energy Market Integration Project
MED-ENEC	Euro- Mediterranean Project on Energy Efficiency in the Construction
MoF	Ministry of Finance
NEEREA	National Energy Efficiency and Renewable Energy Account
PV	Photovoltaic
RCREEE	Regional Center for Renewable Energy and Energy Efficiency
UNDP	United Nations Development Program
USAID	US Agency for International Development
WB	World Bank

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1. Overview: Overall national indicative target

1.1 Key indicators

No	Indicator	Unit	Year 2010	Year 2020 ¹
1	Electricity intensity	GWh/\$ ²	0.44kWh/\$	0.42
2	National end use electricity consumption ³	GWh/year	15000*	
3	Projected electricity consumption growth rate ⁴	% /year	7**	
4	Share of electricity in final energy consumption ⁵	%	47	
5	Share of electricity consumption by sector ⁶			
	Sector 1 Industrial	26%	3900 GWh	5% reduction in growth rate
	Sector 2 Building	38%	5700 GWh	
	Sector 3 Governmental	17 %	2550 GWh	
	Sector 4 Others + losses	19 %	2850 GWh	
6	Marginal cost of kWh supplied (2011-2013) ⁷	\$/kWh	21 cents/kWh [3]	

* MEW/EDL anticipated demand, production and purchases: 11522 GWh

** MEW: new 150MW by 2014, and 1000MW after 2014, in addition to around 200MW from rehabilitation

1.2 Indicative target

The national indicative target is to be calculated according to paragraph 1.4 and the sectorial indicative targets will be estimated based on the sectors baseline and the sector EE measurers reported in chapter 2 in order to meet the national target.

	Baseline consumption GWh/5 years average	National indicative Energy Efficiency target			
		2020		2013 (First NEEAP) 3 years	
		%	GWh	%	GWh
Total					
Sector 1	Industrial – 3627 GWh	5		2	80 [3]
sector 2	Building – 5570 GWh	5		12	1000(SWH)
Sector 3	Governmental – 2500 GWh	5			

¹ Official projection by the power industry or national Bureau of statistics or any other entity

² LC: GDP in local currency at current prices

³ The amount of electricity in GWh that has been supplied by public or private power plants to national transmission and distribution systems, or in the case of captive power plants used for own consumption. In this definition transmission and distribution networks are considered consumers of electricity since technical losses occur. Import of electricity has to be accounted for as well.

⁴ The average growth rate for the next 10 years 2011 to 2020 as reported by authorities

⁵ Based on the national electricity consumption, the national average Gross Heat Rate of power plants and the national primary energy consumption as published in the official energy intensity indicator reporting of a nation

⁶ Sector will be classified according to utilities statistics and as published in the annual power industry reports

⁷ The average generation costs for the next power plants or power blocks to be built in the reporting period based on given design fuels and predicted fuel prices using regulator approved life cycle cost analysis with assumed ROI and weighted average capital costs.

1.3 Name of mandated national entity and contact person

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1.4 Calculation methodology of the baseline electricity consumption and the national indicative electricity savings target for 2020

- Member States shall use the end use electricity consumption for the most recent five year period previous to the implementation of this Directive for which official data are available, to calculate an average amount of annual electricity consumption as per footnote 3.
- This electricity shall constitute the average amount consumed during the five-year period, not adjusted for degree days, structural changes or production changes.
- On the basis of this average amount of electricity consumption, called the baseline consumption, the national indicative electricity savings target shall be calculated for the total duration of this Directive

Example-1: If the five year averaged national end use electricity consumption has been 10,000,000 MWh and the indicative target for 2020 has been set at 20% than $10,000,000 \times 0.20 = 2,000,000$ MWh of electricity need to be saved through projects listed in the NEEAP until the end of 2020.

The indicative electricity savings target in MWh for 2020 should be supported by measures listed and described in the national NEEAP. The calculation to reach this target is based on **accumulated** accounting of annual electricity savings. This methodology does not require by definition to select only measures producing sustainable electricity savings for all years up 2020; nor does it require “infinite” sustainability. However a realistic sustainability of each measure should be given to calculate the accumulated electricity savings up to and including 2020



2. Sectorial presentation:

Planned and ongoing EE measures for 2011-2013

Energy efficiency improvement program, energy services, other measures to improve energy efficiency

2.1 Sector 1

2.1.1 Overview table of all EE measures

No	Title and description of the EE measure	Implementation period	Electricity savings for the first 3 years 2011-2013
1	Towards Banning the Import of Incandescent Lamps to Lebanon: This initiative aims at banning the import of incandescent lamps to Lebanon by the end of the year 2012, through the application of different independent but interrelated actions, mainly the 3 million CFL's project.	2010-2012	160MW or 1401 GWh (\$76M annually over 4 years) [4]
2	Adoption of the Energy Conservation Law and Institutionalization of the Lebanese Center for Energy Conservation (LCEC) as the national energy agency for Lebanon: The law offers a legal framework for the following subjects: energy audits, energy efficiency standards and labels, financial incentives for energy efficiency appliances, and net-metering.	Dec. 2010 – open end	N.A.
3	Promotion of Decentralized Power Generation by PV and Wind Applications in the Residential and Commercial Sectors: This initiative aims to support the residential and commercial uses of wind energy and solar photovoltaic systems by increasing decentralized power generation by renewable energy sources.	By 2015	50-100MW installed capacity [1]
4	Solar Water Heaters for Buildings and Institutions: This initiative aims at promoting the use of solar water heaters mainly in the residential sector.	Sept. 2010-2012	337 GWh/year [3]
5	Design and Implementation of a National Strategy for Efficient and Economic Public Street Lighting in Lebanon: This initiative aims at offering a safe and energy efficient street lighting with an intelligent monitoring, control, and maintenance procedure. This initiative can be achieved by updating, replacing, and installing new photo-sensor devices in the different street lighting sectors in order to illuminate the roads when	Aug. 2010 – open end	18.6 GWh over 3 years [3]



	needed, and to develop technical specifications for the energy efficient street lighting lamps, as well as the increase in the know-how and capacity of the personnel working on the operation and maintenance.		
6	Electricity Generation from Wind Power: This initiative aims to promote the generation of electricity through the use of wind energy. This can only be achieved through technical and policy related actions.	2010-2014	60-100MW (12% saving in consumption for all renewable resources) [1]
7	Electricity Generation from Solar Energy: This initiative aims to start the development and promote the generation of electricity through the execution of Photovoltaic (PV) and Concentrated Solar Power (CSP) farms. For this to be achieved, proper policy and technical actions are to be taken in addition to ensuring the right financial modalities.	Feb.2011- 2015	100-200MW installed by 2014. [4]
8	Hydro Power for Electricity Generation: This initiative aims to encourage and promote the use of hydro power to produce electricity. This is to be achieved through support of hydro and micro- hydro projects and working on better exploitation of water resources.	2010-2015	100 MW additional [1]
9	Geothermal, Waste to Energy, and Other Technologies: This initiative aims to help reduce waste and benefit from waste to energy conversion techniques in addition to the geothermal power to produce electricity. This is to be achieved through several actions including finding a solution to solid waste treatment.	2011 - 2014	15-25 MW [1]
10	Building Code for Lebanon: This initiative aims to set a standard for the existing and new buildings, to identify the minimum acceptable energy performance and present proper building envelope enhancement for Lebanese territories.	2010-2015	1.4 M toe over 20 years, or 16282 GWh/20 years [3]
11	Financing Mechanisms and Incentives: This initiative aims to provide proper financing mechanism in order to promote the use of energy efficiency and renewable energy. This is mainly linked to the collaborative work with the ministry of finance and the central bank of Lebanon.	2011-2015	N.A.
12	Awareness and Capacity Building: This initiative aims to raise awareness about the importance of energy efficiency and introducing efficient technologies. It also focuses on analyzing and disseminating good practices, creating skills and	Since 2005	N.A.



	experience in energy efficient technologies, as well as strengthening existing ones.		
13	Paving the Way for Energy Audit and ESCO Business: This initiative aims to help Energy Service Companies (ESCOs) and to provide them with financial, fiscal, and technical incentives to remove barriers and promote energy audit activities.	Since 2005	N.A.
14	Promotion of Energy- Efficient Equipment: This initiative aims to promote the use of energy-efficient equipment in households and commercial buildings. This includes focusing on electrical equipment and establishing a national energy efficiency standard.	2009-2013	16 MW in the industrial sector [3]

2.1.2 Detailed information of individual measures⁸

Initiative (1)	Banning the Import of Incandescent Lamps to Lebanon
Objective	This initiative aims at banning the import of incandescent lamps to Lebanon by the end of the year 2012, and can only be reached through the application of different independent but interrelated actions, mainly the 3 million CFL's project.
Description of the measure	<p>The Government of Lebanon has committed to design and implement, through LCEC, the replacement of 3 million incandescent lamps with 3 million CFL's.</p> <p>The Lebanese Center for Energy Conservation (LCEC) has selected the energy efficiency standard for CFL's in Lebanon. LIBNOR has adopted the standard and The Council of Ministers has also approved the adoption of the standards for the CFL and the SWH as mandatory.</p> <ul style="list-style-type: none"> ➤ Delivery of 3 million CFL's to be completed in two phases: <ul style="list-style-type: none"> ○ 90,000 CFL's delivered by end of 2010; ○ Rest by end Of 2011. ➤ Coordinate with the Industrial Research Institute (IRI) to setup a testing facility for CFL's. ➤ These CFL's are one component of a grant by the Greek Government for the reconstruction of the South after the July 2006 war. The Greek grant project is supervised and managed by the UNDP. ➤ The ministry of energy and water launched a nationwide awareness campaign on the CFL's project and its benefits in October 2010.
Implementing agency	The LCEC is in charge of this initiative. A team of 9 professionals

⁸ One separate information table for each measure listed in the table 3.1.1



	has been selected to supervise the distribution of the lamps. The LCEC has distributed 90,000 CFL's in 31 villages in South Lebanon. [4]
Stakeholders involved	LCEC, EDL, IRI, Ministry of Finance, LIBNOR, retailers, municipalities.
Target group	Residential sector (Lebanese households)
Program cost	\$ 7 million [4]
Total resource cost	\$ 7 million (+cost of incandescent lamps collected??)
Cost / kWh saved	
Reduction of subsidies	The distribution of the 3 million CFL's will reduce the electricity demand by a minimum of 160 MW. In terms of energy and money savings, it is estimated that the project will result in savings of around 76 million USD annually for a period of 4 years.(\$26/year/household [3])
Source of funding	GoL, Greek Government grant, UNDP/CEDRO
Financial instruments	Greek grant, CDM carbon credits purchaser, financial incentives on the import of incandescent lamps, and later banning the import of these lamps.
Awareness	Promotional campaign through local media, MEW's national campaign, national workshops in coordination with Order of Engineers and Architects, building developers, suppliers, and importers, vouchers.
Monitoring and quantification of impact	Assess the pilot project in Safad Al Batikh, 350 households totally fitted with CFLs, SWH, and new metering sets.

Initiative (2)	Adoption of the Energy Conservation Law and Institutionalization of the Lebanese Center for Energy Conservation (LCEC) as the National Energy Agency for Lebanon:
Objective	The law offers a legal framework for initiatives such as energy audits, energy efficiency standards and labels, financial incentives for energy efficient appliances, and net-metering.
Description of the measure	A committee of 4 experts has drafted the energy conservation law, which was then debated and updated in a national workshop in 2010. Institutionalization of LCEC as an independent organization operating under the supervision of MEW is being finalized. In the meantime, LCEC is still maintained by UNDP. MEW has donated a piece of land to build the center on. Building design is being processed.
Implementing agency	GoL, Parliament, LCEC
Stakeholders involved	MEW, GoL, Parliament, LCEC, UNDP and GEF.
Target group	All sectors, public and private
Program cost	3.7 million (3M from UNDP, and 0.5M Euros from EU)



Total resource cost	N.A.
Cost / kWh saved	\$ 0.023-0.133 [2]
Reduction of subsidies	\$0.06/kWh [2]
Source of funding	UNDP, GEF
Financial instruments	Banks, GoL, carbon credits trading
Awareness	National workshops, and promotion campaigns.
Monitoring and quantification of impact	LCEC is the national focal point for the EU- funded regional projects of MED-ENEC and MED-EMIP. LCEC is also the official representative of Lebanon in the RCREEE.

Initiative (3)	Promotion of decentralized power generation by PV and wind applications in the residential and commercial sectors.
Objective	This initiative aims to support the residential and commercial uses of wind energy and solar photovoltaic systems by increasing decentralized power generation by renewable energy sources with a target to achieve an installed capacity of 50 to 100 MW by 2015.
Description of the measure	This requires technical, marketing, as well as financial support with necessary actions to be taken at the legal framework. Power generation by private sector will be allowed. Wind atlas to be published.
Implementing agency	UNDP/CEDRO, GoL, LCEC
Stakeholders involved	UNDP, MEW, MoF, EDL, EU.
Target group	Residential, commercial, and agricultural sectors
Program cost	\$250-500M [4]
Total resource cost	
Cost / kWh saved	
Reduction of subsidies	50-100MW decentralized renewable energy generation
Source of funding	NEEREA, CEDRO (wind atlas)
Financial instruments	NEEREA, long- term loans
Awareness	National workshops and seminars
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (4)	Solar Water Heaters for Buildings and Institutions
Objective	To promote the use of solar water heaters mainly in the residential sector so as to obtain around 30% savings.
Description of the measure	To implement a financing mechanism to subsidize residential solar water heaters that comply with pre- set standards. Also, the aim is to assess the use of solar heaters and accelerate their market penetration. Installation of 190,000m ² of solar collectors by 2014.



Implementing agency	LCEC
Stakeholders involved	LCEC, UNDP, Central Bank, Greek Govt, IRI
Target group	Residential and commercial buildings
Program cost	\$3M
Total resource cost	
Cost / kWh saved	\$0.06/kWh [2]
Reduction of subsidies	\$0.0987/kWh
Source of funding	UNDP, Greek Govt, Chinese Govt., NEEREA, Central Bank, and GoL.
Financial instruments	Long- term Interest- free loans, donations, and tax deduction.
Awareness	Several campaigns will be launched nationwide with a budget of \$50,000. [3]
Monitoring and quantification of impact	500 SWH installed in 2008, and additional 400 during 2010. [5] Testing facility at IRI.

Initiative (5)	Design and implementation of a national strategy for efficient and economic public street lighting in Lebanon
Objective	The aim is to offer a safe and energy- efficient street lighting with an intelligent monitoring, control, and maintenance procedure.
Description of the measure	This initiative can be achieved by updating, replacing, and installing new photo-sensor devices in the different street lighting sectors in order to illuminate the roads when needed, and to develop technical specifications for the energy- efficient street lighting lamps, as well as the increase in the know-how and capacity of the personnel working on the operation and maintenance. Mercury lamps will be replaced with sodium lamps.
Implementing agency	MEW and LCEC
Stakeholders involved	MEW, UNDP/CEDRO, LCEC, GoL, Ministry of Public Works, Ministry of Interior and Municipalities, CDR,
Target group	Municipalities, and residential areas
Program cost	\$25M [1]
Total resource cost	
Cost / kWh saved	\$0.21/kWh + \$0.315/kWh from voltage regulators [3]
Reduction of subsidies	\$4M savings [5]
Source of funding	GoL, and UNDP/CEDRO
Financial instruments	Long- term interest- free loans
Awareness	National campaigns, and a hotline to deal with complaints and problems nationwide. Also, through training and capacity building workshops for municipalities, and ministries staff
Monitoring and quantification of impact	Reduction in municipalities bills, CEDRO analysis document.



Initiative (6)	Electricity Generation from Wind Power
Objective	This initiative aims to promote the generation of electricity through the use of wind energy. This can only be achieved through technical and policy related actions.
Description of the measure	Small scale pilot projects after the wind atlas for the country is published. Regulatory and legal frameworks will also be reviewed by experts. A market survey to identify local dealers and suppliers has been conducted as well.
Implementing agency	LCEC, MEW, and UNDP/CEDRO
Stakeholders involved	LCEC, MEW, UNDP/CDERO, NEEREA, Ministry of Finance, and Central Bank of Lebanon, EDL, and IPP.
Target group	Private utilities, and buildings sector
Program cost	85,000 USD for the wind atlas, and 115-190M (for 60-100MW) [1,4]
Total resource cost	
Cost / kWh saved	9.8 cents/kWh [6]
Reduction of subsidies	120 GWh by 2018 (\$9.8M).[1]
Source of funding	UNDP/CEDRO, NEEREA, and private sector
Financial instruments	Long- term interest free loans with full risk guarantee
Awareness	National promotional campaigns and workshops
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (7)	Electricity Generation from Solar Energy
Objective	This initiative aims to start the development and promote the generation of electricity through the execution of Photovoltaic (PV) and Concentrated Solar Power (CSP) farms.
Description of the measure	Proper policy and technical actions are to be taken in addition to ensuring the right financial modalities. Pilot projects are being implemented in a number of public buildings such as hospitals and schools. A market survey has already been conducted by LCEC to identify eventual dealers and suppliers.
Implementing agency	LCEC, CDR, and UNDP/CEDRO
Stakeholders involved	Ministry of Finance, EDL
Target group	IPP, residential and commercial buildings
Program cost	Feasibility study: 40,000 USD, in addition to private funding still being negotiated.
Total resource cost	\$1.5M
Cost / kWh saved	
Reduction of subsidies	5.2GWh(\$0.5M/year)-[6]
Source of funding	UNDP/CEDRO, international donors, and private sector
Financial instruments	Long- term interest free loans, and other financial incentives by MoF



Awareness	MEW's national campaign
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (8)	Hydro Power for Electricity Generation
Objective	This initiative aims to encourage and promote the use of hydro power to generate electricity.
Description of the measure	This is to be achieved through support of hydro and micro- hydro projects and working on better exploitation of water resources, and through rehabilitation of existing plants. A hydro atlas for Lebanon will be developed to assess the potential of hydro power.
Implementing agency	MEW, and EDL
Stakeholders involved	MEW, UNDP/CEDRO, IPP,
Target group	MEW,EDL, IPP
Program cost	\$500M [1]
Total resource cost	
Cost / kWh saved	
Reduction of subsidies	\$34M/year (for additional 80MW) [6]
Source of funding	Private sector and international loans
Financial instruments	NEEREA
Awareness	Promotion initiatives and pilot projects
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (9)	Geothermal, Waste to Energy, and Other Technologies
Objective	This initiative aims to help reduce waste and benefit from waste to energy conversion techniques in addition to using the geothermal power to produce electricity. This is to be achieved through several actions including finding a solution to solid waste treatment.
Description of the measure	Biomass strategy for Lebanon will be finalized. A study on the potential of geothermal energy in the country. Pilot projects for building relevant power plants will be commissioned. To investigate mineralogical map of the region.
Implementing agency	LCEC
Stakeholders involved	LCEC, MEW, UNDP/CEDRO, NEEREA, IPP.
Target group	
Program cost	\$30-50M for 15-25MW [1]
Total resource cost	Program costs plus, if applicable, contributions by beneficiaries



Cost / kWh saved	
Reduction of subsidies	\$ 6-10M/year
Source of funding	UNDP/CEDRO, NEEREA, CDM
Financial instruments	NEEREA
Awareness	Local media
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (10)	Building Code for Lebanon:
Objective	This initiative aims to set a standard for the existing and new buildings, to identify the minimum acceptable energy performance and to present proper building envelope enhancement for Lebanese territories.
Description of the measure	To review, update, and promote the thermal standards for Lebanese buildings, and to incorporate these codes into law and practice.
Implementing agency	LCEC, Urban Planning, and UNDP
Stakeholders involved	Order of Engineer and Architects, Lebanon Green Building Council, GEF, WB, International Finance Corporation, USAID/Amideast
Target group	Building sector
Program cost	306,000 USD, in additions to funds from NEEREA
Total resource cost	
Cost / kWh saved	10-15% savings [3]
Reduction of subsidies	
Source of funding	GEF, ADEME, WB, NEEREA, IFC, Amideast
Financial instruments	Interest free and long- term loans.
Awareness	Published reports, workshop and discussion
Monitoring and quantification of impact	Urban Planning

Initiative (11)	Financing Mechanisms and Incentives
Objective	The aim is to provide proper financing mechanism in order to promote the use of energy efficiency and renewable energy. This is mainly linked to the collaborative work with the MoF, and the Central Bank of Lebanon.
Description of the measure	To collaborate with the MoF to provide financial incentives for the import and market spread of solar water heaters, and to make use of the carbon credits. Also, to define policy interventions (fiscal and economic incentives)
Implementing agency	MoF, LCEC
Stakeholders involved	MoF, NEEREA, UNDP, Central Bank, LCEC, and EU
Target group	Residential sector



Program cost	\$100M by 2015 (NEEREA FUND)
Total resource cost	
Cost / kWh saved	N.A.
Reduction of subsidies	
Source of funding	MoF, NEEREA, banking sector
Financial instruments	Long- term interest- free loans, carbon credits
Awareness	Workshops and promotion campaigns
Monitoring and quantification of impact	BoL circulars and reports

Initiative (12)	Awareness and Capacity Building:
Objective	The aim is to raise awareness about the importance of energy efficiency and to introduce energy- efficient technologies, and energy audit concepts.
Description of the measure	The focus is on analyzing and disseminating good practices, creating skills and experience in energy efficient technologies, as well as strengthening existing ones.
Implementing agency	LCEC, MEW
Stakeholders involved	LCEC, MEW, UNDP, Ministry of Education, LAS, MED-ENEC, MED_EMIP
Target group	Building and industrial sectors
Program cost	\$1.4M (SWH)
Total resource cost	
Cost / kWh saved	N.A.
Reduction of subsidies	
Source of funding	MEW, EU, MED-ENEC
Financial instruments	
Awareness	Awareness campaigns, pilot projects and standards and labels.
Monitoring and quantification of impact	Implementation Management Unit at MEW

Initiative (13)	Paving the Way for Energy Audit and ESCO Business
Objective	This initiative aims to help and promote Energy Service Companies (ESCOs) and to provide them with financial, fiscal, and technical incentives to remove barriers and promote energy audit activities.
Description of the measure	LCEC launched an energy audit support program, and a campaign to promote energy efficiency in the building and industrial sectors.
Implementing agency	MEW, LCEC
Stakeholders involved	MEW, LCEC, NEEREA, UNDP, ESCO companies, private sector, banks



Target group	Building and industrial sectors
Program cost	\$9.7M
Total resource cost	\$7.5M [3]
Cost / kWh saved	38GWh/year [3]
Reduction of subsidies	\$3.8M/year
Source of funding	NEEREA, CEDRO, banks
Financial instruments	NEEREA
Awareness	Promotion campaigns and capacity building programs
Monitoring and quantification of impact	120 audits conducted in various sectors

Initiative (14)	Promotion of Energy- Efficient Equipment
Objective	This initiative aims to promote the use of energy- efficient equipment in households and commercial buildings.
Description of the measure	This includes focusing on energy- efficient electrical equipment such as CFL, AC units, fridges,... and establishing a national energy efficiency standard.
Implementing agency	LCEC
Stakeholders involved	MEW, MEW, MoF, LIBNOR
Target group	Households and commercial buildings
Program cost	
Total resource cost	
Cost / kWh saved	N.A.
Reduction of subsidies	
Source of funding	International funds
Financial instruments	Financial incentives and decentives
Awareness	Promotion campaigns
Monitoring and quantification of impact	LCEC, LIBNOR

2.2 Sector 2

Please add a number of sectors according to country sector classification



3. Additional measures

3.1 Measures for exemplary role of public sector

3.1.1 Overview table

No	Title and description of the EE measure	Implementation period	Electricity savings for the first 3 years 2011-2013
1	Standards and Labeling	July 2008 -	8GWH [3]
2	Measure 2		
3	Measure 3		
4	Measure 4		

3.1.2 Detailed information of individual measures

Please provide information on EE measures using the same table structure of the section above 2.1.2.

Initiative (15)	Standards and Labeling
Objective	This initiative aims at defining appliances to be subjected to energy efficiency standards.
Description of the measure	Energy efficiency standards will be assigned for SWH, CFLs, Refrigerators, AC split units, and electric/gas water heaters.
Implementing agency	LCEC,
Stakeholders involved	Ministry of Industry, LIBNOR
Target group	Households and commercial buildings
Program cost	\$1M
Cost / kWh saved	
Reduction of subsidies	
Source of funding	Greek Fund
Financial instruments	Financial incentives
Awareness	Promotion campaigns, local media
Monitoring and quantification of impact	LIBNOR



3.2 Measures under utility responsibilities (according to article 5 of Arab EE directive)

3.2.1 Overview table

No	Responsibility	Qualitative progress
1	Provision of data and information	Data on generation and distribution were used in the MEW recent Policy paper.
2	Providing services	Distribution of 3M CFLs
3	Contributing to an EE fund	CFL and street lighting projects
4	Awareness campaigns	MEW national campaign

Please identify and add relevant measures

3.2.2 Detailed information of individual measures

Please provide information on EE measures using the same table structure of the section above 2.1.2

3.3 Measures for power sector (according to article 4 of Arab EE directive)

3.3.1 Performance overview

No	Title and description of the EE measure	Implementation period	Unit (Savings M\$/year)
1	Reduction of net heat rate in power plant operation ⁹ (in MJ, kCal, or kWh per kWh, or %)	20%-30% by 2015	80 [1]
2	Reduction of technical losses, the national grid, % ¹⁰	7% by 2014	26
3	Reduction of commercial losses , Millions LC	20% by 2014	11
4	Upgrade of metering and smart grid strategies	2010-2014	669 over 4 years

Please identify and add relevant measures

3.3.2 Detailed information of individual measures

Please provide information on EE measures using the same table structure of the section above 2.1.2

⁹ Use the most accepted definition of net heat rate by subtracting first from the annual MWh gross generation at the busbar the GWh power station use. Next divide the annual energy input to the power plant based on a Gross Calorific Value also called Higher Heating Value (HHV) by this number. Convenient units are MJ/kWh or kCal/kWh or kWh/kWh .

¹⁰ Reduction of technical losses in the transmission and distribution grid as percentage of gross or net generation



4. Horizontal and Cross-sectorial measures¹¹

4.1 Overview table

No	Title and description of the EE measure	Implementation period
1	Solar panels distribution would trigger the industrial sector to get the know-how related to their manufacturing.	2010-2013
2	PV cells proven useful for residential as well as agricultural sectors.	2011-2014
3	Building code and the construction sector	2011-

4.2 Detailed information of individual measures

Please provide information on each measure for horizontal cross sectorial using the same table structure of the section above 2.1.2

4.3 Supportive measures with difficult to quantify electricity savings impact

	Title and description of the EE measure	Qualitative progress
1	General sector specific stand alone awareness program	Awareness campaigns (local media, vouchers, workshops,...)
2	Research & Development of EE technologies	Testing at IRI
3	University curriculum development in EE	In progress (AUB, LU, USEK,...)
4	Public awareness campaigns	MEW, LCEC (ongoing)

Please identify and add relevant measures

¹¹ In case of a measure do cover one more than one sector, it should be reported in this chapter (table5.1)



5. Criteria to assess energy efficiency policy implementation progress

Progress for overall country measures such as energy policies, directives and politics

No	Action/Activity	Qualitative progress
1	Energy efficiency policy announcement	MEW, law 462/2002, and policy paper of June 2010
2	Technical committee to write a first draft of the EE known and announced	MEW, LCEC
3	EE policy draft was prepared and had been circulated	Still under discussion (NEEAP)
4	EE policy paper released to the public	Still under discussion
5	EE policy paper is also a directive or tabled in parliament as a bill to become a law and contains rules and regulations	Draft law under discussion
6	EE policy paper contains a target or benchmark to be achieved at a specific year	Success stories from Tunis, Jordan, and Mexico
7	The EE policy or law is backed up by an action plan (business plan) .This is the equivalent of a NEEAP	Under discussion
8	The action or business plan contains an estimate of the total resources necessary to implement the policy	\$134 M [3]
9	The Government is providing a full or partial public or PPP budget to finance the action plan	\$25 M over 4 years, relevant bylaws being prepared
10	The Government has decided to treat energy efficiency as a source of energy and publicly tenders the EE business plan as they would tender a new power plant	Service provider tendering

References

1. Policy Paper for the Electricity Sector, MEW, June 2010.
2. RCREEE Country Report, Lebanon, Sept. 2009.
3. Energy Efficiency Study in Lebanon, World Bank, Dec.2009.
4. LCEC NEEAP draft.
5. LCEC Newsletter.
6. Calculations: The reduction in subsidies for all renewables is estimated taking into consideration the 9.8 cents/kWh cost deficit (subsidy).