CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance

Request Submission Form

Requesting country or countries:	Lebanon
Request title:	Development and enforcement of an efficient appliance strategy in Lebanon
NDE	Ministry of Environment, Ms. Samar Malek, Acting Head of the Service of Environmental Technology, samar@moe.gov.lb, Phone: +961 1 976 555 ext 434
Request Applicant:	Lebanese Center for Energy Conservation, Mr. Pierre ElKhoury, General Director, pierre.khoury@lcec,org.lb, Phone:+961 1 565 108

Climate objective:

☐ Adaptation to climate change

☒ Mitigation of climate change

☐ Combination of adaptation and mitigation of climate change

Geographical scope:

☐ Community level

☐ Sub-national

☒ National

☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change:

Climate change problems in Lebanon are resulting from all sectors consuming electricity and fuel. Starting by the building sector to the industrial sector and ending in the transport sector. The main issues are related to the use of non-efficient electricity generators as well as non-efficient transportation means.

The request here focuses on the use of efficient equipment at the end-use level in order to reduce the CO_2 emissions related to the electricity sector. The problem tackling this issue is two-fold [1]:

- Electricity sector problems

The electricity sector in Lebanon suffers from several problems that make the electricity produced non-sufficient to respond to the increasing demand leading to a wide private generators business.
Electricity generation in Lebanon is basically from thermal and hydroelectric power plants. In 2009, around 7.5% of the total electricity production was purchased from Syria (589 GWh) and Egypt (527 GWh) through regional interconnections. In addition to the deficit in electricity supply, the Lebanese electricity sector is facing several problems such as load shedding, technical losses, and the aging of power plants. The Lebanese end-users are forced to rely on diesel generators to overcome the electricity shortages.
The difficulty in reforming the electricity sector is causing an annual deficit of 1.5 billion dollars on the public purse and losses on the national economy estimated at not less than $2.5 billion dollars per year. This crisis is caused by several reasons namely, the lack of worthy investments, high fuel bill , the operating status of power plants half of which are old and inefficient, high technical and commercial losses in transmission and distribution, wrong tariff structure and low average tariff, deteriorating financial, administrative, technical and human resources of EdL.
In addition to environmental problems resulting from using old conventional power plants and diesel generators, the electricity sector is causing economic problems in Lebanon. The subsidy from 1992 to 2009 was $6.4 billion, amounting to a total deficit of around $8 billion without interest. However, the losses to the national economy includes the cost of energy not supplied (Value of Lost Load VoLL). It has been estimated to vary between 200 and 2,000 $/MWh. Losses amounting around $2.5 billion in 2009 for the Lebanese economy are equivalent to an average value of $700 per MWh not supplied.

- Increased demand

In normal conditions, the increase in electricity demand in Lebanon is estimated at 7% per annum. Besides, Lebanon is currently suffering from the Syrian refugees' crisis which lead to increasing the electricity demand drastically since 2010.
The total energy demand in 2009 was 15,000 GWh although the total production and purchases were 11,522 GWh. Thus the electric energy deficit in Lebanon can be estimated at around 3,478 GWh (23% of the total demand). The average capacity and imports available in 2009 was 1,500 MW while the average demand was 2,000-2,100 MW and the instantaneous peak in the summer was 2,450 MW
The main problem that should be addressed is: A steady increase of around 7% in the Lebanese energy demand, with an energy production relying mainly on imported conventional energy sources with high cost. Increasing demand increases the environmental issues related to the use of conventional plants and inefficient diesel generators.

[1] The policy paper for the electricity sector, 2010

Past and on-going efforts to address the problem :

The electricity sector issues have been addressed since 2010 through three types of initiatives:

- Voluntary commitments: National Energy Efficiency Action Plan[2] (NEEAP 2011-2015), Policy paper for the electricity sector, standards for Compact Fluorescent Lamps and solar water heaters
- Financial instruments: National Energy Efficiency and Renewable Energy Action (NEEREA), Solar water heaters 200$ Subsidy, EU grant
- Awareness and training
- Encouraging Projects
    - Compact Fluorescent lamps (3 millions CFL distributed)
    - Efficient street lighting
    - UNDP projects (CEDRO: Installing Photovoltaic and Solar water heater systems)

Despite all these efforts, the reduction in the electricity demand is negligible compared to the country demand, the electricity deficit thus remains. These policies and plans helped in created a new market for the energy efficiency and renewable energy systems leading thus to jobs creation. More than 10,000 direct and indirect jobs in the sustainable energy sector were created in Lebanon. Although they presented a lot of advantages, these initiatives responded to a small part of the problem especially with the lack of funds. This lack did not allow to implement the policy paper for the electricity sector as well as the first NEEAP for Lebanon.

In March 2016, LCEC has published the NEEAP 2016-2020[3], which is based on the "European Union directive on energy end-use efficiency and energy services". The NEEAP includes energy efficiency measures in the different sectors of the Lebanese economy (electricity, industry, public buildings, transport and agriculture)

Moreover, The National Renewable Energy Action plan (NREAP 2016-2020)[4] has been published in November 2016 developed and it includes the Lebanese strategy in increasing the renewable energy share in the Lebanese electricity mix. It details the possibilities in solar photovoltaic systems, concentrated solar power systems, solar water heaters and wind energy systems.

Several projects are currently being conducted by the LCEC related to green buildings and sustainable development. In fact, the LCEC is a member in several Libnor[5] technical committees namely the TC205 concerning the development of a green building code for Lebanon.

The LCEC is also working on "Accelerating 0-emission building sector ambitions in the MENA region". The project will support relevant private actors in facilitating recently started projects and implementing new pilot projects covering energy efficiency measures and the use of renewable energies in buildings. With a participatory approach involving different groups of stakeholders, we will identify differences, individual strengths and weaknesses of the legal and economic framework in the target countries.

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[2] The National Energy Efficiency Action Plan for Lebanon, NEEAP 2010-2015. Beirut : Lebanese Center for Energy Conservation, 2011.
[3] The Second National Energy Efficiency Action Plan of the Republic of Lebanon, NEEAP 2016-2020. Beirut : Lebanese Center for Energy Conservation, 2016.
[4] The National Renewable Energy Action plan for the Republic of Lebanon 2016-2020. Beirut : Lebanese Center for Energy Conservation, 2016.
[5] Lebanese Standards Institution

Specific technology[6] barriers:

Both the first and second NEEAP for Lebanon mentioned the efficient equipment and appliances use as main initiatives. Initiative 14 of the first NEEAP "Promotion of Energy Efficient Equipment" aimed to promote the use of energy efficient equipment in households and other commercial buildings. This includes focusing on electrical equipment and establishing a national energy efficiency standard.

The second NEEAP specified in its horizontal measures chapter, MEPS as the first initiative to be implemented in Lebanon. MEPS implementation is cited as a major measure to be achieved during the period 2016-2020.

A preliminary assessment performed by the LCEC showed that the building sector is consuming around 78% of the overall electricity generated in Lebanon. The residential sector is the largest consumer in electricity in the recent years. It approximated 30% of the overall electricity demand in Lebanon. Cooling and dehumidification, combined, constituted 29% of the total electricity consumption in Lebanon in 2009 and reached 40% in 2014. Cooling is followed by the lighting as the second main consumer in the building sector reaching 31% of the total Lebanese consumption in 2013. The residential sector cooling share reached 19% in 2014 followed by the commercial sector with 11% and the health and education sector with 8% of the total Lebanese electrical consumption.

The fact that Lebanon is lacking of minimum energy performance standards (MEPS) for appliances and electrical equipment increases the consumption of the end-user and affects its perception of energy efficient equipment due to the lack of labelling system.

MEPS are the crucial to support in covering the increasing energy demand in buildings. 1.5 TWh of electricity savings can be achieved by 2020 if the second NEEAP is implemented. 149 GWh of these savings are expected in the building sector of which 55.6 GWh from using energy efficient equipment. In order to achieve these savings and most importantly to stimulate the market towards energy efficiency, minimum energy performance standards (MEPS) and energy labels are to be introduced.

Appliances and equipment (except for CFL and SWH) imported to Lebanon or locally manufactured are not subject to energy standards resulting in non-monitored market. Thus, the end-user is buying high energy consumer appliances/equipment. In order to control and monitor the market, MEPS are a must.

A UNDP preliminary market study showed that few appliances in the Lebanese market have energy labels. The survey showed that energy labels are available at the retailers' stores for some of the washing machines (35%), refrigerators (21%) and TVs (22%) – mostly placed inside the equipment, not tagged on it expect for TVs. None of the surveyed ACs were found with an energy label.

Sectors:

Please indicate the main sectors related to the request:

[6] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

☐ Coastal zones	☐ Early Warning and Environmental Assessment	☐ Human Health	☐ Infrastructure and Urban planning
☐ Marine and Fisheries	☐ Water	☐ Agriculture	☐ Carbon fixation
☒ Energy Efficiency	☐ Forestry	☐ Industry	☐ Renewable energy
☐ Transport	☐ Waste management		

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☒ Communication and awareness	☒ Economics and financial decision-making	☐ Governance and planning	☐ Community based
☐ Disaster risk reduction	☐ Ecosystems and biodiversity	☐ Gender	

Technical assistance requested (up to one page):

The Lebanese market of appliances and electrical equipment is not organized regarding the energy efficiency and the performance aspects. The Lebanese Standards Institutions (LIBNOR), adopted voluntary energy efficiency standards for five household appliances: Solar Water Heaters, Compact Fluorescent Lamps, Refrigerators, AC split units, Electric/Gas water heaters. In the decree N°5305 dated 28 October 2010, the council of Ministers of Lebanon adopted the standards of Solar Water Heaters and Compact Fluorescent lamps as mandatory standards. In the same scope of this standardization process, the Industrial Research Institution (IRI) proceeded with the installation of a testing facility for solar collectors as part of a project financed by the Hellenic Aid, jointly managed by the United Nations Development Programme (UNDP) and the Greek Center for Renewable Energy Sources (CRES) and implemented by the LCEC. This was followed by a testing facility for Compact Fluorescent Lamps.

However, other appliances are still not regulated. Knowing that the residential sector presents a high share of the Lebanese energy consumption. The second NEEAP for Lebanon cited 2 main appliances and equipment to be standardized in a first place. These appliances are: air conditioner split units and refrigerators/ freezers.

Going along with the Lebanese action plan for energy efficiency and, in order to establish a strategy to integrate the standards and labels in the Lebanese appliances market and in order to increase the level of energy efficiency of the used/bought appliances this technical assistance is requested.

This technical assistance request is to:

- Support the development of a strategy for standards and labels
- Support the development of a strategy to implement and enforce MEPS for the four priority appliances
- Assist in developing a financing mechanism/incentive for the deployment of high energy efficient equipment
- Propose an awareness plan to reach the end-user properly and effectively
- Assist the LCEC in applying to international funds in order to implement the strategies

All these goals will help the Lebanese end-user reduce its electricity consumption due to using new high efficient equipment reducing thus the emissions of pollutants resulting from conventional electricity production.

Expected timeframe: 12 Months

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
1. Country assessment												
2. Development of a strategy for standards and labels												
3. Development of a strategy to implement and enforce MEPS for the four priority appliances												
4. Development of a financing mechanism/incentive for the deployment of high energy efficient equipment												
5. Proposing an awareness plan to reach the end-user properly and effectively												
6. Assist the LCEC in applying to international funds in order to implement the strategies												

Key stakeholders:

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity: Ministry of Environment	Its role is directly related to the Lebanese target in the NDC. The Ministry of Environment (MoE) has also recently published the decree 167-2017 on tax exemptions for environmentally-friendly equipment imported in Lebanon. The outcome of this project will allow the definition of products eligible to tax exemption.
The Lebanese Center for Energy Conservation (LCEC)	Request applicant, The Lebanese Center for Energy Conservation (LCEC) is the national energy agency for Lebanon. LCEC is a governmental organization affiliated to the Lebanese Ministry of Energy and Water (MEW). LCEC is the technical arm of the Ministry in all subjects related to energy efficiency, renewable energy, and green buildings. LCEC has succeeded in establishing itself as the main national reference on sustainable energy in Lebanon.
Ministry of Energy and Water	The Ministry for Energy and Water is the central public organization in charge of energy and water security issues in Lebanon. LCEC is directly linked to the Minister of Energy and Water in all major decisions, initiatives and projects related to energy efficiency and renewable energy.
LIBNOR	The Lebanese Standards Institution (LIBNOR) is a public organization affiliated to the Ministry of Industry. As per the law-dated 23/7/1962, LIBNOR is the sole authority in charge of setting national standards and giving the right to use the Lebanese Conformity Mark, which indicates the compliance of products with the Lebanese standards. The role of LIBNOR in this project would formulate or adopt standards to measure the performance of the products.
IRI	The Industrial Research Institute (IRI) is a non-profit institution affiliated to the public sector in Lebanon. LCEC collaborated with the IRI on the development of voluntary energy efficiency standards and labels for equipment and mandatory standards for compact fluorescent lamps and solar water heaters, on the realization of a testing facility for solar collectors and recently on the implementation of a training platform for solar installer at the premises of IRI. The role of IRI in this project would be to test or certify the performance of the products.
Civil Society	Awareness campaigns will allow the promotion of the high efficient household appliances at the end-user level.

Alignment with national priorities (up to 2000 characters including spaces):

The outcome of this technical assistance through the proposed strategies for standards and labels, and MEPS will allow the country to respond to its NDC commitment for reducing its GHG emissions and to

its national engagement in reducing the overall energy consumption of 5% by 2020.	
Reference document (Second National Energy Efficiency Action Plan, March 2016)	**H01:** This measure aims at implementing MEPS and Labeling Program for at least 5 types of equipment (air conditioners, lamps, refrigerators, televisions, washing machines) Chapter 5: Horizontal End-Use Measures, 5.1 Minimum energy performance standards
Nationally Determined Contribution (NDC)	Lebanon's Intended Nationally Determined Contribution under the United Nations Framework Convention on Climate Change, Chapter4: Mitigation, September 2015.
Technology Needs Assessment	
National Adaptation Plans	
Nationally Appropriate Mitigation Actions	
Add others here as relevant	

Development of the request (up to 2000 characters including spaces):

Based on the second national action plan for Lebanon, a workshop including all Lebanese stakeholders was organized on May 10, 2017 to introduce the MEPS and Labeling concept as well as to define the barriers and constraints at the producers/retailers and the end-user level.
The stakeholders included institution of standardization, producers, retailers, ministries....

Background documents and other information relevant for the request:

- Lebanon's Intended Nationally Determined Contribution under the United Nations Framework Convention on Climate Change, Chapter4: Mitigation, September 2015. http://www4.unfccc.int/submissions/INDC/Published%20Documents/Lebanon/1/Republic%20of%20Lebanon%20-%20INDC%20-%20September%202015.pdf
- Second National Energy Efficiency Action Plan for the Republic of Lebanon, March 2016. http://lcec.org.lb/en/LCEC/DownloadCenter/Others#page=3
- National Energy Efficiency Action Plan for the Republic of Lebanon, November 2011. http://lcec.org.lb/en/LCEC/DownloadCenter/Others#page=3
- The policy paper for the electricity sector, 2010 http://s50.omsar.gov.lb/Docs/Strategies/NEstrategy_en.pdf

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in

line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[7].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☐ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.

Signature:

NDE name: SAMAR MALEK

Date: 8/6/2018

Signature:

THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.

[7] Please see:
https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf