

## **Concept Note for the “Efficient Cooling Systems” Training (based on PA-CEMP)**

**9 and 10 July 2024**

<b>Consultant:</b>	Regional Center for Renewable Energy and Energy Efficiency (RCREEE)/ PA-CEMP Secretariat.
<b>Beneficiary:</b>	Lebanese Center for Energy Conservation (LCEC)
<b>Execution Partner:</b>	GUIDEHOUSE Germany GmbH
<b>Supported By:</b>	Cool Up programme (part of the International Climate Initiative (IKI) supported by The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMUV)

### **1. About RCREEE:**

RCREEE is an intergovernmental organization with a diplomatic status that aims to enable and increase the adoption of renewable energy and energy efficiency practices in the Arab region. RCREEE teams with regional governments and global organizations to initiate and lead clean energy policy dialogues, strategies, technologies, and capacity development to increase Arab states’ share of tomorrow’s energy. We cover 17 Member states: Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Palestine, Somalia, Sudan, Syria, Tunisia, and Yemen.

We, the Regional Center for Renewable Energy and Energy Efficiency, are the strategic partner for Arab countries in driving energy transition contributing to a better life for all our people and one of the oldest regional renewable energy and energy efficiency centers across the world. With a track record for successfully implementing EU, UN and World Bank funded projects and a market leader for the development of complex policy plans such as the national energy efficiency (EE) and renewable energy (RE) plans, RCREEE is the technical arm of the League of Arab States. With over 30 team members at the Secretariat located at our headquarters in Cairo, a team of interns and regional antennas and a large pool of external experts, RCREEE guarantees top technical policy and engineering expertise delivered by an international and multicultural team.

### **2. PA-CEMP Background:**

The Pan Arab Certified Energy Management Professionals program (PA-CEMP) is an in-depth professional certification program for Energy Mangers tailored for the Arab region. RCREEE in collaboration with League of Arab States Energy department saw the need to introduce the PA-CEMP program. The Executive Bureau of the Arab Ministerial Council of Electricity endorsed the program during their 32nd session on May 31, 2016.

PA-CEMP aims to assist EE policy makers and program administrators in planning and implementing Energy Efficiency programs and measures in the Arab region.

Through a recognized certificate, energy management professionals will be equipped with the latest technologies, energy essentials and the effective means with solutions to reduce energy consumption in a cost-effective approach and achieve energy targets in line with the Arab EE Guideline.

In addition, the program will support boosting job creation in the Arab region by reducing energy imports and delivering cost effectively measures. PA-CEMP is currently being implemented in Egypt, Jordan, Libya, and soon in Tunisia.

### **3. PA-CEMP Objectives:**

Training and capacity building for the energy sector are highly required to identify energy saving opportunities in industrial and commercial facilities and support the rehabilitation and maintenance of energy productive infrastructures.

Under PA-CEMP certified energy management professional course and exam, RCREEE will provide capacity building services for the energy production/consumption sector in Bahrain on how to technically assess the actual situation of energy use, as a key step to establish an effective plan to reduce energy losses in several important industrial and commercial facilities.

### **4. PA-CEMP Technical Content:**

**Electrical Energy:** This section tackles all matters related to electrical systems in terms of production, distribution, and consumption within all kinds of facilities.

**Thermal Energy:** This part reviews the engineering principles, application, and energy conservation measures of the different thermal systems in industrial and commercial facilities.

**Energy Management:** PA-CEMP program focuses on developing a supporting management structure to enable deep efficiency improvement within the different industrial and building facility, as well as some guidance will be provided on establishing an energy management system (EnMS) according to the requirement of ISO 500001.

**National Energy Policies:** PA-CEMP is distinguished by including national situation updates, where applicants are required to prove knowledge of their country's energy status.

### **5. Context of the "Efficient Cooling Systems" Training:**

As a part of its activities under Cool Up programme, and in partnership with GUIDEHOUSE Germany GmbH, the Lebanese Center for Energy Conservation (LCEC) is seeking to collaborate with the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) in order to organize specific training sessions on the "Efficient Cooling Systems" in Lebanon, based on PA-CEMP program. This collaboration initiative is targeting to train different groups of Lebanese engineers and technicians performing in the cooling related fields, aiming to equip them with the essential principles of the efficient cooling, energy-saving technologies, and best practices for system design, sizing, and maintenance.

## 6. Training Implementation:

### PA-CEMP Program Manager:

- Eng. Khalid Salmi ([khalid.salmi@rcreee.org](mailto:khalid.salmi@rcreee.org))

### PA-CEMP Trainers:

- Dr. Khaled Elfarra
- Eng. Ayman Alsakka

### Implementation Process:

- **Dates:** 2 sessions in 2024 (**July & September**) / 2 Sessions in 2025 (**TBC**) – 4 sessions in Total.
- **Venue:** Beirut, Lebanon (Physical Attendance)
- **Targeted Audience:** 2 groups of 40 engineers and technicians performing in the Lebanese cooling market, to be nominated by LCEC.

## 7. Trainees Eligibility Criteria:

Category	Education Degree	Required Experience
Engineers	Applicants holding an <b>Engineering</b> Degree	<b>Minimum 1 year</b> experience in energy engineering/management
Technicians	Applicants holding a <b>technical</b> degree	<b>8 years'</b> experience in energy engineering/management

## 8. Submission and Certification Process:

- Submit your CV and your degrees to [farah.mawla@lcec.org.lb](mailto:farah.mawla@lcec.org.lb) using [Efficient Cooling Systems Training] in the subject.
- No participation fee is required from the applicant.
- A certificate of attendance is granted at the end of the training.
- The required number of attendees is 20 per session.

## Agenda & Sessions Plan: Efficient Cooling Systems Training

(Date: 9 and 10 July 2024 - Venue: Beirut, Lebanon TBC)

From	To	<b>DAY # 1</b>	
8:00	8:30	<b>Registration and Welcoming Remarks</b>	
8:30	10:30	<b>Section 1</b>	<b>Energy Basics Overview</b>
		1.1.	Sources, World Energy Balance
		1.2	Energy Measuring Units
		1.3	Fuels Heating Values
		1.4	Basic Energy Calculations
		<b>Section 2</b>	<b>Energy Conversion and Efficiency</b>
		2.1	Energy Efficiency
		2.2	Energy Sustainability
		2.3	Energy Efficiency Economics
		2.4	Energy Efficiency Building Codes
<b>10:30</b>	<b>10:45</b>	<b>BREAK</b>	
10:45	12:45	<b>Section 3</b>	<b>Energy Management</b>
		3.1	Definition and Benefits of Energy Management
		3.2	Establishing Energy Management Systems (EnMs)
		<b>Section 4</b>	<b>Electrical Energy Management</b>
		4.1	Fundamentals of Electricity
		4.2	Pumps Compressed Air System
<b>12:45</b>	<b>13:30</b>	<b>LUNCH BREAK</b>	
13:30	15:30	<b>Section 5</b>	<b>Thermal Energy Management</b>
		5.1	Energy Flows
		5.2	Heat Transfer and Thermal Envelope
<b>15:30</b>	<b>15:45</b>	<b>BREAK</b>	
15:45	16:45	5.3	HVAC Systems
		5.4	Cooling Systems
<b>16:15</b>	<b>17:00</b>	<b>Review and Discussion</b>	

From	To	<b>DAY # 2</b>	
8:30	10:30	<b>Section 5</b>	<b>Thermal Energy Management</b>
		5.5	Boilers and Steam System
		5.6	Automation System
		5.7	Cooling Cycles
		5.8	Heat Rejection
		5.9	Systems' sizing & design
		5.10	Maintenance & Optimization
<b>10:30</b>	<b>10:45</b>	<b>BREAK</b>	
10:45	12:45	<b>Section 6</b>	<b>Renewable Energy Systems</b>
		6.1	RE Systems Implementation Process
		6.2	Renewable Energy Technologies
		6.3	Solar Photovoltaic
		6.4	Solar Water Heaters
6.5	Solar Heating & Cooling		
<b>12:45</b>	<b>13:30</b>	<b>LUNCH BREAK</b>	
13:30	15:30	<b>Section 7</b>	<b>Commercial, Institutional and Industrial Facilities</b>
		7.1	Barriers and Drivers for Energy Efficiency
		7.2	Industrial Performance
		<b>Section 8</b>	<b>Energy Auditing - ISO 50002</b>
		8.1	Types and Uses of Energy Audits
		8.2	Energy Auditing Steps
		8.3	Measuring Instruments and toolkits
		<b>Section 9</b>	<b>Measurement and Verification (M&amp;V)</b>
		9.1	Fundamentals of M&V
		9.2	M&V framework and Options
9.3	Baseline Development & Determination of Savings		
<b>15:30</b>	<b>15:45</b>	<b>BREAK</b>	
15:45	16:15	Annex A	National Policies, Legal and Framework
		Annex B	Lebanon - Energy Policies
<b>16:15</b>	<b>16:30</b>	<b>Review and Discussion</b>	
<b>16:30</b>	<b>17:00</b>	<b>Final Quiz</b>	