CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

CTCN Technical Assistance
Response Plan

Country:	**JORDAN**
Request Identification Number:	2016000018

Title:	**Building capacities of the national energy efficiency laboratory to perform testing of lighting technologies, in line with international standards**

Summary of the CTCN Technical Assistance

In Jordan, the National Energy Efficiency Action Plan (NEEAP) endorsed in 2013 sets a national target for energy efficiency increase of 20% by 2020. The Plan identifies concrete measures in a number of key sectors to guide Jordan towards achieving this target on the demand side (e.g. energy labels, lighting). The Jordan's 2025 National Vision and Strategy launched in 2015 also addresses energy security and identifies energy efficiency as the one of the priority in this sector. The increased use of energy-efficient lighting are expected to reduce the national electricity consumption and associated GHGs emissions, which will contribute to mitigate climate change.

The Jordan Standards and Metrology Organization's Energy efficiency laboratory, established in February 2015, is the first national governmental lighting lab (JSMO NEELL) in Jordan. The laboratory is responsible for testing the performance requirements and energy efficiency of different types of lamps to ensure the quality of lighting products entering into or existing within the national market. The lab will support the phasing-out of energy inefficient lamps, in order to increase the use of energy efficient lamps; which will be beneficial for the environment and in combatting climate change. For this purpose, JSMO NEELL is seeking to obtain international accreditation for conducting performance tests on energy efficient lighting products and for improving their ability to consistently produce valid results. The general standard used for testing lighting laboratories is ISO/IEC 17025. However, JSMO NEELL is facing some obstacles to get international accreditation, including lack of verification of test methods, participation in inter-laboratory comparison test, and uncertainty calculations.

Therefore, JSMO NEELL requested technical support to the CTCN in order to increase it capacities and the technical expertise of its staff, up to the desired international standards. More specifically, the technical assistance aims to: 1) develop a training series for JSMO NEELL on lighting measurement, standards, laboratory management; 2) organize an inter-laboratory comparison test according to ISO/IEC 17043:2010. The trainings will enhance the capacity of JSMO personnel to perform necessary tests on efficient lighting technologies (CFLs and LEDs) including uncertainty analysis and verification of test methods according to the related lighting standards. The performing of inter-laboratory comparison test will find out the testing capacity, test results reliability in JSMO NEELL. This work will improve the laboratory's management in order to meet the requirement of ISO/IEC 17025:2005 and will enable the lab to play a strong role in the transition to energy efficient lighting products in Jordan.

1. Overview of the CTCN technical assistance

1.1 Technology aspects

The CTCN will provide expertise to JSMO laboratory employees to acquiring international accreditation on testing and calibration according to ISO/IEC 17025:2005 and on accountability to perform inter-laboratory comparison test according to ISO/IEC 17043:2010. Furthermore, the CTCN will also perform training to increase capacity of laboratory personnel in lighting uncertainty analysis, technical specification and related test methods for the CFL and LED lighting products, including but not limited with CIE S 025, LM 79, LM 80, IEC 60969..

1.2 Objectives (outcomes)

The main objective of the technical assistance is to enable the national efficient lighting laboratory in Jordan to ensure quality of lighting products on the market by testing the product performance, and to support Jordan National Energy Plan to phase out energy inefficient lamp from the market. This will be done by enhancing the capability of the laboratory and its personnel.

1.3 Results (outputs expected from CTCN assistance)

The main outputs expected from this technical assistance include:

- Capacity development of JSMO NEEL personnel to perform uncertainty analysis for energy efficient lighting measurement;
- Capacity development of JSMO NEEL personnel to carry out verification of test methods;
- Accomplishment of JSMO NEEL on performing inter-laboratory comparison test and ensuring laboratory quality system meets the requirements of ISO 17025.

1.4 Expected use of outputs

The CTCN assistance aims to support JSMO NEEL in ensuring tests quality of the JSMO NELL and support its international accreditation. After getting international accreditation JSMO NELL will be instrumental in phasing-out inefficient lamps and control the quality of lamps within or entering to the Jordanian national market. Furthermore JSMO NELL will support more efficiently the enforcement and compliance with the existing lighting standards and regulations. The increased market penetration of energy efficient lighting will lead to reducing national and regional GHG emission, as well as high economic and environmental benefits through decreasing electricity consumption.

2. Description of Assistance

Activity 1– Laboratory pre-assessment based on ISO/IEC 17025
ISO/IEC 17025 is the basic standard applied for testing laboratories. The laboratory uses ISO/IEC 17025 accreditation to implement a quality system aimed at improving their ability to consistently produce valid results. This activity will send an experienced expert to provide a pre-assessment to JSMO NEEL according to ISO/IEC 17025.

Activity 1.1– Review the current test arrangements and compare with required standards; assist the staff to improve any deficiencies
Experts will do an inventory of current test arrangements and assess them against required standards to comply the ISO/IEC 17025. Non-compliance that might be found during the development of this activity will be solved by CTCN experts in order to improve personnel capacity.

Activity 1.2– Support laboratory employees to perform tests and record results; assist the staff to improve any deficient practices
Following the review of test arrangements, practical capability of personnel shall be assessed in this activity. The laboratory employees will conduct energy efficiency tests on lighting products then results will be reported. The objective is to acquire a whole understanding of JSMO NEEL human resources capacity.

Activity 1– Deliverables

Deliverables	Delivery date
Pre-assessment report to Jordan testing laboratory	18th week
Results of energy efficiency testing	18th week

Activity 2– Inter-laboratory comparison test

The inter-laboratory comparison test is known to be one of the most reliable tools to assess the technical competence of a participating laboratory. It is organized either to check the ability of laboratories to deliver accurate testing results to their customers or to find out whether a certain analytical method performs well and is fit for its intended purposes. According to the ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories", it requires the laboratory to have quality control procedures for monitoring the validity of tests, and one of the monitoring approach is to participate in inter-laboratory comparison test. This activity aims to organize an inter-laboratory comparison test for JSMO NEEL to check their testing ability.

Activity 2.1 – Developing inter-laboratory comparison test plan

This objective of this activity is to develop a document that provides specific instructions to perform inter-laboratory comparison test according to ISO/IEC 17043:2010. In parallel to fulfilling ISO/IEC 17025 requirement, the inter-laboratory comparison test plan will include procedures to monitor the validity of all laboratory tests to assure the quality of results. In this activity, pre-test preparation and selecting samples also will be carried on.

Activity 2.2 – Performing inter-laboratory comparison test

This activity is related to making inter-laboratory comparison test in the laboratory based on inter-laboratory comparison test plan developed in the previous activity. It is expected that JSMO NEEL will successfully complete at least one inter-laboratory comparison test on one SSL product prior to obtaining accreditation.

Activity 2.3 – Reporting results and analysis of inter-laboratory comparison test

The collection of data as results from the inter-laboratory comparison test will be conducted by JSMO NEEL personnel with assistance of CTCN experts. All documentation including equipment inventory, technical requirements, questionnaires, tests preparation and tests performance will be compiled and reported.

Activity 2.4 – Reporting weakness identified during the inter-laboratory comparison test and recommendations

The inter laboratory comparison test is also helpful to identify potential weakness of the NELL JSMO techniques and competences. This activity is related to providing a report on those weakness and recommendation to minimize them and improve the testing methodologies.

Activity 2– Deliverables

Deliverables	Delivery date
Inter-laboratory comparison test protocol	3rd week
Inter-laboratory comparison test report	17th week
Report on weakness identified during the inter-laboratory comparison test and recommendations	19th week

Activity 3 – Technical assistance to laboratory employees – Technical training

This activity is related to organizing technical training for the NELL JSMO laboratory. The technical trainings will be provided based on the non-compliances and other findings from the pre-assessment, in order to improve the laboratory capacity and support their accreditation.

Activity 3.1– Training on measurements of lighting performance

This activity aims to increase capacity of JSMO NEEL personnel in measurements of lighting performance, notably verification of test methods and uncertainty calculation. A training will be organized to enable the personnel to implement these technical procedures and analysis for testing lighting products and validate their compliances before the product will be included in the national market.

Activity 3.2– Training on international lighting standards
This activity aims to support capacity increase of JSMO NEEL personnel beside measurements of lighting performance. Experts will organize training on the most recent international lighting standards and regulations, as well related technical topics in energy efficient lighting product performance testing.

Activity 3.3– Trainings on laboratory management
A training will be organized for JSMO NEEL management staff. The activity aims to improve the organizational performance and management quality. Experts will provide training including laboratory documentation management, laboratory quality assurance, accommodation and environmental conditions.

Activity 3.4– Share the experiences of laboratory accreditation
A meeting will be organized to bring together stakeholders, representative of the Ministry of Environment, JSMO NEEL personnel and staff, and CTCN experts to share the lesson learned that personnel and staff experienced during laboratory accreditation.

Activity 3 – Deliverables

Deliverables	Delivery date
Training materials on measurements of lighting performance	18th week
Training materials on international lighting standards	18th week
Training materials on laboratory management	19th week
Training mission report	19th week
Training for trainers manual	20th week

2.2 Synergies and Baseline Setting

The CTCN response plan builds on the established Jordan Energy Efficiency Technical Regulation for Lighting that has been enforced since 2014. During the first stage of setting the specifications of JSMO NEELL, UNEP, through the establishment of Jordan National Efficient Lighting Action Plan (JNELAP) in 2013, had a significant role in the technical support of JSMO by sending an employee to an accredited lab in China to help finalize the shape of the lab. JSMO NEELL was established in February 2015, is the first governmental laboratory in Jordan. UNEP since the earliest stage of establishing JSMO NEELL shared JSMO the vision of having an accredited energy efficiency lighting lab, which is needed to accomplish JSMO national mandate.

A basic training program for the operation of equipment and general testing procedures was held by the equipment manufacturer immediately after the lab establishment, but that training did not include the important technical topics: such as lighting standards, measurement uncertainty and verification of test methods. These topics are technical requirements in ISO/IEC 17025 and are important for the accreditation. Furthermore, there is no training or assessment on the laboratory management, which is another important element to laboratory accreditation according to ISO/IEC 17025.

Baseline:
Activity 1: No measurement uncertainty and verification of test methods according to ISO/IEC 17025 have been implemented at JSMO NEELL before.
Activity 2: No inter-laboratory comparison test has been conducted in JSMO NEELL so far.
Activity 3: Basic trainings on the operation of equipment and on general testing procedure have been conducted by the equipment manufacturer; no specific technical trainings on standards, measurement uncertainty and verification of test methods and no laboratory management training according to ISO/IEC 17025 implemented at JSMO NEELL before.

2.3 Timeline

It is estimated that all tasks would be completed by 60 working days within five months.

Activity	M1	M2	M3	M4	M5
Activity 1 Laboratory pre-assessment based on ISO/IEC 17025					
1.1 Review the current test arrangements and compare with required standards; assist the staff to improve any deficiencies					
1.2 Support laboratory employees to perform tests and record results; assist the staff to improve any deficient practices.					
Activity 2 Inter-laboratory comparison test					
2.1 Developing inter-laboratory comparison test					
2.2 Performing inter-laboratory comparison test					
2.3 Reporting results and analysis of inter-laboratory comparison test					
2.4 Reporting weakness identified during the inter-laboratory comparison test and recommendations					
Activity 3 Technical assistance to laboratory employees – Technical training					
3.1 Training on measurements of lighting performance					
3.2 Training on international lighting standards					
3.3 Trainings on laboratory management					
3.4 Share the experiences of laboratory accreditation					

2.4 Expertise required

Activity 1 - Laboratory pre-assessment based on ISO/IEC 17025 and technical trainings	
Expert 1	Experience laboratory expert
Event 1	Pre-assessment at JSMO NEELL
Materials	Results, weakness and recommendations reports
Activity 2 - Inter-laboratory comparison test	
Expert 1	Testing expert
Expert 2	Technical expert (for data analysis and reporting)
Event 1	Testing laboratory equipped with sufficient facilities are required Technical staff are required
Materials	Appropriate samples (by selection); special packaging (for shipment)
Activity 3 - Technical assistance to laboratory employees – Technical training	
Expert 1	Technical expert (for training)
Event 1	Trainings to JSMO NEELL employees
Materials	Training materials

2.5 Main partners

Stakeholder	Role to support the implementation of the CTCN assistance
Ministry of Environment	Overseeing institution at the national level in the field of energy efficiency

2.6 Indicative budget

The maximum amount of resources is up to **77,720** USD including all fees, except translation costs (English to Arabic. if needed) and logistic costs during the training period.

2.7 Gender considerations

The CTCN assistance will encourage and actively promote gender equality of stakeholders' participation to the training and technical assistance provided by CTCN.

2.8 Risk identification and risk mitigation

Risk	Consequence	Probability	Mitigation measure
Lack of equipment	Test cannot be performed	Low - Medium	Assess the availability of equipment prior to test and request applicant to provide the deficiencies
Staff has less understanding of standards	The test could not be performed correctly	Low - Medium	Development of detailed testing protocol to instruct the testing; specific training will be provided

3. Long-term impacts of the assistance

3.1 Expected climate change-related benefits

	CTCN climate technology impact	Anticipated contribution from CTCN assistance
		MVE capacity would be improved by CTCN assistance; ensure the high energy efficiency lighting technologies adopted in Jordan.
1	Climate technologies adapted to national context are identified and prioritized to enable their deployment and/or transfer in the requesting countries	support more efficiently the enforcement and compliance with the existing lighting standards and regulations; protect the Jordanian market from the entering of poor quality lamps and this will protect consumers
9	New or strengthened Public-Private Partnerships (PPP) created directly as a result of the response	

3.2 Co-benefits

The CTCN technical assistance would also contribute to several SDGs, including SDG-7 and its targets to ensure access to affordable, reliable, sustainable, and modern energy for all; SDG-9 and its target related to promote sustainable industrialization and foster innovation; and SDG-13 related to climate change mitigation.

3.3 Monitoring and Reporting of technical assistance results and impacts

Monitoring will be carried on during the execution of each activity, deliverables will be also monitored by NDE and CTCN. This document defines all the significant elements to effectively monitor project progress and achievements, including: project activities, objectives and expected impacts, work plan and expected milestones, and a preliminary post-assistance plan for monitoring the expected impacts of the technical assistance provided.

NDE and CTCN will monitor the progress of the technical assistance activities by:

- Maintaining regular communication with the response implementer and JSMO NELL (request applicant/proponent)
- Verifying project progress against timeline and associated milestones (see annex 1)

JSMO will coordinate activities between the response implementer and stakeholders involved in the technical assistance activities. When and if required, JSMO NELL may suggest to the response implementer any adjustments and planning modification needed. Any proposed adjustments and planning modification must be defined by NDE and CTCN to be effective.

The monitoring and reporting of CTCN assistance will be carried on through preparation and technical execution in 60 days over five months. Reporting will focus on laboratory progress for the accreditation process and consistency of trainings. JSMO and the response implementer can request NDE and/or CTCN for additional coordination meetings or teleconferences whenever needed.

4. Signatures

Signatures of the requesting country

NDE	**Request Proponent**
Name: Hanadi Marie	Name: Hind Shnaikat
Title: Head of Adaptation Section	Title: Head of Lab
Date: 4/1/2017	Date: 26/12/2016
Signature:	Signature: Hind

Signatures of the CTCN

CTCN Director	**Climate Technology Manager**
Name: JUKKA UOSUKAINEN	Name: RAJIV GARG
Title: DIRECTOR	Title:
Date: 01/12/2016	Date: 01/12/2016
Signature:	Signature:

Annex 1: Response Logframe

Activity	Description of sub-activities conducted by the CTCN	Output/ Deliverable	Expected Outcome	Main national partners involved	Objectively Verifiable Indicator	Means of Verification
Activity 1: Laboratory pre-assessment based on ISO/IEC 17025	*Activity 1.1* Review the current test arrangements and compare with required standards; assist the staff to improve any deficiencies *Activity 1.2* Support laboratory employees to perform tests and record results; assist the staff to improve any deficient practices.	1) Pre-assessment report to Jordan testing laboratory	- MVE capacity would be improved by CTCN assistance; - Ensure the high energy efficiency lighting technologies adopted in Jordan	-----	On-site pre-assessment of JSMO NEEL organized; Feedbacks from JSMO NEEL;	Documentation of the pre-assessment
Activity 2: Inter-laboratory comparison test	*Activity 2.1* Developing inter-laboratory comparison test plan *Activity 2.2* Performing inter-laboratory comparison test *Activity 2.3* Reporting results and analysis of inter-laboratory comparison test *Activity 2.4* Reporting weakness identified during the inter-laboratory comparison test and recommendations	1) Inter-laboratory comparison test protocol 2) Inter-laboratory comparison test report	- MVE capacity would be improved by CTCN assistance	-----	One inter-laboratory comparison test organized; Feedbacks	Inter-laboratory comparison report
Activity 3 Technical assistance to laboratory employees – Technical training	*Activity 3.1* Training on measurements of lighting performance *Activity 3.2* Training on international lighting standards *Activity 3.3* Trainings on laboratory management	1) Training materials on international lighting standards 2) Training materials on laboratory management 3) Training mission report	- Support more efficiently the enforcement and compliance with the	Related departments in JSMO (Inspection and Surveillance department, Standardization department)	**20** participants trained; Training evaluation and feedback.	Training materials Training for trainers report

	Activity 3.4 Share the experiences of laboratory accreditation		existing lighting standards and regulations; - Protect the Jordanian market from the entering of poor quality lamps and this will protect consumers.			

Annex 2: Response Budget

Activity	Notes	Quantity	Unit	Unit Cost ($)	Cost 2016	Cost 2017	Total Cost ($)
Activity 1 : Laboratory pre-assessment based on ISO/IEC 17025							
Activity 1.1: Review the current test arrangements and compare with required standards; assist the staff to improve any deficiencies							
Personnel							
Expert	*On-site visit and conduct the pre-assessment*	*6*	*Person day*	*650*	*3,900*		*3,900*
Component sub-total							***3,900***
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*
DSA for expert	*DSA (Oman)*	*2*	*DSA*	*306*	*612*		*612*
Component sub-total							***2,412***
Sub-total activity 1.1							**6,312**
Activity 1.2: Support laboratory employees to perform tests and record results; assist the staff to improve any deficient practices							
Personnel							
Expert	*Witness the test and correct, assist the improvement*	*1*	*Person day*	*650*	*650*		*650*
Component sub-total							***650***
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*
DSA for expert	*DSA (Oman)*	*2*	*DSA*	*306*	*612*		*612*
Component sub-total							***2,012***
Sub-total activity 1.2							**3,062**
Sub-total activity 1							**9,374**
Activity 2 : Inter-laboratory comparison test							
Activity 2.1: Developing inter-laboratory comparison test							
Personnel							
Expert	*Developing test protocol*	*6*	*Person day*	*650*	*3,900*		*3,900*
Component sub-total							***3,900***
Sub-total activity 2.1							**3,900**
Activity 2.2: Performing inter-laboratory comparison test							
Personnel							
Expert	*Performing test*	*8*	*Person day*	*650*	*5,200*		*5,200*

Testing engineer	*Purchasing, pre-burning, packaging and shipping*	*18.5*	*Person day*	*300*	*5,550*		*5,550*
Component sub-total							***10,750***
Sub-total activity 2.2							**10,750**
Activity 2.3: Reporting results and analysis of inter-laboratory comparison test							
Personnel							
Expert	*Develop test reports*	*2*	*Person day*	*650*	*1,300*		*1,300*
Component sub-total							***1,300***
Sub-total activity 2.3							**1,300**
Activity 2.4: Reporting weakness identified during the inter-laboratory comparison test and recommendations							
Personnel							
Expert	*Develop reports and analysis*	*5*	*Person day*	*650*	*3,250*		*3,250*
Component sub-total							***3,250***
Sub-total activity 2.4							**3,250**
Sub-total Activity 2							**19,200**
Activity 3 : Technical assistance to laboratory employees – Technical training							
Activity 3.1: Training on measurements of lighting performance							
Personnel							
Expert	*Preparing materials and Provide 4-days training on measurement*	*16*	*Person day*	*650*	*10,400*		*10,400*
Component sub-total							***10,400***
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*
DSA for expert	*DSA (Oman)*	*5*	*DSA*	*306*	*1,530*		*1,530*
Component sub-total							***3,330***
Sub-total activity 3.1							***13,730***
Activity 3.2: Training on international lighting standards							
Personnel							
Expert	*Preparing materials and Provide 3-days training on standards*	*15*	*Person day*	*650*	*9,750*		*9,750*
Component sub-total							***9,750***
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*

DSA for expert	*DSA (Oman)*	*4*	*DSA*	*306*	*1,224*		*1,224*
Component sub-total							***3,024***
Sub-total activity 3.2							**12,774**
Activity 3.3: Trainings on laboratory management							
Personnel							
Expert	*Preparing materials and Providing 4-days training*	*18*	*Person day*	*650*	*11,700*		*11,700*
Component sub-total							***11,700***
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*
DSA for expert	*DSA (Oman)*	*5*	*DSA*	*306*	*1,530*		*1,530*
Component sub-total							***3,330***
Sub-total activity 3.3							**15,030**
Activity 3.4: Share the experiences of laboratory accreditation							
Personnel							
Expert	*Preparing materials and having 1 day face to face communication with stakeholders*	*4*	*Person day*	*650*	*2,600*		*2,600*
Component sub-total							**2,600**
Travel							
Ticket for expert	*International travelling*	*1*	*Ticket*	*1,800*	*1,800*		*1,800*
DSA for expert	*DSA (Oman)*	*2*	*DSA*	*306*	*612*		*612*
Component sub-total							***5,012***
Sub-total activity 3.4							***5,012***
Sub-total activity 3							**49,146**
TOTAL							**77,720**