TERMS OF REFERENCE (TOR) FOR

EXPERTS / CONSULTANT

PROJECT NAME:

“ROUND-ROBIN TESTING FOR LIGHTING APPLIANCES IN ASEAN”

DEADLINE:

1 November 2024

PROJECT NAME

Round- Robin Testing for Lighting Appliances in ASEAN

POST TITLE

Technical Expert on Round-Robin Testing for Lighting Appliances

BACKGROUND

The ASEAN Centre for Energy (ACE) is an intergovernmental organisation that independently represents the 10 ASEAN Member States' (AMS) interests in the energy sector. The Centre serves as a catalyst for the economic growth and integration of the ASEAN region by initiating and facilitating multilateral collaborations as well as joint and collective activities on energy. It is guided by a Governing Council composed of Senior Officials on Energy from each AMS and a representative from the ASEAN Secretariat as an ex-officio member. Hosted by the Ministry of Energy and Mineral Resources of Indonesia, ACE office is located in Jakarta.

Part of the efforts to fulfil its function as a regional centre of excellence that builds a coherent, coordinated, focused and robust energy policy agenda and strategy for ASEAN, ACE conducts joint studies, policy dialogues and capacity buildings for ASEAN Member States to support the implementation of the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025.

APAEC Phase II: 2016 – 2025 is the blueprint for enhancing energy connectivity and market integration in ASEAN to achieve energy security, accessibility, affordability, and sustainability for all AMS. These provide the regional blueprint for reducing the energy intensity of the region by 32% by 2025. One of the main program areas is Energy Efficiency and Conservation (EE&C). One of the outcome-based strategies (OBS) under the EE&C program area is OBS 1, which aims to expand, harmonise, and promote energy efficiency standards and labelling for energy-related products.

In 2019, the 37th ASEAN Ministers of Energy Meeting (AMEM) endorsed the Regional Policy Roadmap for Minimum Energy Performance Standards (MEPS) for Lighting. The regional policy roadmap states that by 2023, ASEAN countries aim to implement mandatory MEPS, targeting a minimum efficacy of 80 lm/W for all non-directional LED lamps, as well as linear LED and fluorescent lamps within the agreed scope. As part of adopting this regional policy, there is an imperative to conduct Round-Robin Testing (RRT) to harmonise the capabilities of testing laboratories across Southeast Asia.

RRT is pivotal as it validates the consistency and reliability of established measurement standards. The results of such interlaboratory comparisons are vital for assessing the performance of laboratories in testing lighting products, identifying issues with operations and equipment, evaluating different testing methodologies, and providing educational insights through benchmarking with other facilities.

The role of testing laboratories is critical in the implementation of MEPS, as these institutions verify the energy performance claims of lighting products. These facilities may be designated as official testing centres for enforcing MEPS regulations and for ongoing market surveillance. Consequently, it is vital to ensure that the methodologies, equipment, and expertise of laboratory personnel meet high standards. To improve testing proficiency, the common

scheme applied to interlaboratory comparative tests is the RRT.

Harmonising the quality of laboratory testing across the ASEAN region establishes a robust foundation for a unified approach to market compliance, monitoring, verification, and enforcement. This standardisation also reduces costs for manufacturers and importers by eliminating the need for multiple compliance tests, thereby streamlining the regulatory process. For policymakers, the outcomes of round-robin testing provide critical insights into the capabilities of testing laboratories, enabling the comparison of their performance and the benchmarking of their domestic LED lighting products. Furthermore, the results from the RRT will be instrumental in informing the development of new mechanisms to strengthen the MEPS for lighting across ASEAN. Ultimately, this process not only facilitates the removal of trade barriers but also accelerates the transition to energy-efficient lighting, delivering substantial benefits to both the market and consumers.

Main activities of the RRT for Lighting Appliances in ASEAN include in the following activities:

1. Concept note development and circulation to AMS (May 2024)
2. Laboratory selection (June – July 2024)
3. Guidelines development (August – September 2024)
4. Preparation and testing activities by the nucleus laboratory (October 2024)
5. Testing activities by the participating laboratories from Malaysia, Philippines and Thailand (November 2024 – January 2025)
6. Expert analysis (November 2024 – February 2025)
7. Consultation workshop with ASEAN Member States (February 2025)
8. Final report development (March 2025)

Therefore, ACE is seeking an experienced expert to analyse the result of RRT and provide technical and policy recommendations, which will be beneficial in strengthening the MEPS for lighting appliances. This Term of Reference (TOR) outlines the engagement of the expert in the RRT for lighting appliances in ASEAN.

OBJECTIVE AND OUTCOMES

The primary objective of this consultancy is to provide expert technical and policy advice to improve the performance of testing laboratories in ASEAN and support the implementation of the regional policy roadmap for MEPS for lighting appliances. The expected outcomes are:

- Comparative analysis of the performance of testing laboratories in supporting the implementation of MEPS for lighting.
- Analysis of the availability and quality of testing laboratories in each AMS.
- Recommendations for improving the quality of testing laboratories across AMS.
- Review of the national policies related to MEPS for lighting appliances in each AMS.
- Recommendations of mechanisms for strengthening the regional policy roadmap of MEPS for lighting appliances.

SCOPE OF THE STUDY

The scope of this consultancy will cover the following areas:

- Technical analysis of RRT, including guidelines, testing scope, testing methodology, and testing result
- Technical analysis of the performance of testing laboratories for lighting appliances in ASEAN
- Policy recommendations to implement and strengthen the MEPS for lighting appliances in ASEAN

TASKS TO BE UNDERTAKEN

A. Comparative analysis of the performance of testing laboratories in supporting the implementation of MEPS for lighting.

- Develop a comparison framework with clear metrics for evaluating the performance of each testing laboratory in the RRT, including efficiency, accuracy, compliance with RRT guidelines, and alignment with MEPS requirements.
- Conduct an in-depth analysis of the testing results from each participating laboratory, focusing on key performance indicators such as accuracy, compliance with RRT guidelines, and alignment with MEPS.
- Identify and compare differences in testing equipment, calibration certificate, testing techniques and compliance to reference standards, then analyse how these variations impact the consistency and accuracy of the testing results.
- Identify best practices from high-performing laboratories and assess how these practices contribute to the successful implementation of MEPS.
- Examine equipment limitations, skills gaps, or procedural inconsistencies that may hinder laboratory performance.
- Perform both quantitative (e.g., descriptive statistics and graphs) and qualitative analysis (e.g., gap performance analysis and barriers to MEPS implementation)

B. Analysis of the availability and quality of testing laboratories in each AMS.

- Identify the current availability of testing laboratories for lighting appliances in each AMS, providing a detailed breakdown of the laboratories by country.
- Develop a structured comparison framework to assess the quality and capabilities of these laboratories across AMS, incorporating key performance indicators such as equipment, staff expertise, testing capacity, and testing accuracy.
- Conduct a comparative analysis of laboratory capabilities, focusing on key performance metrics to highlight differences in laboratory quality across AMS.
- Identify and analyse gaps in testing coverage and capabilities, particularly in countries where laboratories are limited or unavailable.
- Evaluate common financial, technical, and operational barriers that hinder the development or improvement of testing laboratories in AMS.
- For AMS without existing testing laboratories, conduct a risk-benefit assessment for establishing local testing laboratories or using overseas facilities.

- Provide a comprehensive summary of the availability, quality, and gaps in testing laboratories across AMS, highlighting key insights from the analysis.

C. Recommendations for improving the quality of testing laboratories across AMS.

- Based on the analysis, provide specific technical recommendations to improve the performance of each participating laboratory.
- Recommend necessary improvements, including infrastructure development, calibration of testing equipment, staff development programs, and the implementation of enhanced standard operating procedures.
- Offer guidance to AMS that lack established testing laboratories by providing support in developing local testing infrastructure. Alternatively, AMS may consider agreeing on a regional Mutual Recognition Arrangement (MRA) for lighting appliances, which would facilitate compliance and streamline the testing process across the region.
- Offer guidance to AMS without existing testing laboratories by providing support in establishing local testing infrastructure or joining a regional Mutual Recognition Arrangement (MRA) for lighting appliances.

D. Review of the national policies related to MEPS for lighting appliances in each AMS

- Conduct a detailed review of each AMS's current national policies and regulations regarding MEPS for lighting appliances, identifying key differences, areas for improvement, and potential misalignments with regional standards.
- Analyse the policy gaps that may hinder the effective MEPS implementation in each AMS.
- Identify best practices from AMS and other regions that can be adapted to improve the alignment and enforcement of MEPS.

E. Recommendations of mechanisms for strengthening the regional policy roadmap of MEPS for lighting appliances.

- Provide policy comprehensive recommendations for harmonising MEPS across AMS, facilitating mutual recognition of testing results, and improving the enforcement of MEPS policies.
- Develop a set of actionable policy recommendations and technical mechanisms for strengthening regional cooperation on MEPS for lighting appliances, ensuring alignment with APAEC milestones and supporting the region's energy efficiency goals.
- Based on an in-depth analysis of national MEPS policies and the capabilities of testing laboratories across ASEAN, provide recommendations for the developing Monitoring, Verification, and Enforcement (MVE) guidelines and propose mechanisms for establishing a regional MRA for lighting appliances.

F. Develop the final report

- Conduct consultation with the ASEAN EE&C Working Group on Appliances regarding the findings of the study before finalising the report. This consultation will be arranged and coordinated by ACE.
- Submit a comprehensive, well-written report, covering all expected outcomes of the study.

EXPECTED DELIVERABLES

A comprehensive and well-written report in English language, that delivers the expected outcomes of the study:

- Comparative analysis of the performance of testing laboratories in supporting the implementation of MEPS for lighting.
- Analysis of the availability and quality of testing laboratories in each AMS.
- Recommendations for improving the quality of testing laboratories across AMS.
- Review of the national policies related to MEPS for lighting appliances in each AMS.
- Recommendations of mechanisms for strengthening the regional policy roadmap of MEPS for lighting appliances.

The draft outline for the final report is expected to be delivered as follows:

Chapter	Methodology
Chapter 1 – Introduction and Objectives a. Overview of the role of testing laboratories in supporting MEPS for lighting in AMS. b. Scope and objective of the study c. Outcome of the study	
Chapter 2 – Analysis of Testing Result a. Testing Result from the Laboratory 1 b. Testing Result from the Laboratory 2 c. Testing Result from the Laboratory 3 d. Testing Result from the Laboratory 4	• Desk Study
Chapter 3 – Comparative Analysis of Laboratory Performance in RRT a. Comparison Frameworks b. Testing Procedure and Compliance c. Testing Equipment d. Challenges in Supporting MEPS for Lighting Appliances e. Best Practices from High-Performing Laboratories f. Summary of the Comparative Analysis of Laboratory Performance in RRT	• Desk Study
Chapter 4 – Analysis of Testing Laboratory Availability and Quality in AMS a. Inventory of Existing Laboratories by Country	• Desk Study

Chapter	Methodology
b. Comparison Frameworks c. Key Performance Indicators (KPIs) for Laboratory Capabilities d. Cross-country Comparison of Laboratory Quality e. Assessment of Gaps in Testing Capabilities Across AMS f. Common Barriers to Establishing or Enhancing Testing Facilities g. Risk-Benefit Assessment for Establishing Local Laboratories h. Summary of Findings on Laboratory Availability and Quality in AMS	
Chapter 5 – Recommendations to Improve the Quality of Testing Laboratories a. Technical Recommendations based of RRT Result b. Capacity-building Recommendations for ASEAN Laboratories c. Recommendation for Enhancing Regional Collaboration on Laboratory Development	• Desk Study
Chapter 6 – Review of Current National MEPS for Lighting Appliances in AMS a. Overview of National MEPS Policies in AMS b. Policy Gaps and Variations Between AMS c. Best Practices in MEPS Policy Implementation d. Summary of National MEPS Policies and Key Findings	• Desk Study
Chapter 7 - Recommendations for Harmonising and Strengthening Regional MEPS Policies a. Policy Recommendations for Harmonising MEPS Across AMS b. Mechanisms for Strengthening Regional Cooperation on MEPS c. Recommendations for Developing MVE Guidelines d. Recommendations for Establishing a Regional MRA	• Desk Study
Chapter 8 – Conclusion a. Summary of Key Findings b. Recommendations c. Future Directions	• Desk Study

**Content of the report is subject to change, following the development of the study as agreed by ACE and Consultant*

WORK MECHANISMS

The implementation of the project is arranged as below:

- Led by the Energy Efficiency and Conservation (CEE) Department and SPP's Project Management Unit (SPP PMU), ACE is responsible for the project's full implementation. It will manage and facilitate the work and communication with government officials from ASEAN (EEC-SSN focal points), SOME, and AMEM, including with other official parties, if needed.
- External Consultant to provide the policy and technical expertise as described in this TOR. During the work period, the consultant must have regular check-in meetings with ACE to discuss progress in every step of the work. Any interaction with the external parties to support the project by the consultant must be approved by ACE.

DURATION OF ENGAGEMENT

The Consultant awarded with the assignment will be hired from **November 2024 until March 2025** and obliged to work within the required deadlines and be available for call if needed. An indicative timeline is provided below:

No.	Activities	Deadline
1.	**Kick-Off Meeting Consultant - ACE**	6 November 2024
2.	Review of Current National MEPS for Lighting Appliances in Each AMS	15 November 2024
3.	Analysis of Testing Laboratory Availability and Quality in Each AMS	29 November 2024
4.	Analysis of the Testing Results from Each Laboratory in RRT	November - January 2024
5.	**Comparative Analysis of Laboratory Performance in RRT**	13 January 2025
6.	Recommendations for Improving Laboratory Quality and Strengthening MEPS for Lighting Appliances.	24 January 2025
7.	**Consultation with AMS**	February 2025
8.	Draft Final Report	24 February 2025
9.	**Final Report Publication**	7 March 2025

CONSULTANT QUALIFICATION

ACE requires a consulting service provider or technical experts with proven experience and capacity to provide the necessary tasks, outputs/deliverables as described above

- At least one (1) technical expert with a postgraduate degree in electrical engineering, engineering physics, or another appropriate specialist discipline.
- At least one (1) policy expert with a postgraduate degree in energy policy and planning, public policy, international relations, or another appropriate specialist discipline.
- Proven track record of participating in or conducting RRT for lighting appliances.

- At least five (5) years of working experience in the lighting sector or energy sector.
- Strong analytical skills to analyse test results of the RRT for lighting appliances.
- Understanding of national MEPS in AMS and regional policy roadmap of MEPS for lighting appliances.
- Ability to produce detailed and comprehensible reports, including actionable recommendations for energy efficiency improvements.
- Excellent command of English and capacity to write high-quality reports in the language.
- Capacity and flexibility to complete the assignment within the required time frame.

SERVICE FEE

- For satisfactory performance of the assignment, Consultant will **be paid a fixed fee, not exceeding USD 12,000.**
- The service fee awarded to the consultant will depend on the scope of the work and tasks to be delivered. ACE and consultant will agree upon a detailed price breakdown before the start of the activities.
- We strongly encourage all interested candidates to submit a competitive price proposal. Given the high level of competition, proposals that demonstrate equivalent qualifications at a more favorable price point will be given preferential consideration.
- Payment will be made to Consultant's nominated bank account.
- ACE is an intergovernmental organisation and not liable for any taxes. The consultant shall file and settle any payment for income tax arising from the income from ACE. ACE shall not be responsible for any consequences of your failure to fulfil your obligation relating to income taxation laws of your respective country.

REQUIRED DOCUMENTS

Interested consultants or individual experts should submit a proposal (maximum 10 pages), divided into two sections:

A. Technical Proposal

1. Executive Summary:
   A concise overview of the proposal, demonstrating the consultant's comprehensive understanding of the tasks, objectives, and scope of the project.
2. Methodology and Approach:

- Comparative framework for assessing the performance of participating laboratories in RRT.
- Methodology for conducting an inventory of testing laboratories in AMS, including the structured framework for comparing capabilities and analysing gaps.
- Approach for reviewing national MEPS policies, analysing policy gaps, and recommending strategies for harmonising and strengthening MEPS for lighting appliances.

3. Work Plan and Timeline:
   This section should ensure that the project will be completed within the required time frame. Provide a detailed project schedule that outlines the key milestones, tasks, and deliverables for each phase of the project, such as:

- Development of the comparison framework for laboratory performance.
- Data collection of the availability and quality of testing laboratories in AMS
- Analysis of testing results from participating laboratories in the RRT
- Review of national MEPS policies and formulation of recommendations
- Consultation and final report submission

4. Team Composition and Expertise

- Profiles of Experts:
  Include the CVs of technical and policy experts, highlighting their qualifications in electrical engineering, energy policy, or another appropriate specialist discipline. The proposal should demonstrate that the team has at least five years of experience in the lighting/energy sector and is equipped with strong analytical capabilities and policy review experience.
- Roles and Responsibilities
  Clearly define the role of each team member (e.g., technical expert, policy expert), showing how their skills align with the tasks outlined in the project.

5. Relevant Experience and Track Record

- Track Record in RRT for Lighting Appliances

Explain the experience of the experts in RRT for lighting appliances.

- Other Relevant Experience
  Provide examples of previous projects or consulting work in which the experts were involved, particularly those related to RRT for lighting appliances, MEPS analysis, or policy review and development in the energy sector. Highlight the team's familiarity with national MEPS in AMS and regional policy frameworks for lighting appliances.

6. Detailed Plans to Fulfil the Deliverables

- Outline the planned activities for achieving each deliverable, and identify the technical or policy expert(s) responsible for each activity. Additionally, the consultant must specify the number of working days required for each deliverable. The total duration for completing all deliverables is estimated to be 30 to 35 working days. The consultant must provide an exact breakdown of the working days allocated to each deliverable.
- Consultant must submit the detailed plan following the format specified in ***ANNEX 2*** (two) of this TOR.

7. Risk Management Strategy

- Outline potential risks related to project implementation (e.g., data collection, stakeholder engagement) and the strategies that will be employed to mitigate these risks.

B. Financial Proposal

Provide a detailed financial proposal which must include a personnel cost (man-days x rate), cost breakdown, and payment schedule following ***ANNEX 1*** (one) to this TOR. Financial components may include travel costs *(if necessary),* consultation meetings, report development, and other specific expenditures which may or may not be applicable.

SELECTION PROCESS AND TIMELINE

The selection process and timeline for this procurement are as follows:

- Call for Proposals : 11 October – 1 November 2024
- Shortlisting of Proposals : 4 – 5 November 2024
- Interview : 5 – 7 November 2024
- Final Evaluation : 8 November 2024
- Clarification with the Winner : 8 November 2024
- Winner Announcement : 10 November 2024

SUBMISSION OF APPLICATION

Please submit the proposal alongside with Consultant's CV or Company Profile to email with the subject: **"Consultant for RRT for Lighting Appliances in ASEAN"** to ACE's Procurement Division (procurement@aseanenergy.org) and cc to cee@aseanenergy.org, tung.phuong@aseanenergy.org and dwiky.syarief@aseanenergy.org no later than **1 November 2024 (GMT+7).**

We encourage early applications as the recruitment process will close upon the selection of a suitable candidate.

AMENDMENT TO TERMS OF REFERENCE

These Terms of Reference may be amended in writing only, subject to the agreement of both parties.

CONFIDENTIALITY AGREEMENT

Without written permission from ACE, the consultants shall not disclose any data or information to external parties.

ACE GOVERNANCE POLICIES ON FRAUD AND CORRUPTION

ACE takes a zero-tolerance approach to fraud and corruption involving ACE Staff Members and third parties concerning their work with ACE. ACE encourages the use of the Whistle-Blower Policy to report any identified cases of fraud and/or corruption in ACE operations.

COPYRIGHT AND INTELLECTUAL PROPERTY

All material produced under this assignment will belong to ACE and remain the property of ACE. The consultants will not have any control over copyright claims and intellectual property.

CONTACT PERSON

All communications and queries related to this ToR shall be submitted in writing through email to cee@aseanenergy.org and cc to tung.phuong@aseanenergy.org and procurement@aseanenergy.org and dwiky.syarief@aseanenergy.org

ANNEX 1

Fees and Payment Schedule

(To be submitted as part of the Financial Proposal)

A. FEES

Table 1. Consultant Fee

No	Description	Unit	Total estimated cost (USD)
1	Professional Services		
	- Input days for each expected deliverable	(# of working days)	
2	Travel Expenses (if any)		
3	Other Expenses (if any)		
TOTAL			

B. PAYMENT SCHEDULE

ACE shall make payment of the total contract amount to the Consultant upon completion of the specified deliverables, as outlined in the following table:

Table 2. Payment Terms and Deliverables

Payment Term	Percentage	Deliverables	Date
First Payment	15%	Report on the review of national policies related to MEPS for lighting appliances in each AMS (Chapter 6)	15 November 2024
Second Payment	20%	Report on the analysis of the availability and quality of testing laboratories in each AMS (Chapter 4)	29 November 2024
Third Payment	25%	Comparative analysis report on laboratory performance in RRT (Chapter 3), including analysis of testing results from each laboratory (Chapter 2)	13 January 2025
Fourth Payment	15%	Report on technical and policy recommendations, including: a. Recommendations for improving the quality of testing laboratories across AMS (Chapter 5)	24 January 2025

		b. Recommendations of mechanisms for strengthening the regional policy roadmap of MEPS for lighting appliances (Chapter 7)	
Fifth Payment	25%	Final report, incorporating the feedback from AMS	7 March 2025

The payment shall be remitted to the following bank account:

Name of Bank :

Address of Bank :

BIC* (Swift Code): Account No. :

Beneficiary's Name :

ANNEX 2

Detailed Plans to Fulfill the Deliverables

(To be submitted as part of the Technical Proposal)

A. PLANS FOR DELIVERABLES

Table 3 Format of Person-days Proposed by External Consultant

No	Deliverables	Planned Activities	Deadline	Proposed Expert(s)	Involved Working Days
1	Report on the review of national policies related to MEPS for lighting appliances in each AMS (Chapter 6)		15 November 2024		
2	Report on the analysis of the availability and quality of testing laboratories in each AMS (Chapter 4)		29 November 2024		
3	Comparative analysis report on laboratory performance in RRT (Chapter 3), including analysis of testing results from each laboratory (Chapter 2)		13 January 2025		
4	Report on technical and policy recommendations, including: a. Recommendations for improving the quality of testing laboratories across AMS (Chapter 5) b. Recommendations of mechanisms for strengthening the regional policy roadmap of MEPS for lighting appliances (Chapter 7)		24 January 2025		
5	Final Report, incorporating the feedback from AMS		7 March 2025		