



MINISTRY OF ENVIRONMENT AND ENERGY

Male' Republic of Maldives

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TERMS OF REFERENCE

Assessment and Design of Cost Effective, Energy Efficiency Improvements for Selected Buildings

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Prepared by:

Project Management Unit

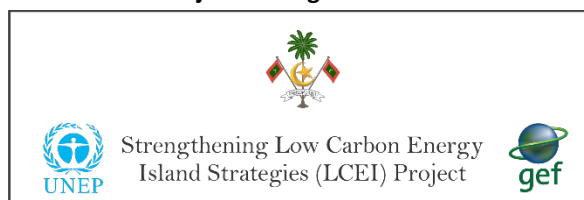


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1. Introduction & Background

The Republic of the Maldives has strongly identified their intention to transition to a low carbon economy. As a result, many interventions have been proposed. On an economy-wide basis, the business as usual scenario for GHG emissions show a growth of 92% to 2.5 Mt CO₂-e by 2020, from the estimate of 1.3 Mt CO₂-e for 2009 (Carbon audit, conducted to IPCC standards in 2009). Electricity generation/consumption accounted for 82% of greenhouse gas emissions in the 2009 estimates. Electricity use and its associated diesel consumption is expected to grow strongly: from 79MW in 2010 to 117 MW in 2020, 48% in 10 years (SARI/Energy study). However, building sector projects focus on social housing and housing needs, not on the energy efficiency of these contributions.

Maldives faces a particular series of challenges in the building sector, including high import cost of construction materials, historic depletion of natural resources (past use of coral materials in construction works, which is now prohibited by law) and high population density of its capital city Malé with small population groups dispersed across multiple islands and atolls.

The building sector of the Maldives is generally under-investing in energy efficiency and other low carbon energy building technologies due to diffused responsibility for energy consumption over the lifetime of any given building. For example, there are no nationally coordinated efforts to promote energy efficient building and municipal technologies, such as efficient lighting. A comprehensive set of standards, rating systems, market suasion and innovation incentive tools are needed to break the stagnation in progressive improvements. Key constraints to these processes include fragmentation of stakeholders, lack of awareness, lack of means for key decision makers to participate in the global process to design a common benchmarking system, lack of capacity to adequately analyse the needs for policy intervention at local levels, and inadequate capacity to build capacity to collect local level data required for baselines and policy tools, such as information about availability of materials, products, services and the local level of technological development.

The existing policies and regulations lack provisions to encourage adoption of energy efficient design and the use or integration of efficient appliances, including incentives (or ‘push’) for existing building stocks to retrofit towards energy conservation and energy efficiency. The existing polices do not include energy efficiency guidelines or standards for building material and design, and building construction. Energy efficiency can be promoted under other names - good lighting,

natural ventilation, preventing solar heat gain - to achieve EE outcomes. Although there is some awareness within the building design and construction industry of the basic design and construction methods for energy efficiency in buildings, there is room for substantial improvement through the preparation and implementation of guidelines, standards and possibly codes that focus on energy efficiency measures including energy efficient construction materials for new construction.

The Project “Strengthening Low Carbon Energy Island Strategies Project (LCEI)”, intends to invest part of the funds to the development of monitoring and assessment systems and phased implementation plan for strengthening the legal framework on building energy efficiency in the Maldives

LCEI Project is implemented by Ministry of Environment and Energy (MEE) with support from UNEP and funded by the Government of Maldives and the Global Environmental Facility (GEF). The project aims to reduce greenhouse gas (GHG) emissions through energy efficiency in the building sector.

2. Objective

The objective of this consultancy is the assessment and design of cost effective energy efficiency improvements in selected buildings.

3. Scope

The assignment involves 4 buildings:

1. Building 1: Velaanaage Building, Male’ – assessment and design EE improvements
2. Building 2: A residential building under the HDC, Hulhumale’ (approximate building size: 350 sqm, 4 floors) – assessment and design EE improvements
3. Building 3: Mosque (approximate size: people capacity 800, located in Male’, Vilimale’ or Hulhumale’) – assessment and design EE improvements
4. Building 4: Maldives Meteorological Service office in Seenu Gan – assessment only

All the buildings will require a detailed energy audit. The results of the energy audit must show an energy efficiency indicator measurement - energy efficiency per square ft, or per number of persons and energy consumption patterns in the buildings. Using the results of the energy audit, cost

effective energy efficiency improvements will have to be developed for the buildings (Velaanaage', Residential building and mosque).

The designs shall consist of architectural, building materials and building services modifications and/or retrofits. Implementing the proposed designs and modifications is NOT part of this terms of reference.

4. Indicative Tasks

The following are indicative tasks to achieve the objectives above, but are not necessarily limited to the following activities:

1. Inception – meetings with stakeholders and finalizing the detailed methodology for conducting the assessment
2. Review relevant documents such as the Maldives Construction Act (Number 4/2017, Dhivehi) and Maldives Building Code (Draft, English) and Planning Regulations (2015/R-192, Dhivehi) and amendments. In case any translations are required, it must be obtained by the consultant.
3. Conduct a detailed energy audit of the selected buildings - Assess the baseline energy consumption, building envelope, internal space design and usage, and materials used. Taking metered data for the detailed audit is required for Velaanaage building for a duration of 1 week (minimum). Other buildings may be assessed based on utility bill information, initial walk through audit, assessing the drawings and the building, taking inventory of equipment etc.
4. Each building's design and energy consumption shall be assessed for features that enable energy efficiency and those features that make it consume more energy.
5. Analyze and design energy efficiency improvements - The proposed improvements must be cost effective and explore materials easily available/accessible in the Maldives. The proposed improvements must also be within the limits set by the Maldives Building Act and Planning regulations.
6. Estimate energy savings and GHG reductions from the recommended energy efficiency improvements
7. Recommend a monitoring plan for undertaking continuous energy consumption monitoring of these buildings to measure the benefits (energy and GHG) of implementing the energy

efficiency improvements – the monitoring plan must include any extra equipment needed, including specifications, measurement points and any other activities and arrangements that will need to be undertaken. Implementing the monitoring plan is NOT part of this terms of reference.

8. Dissemination workshop (1 day) to share the findings of the assessment
9. The final report shall be a single structured report and must include the following chapters. The drafts of these chapters are shall be delivered as per the schedule under “Deliverables” and when finalized will make the main content of the final report:
 - Energy audits of the 4 buildings
 - Designs of cost effective energy efficiency improvements for building 1, 2 and 3
 - Recommended monitoring plan for undertaking continuous energy consumption monitoring for building 1, 2 and 3 (refer to indicative task #7)

5. Deliverables

Deliverable	Delivery Date*
1. Inception report with detailed methodology and work plan	3 weeks
2. Draft energy audit report for the 4 buildings	10 weeks
3. Draft design of cost effective energy efficiency improvements for the 3 buildings	16 weeks
4. Draft report on recommended monitoring plan for undertaking continuous energy consumption monitoring in the 3 buildings	
5. The Final Report (refer to #9 under “indicative tasks”)	19 weeks
6. Stakeholder dissemination workshop**	TBC

* **From the date of contract signing**

** **Logistical and financial arrangements for workshop (venue, catering and invitations) will be supported by the project.**

6. Duration of the Consultancy

Duration of the assignment is 4.5 calendar months upon signing the contract.

7. Reporting Requirements

Consultants are expected to work closely with the LCEI project management unit and the Ministry of Housing and Infrastructure.

The consultants will report directly to LCEI Project Manager.

The consultants shall attend progress meetings once every 3 weeks with the LCEI PMU. Team leader and key members must participate in the progress meetings. Key members who are not in Maldives at the time of the meeting shall participate via skype.

For meetings held under this consultancy, the Minutes of Meeting must be provided to the Project Management Unit within 2 days of the meeting.

8. Requirements for Experience and Qualifications

The following consultants are required for the assignment

#	Post	Nos
1	Building Energy Efficiency Expert (Team Leader)	1
2	Energy Auditor Expert	1
3	Building sector national expert	1

Interested companies should provide CVs and commitment letters of team members meeting the following requirements:

1) Building Energy Efficiency Design Expert (Team Leader)

- Must have postgraduate qualification in relevant field e.g. Architecture, Energy management, Engineering or related field;

- Minimum 3 year post qualification experience in professional, commercial or industrial energy management analysis (Other combinations of education, training and experience will be evaluated on an individual basis for comparability).
- Must have demonstrated experience in conducting building energy efficiency assessments
- Must have experience with climate change mitigation, GHG reduction assessments for energy efficiency improvements
- Must have demonstrated experience and abilities to pro-actively lead and coordinate a team, including strong interpersonal skills with ability to multi-task and maintain effective work relationships with diverse range of institutional partners and undertake complex assignments.
- Must have excellent presentation and report writing skills in English.
- Must have excellent speaking, reading and writing skills in English

2) Energy Auditor Expert

- Must have undergraduate qualification in relevant field e.g. Engineering, Energy Management, Energy Auditing, Building Services Engineering or related field with demonstrated experience in conducting energy audits;
- Diploma in relevant field from a recognized institution with demonstrated experience in energy auditing, and not less than 5 years work experience could also be considered
- Minimum 2 year post qualification experience in energy audit of public and residential buildings;
- Must have significant experience in conducting building sector baseline energy assessments with cost and benefit analysis energy consumption improvements.
- Must have excellent presentation and report writing skills in English.
- Must have excellent speaking, reading and writing skills in English

3) Building sector expert (National)

- Must have undergraduate qualification in a building related field e.g. Civil Engineering, Architecture, or related field
- Minimum 3 years post qualification work experience in Maldives building construction/design sector
- Must have excellent working knowledge of building design/construction sector of the Maldives – must be described in the CV
- Must have excellent communication skills in Dhivehi and English.
- Must have the ability to work well in a team

9. Selection criteria

The following criteria's will be applied during the evaluation of the proposals and attention should be paid while preparing the proposals.

	<u>Points</u>
(A) Project Team	[100]
Building Energy Efficiency Expert (Team Leader)	[40]
Energy Auditor Expert	[40]
Building sector national expert	[20]
Total A	[]

The number of points to be assigned to each of the above positions or disciplines shall be determined considering the following three sub-criteria and relevant percentage weights:

Relevant education and qualifications	[40%]
Experience in similar assignments	[60%]

(B) Approach, Methodology & Work plan	[100]
Approach & Methodology	[60]

Work plan of the Assignment	[40]
Total C	[]

$$\text{Technical Score (St)} = A/100*[W1] + B/100*[W2]$$

Weights Distribution

W1	Project Team	[60]
W2	Approach & Methodology	[40]

The formula for determining the financial scores is the following:

$S_f = 100 * F_m / F$, in which S_f is the financial score, F_m is the lowest price and F the price of the proposal under consideration.

The weights given to the Technical and Financial score are:

$$T = [0.6] * St, \text{ and}$$

$$P = [0.4] * Sf$$

10. Payment

Payments will be in Maldivian Rufiyaa in accordance with the schedule specified below:

REQUIREMENT	ALLOCATION
Submission and acceptance of inception report with finalized detailed methodology and work plan	10%
Submission and acceptance of draft audit report for 4 selected buildings	20%
Submission and acceptance of draft report – design of cost effective energy efficiency improvements for the 3 buildings	30%
Submission and acceptance of draft report on recommended monitoring plan for undertaking continuous energy consumption monitoring in the 3 buildings	

Submission and acceptance of the final report and completion of dissemination workshops*	40%
Total	100%

* **Logistical and financial arrangements for workshop (venue, catering and invitations) will be supported by the project.**

11. Additional Information

The Project Management Unit of Strengthening Low Carbon Energy Island Strategies of MEE has overall responsibility for the management of the contract and contractual reporting obligations.

Documents and data provided by the government for the purpose of this assessment which is not of public nature shall be considered confidential and should not be disclosed to any other party.

All outputs and materials produced as part of this TOR shall be handed over to Project Management Unit (PMU) of Strengthening Low Carbon Energy Island Strategies at the end of the contract and will become the Ministry of Environment and Energy’s sole property.

If international consultants are engaged in the assignment, obtaining the necessary visa and documents are the responsibility of the consultant. The MEE will only provide the necessary visa facilitation letter.

If international consultants are proposed for the team positions 1 or 2, at minimum, they are expected to be physically present in the Maldives to (1) assess the buildings, (2) to present and discuss the draft energy efficiency improvement designs and monitoring plan, and (3) at the dissemination workshop.

For the dissemination workshop: invitations, catering and venue will be financed directly by the project. This cost should not be included in the price quotation.

12. Application

Consultants should submit their proposals containing the following (Standard forms provided in Annex 1):

- Completed proposal submission form (**FORM-1**)
- Completed financial breakdown form (**FORM-2**) – Please refer to “**11. Additional Information**” of this terms of reference.
- Brief description of the company and an outline of recent similar consultancy services provided along with references.
- A description of the approach, methodology and work plan for performing the assignment covering the following subjects: technical approach and methodology, work plan, and

organization and staffing schedule. Guidance on the content of this section is provided in **FORM-3**. The list of the proposed professional staff team, the position that would be assigned and their tasks (**FORM-4**).

- The description of the work plan shall be given in **FORM 3**, and summary presented in the format in Work Schedule (**FORM -5**) which will show in the form of a bar chart the timing proposed for each activity.
- Demonstrations of required experiences listed in this TOR along with detailed CVs of the experts signed by the expert themselves and **letter of commitment from each member to undertake the project**.
- Required experiences and other experiences relevant to this TOR must be specified separately or highlighted in their respective CVs.
- Copy of Company Registration
- Copy of GST Registration

13. Queries

For any queries please email to procurement@environment.gov.mv and CC to low.carbon@environment.gov.mv before 1700hrs of 05th July 2017. Answer will be provided to all the queries received by the deadline and will be made available via the Ministry website (www.environment.gov.mv) and Ministry Facebook page ([@environment.gov.mv](https://www.facebook.com/environment.gov.mv)) on 10th July 2017.

14. Submission

Proposals must be delivered in sealed envelopes titled “**Assessment and Design of Cost Effective, Energy Efficiency Improvements for Selected Buildings**” to the address below on 24th July 2017 at 1130 hours local time. Electronic bidding is not permitted. Late bids will be rejected. Bids will be opened in the presence of the bidders’ representatives at the address below on 24th July 2017 at 1130.

Procurement Section

Ministry of Environment and Energy
Green Building, Handhuvaree Hingun, Maafannu
Male’, 20392, Republic of Maldives
procurement@environment.gov.mv

ANNEX 1: STANDARD FORMS

1. STANDARD FORMS

FORM -1: PROPOSAL SUBMISSION FORM

[*Location, Date*]

To: [*Name and address of Client*]

Dear Sirs:

We, the undersigned, offer to provide the “**Assessment and Design of Cost Effective, Energy Efficiency Improvements for Selected Buildings**” in accordance with your Terms of Reference dated [*Insert Date*] and our Proposal. We are hereby submitting our Proposal; our financial offer is for the sum of [*Insert amount(s) in words and figures (Should quote the amount in Maldivian Rufiyaa)*] which is inclusive of the local taxes.

We hereby declare that all the information and statements made in this Proposal are true and accept that any misinterpretation contained in it may lead to our disqualification.

If negotiations are held during the period of validity of the Proposal, we undertake to negotiate on the basis of the proposed staff. Our Proposal is binding upon us and subject to the modifications resulting from Contract negotiations.

We undertake, if our Proposal is accepted, to initiate the services and fulfill the requirements of the terms of reference.

We understand you are not bound to accept any Proposal you receive.

We remain,

Yours sincerely,

Authorized Signature [*In full and initials*]: _____

Name and Title of Signatory: _____

Name of Company: _____

Address: _____

FORM-2: FINANCIAL BREAKDOWN

	Description	MVR
	Total :	
	GST :	
	Total with GST:	

Indicate the total cost with detail cost to be paid in Maldivian Rufiyaa.

Note: The total contract price should be quoted inclusive of Goods and Services Tax (GST) as per the GST Legislation and Circulars.

***Client will make arrangements for venue and catering for the stakeholder workshop**

FORM-3: DESCRIPTION OF APPROACH, METHODOLOGY AND WORK PLAN FOR PERFORMING THE ASSIGNMENT

Technical approach, methodology and work plan are key components of the Technical Proposal. You are suggested to present your Technical Proposal divided into the following three chapters:

- a) Technical Approach and Methodology,*
- b) Work Plan, and*
- c) Organization and Staffing,*

a) Technical Approach and Methodology. In this chapter you should explain your understanding of the objectives of the assignment, approach to the services, methodology for carrying out the activities and obtaining the expected output, and the degree of detail of such output. You should highlight the problems being addressed and their importance, and explain the technical approach you would adopt to address them. You should also explain the methodologies you propose to adopt and highlight the compatibility of those methodologies with the proposed approach.

b) Work Plan. In this chapter you should propose the main activities of the assignment, their content and duration, phasing and interrelations, milestones (including interim approvals by the Client), and delivery dates of the reports. The proposed work plan should be consistent with the technical approach and methodology, showing understanding of the TOR and ability to translate them into a feasible working plan.

c) Organization and Staffing. In this chapter you should propose the structure and composition of your team. You should list the main disciplines of the assignment, the proposed professional staff responsibility.

FORM-4: TEAM COMPOSITION AND TASK ASSIGNMENT

Name of Staff	Position Assigned	Task Assigned

FORM-5: WORK SCHEDULE

	<i>[1st, 2nd, etc. are days from the start of assignment.]</i>												
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	...
Activity (Work)													

