PARTNERSHIP FOR MARKET READINESS: PMR - Thailand

(Ref. No. CS-16) Terms of Reference for Development of mobile application on GHG emissions in buildings.

1. Background of the Partnership for Market Readiness (PMR) Programme

The Government of Thailand, through Thailand Greenhouse Gas Management Organization (Public Organization): TGO, with support from the World Bank, is currently exploring potential new domestic market-based instruments to support cost-effective greenhouse gas emissions reduction in Thailand, with the purpose to contribute to the achievement of Thailand's national climate change policies and plans, as well as to assist in the implementation of its Nationally Determined Contribution (NDC) under the Paris Agreement.

In this connection, TGO, in collaboration with the Department of Alternative Energy Development and Efficiency (DEDE), the Ministry of Energy, is conducting preparatory study, development and assessment of key components of the voluntary Energy Performance Certificate (EPC) scheme, which is planned to be a "voluntary target-and-reward scheme" targeting at Designated Factories and Buildings (DF&Bs) of intensive energy consumption sectors, which contribute to substantive GHG emissions in Thailand.

The preparatory work on the EPC scheme covers six activities as follows:

Activity 1: Reviewing and analyzing policies, laws, regulations and institutional arrangements required in order to implement the EPC;

Activity 2: Developing the MRV system for the EPC in Thailand;

Activity 3: Assessing the DF&Bs energy management system and updating Specific Energy Consumption (SEC) for 11 sectors[1];

Activity 4: Verifying energy data of participating DF&Bs and setting up the baseline;

Activity 5: Analyzing target setting methods for different industrial sectors and buildings; and

Activity 6: Analyzing potential performance-based incentive and pricing mechanism for EPC.

This Terms of Reference (TOR) aims to develop a mobile application on evaluation of Greenhouse Gas (GHG) emissions in building sectors by assessing their Specific Energy Consumption (SEC) which could be converted to the GHG emissions, including proposing potential of energy and GHG reduction.

Based on the above, TGO, as the Implementing Country Participant for the World Bank's Partnership for Market Readiness (PMR)[1] Programme, is seeking a consultancy to undertake the assignment as defined herein.

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[1] More information on the PMR is online available at: http://www.thepmr.org.

2. Objective of consultancy

The objectives of this TOR are;

(1) To develop the mobile application and simplify the calculation of Specific Energy Consumption (SEC) in building sectors, including evaluation of GHG emissions and potential of reduction.

(2) To consolidate and classify all relevant data of SEC calculation in buildings.

(3) To provide information on energy reduction and GHG mitigation measures/methods.

3. Scope of Work

3.1 The consultant shall review the analytical results of the consultant CS-8, Assessment of the DF&Bs energy management system and updating SEC for 11 sectors, principle of SEC of commercial building sectors, and other relevant studies on SEC of commercial and residential sectors, and then design the mobile application to facilitate users.

3.2 Execute assigned works and deliver outputs as defined in tasks 4.1 – 4.3.

3.3 Provide periodic reports on the progress of all activities under the consultancy services.

3.4 Coordinate with the key stakeholders, such as consultant CS-8 and etc., in consultation with TGO.

3.5 Prepare presentations and meeting materials as well as documenting the outcomes and next steps of the work to present in the EPC working group meetings.

3.6 Provide response to comments and suggestions of TGO and then adjust the operation according to these.

3.7 Present progress of works to TGO once every two (2) months.

3.8 Organize training workshops on software application for TGO staff and relevant agencies. The workshops will be held in Bangkok.

Contents	Time Frame	Participant	Number of Participant (at least)
- Database management - Back office system	Within 1 month before closing date of contract	TGO's system administrator	3-5

3.9 Provide a one (1) year warranty on the application and update the OS, if available, accordingly.

3.10 Deliver of software source code and manuals to TGO.

4. **Specific tasks to be carried out**

4.1 **Review data for SEC and GHG emissions analyses and propose simple method for mobile application.**

The consultant shall review relevant studies on SEC analysis and GHG emissions calculation of the selected building sectors, which are (1) Department Store, (2) Office, (3) Hotel, (4) Hospital, (5) Education and (6) House/Condominium/Apartment, and propose suitable method for displaying on the mobile application.

The consultant shall consolidate all requirement data for database development of the application. The consultant shall also review and consolidate energy reduction measures/technologies, GHG mitigation measures/methods, and energy benchmarking of both Thai and International standards of each type of the building which could be linked to its SEC and GHG analytical results.

4.2 **Develop back office and front office of the mobile application.**

The consultant shall design and develop user interface, summary of result format and backend system for the mobile application. The user interface should be comprehensive and also user-friendly with a modern design. For the summary of the analytical results, it could present the energy performance and GHG emissions of the buildings, benchmark with the best practice of both Local and International Standards, and suggest possible measures/methods to reduce energy consumption and GHG emissions, including link to relevant websites. Moreover, the summary could compare and show the ranking of user building and could be converted to appropriate presentation formats.

The consultant shall design and develop the back office system of the application which comprises of all important and relevant components, such as master data management, statistic system, data storage, security, raw data template and analysis and etc.

The mobile application shall be developed for Android, iOS, and Window phones. The version of Operating Systems (OS) shall be in consultation with TGO. The application shall also provide general requirements, such as simplicity for the user, good performance and loading speed and etc.

4.3 **Provide application testing and dissemination**

The consultant shall test the application to ensure its functionality, usability and consistency. Furthermore, the consultant shall disseminate the developed application via various platforms and adjust the application as feedback from TGO staff and users throughout the warranty period.

5. Contract Supervision

The consultant will work under the overall oversight of the Thailand Greenhouse Gas Management Organization (Public Organization: TGO), and in close cooperation with The World Bank.

6. Timeline and Key Deliverables

The Consultant shall prepare the reports as following:

6.1 **Progress report** 6 copies and CD recording 3 copies within 2 month from the date of the contract. This report should cover the task 4.1 and partial structure of 4.2.

6.2 **Final Report** 6 copies and CD recording 3 copies within 4 months from the date of the contract. This report should cover the tasks 4.1 - 4.3, including the key deliverables of i) administration manual ii) User Manual iii) Source Code iv) the completed mobile application.

All reports should be submitted full report in Thai and summary in English.

7. Minimum Qualifications Requirement

The consultants will be selected through Consultant's Qualifications Selection (CQS) process. The consulting firm: is expected to meet the following minimum qualifications:

- Minimum three (3) years of substantive experience in application software development , energy data management, energy efficiency technology, and;
- Experience in consultation and need assessment;

Key staff: (The qualifications of the proposed key staff will be evaluated at the proposals stage)
Key staff of consultant and their committed availability to have experience in similar projects.

- **Team Leader's minimum requirement:**
  - (i) At least Bachelor's Degree in Engineering, Computer Science, information technology or related field;
  - (ii) Minimum 5 years of substantive experiences in energy management, energy efficiency technology, application development, network system architecture or related fields;

- **Application Developer minimum requirement:**
  - (i) At least Bachelor's Degree in computer engineering or computer science, information technology, or related fields;
  - (ii) Minimum 5 years of substantive experiences in mobile application development or related field.

- **Coordinator's minimum requirement:**

  - (i) Bachelor's Degree in Engineering, Science, Computer Science or related fields;

  - (ii) Minimum 1 year of experiences in project coordination, data management, computer literacy or administration.