Global Environmental Facility

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Government of Malaysia

Public Works Department

UNDP/GEF Project PIMS 3598: Building Sector Energy Efficiency Project (BSEEP)

Terminal Evaluation Report

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The Evaluators would like to thank greatly the BSEEP Project Team, especially the National Project Director, National Project Manager, Project Executive and the Consultants for their cooperation in the evaluation and their willingness to provide the necessary information (though limited by the actual availability of the necessary data for the evaluation in some indicators) and to discuss project implementation issues despite their very busy schedules in the office.

The Evaluators would also like to thank very much the UNDP Malaysia Country Office for its invaluable guidance and support throughout the evaluation process and for entrusting to us this important task; as well as the other Stakeholders and Beneficiaries for their varied inputs, shared experiences and enlightening reflections -- in short, to all who took time out of their schedules to provide feedback on the Project's accomplishments and challenges.

TE Mission Team

Executive Summary

• Introduction

This Terminal Evaluation report is for the evaluation of the **Building Sector Energy Efficiency Project (BSEEP)** (PIMS 3598). The Project was funded by the Global Environmental Facility (GEF) and implemented through the United Nations Development Programme (UNDP) – Malaysia Country Office with the Public Works Department as the Executing Agency.

• Project Summary Table

Project Title:	**Building Sector Energy Efficiency Project (BSEEP)**			
GEF Project ID:	3598 (GEF PMIS #)		*At endorsement (US$)*	*At completion (US$)*
UNDP Project ID:	3108 (UNDP PIMS #) 00072266 (Atlas ID)	GEF financing:	5,000,000	4,778,562
Country:	Malaysia	IA/EA own:		
Region:	Asia Pacific	Government:	19,405,326	37,093,523
Focal Area:	Climate Change	Private:	5,230,556	49,369,076
FA Objectives, (OP/SP):	OP 5 / SP 1	Total co-financing*:	24,635,882	86,462,599
Executing Agency:	Public Works Department	Total Project Cost:	29,635,882.00	86,462,599
Other Partners involved:	N/A	ProDoc Signature (date project began):		8 July 2010 (Note: Project Manager onboard 1 Jan 2011)
		(Operational) Closing Date:	*Proposed:* Dec 2015	*Actual:* June 30, 2017

*Details in Table 9: BSEEP Co-financing Realized, page 22-23 as provided by Project Team.

• Brief Project Description

The UNDP-GEF Project "Building Sector Energy Efficiency Project" or BSEEP has for its goal the reduction in the annual growth rate of GHG emissions from the Malaysia buildings sector. The project objective is the improvement of the energy utilization efficiency in Malaysian buildings, particularly those in the commercial and government sectors, by promoting the energy conserving design of new buildings and

by improving the energy utilization efficiency in the operation of existing buildings. The realization of this objective will be facilitated through the removal of barriers to the uptake of building energy efficiency technologies, systems, and practices. The project is in line with the GEF's climate change strategic program on Promoting Energy Efficiency in Residential and Commercial Buildings (SP-1). It is comprised of activities aimed at improving energy efficiency and promoting the widespread adoption of energy efficient building technologies and practices in the Malaysian buildings sector. Specifically, the proposed project will reduce carbon emissions by an estimated 581.1 ktons CO_2 per year (or cumulative total of about 1,421.3 ktons CO_2) by end of the project. This represents about 4% reduction in CO_2 emissions compared to the magnitude of CO_2 emissions under a business-as-usual scenario. Five years after the project end, CO_2 emissions are forecast to be about 7.2% lower in annual emissions if there will be no BSEEP.

The project logical framework was proposed to be modified by the Project Management Unit (PMU) slightly as a result of the recommendations in the mid-term evaluation, the five project outcomes remained the same, with the project framework updated on April-June 2015:

> **Outcome 1:** Clear and effective system of monitoring and improving the energy performance of the building sector
> **Outcome 2:** Implementation of, and compliance to, favorable policies that encourage the application of EE technologies in the country's buildings sector
> **Outcome 3:** Availability of financial and institutional support for initiatives on EE building technology applications
> **Outcome 4:** Enhanced awareness of the government, public and the buildings sector on EE building technology applications
> **Outcome 5:** Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications leading to the replication of the EE technology application demonstrations.

The project certainly gained its momentum in the last two years of implementation as it was committed to complete the activities by December 31, 2016 but needed to be extended for the last time up to June 30, 2017.

- **Evaluation Rating Table**

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***Rating***
M&E design at entry	S	Quality of UNDP Implementation – Implementing Agency (IA)	MS
M&E Plan Implementation	MS	Quality of Execution - Executing Agency (EA)	MS
Overall quality of M&E	MS	Overall quality of Implementation / Execution	MS
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**Rating**
Relevance	2 (R)	Financial resources:	L

Effectiveness	MS	Socio-political:	ML
Efficiency	MS	Institutional framework and governance:	MU
Overall Project Outcome Rating	MS	Environmental:	ML
		Overall likelihood of sustainability:	ML

* As stated in the TE TOR, all criteria marked with (*) were rated using the prescribed rating scales.

Rating Scales:		
Ratings for Effectiveness, Efficiency, Overall Project Outcome Rating, M&E, IA & EA Execution	***Sustainability Ratings***	***Relevance Ratings***
6: Highly Satisfactory (HS): no shortcomings 5: Satisfactory (S): minor shortcomings 4: Moderately Satisfactory (MS) 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major problems 1. Highly Unsatisfactory (HU): severe problems	4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML): moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	2. Relevant (R) 1. Not relevant (NR)
Additional ratings where relevant: Not Applicable (N/A) Unable to Assess (U/A)		

- **Summary of Conclusions, Recommendations and Lessons**

Conclusions

1. Performance Ratings:

   a. Overall project results: **Moderately Satisfactory (MS)**
      - Relevance: Still very appropriate given changed circumstances and market characteristics. The country has moved forward in intensifying the development and implementation of the building energy efficiency program in line with its economic and environmental goals and commitments.
      - Sustainability: Likely to deliver desired benefits for the coming 10-20 years after its completion. The project has initiated major interventions, among others, preparation for the EE&C law, loan guarantee facility by MDV, capacity building among the stakeholders, information and awareness activities, institutional strengthening of JKR and KeTTHA and incentives policies, to ensure program sustainability.

- Replicability: Big potential for replication as demonstrated in the various pilot demonstrations. The project has strongly pointed out the huge potential in the energy savings and GHG reduction impacts of the project in the long-term.

b. Organizational strength, determination and synergistic approach proved to be very necessary to sustain and apply building energy efficiency improvements due to very wide scope and number of stakeholders across multi-sectoral and multi-ministerial boundaries.
c. More government support and fund mobilization is critical to realize the BEE economic, sustainable development and environmental potential.

2. In the TE process, there are four phases suggested in the TE Guidelines explaining the key activities and responsibilities involved during the evaluation, viz, pre-evaluation, preparatory, implementation and post-evaluation. The BSEEP TE process should have been facilitated more effectively if a pre-evaluation was done to complete the data needed by the TE Mission prior to the TE implementation.

3. The BSEEP project has certainly revived its momentum since it experienced years of almost stagnant state from 2011 to 2013. The project picked up in 2014. The Project team composed of the NPM, Project Executive, Finance Assistant and the Component Consultants/Managers were all on board in 2014. Nevertheless, with the extended term of almost two years up to closure on June 30, 2017 it sped up implementation of the activities that led to the completion of the remaining outputs. During the period, BSEEP has been focusing strongly on various hands-on capacity building of JKR technical staff related to passive and active design elements and BEI prediction software for new buildings design.

4. GHG emission reduction and energy saving were the goal and objectives of the Project. Its importance could have been established at the early stage and at a high level of attention to be an agenda item in the NSC and/or PRC meetings. Even though the project's monitoring had been conducted as part of the yearly PIR process, a more rigorous tracking should have been undertaken along the project implementation. During the evaluation, some information and details to explain or justify the accomplishments were lacking or unavailable. In the process, the Project Team devised a Dropbox system for the needed information. In the calculation of the project's impacts on energy and GHG reductions, for instance, the areas with insufficiencies or lack of clarity included the methodology applied, data and values used, assumptions made, and details of calculation. Nevertheless, the project has pointed out very strongly the huge potential on the project impacts in the coming years.

5. The management arrangement of the project was generally established in accordance to the ProDoc. However, even though the NSC and PRC involved different stakeholders for providing inputs, the implementation process relied too heavily on the project members. As the project dealt with wide-ranging issues, the actions taken might still be insufficient and less than timely for gathering technical inputs in supporting the project team and implementation. For example, as an apparent deviation from what was indicated in the ProDoc, the PRC could have created

ad hoc technical working groups as task forces to involve more diversified stakeholders or experts for in-depth deliberation on specific technical matters, including policy, finance and demonstration activities on a fast-track basis. In view of the challenges experienced by the project as reported in the MTR and the subsequent project frameworks review, the project took longer time to adjust and exercise adaptive management to keep it on track and produce the planned outputs.

6. There is a need to pass a national law that will provide for the integration of building-related programs and activities because of the multi-sectoral and multi-ministerial nature of the building energy efficiency area with overarching objectives. KeTTHA has begun drafting the Energy Efficiency and Conservation (EE&C) Act. BSEEP has contributed significantly to the efforts towards this direction, and has provided resources to develop this Act.

7. As discussed during the interviews with stakeholders (MUWHLG), despite the promotion by BSEEP and the entry of the MS 1525 in the Gazette regarding adoption and application of standard BEI, the national government has no power to impose to each state the enforcement of said guidelines. A positive development along this line is the statement made by the Deputy Prime Minister on the need to enforce MS 1525 under the UBBL directive.

8. It was observed that while waiting for the EE&C Law, there is already the need to include the MS1525 requirements in the building permit system and form. Up to this time this has not yet been done as targeted by the project. This is due to the absence of a regulator or facilitator of building energy codes (MS1525) unlike in the other local building code requirements i.e. fire protection, telecommunication, and electricity which are regulated by the relevant agencies. Nevertheless, one local authority, Putrajaya, has initiated including the MS1525 requirement in the building plan approval form.

Recommendations

1. For further improving the successful achievement of the project objectives/ outcomes:

    a. *Implement until completion the remaining activities and use the committed and remaining funds before the final financial closure by December 31, 2018*. The status of pending or remaining activities is seen in Annex H. The proposed additional activities that were identified as relevant to the attainment of the project objective and corresponding proposed budget are also indicated therein.
    b. *Develop and lobby for the passage of an EE&C Law that will institutionalize energy efficiency programs including energy efficiency in buildings as post-project plan after BSEEP*. This will provide the legal basis for a national platform and authorities in planning and administering the building energy efficiency program and ensure its sustainability. The policy will provide for a regulator or facilitator of building energy codes (e.g. MS1525) just like in the other local building code requirements in fire protection, telecommunication, and electricity which are

regulated by the relevant agencies. The follow-up plan will build upon the work already initiated by KeTTHA on the said development and endorsement of a draft law and considering the experiences in the 3 states that adopted the energy related provisions of the gazzeted MS 1525.

c. *Develop and establish an inter-ministerial coordination mechanism or a national steering committee to provide the venue for discussing cross-sectoral issues, finding solutions and executing sustainable programs.* Because of the multi-sectoral coverage of incorporating energy efficiency aspects in buildings, there is the need for an integrated and synchronized approach to be supported by the relevant ministries and agencies to push the building energy efficiency program further in realizing the big potential in terms of energy saving and GHG emissions reduction.
d. *Strengthen the delivery of building energy efficiency technologies and services, particularly in intensifying the role of the ESCOs, academic/research institutions, industry associations and other stakeholders.* This will be the follow-up action that JKR will initiate in cooperation with KeTTHA in sustaining the results and systems contributed by BSEEP through its interventions.
e. *UNDP to continue to monitor the progress of project interventions after the project has ended, in close co-operation with JKR and KeTTHA*. This will strengthen the impact and ensure the sustainability of project interventions.

2. For future building energy efficiency projects:

a. *Determine means to improve further the appropriate methodology and monitoring and evaluation process for data collection, calculation and verification of the impacts of the building energy efficiency projects*. Since the GHG emission reduction and energy saving were the goal and objectives of the Project, its importance should be established at the project inception stage at the NSC/PRC level with a more rigorous monitoring using an accepted methodology such as the updated GEF-STAP methodology, and to be undertaken periodically along the project implementation.
b. *Determine means improving the access and availability of sustainable financing for building energy efficiency projects*. This applies to all government, residential and commercial buildings noting the peculiarities of each in terms of financial needs and application. The role and preparedness of the banks, ESCOs, service and supply support industries will be important factors in the sustainability aspects of the program.
c. *Establish a program for a continuing knowledge management and dissemination of the experience gained from BSEEP*. This should be decided as a post-project follow-up plan between JKR and KeTTHA in the short term as the project ends and be confirmed in the development of the EE&C Law for the long-term, to define custodianship and management responsibilities of the designated agency and establish the coordination mechanism among the relevant ministries and agencies towards sustainability of the knowledge management and dissemination system under the building energy efficiency program.

Lessons Learned

1. A review of performance indicators, particularly on the energy savings and GHG reduction impacts, should have been carried out in a more realistic manner. As such, a pragmatic and sensible assessment of the indicators should be done at the inception stage to ensure that performance targets are understood with reference to accepted methodologies and are achievable considering the project interventions and resources.

2. The NSC/PRC could have created ad hoc technical working groups to involve more diversified stakeholders or experts for more in-depth but focused deliberation on specific technical matters on a timely manner.

Acronyms and Abbreviations

APR	Annual Project Report
BEI	Building Energy Index
BEM	Building Energy Management
BSEEP	Building Sector Energy Efficiency Project
CASKT	*Cawangan Alam Sekitar dan Kecekapan Tenaga* (Environment & Energy Efficiency Branch)
CBEED	The Centralized Building Energy Efficiency Database System
CETREE	Centre for Education, Training, & Research in Renewable Energy and Energy Efficiency
CIDB	Construction Industry Development Board
CTA	Chief Technical Advisor
EE	Energy Efficiency
EE&C	Energy Efficiency and Conservation
EMIS	Energy Management Information System
EOP	End of Project
EPU	Economic Planning Unit
ESCO	Energy Service Company
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GOM	Government of Malaysia
GTCCC	Green Technology and Climate Change Council
GWh	Gigawatt-hour
JKR	*Jabatan Kerja Raya* (Public Works Department)
KeTTHA	*Kementerian Tenaga, Teknologi Hijau dan Air* (Ministry of Energy, Green Technology and Water or MEGTW)
M&E	Monitoring and Evaluation
MAESCO	Malaysia Association of Energy Service Companies
MDV	Malaysian Debt Venture Sdn. Bhd
MEERB	Malaysian Energy Efficiency Rating for Buildings
MEGTW	Ministry of Energy, Green Technology and Water
MGTC	Malaysia Green Technology Corporation
MNRE	Ministry of Natural Resources and Environment
MTR	Mid-Term Review
MUWHLG	Ministry of Urban Wellbeing, Housing and Local Government
NBEMS	National Building Energy Management System
NEX	Nationally-Executed Modality
NIM	Nationally Implemented Modality
NPD	National Project Director
NPM	National Project Manager
NSC	National Steering Committee
PAM	*Pertubuhan Arkitek Malaysia* (Malaysian Institute of Architects)
pHJKR/MyCREST	*Penarafan Hijau JKR* Tool/Malaysian Carbon Reduction and Environmental Sustainability Tool
PIF	Project Identification Form
PIR	Project Implementation Review

PMU	Project Management Unit
PRC	Project Review Committee
ProDoc	Project Document
PSC	Project Steering Committee
PTM	*Pusat Tenaga Malaysia* (Malaysia Energy Centre)
SEDA	Sustainable Energy Development Authority
SIRIM	Scientific and Industrial Research Institute of Malaysia
ST	*Suruhanjaya Tenaga* (Energy Commission)
STAP	Scientific and Technical Advisory Panel
TE	Terminal Evaluation
TOR	Terms of Reference
UBBL	Uniform Building By-Laws
UNDP	United Nations Development Programme

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UNDP/GEF Project PIMS 3598: Building Sector Energy Efficiency Project (BSEEP)

Terminal Evaluation Report

1. Introduction

This Terminal Evaluation (TE) Report is part of the requirements of the evaluation process under the United Nations Development Programme (UNDP) Guidelines for Conducting Terminal Evaluation for GEF-funded projects. The project being evaluated is the Building Sector Energy Efficiency Project (BSEEP), funded by the Global Environmental Facility (GEF) and implemented through the UNDP as a Nationally-Executed or Nationally Implemented Modality by the Malaysian Government with *Jabatan Kerja Raya* (*JKR* or Public Works Department) as the appointed Executing Agency.

The TE Mission was conducted in greater Kuala Lumpur and Putrajaya with field visits to some project sites for the period of June - July 2017.

1.1. Purpose of the Evaluation

This Terminal Evaluation is compliant with the UNDP and GEF Monitoring & Evaluation (M&E) policies and procedures for all full and medium-sized UNDP-supported, GEF-financed projects which are required to undergo a terminal evaluation upon completion of implementation.

1.2. Scope & Methodology

The evaluation employed a mixed methodology of document review, interviews, and observations from project site visits, and information verification. As an important part of the TE, the evaluation used the criteria of relevance, effectiveness, efficiency, sustainability, and impact, as defined and explained in the UNDP Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects.

The scope of the activities of the TE includes the following:

- Evaluation of the project achievements against the original project logical framework up to December 2016
- Assessment of:
    - Physical work progress
    - Operational status of project activities
    - Replication potential

    - Sustainability
- Identification of issues, constraints and lessons learnt
- Recommendations on strategies to move the project forward and recommendations for follow-up effort by the Government of Malaysia, UNDP and other key partners.

The TOR for the conduct of the Terminal Evaluation is shown in **Annex A** (with its own annexes removed) but the relevant TOR annexes that are to be included in this TE report are seen attached as the TE Report annexes. The overall TE Mission schedule, persons interviewed and sites visited are shown in the Mission Schedule or itinerary as **Annex B**.

The Terminal Evaluation Team (TE Team) conducted interviews with selected government counterparts, private sector representative, representatives of industry associations and research institutes, and other stakeholders. The List of Persons met/interviewed is shown in **Annex C**. The TE Team conducted field missions to various project stakeholder locations and project field with descriptions and photographs in **Annex D**. The evaluation referred to reports and documents provided by UNDP and the Project Management Team which were made available in a Dropbox system, as listed in **Annex E**. A matrix of questions covering each of these criteria was used as guidance and is included as **Annex F** of this TE Report.

In assessing the outputs and outcomes, the evaluation referred to the Project Logical Framework that indicates success indicators and targets as shown in **Annex A** as attached to the TE TOR. While there was no change in the intended outcomes, there were some updating in the project's activities and outputs In June 2015 as approved by the PSC and reported to the UNDP/GEF in the APR/PIRs on the project completion activities.

In the TE process, there are four phases suggested in the TE Guidelines explaining the key activities and responsibilities involved during the evaluation, viz, pre-evaluation, preparatory, implementation and post-evaluation. The BSEEP TE process should have been facilitated more effectively if a pre-evaluation was done to complete the data needed by the TE Mission prior to the TE implementation.

1.3. Structure of the Terminal Evaluation Report

The TE Report includes the following:

- Assessment of the actual project approach vis-à-vis project design/formulation
- Assessment of project implementation in terms of management, partnership, M&E, financing and execution by the implementing agency (UNDP) and executing agency (Public Works Department)
- Assessment of project results in terms of relevance, effectiveness, efficiency, ownership, mainstreaming, sustainability, and impact
- Conclusions, recommendations and lessons.

2. Project Description and Development Context

The project was designed to reduce the annual growth rate of greenhouse gas (GHG) emissions from the Malaysian buildings sector. The project objective is the improvement of the energy utilization efficiency in Malaysian buildings, particularly those in the commercial and government sectors, by promoting the energy conserving design of new buildings and by improving the energy utilization efficiency in the operation of existing buildings. The realization of this objective will be facilitated through the removal of barriers to the uptake of building energy efficiency technologies, systems, and practices. The project is in line with the GEF's climate change strategic program on Promoting Energy Efficiency in Residential and Commercial Buildings (SP-1). It is comprised of activities aimed at improving energy efficiency and promoting the widespread adoption of energy efficient building technologies and practices in the Malaysian buildings sector. Specifically, the proposed project will reduce carbon emissions by an estimated 581.1 ktons CO_2 per year (or cumulative total of about 1,421.3 ktons CO_2) by end of the project. This represents about 4% reduction in CO_2 emissions compared to the magnitude of CO_2 emissions under a business-as-usual scenario13. Five years after the project ends, CO_2 emissions are forecasted to be about 7.2% lower in annual emissions if there will be no BSEEP.

The expected outcomes of the project are the following:

Outcome 1: Clear and effective system of monitoring and improving the energy performance of the building sector

Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies in the country's buildings sector

Outcome 3: Availability of financial and institutional support for initiatives on EE building technology applications

Outcome 4: Enhanced awareness of the government, public and the buildings sector on EE building technology applications

Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications leading to the replication of the EE technology application demonstrations.

2.1. Project Development Background and Chronology

A summary of project development, implementation history and chronology of important events is shown below:

Table 1: Key Project Milestones/Events

Key Project Milestones/Events	Timeframe
PIF approval date	February 22, 2008
CEO endorsement date	December 30, 2009
Project Document (Prodoc) Signature date (project start date)	July 8, 2010

Key Project Milestones/Events	Timeframe
National Project Manager (NPM) on board	January 1, 2011
First NSC meeting	July 4, 2011
Inception Report approved by the NSC	July 4, 2011
Major project team turnovers: NPM (resigned early 2012), Chief Technical Advisor (CTA) (resigned October 2012), Project Executive and Finance Officer (resigned middle of 2013) and recruitment delays with the project having no full-time staff until the new NPM was on board	May 1, 2013
Rapid Evaluation Exercise commissioned by UNDP	April/May 2013
Component managers and other members of the project team were hired	4th Quarter 2013
Mid-term review report finalized	February 2014
Original planned closing date	February 28, 2015
Review and validation of the proposed changes in the project framework	April 2015
Adoption of the revised project framework	June 2015
First revised closing date	December 31, 2015
Second revised closing date (operational)	June 30, 2017
Terminal Evaluation	July – August 2017
Final closing date (financial)	December 31, 2018

The Terminal Evaluation, therefore, has to view the assessment process on the basis of the original commitment in the ProDoc as the updated targets under the reprogrammed arrangement (as of June 2015). The project continued to be implemented and planned to be completed with the updated set of targets and with a timeframe up to December 31, 2018 until financial closure.

2.2. Problems that the Project Sought to Address

In review, as worded in the ProDoc, the project followed basically a barrier removal approach. Understanding the barriers or the problems that the project sought to address has helped the evaluation in putting the process in a clearer context. The following are the major barriers that were identified during the design stage of the project (2008 to 2010), and confirmed during the Inception Workshop with the National Steering Committee (NSC) in July 2011. These barriers have been affecting the ability and capacity of the Malaysian building sector to adopt energy efficient building technologies and concepts. Project activities were therefore designed to address these barriers:

Policy/Regulatory

- There is no strong integrated energy policy or strategy by the Government of Malaysia (GOM) to guide activities and investments. Statements on energy efficiency (EE) in 9th Malaysia Plan are general and without distinct targets. (Activity 1.1)

- The current voluntary code of practice for EE building design, MS 1525:2007, has not yet been made mandatory through incorporation in the Unified Building Bylaws (UBBL) despite various efforts to this end over the last 5 years. (Activity 3.2.1).
- There are no regulations or mandatory legislation in place that support energy efficiency in the building sector. (Activity 3.2.2)
- Subsidized energy prices skew the market, and furthermore it is not clear that electricity tariffs give enough incentive for spontaneous EE project development and implementation. (Activity 3.3.3)
- There is no clear system to monitor, gather, analyze and disseminate information on developments and progress on energy efficiency. This hampers not only awareness in general but also the development of effective policies and targets, as well as making it nearly impossible to assess if existing initiatives are successful or not and thus whether or not to continue funding, strengthen it, or redirect it to other, more effective, measures. (Activity 3.3.5).

Institutional

- The EE section of Energy Commission (ST) is essentially non-operational at present. Regulations and other supportive measures promoting energy efficiency and energy management are not developed and implemented (Activity 1.1)
- Research and educational institutions dealing with energy efficiency in buildings are few and generally under-resourced. (Activity 1.1)
- Energy efficiency is dealt with by numerous ministries, departments, authorities (e.g. MEGTW, PWD, Ministry of Housing, Ministry of Health, Ministry of Defense, ST, local authorities etc.) and institutions (e.g. Universities, CETREE, PTM, etc.) with little coordination of efforts. This is linked to the fact that there is no strong overarching energy efficiency policy or strategy by GOM. (Activity 1.2).

Technical

- Although advanced building materials are generally available, they are often imported which adds to their cost as well as to the time to acquire them. There is limited demand for these materials in the local market and the local manufacturers have not found it sufficiently attractive to start local production. (Activity 4.3.1, 4.3.2 & 5.2.1)
- The technical capacity of local professionals to carry out energy efficiency projects is limited in the sense that there are very few professionals in the market with the necessary skills and knowledge. As with many market-driven issues, the lack of a strong demand and stable market for EE building services has the effect of limiting the available expertise to a niche. (Activity 4.3.1, 4.3.2 & 5.2.1).

Information and Awareness

- There is a general lack of awareness of the importance of EE in buildings, as well as of the opportunities for implementing EE in buildings, amongst decision makers in the building sector. (Activity 4.1.1)
- There have been few, if any, efforts to raise and maintain awareness on EE in buildings. Some general efforts have been made mainly on energy management (e.g. by ST and CETREE), but there has been a distinct lack of a sustained targeted effort towards decision makers, professionals and financing institutions. (Activity 4.2.1)
- There is no easily accessible information on building EE – comprehensive real-life case studies; technology demonstrations and information; index of professional services and suppliers; financing information/opportunities; information offices with professional experts to guide and support e.g. building owners or developers; no easily available regular and sufficiently detailed up-to-date statistics and energy performance information for buildings for comparison and benchmarking. (Activity 4.1.2)
- There are few real-life building projects that demonstrate how to go about making a building energy efficient in a cost-effective manner (both new builds and retrofit projects). The few examples that exist are all prestigious office building projects, which makes it harder for the general building developer/client to relate to them and see that such technologies, methods and results are also implementable in more commonplace projects and does not come at an unaffordable additional cost. (Activity 5.1)

Market

- Energy Service Companies (ESCOs) have difficulties in generating sufficient commercial volume for their activities. Basically, most ESCOs operating in Malaysia are very small. Because of their size, ESCOS do not have sufficient resources to make financially and technically attractive offers to potential clients (i.e. where the ESCO provides financing, technical expertise and project implementation). Since energy efficiency is not generally seen as a priority, the market for ESCOs remains small and financing institutions are reluctant to provide stable financing. In terms of the EE market, there is limited awareness of the importance of, and possibilities for EE in buildings; electricity prices remain relatively low hence energy costs are a small share of total costs; and there is no legal/regulatory imperative etc. This has led to a vicious circle where it is difficult for the ESCOs to attract technical expertise and funding, which in turn makes it even more difficult for them to make attractive offers, which again undermine their business. (Activity 3.3 & 3.4)
- Although advanced building materials are generally available, they are often imported which adds to their cost as well as to the time to acquire them. The main barrier seems to be that because there is such a limited demand for these materials in the local market the local manufacturers have not found it sufficiently attractive to start local production. This is another example of a vicious circle that needs to be broken in order to promote EE in buildings locally. (Activity 3.5)

- The technical capacity of professionals to carry out energy efficiency projects is limited in the sense that there are very few professionals in the market with the necessary skills and knowledge. Those that are available are capable enough but occupy a niche segment of the construction industry. As with many market-driven issues the lack of a strong demand and stable market for EE building services has the effect of limiting the available expertise to a niche. To break this niche status the market needs to be developed.

2.3. Immediate and Development Objectives of the Project

BSEEP has for its goal (aligned with GEF's environmental goal) the reduction of GHG emissions from the Malaysian buildings sector. The project objective is the improvement of the energy utilization efficiency in Malaysian buildings, particularly those in the commercial and government sectors, by promoting the energy conserving design of new buildings and by improving the energy utilization efficiency in the operation of existing buildings. The realization of this objective was facilitated through the removal of barriers (as mentioned above) to the uptake of building energy efficiency technologies, systems, and practices.

Specifically, the proposed project was aimed at reducing carbon emissions by an estimated 581.1 ktons CO_2 per year (or cumulative total of about 1,421.3 ktons CO_2) by end of the project. This represents about 4% reduction in CO_2 emissions compared to the magnitude of CO_2 emissions under a business-as-usual scenario. Five years after the project ends, CO_2 emissions are forecasted to be about 7.2% lower in annual emissions if there will be no BSEEP.

The objective of the project is the improved energy utilization efficiency in the Malaysian buildings sector, the success of which can be manifested by EE being more widely practiced and implemented in the building sector; and, more energy efficient buildings being constructed.

The expected outcomes of the project are the following:

- Outcome 1: Clear and effective system of monitoring and improving the energy performance of the building sector
- Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies in the country's buildings sector
- Outcome 3: Availability of financial and institutional support for initiatives on EE building technology applications
- Outcome 4: Enhanced awareness of the government, public and the buildings sector on EE building technology applications
- Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications leading to the replication of the EE technology application demonstrations.

The abovementioned set of outcomes was designed to be realized through the delivery of the following outputs:

- GOM agencies/departments that employ and implement energy management systems in their buildings and facilities
- Improved Malaysian EE Building policies, Act/legislation, regulations and action plan
- EE Buildings code of practice approved and enforced by relevant legislation & regulations
- Utility regulations that promote and support EE technology applications in buildings
- More available, extensive and accessible financing for EE building projects
- Tools for enhancing the skills and experience of local building practitioners in the design of energy efficiency projects in buildings
- Market-oriented EE programs in the buildings sector at the national and local levels
- Government agencies and private sector entities capable of designing and implementing EE building projects
- Completed demonstrations projects showcasing successful applications of building EE technologies, techniques and practices
- More knowledgeable and technically capable and competent building practitioners in the GOM and private sector.

2.4. Baseline and Project Success Indicators established at the Outcome and Output Level

Table 2: Project Success Indicators

Description	Success Indicator
GOAL: Reduced intensity of GHG emissions from the building sector	Cumulative CO2 emission reduction from the buildings sector by end-of-project (EOP, Year 2016), kton CO2eq Direct GHG ER (including 15-20 yr. lifetime ER of EE measures) achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project's supervised implementation period according to STAP methodology 'Calculating GHG Benefits of GEF EE Projects', Version 1.0., March 2013.
	% reduction in GHG emissions from the buildings sector by EOP
	Average emission reduction in the building sector by EOP, kg/m^2
OBJECTIVE: Improved energy utilization efficiency in the buildings sector	Cumulative energy savings from the buildings sector by EOP (GWh)
	Average BEI in the Malaysian buildings sector by EOP (kWh/m2-yr)
	% Energy savings reduction by EOP
	No. buildings with EMS and/or EMP in place by EOP
	% improvement of BEI in the buildings sector by EOP

Description	Success Indicator
	No. of new EE buildings by EOP (Basis: End -2010)
	% of new buildings that are considered EE buildings at EOP (Basis: End 2010)
Outcome 1: Clear and effective system of monitoring and improving the energy performance of the buildings sector.	Annual Energy use in 25 GOM buildings (GWh)
Output 1: GOM agencies/departments that employ and implements energy management systems	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP
Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies and practices in the country's buildings sector	Percentage of new buildings (nationally by area) which comply to the provisions of MS1525 by EOP
Output 2.1: Improved Malaysian EE Building policies, legislation, regulations and action plan	Cumulative no. of approved policies on building EE technology applications by EOP
Output 2.2: Approved and Enforced EE Buildings Code of Practice	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for incorporation in the UBBL by the MHLG by EOP
Output 2.3: Utility regulations that promote/support EE technology applications in buildings	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP
Outcome 3: Availability of financial and Institutional support for initiatives on EE Building technology applications	Total volume of financing provided by local banks /financial institutions for EE building projects and to the local ESCOs for EE building projects by EOP (RM million)
Output 3: Enhanced availability and accessibility of financing for EE building projects	Total private sector funding committed to financial mechanisms designed by the BSEEP by EOP (million USD)
Outcome 4: Enhanced awareness of the government, public and the building sector on EE building technology applications	Cumulative no. of trained EE building practitioners by EOP
Output 4.1: Tools for enhancing the skills and experience of local building practitioners in the design of energy efficiency projects in buildings	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012 Government-endorsed Building Performance Prediction Software Tool officially launched by Year 2015

Description	Success Indicator
Output 4.2: Implemented market oriented EE programs in the buildings sector both at the national and local levels	Government-endorsed energy efficiency assessment tool officially launched by Year 2015
Output 4.3: Government agencies and private sector entities capable of designing and implementing EE building projects	Cumulative no. of trained EE building practitioners by EOP
Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications	Combined annual CO2 Emission reductions from planned pipe-line projects resulting from demonstration projects by EOP (ktonCO2/yr)
Output 5.1: Completed demonstration projects showcasing successful applications of building EE technologies, techniques and practices.	Combined annual CO2 Emission reductions from demonstration projects by EOP (ktonCO2/yr)
Output 5.2: More knowledgeable, technically capable and competent building practitioners in the GOM and the private sector	Cumulative no. of practitioners experienced in EE building practices by means of the demonstration buildings by EOP.

2.5. Main Stakeholders

The list of BSEEP stakeholders and partners and their roles in project implementation are as shown below:

Table 3: BSEEP Stakeholders and Roles

Ministries/Agencies	Person in Charge	BSEEP Components	Role within BSEEP & Contribution to BSEEP
Jabatan Kerja Raya (Public Works Department) - Agency under Ministry of Works	Ybhg. Dato'Sri Ir. Dr. Roslan Md Taha (National Steering Committee Chairman)	1,2,3,4 & 5	Implementing Partner. Agency identified to undertake sustainable EE training after BSEEP. MyCREST certifications for new government buildings. Established training center in Melaka.
Cawangan Alam Sekitar dan Kecekapan Tenaga Jabatan Kerja Raya (Public Works Department Environment & Energy Efficiency Branch)	Ir. Gopal Narian Kutty (National Project Director)	1,2,3,4 & 5	
Cawangan Kejuruteraan Mekanikal Jabatan Kerja	Dr. Ir. Abdul Murad	1,2,4 & 5	Energy Management System for JKR managed government

Ministries/Agencies	Person in Charge	BSEEP Components	Role within BSEEP & Contribution to BSEEP
Raya (Public Works Department Mechanical Engineering Branch)			buildings. Oversees EE in government buildings.
Cawangan Kejuruteraan Elektrikal Jabatan Kerja Raya (Public Works Department Electrical Engineering Branch)	Ir. Baihaki, Ir. Zilaila,	1,2,4 & 5	Energy Management System for JKR managed government buildings. Oversees EE in government buildings. Assisted BSEEP in the JKR Blok F LED lighting project.
Cawangan Kejuruteraan Senggara Jabatan Kerja Raya (Facilities Engineering Branch Public Works Department)	Ir. Azizul Ariffin, Mr. Harjit Singh En. Shahril	1,2,4 & 5	JKR Blok F LED lighting retrofit project. JKR Online Monitoring System. Facilities Management for JKR buildings
Construction Industry Development Board (CIDB) - Agency under Ministry of Works	Pn. Emasria	2 & 4	MyCREST certification program for government buildings. Research center at CREEAM.
Economic Planning Unit (EPU) International Cooperation Section	Pn. Renuka	2	Government liaison for UNDP projects in Malaysia.
Economic Planning Unit Energy (EPU) Section	Dr. Shaharin, Pn. Usha	2	Energy policy makers. Collaborated with BSEEP on inputs in SCP blueprint and the ongoing Demand Side Management (DSM) Study.
Kementerian Tenaga, Teknologi Hijau dan Air, KeTTHA (Ministry of Energy, Green Technology and Water)	a. Dato' Seri Ir Dr Zaini Ujang – Secretary General b. Datin Badriyah Abd Malek – Deputy Secretary General c. Pn. Noor Afifah Abdul Razak d. Mr. Wong Tin Song e. Pn Falisya bt Noor Azam f. Cik Siti Sarah Sharuddin	1,2,3,4 & 5	Energy policy makers. Collaborated with BSEEP and MDV in creating a 200 million EPC fund. Secretariat of the Malaysian Green Tech and Climate Change Council which is chaired by the Prime Minister. Currently developing the Building Energy Index (BEI) labelling scheme for government buildings.
Suruhanjaya Tenaga (Energy Commission - Agency under *KeTTHA)*	a. Abdul Rahim Ibrahim – Director b. Zulkiflee Umar – Head, Demand Side Management	1,2,3& 4	Energy Regulator of the Country. Enforcer of EMEER 2008 which covers 645 commercial buildings. Host of Energy Management Information System - a centralised national building

Ministries/Agencies	Person in Charge	BSEEP Components	Role within BSEEP & Contribution to BSEEP
			energy reporting and monitoring system
Sustainable Energy Development Authority (SEDA) - Agency under KeTTHA	Mr. Steve Anthony Lojuntin	1,2,4 & 5	Agency appointed to undertake the Malaysian Building Energy Management Program after BSEEP. Agency responsible in disbursing grants under the RMK 11 Energy Audit Conditional Grant Scheme. Online monitoring system as C5 demonstration project
Malaysia Green Technology Corporation - Agency under KeTTHA	Datin Paduka Che Asmah Ibrahim – VP for Green Living	2,3 & 4	Collaborated with BSEEP in conducting roadshows for Green Technology Financing Scheme (GTFS). Developed tax incentive schemes for green technology.

2.6. Expected Results

The realization of the project goal and objectives, as designed, is manifested by the achievement of the following results:

- Strengthened government building energy policy making capacity and policies on EE in buildings through the development of an EE strategy and supportive legislation (including incorporation of MS 1525 in the UBBL mandatory building regulations)
- Heightened awareness and strengthened capacity within financial institutions on EE in buildings through among others a number of seminars and conferences, training courses, a design competition and targeted media campaigns
- Completion of a number of building demonstration projects to showcase energy efficient building technologies in new and existing buildings over a range of building types. The demonstration projects will comprise both new construction and retrofitting of existing buildings, and will span over a number of different building uses from residential units to offices and educational facilities
- MS 1525:2007 incorporated into UBBL and thus made mandatory, as well as being updated to reflect developments in technology since last revision
- Incentives for promotion of EE in buildings have been improved and thereby provide a larger amount of support to building EE projects. It is the plan to analyze and propose improvements to existing incentives schemes as well as to push for additional incentives and financing (e.g. establishment of a revolving fund or similar means)
- An established and implemented building energy rating system

- A monitoring system for building energy efficiency has been developed and implemented. It is envisaged that the monitoring system will be based on the building rating system
- Information on good practices, technologies, suppliers and experts is made available through an open database information system, guidelines, and other materials and kept regularly up to date. Information will also be disseminated through seminars, conferences and other professional gatherings, as well as through training courses, guidelines, supporting software building energy design tools and so on.

Table 4: Expected Results of Project

Project Indicator	Project Start	Project End	5 Years after EOP	10 Years after EOP
Baseline Electricity Consumption (GWh/yr)	8,315.4	11,824.0	16,812.9	23,906.8
Alternative Electricity Consumption (GWh/yr).	-	10,974.4	14,905.4	20,471.1
Electricity Savings (GWh/yr)	0	849.6	1,907.5	3,435.7
Savings compared to Baseline (% lower than baseline)	0	7.2	11.3	14.4
CO_2 Reductions (MMT/year)	0	0.581	1.305	2.350
CO_2 Emission Avoided (% lower than baseline)	0	7.2	11.3	14.4
Cumulative CO_2 Savings (Total MMT)	0	1.421	6.204	15.816

3. Findings

3.1. Project Design / Formulation

3.1.1. Analysis of Project Logical Framework (Project Logic, Strategy, Indicators)

The BSEEP Project Logical Framework was used as the reference for the indicators, baseline and targets and the project logic/strategy. The Logical Framework was reviewed and updated from what was originally conceived and approved by UNDP/GEF. But this review and validation process took more than a year to decide on the appropriate framework and timeline and adjust the planning and implementation of the project.

By end of 2013, or around two and half years from official start of project implementation, the Mid-Term Review (MTR) of the project concluded among others that:

- The weaknesses are related to the design of activities rather than the project structure as a whole
- Activities and their indicators of performance showed extremely difficult targets to achieve
- The Inception Phase did not critically look into or make any attempt to update project activities, knowing that the targets were difficult and not achievable
- The MTR recommended that the project implement the following:
    - Revision of the Planning Matrix and Budgeting
    - Refocusing the key Component 1 outputs
    - Putting the emphasis of Component 3, EE Financial Mechanism Capacity Improvements on the ESCO business model
    - Revising Component 5 budget to include purchase of monitoring systems and inclusion of best practices in energy management
    - Extending the network of stakeholders
    - Extending the project duration from the expected date of December 2016 to December 2016.

In April 2015, UNDP commissioned a review and revalidation consultancy assistance on the proposed changes to the project framework, including data/information sources and annual targets. The report consisted of detailed 11-point prescriptions on how to update the BSEEP log frame, which proposed changes at the activity, output indicator and targets. The number of indicators was observed to be too many which could affect the effectiveness of monitoring, and could divert the focus and attention of the project from the key indicators of success.

Resulting from the series of reviews, the updated framework and indicators that was revalidated in April 2015 was adopted by PSC in June 2015. The implementation period was extended for another year since most of the desired outputs were not yet achieved. The results timeframe has been updated to end of December 31, 2016 with the corresponding AWPs for 2015 and 2016. Furthermore, based on the progress review of the project, another adjustment was approved to have the last extension up to June 30, 2017 in order to complete the committed and contracted activities. The project has planned to complete remaining activities and outputs until the financial closure date up to December 31, 2018.

For this Terminal Evaluation, the project planning matrix adopted in June 2015 with the activities, indicators and EOP targets as shown in **Annex A1** were used as basis for the assessment of achievements and for the required performance rating.

The project framework therefore, continued to serve as the basis for evaluation and remained as a critical planning and implementation tool. The project framework is the core of the design of the project which is expected to be relevant, timely and relatively flexible to allow for adaptive management. The extent of allowable changes and adaptive management using the framework was finally cleared in June 2015. However, it took very long to decide and take action to address the problems in advancing the project's progress. In retrospect, the opportunity to update the project framework was missed during the inception phase in January 2011, considering that the preparatory project development process until inception took three (3) years to complete since the PIF design stage started in January 2008.

3.1.2. Assumptions and Risks

There was a long list of assumptions (which are risks when stated in the negative form) that would influence the success of the project stated in the ProDoc including the following:

- GOM commitment to EE remains firm
- Current economic growth at least remains constant
- GOM institutions interested in learning EC&EE, particularly Building Energy Management.
- Continuous support of GOM institutions on MFBEMP even after the BSEEP closes
- Building owners see the benefits of the Building Energy Reporting and Monitoring (BERM) program and continuously support it even after the BSEEP
- MUWHLG supports the incorporation of EE aspects in the UBBL
- Building practitioners are interested in the training courses
- MUWHLG supports the enforcement of the EE Code of Practice for residential buildings
- ST & TNB supports study and make use of it for policymaking
- Banks/FIs are willing to finance building EE projects
- Banks/FIs are interested in EE training courses
- Growth in the Malaysian buildings sector is such that local and international financing entities becomes interested in venturing on EE building projects
- ESCOs are willing to venture on EE building projects

- Building developers and owners are willing to work with ESCOs
- Building developers are interested in "clearinghouse" or "one-stop-shop" type of assistance for their EE projects
- Buildings sector agrees to JKR administering CBEED
- Regular exchanges with partner database keepers and CBEED
- Initial EE Information Offices are JKR State Offices
- Local industries are interested learning how to, and in investing in the, manufacture of EE building materials and EE building equipment and/or components.

During the project design the following served as the risk analysis for the project:

Table 5: Project Risks and Mitigating Actions

Risk	Level of Risk	Mitigating Actions
Political support for EE	Low	• Among others involvement of government decision makers in project implementation and information activities targeting political decision makers
Unstable economic growth in Malaysia	Medium	• None realistically possible through project
Inaccuracy of data submitted in CBEED and MEERB program	Low	• Ensure data is properly vetted by approved personnel • Caution on normalization and consistency with other buildings • Training will be always conducted for the relevant personnel
Low commitment from state and local authorities	Low	• State and local authority will be consistently updated on project progress
Lack of support from building sector professionals	Low	• Involve the professionals in all stages of the project so that the outcomes are in agreement with such groups
Poor performance of demonstrated technologies, non-achievement of projected energy savings and increased investment or maintenance costs for energy efficient technologies	Low	• Proper selection of the EE technologies that will be demonstrated • Activities for the removal of barriers to the effective implementation of demonstrations will be carried out • Use of proven off-the-shelves equipment that can easily fit various performance level requested by the owners. • Adequate capacity building for building practitioners in the feasibility study of EE

		technology applications, selection, deployment and operation of EE technology application projects
Overall	**Low**	

The key risk reported and identified in the project endorsement stage and reaffirmed during project inception pertained to the lack of interest by financial institutions on the business of operationalization of an EE Fund. Towards the end of the project, this risk has been overcome in view of the establishment of the Credit Guarantee Facility offered under MDV. The other risk factors were also managed accordingly. On the other hand, the risk which caused the period of long stagnancy of project implementation in achieving results in the early years was attributed to unexpected turn-overs due to the resignation of key project staff (NPM, CTA, Project Executive and Accountant) and the long period for hiring their replacements as well as new hiring of component managers. While measures were done by the Project Team to mitigate it, the Project Team explained that it has very limited control on the availability of qualified candidates and the length hiring process.

3.1.3. Planned Stakeholder Participation

BSEEP has engaged the relevant GOM ministries and agencies, regulatory authorities, private sector industry organizations, professional institutions and civil society representatives (NGOs) as partners for the project implementation. The following are the stakeholders of the BSEEP and their expected roles in the project:

Table 6: Project Stakeholders and Role in BSEEP

Institution	Role in BSEEP
Central Government Agencies	
PMO	Advise on national policies and strategies for sustainable development Demonstration host and demonstration project co-financier
EPU	Signatory of the UNDP-GEF project agreement on behalf of the government of Malaysia Advise on energy pricing policy mechanisms
MOF	Advise on policy for Energy Efficiency and Energy Management procurement.
Ministries and Sectoral Policy Makers	
MEGTW	Advise on Energy Efficiency policy and strategies as applied to the buildings sector Advise on electricity tariffs and pricing mechanisms Lead Agency on Activity 2.3.4 and 2.3.4
MNRE	Demonstration host and demonstration project co-financier
MHLG	Facilitation of discussions on the incorporation of MS 1525 into UBBL and for securing Cabinet approval; Facilitation of the implementation of MS 1525 with State/Local Authorities (and its subsequent enforcement);

Institution	Role in BSEEP
	Provide continuous training on Energy Efficiency for staff at National, State and District levels. Lead agency in Activity 2.2.1 and 2.2.2;
MOSTI	Agency to finance relevant R&D activities as may be needed to develop or introduce EE components in the building industry
EC	Advisor on Electricity Supply Industry Regulations, including the "Efficient Management of Electrical Energy Regulations
SIRIM	Advise on, and updating of, the MS 1525 Testing agency for certification of Green labeling, etc
Department of Statistics	Lead coordinator for the CBEED
MGTC	Energy Information Bureau data source Manager for the GTFS (Green Technology Financing Scheme)
TNB	Assist in the discussions concerning proposed tariffs for electricity used in buildings Contributor to the CBEED Partner for promoting EE for buildings in particular and all sectors in general
JKR/ Public Works Department	Executing Agency for BSEEP and Designated Implementing Partner of UNDP Advise on energy policy for JKR and advisory services to JKR States on the practice of Energy Efficiency Supervise the BSEEP Project Management Team Provision of project office space and logistics to project management team Demonstration host and demonstration project co-financier; as well as designer of JKR-funded demonstration projects included in BSEEP Provision of assistance on the BERM, MEERB, and MFBEMP implementation, as well as other BSEEP activities Construction management of JKR-funded demonstration projects included in BSEEP.
Private Sector Entities (Demonstration Project Hosts)	
UTM	Demonstration host and demonstration project co-financier
MoH	Demonstration host and demonstration project co-financier
Others	
UNDP	Implementing agency for the BSEEP on behalf of the GEF Guide, monitor and evaluate the management and implementation of the project

The National Steering Committee (NSC) is comprised of main stakeholders as follows:

- Director General of the Jabatan Kerja Raya (as the Chair)
- Deputy Director General of JKR (also as the Chair of the Project Review Committee)
- Ministry of Energy, Green Technology and Water (MEGTW)
- Economic Planning Unit (EPU) of the Prime Minister's Department
- Ministry of Natural Resources and Environment (GEF National Operational Focal Point)
- Ministry of Urban Wellbeing, Housing and Local Government (MUWHLG)
- Ministry of Finance (MOF)

- UNDP Malaysia.

Additional members such as NGOs and private sector representatives or resource groups were also invited in the course of project implementation.

3.1.4. Replication Approach

The incorporation of institutional and legislative framework enhancement was specifically designed and endorsed towards ensuring increased replication not only by the GOM for government buildings but also by the private sector for commercial and residential buildings. It was deemed very necessary, and if possible be enforced under a mandatory approach. The mandatory requirements were complemented by the development and widespread dissemination of cost-benefit assessments of the successful demonstration projects to attract the private sector to follow the government's successes in transforming the buildings to use EE building technologies. This was further enhanced by repeated and extensive awareness raising regarding the fiscal incentives that the government has granted for the implementation of EE measures, whether in new facilities or as retrofits for existing facilities.

Additionally, the corrective policy regarding gradually increasing electricity tariffs due to removal of primary fuel subsidies to reflect true economic and market costs has helped in further leveraging the acceptance of the marginal incremental costs for the EE buildings, and encouraged more rapid replication of the demonstrated successful designs and technologies by the government and some private sector building owners. The project also paid attention to the replication of the successful projects through the documentation of the EE demonstration projects implemented under the BSEEP project period.

The monitoring and validation of the degree of replication was conducted by the project which will be supplemented at the end of the project as a post-implementation survey.

3.1.5. UNDP Comparative Advantage

The project gained much in UNDP's intervention and development strategy in addressing the above barriers and assisting Malaysia's energy efficiency objectives for buildings through the aforesaid project activities. The building sector encompasses several other sectors both public and private and overarching development objectives and covers multiple programs being implemented by several ministries. UNDP, in cooperation with the Government led the project in synchronizing and optimizing potential synergies among the related UNDP-assisted projects in achieving the Project's common goal and objectives. UNDP continued to adhere to long-term commitment in developing these sectors and in following the relevant Country Action Plan that UNDP administers for Malaysia. Therefore, UNDP is in a vantage position and has applied a multi-point development approach in the BSEEP project to help Malaysia in reducing energy consumption and reducing GHG emissions. As part of its overall strategy,

UNDP has continued to contribute in creating the appropriate infrastructure for sustained adoption of new and improved technologies for production and use of building energy efficiency in Malaysia.

3.1.6. Linkages Between the Project and Other Interventions Within the Sector

The project has developed within the sector new linkages through BSEEP and utilized existing linkages through the JKR and KeTTHA in line with the integrated approach in energy efficiency applications in buildings. The project established the Centralized Building Energy Efficiency Database System (CBEED) which involved the design and development of an institutional mechanism for a centralized building energy database system and has become a major key to the project linkages between projects and other interventions in related areas. The database included information on EE building designs and design practices, EE building technologies and technology applications in Malaysia and in other tropical countries, as well as linkages with other buildings databases in the country (e.g., registry of building, building projects, etc). This database would have covered (but not necessarily limited to) information on: (a) Energy consumption patterns in different types of buildings and locations in Malaysia; (b) Documentation and details on relevant case studies from existing EE projects; (c) Suppliers and technologies for building EE available in Malaysia and abroad; and, (d) Building materials and components performance data. This activity would have facilitated the linkages with existing databases and information systems developed by different ministries and their projects with the aim of creating a national web-based IMS. These did not materialize during the BSEEP implementation. Belonging previously in Activity 4.1.2, the CBEED has been moved from Outcome 4 to be developed with the BERM under the umbrella of the Energy Management Information System (EMIS). The EMIS system was originally developed under a UNDP Croatia project, and the system is being transferred and customized to Malaysia under the BSEEP project. It will be institutionalized in the EC and will continue operation after EOP. Due to the delayed launch, the assessment of the CBEED system will be performed after EOP by the EC.

The Project has also been linking and working closely with the Economic Planning Unit to develop long-term policy planning tools to ensure that long-term targets are developed for the building sector in Malaysia. EPU has included building energy efficiency as among the pillars or key elements of the Sustainable Consumption and Production Blueprint which has been finalized.

3.1.7. Management Arrangements

In retrospect, the project's management arrangement was affected due to the inability of the project to fill up the posts necessarily and timely as needed critically by the Project at the early months of the project. Though the NPM, Project Assistant and Financial Assistant were in place as planned, the other positions were not available in the initial phase. As observed in the MTR Report (December 2013): "JKR did set up the committees (NSC, PRC) and appointed the NPD at the earliest stage of the project's implementation however."

The management arrangement was greatly improved starting mid of May 2013. The UNDP has intervened in sorting out the management and reporting issues which led to a renewed vigor in project implementation and execution. This resulted in the accelerating many activities and significantly producing outputs in the last two years of implementation, with full manpower complement of project management team and consultants.

3.2. Project Implementation

3.2.1. Adaptive Management (Changes to the Project Design and Project Outputs During Implementation)

During the early part of the project implementation, as reported in the MTR, the project did not exercise adaptive management practice in spite of the changes in the current situation from what was designed in the ProDoc. It was cited that, for example, two relevant agencies, the Sustainable Energy Development Authority (SEDA) and Malaysia Green Technology Center (MGTC) which were newly created and involved in energy efficiency were not included as members of the NSC. Up to 2013, before the new Project Manager and Project Executive joined the project, the members of the NSC involved only the ministries. After the MTR, as recommended, the NSC and Project Review Committee (PRC) expanded to include a wider network of stakeholders, including the Sustainable Energy Development Authority and the Malaysia Green Technology Center. This reflects the adaptive management practices during the project implementation. Likewise, in the early years of the project, the allowed staff complement was not hired despite the need and availability of resources. Following the recommendations of the MTR, the project recruited its full plantilla and roster of consultants to fully implement the project. The pilot demonstrations were subsequently implemented as the project exerted efforts in making them operate under the agreed guidelines and procedures.

3.2.2. Partnership Arrangements (with Relevant Stakeholders Involved in the Country/Region)

BSEEP was not able to utilize fully the potential partnership arrangements with project partners and stakeholders to its advantage during the early years of project implementation. As stated above, the project started to turn around when the project was reorganized with the new NPM and Project Executive in May 2013 which marked the increased involvement of the JKR management in the implementation of the project. The NPM was responsible to collaborate with a bigger pool of stakeholders and helped the project to achieve the goals and objective despite working. This was further intensified in the last two years of implementation (2015 -2016) with more active partnerships and engagements to harness leveraging and adaptive management that contributed to the attainment of the EE objectives of the project for the country. The pace and effectiveness of implementation in achieving results were bolstered when JKR started to position the project and leveraged its resources to cover wider reach in the project's pilot demonstration and policy activities. At the end of the project,

BSEEP had achieved active collaboration with stakeholders, sharing project information and progress of activities with partners and stakeholders.

3.2.3. Feedback from M&E Activities Used for Adaptive Management

As part of the regular M&E and planning activities, the project uses a feedback system to know the status and reporting like the quarterly reports and annual project review, project implementation review (APR/PIR) in the UNDP/GEF system. The ATLAS has been helpful to the project in the M&E process and providing regular feedback among the Prime Minister's Office (PMO), JKR and UNDP Malaysia. Such feedback system has also been employed as well as with the industry players.

3.2.4. Project Finance

GEF Funds

In summary, the project budget and expenses as of August 31, 2017 are shown below in Table 7:

Table 7: Summary of Annual Expenditures

BUDGET YEAR	CUMULATIVE EXPENDITURE (as of August 31, 2017)
2010	5,793.31
2011	123,278.82
2012	241,111.26
2013	285,245.15
2014	465,036.54
2015	1,013,857.95
2016	1,601,479.29
2017	1,057,748.85
Total Expenditures	**4,795,043.40**
Total Budget	5,000,000.00
Balance	**204,956.60**
Percent expenditure	**95.90%**

As of closing date, there is a remaining fund balance of USD 204,956.66 with cumulative expenditure at 95.90% of the GEF committed budget of US$ 5,000,000.

The detailed accounting of the BSEEP project finance of the GEF funds is shown in Table 8.

Table 8: Summary of GEF Funds Project Annual Budget versus Expenditures per Outcome (US$)

	2010	2011	2012	2013	2014	2015	2016	2017	Totals
Budgeted (per AWP)									
Outcome 1		26,400	184,400	105,700	283,000	114,500	229,500	43,000	986,500
Outcome 2		26,300	176,300	87,650	107,500	630,500	162,500	146,500	1,337,250
Outcome 3		18,500	137,450	63,950	108,500	218,000	181,500	73,000	800,900
Outcome 4		86,100	367,000	159,250	251,500	371,000	215,100	152,500	1,602,450
Outcome 5		55,500	322,875	135,500	618,500	973,000	1,133,500	370,000	3,608,875
Project Management		91,800	79,800	63,400	66,000	36,000	53,000	145,000	535,000
Total Annual Planned Disbursement		**304,600**	**1,267,825**	**615,450**	**1,435,000**	**2,343,000**	**1,975,100**	**930,000**	**8,870,975**
Actual annual Expenditures (per AWP)	**5,793**	**123,281**	**241,195**	**286,341**	**464,866**	**1,014,339**	**1,601,479**	**1,057,749**	**4,795,043**
% Expended vs. Planned disbursement	*N/A*	*40.47%*	*19.02%*	*46.35%*	*32.41%*	*43.27%*	*81.08%*	*112.12%*	
Cumulative expenditures	*5,793*	*129,072*	*370,183*	*655,428*	*1,120,465*	*2,134,323*	*3,735,802*	*4,778,562*	
Balance as of 31 August 2017									**204,957**

Co-financing

The extent of co-financing realized by the project is valued at USD **86,462,599** as compared to the indicative values during the project approval at USD **24,635,882**. The details of the actual co-financing realized are shown below:

Table 9: BSEEP Co-financing Realized

Contributor	Classification	Type	ProDoc Committed Amount (US$)	Estimated EOP Value of Actual Co-financing Realized*	Remarks
A. Government					
Public Works Department (*JKR*)	Gov't Agency	Cash	15,947,222	33,000,000*	Incremental cost of construction for Menara Kerja Raya and National Cancer Institute related to EE measures
Public Works Department (*JKR*)	Gov't Agency	In-kind	3,458,104	403,055	Office space, man-month costs of CASKT director and admin
Ministry of Energy, Green Technology and Water (KeTTHA)	Gov't Agency	Cash	0	3,690,468	Payment of credit guarantee and interest subsidies to MDV for the RM 200 million EPC Financing Facility
Sub-total Government		Cash	15,947,222	36,690,468	
		In-Kind	3,458,104	403,055	
		Totals	19,405,326	37,093,523	
B.Private Sector					
Putra Perdana	Private Sector	Cash	1,666,667	0	
	Private Sector	In-kind	100,000	0	
Sime Darby	Private Sector	Cash	3,263,889	2,654,293	Cost of roof insulation and brick walls based on contract values
Sime Darby	Private Sector	In-kind	200,000	0	

Contributor	Classification	Type	ProDoc Committed Amount (US$)	Estimated EOP Value of Actual Co-financing Realized*	Remarks
Malaysian Debt Ventures (MDV)	Private Sector	Cash	0	46,714,783	RM 200 million EPC financing facility
Sub-total Private Sector		Cash	4,930,556	49,369,076	
		In-kind	300,000	0	
		Total	5,230,556	49,369,076	
TOTAL			**24,635,882**	**86,462,599**	

*The value of co-financing is the incremental cost to implement energy efficient measures in the building design taken at 10% of the total cost construction cost (US$ 330,000,000) of the two (2) buildings by JKR (Menara Kerja Raya and National Cancer Institute at Putrajaya which are also BSEEP demonstration projects); based on Aug 2017 UNORE at 1 USD: 4.2813 MR.

Table 10: Details of the BSEEP Co-financing

Co-financing (type/source)	UNDP own financing (US$)		Government (US$)		Partner Agency (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants								
Loans/Concessions								
In-kind support								
Other			19,405,326	37,093,523	5,230,556	49,369,075	24,635,882	86,462,599
Totals			19,405,326	37,093,523	5,230,556	49,369,075	24,635,882	86,462,599

Pilot Demonstrations

For the pilot demonstration projects that BSEEP supported, as seen in the table below, the total expenditures amounted to US$ 477,153.95 versus the approved pilot demonstration budget of US$ 500,000. All projects have received technical assistance in the form of energy audits, design inputs as well as trainings on passive and active design. This financial status translates to a savings of US$ 22,846.05 in terms of unutilized budget.

Table 11: BSEEP Pilot Demonstration Expenditures

	Approved Funds (US$)	**500,000.00**	
	BSEEP Project Pilot Demonstrations*	**Grant (US$)**	**Grant (RM) Equivalent**
1	JKR LED Retrofit	116,272.67	
2	PAM New HQ	53,000.00	
3	Sime Elmina	90,000.00	
4	GMKL	46,701.69	200,000.00
5	DBKU	23,350.85	100,000.00
6	Xiaoby Crustz	1,000.00	
7	SEDA Online Monitoring Project	84,063.05	360,000.00
8	JKR Complex Online Monitoring Project	57,862.02	247,794.08
9	FMM-MIMG Insulation Project	4,903.68	21,000.00
	Total	**477,153.95**	
	Unutilized budget (Savings)	**22,846.05**	

*These are the final list of pilot demonstrations that received grants from the BSEEP. Originally, there were 13 projects for BEE demonstration lined up as reported in PIR 2016; five projects, viz., Digi Lot 10, Shah Alam (Office); Small Office for Integrity Solution; Gading Kencana, Shah Alam; Menara Tabung Haji, KL and Langkawi Development Authority (LADA) did not materialize. The PAM New HQ Building was included in the final list.

3.2.5. Monitoring and Evaluation: Design at Entry and Implementation (*), and Overall Assessment (*)

Design at Entry and Inception (*)

The TE Team finds the Project M&E as designed at the endorsement stage and at inception to be robust and according to time-tested procedures and standards of GEF and UNDP.

Rating: (S) Satisfactory

***During Implementation** (*)*

The TE Team finds that the project M&E system and its implementation as having several areas for improvement in the management of resources allocated for the project. If the monitoring of the project implementation according to the M&E Plan has been sufficient and effective, the long delay and intermittent operation of the project in the early years of implementation should have been detected and adaptive management should have been exercised to mitigate the potential effects of prolonged implementation instability. The TE covers the entire duration and not only the recent 2-year period which undoubtedly made great satisfactory progress compared to the past 4 years. It took time however to correct and do the adaptive management on a timely and effective manner after the MTR (Feb 2014) and the Project Framework Review (April 2015) were completed for the M&E recommendations. The committed monitoring plan of the project expected from the project management team in cooperation with the key partners should have been fully established and consistently enforced as designed and approved for it to significantly contribute as an effective tool for tracking their commitment and participation and using it for adaptive management as expected to achieve planned project goals during the early years of project implementation. After the MTR, the performance of the M&E during the later years of the project (2014-2016) was greatly enhanced, where a much greater effort was made for M&E of the project and closer project management involvement was experienced.

**Rating: (MS) Moderately Satisfactory*

***Overall Assessment** (*)*

In this regard, the project had severe shortcomings in the regular monitoring and evaluation to keep the project implementation on track and on time in its early years. Nevertheless, the TE Team noted the great improvement in the last two years of implementation.

Rating: (MS) Moderately Satisfactory

3.2.6. Implementation and Execution

***Implementing Agency (UNDP) Execution* (*)**

UNDP had to intervene in the project implementation when the project experienced implementation and execution problems caused by the long resolution of issues affecting the continuity of the project implementation. It had to exercise direct adaptive management by assuming the responsibility of

implementing the project through a shift of implementation modality from Nationally Implemented Modality to UNDP-assisted modality in order to resume implementation and complete the project towards its goals and objectives. UNDP provided the necessary support throughout the entire cycle of the project, including in its identification, preparation of concept, appraisal, preparation of detailed proposal, approval and start-up, oversight, supervision, completion and evaluation. UNDP also played a key role in the monitoring and evaluation of the project, working closely with project partners to ensure that the outputs of the project were on track through field visits, consultations and reviews with stakeholders. Beyond that, UNDP also provide technical advice and advisory support to the project.

**Rating: (MS) Moderately Satisfactory*

Executing Agency Execution (*)

On the overall, the execution performance of the project could have been improved if adaptive management and more rational decision making had been resorted to in the earlier years of project implementation. This has been tackled in the Mid-Term Review and therefore, this Terminal Evaluation will focus more on the achievement of results for the post-mid-term period when more of the significant performance happened. This falls under the responsibility of the Implementing Partner and the Responsible Party, the strategic decisions took much longer that it should have normally taken. The PSC responsibility as chaired by the Implementing Partner within the policy and decision-making role should have influenced, fully asserted and executed to have a more stable operation. Nevertheless, from the overall project standpoint, the expected outcomes have been satisfied in view of the successful completion of the remaining tasks through the combined co-operation among JKR and UNDP Malaysia Country Office based on the targets and timelines agreed in June 2015 to bring the project to a successful closure.

**Rating: (MS) Moderately Satisfactory*

Overall Project Implementation/Execution (*)

**Rating: (MS) Moderately Satisfactory*

3.3. Project Results

Most of the more significant BSEEP achievement of results happened during the last two years (in 2015 and 2016) of implementation. The five-year project that started implementation in 2011 had its last extension up to June 2017 or a total of more than 6 years. After its resumption into activity from almost

three years of lull, it focused on the completion of the critical outputs that are important to the achievement of the project goal and objective.

With the full complement of the PMU and the support consultants and the determination of JKR and partners to complete the project, this Terminal Evaluation concludes that the Project has significantly produced the expected results towards achieving the desired overall outcomes. The following summarizes the achievements vis-à-vis the project results framework following the progress in implementation based on the mid-term review findings and recommendations.

3.3.1. Overall Results (Attainment of Objectives) (*)

Annex G presents the actual accomplishments versus the targeted levels in greater detail. Briefly, an immediate view of the highlights of performance vis-à-vis the list of the BSEEP expected outcomes in the Project PIF during the project approval stage and updated in June 2015 has been analyzed and ratings explained. The result of the analysis using the key evaluation criteria in the TE TOR on relevance, efficiency and effectiveness and overall rating, is summarized at the Outcome/Output level in Table 12 below:

Table 12: Result of the Analysis using the Key Evaluation Criteria on Relevance, Efficiency

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
GOAL: Reduced intensity of GHG emissions from the building sector	Cumulative CO_2 emission reduction from the buildings sector by end-of-project (EOP, Year 2016), kton CO_2eq	1,421.3	1,886.8	2 (R)	4 (MS)	4 (MS)	MS
	% reduction in GHG emissions from the buildings sector by EOP	7.2	9.56	2 (R)	3 (MS)	3 (MS)	MS
	Average emission reduction in the building sector by EOP, kg/m^2	5.3	17.07	2 (R)	4 (MS)	4 (MS)	MS
OBJECTIVE: Improved energy utilization efficiency in the buildings sector	Cumulative energy savings from the buildings sector by EOP (GWh)	2,078	7,060.1	2 (R)	4 (MS)	4 (MS)	MS
	Average BEI in the Malaysian buildings sector by EOP (kWh/m2-yr)	187.3	185	2 (R)	3 (MS)	3 (MS)	MS
	% Energy savings reduction by EOP	7.2	9.56	2 (R)	3 (MS)	3 (MS)	MS
	No. buildings with EMS and/or EMP in place by EOP	576	645	2 (R)	4 (MS)	4 (MS)	MS

[1] Relevance: The extent to which the activity is suited to local and national development priorities and organizational policies, including changes over time or the extent to which the project is in line with the GEF Operational Programs or the strategic priorities under which the project was funded.

[2] Efficiency: The extent to which results have been delivered with the least costly resources possible; also called cost effectiveness or efficacy with respect to agreed timeframe also.

[3] Effectiveness: The extent to which an objective has been achieved or how likely it is to be achieved

[4]Rating: The explanation on the ratings can be seen in the Remarks indicating the basis of the assessment and rating with reference to the evaluation criteria.

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
	% improvement of BEI in the buildings sector by EOP	8.6	9.56	2 (R)	3 (MS)	3 (MS)	MS
	No. of new EE buildings by EOP (Basis: End -2010)	39	42	2 (R)	4 (MS)	4 (MS)	MS
	% of new buildings that are considered EE buildings at EOP (Basis: End 2010)	30	19	2 (R)	3 (MU)	3 (MU)	MU
Outcome 1: Clear and effective system of monitoring and improving the energy performance of the buildings sector.	Annual Energy use in 25 GOM buildings (GWh)	225 (2016)	236	2 (R)	4 (MS)	4 (MS)	MS
Output 1: GOM agencies/departments that employ and implements energy management systems	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP	150	> 150	2 (R)	3 (MU)	3 (MU)	MU
Outcome 2: Implementation of, and compliance to, favorable policies that encourage	Percentage of new buildings (nationally by area) which comply to the provisions of MS1525 by EOP	30%	14.2%	2 (R)	3 (MU)	3 (MU)	MU

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
the application of EE technologies and practices in the country's buildings sector							
Output 2.1: Improved Malaysian EE Building policies, legislation, regulations and action plan	Cumulative no. of approved policies on building EE technology applications by EOP	2	3	2 (R)	4 (MS)	3 (MU)	MS
Output 2.2: Approved and Enforced EE Buildings Code of Practice	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for incorporation in the UBBL by the MHLG by EOP	5	4	2 (R)	- 4 (MS)	4 (MS)	MS
Output 2.3: Utility regulations that promote/support EE technology applications in buildings	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP	20	65	2 (R)	5 (S)	4 (MS)	S
Outcome 3: Availability of financial and	Total volume of financing provided by local banks /financial institutions for EE	100[4]	200	2 (R)	5 (S)	5 (S)	S

[4] The original EOP target was RM 500 million, but was subsequently revised to RM 100 million. However, it was uncertain when and how the revision was made and adopted by the appropriate committee.

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
Institutional support for initiatives on EE Building technology applications	building projects and to the local ESCOs for EE building projects by EOP (RM million)						
Output 3: Enhanced availability and accessibility of financing for EE building projects	Total private sector funding committed to financial mechanisms designed by the BSEEP by EOP (million USD)	5	8	2 (R)	6 (HS)	6 (HS)	HS
Outcome 4: Enhanced awareness of the government, public and the building sector on EE building technology applications	Cumulative no. of trained EE building practitioners by EOP	480	2,176	2 (R)	6 (HS)	6 (HS)	HS
Output 4.1: Tools for enhancing the skills and experience of local building practitioners in the design of energy efficiency projects in buildings	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012	1	2	2 (R)	5 (S)	5 (S)	S
	Government-endorsed Building Performance Prediction Software Tool	1	1	2 (R)	4 (MS)	4 (MS)	MS

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
	officially launched by Year 2015						
Output 4.2: Implemented market oriented EE programs in the buildings sector both at the national and local levels	Government-endorsed energy efficiency assessment tool officially launched by Year 2015	-	1	2 (R)	4 (MS)	4 (MS)	MS
Output 4.3: Government agencies and private sector entities capable of designing and implementing EE building projects	Cumulative no. of trained EE building practitioners by EOP	480	2,176	2 (R)	6 (HS)	6 (HS)	HS
Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications	Combined annual CO2 Emission reductions from planned pipe-line projects resulting from demonstration projects by EOP (ktonCO$_2$/yr)	45	30.2	2 (R)	3 (MU)	3 (MU)	MU

Description	Success Indicator	Updated EOP Target	EOP June 30 2017	Relevance [1]	Efficiency[2]	Effective-ness[3]	Rating[4]
Output 5.1: Completed demonstration projects showcasing successful applications of building EE technologies, techniques and practices.	Combined annual CO_2 Emission reductions from demonstration projects by EOP (ktonCO_2/yr)	15	19.79	2 (R)	5 (S)	5 (S)	S
Output 5.2: More knowledgeable, technically capable and competent building practitioners in the GOM and the private sector	Cumulative no. of practitioners experienced in EE building practices by means of the demonstration buildings by EOP.	30	>30	2 (R)	4 (MS)	4 (MS)	MS
	Average Ratings			***2 (R)***	***4 (MS)***	***4 (MS)***	***MS***
	OVERALL PROJECT RATING			***4 (MS)***			

Rating Scales		
Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution **6**: **Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency **5: Satisfactory (S):** There were only minor shortcomings **4: Moderately Satisfactory (MS)**: there were moderate shortcomings **3: Moderately Unsatisfactory (MU)**: the project had significant shortcomings **2: Unsatisfactory (U):** there were major shortcomings in the achievement of project objectives in terms of relevance, effectiveness, or efficiency 1: **Highly Unsatisfactory (HU):** The project had severe shortcomings	**Sustainability Ratings** **4**. **Likely (L)**: negligible risks to sustainability **3. Moderately Likely (ML):** moderate risks **2**. **Moderately Unlikely (MU):** significant risks **1**. **Unlikely (U):** severe risks	**Relevance Ratings:** **2**. **Relevant (R**) **1**. **Not relevant (NR)** **Impact Ratings:** **3**. **Significant (S)** **2**. **Minimal (M)** **1**. **Negligible (N)**

Based on the above, the project results under the updated Project Framework and renewed commitment by the Implementing Party after June 2015 are rated as:

- **Relevant – 2 (R)**: The project is suited to local and national development priorities and organizational policies, including changes over time and it is in line with the GEF Operational Programs or the strategic priorities under which the project was funded.

- **Moderately Satisfactory (MS) in terms of Efficiency** - There were moderate shortcomings on the extent to which an objective has been achieved or how likely it is to be achieved.

- **Moderately Satisfactory (MS) in terms of Effectiveness** - There were moderate shortcomings on the extent to which results have been achieved with the least costly resources possible (cost effectiveness or efficacy).

The overall rating of the achievement of project results is **Moderately Satisfactory (MS)**.

This means that the project has achieved most of its major relevant objectives but with moderate shortcomings. The Project is expected not to achieve some of its major global environmental objectives within the project period.

This is further highlighted based on the following major outcomes and outputs as briefly described below while noting some observations for further improvement in similar project implementation as seen below:

- Cumulative CO2 emission reduction from the buildings sector by end-of-project 1,888.1 kton CO2eq vs. 1,421.3 target
- Cumulative energy savings from the buildings sector by EOP 7,061.9 GWh vs. 2,078
- Total volume of financing provided by local banks /financial institutions for EE building projects and to the local ESCOs for EE building projects at 200 RM million vs. 100
- Cumulative no. of trained EE building practitioners by EOP at 1,631 vs. 480
- Completion of the four (4) remaining critical outputs which greatly enhanced the overall project contribution to the building sector of Malaysia:

  a) commissioning of the EMIS (Component 1)
  b) adoption of the Long-Term Policy Strategy on EE and adoption of MS1525 by local authorities
  c) operationalization of the Credit Guarantee Line at MDV
  d) completion of the demonstration projects

Cumulative CO_2 Emission Reduction from the Building Sector Exceeded

The direct and indirect emission reductions during the project lifetime were accounted for the in the TE final calculations. The accounting for post-project emission reductions within the goal calculations will be accounted separately from the project lifetime emission reductions according to GEF procedures and will be verified in the Terminal Evaluation upon the collection and availability of more reliable building stock data. As the Project Team reported, the cumulative direct GHG emissions reduction during the project implementation for the project implementation period (2011-2017) and during the anticipated lifetime of EE measures after end of the Project (2018-2037) were 223.924 kton CO_2eq and 2,320.7 kton CO_2eq, respectively. Total cumulative direct GHG emissions reduction as a result of the Project from 2011-2037 was 2,544.6 kton CO_2eq. However, after a review and recalculation using the information and data gathered during the interviews by the TE Team, this figure is revised to be 1,888.1 kton CO_2eq, using the same GEF-EE calculation methodology. The project has successfully achieved its project goal level EOP target of GHG emissions reductions which is 1,421.3 kton CO_2eq.

The Project reduced emissions in three modules with four activities: (1) MS 1525 Enforcement (Building Code module); (2) Active & Passive Design Integration – pHJKR and MyCrest (Building Code module); (3) Demonstration Projects (Demonstration & Diffusion module); and (4) Energy Performance Contract Financing Scheme for ESCOs (Financial Instrument).

From the learning side regarding the estimation procedure, there are essentially two main issues in the estimation: (1) some activities applied optimistic or ambitious assumptions, which would result in an overestimation of the impacts on emissions reductions, and (2) there was a lack of clarity on the assumptions applied in most activities. The TE Team observed that there are issues on the values, assumptions and parameters used which could be corrected in future similar calculation of impacts. The Project Team explained that for Active and Passive Design Integration – pHJKR and MyCrest (Building Code module), the figures on the emission reductions are calculated directly based on BEI reductions

and derived from the registration list for pHJKR /MyCREST projects managed by JKR CASKT. The Energy Performance Contract Financing Scheme for ESCOs is based on proven assumptions on similar model projects in Eastern Europe. The TE Team, however, has re-examined in-depth the assumptions and methodology, and recalculated based on the revalidated information and presents the results as indicated above. At this juncture, the TE Team observed that there are areas that need improvement to enhance consistency of assumptions and methodology which were identified during the MTR and now, in this TE process.

Cumulative energy savings from the buildings sector exceeded

The cumulative energy savings were reported to be at 7,061.9 GwH exceeding the targeted 2,708 GwH level. Similar to the GHG reduction estimates using the methodology, the accuracy is also dependent on the assumptions used which can be corrected in future energy saving calculations. However, despite these assumptions, there is a high degree of confidence that the cumulative energy savings from the buildings have been over-exceeded.

Total volume of financing provided by local banks /financial institutions for EE building projects achieved

A RM 200 million energy efficiency credit financing facility was established by Malaysian Debt Venture (MDV) Sdn. Bhd. for building EE projects. This was pursuant to a Collaboration Agreement with JKR on 22 Sep 2016, which also stipulated that a sum of RM 2 million to be made available by JKR for the purpose of paying for third party credit guarantee fees for credit guarantees offered by Credit Guarantee Corporation Malaysia Berhad. In addition, the Ministry of Energy, Green Technology and Water (KeTTHA) will also provide another RM 10 million for credit guarantee as well as a subsidy of RM 5.8 million to reduce the interest rate of loans secured by the ESCO by 1% annually. KeTTHA's contribution will be channeled through the Energy Commission once an agreement is entered with MDV. It is noted that the original EOP target was RM 500 million which was reduced to RM 100 million during the Project Framework review in June 2015.

Cumulative no. of trained EE building practitioners exceeded

A total of 45 events were organized by the Project or in collaboration with other organizations from 2014 to 2017, which were attended by 2,176 participants. The project also gained its momentum with the adoption and implementation of EE buildings training program and is now considered a sustainable training program.

Completion of the four (4) remaining critical outputs which greatly enhanced the overall project contribution to the building sector of Malaysia:

a) Commissioning of the EMIS (Component 1)

The Project indicated that the requirements for energy management and conservation in government buildings and facilities are governed through the 'GoM Standard Form of Contract for Facilities Management & Maintenance'. The contract applies to all GoM buildings of which there are more than 150 buildings. However, it was not clarified whether these 150 buildings have employed BEM programs and since when if they did. In a JKR circular to all JKR offices in the country on 18 April 2017, the implementation of Energy Management System in all JKR buildings nationwide was required, starting 2017. Based on the reports, it was pointed out that only 5 buildings out of the nine (9) at JKR-HQ complex have implemented an energy management system. On the other hand, the JKR-managed buildings in Putrajaya office complexes (more than 60 buildings) were all subjected to building energy management based on the quarterly report submitted by the Facility Managers to the ST (Energy Commission). Nevertheless, the implementation of EMIS with ST is also a major milestone to allow online reporting of energy and an energy reduction program to be reported by energy managers from their respective buildings in collaboration with the MEGTW.

b) Adoption of the Long-Term Policy Strategy on EE and adoption of MS1525 by local authorities

To some extent the adoption of the MS1525 has been successful in the local authorities in the three participating three states. However, as discussed during the interviews with stakeholders (MUWHLG), despite the promotion by BSEEP and the entry of the MS 1525 in the Gazette regarding adoption and application of standard BEI, the national government has no power to impose to each state the enforcement of said guidelines. From the point of view of KeTTHA, they suggested that for this to take effect, there should be an energy efficiency and conservation (EE&C) Law as post-project plan after BSEEP. Another recommendation while waiting for the Law is to already include in the building permit form the MS1525 requirements which up to this time has not yet been done.

c) Operationalization of the Credit Guarantee Line at MDV

A RM 200 million energy efficiency credit financing facility was established by Malaysian Debt Venture (MDV) Sdn. Bhd. for building EE projects. This was pursuant to a Collaboration Agreement with JKR on 22 Sep 2016, which also stipulated that a sum of RM 2 million to be made available by JKR for the purpose of paying for third party credit guarantee fees for credit guarantees offered by Credit Guarantee Corporation Malaysia Berhad. In addition, the Ministry of Energy, Green Technology and Water (KeTTHA) will also provide another RM 10 million for credit guarantee as well as a subsidy of RM 5.8 million for the purpose of reducing interest rate of loans secured by the ESCO by 1% annually. KeTTHA's contribution will be channeled through the Energy Commission once an agreement is entered with MDV. It is noted that the original EOP target was RM 500 million which was clarified during the Project Framework review in June 2015. Under the program scenario, the value adopted for the "Investment in Year" 2017 was RM 200 million. While this was the amount established by MDV Sdn. Bhd. for building EE projects, was acknowledged by the TE that total disbursement of RM 200 million in 2017 is an ambitious goal. By 30 June 2017, the expected disbursement could be RM 6-7 million.

d) Completion of the Demonstration Projects

The BSEEP project has successfully brought the achievements to greater heights in achieving Outcome 5, having started and operated 13 demonstration projects. The project has successfully showcased applications of building EE technologies, techniques and practices. A summary list of the demonstration activities undertaken by the Project was provided. It indicated total emission reduction from 28 demonstration activities, involving different types of buildings including mostly offices and residential, which were located in the Peninsular Malaysia except one in an office in Kuching, Sarawak. Assistance provided by the Project included grant, expert advisory, simulation, investment grade audits, online metering and building audits. Emission reductions were estimated based on annual energy savings through the enhanced BEI as a result of different EE interventions. While some activities were reported to have involved respective EE actions, others were merely simulations that had also been assumed leading to emission reductions. However, it is not clear if the actions were actually implemented in both situations. There were also no further details of the EE actions including the measures, duration, and derivation of base BEI and enhanced BEI. The cumulative direct emission reductions achieved by 8 demonstration projects (among the total 13 demos) were 3.97 and 55.50 kt CO_2eq, respectively.

Other Significant Achievements:

Among others, the following outputs are worthy of mentioning:

- *Building Energy Efficiency Rating System Developed*- BSEEP had contributed in the sections on building EE as part of the development of a rating system by the Government called the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST.) The project was able to develop the Malaysian Energy Efficiency Rating for Buildings (MEERB) led by Component 4 Consultant as it was targeted in the ProDoc. However, there was no buy-in from stakeholders. The tool was however presented to the stakeholders during the BEI labelling workshop hosted by the Energy Commission on the 22nd May 2017. The sector has yet to see the expected number of buildings actively using the tool from the project fulfilled. The Project Team informed that for the project period (2011-2017), more than 80 building projects have been developed by JKR along the EE building principles under the MyCREST/pHJKR rating system. JKR has also issued a directive for all new Government building projects across the country to adopt the rating system effective 2016. For projects costing less than RM 50 million, they will use the JKR Penarafan Hijau Tool; while for projects costing more than RM 50 million, they must adopt the MyCrest Rating Tool.

- *Building Performance Prediction Software Tool*- This has been officially endorsed and launched in 2015.

3.3.2. Relevance(*)

The project continued to monitor the project implementation progress and performance through the PRC which provided necessary recommendations to the NSC on matters including the relevance of BSEEP to the national level energy efficiency, particularly in building energy efficiency. It has achieved most of its major relevant objectives but with moderate shortcomings or modest overall relevance. On the extent to which the project activities are suited to the local and national development priorities and organizational policies, some of the initially planned project activities were found to be not relevant anymore because of changes over time since it was designed starting many years ago in 2008. However, the project maintained its relevance by revising its project activities to be congruent with national priorities. For instance, in order to maintain its relevance to current thrusts of the country, the project focused on developing EMIS which is based and operated in the Energy Commission instead of the Centralized Building Energy Efficiency Database System (CBEED) under the National Building Energy Management System (NBEMS), which may have to be implemented after EOP.

On the overall, the stakeholders consider the project relevant to their needs as they also pursue their own objectives towards the country's common goals.

The project outcomes remain relevant to the GEF focal areas/ operational program strategies, country priorities according to the 10th and 11th Malaysia Plan, and the mandates of UNDP.

**Rating: R (Relevant)*

3.3.3. Effectiveness (*)

Project management had been ineffective during the first two years of implementation vis-à-vis the expectations in the ProDoc. The project reviews that were conducted have led to changes and they are effective in accelerating the pace of the project implementation in the last two years. However, this renewed interest and determination to complete the project took time to execute since it was recommended in 2013. The decision-making was streamlined within JKR which resulted to transparent and timely changes. By end of project, the project was able to complete effectively most of its targets as updated in June 2015 due to effectiveness of the project management unit in guiding project implementation and the responsiveness of the NSC in overseeing it. On the overall, considering the full term of implementation, most outcomes have been achieved with moderate shortcomings.

**Rating: MS (Moderately Satisfactory)*

3.3.4. Efficiency (*)

The efficiency of delivery of outputs has improved a lot in the last two years of implementation. The full manpower and recruitment of consultants contributed to the accelerated delivery of outputs within the

desired delivery rates in terms of project expenditures and annual budgets. For 2016 and mid-2017, the delivery rates are 81% and 112%, respectively, compared to 19% to 46% in the previous years corresponding to the Annual Work Plans. Taken for the entire implementation period, however, overall performance would still have moderate shortcomings.

**Rating: MS (Moderately Satisfactory)*

3.3.5. Country ownership

The role of JKR or the Public Works Department, an agency under the Ministry of Works, as designated executing agency, being centrally involved in the planning, design, construction and maintenance of public buildings in Malaysia, is at the forefront of building energy efficiency. This has contributed a lot in enhancing government ownership of the building energy efficiency program. BSEEP coordinated the EE technology application projects of selected project partners, namely JKR, MEGTW, ST and MGTC. Together with these key stakeholders, the other stakeholders comprising SIRIM, Malaysian Sustainable Buildings Council, CIDB, Professional organizations, developers and entrepreneurs, academicians, MAESCO, financing institutions etc altogether highlights the country ownership of the BEE program and related to developmental efforts in national EE action planning, legislation and financing schemes for the building sector. On top of everything, country ownership is also strongly manifested for the project results and long-term impacts on energy savings and GHG emissions.

3.3.6. Mainstreaming

The project has worked closely with the Economic Planning Unit to develop long-term policy planning and tools on building energy efficiency and has facilitated the approval of the inclusion of EE applications in buildings in the government Long-Term Policy Strategy beginning from the review of the 11 Malaysia Plan. This is one way that the building energy efficiency has been mainstreamed in the national flow of developmental activities with high potential for contributing in mitigating climate change effects. The pilot demonstrations have become the gateways for entry of relevant groups through their participation in bringing building energy efficiency program accessible to local governments, building owners, banks and other program participants. The public awareness, training and information dissemination have also facilitated acceptance of the program paving the way for the building energy efficiency program's long-term program for sustainability.

3.3.7. Sustainability

The sustainability measures that were pursued by the Project and adopted by the government (in its leading by example role) has contributed significantly to the attainment of sustainability of results to ensure that the knowledge and experience generated by BSEEP can be available even years beyond the project completion. These include the following:

a) Putting in place the Credit Guarantee Facility with MDV which is a market based instrument to support ESCO projects and will continue to be sustained for a long period of time
b) Undertaking the implementation of EMIS with ST to allow an online reporting of energy management and reduction program to be reported by energy managers from their respective buildings in collaboration with the MEGTW
c) Working closely with the Economic Planning Unit to develop long-term policy planning and tools. EPU has facilitated the approval of the inclusion of EE applications in buildings in the government Long-term Policy Strategy beginning from the review of the 11 Malaysia Plan
d) Continuation of capacity development by engaging SEDA to establish the Malaysian Building Energy Management program which consists of energy management training workshops and online building energy monitoring program
e) Establishment of the project website www.bseep.gov.my owned by the government to serve as an important portal for knowledge management and communication that will be managed by the Department of Public Works (*JKR*) under its Environmental and Energy Division
f) Engagement of key players in the building industry as strategic partners that did not only benefit in the capacity building program but also committed to the good intentions of the project in sustainable development and environmental management. As mentioned above, the capacity building provided by the project to JKR and the key stakeholders made it possible for them to play their roles more effectively as evidenced by the key project outputs. This altogether point to the sustainability of BSEEP-initiated program where JKR plays a pivotal role.

Financial Resources (*)

The project has fully optimized the use of the GEF funds with the remaining balance of US$ 204,956.60 as of August 31,2017 which was also committed for the remaining activities and outputs up to the financial closure on December 31, 2018 that are ongoing and relevant to the attainment of overall project objectives. The co-financing inputs have also complemented the requirements of the whole program more than the expected level of commitments from the project partners. The leveraging effect realized by the project co-financing brought the level of the overall financial resources to advantage in fulfilling the project goals.

**Rating: (L) Likely*

Socio-economic/Political (*)

The project was able to integrate socio-economic considerations related to building construction and development. BSEEP has launched a new green building rating tool which is the MyCREST that inputs socio-economic parameters into the rating of buildings in terms of reduced carbon emissions and environmental impact, while taking into account a more realistic life cycle costing and benefit analysis. Along the line of economic feasibility, BSEEP also developed the EPC credit facility model with

MDV to support ESCOs embarking on retrofitting project in the country. The initiative will help improve ESCOs credit rating to financial institutions.

**Rating: (ML) Moderately Likely*

Institutional Framework and Governance (*)

The Project's institutional and implementation arrangements are still relevant and helpful in the achievement of the Project's objectives especially in the renewed momentum created for the last two years of implementation. Overcoming the difficulties experienced for almost 2 and half years, the project has resolved any institutional concerns that have hindered the Project's implementation and progress. The lead role that JKR had played in the BSEEP could be a pattern for the post-project institutional structure and governance for the long-term sustainability of building energy efficiency program. The institutional framework should include a coordination mechanism or policy guideline that will institutionalize the co-operation and coordination among relevant government agencies and organizations particularly including the private sector in policy deliberations and implementation. As mentioned in several sections of this report, the building energy sector is covered by inter-ministerial and multi-sectoral concerns and therefore would need similar multi-sectoral solutions and approaches to develop synergism and oneness in direction and necessary governance to achieve maximum benefits for the country. JKR is the biggest contractor for Government projects and the single Government agency which has been empowered to oversee Government new building projects to be built will be energy efficient as per MyCREST directive issued in 2016. This directive was presented and received endorsement in the recent Green Technology and Climate Change Council chaired by the Honorable Prime Minister in March 2017. This is a significant step towards the desired unification and integration in direction and governance on building EE programs involving Government projects throughout Malaysia.

**Rating: (MU) Moderately Unlikely*

3.3.8. Environmental (*)

The project has made significant contribution to the national objectives of reducing the energy consumption in government and private buildings as seen in Annex G, using the GEF-EE methodology, the Project Team claimed that the cumulative direct GHG emissions saving during the Project implementation in 2011-2017 and during the lifetime of EE measures after end of the Project in 2018-2037 were 223.924 kton CO_2eq and 2,320.660 kton CO_2eq, respectively. Total cumulative direct GHG emissions saving as a result of the Project from 2011-2037 was 2,544.585 kton CO_2eq. In general, there are essentially two main issues in the estimation. Firstly, some activities applied optimistic or ambitious assumptions, which would result in an overestimation of the impacts on emissions reductions. These activities included MS1525 Enforcement and Energy Performance Contract Financing Scheme for ESCOs. Secondly, there was a lack of clarity on the assumptions applied in most activities.

The TE Team, proposes a recalculation based on the revalidated information and data gathered and came up with the updated value for total cumulative direct GHG emissions saving as a result of the Project from 2011-2037 at 1,888.1 kton CO_2eq.

The TE Team, nevertheless, noted that the project has contributed to the national priority on the promotion of energy efficiency and facilitation of measurable reductions in GHG emissions. It is also in line with the national environmental strategy and has been included as an important component of the SCP – Energy Wise Building chapter and the Electricity component of Demand Side Management adopted by the government through EPU along the 11th Malaysian Plan. BSEEP has opened large potentials for investments in energy efficiency projects and production of EE technologies in Malaysian building sectors.

Rating: (ML) Moderately Likely

Overall Likelihood (*)

**Rating: Moderately Likely (ML): Moderate risks*

4. Conclusions, Recommendations & Lessons

4.1. Conclusions

1. Performance Ratings:

   a. Overall project results: **Moderately Satisfactory (MS)**
      - Relevance: Still very appropriate given changed circumstances and market characteristics. The country has moved forward in intensifying the development and implementation of the building energy efficiency program in line with its economic and environmental goals and commitments.
      - Sustainability: Likely to deliver desired benefits for the coming 10-20 years after its completion. The project has initiated major interventions, among others, preparation for the EE&C law, loan guarantee facility by MDV, capacity building among the stakeholders, information and awareness activities and institutional strengthening of JKR and KeTTHA and incentives policies, to ensure program sustainability.
      - Replicability: Big potential for replication as demonstrated in the various pilot demonstrations. The project has strongly pointed out the huge potential in the energy savings and GHG reduction impacts of the project in the long-term.
   b. Organizational strength, determination and synergistic approach proved to be very necessary to sustain and apply building energy efficiency improvements due to very wide scope and number of stakeholders across multi-sectoral and multi-ministerial boundaries.
   c. More government support and fund mobilization with active support from the private sector has been proven by the project to be the critical tandem to realize the BEE economic, sustainable development and environmental potentials.

In the TE process, there are four phases suggested in the TE Guidelines explaining the key activities and responsibilities involved during the evaluation, viz, pre-evaluation, preparatory, implementation and post-evaluation. The BSEEP TE process should have been facilitated more effectively if a pre-evaluation was done in order to complete the data needed by the TE Mission prior to the TE implementation.

The BSEEP project has certainly revived its momentum since it experienced years of almost stagnant state from 2011-2013. The first Project Implementation Review (PIR) was made available only in October 2013 and reported that: "The IP has not recruited the necessary technical expertise required to achieve the project objectives. No CTA since Q4 2012. C1, 2, 3 and 5 managers and team were not in place. TORs were not prepared and call for applications not posted. However, with the new NPM on board, the TORs are being prepared and Request for Proposals progressing. The component managers and rest of the project team are anticipated to aboard by Q4 2013." As explained by the Project Team, during the period, BSEEP had been focusing on various hands-on capacity building

of JKR technical staff related to passive and active design elements and BEI prediction software for new buildings design. It reported that during the 2013-2015 period, the first 23 demonstration projects based on the newly gained expertise have been deployed and successfully completed. As a result of the competency gained through the capacity building of staff involved, JKR managed to develop and implement more than total of 80 EE buildings in the span of 6 years. The internal focus taken by BSEEP Project Management was considered by the Project Team as not at all wasted, but rather resulted to the internal strengthening of JKR competency on EE buildings development. This expertise build-up, accordingly, has also resulted in the successful launching of pHJKR/MyCREST green rating tool which served to measure and document improvement of EE building performance. The total value of these 80 projects is considerably huge not only in terms of value of assets involved but also in the potential energy saving and GHG reduction impact. The ability of JKR to roll-out MyCREST-rated projects during the period has more than convinced the Malaysian Federal Government to recognize MyCREST as an important rating tool for the building sector and to issue a directive for projects with asset value exceeding RM50 million to comply with MyCREST green building approach. BSEEP was instrumental in achieving this successful outcome. Nevertheless, with project in the extended term of almost two years from 2015, it sped up implementation of the activities and planned accordingly the completion of the remaining outputs up to December 31, 2018 at the project's financial closure.

GHG emission reduction is the goal of the project. As such, its tracking should be undertaken along the project implementation, not merely towards the end of the project. Its importance could be established at early stage and at high level such as an agenda item in the NSC and/or PRC. Even though its monitoring had been conducted as part of the yearly PIR process, a more rigorous tracking should be undertaken along the project implementation. During the evaluation, there had been a lack of information and details to explain and justify the accomplishments indicated by the Project. These insufficiencies included the methodology applied, data and values used, assumptions made, and details of calculation.

Management arrangement of the project was generally established in accordance to the ProDoc. Even though the NSC and PRC involved different stakeholders for providing input, the implementation process relied too heavily on the project members. As the project dealt with wide-ranging issues, it might still be insufficient and timely for gathering technical input in supporting the project team and implementation. For example, as indicated in the ProDoc, the PRC could have created ad hoc technical working groups to involve more diversified stakeholders or experts for in-depth deliberation on specific technical matters, including policy, finance and demonstration activities.

There is a need to pass a national law that will provide for the integration of building-related programs and activities because of the multi-sectoral and multi-ministerial nature of the building energy efficiency area.

KeTTHA has begun drafting the Energy Efficiency and Conservation (EE&C) Act. BSEEP has contributed significantly to the efforts towards this direction, and has provided resources to develop this Act.

As discussed during the interviews with stakeholders (MUWHLG), in spite of the promotion by BSEEP and the entry of the MS 1525 in the Gazette regarding adoption and application of standard BEI, the national government has no power to impose to each state the enforcement of said guidelines. A positive development along this line is the statement made by the Deputy Prime Minister on the need to enforce MS 1525 under the UBBL directive.

It was observed that while waiting for the EE&C Law, there is already the need to include the MS1525 in the building permit system and form. Up to this time this has not yet been done as targeted by the project. This is due to the absence of a regulator or facilitator of building energy codes (MS1525) unlike in the other local building code requirements i.e. fire protection, telecommunication, and electricity which are regulated by the relevant agencies. Nevertheless, one local authority, Putrajaya, has initiated including the MS1525 requirement in the building plan approval form.

4.2. Recommendations

4.2.1. For Further Improving the Successful Achievement of the Project Objectives/ Outcomes

1. *Implement until completion the remaining activities and use the committed and remaining funds before the final financial closure by December 31, 2018.* The status of pending or remaining activities is seen in **Annex H.** The proposed additional activities that were identified as relevant to the attainment of the project objective and corresponding proposed budget are also indicated therein.

2. *Develop and lobby for the passage of an EE&C Law that will institutionalize energy efficiency programs including energy efficiency in buildings as post-project plan after BSEEP*. This will provide a legal basis for a national platform and authorities in planning and administering the building energy efficiency program with a regulator or facilitator of building energy codes (e.g. MS1525) just like in the other local building code requirements in fire protection, telecommunication, and electricity which are regulated by the relevant agencies. As mentioned in above observations, there is already the need to include the MS1525 requirements in the building permitting system and forms being used. Based on this status, the follow-up plan will build upon the discussions already initiated by KeTTHA on the said development and endorsement of a draft law and considering the experiences in the 3 states that adopted the energy related provisions of the gazzeted MS 1525.

3. *Develop and establish an inter-ministerial coordination mechanism or a national steering committee to provide the venue for discussing cross-sectoral issues, finding solutions and*

executing sustainable programs. Because of the multi-sectoral coverage of incorporating energy efficiency aspects in buildings, there is the need for an integrated and synchronized approach to be supported by the relevant ministries and agencies in order to push the building energy efficiency program further in realizing the big potential in terms of energy saving and GHG emissions reduction.

4. *Strengthen the delivery of building energy efficiency technologies and services, particularly in intensifying the role of the ESCOs, academic/research institutions, industry associations and other stakeholders*. This will be the follow-up action that JKR will initiate in cooperation with KeTTHA in sustaining the results and systems contributed by BSEEP through its interventions.

5. *UNDP to continue to monitor the progress of project interventions after the project has ended, in close co-operation with JKR and KeTTHA*. This will strengthen the impact and ensure the sustainability of project interventions.

4.2.2. For Future Building Energy Efficiency Projects

1. *Determine means to improve further the appropriate methodology and monitoring and evaluation process for data collection, calculation and verification of the impacts of the building energy efficiency projects.* Since the GHG emission reduction and energy saving were the goal and objectives of the Project, its importance should be established at the project inception stage at the NSC/PRC level with a more rigorous monitoring using an accepted methodology such as the updated GEF-STAP methodology, and to be undertaken periodically along the project implementation.

2. *Determine means to improve the access and availability of sustainable financing for building energy efficiency projects*. This applies to all government, residential and commercial buildings noting the peculiarities of each in terms of financial needs and application. The role and preparedness of the banks, ESCOs, service and supply support industries will be important factors in the sustainability aspects of the program.

3. *Establish a program for a continuing knowledge management and dissemination of the experience gained from BSEEP*. This should be decided as a post-project follow-up plan between JKR and KeTTHA in the short term as the project ends and be confirmed in the development of the EE&C Law for the long-term, in order to define custodianship and management responsibilities of the designated agency and establish the coordination mechanism among the relevant ministries and agencies towards sustainability of the knowledge management and dissemination system under the building energy efficiency program.

4.3. Lessons Learned

1. The PRC could have created ad hoc technical working groups to involve more diversified stakeholders or experts for more in-depth deliberation on specific technical matters.

2. Review of performance indicators should have been carried out in a more realistic manner. As such, a pragmatic and sensible assessment of the indicators should be done in order to ensure performance targets are achievable.

5. Annexes

Annex A: Terms of Reference for the Terminal Evaluation of the BSEEP Project

Annex A1: BSEEP Logical Framework and Targets (based on Reviewed Changes made in June 2015)

Annex B: Itinerary of the TE Mission

Annex C: List of Persons Interviewed

Annex D: Summary of BSEEP Demos Visited during the TE Mission

Annex E: List of Documents Reviewed

Annex F: Evaluation Question Matrix - BSEEP

Annex G: Target and Actual Achievement of ProDoc Log Frame Outcomes and Ratings

Table G1: UNDP – GEF Evaluation Criteria and Rating Standards

Annex H: Status of the Action plan for the Pending or Remaining Activities and Corresponding Estimated Budget

Annex I: Evaluation Consultant Agreement Form

Annex J: Evaluation Report Clearance Form

Annex K: *Annexed in a separate file*: TE audit trail

Annex L: *Annexed in a separate file*: GEF Focal Area Terminal Tracking Tool

Annex A: Terms of Reference for the Terminal Evaluation of the BSEEP Project

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP support GEF financed projects are required to undergo a terminal evaluation upon completion of implementation. These terms of reference (TOR) sets out the expectations for a Terminal Evaluation (TE) of the *Building Sector Energy Efficiency Project in Malaysia*.

The essentials of the project to be evaluated are as follows:

PROJECT SUMMARY TABLE

<table>
<tr><td>Project Title:</td><td colspan="5">Building Sector Energy Efficiency Project</td></tr>
<tr><td>GEF Project ID:</td><td>3598 (GEF PMIS #)</td><td></td><td><u>at endorsement (Million US$)</u></td><td colspan="2"><u>at completion (Million US$)</u></td></tr>
<tr><td>UNDP Project ID:</td><td>3108 (UNDP PIMS #) 00072266 (Atlas ID)</td><td>GEF financing:</td><td>5,000,000</td><td colspan="2">4,950,000 (TBC – Aug 2016)</td></tr>
<tr><td>Country:</td><td>Malaysia</td><td>IA/EA own:</td><td></td><td colspan="2"></td></tr>
<tr><td>Region:</td><td>Asia Pacific</td><td>Government:</td><td>19,405,326</td><td colspan="2">20,000,000 (TBC)</td></tr>
<tr><td>Focal Area:</td><td>Climate Change</td><td>Other:</td><td>5,230,556</td><td colspan="2">6,000,000 (TBC)</td></tr>
<tr><td>FA Objectives, (OP/SP):</td><td>OP 5 / SP 1</td><td>Total co-financing:</td><td>24,635,882</td><td colspan="2">26,000,000 (TBC)</td></tr>
<tr><td>Executing Agency:</td><td>Public Works Department</td><td>Total Project Cost:</td><td>29,635,882.00</td><td colspan="2">30,950,000</td></tr>
<tr><td rowspan="2">Other Partners involved:</td><td rowspan="2">N/A</td><td colspan="3">ProDoc Signature (date project began):</td><td>8 July 2010 (Note: Project Manager onboard 1 Jan 2011)</td></tr>
<tr><td colspan="2">(Operational) Closing Date:</td><td>Proposed: Dec 2015</td><td>Actual: Dec 2016</td></tr>
</table>

OBJECTIVE AND SCOPE

The project was designed to: BSEEP has for its goal the reduction in the annual growth rate of GHG emissions from the Malaysia buildings sector. The project objective is the improvement of the energy utilization efficiency in Malaysian buildings, particularly those in the commercial and government sectors, by promoting the energy conserving design of new buildings and by improving the energy utilization efficiency in the operation of existing buildings. The realization of this objective will be facilitated through the removal of barriers to the uptake of building energy efficiency technologies, systems, and practices. The project is in line with the GEF's climate change

strategic program on Promoting Energy Efficiency in Residential and Commercial Buildings (SP-1). It is comprised of activities aimed at improving energy efficiency and promoting the widespread adoption of energy efficient building technologies and practices in the Malaysian buildings sector. Specifically, the proposed project will reduce carbon emissions by an estimated 581.1 ktons CO2 per year (or cumulative total of about 1,421.3 ktons CO2) by end of the project. This represents about 4% reduction in CO2 emissions compared to the magnitude of CO2 emissions under a business-as-usual scenario13. Five years after the project end, CO2 emissions are forecast to be about 7.2% lower in annual emissions if there will be no BSEEP.

The expected outcomes of the project are the following:

Outcome 1: Clear and effective system of monitoring and improving the energy performance of the building sector
Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies in the country's buildings sector
Outcome 3: Availability of financial and institutional support for initiatives on EE building technology applications
Outcome 4: Enhanced awareness of the government, public and the buildings sector on EE building technology applications
Outcome5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications leading to the replication of the EE technology application demonstrations.

BSEEP is Nationally-Executed (NEX) (or Nationally Implemented Modality – NIM) by the Malaysian Government and JKR is the appointed executing agency.
The Project Document and other relevant GEF documents can be downloaded from the following weblink: http://www.thegef.org/gef/sites/thegef.org/files/repository/11-30-09%20ID3598%20-%20Council%20letter.pdf
Information on the UNDP evaluation process and experience from other countries can be referred at the Evaluation Resource Center at the following weblink http://erc.undp.org.
Information on project can be viewed at http://www.bseep.gov.my/.

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects. The objectives of the evaluation are to assess the achievement of project results, and to draw lessons that can both improve the sustainability of benefits from this project, and aid in the overall enhancement of UNDP programming.

EVALUATION APPROACH AND METHOD

An overall approach and method[5] for conducting project terminal evaluations of UNDP supported GEF financed projects has developed over time. The evaluation should include a mixed methodology of document review, interviews, and observations from project site visits, at minimum, and the evaluators should make an effort to triangulate information. The evaluator is expected to frame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the UNDP Guidance for

[5] For additional information on methods, see the Handbook on Planning, Monitoring and Evaluating for Development Results, Chapter 7, pg. 163

Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. A set of questions covering each of these criteria have been drafted and are included with this TOR (*fill in Annex C*) The evaluator is expected to amend, complete and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The evaluator is expected to follow a participatory and consultative approach ensuring close engagement with government counterparts, in particular the GEF operational focal point, UNDP Country Office, project team, UNDP GEF Technical Adviser based in the region and key stakeholders. The evaluator is expected to conduct a field mission to Kuala Lumpur, Malaysia including the following project sites *in greater Kuala Lumpur and Putrajaya*. Interviews will be held with the following organizations and individuals at a minimum:

- National Project Director
- National Project Manager
- Project Executive
- Component Managers (all) if any
- Key government stakeholders in building energy efficiency (i.e. EPU International Cooperation, EPU Energy, MEGTW, Energy Commission, and Sustainable Energy Development Authority (SEDA))
- Other sections/departments in the Implementing Partner relevant to BSEEP
- Representative from the Industry association
- Representative from the academia relevant to BSEEP
- Selected members of the NSC meeting
- Consultants
- Participating industries / demonstration sites
- Other project partners relevant to the outcome of the project

The evaluator will review all relevant sources of information, such as the project document, project reports – including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, national strategic and legal documents, and any other materials that the evaluator considers useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluator for review is included in Annex B of this Terms of Reference.

EVALUATION CRITERIA & RATINGS

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework (see Annex A), which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of: **relevance, effectiveness, efficiency, sustainability and impact.** Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary. The obligatory rating scales are included in Annex D.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA & EA Execution**	***rating***

M&E design at entry		Quality of UNDP Implementation – Implementing Agency (IA)	
M&E Plan Implementation		Quality of Execution - Executing Agency (EA)	
Overall quality of M&E		Overall quality of Implementation / Execution	
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance		Financial resources	
Effectiveness		Socio-political	
Efficiency		Institutional framework and governance	
Overall Project Outcome Rating		Environmental	
		Overall likelihood of sustainability	

PROJECT FINANCE / COFINANCE

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US$)		Government (mill. US$)		Partner Agency (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

MAINSTREAMING

UNDP supported GEF financed projects are key components in UNDP country programming, as well as regional and global programmes. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender. The evaluation will examine this project's contribution to the United Nations Development Assistance Framework (UNDAF).

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated: a) verifiable improvements in ecological status, b) verifiable reductions in stress on ecological systems, and/or c) demonstrated progress towards these impact achievements.[6]

CONCLUSIONS, RECOMMENDATIONS & LESSONS

The evaluation report must include a chapter providing a set of **conclusions**, **recommendations** and **lessons**. Conclusions should build on findings and be based in evidence. Recommendations should be prioritized, specific, relevant, and targeted, with suggested implementers of the recommendations. Lessons should have wider applicability to other initiatives across the region, the area of intervention, and for the future.

IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation resides with the UNDP CO in Malaysia. The UNDP CO will contract the evaluators and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. The Project Team will be responsible for liaising with the Evaluators team to set up stakeholder interviews, arrange field visits, coordinate with the Government etc.

[6] A useful tool for gauging progress to impact is the Review of Outcomes to Impacts (ROtI) method developed by the GEF Evaluation Office: ROTI Handbook 2009

EVALUATION TIMEFRAME

The total duration of the evaluation will be *30* working days (1.5 months) according to the following plan.

Activity	Timing	Completion Date
Preparation	*3 working* days	*3 Aug 2016*
Evaluation Mission	*12 working* days	*19 Aug 2016*
Draft Evaluation Report	*10 working* days	*2 Sep 2016*
Final Report	*5 working* days	*9 Sep 2016*

EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

Deliverable	Content	Timing	Responsibilities
Inception Report	Evaluator provides clarifications on timing and method	No later than 2 weeks before the evaluation mission.	Evaluator submits to UNDP CO
Presentation	Initial Findings	End of evaluation mission	To project management, UNDP CO
Draft Final Report	Full report, (per annexed template) with annexes	Within 3 weeks of the evaluation mission	Sent to CO, reviewed by RTA, PCU, GEF OFPs
Final Report*	Revised report	Within 1 week of receiving UNDP comments on draft	Sent to CO for uploading to UNDP ERC.

*When submitting the final evaluation report, the evaluator is required also to provide an 'audit trail', detailing how all received comments have (and have not) been addressed in the final evaluation report. See Annex 1 for an audit trail template.

TEAM COMPOSITION

The evaluation team will be composed of *1 international consultant (also as lead consultant) and 1 national consultant.* The consultants shall have prior experience in evaluating similar projects. Experience with GEF financed projects is an advantage. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project related activities.

The Team members must present the following qualifications:

<u>International Consultant</u>

Education

Tertiary education in building science, engineering or in relevant environmental disciplines related to climate change mitigation. Post-graduate or with relevant professional qualification is preferred;

Experience

- More than 10 years working experience in climate change mitigation projects with good knowledge of the state-of-the-art approaches and international best practices of similar projects;
- Experience with UN / UNDP / GEF result-based management evaluation methodologies. Project evaluation experiences within UNDP/GEF in Climate Change mitigation projects will be preferred.
- Experience applying Logical Framework Analysis and SMART indicators, project design and validating baseline scenarios;
- Competence in project Adaptive Management
- Demonstrable analytical skills;
- Excellent English writing and communication skills.

National Consultant

Education

Tertiary education in building science, engineering or in relevant environmental disciplines related to climate change mitigation. Post-graduate or with relevant professional qualification is preferred;

Experience

- More than 5 years working experience in the energy field or in any climate change mitigation projects
- Experience in implementing projects with the Government of Malaysia
- Have strong linkage with national stakeholders related to energy and climate change mitigation projects
- Experience in Project evaluation especially on UNDP/GEF in Climate Change mitigation projects will be preferred.
- Excellent in English and Bahasa Malaysia writing and communication skills will be a must

EVALUATOR ETHICS

Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (Annex E) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluations'

PAYMENT MODALITIES AND SPECIFICATIONS

%	Milestone
10%	Following submission and approval of TE inception report
40%	Following submission and approval of the 1ST draft terminal evaluation report
50%	Following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report

APPLICATION PROCESS

Applicants are requested to apply online (indicate the site, such as http://jobs.undp.org, etc.) by (date). Individual consultants are invited to submit applications together with their CV for these positions. The application should contain a current and complete C.V. in English with indication of the e-mail and phone contact. Shortlisted candidates will be requested to submit a price offer indicating the total cost of the assignment (including daily fee, per diem and travel costs). UNDP applies a fair and transparent selection process that will take into account the competencies/skills of the applicants as well as their financial proposals. Qualified women and members of social minorities are encouraged to apply.

Annex A1: BSEEP Logical Framework and Targets (Based on Reviewed Changes made in June 2015)

Description	Description of Indicator	Baseline	EOP Target
GOAL: Reduced intensity of GHG emissions from the building sector	Cumulative CO2 emission reduction from the buildings sector by end-of-project (EOP, Year 2016), kton CO2eq * Direct GHG ER (including 15-20 yr. lifetime ER of EE measures) achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project's supervised implementation period according to STAP methodology 'Calculating GHG Benefits of GEF EE Projects, Version 1.0., March 2013.	0	1,421.3
	% reduction in GHG emissions from the buildings sector by EOP	0	7.2
	Average emission reduction in the building sector by EOP, kg/m^2	0	5.3
OBJECTIVE: Improved energy utilization efficiency in the buildings sector	Cumulative energy savings from the buildings sector by EOP (GWh)	0	2,078
	Average BEI in the Malaysian buildings sector by EOP (kWh/m2-yr)	205	187.3
	% Energy savings reduction by EOP	0	7.2
	No. buildings with EMS and/or EMP in place by EOP	160	576
	% improvement of BEI in the buildings sector by EOP	0	8.6
	No. of new EE buildings by EOP (Basis: End -2010)	0	39
	% of new buildings that are considered EE buildings at EOP (Basis: End 2010)	0	30
Outcome 1: Clear and effective system of monitoring and improving the energy performance of the buildings sector.	Annual Energy use in 25 GOM buildings (GWh)	264 (2013)	225 (2016)
Output 1: GOM agencies/departments that employ and implements energy management systems	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP	10	150
Activity 1.1: Capacity Needs Assessment in the GOM Institutions	No. of training programs on building energy management in Government Agencies/Institutions conducted by EOP starting Year 2012	0	20

Description	Description of Indicator	Baseline	EOP Target
on Building Energy Management	Cumulative no. of government agencies/institutions that are aware of, and the benefits of, building energy management (BEM) in their day-to-day operations by EOP	10	150
	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP	10	150
Activity 1.2: Development of a Malaysian Federal Building Energy Management Program (MFBEMP)	An established and fully operational Malaysian Federal Buildings Energy Management Programme (MFBEMP) by Year 2015	0	1
	Total budget for the MFBEMP by EOP, (RM Million).	0	-2
Activity 1.3: Preparation of Specific Energy Management (EM) Guidelines for Government Institutions	Completed and approved guidebook on Energy Management Guidelines for Government Institutions by Year 2015	0	1
	Cumulative no. of government building managers that are satisfied in using the EM guidelines by EOP	0	50
	Cumulative no. of government buildings with BEM programs designed based on the EM guidelines by EOP	0	100
Activity 1.4: Monitoring and Evaluation of the MFBEMP Impacts	Average level of investment/budget each year on energy efficiency per building starting Year 2012, RM	0	20,000
	Average annual energy savings per building generated from EE projects and BEM activities starting Year 2013, RM	0	100,000
Activity 1.5: Building Energy Reporting and Monitoring (BERM) Program—under the National Building energy Management System (NBEMS)	Cumulative no. of buildings actively participating in the NBEMS by EOP	0	350
	Cumulative no. of reporting buildings that have implemented no cost measures by EOP	0	20
	% Improvement in the BEI (i.e., reduction) per building category by EOP		
	Office buildings	0	10
Activity 1.6: Establishment of a Centralized Building	a fully established and operational Centralized Building Energy Efficiency Database System (CBEED) by Year2015	0	1

Description	Description of Indicator	Baseline	EOP Target
Energy Efficiency Database System (CBEED) under the National Building energy Management System (NBEMS)	No. of database-keepers (national and international) linked and/or contributing to the CBEED by EOP	0	10
	No. of EE information offices (EIOs) operating by EOP	0	10
Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies and practices in the country's buildings sector	Percentage of new buildings (nationally by area) which comply to the provisions of MS1525 by EOP	0%	30%
Output 2.1: Improved Malaysian EE Building policies, legislation, regulations and action plan	Cumulative no. of approved policies on building EE technology applications by EOP	0	2
Activity 2.1.1: Conduct of Building EE Policy Studies	Cumulative no. of policy studies conducted by EOP	0	10
	Cumulative no. of recommended policies from completed policy studies that are implemented and enforced by local governments, JKR and MHLG by EOP	0	2
Activity 2.1.2: Formal & informal discussions with policymakers	Cumulative no. of policy making agencies endorsing the proposed policies by EOP	0	5
	Cumulative no. of approved policies on building EE technology applications by EOP	0	2
Output 2.2: Approved and Enforced EE Buildings Code of Practice	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for incorporation in the UBBL by the MHLG by EOP	0	5
Activity 2.2.1: Review of Existing Buildings Code of Practice	Cumulative no. of existing articles and provisions in the MS 1525 that were reviewed, adjusted/modified or upgraded to facilitate incorporation in the UBBL by EOP	0	10
Activity 2.2.2: Formulation, Approval and Enforcement of a	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for incorporation in the UBBL by the MHLG by EOP	0	5

Description	Description of Indicator	Baseline	EOP Target
Policy on EE Building Design	Cumulative no. of MHLG personnel trained on the enforcement of MS 1525 as part of the UBBL by EOP	0	150
Activity 2.2.3: Capacity Building on the Application of Building Energy Codes	Cumulative no. of training courses conducted on building energy codes for building practitioners by EOP	0	20
	Cumulative no. of training courses conducted on the design, construction, economic feasibility evaluation, operation and maintenance of EE buildings by EOP	0	20
	Cumulative no. of technically capable building practitioners and building service providers by EOP.	0	600
	Cumulative no. of local engineering and engineering consulting firms that are providing EE building system services by EOP	0	20
Activity 2.2.4: Development of an EE Code of Practice in Residential Buildings	A completed government-endorsed EE Code of Practice in Residential Buildings officially launched by Year ~~2012~~ 2016	0	1
Output 2.3: Utility regulations that promote/support EE technology applications in buildings	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP	0	20
Activity 2.3.1: Assessment of Utility Regulations Promoting/Supporting EE Building Technology Applications	Completed assessment report on applicable policies and regulations that are supportive of the implementation of EE initiatives in the design, construction, retrofit and operation of buildings by Year 2014	0	1
Activity 2.3.2: Design of EE System Incentives in Buildings	Cumulative No of approved incentives for EE buildings by EOP	0	5
	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP	0	20
Activity 2.3.3: Review of Utility Tariffs Focusing on EE in the Buildings Sector	Satisfactorily completed and acceptable report on the Electricity Pricing Study that is intended for EE policy decision making regarding pricing issues by Year2016	0	1

Description	Description of Indicator	Baseline	EOP Target
Activity 2.3.4: Discussions on Energy Pricing for Buildings	Cumulative no. of tariff adjustments made by public utilities that are supportive of EE buildings incentive schemes by EOP	0	2
Activity 2.3.5: Web-based Monitoring of Incentives Scheme Implementation	An operational web-based online fiscal/financial incentive mechanism monitoring service by Year ~~2011~~ 2015	0	1
Outcome 3: Availability of financial and Institutional support for initiatives on EE Building technology applications	Total volume of financing provided by local banks /financial institutions for EE building projects and to the local ESCOs for EE building projects by EOP (RM million)	0	500
Output 3: Enhanced availability and accessibility of financing for EE building projects	Total private sector funding committed to financial mechanisms designed by the BSEEP by EOP (million USD)	0	5
Activity 3.1: Streamlining Processes for Financing Applications	Approved streamlined procedures for applying for and getting financial incentives for building EE activities by Year 2014	0	1
Activity 3.2: Capacity Building on EE Building Technologies for the Banking/Financial Sector	Cumulative no. of training courses on EE building technologies for the banking/financial institutions designed and conducted by EOP	0	10
	Total No. of EE building projects that are financed by local banks/financial institutions by EOP	0	10
	Total volume of financing provided by local banks/financial institutions for EE building projects by EOP (RM million)	0	100
Activity 3.3: Development of an Action Plan for EE Building Project Financing	Completed and approved action plan for the facilitation of the provision of financing of energy efficiency initiatives by Year 2013	0	1
Activity 3.4: Design of Financing Schemes for EE Building Project Financing	No. of applicable project financing schemes on building EE identified and designed by Year 2013	0	3

Description	Description of Indicator	Baseline	EOP Target
Activity 3.5: Promotion of EE Building Projects to Local 'ESCOs'	Cumulative no. of seminar-workshops on EE building project ventures for local ESCOs conducted by EOP	0	10
	Total volume of financing provided to the local ESCOs for EE building projects by EOP (RM million)	0	100
Activity 3.6: Capacity Building on EE Building Project Financing	Cumulative no. of seminar-workshops conducted for the buildings sector on potential financing options for supporting their EE building and EE building technology projects by EOP from 2012	0	8
Activity 3.7: Business Development Matching and Strategic Partnership Establishment	An operational EE Building Market Services Group (MSG) with a clear mandate of identifying business opportunities through providing technical support to EE building project financing by Year 2013	0	1
	Cumulative no. of EE building project developers/owners, banks and financial institutions assisted by the MSG building their capacity to deliver EE building and EE building technology application project financing, and market their projects and financing products by EOP	0	10
Outcome 4: Enhanced awareness of the government, public and the building sector on EE building technology applications	Cumulative no. of trained EE building practitioners by EOP	0	480
Output 4.1: Tools for enhancing the skills and experience of local building practitioners in the design of energy efficiency projects in buildings	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012 Government-endorsed Building Performance Prediction Software Tool officially launched by Year 2015		
Activity 4.1.1: Detailed Study on the Current Building Designs and EE Building Applications	Completed study on best practices in the application of EE technologies and techniques in the design, construction and operation of buildings by Year 2012	0	1
Activity 4.1.3: Establishment of a Comprehensive	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012	0	1

Description	Description of Indicator	Baseline	EOP Target
Guidebook on EE Building Design			
Activity 4.1.4: Development of a Peer-Reviewed, User-Friendly Building Performance Prediction Software Tool	Government-endorsed Building Performance Prediction Software Tool officially launched by Year ~~2011~~ 2015	0	1
	No. of downloads of the building performance prediction software tool by EOP		100
Output 4.2: Implemented market oriented EE programs in the buildings sector both at the national and local levels	Government-endorsed energy efficiency assessment tool officially launched by Year 2015		
Activity 4.2.1: Design of the Energy Efficiency assessment tool for Buildings	Government-endorsed MEERB officially launched by Year 2015	0	1
Activity 4.2.2: Development of the Institutional Mechanism for the energy efficiency assessment tool Scheme	Approved implementing rules and regulations on the energy efficiency assessment tool implementation by Year-2015	0	1
Activity 4.2.3: Implementation, Monitoring and Evaluation of the energy efficiency assessment tool Scheme	Cumulative no. of buildings actively using the energy efficiency assessment tool by EOP	0	18
Activity 4.2.4: EE Buildings Advocacy and Promotion	Cumulative no. of promotional campaigns conducted each year to promote EE in buildings and EE building design starting Year 2012	0	10
Output 4.3: Government agencies and private sector entities capable of designing and implementing EE building projects	Cumulative no. of trained EE building practitioners by EOP	0	480

Description	Description of Indicator	Baseline	EOP Target
Activity 4.3.1: EE Buildings Training Needs Assessment and Planning	Cumulative no. of subjects/concepts on energy efficient design, construction, operation and maintenance of buildings identified for inclusion in training courses by Year 2010	0	20
Activity 4.3.2: Design and Implementation of EE Building Training Courses	Cumulative no. of sets of training materials developed and disseminated by EOP	0	20
	Cumulative no. of training courses conducted EOP	0	20
	Overall no. of personnel trained by EOP	0	480
	% of overall no. of trainees that are gainfully employing learned skills on EE building design / construction/operation & maintenance of new and/or retrofitted building by EOP	0	70
	Cumulative no. of trained EE building practitioners by EOP	0	480
Activity 4.3.3: Sustainable Training Program Design	A completed, ready-for-implementation and funded sustainable follow-up EE building training program approved by the National Steering Committee by Year 2014	0	1
Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE building technology applications	Combined annual CO2 Emission reductions from planned pipe-line projects resulting from demonstration projects by EOP (ktonCO2/yr)	0	45
Output 5.1: Completed demonstration projects showcasing successful applications of building EE technologies, techniques and practices.	Combined annual CO2 Emission reductions from demonstration projects by EOP (ktonCO2/yr)	0	15
Activity 5.1.1: Demonstration of EE Building and EE Building Technology Applications	A set of criteria ready to be used for selecting demonstration projects by Year 2011	0	1
	Cumulative no. of detailed technical and financial feasibility studies done for demonstration site selection by Year 2012	0	30

Description	Description of Indicator	Baseline	EOP Target
	Cumulative no. of finalized and approved demonstration project designs (engineering & construction) by Year 2012	0	10
	Cumulative no. of financed demonstration projects confirmed and approved for implementation by EOP	0	10
Activity 5.1.2: Demonstration Project Implementation	Cumulative no. of demo projects implemented ~~each year~~ by EOP	0	10
	Cumulative no of dissemination exercises conducted ~~e~~ by EOP	0	2
Output 5.2: More knowledgeable, technically capable and competent building practitioners in the GOM and the private sector	Cumulative no. of practitioners experienced in EE building practices by means of the demonstration buildings by EOP.	0	30
Activity 5.2.1: Follow-up Capacity Building for the Local Building Industry	Completed assessment report on the viability of a local industry for the manufacture of EE building materials and EE building equipment/components by ~~Year 2013~~ EOP	0	1
	Cumulative no. of training courses designed and conducted for local building materials producers/suppliers on EE building materials applications by EOP	0	8
	Cumulative no. of training courses designed and conducted for local engineering firms on EE building materials production and applications by EOP	0	8
	Cumulative no. of new EE building projects designed based on, or influenced by the results of the demonstration project by EOP	0	40

Annex B: Itinerary of the TE Mission

Date	Time	Agenda	Location
12 June (Monday)	9:00-9:30	Meeting with UNDP	Wisma UN
	9:30-12:00	Project briefing with NPM & Project Assistant	Wisma UN
	2:00-5:00	Discussion between the consultants	Wisma UN
13 June (Tuesday)	9:00-11.30	Kick-off meeting & briefing with BSEEP	BSEEP Office, JKR
	2:00-5:30	Meeting with the Project Consultants	BSEEP Office, JKR
14 June (Wednesday)	10.00 – 11.00	Meeting with EPU Energy Section	EPU, Putrajaya
	12.00 – 1.00	Meeting with JKR Electrical Engineering Division	JKR Block G, HQ
	2:00-3:00	Meeting with JKR Mechanical Engineering Division	JKR Block G, HQ
	4.00 – 5.00	Skype call with Component 2 Manager, Marina Yong	Wisma UN
15 June (Thursday)	9:00-10:30	Meeting with KeTTHA	KeTTHA, Putrajaya
	12.15- 1.15	Meeting with SEDA	SEDA, Putrajaya
	3.00 – 3.30	Meeting with NSC Chair	Menara Kerja Raya
	4.00 – 5.00	Meeting with Prof Nor Zaini, UiTM	Menara Kerja Raya
16 June (Friday)	9:00-10:00	Meeting with ST	ST, Putrajaya
	11.00 – 12.00	Meeting with MUWHLG	MUWHLG, Putrajaya
	3.30 – 4.30	Meeting with MDV	MDV, KL
19 June (Monday)	9.30 – 12.00	Visit to JKR Block F	JKR Block F, HQ
	2:00-3:00	Visit to PAM Building	PAM, KL
	3:30-4:30	Meeting with GBI	PAM, KL
20 June (Tuesday)	10.00 – 10.30	Visit to NRE	NRE
	2.00 – 3.00	Meeting with MAESCO	MAESCO, Petaling Jaya
21 June (Wednesday)	9.30 – 11.30	Visit to Sime Elmina	Sime Elmina, Rawang
	2.30 – 4.30	Presentation of preliminary findings & wrap up	Menara Kerja Raya

EPU: Economic Planning Unit; JKR: Public Works Department; KeTTHA: Ministry of Energy, Green Technology and Water; MAESCO: Malaysian Association of ESCOs; MDV: Malaysian Debt Venture Sdn. Bhd.; MUWHLG: Ministry of Urban Wellbeing, Housing and Local Government; NRE: Ministry of Natural Resources and Environment; PAM: Pertubuhan Arkitek Malaysia; SEDA: Sustainable Energy Development Authority; ST: Energy Commission; UiTM: Universiti Teknology Mara

Annex C: List of Persons Interviewed

Agency	Name / Position	Contact Details
Economic Planning Unit (EPU)	Dr. Mohd Shaharin Umar, Director of Energy Section Mr. Ahmad Zuhairi Muzakir, Principal Assistant Director Ms. Usha A/P Thamotharan, Assistant Director	Prime Minister's Department, Block B5 & Block B6, Federal Government Administrative Centre, 62502 Putrajaya. Tel: 03- 88725855
Energy Commission (ST)	Mr. Zulkiflee Umar, Head of Demand Side Management. Mr. Norazrin Rupadi, Executive.	No. 12, Jalan Tun Hussein Precinct 2, 62100, Putrajaya. Tel: 03-8870 8500
GBI Sdn. Bhd.	Ir. Chen Thiam Leong, Past President & GBIAP Member	Level 4, PAM Centre, 99L, Jalan Tandok, Bangsar 59100 Kuala Lumpur. Tel: +603 2201 6066
Ministry of Energy, Green Technology and Water (KeTTHA)	Datin Badriyah bt Ab Malek, Deputy Secretary General. Mr. Wong Ting Song, Undersecretary	Blok E4/5, Kompleks Kerajaan Parcel E, Pusat Pentadbiran Kerajaan Persekutuan, 62668 Putrajaya. Tel : 03-8000 8000
Malaysian Association of ESCOs (MAESCO)	Ar. Zulkifli Zahari, President	No 9 Jalan SS7/10, Kelana Jaya, 47301 Petaling Jaya, Selangor. Tel: +603-78730784
Malaysian Debt Venture Sdn. Bhd. (MDV)	Mr. Yashvin Metha Vythy, Senior Corporate Planning Manager	Level 5, Menara Bank Pembangunan, 1016, Jalan Sultan Ismail, 50250 Kuala Lumpur. Tel: +603 2617 2888
Ministry of Natural Resources and Environment (NRE)	Mr. Jaya Singam Rajoo, Undersecretary of Environment Management and Climate Change Division. Dr. Gary Theisera, Deputy Undersecretary Mr. Yusmazy Md. Yusup, Principal Assistant Secretary.	Level 6, Wisma Sumber Asli, No.25 Persiaran Perdana, Presint 4, 62574 Putrajaya. Tel : +603 88886 1125

	Mr. Muhd. Ridzwan Ali, Assistant Secretary.	
Department of Local Government, Ministry of Urban Wellbeing, Housing and Local Government (MUWHLG)	Ar. Sharina Intan Abdullah, Ketua Perunding	Aras 25-29, No. 51, Persiaran Perdana, Presint 4, 62100 Putrajaya. Tel: +60-88913436
Public Works Department (JKR)	Datuk Seri Ir Dr Roslan Md Taha, Director General / NSC Chair Ir. Gopal Narian Kutty, JKR-CASKT Director / National Project Director Ir. Dr. Abdul Murad bin Zainal Abidin, Principal Mechanical Engineer Ir. Baihaki Azraee, Principal Electrical Engineer	Ibu Pejabat JKR, Jalan Sultan Salahuddin, 50582 Kuala Lumpur Tel: +603 - 2618 8799
Public Works Department - BSEEP	Mr. Ahmad Zairin Ismail, National Project Manager Mr. Deep Kumar, Project Executive Ms. Mira Mohd. Noor, Communication Officer Ms. Marina Yong, Consultant Ir. Looi Hip Peu, Consultant Mr. Henrik Rytter Jensen, Consultant Mr. Miroslav Lesjak, Consultant Dr. Yeoh Bee Ghin, Consultant	Cawangan Alam Sekitar dan Tenaga Jabatan Kerja Raya Malaysia HQ Level 22-23, Menara PJD, No. 50 Jalan Tun Razak 50400 Kuala Lumpur Tel: +603 4041 1924
Sustainable Energy Development Authority (SEDA)	Mr. Steve Anthony Lojuntin, Head, Energy Demand Management Unit	Galeria PjH, Aras 9, Jalan P4W, Persiaran Perdana, Presint 4, 62100 Putrajaya. Tel: +603-8870 5800
Universiti Teknology Mara (UiTM)	Dr. Nor Zaini Ikrom Zakaria, Lecturer	Faculty of Applied Science, UiTM, 40450 Shah Alam, Selangor. Tel: +603-55443855
United Nations Development Programme (UNDP)	Mr. Asfaazam Kasbani, Assistant Resident Representative Ms. Nasha Lee, Programme Assistant	Wisma UN, Block C, Kompleks Pejabat Damansara, Jalan Dungun, Damansara Heights, 50490 Kuala Lumpur. Tel: +603-21076000

Annex D: Summary of BSEEP Demos Visited during the TE Mission

No.	Demo Host(Demonstrated)	Type	Ownership	Grant Amount
1	Sime Elmina Development • Energy efficient homes • Autoclaved aerated concrete block work for external wall to achieve U-value 1.6 • Roof/ceiling insulation to achieve U-value 0.4	Residential	Private	USD 90,000
2	PAM (Petubuhan Akitek Malaysia) New HQ • Low energy consumption office building • Passive and active energy savings	Office Building	Private	USD 53,000
3	JKR Block F • Lighting Retrofit Project • Fluorescent T8 tubes to LED T8 tubes • On-line monitoring	Office	Public	USD 116,272
4	SEDA Online Monitoring Project • On-line building energy performance monitoring • 19 buildings that received the energy audit grant	Monitoring System	Public	RM 360,000

Annex E: List of Documents Reviewed

Documents Reviewed	Particulars (checklist if available to TE Team
• Project Initial Form (PIF) • UNDP/GEF BSEEP Project Document • Inception Report • All output reports and documents produced under BSEEP • Minutes of Project Steering Committee Meetings and National Steering Committee meetings. • Amendments to the inception report (if any) • Mid-Term Review (MTR) • Review/evaluation report • Latest project document review report • Latest Project Implementation Report PIR • Latest NEX audit reports or any other audit reports • Past consultancies' assignments and summary of the results • Quarterly reports • Pictures of equipment, installations and sites if any • Newspaper/publication articles • UNDP Development Assistance Framework (UNDAF) • UNDP Country Programme Document (CPD) • UNDP Country Programme Action Plan (CPAP) • GEF focal area strategic program objectives	*(provided through the on-line Dropbox system)*

Annex F: Evaluation Question Matrix - BSEEP

Evaluative Criteria	Questions	Indicators	Sources[7]	Methodology[8]
Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?				
• Is the project relevant to National priorities and commitment under international conventions?	• Is the project country-driven?	• Participation of the stakeholders and beneficiaries	• PIR, Field reports and UNDP CO assessments	• Document analysis and interviews
	• Does the project adequately take into account the national realities, both in terms of institutional and policy framework in its design and its implementation?	• Government programs and laws and regulations passed	• Copies of policy pronouncements	• Document analysis and interviews
	• How effective is the project in terms of supporting and facilitating needs of the building sector through improvement of energy utilization efficiency in Malaysian buildings?	• Participation of the stakeholders and beneficiaries • Relevant impacts on efficiency improvement in buildings	• PIR, Field reports and UNDP CO assessments • Energy audit reports on the selected buildings under the BSEEP	• Document analysis and interviews • Field visits and inspections
	• What was the level of stakeholder participation in project design and ownership in project implementation?	• Satisfaction of the stakeholders and beneficiaries	• PIR, Field reports and UNDP CO assessments	• Document analysis and interviews

[7] Various sources, but not limited to project document, project reports, national policies & strategies, key project partners & stakeholders, needs assessment studies, data collected throughout monitoring and evaluation, data reported in project annual & quarterly reports etc.

[8] Various methodologies, but not limited to Data analysis, Documents analysis, Interviews with project team, Interviews with relevant stakeholders etc.

• Is the project internally coherent in its design?	• Are there logical linkages between expected results of the project (log frame) and the project design (in terms of project components, choice of partners, structure, delivery mechanism, scope, budget, use of resources etc.)?	• Number/degree of changes in the log frame and targets	• MTR report • UNDP CO assessments • PMU Reports	• Document analysis and interviews
	• Even after the extension(s), does the project achieve its expected outcomes?	• Performance improvement and deliveries as a result of extensions	• PIR • PMU report • UNDP CO assessments	• Document analysis and interviews
	• Did the project made satisfactory accomplishment in achieving project outputs vis-à-vis the targets and related delivery of inputs and activities?	• Achievement of targets • Explanation on non-achievement and shortfalls	• PIR • PMU report • UNDP CO assessments	• Document analysis and interviews
• Does the project provide relevant lessons and experiences for other similar projects in the future?	• Has the experience of the project provided relevant lessons for other future projects targeted at similar objectives concerning the Malaysian building sector?	• lessons learned reported	• PIR • PMU report • UNDP CO • Lessons learned reports	• Document analysis and interviews
Effectiveness: The extent to which an objective has been achieved or how likely it is to be achieved?				
• Does the project been effective in achieving the expected outcomes and objectives?	• Were the performance measurement indicators and targets used in the project monitoring system accomplished and able to achieve desired project outcomes within the original project timeline and extension?	• Achievement of targets under each outcomes – to be rated	• Project Framework (logframe) in the GEF-Approved project document and	• Document analysis and interviews • Completion of data and analysis in the Annex C:

			subsequent revisions approved by UNDP/GEFas endorsed by the PSC • PIR	Evaluation of achievements based on the logframe targets or any revision thereof
• How is risk and risk mitigation being managed?	• How well are risks, assumptions and impact drivers being managed?	• Risks identified and managed	• PIR • PMU reports • Project risk logs	• Project Risk logs Document analysis and interviews
	• What was the quality of risk mitigation strategies developed? Were these sufficient?	• Quality assessment	• PIR • PMU reports • Project risk logs	• Document analysis and interviews
	• Are there clear strategies for risk mitigation related with long-term sustainability of the project?	• Risk mitigation done	• PIR • PMU reports • Project risk logs	• Document analysis and interviews
• Consideration of recommendations and reporting of information	• Did the project consider Midterm Review recommendations conducted on time and reflected in the subsequent project activities • Reporting of the petroleum fuels and the power reduction in each of the model units from implementing eco-tech options and the corresponding carbon emission reductions.	• Compliance with agreed MTR recommendations • Fuel saving achieved	• PIR • PMU reports • Field reports • UNDP CO assessments • Tracking tool (mid-term)	• Document analysis and interviews
• What lessons can be drawn regarding effectiveness for other similar projects in the future?	• What lessons have been learned from the project regarding achievement of outcomes?	• Lessons learned reported	• PIR • PMU lessons learned reports • Field reports	• Document analysis and interviews

			• UNDP CO assessments	
	• What changes could have been made (if any) to the project design in order to improve the achievement of the project's expected results?	• Nature of changes in indicators and targets	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards and delivered results with the least costly resources possible?				
• Was project support provided in an efficient way?	• How does the project management systems, including progress reporting, administrative and financial systems and monitoring and evaluation system were operating as effective management tools, aid in effective implementation and provide sufficient basis for evaluating performance and decision making?	• Problems identified and addressed	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• How effective was the adaptive management practiced under the project and lessons learnt?	• Adaptive management actions reported and results	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• Did the project logical framework and work plans and any changes made to them used as management tools during implementation?	• Satisfaction by the PMU and co-operating agencies in using the LogFrame as management tool	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• Utilization of resources (including human and financial) towards producing the outputs and	• Resource inventory and utilization indices	• Project plantilla of personnel PIR	• Document analysis and interviews

	adjustments made to the project strategies and scope.	• Extent of adjustments done and results	• PMU Reports • UNDP CO assessments • Field reports	
	• Details of co-funding provided (Ministry of Urban Development, GoI and Financing Units) and its impact on the activities (Refer to Table in section 6. Project Finance / Co-Finance).	• Ratio of co-financing actually realized vs. committed values	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• How does the APR/PIR process helped in monitoring and evaluating the project implementation and achievement of results?	• Satisfaction of the PMU and UNNP CO in using it as management M&E tool	• Assessment reports of PIRs	• Document analysis and interviews
• How efficient are partnership arrangements for the project?	• Appropriateness of the institutional arrangement and whether there was adequate commitment to the project?	• Level of partnership developed vs. committed level	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• Was there an effective collaboration between institutions responsible for implementing the project?	• Level of collaboration achieved	• PIR • PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• Is technical assistance and support received from project partners and stakeholders appropriate, adequate and timely specifically for project PMU?	• Level of satisfaction by PMU	• PMU Reports • UNDP CO assessments	• Document analysis and interviews
Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?				•

• Will the project be sustainable on its conclusion and stimulate replications and its potential?	• How effective is the project in terms of strengthening the capacity of building sector professionals	• Satisfaction level of professionals accessing project results	• PMU Reports • UNDP CO assessments	• Document analysis and interviews
	• Was an exit strategy prepared and implemented by the project? What is the "Expected situation at the end of the Project"	• Coy of Exit Strategy	• Exit strategy report • UNDP Assessment	• Document analysis and interviews
	• Appropriateness of the institutional arrangement and whether there was adequate commitment to the project.	• Level of commitment through results realized	• PMU Reports • UNDP CO assessments	• Document analysis and interviews
Impact: Are there indications that the project has contributed to, or enabled progress towards maximizing environmental benefits?				
• What was the project impact under different components?	To what extent has the project contributed to the following?: (a) Institutional Arrangements Strengthened (b) Effective Information Dissemination Program Developed (c) Stakeholders capacity enhanced	• Institutional Arrangements Strengthened ▪ • Information programs developed	Annex C: Evaluation of achievements based on the logframe targets or any revision thereof	Document analysis and interviews
• What are the indirect benefits that can be attributed to the project?	• Were there spinoffs created by the project, if any, as a result of the various workshops held nationwide, toolkits, case studies developed?	• Spin-offs created	• PMU Reports • UNDP CO assessments	Document analysis and interviews

• Impacts due to information dissemination under the project	• To what extent did the dissemination activities facilitate the progress towards project impacts?	• Level of dissemination of results achieved	• PIR • PMU Reports • UNDP CO assessments	Document analysis and interviews

Annex G: Target and Actual Achievement of ProDoc Log Frame Outcomes and Ratings

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
GOAL: Reduced intensity of GHG emissions from the building sector	Cumulative CO2 emission reduction from the buildings sector by end-of-project (EOP, Year 2016), kton CO2eq[10]	0	1,421.3	1,886.8	CO_2 emission reduction of the Project was estimated using GEF-EE "Revised Methodology for Calculating Greenhouse Gas Benefits of GEF Energy Efficiency Projects (Version 1.0)", including the Excel Spreadsheet. Of all four modules in the methodology, the Project reduced emissions in three modules with four activities: (1) MS 1525 Enforcement (Building Code module); (2) Active & Passive Design Integration – pHJKR and MyCrest (Building Code module); (3) Demonstration Projects (Demonstration & Diffusion module); and (4) Energy Performance Contract Financing Scheme for ESCOs (Financial Instrument). The initial target in the ProDoc was 1,421.3 kton CO_2eq, which should be achieved by EOP (originally 2015, but extended to 2017). However, this target was reviewed in 2015 to also include the 20-year technology life-cycle savings. The Project Team reported that cumulative direct GHG emissions saving during the Project implementation in 2011-2017 and during the lifetime of EE measures after end of the Project in 2018-2037 were 223.924 kton CO_2eq and 2,320.660 kton CO_2eq, respectively. Total cumulative direct GHG emissions saving as a result of the Project from 2011-2037 was 2,544.585 kton CO2eq. However, the TE Team observed that, in general, there are essentially two main issues in the estimation. Firstly, some activities applied optimistic or ambitious assumptions, which would result in an overestimation of the impacts on emissions reductions. These activities included MS1525 Enforcement and Energy	MS

[9] Based on reviewed and changes made latest June 2015)

[10] Note: Direct GHG ER (including 15-20 yr. lifetime ER of EE measures) achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project's supervised implementation period according to STAP methodology 'Calculating GHG Benefits of GEF EE Projects, Version 1.0., March 2013.

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					Performance Contract Financing Scheme for ESCOs. Secondly, there was a lack of clarity on the assumptions applied in most activities. These activities included MS1525 Enforcement, Active & Passive Design Integration – pHJKR and MyCrest, and Demonstration Projects. (1) MS 1525 Enforcement: • The parameters "Year Building Code in Force" and "Percent New Square Meters Built Compliant with Code" were year 2017 and 100 per cent, respectively. On the former parameter, the Project indicated that the gazettement dates of Selangor, Terengganu and Penang were 2012, 2013 and 2016, respectively; hence the effective years would be 2017, 2018 and 2021, respectively. On the latter parameter, the project assumed that the gazettement of the provisions of MS 1525 in the UBBL by the state governments entail mandatory compliance (100%) by all new property development projects within the state covered by the UBBL effective from the gazettement date. However, such assumption was not reflected in the consultation conducted by the evaluators with the Local Government Department of the Ministry of Urban Wellbeing, Housing and Local Government. Therefore, a gradual percentage of adoption for MS1525 was applied, with a 50% adoption of the code after 5 years of gazettement and 100% after 10 years of gazzetement. Monitoring of implementation of the UBBL is under the purview of the local councils, and the new UNDP-GEF GTALCC project will assist in setting up monitoring frameworks. (2) Active & Passive Design Integration – pHJKR and MyCrest: • The impact resulted from this activity was estimated based on projects registered with JKR in 2012-2017 for pH-JKR and MyCREST. The averaged value of these historical data on annual building areas was assumed for	

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					2018 to 2037. Although the parameter "Percent New Square Meters Built Compliant with Code" was initially assumed 100 per cent since 2012, based on the values were provided by JKR-CASKT that will be monitored by the division, this was later revised to gradual compliance towards 100% in 2020. (3) Demonstration Projects: • The Project involved in 17 demonstration activities. Among these, there were 7 sites with EE measures funded by the Project. The average annual electricity savings of these sites was estimated at 426 MWh. (4) Energy Performance Contract Financing Scheme for ESCOs: • Under the Programme scenario, the value adopted for the "Investment in Year" 2017 was RM 200 million. While this was the amount that was made available by Malaysian Debt Venture (MDV) Sdn. Bhd. for building EE projects, it was acknowledged by the consultant that total disbursement of RM 200 million in 2017 is an ambitious goal. By 30 June 2017, the expected disbursement could be RM 6-7 million. Based on the data and information provided in a series of review and validation of the assumptions and methodology, the TE Team proposes a recalculation (also enclosed herewith) which resulted in the revised EOP values as indicated. The cumulative direct GHG emissions saving during the Project implementation in 2011-2017 and during the lifetime of EE measures after end of the Project in 2018-2037 were 89.971 kton CO_2eq and 1,798.145 kton CO_2eq, respectively. Total cumulative direct GHG emissions saving as a result of the Project from 2011-2037 was 1,888.116 kton CO_2eq.	

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	% reduction in GHG emissions from the buildings sector by EOP	0	7.2	9.56	The Project estimated the achievement of this parameter by assuming similar ratio of the EOP target to achievement for "Goal: Cumulative CO2 emission reduction from the buildings sector", with the calculation as follows: (1421.3/1886.8)*7.2 = 9.56%. However, the TE noted that this parameter should be estimated based on the actual and BAU levels of GHG emissions from the sector by EOP. The estimation for the "Goal: Cumulative CO2 emission reduction from the buildings sector" reflects only the level of reduction achieved by specific activities as outlined above, which was not representative for the whole building sector. The targets in the ProDoc were based on projections using specific methodology, assumptions and values. These are highly unlikely comparable to the approach adopted by the Project. This parameter could be estimated using the methodology stated in the ProDoc or other comparable methodology as sufficient data and information should already be available to the Project.	MS
	Average emission reduction in the building sector by EOP, kg/m^2	0	5.3	17.07	Based on estimated building stock area as per data from NAPIC using Obtain growth in gross floor area of national and individual states - Selangor, Penang, Terengganu by using polynomial regression to second order with best fit.as calculated based on building stock data. However, similarly as explained above, the TE noted that average emission reduction should be estimated based on the actual and BAU levels of GHG emissions from the sector by EOP. The estimation reflects only the level of reduction achieved by specific activities as outlined above, which was not representative for the whole building sector. Nevertheless, it is remarkable that the project has been instrumental in laying the good foundations in terms of the necessary EE building policies and regulations for the sustainability of the initial outcomes which should be backed by effective M&E towards the achievement of the long-term goals.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
OBJECTIVE: Improved energy utilization efficiency in the buildings sector	Cumulative energy savings from the buildings sector by EOP (GWh)	0	2,078	7,060.1	Cumulative energy savings from the buildings sector as a result of the Project was estimated using GEF tool for four activities as elaborated in the "Goal" above. The target in the ProDoc was 2,078 GWh, which should be achieved by EOP (originally 2015, but extended to 2017). During the evaluation, the Project Team reported that the cumulative energy savings by EOP from the Project implementation in 2011-2017 and the lifetime of EE measures after EOP in 2018-2037 were 305.0 GWh and 7,105.1 GWh, respectively. Total cumulative energy savings as a result of the Project from 2011-2037 was 7,410.1 GWh. Based on the data and information provided in a series of review and validation of the assumptions and methodology, the TE Team proposes a recalculation (also enclosed herewith) which resulted in the revised EOP values as indicated. While it was not clarified the temporal coverage of the targeted level in ProDoc, it was assumed that, along with the review of the target on GHG emission reduction, the cumulative energy savings included the effects of the 20-year technology life-cycle savings. Based on the recalculation by the TE Team, total cumulative direct electricity savings from 2011-2037 was 7,060.1 GWh. These savings included 122.4 GWh during the Project implementation in 2011-2017 and 6,937.7 GWh during the lifetime of EE measures after ending of the Project in 2018-2037.	MS
	Average BEI in the Malaysian buildings sector by EOP (kWh/m2-yr)	205	187.3	185	The Project estimated the achievement of this parameter using the similar approach as described in the parameter "Goal: % reduction in GHG emissions from the buildings sector by EOP" above, with the calculation as follows: 205* (100-9.56) = 185. However, as noted above, the methodology in the ProDoc are highly unlikely comparable to the approach adopted by the Project. This parameter could be estimated using the methodology stated in the ProDoc or other comparable methodology as sufficient data and information should already be available to the Project.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	% Energy savings reduction by EOP	0	7.2	9.56	Refer to the comment on the parameter "Objective: Average BEI in the Malaysian buildings sector by EOP" above.	MS
	No. buildings with EMS and/or EMP in place by EOP	160	576	645	Under the Efficient Management of Electrical Energy Regulations 2008 (EMEER 2008), 645 commercial installations in the country were required to report their energy consumption to the Energy Commission (EC) every six months. Recording of this reporting has been manually undertaken by EC. Through the Project's assistance to EC, a web-based 'Energy Management Information System (EMIS)' was developed and will be fully operational in 2018.	MS
	% improvement of BEI in the buildings sector by EOP	0	8.6	9.56	Refer to the comment on the parameter "Objective: Average BEI in the Malaysian buildings sector by EOP" above.	MS
	No. of new EE buildings by EOP (Basis: End -2010)	0	39	42	Based on the Gazettement of UBBL Clause 38A in Selangor, Penang and Terengganu and NAPIC data, the number of buildings can be derived. But, however, it is not certain if the new buildings really complied with EE designs as intended by MS1525. KETTHA has some suggestions to ensure that the EE-related regulations are followed. As of this TE, the assumption that they are EE buildings may not be supported.	MS
	% of new buildings that are considered EE buildings at EOP (Basis: End 2010)	0	30	19	Based on the argument above, this figure may not be supported.	MU
					Average Goal/Objective Rating	**MS**
Outcome 1: Clear and effective system of monitoring and improving the energy performance of the buildings sector.	Annual Energy use in 25 GOM buildings (GWh)	264 (2013)	225 (2016)	236	In the presentation by Energy Commission during BSEEP National Conference 2017 on 11 May 2017, it was projected that the electricity consumption of 25 ministries' buildings monitored as 235.85 GWh in 2016.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
Output 1: GOM agencies/departments that employ and implements energy management systems	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP	10	150	150	The Project indicated that the requirements for energy management and conservation in government buildings and facilities are governed through the 'GoM Standard Form of Contract for Facilities Management & Maintenance'. The contract applies to all GoM buildings that are more than 150. However, it was not clarified whether these 150 buildings have employed BEM program and since when if they did. In a JKR circular to all JKR offices in the country on 18 April 2017, which requires the implementation of Energy Management System in all JKR buildings nationwide starting 2017, it pointed out that only 5 buildings at JKR-HQ have implemented energy management system.	MU
Activity 1.1: Capacity Needs Assessment in the GOM Institutions on Building Energy Management	No. of training programs on building energy management in Government Agencies/Institutions conducted by EOP starting Year 2012	0	20	26	23 events were conducted in 2014 to 2017 by the Project or in conjunction with other partners.	S
	Cumulative no. of government agencies/institutions that are aware of, and the benefits of, building energy management (BEM) in their day-to-day operations by EOP	10	150	150	Refer to the remarks in Output 1.	MS
	Cumulative no. of government agencies/institutions that have employed BEM programs by EOP	10	150	150	Refer to the remarks in Output 1.	MU
Activity 1.2: Development of a Malaysian Federal Building Energy	An established and fully operational Malaysian Federal Buildings Energy Management	0	1	1	SEDA was appointed by BSEEP-JKR on 16 Jan 2017 as the Implementing Agency for (i) Malaysian Building Energy Management and Development of National Competency Standard Certification; (ii) On-line Building Energy Performance Monitoring. Both activities were expected to be completed by June 2017. The	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
Management Program (MFBEMP)	Programme (MFBEMP) by Year 2015				National Competency Standard was developed and appointment of contractor for developing the Online Building Energy Performance Monitoring was done in May 2017.	
	Total budget for the MFBEMP by EOP, (RM Million).	0	2	0.44	Total fund provided to SEDA was RM 440,000, including RM 80,000 for developing the National Competency Standard and RM 360,000 for developing the Online Building Energy Performance Monitoring.	S
Activity 1.3: Preparation of Specific Energy Management (EM) Guidelines for Government Institutions	Completed and approved guidebook on Energy Management Guidelines for Government Institutions by Year 2015	0	1	1	The "Guidelines on the Development and Implementation of an Energy Management System for Building Facilities" was published in May 2017.	S
	Cumulative no. of government building managers that are satisfied in using the EM guidelines by EOP	0	50	>50	8 events were conducted in 2016 by the Project, which were attended by 142 participants. However, it was not clarified if these participants were government building manager and were satisfied in using the EM guidelines.	MS
	Cumulative no. of government buildings with BEM programs designed based on the EM guidelines by EOP	0	100	> 150	Refer to the remarks in Output 1.	MU
Activity 1.4: Monitoring and Evaluation of the MFBEMP Impacts	Average level of investment/ budget each year on energy efficiency per building starting Year 2012, RM	0	20,000	148,000	The 'Energy Audit Conditional Grant', an EE initiative under the 11th Malaysia Plan, was implemented by the government of Malaysia in 2016-2020. The initiative involves commercial buildings implemented by SEDA Malaysia. In 2016, the average energy savings from the 28 participating buildings is around 246,837 kWh per building. This is based on projection of 3% energy reduction, which must be achieved in order to satisfy the conditions of the grant. Based on SEDA's rule of thumb of RM 0.60 per kWh reduction, the average level of investment on energy efficiency is estimated at RM 148,000.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	Average annual energy savings per building generated from EE projects and BEM activities starting Year 2013, RM	0	100,000	RM 444,306.21.	The Project indicated that the average annual energy savings per building generated from EE projects and BEM activities was RM 444,306.21. This was based on 28 buildings participating in the Energy Audit Conditional Grant scheme operated by SEDA for Commercial Buildings, and the assumption that 15% projected savings per building multiplied by average tariff of RM 0.36/ kwH. The grants recipients are required to implement energy saving measures to reduce up to 15% in energy consumption whereby failure to achieve the targeted savings will result in breach of contract with SEDA and the building owner will be required to pay back the grant to SEDA.	S
Activity 1.5: Building Energy Reporting and Monitoring (BERM) Program under the National Building energy Management System (NBEMS)	Cumulative no. of buildings actively participating in the NBEMS by EOP	0	350	645	Under the Efficient Management of Electrical Energy Regulations 2008 (EMEER 2008), 645 commercial installations in the country were required to submit report to the Energy Commission (EC) every six months. The current reporting is using Microsoft Excel format, which is then manually processed by EC team. The Project supported the development of 'Energy Management Information System (EMIS)' at EC. The web-based EMIS will be fully operational in 2018.	MS
	Cumulative no. of reporting buildings that have implemented no cost measures by EOP	0	20	19	The Project indicated that there were 19 buildings in the Online Building Energy Performance Monitoring programme implemented by SEDA. However, the information on these 19 buildings was not provided and it was not clarified if these buildings have implemented no cost measures.	MS
	% Improvement in the BEI (i.e., reduction) per building category by EOP					
	Office buildings	0	10	9.56	Refer to the comment on the parameter "Goal: % reduction in GHG emissions from the buildings sector by EOP" above.	MS
Activity 1.6: Establishment of a Centralized Building Energy Efficiency Database System (CBEED) under the National Building energy	a fully established and operational Centralized Building Energy Efficiency Database System (CBEED) by Year2015	0	1	1	The Project supported the development of 'Energy Management Information System (EMIS)' at the Energy Commission (EC). The web-based system, which was expected to be fully operational in 2018, will improve the reporting framework currently implemented under the Efficient Management of Electrical Energy Regulations 2008.	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
Management System (NBEMS)	No. of database-keepers (national and international) linked and/or contributing to the CBEED by EOP	0	10	Not relevant	EMIS is based in and operated by the Energy Commission.	S
	No. of EE information offices (EIOs) operating by EOP	0	10	Not relevant	EMIS is based in and operated by the Energy Commission.	S
					Average Component 1 Rating	MS
Outcome 2: Implementation of, and compliance to, favorable policies that encourage the application of EE technologies and practices in the country's buildings sector	Percentage of new buildings (nationally by area) which comply to the provisions of MS1525 by EOP	0%	30%	14.2%	This value was calculated based on floor area data of NAPIC on new buildings for Penang, Selangor and Terengganu only as the 3 states (out of the total 13) have adopted and enforced the MS1525 regulations. Other states are in various stages of adoption/compliance. The assumption that all new buildings in the 3 states have adopted and complied with MS 1525 may not be consistent. The 14.2 % was derived as the percentage of Total New Buildings in 3 states (sqm) out of Total New Buildings nationally in 2016 (see Excel Worksheet Component 2 GHG MS1525) as explained by Marina. HOWEVER, as discussed during the interviews with stakeholders (MUWHLG), in spite of the promotion by BSEEP and the entry of the MS 1525 in the Gazette regarding adoption and application of standard BEI, the national government has no power to impose to each state the enforcement of said guidelines. From the point of view of KeTTHA, they suggested that for this to take effect, there should be an EE&C Law as post-project plan after BSEEP. Based on this, the uptake by new building owners to comply with the MS1525 provisions has been greatly affected.	MU
Output 2.1: Improved Malaysian EE Building policies, legislation,	Cumulative no. of approved policies on building EE technology applications by EOP	0	2	3	*By EOP* 1) Policy on Financing to drive long-term BEE program approved at total of RM200 million from MDV as leveraged financing for building retrofits [December 2016]. Status of funds: USD 500,000 transferred in December 2016 from BSEEP; the balance of the funds (RM 10,000,000 and RM 5,800,000 to buy down the interest	HS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
regulations and action plan					rate by about 1.5%) from KETTHA and others are being processed pending actual transfer. 2) Policy adopting the MyCREST building rating tool [2016] 3) Green Technology Master Plan launched in IGEM [October 2017] *Green Technology Master Plan Link:* https://1drv.ms/b/s!Ammdn1prNcSe72WGzxUU2ICGeKrk The GTMP outlines the action plan and initiatives that cut across six major sectors — energy, manufacturing, building, transport, waste and water. The plan presents Malaysia's green technology strategy to create a resource-efficient, low-carbon footprint economy. Compared to the two (2) policies specific to building energy efficiency policy/regulation as cited above, the GTMP presents a general action plan and also includes the said two policies. It is noted however, that the launching (not clear if a new policy was officially approved) took place after the project EOP of 30 June 2017 as cut off of the TE. *In Progress* 1) Policy on BEI disclosure for government buildings in support of MS1525. Status: For approval by the PM, to be tabled at the MTHPI in Sept 2017 2) Long-term BEE Policy within a national Energy Efficiency and Conservation Law to be revived from an initial draft 4 years ago; deliberations to start 3rd Quarter 2017. 3) Policy updating MS1525 that progressively tightens provisions (through SIRIM). Deliberation to revise begins in June 2017 to consider modern technology developments and benchmark at BEI 120; projected to be approved in 2019.	
Activity 2.1.1: Conduct of Building EE Policy Studies	Cumulative no. of policy studies conducted by EOP	0	10	16	List of policy studies completed: 1. A utility Energy Efficiency Obligation (UEEO)-2014	HS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					2. Appliance and Equipment Standards and Labelling (S&L)-2014 3. Disclosure of Building Performance -2014 4. Energy efficiency building rating tools -2014 5. A National Building Energy Consumption Database (NBECD)-2014 6. Energy efficiency codes and standards for buildings -2014 7. Energy efficient technologies/ construction methods for new buildings-2014 8. Energy performance standards for government buildings- 2014 9. Enabling energy services contractors- 2014 10. Mortgages to enable EE-2015 11. Capacity building in EE- 2015 12. Incentives for EE- 2015 13. Cool roofs -2015 14. Malaysia EE fund -2015/2016 15. Credit guarantee line -2016 16. Long-term policy strategy -2016	
	Cumulative no. of recommended policies from completed policy studies that are implemented and enforced by local governments, JKR and MHLG by EOP	0	2	5	As listed above (Output 2.1)	HS
Activity 2.1.2: Formal & informal discussions with policymakers	Cumulative no. of policy making agencies endorsing the proposed policies by EOP	0	5	5	1.EPU (input to SCP - Energy Wise Building Chapter and Electricity component of Demand Side Management) 2.KETTHA (input to Green Tech Masterplan - Green Building Chapter) 3.ST (input to GTMP, EMIS, BEI Labelling for government buildings), 4.SEDA (input as per KETTHA)	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					5.JKT (input to State governments on MS1525 via JKT)	
	Cumulative no. of approved policies on building EE technology applications by EOP	0	2	2	As listed above (Output 2.1)	-
Output 2.2: Approved and Enforced EE Buildings Code of Practice	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for incorporation in the UBBL by the MHLG by EOP	0	5	4	The proposed 4 upgraded provisions, i.e. OTTV, RTTV, Roof U-value and Energy Management System, have been incorporated in the UBBL.As a side note on the adoption at the local level (not included in this performance indicator), the UBBL (originally adopted in 1984) was revised in 2012/2014 to incorporate MS1525. Three (3) states to date have gazzeted it: Selangor (2012), Terengganu (2013) and Penang (2016). MS1525 is a voluntary instrument which has gained very little traction in the building industry. Efforts to adopt the building envelope energy performance requirements at the local level has been stymied with only 3 states to date that have gazzeted it [GTMP 2017-2030]. This could affect the achievement of the project's long-term goals if they are not enforced as indicated further in Output 2.2.	MS
Activity 2.2.1: Review of Existing Buildings Code of Practice	Cumulative no. of existing articles and provisions in the MS 1525 that were reviewed, adjusted/modified or upgraded to facilitate incorporation in the UBBL by EOP	0	10	>60	More than the target number of revisions as listed in the 'Comparison between the 2007 version and 2014 version'. The next revision of MS1525 is planned to be initiated with BSEEP funding and technical support starting June 2017	HS
Activity 2.2.2: Formulation, Approval and Enforcement of a Policy on EE Building Design	Cumulative no. of upgraded provisions in the MS 1525 completed and approved/endorsed for	0	5	4	The proposed 4 upgraded provisions, i.e. OTTV, RTTV, Roof U-value and Energy Management System, have been incorporated in the UBBL.	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	incorporation in the UBBL by the MHLG by EOP					
	Cumulative no. of MHLG personnel trained on the enforcement of MS 1525 as part of the UBBL by EOP	0	150	149	Based on the report on training and tabulation by BSEEP on UBBL/MS 1525 conducted under BSEEP.	S
Activity 2.2.3: Capacity Building on the Application of Building Energy Codes	Cumulative no. of training courses conducted on building energy codes for building practitioners by EOP	0	20	30	Based on the report on training and tabulation by BSEEP on UBBL/MS 1525 conducted under BSEEP	HS
	Cumulative no. of training courses conducted on the design, construction, economic feasibility evaluation, operation and maintenance of EE buildings by EOP	0	20	96	Based on the report on training and tabulation by BSEEP on UBBL/MS 1525 conducted under BSEEP	HS
	Cumulative no. of technically capable building practitioners and building service providers by EOP.	0	600	4,242	Based on the report on training and tabulation by BSEEP on UBBL/MS 1525 conducted under BSEEP	HS
	Cumulative no. of local engineering and engineering consulting firms that are providing EE building system services by EOP	0	20	111	Based on list of ESCOs (as qualified local engineering and engineering consulting firms providing EE building system services) that are registered with EC	HS
Activity 2.2.4: Development of an EE Code of Practice in Residential Buildings	A completed government-endorsed EE Code of Practice in Residential Buildings	0	1	1	MS 2680:2017 -Code of Practice on Energy Efficiency for Residential Buildings released in May 2017	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	officially launched by Year 2012 2016					
Output 2.3: Utility regulations that promote/support EE technology applications in buildings	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP	0	20	65	40 and 25 commercial buildings in 2016 and 2017, respectively, for the Energy Audit Conditional Grant under RMK 11	S
Activity 2.3.1: Assessment of Utility Regulations Promoting/Supporting EE Building Technology Applications	Completed assessment report on applicable policies and regulations that are supportive of the implementation of EE initiatives in the design, construction, retrofit and operation of buildings by Year 2014	0	1	1	Policy study report on 'Utility Energy Efficiency Obligation through an Energy Efficiency Generator Model'.	S
Activity 2.3.2: Design of EE System Incentives in Buildings	Cumulative No of approved incentives for EE buildings by EOP	0	5	4	(1) Green Investment Tax Allowance scheme encompassing the Building Sector operated by MIDA.[renewed January 2016] (2) KeTTHA's Energy Audit Conditional Grant scheme operated by SEDA for the Commercial Building Sector. [implemented 2016-2018] 3) The RM200 million EPC Fund jointly funded by BSEEP and KETTHA [approved in December 2016] 4. Green Technology Financing Scheme [Implemented 2010- 2022]	MS
	Cumulative No. of buildings that applied, will benefit or benefited from the incentive given by EOP	0	20	65	Based on SEDA report confirming the number of applications approved under the Energy Audit Conditional Grant scheme operated by SEDA for the Commercial Building Sector.	HS
Activity 2.3.3: Review of Utility Tariffs Focusing on EE in the Buildings Sector	Satisfactorily completed and acceptable report on the Electricity Pricing Study that is	0	1	1		S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	intended for EE policy decision making regarding pricing issues by Year2016					
Activity 2.3.4: Discussions on Energy Pricing for Buildings	Cumulative no. of tariff adjustments made by public utilities that are supportive of EE buildings incentive schemes by EOP	0	2	2	(1) Electricity tariff increase in January 2014. (2) Electricity tariff increase in January 2016 BSEEP has raised awareness on the low tariff pricing which depresses energy efficiency efforts and contributed to motivate Government initiative to raise tariffs as a market driver to increase EE impacts.	S
Activity 2.3.5: Web-based Monitoring of Incentives Scheme Implementation	An operational web-based online fiscal/financial incentive mechanism monitoring service by Year 2011 2015	0	1	Not relevant	Based on the MTR recommendations, this indicator was not relevant. Originally, this indicator was meant to piggy back with the GTFS but however it was not designed for building efficiency. MGTC was planning on monitoring it but it did not take off. BSEEP funded energy audit grants at SEDA. As an alternative monitoring, BSEEP arranged with SEDA to install online monitoring of building energy efficiency projects that received the energy grant.	
					Average Component 2 Rating	S
Outcome 3: Availability of financial and Institutional support for initiatives on EE Building technology applications	Total volume of financing provided by local banks /financial institutions for EE building projects and to the local ESCOs for EE building projects by EOP (RM million)	0	100[11]	200	A RM 200 million energy efficiency credit financing facility was established by Malaysian Debt Venture (MDV) Sdn. Bhd. for building EE projects. This was pursuant to a Collaboration Agreement with JKR on 22 Sep 2016, which also stipulated that a sum of RM 2 million to be made available by JKR for the purpose of paying for third party credit guarantee fees for credit guarantees offered by Credit Guarantee Corporation Malaysia Berhad. In addition, the Ministry of Energy, Green Technology and Water (KeTTHA) will also provide another RM 10 million for credit guarantee as well as a subsidy of RM 5.8 million for the purpose of reducing interest rate of loans secured b ESCO by 1% annually. KeTTHA's contribution will	S

[11] The original EOP target was RM 500 million, but was subsequently revised to RM 100 million. However, it was uncertain when and how the revision was made and adopted by the appropriate committee.

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					be channelled through the Energy Commission once an agreement is entered with MDV.	
Output 3: Enhanced availability and accessibility of financing for EE building projects	Total private sector funding committed to financial mechanisms designed by the BSEEP by EOP (million USD)	0	5	8	Private sector funding was achieved through the financing scheme operated by MDV. As MDV only provides up to 85% financing, it was expected that the minimum commitment by ESCOs or financing recipients is around RM 35 million or USD 8 million based on the RM 200 million.	HS
Activity 3.1: Streamlining Processes for Financing Applications	Approved streamlined procedures for applying for and getting financial incentives for building EE activities by Year2014	0	1	1	The Project designed a due diligence process for the MDV financing facility for debt financing to ESCOs for implementing Energy Performance Contract. As of June 2017, the due diligence process was undertaken on the initial five applications to the facility.	S
Activity 3.2: Capacity Building on EE Building Technologies for the Banking/Financial Sector	Cumulative no. of training courses on EE building technologies for the banking/financial institutions designed and conducted by EOP	0	10	12	A total of 12 events were organized in 2014-2016. These included eight workshops from Dec 2014 to Feb 2015, in collaboration with Malaysian Green Technology Corporation, for the banking/ financial institutions; and four capacity building workshops for MDV in Apr-May 2016.	S
	Total No. of EE building projects that are financed by local banks/financial institutions by EOP	0	10	2	The Project entered a partnership with MGTC on EE financing capacity improvement in 2014. It was aimed to enhance understanding and familiarity of financing institutions and investors on EE initiatives and create more opportunities for improvement in the utilization of Green Technology Financing Scheme (GTFS) in the building sector. Several capacity building events were undertaken in 2014-2015. From 2014 to 2017, there were 2 EE building projects (user category only)* financed by local banks/institutions under GTFS. * See the hyperlink below, accessed in January 2018. https://www.gtfs.my/certified?field_name_of_company_value=&title=&field_project_sector_value_many_to_one%5B%5D=building	MU

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	Total volume of financing provided by local banks/financial institutions for EE building projects by EOP (RM million)	0	100	200	Refer to the remarks in Outcome 3.	S
Activity 3.3: Development of an Action Plan for EE Building Project Financing	Completed and approved action plan for the facilitation of the provision of financing of energy efficiency initiatives by Year 2013	0	1	1	Refer to the remarks in Outcome 3.	S
Activity 3.4: Design of Financing Schemes for EE Building Project Financing	No. of applicable project financing schemes on building EE identified and designed by Year 2013	0	3	4	Four papers were prepared by the consultant: (1) Formulation of innovative financing schemes to promote energy efficiency building project financing in Malaysia: Dedicated ESCO credit line; (2) Energy audit incentive scheme; (3) Gross floor area incentive scheme framework for green buildings; and (4) Efficient electrical household appliance incentives for on-bill financing programme.	S
Activity 3.5: Promotion of EE Building Projects to Local 'ESCOs'	Cumulative no. of seminar-workshops on EE building project ventures for local ESCOs conducted by EOP	0	10	11	11 seminars/ workshops on EE building project ventures were conducted for local ESCOs.	S
	Total volume of financing provided to the local ESCOs for EE building projects by EOP (RM million)	0	100	200	Refer to the remarks in Outcome 3.	S
Activity 3.6: Capacity Building on EE Building Project Financing	Cumulative no. of seminar-workshops conducted for the buildings sector on potential financing options for	0	8	6	6 seminars/workshops were conducted for the building sector in 2016-2017.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	supporting their EE building and EE building technology projects by EOP from 2012					
Activity 3.7: Business Development Matching and Strategic Partnership Establishment	An operational EE Building Market Services Group (MSG) with a clear mandate of identifying business opportunities through providing technical support to EE building project financing by Year 2013	0	1	1	The Project proposed to MAESCO, via a letter dated 7 May 2015, for taking on the role as a designated EE building market services group. In an email dated 12 June 2015, MAESCO indicated no objection to collaborate with BSEEP on the given proposal. One of the initiatives with the Project was the EE4 Life showcase in conjunction with the ESCO conference in October 2016. MAESCO also organized training courses on energy management, energy audit (CEA), measurement and verification (CMVP). The Project considered these programs as a result of the Project in organizing similar trainings during its implementation The EE Building Market Services Group was operationalized through technical knowledge sharing on building EE project financing and capacity building in the following conferences: • Presentations on EPC financing at the BSEEP National Conference 2017. • Conference on EPC financing mechanism by KeTTHA • ESCO conference 2017 organized by MAESCO	S
	Cumulative no. of EE building project developers/owners, banks and financial institutions assisted by the MSG building their capacity to deliver EE building and EE building technology application project financing, and market their projects and financing products by EOP	0	10	64	The Project indicated that relevant capacity building activities were undertaken in collaboration with MAESCO and other key agencies including KeTTHA. These activities were expected to benefit the 64 members under MAESCO, which were ESCOs.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					Average Component 3 Rating	MS
Outcome 4: Enhanced awareness of the government, public and the building sector on EE building technology applications	Cumulative no. of trained EE building practitioners by EOP	0	480	2,176	A total of 45 events were organized by the Project or in collaboration with other organizations in 2014 to 2017, which were attended by 2,176 participants.	HS
Output 4.1: Tools for enhancing the skills and experience of local building practitioners in the design of energy efficiency projects in buildings	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012 Government-endorsed Building Performance Prediction Software Tool officially launched by Year 2015				Refer to the remarks in Activity 4.1.3 and Activity 4.1.4.	MS
Activity 4.1.1: Detailed Study on the Current Building Designs and EE Building Applications	Completed study on best practices in the application of EE technologies and techniques in the design, construction and operation of buildings by Year 2012	0	1	1	A study was commissioned and a report on the current building designs and EE building applications was prepared in 2012. The report, which mainly recorded the feedback of an industry dialog held on 13 June 2012, summarized the development of passive and active technical design guideline for building industry.	MS
Activity 4.1.3: Establishment of a Comprehensive Guidebook on EE Building Design	Government (JKR) - endorsed Guidebook on EE Building Design officially launched by Year 2012	0	1	2	Two publications were prepared. These are Building EE Technical Guideline for Passive Design (July 2013) and Building EE Technical Guideline for Active Design (December 2016).	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
Activity 4.1.4: Development of a Peer-Reviewed, User-Friendly Building Performance Prediction Software Tool	Government-endorsed Building Performance Prediction Software Tool officially launched by Year 2015	0	1	1	The Project developed Building Energy Estimation Tool (BEET) in 2015. It is a software tool to assess energy use in an air-conditioned building within Malaysian climate, and was designed to be used during conceptual design stage for quick estimates of building energy consumption. The software has not been endorsed by the government yet. It was made available on BSEEP website.	MS
	No. of downloads of the building performance prediction software tool by EOP		100	2,176	Participants to the workshops organized by the Project were provided with the link to download from the software. They were a total of 2,176 participants (see remarks in Outcome 4).	HS
Output 4.2: Implemented market oriented EE programs in the buildings sector both at the national and local levels	Government-endorsed energy efficiency assessment tool officially launched by Year 2015			1	The Project developed Malaysian Energy Efficiency Assessment Tool for Office Buildings (MERIT) in 2015. It was presented to a workshop, which was organized by KeTTHA and ST in May 2017 with the aim to develop a BEI rating system for government buildings. The MERIT tool was expected to be referenced by KeTTHA and ST in their development of the BEI labelling scheme. In addition to MERIT, the Project also contributed to the implementation of Malaysian Carbon Reduction & Environmental Sustainability & Environmental Tool (MyCREST), which was jointly developed by JKR and Construction Industry Development Board (CIDB). Grant was provided to JKR for training assessors and qualified professionals and certifying buildings with the MyCREST tool in the next 5 years.	MS
Activity 4.2.1: Design of the Energy Efficiency assessment tool for Buildings	Government-endorsed MEERB officially launched by Year 2015	0	1	1	Refer to the remarks for Output 4.2.	MS
Activity 4.2.2: Development of the Institutional Mechanism for the energy	Approved implementing rules and regulations on the energy efficiency assessment tool implementation by Year 2015	0	1	1	Refer to the remarks for Output 4.2.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
efficiency assessment tool Scheme						
Activity 4.2.3: Implementation, Monitoring and Evaluation of the energy efficiency assessment tool Scheme	Cumulative no. of buildings actively using the energy efficiency assessment tool by EOP	0	18	20	The Project indicated that 20 buildings applied MyCREST.	S
Activity 4.2.4: EE Buildings Advocacy and Promotion	Cumulative no. of promotional campaigns conducted each year to promote EE in buildings and EE building design starting Year 2012	0	10	48	A total of 48 events were organized by the Project or in collaboration with other organizations.	HS
Output 4.3: Government agencies and private sector entities capable of designing and implementing EE building projects	Cumulative no. of trained EE building practitioners by EOP	0	480	2,176	A total of 45 events were organized by the Project or in collaboration with other organizations in 2014 to 2017, which were attended by 2,176 participants.	HS
Activity 4.3.1: EE Buildings Training Needs Assessment and Planning	Cumulative no. of subjects/concepts on energy efficient design, construction, operation and maintenance of buildings identified for inclusion in training courses by Year 2010	0	20	20	The subjects were available in the two guidebooks developed by the Project (see remarks in Activity 4.1.3), with a total of 20 chapters (11 in the Passive Design Guidebook and 9 in Active Design Guidebooks).	S
Activity 4.3.2: Design and Implementation of EE Building Training Courses	Cumulative no. of sets of training materials developed and disseminated by EOP	0	20	20	Refer to the remarks in Activity 4.3.1.	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	Cumulative no. of training courses conducted EOP	0	20	45	A total of 45 events were organized by the Project or in collaboration with other organizations in 2014 to 2017, which were attended by 2,176 participants.	S
	Overall no. of personnel trained by EOP	0	480	2,176	A total of 45 events were organized by the Project or in collaboration with other organizations in 2014 to 2017, which were attended by 2,176 participants.	HS
	% of overall no. of trainees that are gainfully employing learned skills on EE building design / construction/operation & maintenance of new and/or retrofitted building by EOP	0	70	70	The Project indicated that, based on survey, the participants consisted of professional architects, engineers and green building consultants.	S
	Cumulative no. of trained EE building practitioners by EOP	0	480	2,176	A total of 45 events were organized by the Project or in collaboration with other organizations in 2014 to 2017, which were attended by 2,176 participants.	HS
Activity 4.3.3: Sustainable Training Program Design	A completed, ready-for-implementation and funded sustainable follow-up EE building training program approved by the National Steering Committee by Year 2014	0	1	1	The Environment and Energy Efficiency Branch of JKR was appointed on 17 March 2017 for the 'Implementation of MyCREST Certification in Government Buildings'. A total of RM 800,000 was allocated for capacity building and certification activities for MyCREST implementation in the duration until 30 June 2017.	MS
					Average Component 4 Rating	S
Outcome 5: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of	Combined annual CO_2 Emission reductions from planned pipe-line projects resulting from demonstration projects by EOP (ktonCO_2/yr)	0	45	30.2	The Project indicated that the successful completion of Menara Kerja Raya (one of the Project demonstration activities) led to increased confidence within JKR to design EE building projects. This was realized by stipulating requirements for complying with pH-JKR and MyCREST with a BEI threshold of 140 Kwh/m2/year. As Menara Kerja Raya was completed in 2015, its impacts on other JKR projects was assumed to occur from 2016 onwards. Based on the list provided by the	MU

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
EE building technology applications					Project (https://1drv.ms/f/s!Ammdn1prNcSephxovg2XHWQwnLRi), there were 8 and 4 pH-JKR projects in 2016 and 2017, respectively as well as 7 and 12 MyCREST projects in 2016 and 2017, respectively. Total new projects influenced by the demonstration project was 31.	
Output 5.1: Completed demonstration projects showcasing successful applications of building EE technologies, techniques and practices.	Combined annual CO_2 Emission reductions from demonstration projects by EOP (ktonCO$_2$/yr)	0	15	19.79	The Project was involved in 14 demonstration project activities from 2014 to 2017. These activities included various types of new and existing buildings (mostly offices, hotels, hospital, residential and others) in Peninsular Malaysia, Sabah and Sarawak. The EE measures comprised design of building exceeding MS 1525 requirements, installation of LED lighting, roof insulation, and chiller retrofitting, among others. The Project interventions in these demonstration activities covered grants, investment grade audits, simulations, expert advisory, online metering. Total energy savings from these demonstration projects were approximately 28,515 MWh/year. By using the CO2 emission factors for electricity generation in Peninsular Malaysia, Sabah and Sarawak, respectively, emission reduction was estimated as 19.79 kt CO2e/year.	S
Activity 5.1.1: Demonstration of EE Building and EE Building Technology Applications	A set of criteria ready to be used for selecting demonstration projects by Year 2011	0	1	1	The Project developed a framework for approval of EE grant for demonstration projects.	S
	Cumulative no. of detailed technical and financial feasibility studies done for demonstration site selection by Year 2012	0	30	38	A total 38 sites were involved in the demonstration site selection from 2012 to 2016. Different assessments were conducted in these selection, including investment grade audit, energy simulation, technical studies, BEI calculations, technical and financial proposals, and others.	S
	Cumulative no. of finalized and approved demonstration project designs (engineering & construction) by Year 2012	0	10	14	Refer to the comments in Output 5.1.	S

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	Cumulative no. of financed demonstration projects confirmed and approved for implementation by EOP	0	10	7	Out of the 14 demonstration projects, 7 projects were provided financial grants from BSEEP in 2016 to 2017. Total funding provided was USD 335,229, which covered 6 existing and 1 new buildings. These grants ranged from USD 1,000 on lighting replacement in an existing shop office building to USD 116,273 on retrofitting works in an existing government office building.	MS
Activity 5.1.2: Demonstration Project Implementation	Cumulative no. of demo projects implemented by EOP	0	10	14	Refer to the comments in Output 5.1.	S
	Cumulative no of dissemination exercises conducted by EOP	0	2	3	Three dissemination exercises were carried out as follows: • September 2014 – International Construction Week at PWTC • December 2016 – Energy Efficiency for Life Showcase • May 2017 - National Conference 2017 In addition, information on the demonstration projects were also disseminated in other training workshops.	S
Output 5.2: More knowledgeable, technically capable and competent building practitioners in the GOM and the private sector	Cumulative no. of practitioners experienced in EE building practices by means of the demonstration buildings by EOP.	0	30	>30	The Project assumed at least one practitioner for each demonstration projects were involved.	MS
Activity 5.2.1: Follow-up Capacity Building for the Local Building Industry	Completed assessment report on the viability of a local industry for the manufacture of EE building materials and EE building equipment/components by Year 2013 EOP	0	1	1	A Report on 'Analysis and Evaluation of the Manufacturing Industry for Building Materials for Energy Efficient Buildings in Malaysia' was prepared. The report was undertaken in collaboration between the German RoCABT project and BSEEP, which resulted in a bachelor thesis in 2014 and powerpoint. However, neither the powerpoint nor thesis was conclusive on the viability of a local industry for the manufacture of EE building materials and EE building equipment/components.	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
	Cumulative no. of training courses designed and conducted for local building materials producers/suppliers on EE building materials applications by EOP	0	8	22	A total 22 events were conducted in 2012 to 2016 on the passive and active design that covered EE building materials application i.e. low e glazing, high efficiency chillers, and others. These events were attended by members of local building materials producers and suppliers. In addition, an event was held from the 16th to 20th December 2016 to showcase energy efficient technologies called EE4Life.	S
	Cumulative no. of training courses designed and conducted for local engineering firms on EE building materials production and applications by EOP	0	8	22	A total 22 events were conducted in 2012 to 2016 on the passive and active design that covered EE building materials application i.e. low e glazing, high efficiency chillers, and others. These events were attended by members of local building materials producers and suppliers. In addition, an event was held from the 16th to 20th December 2016 to showcase energy efficient technologies called EE4Life.	S
	Cumulative no. of new EE building projects designed based on, or influenced by the results of the demonstration project by EOP	0	40	34	The Project indicated that the successful completion of Menara Kerja Raya (one of the Project demonstration activities) led to increased confidence within JKR to design EE building projects. This was realized by stipulating requirements for complying with pH-JKR and MyCREST with a BEI threshold of 140 Kwh/m2/year. As Menara Kerja Raya was completed in 2015, its impacts on other JKR projects was assumed to occur from 2016 onwards. Based on the list provided the Project, there were 8 and 4 pH-JKR projects in 2016 and 2017, respectively as well as 6 and 13 MyCREST projects in 2016 and 2017, respectively. Total new projects influenced by the demonstration project was 34. In addition to the JKR projects, the Project also expected positive impacts from other demonstration activities. The energy efficient PAM building will also inspire architects and engineers to apply EE principles in the design of new buildings. Sime Darby property showcased EE low rise housing project which may be replicated in their upcoming project and by other developers.	MS
					Average Component 5 Rating	MS

Description	Updated BSEEP Indicator and Targets[9]			Actual Accomplishment		Rating
	Success Indicator	Baseline	Updated EOP Target	EOP 30 Jun 2017	Remarks on description of outputs and reason for variance in actual performance vs. targets	
					Overall Rating	MS

Table G1: UNDP – GEF Evaluation Criteria and Rating Standards

Rating Scales		
Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution **6**: **Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objectives in terms of relevance, effectiveness, or efficiency **5: Satisfactory (S):** There were only minor shortcomings **4: Moderately Satisfactory (MS)**: there were moderate shortcomings **3: Moderately Unsatisfactory (MU)**: the project had significant shortcomings **2: Unsatisfactory (U):** there were major shortcomings in the achievement of project objectives in terms of relevance, effectiveness, or efficiency **1: Highly Unsatisfactory (HU):** The project had severe shortcomings	**Sustainability ratings:** **4**. **Likely (L)**: negligible risks to sustainability **3. Moderately Likely (ML):** moderate risks **2**. **Moderately Unlikely (MU):** significant risks **1**. **Unlikely (U):** severe risks	**Relevance ratings:** **2**. **Relevant (R**) **1**. **Not relevant (NR)** **Impact Ratings:** **3**. **Significant (S)** **2**. **Minimal (M)** **1**. **Negligible (N)**

Annex H: Status of the Action Plan for the Pending or Remaining Activities and Corresponding Estimated Budget

Outcome	Activity	Responsible Institutions	Remarks on present status of the Activities as of EOP	Budget Requirement/Source
1. Clear and effective system of monitoring and improving the energy performance of the buildings sector	Activity 1.5: Building Energy Reporting and Monitoring (BERM) Program under the National Building energy Management System (NBEMS	ST, KeTTHA	EMIS database is at the last phase of development at the EC involving training of end-users. A full roll-out will be conducted early 2018. 645 commercial buildings are now registered under EMEER 2008	Consultancy work by Ekonerg paid by BSEEP
2. Implementation of, and compliance to, favorable policies that encourage the application of EE technologies and practices in the country's buildings sector	Activity 2.1.1: Conduct of Building EE Policy Studies	KeTTHA	BEI disclosure for government buildings - supports MS1525, to table at MTHPI in Sept 2017. Development of Energy Efficiency & Conservation Law	Proposed funding of USD 100,000 pending NSC approval
	Activity 2.2.1: Review of Existing Buildings Code of Practice	SIRIM & JKR	Revision of MS1525:2014 to commence after EOP	Funds disbursed to SIRIM
	Activity 2.2.4: Development of an EE Code of Practice in Residential Buildings	JKR CASKT,KPKT	Promotion of MS 2680 to both public and private sector. JKR CASKT to collaborate with other training partners to promote this standard.	Funding of USD 200,000 disbursed to JKR CASKT
	Activity 2.3.2: Design of EE System Incentives in Buildings	MDV,ST & KeTTHA	The RM200 million EPC Fund jointly funded by BSEEP and KETTHA	Disbursement of funds of RM 2 million by BSEEP and RM 15.8 million by KeTTHA

Outcome	Activity	Responsible Institutions	Remarks on present status of the Activities as of EOP	Budget Requirement/Source
3. Availability of financial and Institutional support for initiatives on EE Building technology applications	Activity 3.4: Design of Financing Schemes for EE Building Project Financing	MDV, ST & KeTTHA	RM 200 million EPC financing scheme by MDV. Disbursement of loans to ESCOs is ongoing. MDV will set up a joint monitoring committee with ST and KeTTHA.	Proposed funding of USD 30,000 to provide technical assistance to MDV (for presentation in the NSC Meeting on 24 August 2017)
4. Enhanced awareness of the government, public and the building sector on EE building technology applications	Activity 4.1.3: Establishment of a Comprehensive Guidebook on EE Building Design	JKR CASKT	Distribution of Active and Passive Design guidebooks to public and private stakeholders and academic institutions. Proposed translation of the guidebooks to Bahasa Melayu to reach out to a wider audience.	Funding of USD 200,000 disbursed to JKR CASKT
	Activity 4.2.3: Implementation, Monitoring and Evaluation of the energy efficiency assessment tool Scheme	JKR CASTKT, CIDB	All new government buildings costing RM 50 million and above to adopt MyCREST rating tool. Training of new MyCREST assessors and Qualified Professionals.	Funding of USD 200,000 disbursed to JKR CASKT
	Activity 4.3.3: Sustainable Training Program Design	JKR CASKT	The Environment and Energy Efficiency Branch (Cawangan Alam Sekitar dan Kecekapan Tenaga) of JKR has been identified and approved by the National Steering Committee to carry out sustainable follow-up EE building training program.	Funding of USD 200,000 disbursed to JKR CASKT
5. Improved confidence in the feasibility, performance, energy,	Activity 5.1.1: Demonstration of EE	JKR CASKT and demonstration project partners	Successful demonstration projects implemented :	

Outcome	Activity	Responsible Institutions	Remarks on present status of the Activities as of EOP	Budget Requirement/Source
environmental and economic benefits of EE building technology applications	Building and EE Building Technology Applications	i.e PAM & Sime Darby	**1.** 650 units of energy efficient house at Sime Elmina. Sime Darby to replicate EE applications in other residential development projects. **2.** Energy efficient office at PAM HQ	

Annex I: Evaluation Consultant Agreement Form

Evaluation Consultant Agreement Form

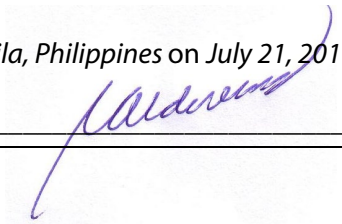
Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Rogelio Z. Aldover

Name of Consultancy Organization (where relevant)**:** Independent Consultant

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Manila, Philippines* on *July 21, 2017*

Signature: 

Evaluation Consultant Agreement Form

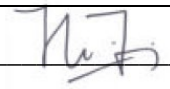
Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Tan Ching Tiong

Name of Consultancy Organization (where relevant)**:** Independent Consultant

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at Kuala Lumpur on 18 September 2017

Signature: 

Annex J: Evaluation Report Clearance Form

Evaluation Report Reviewed and Cleared by:

UNDP Country Office

Name: Asfaazam Kasbani, Assistant Resident Representative (Programme)

Signature: _____ Date: 29 May 2108

UNDP GEF RTA

Name: K Usha Rao, Regional Technical Specialist, EITT, UNDP-GEF, BPPS, BRH

Signature: _____ Date: 29 May 2018

Annex K: Annexed in a Separate File: TE audit Trail

To the comments received on (*date*) from the Terminal Evaluation of UNDP/GEF *Project*-- the *Building Sector Energy Efficiency Project*

The following comments were provided in track changes to the draft Terminal Evaluation report; they are referenced by institution ("Author" column) and track change comment number ("#" column):

Author	#	Para No./ comment location	Comment/Feedback on the draft TE report	TE team response and actions taken

Annex L: Annexed in a separate file: GEF Focal Area Terminal Tracking Tool

Tracking Tool for GEF6 Climate Change Mitigation Projects (At Terminal Evaluation)

Special Notes: Projects need to report on all indicators that are included in their results framework
Reporting on lifetime emissions avoided **Lifetime direct GHG emissions avoided:** Lifetime direct GHG emissions avoided are the emissions reductions attributable to the investments made **during the project's supervised implementation period**, totaled over the respective lifetime of the investments. **Lifetime direct post-project emissions avoided:** Lifetime direct post-project emissions avoided are the emissions reductions attributable to the investments made outside the project's supervised implementation period, but supported by financial facilities put in place by the GEF project, totaled over the respective lifetime of the investments. These financial facilities will still be operational after the project ends, such as partial credit guarantee facilities, risk mitigation facilities, or revolving funds. **Lifetime indirect GHG emissions avoided (top-down and bottom-up):** indirect emissions reductions are those attributable to the long-term outcomes of the GEF activities that remove barriers, such as capacity building, innovation, catalytic action for replication. Please refer to the following references for Calculating GHG Benefits of GEF Projects. Manual for Energy Efficiency and Renewable Energy Projects Revised Methodology for Calculating Greenhouse Gas Benefits of GEF Energy Efficiency Projects (Version 1.0) Manual for Transportation Projects

For LULUCF projects, the definitions of "lifetime direct and indirect" apply. Lifetime length is defined to be 20 years, unless a different number of years is deemed appropriate. For emission or removal factors (tonnes of CO2eq per hectare per year), use IPCC defaults or country specific factors.

Section A. General Data

	At Terminal Evaluation	
Project Title	Building Sector Energy Efficiency Project (BSEEP)	
GEF ID	3598	
GEF Agency	3108	
Agency Project ID	72266	
Country	Malaysia	
Region	EAP	
Date of Council/CEO Approval	30-Dec-09	Month DD, YYYY (e.g., May 13, 2014)
GEF Grant (US$)	5,000,000	
Date of submission of the tracking tool		Month DD, YYYY (e.g., May 13, 2014)
Is the project consistent with the priorities identified in National Communications, Technology Needs Assessment, or other Enabling Activities (such as Technology Action Plans, Nationally Appropriate Mitigation Actions (NAMA) under the UNFCCC?	1	Yes = 1, No = 0

Section B. Quantitative Outcome Indicators

	Results at Terminal Evaluation	
Indicator 1: Total Lifetime Direct and Indirect GHG Emissions Avoided (Tons CO2eq)		**Indentify Sectors, Sources andTechnologies. Provide**

		disaggregated information if possible. see Special Notes above
Lifetime direct GHG emissions avoided	6,664,394	Direct + Direct Post-Project Emission Savings
Lifetime indirect GHG emissions avoided	3,248,000	Indirect Top-down Emissions savings
Indicator 2: Lifetime Energy Saved	25,422,924 GJ	**IEA unit converter: http://www.iea.org/stats/unit.asp) Fuel savings should be converted to energy savings by using the net calorific value of the specific fuel. End-use electricity savings should be converted to energy savings by using the conversion factor for the specific supply and distribution system. These energy savings are then totaled over the respective lifetime of the investments.**
Indicator 3: Increase in Renewable Energy Capacity and Production		**Disaggregate by type (Wind, Biomass, Geothermal, Hydro, solar, Photovoltaic, Marine power etc)**
Increase in Installed RE capacity per technology (MW)		

Lifetime RE production per technology (MWh)		(IEA unit converter: http://www.iea.org/stats/unit.asp)
Indicator 4: Number of Users of low GHG systems (Number, of which female)		**Identify Sector, describe the low GHG system and technologies and explain methodology for estimation**
Indicator 5: Number of Hectares under Low GHG Management Practices (Ha.)		**Identify source (conservation, avoided deforestation, afforestation/reforestation), type of low GHG Management Practice and describe methodology used for estimation**

Indicator 6: Time Saved in adoption of low GHG technology (Percentage)		**For technologies and practices to be supported under the project (i) estimate baseline time to deployment (without project support), (ii) report actual time to deployment with project support and (iii) calculate % of time saved.**
Indicator 7: Volume of investment mobilized and leveraged by GEF for low GHG development (co-financing and additional financing) of which		**Expected additional resources implies resources beyond co-financing committed at CEO endorsement.**
Public	37,093,523	
Private	49,369,076	
Domestic		
External		
Total	86,462,599	
Indicator 8: Identify specific GHG reduction target (percent), if any, under any national, sectoral, local plans		**Specify plan, area/sector (if subnational), and baseline from which reduction is expected**

Section C. Qualitative Indicators

Indicator 9: Degree of support for low GHG development in policy, planning and regulations	**Target Rating (1-10)**	**Results Rating (1-10)**	**For all policies/sectors relevant to project activities. Identify the policy/regulations (national, sectoral) and provide rating. Guidance for qualitative rating is available at (link to CCM program Results Framework)**
National Plan	n.a.	5	Energy Efficiency & Conservation Law (still not passed)
Building Sector	n.a.	7	Building energy efficiency standards adopted in 3 states; The proposed 4 upgraded provisions, i.e. OTTV, RTTV, Roof U-value and Energy Management System, were endorsed to MHLG for incorporation in the UBBL
Indicator 10: Quality of MRV Systems	**Target Rating (1-10)**	**Results Rating (1-10)**	**Provide details of coverage of MRV systems - area, type of activity for which MRV is done, and of Reporting and Verification processes.**

Activity 4.2.3: Implementation, Monitoring and Evaluation of the energy efficiency assessment tool Scheme	n.a.	7	Cumulative no. of buildings actively using the energy efficiency assessment tool by EOP
Other Activities with their own Indicators for monitoring	n.a.	8	Percentage of new buildings (nationally by area) which comply to the provisions of MS1525; Cumulative no. of trained EE building practitioners; Combined annual CO2 Emission reductions from planned pipe-line projects resulting from demonstration projects
Indicator 11: Degree of strength of financial and market mechanisms for low GHG development	**Target Rating (1-10)**	**Results Rating (1-10)**	**Provide details of the financial mechanisms and identify the sector and the type of low GHG technology or development activity it supports**
Activity 3.4: Design of Financing Schemes for EE Building Project Financing	n.a.	8	(1) Formulation of innovative financing schemes to promote energy efficiency building project financing in Malaysia: Dedicated ESCO credit line; (2) Energy audit incentive scheme; (3) Gross floor area incentive scheme framework for green buildings; and (4) Efficient electrical household appliance incentives for on-bill financing programme. An energy efficiency credit financing facility was established by Malaysian Debt Venture (MDV) Sdn. Bhd. for building EE projects
