INCEPTION REPORT

PROMOTING ENERGY EFFICIENCY IN COMMERCIAL BUILDINGS (PEECB)

AUGUST 2013

Contents

A. PROJECT DOCUMENT UPDATE

A.1 OVERVIEW OF PROJECT INCEPTION PHASE

Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy in cooperation with United Nations Development Programme (UNDP) are promoting the energy efficiency programme for commercial building in Thailand to reduce the growth rate of GHG emission from the Thai commercial building sector. The project namely "Promoting Energy Efficiency in Commercial Buildings, PEECB" has been initiated with funding supported by Global Environmental Facility (GEF), government of Thailand and related private sector.

In this regard, DEDE has prepared this **inception report** to provide the 4 years master plan detailing into activities and sub-activities for each component. Methodologies and approaches to complete the project have been provided for each sub-activity. Details of completed works with the overall project completion as of July 2013 at **5%** according to the project master plan are also highlighted.

COMPLETED WORKS

DEDE has contracted Bright Management Consulting Co.,Ltd. on April 2013 as the project consultant on component 1, partly of component 2&3 and project management. Currently, BMC has completed the work according to the term of reference with the overall percentage of actual completion as of July 2013 at **5%.** Details of completed works of each task are as followings,

Task 1: **The Consultant shall coordinate with DEDE & UNDP to clarify task details in the inception phase**

Detailed of completed works;

BMC has coordinated with DEDE & UNDP to clarify task details through several meetings and email communications. The first coordinate meeting or kick off meeting was arranged on Tuesday 30th April 2013 with the participants from DEDE and UNDP as followings;

1.	Khun Sirinthorn	Vongsoasup	(DEDE)
2.	Khun Manaswee	Hakeme	DEDE)
3.	Khun Borwornpong	unipasa	DEDE)
4.	Khun Kulsiri	Sakprasith	(DEDE)
5.	Khun Kritiya	Petsee	(DEDE)
6.	Dr.Sutharin	Koonphol	(UNDP)
7.	Khun Nisakorn	Puangkamalard	UNDP)

The Project Board (PB) of the PEECB Project has been formulated to supervise and monitor the project to ensure cooperative and effective implementation of the project. The structure of PB consists of representative from key agencies namely;

1. Department of Alternative Energy Development and Efficiency -DEDE
2. United Nations Development Programme -UNDP
3. Office of Natural Resources and Environmental Policy and Planning – ONEP
4. Energy Policy and Planning Office, Ministry of Energy – EPPO
5. Department of Public Works and Town & Country Planning
6. Pollution Control Department -PCD , Ministry of Natural Resources and Environment
7. The Revenue Department
8. Department of City Planning, Bangkok Metropolitan Administrator
9. Thailand Greenhouse Gas Management Organization (Public Organization) – TGO
10. Thai Green Building Institute – TGBI

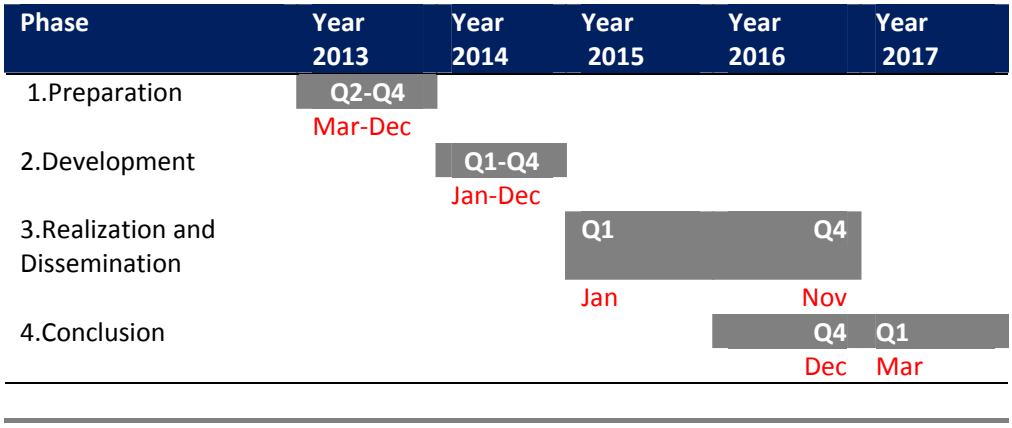
The first project board (PB) meeting was held on 22 May 2013 at Boonrod-Nitipat Meeting Room, 11th Floor, Building 7, DEDE. The objective of the first meeting is to introduce the PEECB project and seeks the approval on the master plan and yearly plan from the board. The minutes of the first meeting is attached in **ANNEX E9 (a)**.

The first expert meeting was also arranged on Thursday 30th May 2013 to introduce the Japanese experts to the project team. Two Japanese experts from Nikken Seiki Research Institute (NSRI), Dr.Shinji Yamamura and Mr.Takahiro Ogawa introduced NSRI's experience and overview of energy efficiency situation in commercial buildings in Japan to the project team.

Task 2 : The Consultant shall develop the master plan (4 years) including resource plan and budgetary plan incorporate with Full-size Project Document on Promoting Energy Efficiency in Commercial Buildings (PEECB)

Details of completed works;

The master plan (4 years) including resource plan and budgetary plan has been developed and was approved in the first project boarding (PB) meeting. The master plan defines the project into 4 phases; Preparation phase, Development phase, Realization and Dissemination phase and Conclusion phase, details as following;
(Detail of 4 years master plan is provided in **ANNEX E3**)



Phase 1 (P1): Preparation phase (Q2Y2013 – Q4Y2013)

The preparation phase will cover studying, reviewing and analysis work of each component as followings.

P1 - Component 1 : Awareness Enhancement on Building EE Technologies and Practices

P1-C-1.1	Identify concept of Commercial Building EE Information Center (CBEEC)
P1-C-1.2	Identify proper campaign to promote awareness on energy efficiency for all stakeholders – Preparation of the first project seminar to open the PEECB Project to public
P1-C-1.3	Identify modification concept for the building energy simulation program
P1-C-1.4	Prepare training structure for technical training curriculum on energy efficiency in commercial buildings
P1-C-1.5	Prepare training structure for non-technical training curriculum on energy efficiency in commercial buildings
P1-C-1.6	Identify promotional concept to support energy efficiency business

P1-Component 2 : EE Building Policy Frameworks

P1-C-2.1 Analyze existing policy and measures on energy efficiency in commercial buildings

P1-C-2.2 Review existing Specific Energy Consumption (SEC), Measurement and Verification (M&V) Protocol and data related to building energy simulation program

P1-C-2.3 Identify promotional scheme to support the implementation of energy efficiency in commercial buildings

P1-C-2.4 Prepare draft promotional plan to support the implementation of energy efficiency in commercial buildings (short and long term plan)

P1-Component 3 : EE Building Technologies and Applications Demonstrations

P1-C-3.1 Conduct feasibility study on the application of energy efficiency in selected demonstration buildings, including the identification of baseline energy consumption and conceptual design for the implementation of energy efficiency technologies

List of buildings that interested to participate in the project as demonstration buildings are as follows;

1. Lamphun Hospital
2. Samrong General Hospital
3. Provincial Electricity Authority – selected buildings
4. Centara Hotels & Resorts – selected buildings
5. Katina Hotel
6. Tesco Lotus – selected buildings

Selection of the demonstration sites will be reviewed to comply with the current situation and project target. Selection criteria will be formulated and presented to PB for approval.

Phase 2 (P2): Development phase (Q1Y2014 – Q4Y2014)

The Development phase will cover development of necessary implementation tools and formulating of related policy on the implementation of energy efficiency in commercial buildings.

P2 - Component 1 : Awareness Enhancement on Building EE Technologies and Practices

P2-C-1.1 Develop and operate the Commercial Building EE Information Center (CBEEC)

P2-C-1.2 Organize promotional campaign to increase awareness on energy efficiency for all stakeholders

P2-C-1.3 Develop and modify building energy simulation program

P2-C-1.4 Develop and organize the technical training course on energy efficiency in commercial buildings

P2-C-1.5 Develop and organize the non-technical training course on energy efficiency in commercial buildings

P2-C-1.6 Organize activities as defined in phase 1

P2-Component 2 : EE Building Policy Frameworks

P2-C-2.1 Formulate policy and measures to promote energy efficiency in commercial buildings

P2-C-2.2 Revise Specific Energy Consumption (SEC), Measurement & Verification (M&V) and update data related to building energy simulation program

P2-C-2.3 Coordinate and organize the public hearing event to gather opinion from all stakeholders on the energy efficiency policy and measures

P2-C-2.4 Finalize promotional plan to support the implementation of energy efficiency in commercial buildings (short and long term plan)

P2-Component 3 : EE Building Technologies and Applications Demonstrations

P2-C-3.1 Finalize conceptual design to improve energy efficiency for each demonstration buildings

P2-C-3.2 Conduct measurement on energy consumption on demonstration buildings, before and after improvement

Phase 3 (P3): Realization and Dissemination phase (Q1Y2015 – Q4Y2016)

The Realization and Dissemination phase will cover implementation of all necessary activities developed in phase 2 as followings;

P3-Component 1 : Awareness Enhancement on Building EE Technologies and Practices

P3-C-1.1 Promote and operate the Commercial Building EE Information Center (CBEEC)

P3-C-1.2 Organize promotional campaign to increase awareness on energy efficiency for all stakeholders

P3-C1.3 Organize the training course on the new revision of building energy simulation program

P3-C1.4 Organize the technical training course on energy efficiency in commercial buildings and follow up the training result

P3-C1.5 Organize the non-technical training course on energy efficiency in commercial buildings and follow up the training result

P3-C1.6 Organize activities as defined in phase 1

P3-Component 2 : EE Building Policy Frameworks

P3-C-2.1 Promote and disseminate policy and measures to promote energy efficiency in commercial buildings

P3-C-2.2 Revise Specific Energy Consumption (SEC), Measurement & Verification (M&V) and update data related to building energy simulation program

P3-Component 3 : EE Building Technologies and Applications Demonstrations

P3-C-3.1 Develop promotional materials on the implementation results of energy efficiency technologies in demonstration buildings

P3-C-3.2 Organize activities and training courses on the implementation of energy efficiency technologies in demonstration buildings

P3-C-3.3 Prepare replication plan of demonstration projects within the commercial building sector

Phase 4 (P4): Conclusion phase (Q4Y2016 – Q1Y2017)

The Conclusion phase will cover the preparation of implementation result, recommendation for the next step and final report

Budgetary Plan

The budget for the PEECB Project is (approximately) 99,990,000 baht. Allocation of the budget for each component is as followings;

1. Component 1 = 31,634,000 baht
2. Component 2 = 18,430,000 baht
3. Component 3 = 41,474,000 baht
4. Project Management = 8,452,000 baht

Budget schedule for each year is set as followings;

Y2013	=	17,497,000	baht
Y2014	=	34,996,000	baht
Y2015	=	29,998,000	baht
Y2016	=	14,998,500	baht
Y2017	=	2,447,500	baht

Task 3 : **Develop a yearly working plan correspond to the master plan and incorporate with Full-size Project Document on Promoting Energy Efficiency in Commercial Buildings (PEECB).**

Details of completed works;

Yearly working plan correspond to the master plan has been developed and was approved in the first project board (PB) meeting. Detail of yearly working plan is attached in **ANNEX E4** of this inception report. Summary of the activities according to the yearly working plan is as follows,

Activities	Period	Remark
1. Inception Workshop	22 May 2013	1st PB Meeting
2. Project Board (PB) Meeting	2 times/Y	Q1 & Q4
3. Project Management Unit (PMU) Meeting	Monthly	
4. Working Group Meeting	Monthly	
5. Stakeholder Meeting	To be confirmed	1st Meeting in May 13
6. Project Public Seminar	Yearly	
7. Technical Training Course	Q2Y14 – Q2Y16	Activity 1.4.2
8. Non-Technical Training Course	Q3Y14 – Q2Y16	Activity 1.5
9. Building Energy Simulation Model (BESM) Training Course	Q2Y15 – Q2Y16	Activity 1.3.1
10. Demo Project Training Course	Q2Y15-Q2Y16	
11. Train the Trainer Course for DEDE's staff	Q4Y13 & Q2Y16	C-1 & C-3

Task 4 : **The Consultant shall develop the Term of Reference (TOR) for DEDE to engage another consultant for the remaining activities as specified in Full-size Project Document on Promoting Energy Efficiency in Commercial Building (PEECB) including all activities in component 2 and component 3.**

Details of completed works;

The Term of Reference (TOR) for DEDE to engage the second consultant on component 2 and component 3 has been completely developed.

Task 5 : **The Consultant shall arrange the meeting for the demonstration buildings to clarify the project details and preparation for the implementation**

Details of completed works;

The meeting for the demonstration buildings was organized on Friday 21st June 2013 at Meeting room no.603, Building 7 DEDE. There are representatives from 5 buildings participated in this meeting namely;

1. Samrong General Hospital
2. Provincial Electricity Authority – selected buildings
3. Centara Hotels & Resorts – selected buildings
4. Katina Hotel
5. Tesco Lotus – selected buildings

Minutes of meeting for the demonstration buildings is attached in **ANNEX E8(b)**

Task 6 : **The Consultant shall organize the inception workshop where attendee comprises of representatives from DEDE, UNDP and other relevant organizations to present the project plan and review logical framework to ensure that the key performance indicators, base year information and target have been set properly .**

Details of completed works;

The **inception workshop** was organized in parallel with the first **Project Board (PB)** meeting in order to introduce and explain details of the PEECB Project to all stakeholders. There are 11 organizations attended the meeting namely;

1. Department of Alternative Energy Development and Efficiency –DEDE
2. United Nations Development Programme –UNDP
3. Office of Natural Resources and Environmental Policy and Planning – ONEP
4. Department of Public Works and Town & Country Planning
5. Pollution Control Department -PCD , Ministry of Natural Resources and Environment
6. The Revenue Department
7. Department of City Planning, Bangkok Metropolitan Administrator
8. Thailand Greenhouse Gas Management Organization (Public Organization) – TGO
9. Thai Green Building Institute – TGBI
10. GIZ Thailand Office
11. United Nation Environmental Programme -UNEP

The opinions gather in the workshop was included in the minutes of meeting for the first project board as attached in **ANNEX E8(a)**

A.2 Changes In Project Environment That May Affect Project Implementation Effectiveness

A.2.1 Changes in The Selected Demonstration Sites

The PEECB project includes the implementation of activities intended to promote the widespread applications of EE technologies, applications and practices in the commercial sector of Thailand. However, not all of the potential savings can be attributed to the implementation of the PEECB project. Some of will be directly attributed to the project, while the rest would be indirectly realized as influenced by the interventions and enabling environments that will be established and facilitated by the project. Most of the direct emission reductions will come from the various EE buildings demonstrations that will be carried out under the project.

The changes in selected demonstration sites from project document will impact on the estimated direct CO_2 emission reductions which mainly influenced to the indirect CO_2 emission estimation by replication factor (bottom-up approach) during period Y2016-2025.

Therefore, the pre-screening criteria of the demonstration sites would be very efficient approach for determining the appropriate demonstration sites in terms of project implementation readiness and target set to be achieved among those sites in practically.

According to the project document, there are 7 sites expressed intention to participate in the PEECB Project. List of these buildings or organizations are;

1. Samrong General Hospital
2. Provincial Electricity Authority – selected buildings
3. Centara Hotels & Resorts – selected buildings
4. Katina Hotel
5. Tesco Lotus – selected buildings
6. Lamphun Hospital
7. Bureau of Energy Efficiency Promotion, Ministry of Public Health

However, there are 2 buildings, Lamphun Hospital and Bureau of Energy Efficiency Promotion – Ministry of Public Health, may not be able to continuously participant in the project. Therefore, selection of the demonstration sites will be reviewed. New selection criteria will be formulated and presented to Project Board for approval.

B SCHEDULE FOR PROJECT REVIEWS, REPORTING AND EVALUATION

Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures. It will be provided by the PMU and the UNDP Country Office (UNDP-CO), with support from the UNDP-GEF Regional Coordination Unit (RCU) in Bangkok. The revised Logical Framework Matrix in **Annex E.8** provides performance and impact indicators for project implementation along with their corresponding means of verification. The CBEEC setting up , DEDE's Energy Reports and Annual reports prepared by project partners e.g. Industry/Professional Associations, Commercial Building Managements and Developers (see section II Part II table 12 in Project Document) will be used as instruments to monitor progress in PA management effectiveness.

Table 1 Project monitoring and evaluation plan and budget

Type of M&E Activity	Responsible Parties	Budget US$[1]	Time Frame
Inception Workshop (IW)	▪ Project Management Unit ▪ UNDP-Thailand ▪ UNDP-GEF RCU ▪ DEDE ▪ Stakeholders	Part of Project Management Budget	Within first 3 months of project start up
Inception Report (IR)			a) Draft IR available before IW b) Final IR available following IW
Micro Assessment of Implementing Partner	▪ Third-party assessment	1,500	During the Inception Phase
Measurement of Means of Verification for Project Progress and Performance	▪ Oversight by UNDP-GEF Technical Advisor and PM ▪ Measurements by DEDE	Part of the Component Budget	Start, mid and end of project
Quarterly Progress Report and Operational Report	▪ Project Management Unit ▪ UNDP-Thailand ▪ UNDP-GEF RCU	None	Quarterly
Annual Project Review and Project Implementation Review	▪ Project Management Unit ▪ UNDP Thailand ▪ UNDP-GEF ▪ DEDE	Part of Project Management Budget	Annually
Tri-Partite Review (TPR) and MPR report	▪ DEDE ▪ UNDP Thailand ▪ Project Management Unit	Part of Project Management Budget	Every year, upon receipt of APR.

[1] Most of the listed M&E activities listed in the table are among the project management activities. Hence the budgets for such activities are included in the PM budget.

Type of M&E Activity	Responsible Parties	Budget US$[1]	Time Frame
	▪ UNDP-GEF RCU		
Project Boarding Meeting	▪ Project Management Unit ▪ UNDP Thailand	Part of Project Management Budget	Following Project IW and subsequently at least twice a year.
PSC Meetings	▪ Project Manager ▪ UNDP Thailand	Part of Project Management Budget	6 monthly and subsequently at least once a year
Periodic status reports	▪ Project Management Unit	Part of Project Management Budget	To be determined by Project team and UNDP Thailand
Technical reports	▪ Project Management Unit ▪ Hired consultants as needed	Part of Component Budget	To be determined by Project Team and UNDP Thailand
Mid-term External Evaluation	▪ Project team ▪ UNDP- Thailand ▪ UNDP-GEF RCU ▪ External Consultants (i.e. evaluation team international and local consultants)	40,000	At the mid-point of project implementation.
Terminal Report	▪ Project Management Unit ▪ UNDP Thailand ▪ External Consultant	Part of Project Management Budget	At least one month before the end of the project
Lessons Learned Report	▪ Project Management Unit ▪ UNDP Thailand ▪ UNDP-GEF RCU	Part of Project Management Budget	Annually
Audit Interim / NEX Audit (as per OAI requirements)	▪ UNDP Thailand ▪ Project team ▪ National Audit Department ▪ Private sector auditors (if necessary)	12,000	One mandatory Audit and provision of the budget of 2nd Audit if needed.
Final External Evaluation	▪ Project team ▪ UNDP Thailand ▪ UNDP-GEF RCU ▪ External Consultants	40,000	At the end of project implementation
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	▪ UNDP Thailand ▪ UNDP-GEF RCU (as appropriate) ▪ Government representatives	Part of Project Management Budget	Annually
TOTAL INDICATIVE COST *Excluding project team staff time and UNDP staff and travel expenses*		**93,500**	

PROJECT MONITORING AND REPORTING

All project reports and publications should include the GEF, UNDP, DEDE and BMC logos on the cover page. In the case of scientific papers and articles in journals, the project should be fully acknowledged.

PMU, with support from the UNDP Country Office, will be responsible for the preparation and submission of the following mandatory monitoring outputs:

(a) Inception Report

A Project Inception Report (IR) will be drafted for review at an Inception Workshop and subsequently finalized. The UNDP-CO and UNDP-GEF RCU will review the finalized document, following which it will be circulated to project counterparts by PMU.

(b) Annual Reports (PIR and ARR)

The Project Implementation Review (PIR) is an annual monitoring process mandated by GEF. It is an essential management and monitoring tool for project managers and provides the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, PMU with support from UNDP-CO will complete a PIR using the template available from GEF (usually in July). The PIR should then be reviewed by the PB so that the result will be a PIR that has been agreed upon by the project, executing agency, UNDP-CO and the UNDP GEF Regional Technical Adviser, prior to being forwarded to the focal area cluster at UNDP-GEF headquarters where the UNDP-GEF Monitoring & Evaluation Unit will analyze the PIR and identify common issues/results and lessons.

In addition to the PIR for GEF purposes, UNDP requires an Annual Review Report (ARR) as part of its Country Office's monitoring protocol. As a minimum requirement, the ARR shall consist of the Atlas standard format for the Project Progress Report (PPR) covering the whole year with updated information for each element of the PPR, as well as a summary of results achieved against pre-defined annual targets at the project level. The ARR should be prepared prior to the PB meeting to review progress achieved in delivering the project's Annual Work Plan. It should consist of the following sections: (i) project risks and issues; (ii) project progress against pre-defined indicators and targets; and (iii) outcome performance.

(c) Quarterly Reports (PPR)

Quarterly Project Progress Reports (PPR) should be prepared according to the format provided by the UNDP-CO. They are intended to provide brief narrative updates on project progress to the local UNDP-CO and the UNDP-GEF RCU. They are prepared by PMU, with inputs from other project team members as necessary.

(d) Periodic Thematic Reports

As and when requested by UNDP, UNDP-GEF or the Project Executing Agency, PMU may need to prepare Specific Thematic Reports, focusing on specific issues or activities for purposes of identifying lessons learnt, addressing specific oversights or evaluating obstacles and means of overcoming them. Such requests will be provided to the Project Director in written form by UNDP, clearly stating the issues or activities to be reported on.

(e) Project Terminal Report

PMU will prepare this report during the last three months of the project. It should provide a comprehensive summary of all activities, achievements and outcomes of the project, lessons learnt, objectives met or not achieved, structures and systems implemented, etc. It is a definitive statement of activities undertaken and should also include recommendations for any further steps necessary to

ensure sustainability and replicability of project activities.

PROJECT EVALUATION

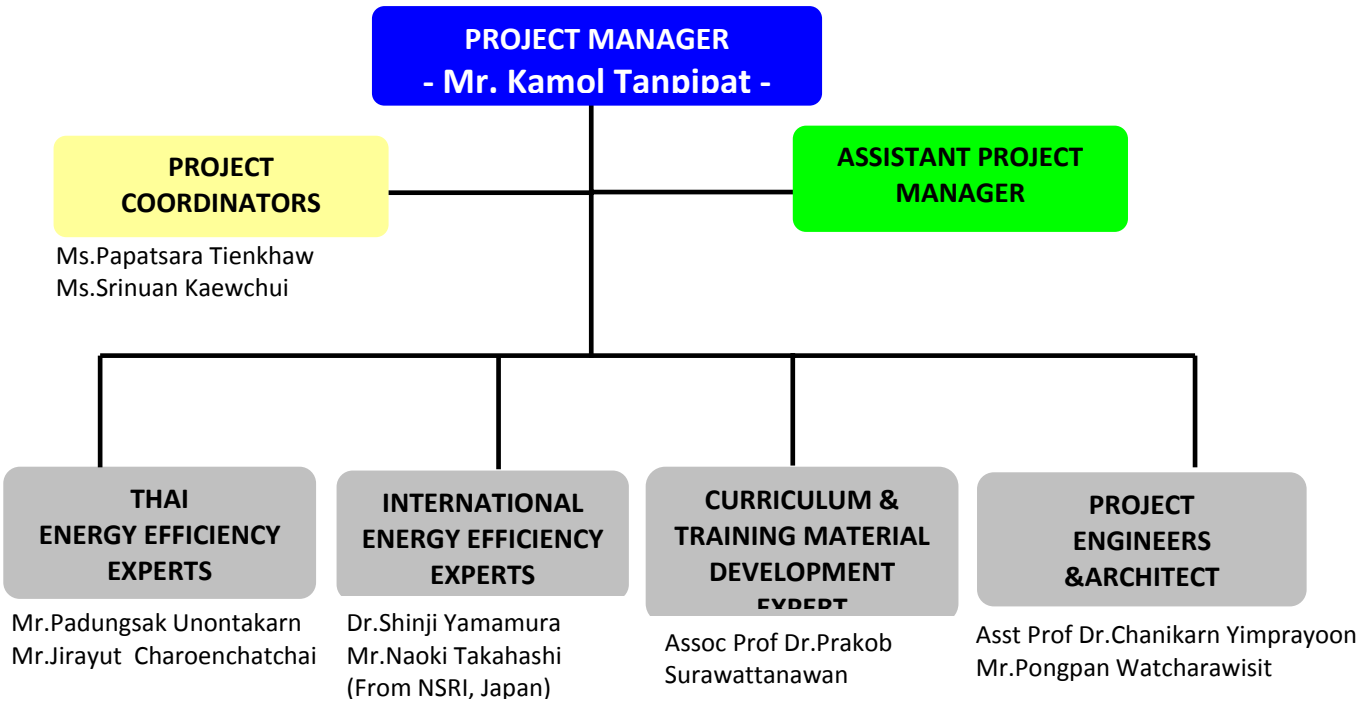
The project will be subjected to at least two independent external evaluations. An independent Mid-Term Evaluation (MTE) will be undertaken at exactly the mid-point of the project's lifetime. The MTE will assess progress made towards the achievement of outcomes and will identify changes in course direction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; highlight issues requiring decisions and actions; and present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organisation, terms of reference and timing of the MTE will be decided after consultation between the parties to the project document. The Terms of Reference for the MTE will be prepared by the UNDP-CO, based on guidance from the UNDP-GEF RCU.

An independent Final Evaluation will take place three months prior to the terminal PEB meeting. It will focus on the same issues as the MTE. The Final Evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF RCU.

C. PROJECT MANAGEMENT STRUCTURE

Bright Management Consulting Co., Ltd. proposes a highly experienced team to work in this project. All team members have in depth experiences on energy efficiency and energy management as well as GHG knowledge and practical experiences on the implementation of Energy Efficiency Technologies in commercial buildings. The specific, relevant and successful projects of the team members are Advanced Technology on Energy Efficiency Demonstration Project Phase 1 and 2 for DEDE, Development of training curriculum for Person Responsible for Energy (PRE) in Designated Buildings and Factories for DEDE, Development of Training Materials for Manual of Refrigeration Servicing Technicians for UNEP, Development of Training Curriculum for ASEAN Energy Manager Accreditation Scheme for ASEAN Center for Energy (ACE), Development of training curriculum on the third country training programme on energy efficiency to reduce global warming for ASEAN countries for Japan International Cooperation Agency (JICA), GHG Inventory development for high emitting industrial sectors and CFC Chiller Replacement Project for Department of Industrial Work (DIW). BMC completed more than 300 energy efficiency projects in assisting clients on setting energy target and 3 year implementation plans. BMC also worked as in-house expert for clients to implement sustainable energy management system and mapping of energy footprint, setting key performance indicators and energy efficiency indexes.

BMC possesses more than 15 years of track record in energy management training. The firm conducted training for building PREs covering all type of commercial buildings such as hotel, hospital, office building, department store and wide range of industrial sectors such as electronic, brewery, beverage plant, confectionary plant etc. BMC also possesses extensive experience in curriculum development and training of more than 1,000 PREs for DEDE. The structure of the project team for PEECB project has been prepared as following diagram;



Key Qualifications of Project Team members :

Project Manager - Mr.Kamol Tanpipat

Kamol possesses more than 20 years experience in managing engineering consulting projects and more than 15 years of direct experience as project manager in managing of international project, feasibility study projects on energy conservation and carbon reduction, implementing energy conservation and energy management projects for major industrial and commercial sectors in Thailand.

He has worked as project manager, trainer and instructor in several consulting projects for Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, Thailand, Japan International Cooperation Agency (JICA), United Nations Environment Programme (UNEP) etc.

He was a co-project manager and acting as senior technical advisor for ASEAN project in the development of theoretical training curricula for energy managers and training providers in ASEAN funded by EC-ASEAN Energy Facility.

He has worked as project manager for Kasikorn Bank and CP Leadership Institute (CPLI) GREEN Building Project as commissioning authority to fulfill the requirement of the LEED Certified level of sustainability under the US Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

The most recent completed international project was the conducting of feasibility study on APEC Low Carbon Model Town (LCMT) project Phase 2 at SAMUI Island Thailand for APEC Secretariat and APEC Energy Research Center (APERC) which he also worked as project manager.

International Energy Efficiency Expert - Dr.Shinji Yamamura

Dr. Yamamura has over 20 years of experience in the field of mechanical engineering and environmental engineering. He has gained extensive project management skills working on various large scale building projects and urban development projects both in Japan and over seas.

Dr. Yamamura is also an expert of Urban environmental planning and evaluation of Heat Island.

From 2006, he has been transferred to Nikken Sekkei Research Institute and started consulting works such as energy conservation of buildings, evaluation of urban climatology, environmental planning and CO2 emission planning and evaluation in urban development

He has been currently engaged in Low carbon town projects and Smart city project in Japan, China, Thailand and other counties. In these projects, he also focus to design the high efficient district energy supply system, smart grid system, etc.

International Energy Efficiency Expert- Mr.Naoki Takahashi

Mr. Takahashi worked on various scale projects ranging from office, hospital, hotel, university and facilities for research, as main designer of mechanical systems.

From 2002, he has started consulting works such as energy conservation of buildings, and feasibility study of ESCO (Energy Service Companies) projects.

From 2006, he has been transferred to NIKKEN SEKKEI Research Institute and started consulting works such as energy conservation of buildings, evaluation of energy consumption of existing buildings, planning of District Heating & Cooling (DHC).

Curriculum and Training Materials Development Expert - Associate Prof Dr.Prakob Surawattanawan

Associate Professor Dr.Prakob possesses more than 12 years experience of curriculum and training materials development for Undergraduate degree (Air Conditioning, Mechanics of Machinery) and Master degree (Optimization in HVAC, Intermediate Refrigeration, Ventilation and HVAC for Safety Engineering). He also has expertise in the area of Heating, Ventilating and Air Conditioning (HVAC), Solar Energy and Alternative Energy through numbers of research and development e.g. Heliostat in Thailand for Solar Thermal Energy, Preventive maintenance for Air conditioning System in SUVARNABHUMI Air port of Thailand etc. His experience and skill are also as journal editor and speaker for example, editor of Mechanical Engineering Network Thailand Conference (ME-NETT Conference) , editor of journal of research in Engineering and Technology (Kasetsart University),speaker of “Workshop Training on Assessment Technique in Cleaner Technology” (National Science and Technology Development Agency : NSTDA), speaker of “Control Applications in HVAC” (Air Conditioning Engineering Association of Thailand), speaker of “Inspection Technique and Maintenance in Air Conditioning System” (Airports of Thailand PCL.) will serve him well in developing the training curriculum and training materials for trainee and trainer and hence contribute to the successful implementation of proposed activity meeting project objectives and time frame.

His previous work and experience in energy efficiency auditing and implementation are also value-added for curriculum development e.g. Capacity Building on Cleaner Production in Thai Food Industries, an “Extended Approach” to promote Socially Responsible Environment Management and Increase Market Opportunities, Client : European Commission, Operating by Thai Environment Institute (TEI) and Center for Energy Environment Resources Development (CEERD).

Energy Efficiency Expert – Thai : Mr.Padungsak Unontakarn

Padungsak currently develops business unit in CDM and Renewable energy department. He possesses more than 15 years experience for energy efficiency consulting projects for major industrial and commercial sectors in Thailand and more than 5 years in technical and project management in energy-related projects for many heavy industries. His experience and skill in both project management and technical expertise will serve him well in managing the project and hence contribute to the successful implementation of proposed activity meeting project objectives and time frame.

His present work had been focusing on carbon mitigation and assessment though numbers of government projects such as GHG Inventory and report development for industrial sector for Department of Industrial Works, Ministry of Industry (2009), Clean Development Mechanism, CDM for Biomass Utilization at TUP (2008), Approaching for Carbon management for commercial and industrial program development such as corporate carbon footprint and product carbon footprints.

Energy Efficiency Expert – Thai : Mr.Jirayut Charoenchatchai

Jirayut with 18 years of engineering and energy management experience has conducted over 80 energy audits, set up energy policy & strategic plan, conduct energy management training and implementation projects in the last ten years. He has undertaken project leadership responsibility in numerous energy management and efficiency projects.

He had involved in applying *Good Practice Guidance and Uncertainty Management* for GHG Inventory and report development for industrial sector for Department of Industrial Works, Ministry of Industry (2009). He also provided Good Practice Training for industries during developing the project and also co-developing GHG manual for industrial sectors.

Building Energy Simulation Expert & Project Engineer - Assistant Prof Dr.Chanikarn Yimprayoon

Assistant Prof Dr.Chanikarn Yimprayoon with 10 years of energy efficient building design both in undergraduate and graduate levels at Kasetsart Univerity. Before her teaching career, she had been a project architect for Energy Engineering Institute, a registered energy conservation audit consultant, responsible for OTTV/RTTV evaluation. She has experiences and trainings in many building simulation programs as well as certificates in green building design which are LEED AP BD+C and TREE-A.

Her recent works has been focusing on green building design such as energy efficiency design strategies for building with grid-connected photovoltaic (PV) systems, which simulated residential, commercial and industrial buildings energy used in 16 weather zones following ASHRAE 90.1 and 90.2 standards. PV productions from those buildings were predicted using TMY2 or real-time satellite derived weather data and actual performance of PV modules tested in the fields.

Project Engineer - Mr.Pongpan Watcharawisit

Pongpan with 12 years of engineering and energy management experience has conducted over 100 energy audits. He has undertaken project responsibility in numerous energy management and energy efficiency projects e.g. the detailed energy audit & analysis to identify energy conservation measures in commercial buildings and factories. The implementation of energy management system in accordance with the Energy Conservation Promotion Act. B.E.2535. His experience are also including measurement and verification of energy saving projects, data collection and analyze of specific energy consumption (SEC) or energy efficiency index (EEI) for buildings and factories in order to improve the services/productivity towards energy target and plan.

Project Coordinator -Ms.Papatsara Tienkhaw

Papatsara with 8 years of experiences in administrative department, organizing the training courses including as project coordinator with international and local government and private agencies such as Japan International Cooperation Agency (JICA), Department of Alternative Energy Development and Efficiency (DEDE), Energy Research Bureau Ministry of Energy, Department of Industrial Work (DIW), Ministry of Industrial etc.

Her recent works has been focusing on project coordinator with project management team and clients including organize/arrangement of meetings/seminars/trainings in the project. The numbers of projects e.g. The Demonstration of Advance Technology Phase II (for Energy Regulation and Conservation Bureau,DEDE), The Training course of Conventional Person Responsible for Energy : PREs (Building) (for Human Resource Development Bureau, DEDE), The Training course of Applicable Renewable Technology in Commercial Building & Industry (for Human Resource Development Bureau, DEDE) etc. made her understanding of work practice among government agencies and private sector which very much important in her role in this project.

Project Coordinator - Ms.Srinuan Kaewchui

Srinuan with 8 years of experiences in administrative department, organizing the training courses including as project coordinator with many government and private agencies such as Department of Alternative Energy Development and Efficiency (DEDE), Energy Research Bureau Ministry of Energy, Department of Industrial Work (DIW), Ministry of Industrial etc.

Her recent works has been focusing on project coordinator with project management team and clients including organize/arrangement of meetings/seminars/trainings in the project. The numbers of projects e.g. The Demonstration of Advance Technology Phase II (for Energy Regulation and Conservation Bureau,DEDE), The Training course of Conventional Person Responsible for Energy : PREs (Building) (for Human Resource Development Bureau, DEDE), The Training course of Applicable Renewable Technology in Commercial Building & Industry (for Human Resource Development Bureau, DEDE) etc. made her understanding of work practice among government agencies and private sector which very much important in her role in this project.

D.STAKEHOLDERS INVOLVEMENT

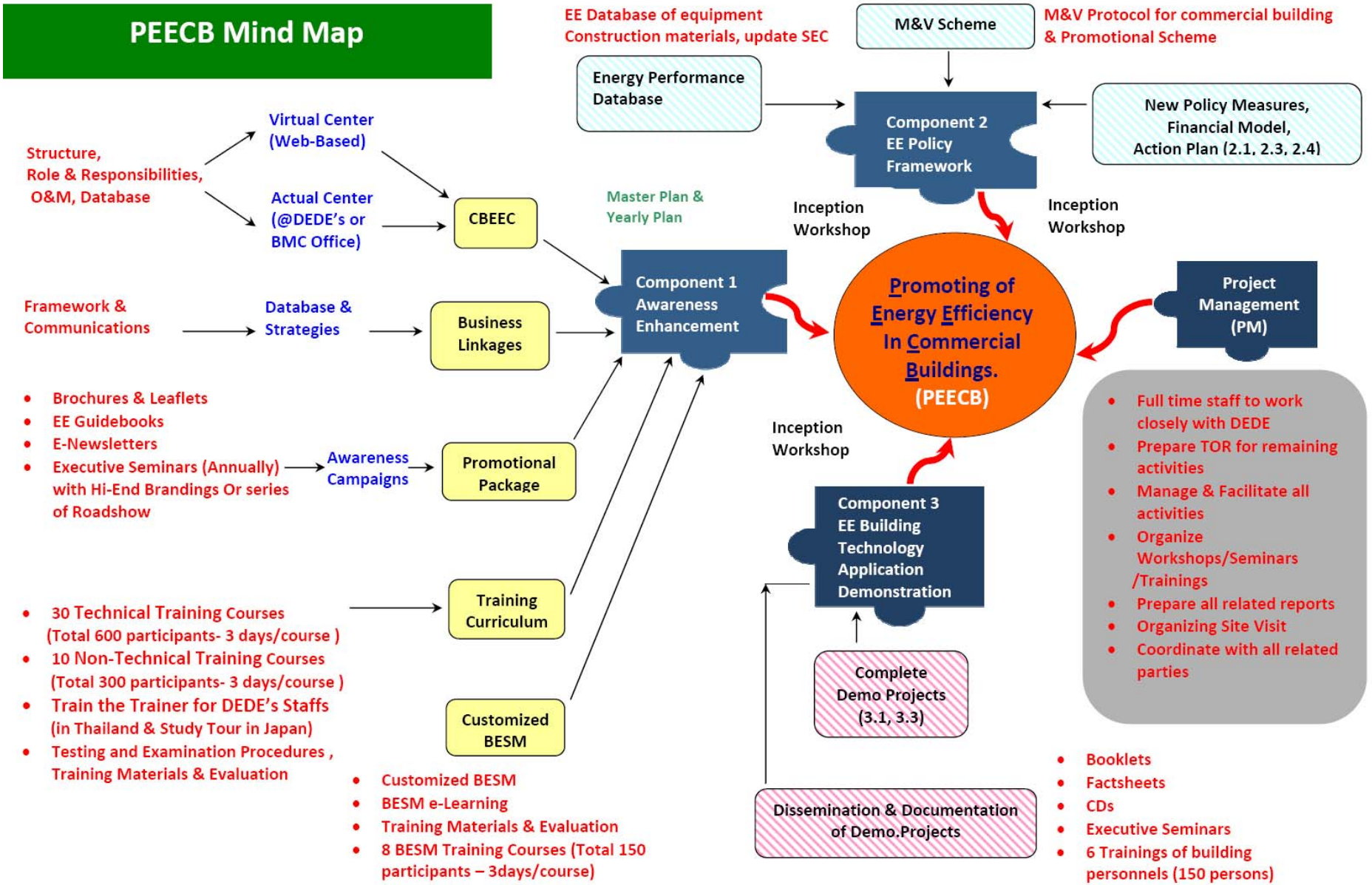
The project aims to create the sustainability on knowledge management which is a significant barrier to the uptake of building energy efficiency technologies, systems and practices.

Since energy consumptions as well as GHG emissions from the commercial building sectors are dramatically increased, the sustainable approach from all associated parties shall be made with fully agreed on knowledge and practice enhancement.

Key Stakeholders in "PEECB"

- Government Agencies
- Building Owners
- Building Practitioners
- Professional Institutes
- Financial Institutes
- EE Technologies & Application Suppliers

Promoting Energy Efficiency in Commercial Building, PEECB Project consists of 3 major components which comprise of broad range of activities. Project Management and other required activities to support the implementation of the 3 components also important for the success of the project. Thus, in order to understand the overall methodologies and approaches that BMC propose for this project, the mapping of all project major activities, deliverables and specific proposed activities has been prepared as "PEECB Mind Map" showing as following Diagram;


PEECB Mind Map
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M&V Protocol for commercial building & Promotional Scheme
Energy Performance Database
Component 2 EE Policy Framework
New Policy Measures, Financial Model, Action Plan (2.1, 2.3, 2.4)
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Virtual Center (Web-Based)
Actual Center (@DEDE's or BMC Office)
CBEEC
Master Plan & Yearly Plan
Inception Workshop
Inception Workshop
Component 1 Awareness Enhancement
Promoting of Energy Efficiency In Commercial Buildings. (PEECB)
Project Management (PM)
Framework & Communications
Database & Strategies
Business Linkages
Brochures & Leaflets
EE Guidebooks
E-Newsletters
Executive Seminars (Annually) with Hi-End Brandings Or series of Roadshow
Awareness Campaigns
Promotional Package
Inception Workshop
Component 3 EE Building Technology Application Demonstration
Full time staff to work closely with DEDE
Prepare TOR for remaining activities
Manage & Facilitate all activities
Organize Workshops/Seminars /Trainings
Prepare all related reports
Organizing Site Visit
Coordinate with all related parties
30 Technical Training Courses (Total 600 participants- 3 days/course)
10 Non-Technical Training Courses (Total 300 participants- 3 days/course)
Train the Trainer for DEDE's Staffs (in Thailand & Study Tour in Japan)
Testing and Examination Procedures , Training Materials & Evaluation
Training Curriculum
Customized BESM
Complete Demo Projects (3.1, 3.3)
Customized BESM
BESM e-Learning
Training Materials & Evaluation
8 BESM Training Courses (Total 150 participants – 3days/course)
Dissemination & Documentation of Demo.Projects
Booklets
Factsheets
CDs
Executive Seminars
6 Trainings of building personnels (150 persons)

The summarization of propose activities and deliverables of each component are shown in the following tables:

Component 1 : Awareness Enhancement on Building EE Technologies and Practices

Activities	Deliverables
Inception Workshop (IW)	- Final master plan (4yrs.), Resource & Budgetary plan - Project Yearly Plan breaking into detail of each activity
Establish CBEEC	- Guidelines or Recommendation on how to setup CBEEC including, - Roles and responsibilities - Organization and Financial Structure - Stakeholders involvement - Operation & Maintenance
Implement Awareness Campaigns	- 4 Executive seminars (Annually) related to building owners/building practitioners/ professional & financial institutes/EE technologies & application practices suppliers - Focus Group Meeting - Promotional Package - Brochures & Leaflets - Energy Efficiency in Commercial Buildings Guidebooks - E-Newsletters - Etc.
Develop Customized Building Energy Simulation Models (BESM)	- Customized BESM Software - BESM e-Learning - BESM Training materials (e.g. workbook, presentation handouts, CDROM) for participants/trainers - Testing/Exam procedures (after attend the course) - Evaluation sheets/Questionnaires - 8 Training courses (Total = 150 participants , 3 days/course)
Focused Group Training Courses - Technical Training Course - Non-Technical Training Course - Train the Trainer for DEDE'personnels	- **Technical & Non-Technical Training** materials (e.g. workbook, presentation handouts, CDROM) for participants/trainers - Testing/Exam procedures (after attend the course) - Evaluation sheets/Questionnaires - 30 Technical Training courses (Total = 600 participants , 3 days/course) - 10 Non-Technical Training courses (Total = 300 participants , 3 days/course) - **Train the Trainer Training for DEDE'personnels** - Training programme and materials - Class room training in Thailand - Study tour in Japan or other country as appropriate
Establish Business Linkages	- Business linkage strategies e.g. technical and financial assistant models, information model sharing etc.

Established Commercial Building EE Information Center (CBEEC):

BMC will recommend the most appropriate approach to establish CBEEC whether to be a new center unit or internet-based virtual center. The considerations shall be included but not limited to the following issues:

- The roles and responsibilities of CBEEC
- All stakeholders that need to be involved in setting up and operation of CBEEC
- The organizational structure of the CBEEC
- Operation and Management of CBEEC
- Financial Structure of CBEEC

BMC will develop the methodologies and guidelines to manage and operate the CBEEC. The up-to-date information shall be actively monitored by qualified staff or assigned DEDE's person and BMC experts in the following manners:

- Regularly reviewed by BMC staff on weekly basis
- Regularly reported by BMC staff & assigned DEDE's personnel on monthly basis

In the project period of 4 years, CBEEC operation center should be set up either at DEDE office or BMC office to be the contact point of the project. BMC will provide administrative staff to operate and maintain CBEEC during the project period.

Implement Awareness Campaigns:

BMC will study and recommend an effective promotional scheme using information from CBEEC database in Activity 1.1.1. The promotional scheme will include but not limited to these list of design activities:

1. Design the official **website** for CBEEC as the portal of EE information center (web-based)
2. Design and prepare the **annual seminar** on Energy Efficiency Technology for Commercial Building. This annual seminar might be able to co-organize with related Professional Association in EE Technology in Thailand such as Thai Green Building Institute (TGBI), Engineering Institute of Thailand (EIT) etc.
3. Design the **brochure and leaflet** to introduce CBEEC roles, responsibilities and activities.
4. Design the **newsletter** regarding the EE technology to update latest technology and news. This newsletter can be published twice or three times a year depend on the availability of the information.
5. Prepare the **focus group meeting** to seek in-dept knowledge on the implementation of Energy Efficiency Technologies in Commercial Building.
6. Design and prepare **"Energy Efficiency in Commercial Building Guidebook"**

Customized Building Energy Simulation Model (BESM) :

BMC will set up the development team consists of Thai Experts and also our international experts from Japan, Nikken Seiki, to work on the development of BESM. Our international experts will provide input on the best practices that have been introduced or implemented in Japan and other countries. While Thai experts will incorporate all inputs from stakeholders and related persons, design and program the new version of BESM.

Before and after developing the new version of BESM, BMC will arrange the focus group meeting for further extend the user's need, the user manual will be incorporated for those changes. The training curriculum for building practitioners, design schools and institutes will also be developed.

Focus group Training Courses:

BMC will develop the overall training program for 2 main target groups:

- Technical Group
  - Building Designer
  - Building Management and Facility Management
- Non-technical and financial Group

The design of **Technical Training Courses** will cover all aspects of Energy Efficiency Technologies in Commercial Building. The training courses will be designed separately for building designer and building management or facility management team.

The design of **Non-Technical Training Courses** will aim to provide necessary information and knowledge on Energy Efficiency in Commercial Building to Developers, Building Owners, Building Executives and Financial Institutes in order to make the proper decision to invest in Energy Efficiency in Commercial Building.

Apart from the Technical and Non-Technical Training Programme, BMC will design and develop the capacity building – train the trainer programme and training package for DEDE's staffs as following details

- Design and Develop the **Train the Trainer Curriculum for DEDE's Staff** – 15 persons
  - **Class-room training (in Thailand) – 15 persons**
  - **Study Tour (in Japan or other country as appropriate) – 5 persons**, select 5 top potential participants or as recommended by DEDE
- Develop training materials for DEDE's staffs as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides
  - Necessary materials to conduct the workshop or exercise during the training course

BMC will conduct the train the trainer course for DEDE's staffs (class-room training in Thailand and study tour in Japan or other country as appropriate). The class room training in Thailand aims to provide train the trainer techniques for DEDE's staffs to extend their knowledge and ability to deliver information and knowledge on the implementation of Energy Efficiency Technologies. The study tour in Japan aims to provide further knowledge and experiences of the actual implementation projects in other countries to DEDE's staff. The 5 top potential participants will be selected or as recommended by DEDE to participate in the study tour activity in Japan or other country as appropriate.

Establish Business Linkages :

BMC will coordinate with related government agencies, domestic professional and industry associations such as Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, Department of Business Development (DBD), Ministry of Commerce, Related Engineering and Architectural Professional Associations in Thailand to set up the database of the commercial buildings in Thailand and potential suppliers related to Energy Efficiency Technologies in Thailand.

The database setup will provide useful and important information to prepare framework in establishing of business linkage according to the type of technologies or type of buildings. The Framework will identify and address the following topics;

1. Business linkage strategy
2. Appropriate technologies to be promoted
3. Related type of buildings of each selected technology
4. Numbers of target group for each technology
5. Appropriate linkage channel for each technology
6. Appropriate business channel
7. Baseline and target

Base on the database and framework set up, variety of linkage channels such as the business seminar and exhibition, call center through CBEEC, technologies fact-sheets, etc , will be recommended, prepared and developed. The meeting, seminar or event to facilitate the business linkage will be organized as necessary.

Component 2 : EE Building Policy Framework

Activities	Deliverables
Compile and update Energy Performance Database of building construction material and electrical equipment for commercial building	- Energy Performance Database for building construction material and electrical equipment for commercial building
Review and update of DEDE's SEC studies and compilation of building stock	- Updated of Specific Energy Consumption (SEC) with recommendation on how to utilize and continuously update the data
Assess M&V Scheme and develop M&V Protocol	- Recommended M&V Protocol for commercial building EE projects

BMC will update the SEC using the annual energy management reports during the past 3 years for all designated buildings in Thailand. However, the information might need the statistical analysis to define and interpret of uncertainty among each of building categories such as hotels and service apartments etc. The comparative performance indication of high EE or low EE buildings of each building type will be analyzed. The mechanism for periodical updates of the necessary information through different channel such as annual energy management report, annual survey, etc. will also be assessed and analyzed.

BMC will develop recommended M&V protocol for commercial building in Thailand based on the reviewed results. The promotional scheme for propose new M&V protocol will also be prepared including the dissemination and training process, the certification of the qualify person, recommended budget to implement the promotional scheme etc.

Component 3 : EE Building Technology Applications Demonstrations

Activities	Deliverables
Document & Disseminate of Demonstration Projects (Case Studies)	- Demonstration project Booklets - Fact Sheets - Demonstration project CD-ROM - Recommended availability & quality on EE technologies for common practices - 3 Executive seminars (Total = 450 participants , 1 day/event) - 6 Technical Training courses for demonstration project personnel (Total = 150 participants , 2 days/course)

Dissemination of Demonstration Projects & Promotional package:

BMC will coordinate with relevant parties in Activity 3.1.1.1 (Conduct of comprehensive feasibility studies and determination of implementation requirements, costing and engineering studies/design of selected demonstration projects) to collect data and information of demonstration projects.

BMC will design and produce the promotional package for the demonstration projects including at least following materials;

1. **The booklet of demonstration projects** ; Documentation of results of the demonstration projects will be presented in the format of booklet that can be disseminated in the annual seminar on EE Technologies as propose in component 1 and also be made available at the CBEEC database and website.
2. **Fact Sheets:** The demonstration results of each demonstration project will also be summarized as fact sheets (1 or 2 pages) to provide the key success in the implementation on EE Technologies.
3. **Demonstration Projects CD-ROM:** All documentation of results, fact sheet and any materials produced under the demonstrating project will be prepared as soft files in CD-ROM.

Other types of promotional materials will be developed as necessary.

BMC will review the existing demonstration projects or case studies in other countries to justify the necessary content and formatting which creates human impact for both managerial and operational level. The available EE technologies and practices are also in consideration as well as project development criteria. The review of the existing demonstration projects or case studies will be focused more on the Japan cases where our partner, Nikken Seiki would be able to search and provide in-dept information for the selected projects. However, the projects or case studies from other parts of the world will also be reviewed as well.

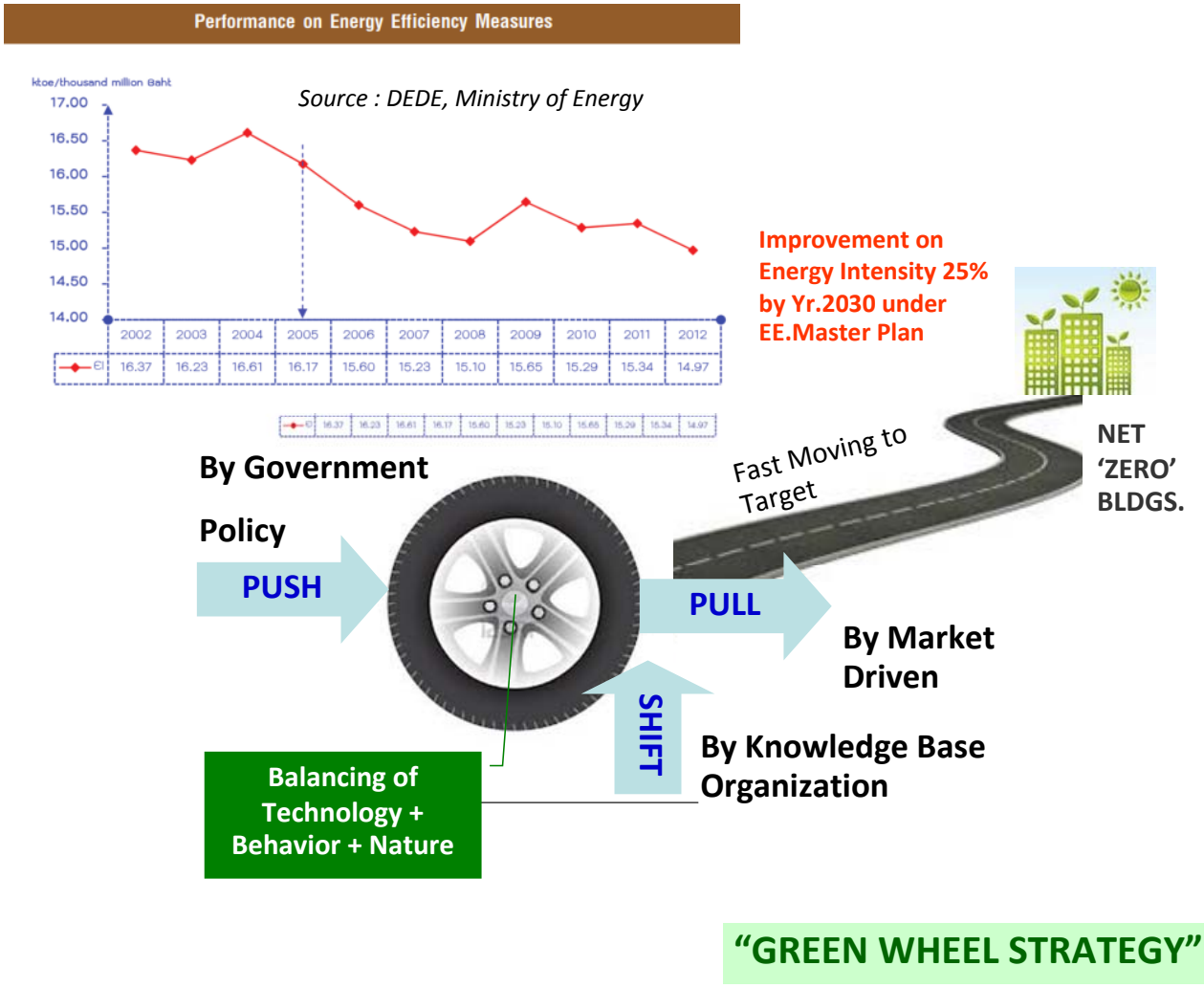
BMC will develop the CBEEC database in corporate with the results from demonstration projects under the PEECB project comparatively with other countries. The availability and quality of EE technologies and practice applied in Thailand will consequently be used as common practice for building owners or managers, building practitioners for future projects, etc. The information on the availability and quality of EE technologies will also be utilized as significant contents in the training course that will be developed under activities 3.2.2.1

BMC will conduct the training course for demo building personnel. The training course will be conducted at each demo building in order to do the hands-on practice on the actual equipment. BMC will provide the qualify trainer to conduct each training course. Classroom training to learn about the theoretical part of the EE Technologies, M&V Protocol and case studies of other completed projects in Thailand and other counties will also be delivered.

E. ANNEXES

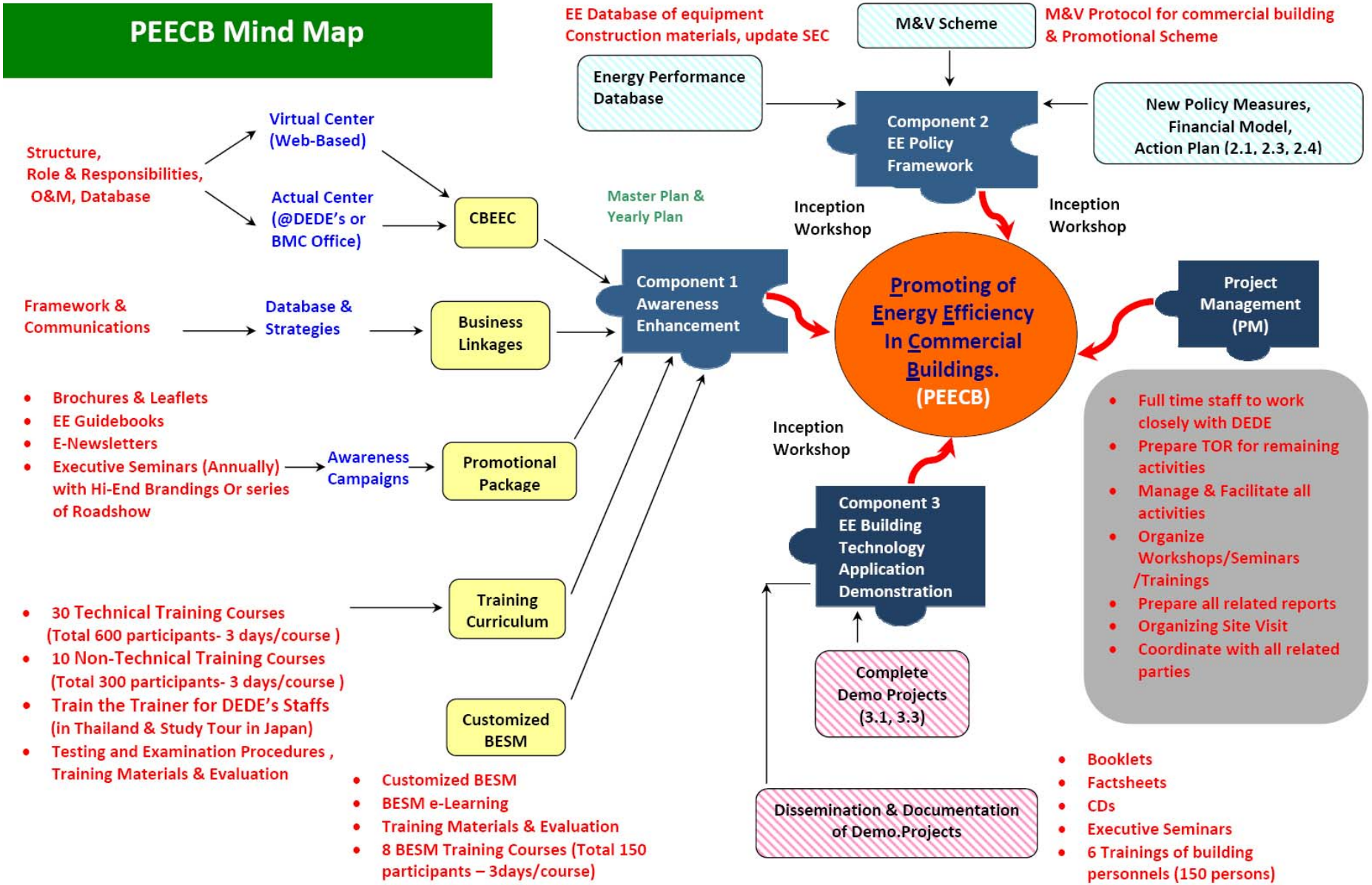
E1. METHODOLOGY & APPROACH

BMC will implement the PEECB project according to the methodologies and approaches proposed in this inception report. The master plan and yearly plan will be periodically reviewed and updated in order to keep the implementation of the project in the proposed timeframe. The quality of the outputs and deliverables will also be strictly monitored and controlled. The next progress report will be expected to submit to DEDE at the overall project completion at 10% within early September 2013.



"GREEN WHEEL STRATEGY"

Promoting Energy Efficiency in Commercial Building, PEECB Project consists of 3 major components which comprises of broad range of activities. Project Management and other required activities to support the implementation of the 3 components also important for the success of the project. Thus, in order to understand the overall methodologies and approaches that BMC propose for this project, the mapping of all project major activities, deliverables and specific proposed activities has been prepared as "PEECB Mind Map" showing in Diagram on the attached page;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New Policy Measures, Financial Model, Action Plan (2.1, 2.3, 2.4)
Structure, Role & Responsibilities, O&M, Database
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Project Management (PM)
Framework & Communications
Database & Strategies
Business Linkages
Brochures & Leaflets
EE Guidebooks
E-Newsletters
Executive Seminars (Annually) with Hi-End Brandings Or series of Roadshow
Awareness Campaigns
Promotional Package
Inception Workshop
Component 3 EE Building Technology Application Demonstration
Full time staff to work closely with DEDE
Prepare TOR for remaining activities
Manage & Facilitate all activities
Organize Workshops/Seminars /Trainings
Prepare all related reports
Organizing Site Visit
Coordinate with all related parties
30 Technical Training Courses (Total 600 participants- 3 days/course)
10 Non-Technical Training Courses (Total 300 participants- 3 days/course)
Train the Trainer for DEDE's Staffs (in Thailand & Study Tour in Japan)
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Dissemination & Documentation of Demo.Projects
Booklets
Factsheets
CDs
Executive Seminars
6 Trainings of building personnels (150 persons)

Details of propose methodologies and approaches of each activity required by the TOR to directly implement and support the implementation of the 3 components has been elaborated breaking into ten tasks (Task 1-10) as followings,

Task 1: The coordination with DEDE & UNDP to clarify task details in the inception phase .

Key Methodology

BMC will study the full project document carefully to avoid missing some of strategic expected outcomes especially in the statement of benefits and sustainability. The internal meeting of project team will be addressed all significant issues from day one of the operation. The standard format and communication forms and channel will be developed to ensure that all relevant updated information will be noted by all related team members and related parties.

BMC will assign all key staffs to review all required task details step-by-step as well as the project monitoring & evaluation (M&E) criteria to outline the key parameters for setting up the inception workshop which aims to clarify the outstanding issues during the inception phase of the project.
A project inception workshop (IW) will be conducted with the full project team members, representatives from Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, representatives from pilot sites, co-financing partners, the UNDP-Thailand Office and the representation from the UNDP-GEF Regional Coordinating unit, as well as UNDP-GEF (HQs) as appropriate.

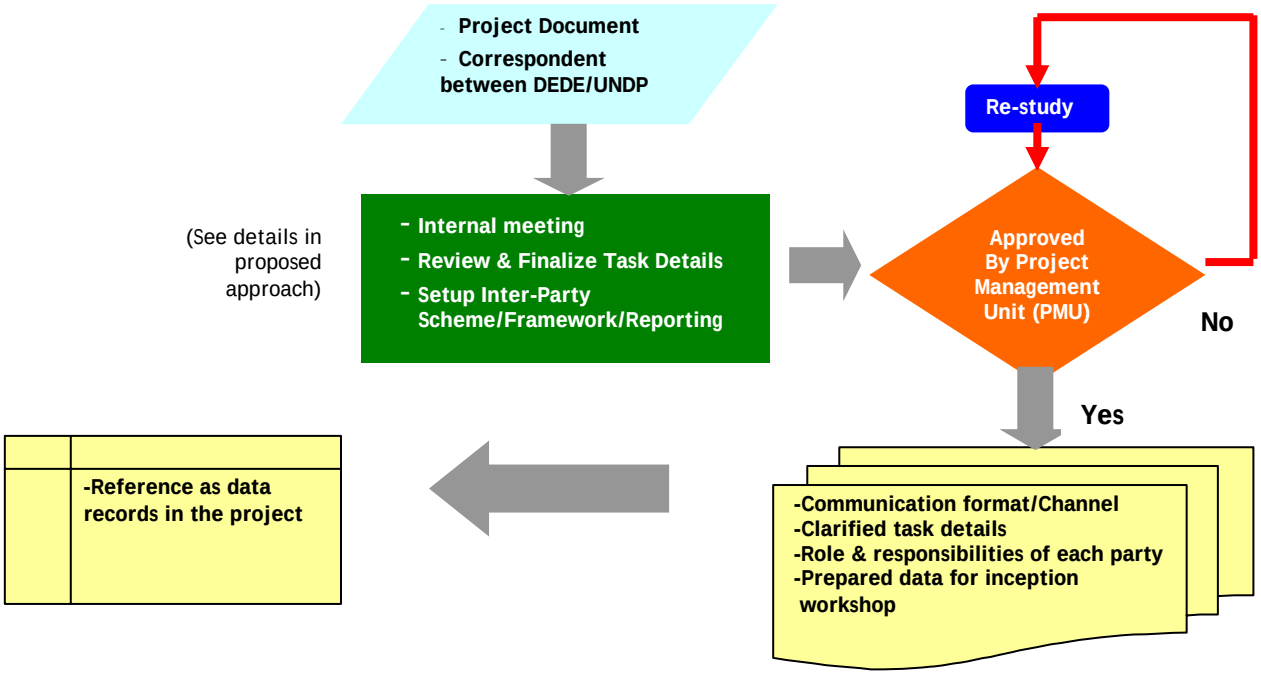
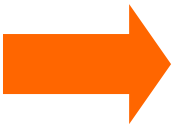


Figure 5 Work Process of Task 1

**Deliverables



Task 1 : Target/Deliverables :

As per Figure 5., the following output shall be achieved to perform for the next task :

- Structure & Format of communication
- List of clarified task details
- Role and responsibilities of project team members vs inter-party
- Agenda of the project inception workshop (IW) and List of Participants

Proposed Approach

1.1 Internal meeting

BMC will arrange the "internal meeting" within the 2nd week after signed contract. All task leaders in each discipline will be informed about 1 week earlier equipped with Full-size Project Document on Promoting Energy Efficiency in Commercial Building (PEECB) where everyone could realize on the objectives and the expected outcomes of the project.

The task leaders of project team member as refer in Chapter 6 will be assigned to present on their task as understanding to see whether there are some unclear issues or conflicts between each activity. The 2nd internal meeting will be arranged during week no.3 after they have finalized the in-depth analysis in major activities e.g. the establishment of the Commercial Building EE Information Center (CBEEC) as expected in Output 1.1

1.2 Review and finalize task details

During 2nd internal meeting, the discussion will be finalized and summarized as the clarification request (CL) for the correspondent to DEDE/UNDP and formally meeting afterwards (if required). The review and finalize task details will be presented in the systematic format e.g. checklist, matrix, table etc. including the key questions/answers as follows :

- What are the main objectives of the task?
- What is the boundary of the task?
- What areas are required to do the operational test?
- Where are the suitable activities in each organization?
- Where is the critical path of the project?
- When is the earliest and the latest timing for the task been implemented?
- Who is the main in-charge and decision maker for the task development?
- How to integrate the task information so that the monitoring and evaluation could be performed in the effective manner?
- Etc.

All of the approach mentioned above will be discussed and agreed among BMC and DEDE/UNDP before proceeding to the inception workshop.

1.3 Set-up inter-party scheme/framework/reporting

According to the finalized on task details clarifications, the draft of inter-party scheme/framework such as BMC/DEDE/UNDP will be set up.

The reporting structure and format will be prepared as part of the preparation works for the inception workshop as initiative process flow of information and results.

Please note that, task 1 will be performed to gather all possible project risk and finalize the recommended solutions from all relevant parties. This is to be completed after the inception workshop has been done properly which BMC describes in more details in the following task (Task 2).

……..……..…End of Task 1…….

Task 2 : Develop the master plan (4years) including resource plan and budgetary plan incorporate with Full-Size Project Document on Promoting Energy Efficiency in Commercial Building (PEECB)

Key Methodology

BMC will carefully study details of each project activities as stated in Full-Size Project Document on PEECB and prepare the first draft master plan (4 years) covering at least the following details;

1. Details and timelines of main and sub items of each activities
2. Potential Stakeholders involved in each main and sub items
3. Budgetary planning for all activities breaking into detail of each main and sub items
4. Resource planning for all activities breaking into detail of each main and sub items
5. Deliverables or outcomes of each main and sub items of all activities

This draft 4 years master plan will be presented in the inception workshop as part of the preparation work in order to gather opinion from all related parties.

The project inception workshop requires some information from task 1 e.g. clarified task details, PEECB stakeholders with role and responsibilities which mainly comprise of government agencies, building policy implementers, professional institutions/entities, private sector entities.

The project inception workshop will be conducted to gather opinion and discuss on how well of information flowing to each inter-party, the interaction and timing between policy makers and implementers shall be identified in order to adjust a draft master plan (4years).

BMC will revise and adjust the draft master plan (4 years) based on the finalized outcomes of the project inception workshop (IW). The final 4 years master plan will then be submitted to DEDE/UNDP for final approval.

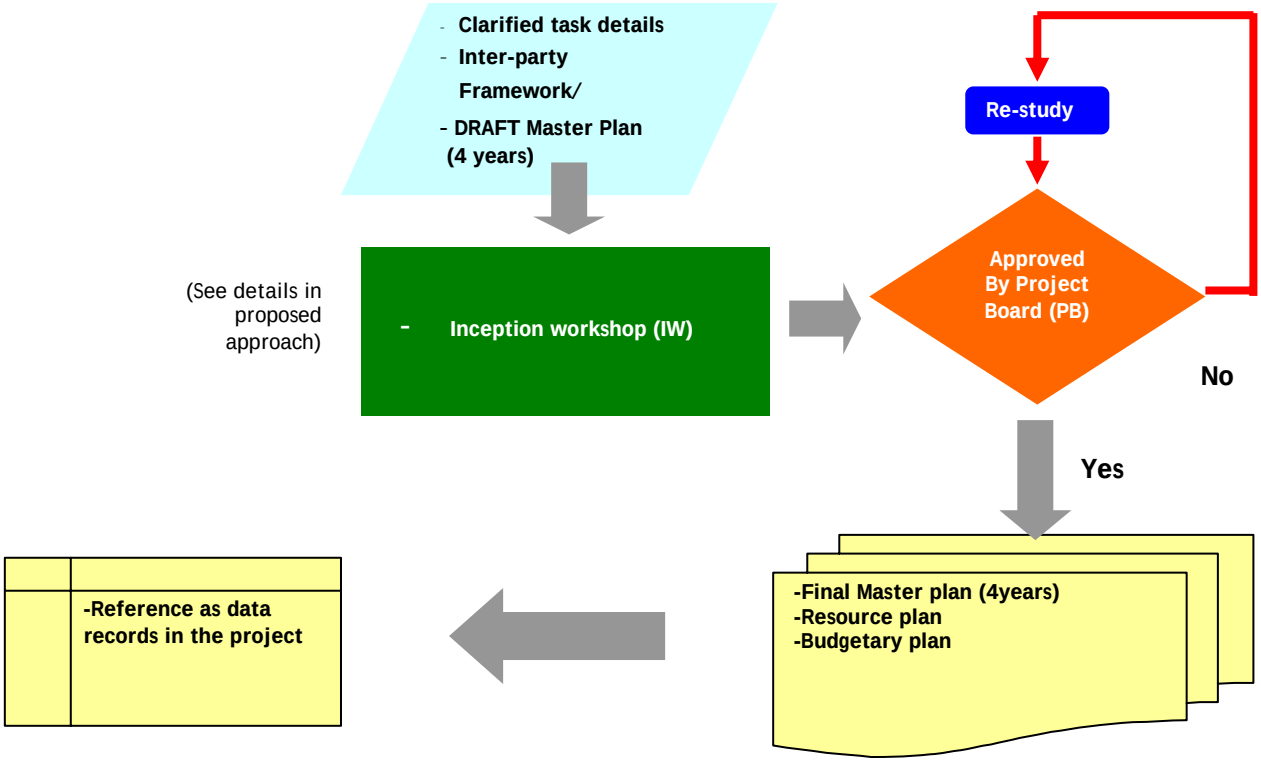


Figure 6 Work Process of Task 2

** Deliverables

Task 2 : Target/Deliverables :

As per Figure 6, the following output shall be achieved to perform for the next task :

- Final Master Plan (4years)
- Resource Plan
- Budgetary Plan

Proposed Approach

2.1 Develop DRAFT Master Plan (4 Years)

BMC will study details of all activities as stated in Full-Size Project Document on PEECB and develop the DRAFT 4 years Master Plan for the project. The DRAFT Master Plan will be breaking into details of 3 components as followings;

Components 1 : Awareness Enhancement on Building EE Technologies and Practices
Components 2 : EE Building Policy Framework
Components 3 : EE Building Technologies and Application Demonstrations

The DRAFT Master Plan of each component will cover at least following items;

1. Details and timelines of main and sub items of each activities
2. Potential Stakeholders involved in each main and sub items
3. Budgetary planning for all activities breaking into detail of each main and sub items
4. Resource planning for all activities breaking into detail of each main and sub items
5. Deliverables or outcomes of each main and sub items of all activities

2.2 Present the DRAFT Master Plan in Inception Workshop (IW)

BMC will arrange the "inception workshop" within 1 month after signed contract. The DRAFT Master Plan will be presented in the inception workshop to gather opinion from all stakeholders. All project stakeholders will be asked to fill-in the pre-evaluation forms/matrix which has been designed for this project. The filled in results will be first round discussed in order to minimize task difficulties and foresee the problems which might be occurred during the project implementation.

Not only mentioned managerial aspect during the workshop but also for the technical aspect as the workshop will concentrate on the BAU scenario and PEECB scenario. The growth rate of CO_2 emission by end of project in Y2016 is also the main topic to be discussed among the participants according to the 4 years implementation plan.

The annual targets for project outcomes as defined in the PEECB full document will be strictly highlighted in the inception workshop as there are some significant impacts directly to the master plan such as the new policy measures for Energy Efficiency in commercial building, the establishment of the Commercial Building EE Information Center (CBEEC) etc.

The following issues will also be discussed in the inception workshop and shall be corresponded to the target or success indicators and budget specified in the project document:

- Component 1 : Awareness Enhancement on Building EE Technologies and Practices

Topics or Activities	Information required from Inception Workshop (IW)	Discussion points
1. Building Stakeholders	• Criteria to identify stakeholders • Criteria to satisfy the quality of information	• Available information By building Categories • Development of questionnaires/Survey Strategy
2. Information exchange through CBEEC	• CBEEC role & activities • Information channel	• CBEEC setup • Database platform
3. Modified BESMs	• Opinion on list of existing software • Software launch/target	• Beta version & Test period • Monitoring/Evaluation period
4. Training Courses on EE technologies & practices	• List of technologies and good practices assessment concerned	• Curriculum design period • Tentative training course
5. Training Courses on financial assessment of projects 6. Business linkages	• Financial scheme/model • Business model/channel for EE investment projects	• Curriculum design period • Tentative training course • Monitoring/Evaluation period

- Component 2 : EE Building Policy Framework

Topics or Activities	Information required from Inception Workshop (IW)	Discussion Points
7. Effective on existing/new policy measures of EE for buildings	• Direction of existing/new policy measures from DEDE • Lesson-learned from previous projects	• Approved & implemented of policy measures • Milestone for project reviews
8. Up-to-date data to facilitate policy implementation	• Building energy use profiles	• Available energy performance database
9. Approved fiscal policies	• Lesson-learned from previous fiscal policies	• Applicable & approved fiscal policies
10. No.of activities in the action plan considered for inclusion in the National Energy Conservation Program	• Key performance indicators of National Energy Conservation Program	• Short/Medium/Long term action plan and activities tracking system

- Component 3 : EE Building Technologies and Application Demonstrations

Topics or Activities	Information required from Inception Workshop (IW)	Discussion Points
11. No. of building EE projects demonstrated	• Commercial building requirements in EE implementation as demonstration projects	• Time frame for demonstration projects
12. Building owners/managers acceptance of demonstration projects	• Dissemination strategy	• Dissemination of demonstrated projects
13. No.of demo building personnel gain fully learned skill	• Human resource development (HRD) of DEDE & UNDP to support	• Demo Training Course
14. No. of new building constructed based on the information regarding success demonstration	• New building codes improvement & enforcement	• Post-installation assessment of demonstration projects • Registration process for new building constructed regarding success demonstration
15. Fully learned skills personnel on EE building design , operation and maintenance	• Existing design / operation and maintenance practice in commercial building sector	• Training Course for building practitioners
	• Communication channel for	• Formulated technologies and

Topics or Activities	Information required from Inception Workshop (IW)	Discussion Points
16. EE technologies and techniques applied in commercial building sector in Thailand	commercial building sector in Thailand and professional association	practices into commercial building businesses

2.3 Prepare Final Master Plan (4years)

According to the outcomes of inception workshop, there shall be useful information to revise and adjust the draft master plan.

The Final Master Plan will include not only the project timeline but also will also cover the resource and budgetary plan as well. The Final Master Plan will then be submitted to DEDE/UNDP for official approval before further proceeding

……..…..……End of Task 2…….

Task 3 : **Develop yearly working plan correspond to the master plan and incorporate with Full-Size Project Document on Promoting Energy Efficiency in Commercial Building (PEECB) as specified in the following items.**

- Component 1 : Activity 1.1.1, 1.2.1, 1.2.2, 1.2.3, 1.3.1, 1.3.2, 1.3.3, 1.4.1, 1.4.2, 1.5 & 1.6
- Component 2 : Activity 2.2.1, 2.2.2, 2.2.3
- Component 3 : Activity 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.2.1

Key Methodology

BMC will develop the yearly working plan based on the finalized 4 years master plan and correspond to the outcomes of each activities specified in the full-size project document. However, a yearly plan will be reviewed, and where necessary revised along the project activities in Task 7&8.

The working plan will be simple and realistic. Furthermore, those directly involve should be able to understand it easily and clearly oversee the status and effectiveness. The software program such as Microsoft project or Microsoft Excel may be used for tracking purposes. The working plan will be prepared detailing in each component and finally combined to be a project yearly working plan including all 3 components[1] .The following table is an example of working plan on output delivery basis:

Example of working plan of each component:

Component 1 : Awareness Enhancement on Building EE Technologies and Practices

Output 1.1 : Establishment of the Commercial Building EE Information Center (CBEEC)

Measures of Effectiveness:

% of overall commercial building stakeholders that are satisfied with availability and quality of CBEEC information services

Objectives/Main Topics	Activities Planned to Meet Objectives	Staff/Partnership Member(s) Responsible	Completed by: (month & year)
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	Activity 1.1.1.1 Conduct of situation analysis • Xxx (Sub activities)[2] Activity 1.1.1.2 Design and development of the CBEEC • Xxx (Sub activities)[2]	xxx xxx	Month 1 Year 1 Month 2 Year 1

Note :

1.All 3 components will be integrated into a yearly working plan of the whole project as described in the proposed approach below.

2.Sub activities are as listed in the proposed approach below

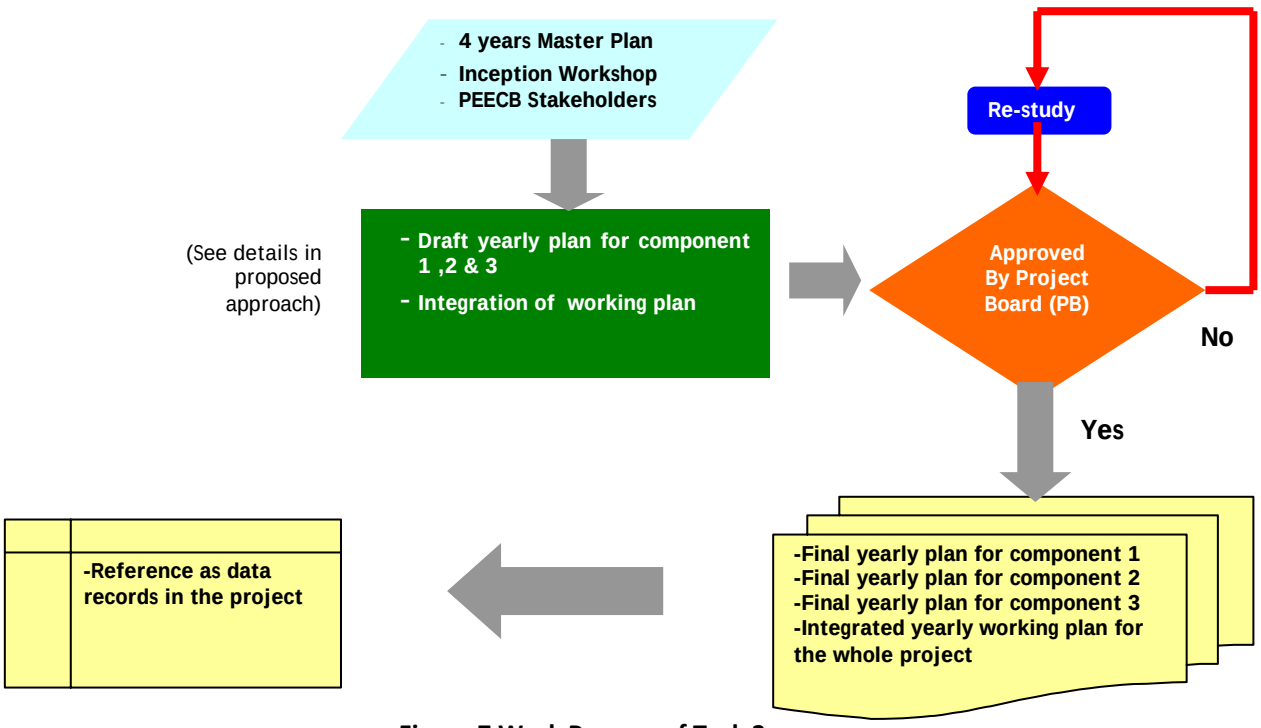


Figure 7 Work Process of Task 3

** Deliverables

Task 3 : Target/Deliverables :

As per Figure 7 the following output shall be achieved to perform for the next task :

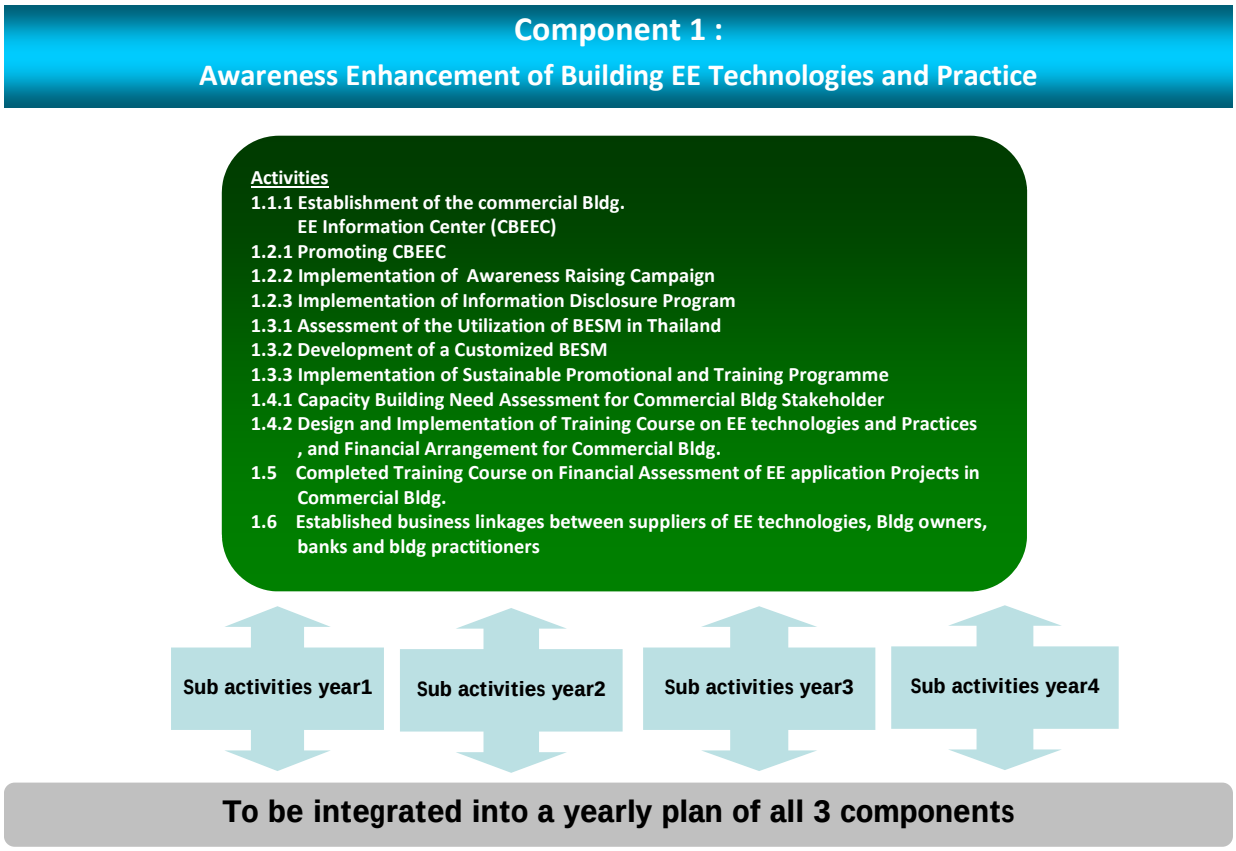
- Final yearly plan for component 1
- Final yearly plan for component 2
- Final yearly plan for component 3
- Integrated yearly working plan (all 3 components)

Proposed Approach

3.1 Yearly plan for **component 1**

BMC has developed a yearly plan of component 1 according to the overview strategy and its statement of each activity. Methodologies and approaches to prepare yearly plan for each activity of component 1 are described as following:

"Overview to develop a Yearly plan"



Activity 1.1.1 : Establishment of the Commercial Building EE Information Center (CBEEC)
This will involve the establishment of the Commercial Building EE Information Center (CBEEC) within DEDE to consolidate, supply, oversee and facilitate information dissemination and exchange among the stakeholders. It will also involve design and development of an internet-based database and communication system which will serve as information dissemination tools and also a virtual home for the center. The center will aim at offering active communication, rather than passive communications being used by various existing EE information centers in Thailand, to create and maintain information sharing among commercial building stakeholders. Innovative communication channels including social media platforms will be considered during design and establishment of the Center to enable management of information and network memberships.

To be able to draw interest from commercial building stakeholders, the Center will compile up-to-date and quality information on EE building designs and design practices, EE building technologies and technology applications in Thailand and in other countries with similar climatic conditions, as well as act as a portal with linkages to other building and technology database in the country (e.g.DEDE's designated building database). The profiles and results of the EE technology application demonstrations that will be carried out under the project will be integrated into this database. The center will serve as a mechanism to consolidate all existing building sector-related database that will be made accessible to various building practitioners.

Sub-activities

1.1.1 (a) Conduct of Situation Analysis

BMC will conduct the situation analysis using the past experience as involving in the energy efficiency activities in Thailand to analyze an outstanding issues regarding to the setting up of 2E-Building center, one stop service of DEDE or other institutional setup under government agencies such as EPPO, ONEP, MOF, DPW&TP and TISI.

Working Schedule of sub-activity 1.1.1 (a):

Tasks	2013																			
	May				June				July				August				September			
1.Review existing EE information in Thailand																				
2.Arrange stakeholder meeting																				
3.Finalize situation analysis																				

1.1.1 (b) Design and Development of the CBEEC

BMC will recommend the most appropriate approach to establish CBEEC whether to be a new center unit or internet-based virtual center. The considerations shall be included but not limited to the following issues:

- The roles and responsibilities of CBEEC
- All stakeholders that need to be involved in setting up and operation of CBEEC
- The organizational structure of the CBEEC
- Operation and Management of CBEEC
- Financial Structure of CBEEC

Working Schedule of sub-activity 1.1.1 (b):

Tasks	2013																			
	May				June				July				August				September			
1.Design structure, roles & responsibilities of CBEEC																				
2.Arrange stakeholder meeting																				
3.Finalize structure, roles and responsibilities of CBEEC																				
4.Design CBEEC Web-site																				
5.Compile EE information																				
6.Develop CBEEC Database																				

1.1.1 (c) Administration and Maintenance of the CBEEC

BMC will develop the methodologies and guidelines to manage and operate the CBEEC during and after the project period. During the project period, the up-to-date information shall be actively monitored by qualified staff or assigned DEDE's person and BMC experts in the following manners:

- Regularly reviewed by BMC staff on weekly basis
- Regularly reported by BMC staff & assigned DEDE's personnel on monthly basis

In the project period of 4 years, CBEEC operation center should be set up either at DEDE office or BMC office to be the contact point of the project. BMC will provide administrative staff to operate and maintain CBEEC during the project period.

Working Schedule of sub-activity 1.1.1 (c) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Develop methodologies & guidelines for CBEEC Operation & Maintenance																
2.Launch Public Seminar																
3.CBEEC in operation																
4.Monitoring & Evaluation																

1.1.1 (d) Collaboration on Database Partners

BMC will set up a meeting with identified key commercial building stakeholders, including industry and professional associations to carry out and facilitate the integration of information database and tools.

Working Schedule of sub-activity 1.1.1 (d) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Arrange stakeholder meeting																
2.Update CBEEC database																

Activity 1.2.1 : Promoting CBEEC as the information portal for the Commercial Building Sector in Thailand
Following the establishment of the CBEEC, this activity will focus on the design and implementation of promotional activities to enhance awareness of the commercial building stakeholders in Thailand on the roles and benefits of the CBEEC as the portal for commercial building EE in Thailand. It is envisaged that the CBEEC promotional activities will involved the organization of an introduction event for the CBEEC, registration of the CBEEC website with popular search engines, and advertisements with local print and electronic media. Monthly statistical data on website hits, frequently used features, types of documents downloaded, etc. in the CBEEC website will be reviewed to determine if necessary modifications and/or improvements will be required following 18 to 24 months of its operation. Focus group meetings with key stakeholders will be organized to seek in-depth comments before and after improvements.

Sub-activities

1.2.1 (a) Design effective promotional scheme

BMC will study and recommend an effective promotional scheme using information from CBEEC database in Activity 1.1.1. The promotional scheme will include but not limited to these list of design activities:

1. Design the official **website** for CBEEC as the portal of EE information center (web-based)
2. Design, prepare and organize the **annual seminar** on Energy Efficiency Technology for Commercial Building. This annual seminar might be able to co-organize with related Professional Association in EE Technology in Thailand such as Thai Green Building Institute (TGBI), Engineering Institute of Thailand (EIT) etc..
3. Design the **brochure and leaflet** to introduce CBEEC roles, responsibilities and activities.
4. Design the **newsletter** regarding the EE technology to update latest technologies and news. This newsletter can be published or distributed through email twice or three times a year depend on the availability of the information.
5. Prepare the **focus group meeting** to seek in-dept knowledge on the implementation of Energy Efficiency Technologies in Commercial Building.
6. Design and prepare **"Energy Efficiency in Commercial Building Guidebook"**

Working Schedule for sub-activity 1.2.1 (a) :

Tasks	2013																			
	May				June				July				August				September			
1.Design CBEEC Website																				
2.Design public seminar content																				
3.Design brochure & leaflet																				
4.Design newsletter																				
5.Prepare focus group meeting																				
6.Design & prepare "Energy Efficiency Guidebook"																				

Activity 1.2.2 :Implementation of Awareness Raising Campaigns

This activity aims to formulate and implement awareness campaigns to develop strong consciousness of decision makers and key stakeholders on the benefits and advantages of EE technologies and applications for commercial buildings, as well as on the availability of tools and data sets developed by the PEECB project. It will involve the conduct of surveys and assessment to understand profiles and characteristics of target audiences, and appropriate means to convey messages, as well as design and implementation of various promotional and information dissemination activities that will enhance adoption of EE in design, construction and operation of commercial buildings in Thailand.

Sub-activities

1.2.2 (a) Review of Profiles and Level of Awareness of Target Audience

BMC will identify level of awareness of target audience referenced by EE projects completion in the past. The pre-survey **questionnaires** will be developed to employ all feedbacks from target audience before setting up the promotional tools and material which would be tailored made to the specific targets. The questionnaires will be distributed to target group through variety of channels as followings;

1. **Personal interview appointment** : Target Management Team of the selected buildings and developers
2. **Direct email** : Management and Person Responsible for Energy

3. **Seminar and focus group meeting** : Decision maker and all key stakeholders invited to the seminar of the specific meeting.

Working Schedule for sub-activity 1.2.2 (a) :

Tasks	2013																			
	August				September				October				November				December			
1.Finalize target audiences																				
2.Design pre-survey questionnaires																				
3.Survey by personnel interview																				
4. Survey by direct e mail																				
5.Survey by focus group meeting																				

1.2.2 (b) Compilation and production of Marketing and Promotional Tools and Materials

According to the surveys result, BMC will compile all relevant information into the CBEEC as center of information exchanges. The marketing and promotional tools and materials to support all promotional schemes specified in activities 1.2.1 will be prepared and produced as followings;

1. **Brochure and Leaflet**
2. **Newsletter** : two or three times per year, distributed by Email
3. Apart from the normal marketing tools as describe above, BMC will gather relevant information related to the Energy Efficiency Technology in Building and prepare a guidelines or manual on **"Energy Efficiency in commercial Building Guidebook"**. This guidelines or manual will be properly published and use as a specific promotional material to raise the awareness of Target Group.

Working Schedule for sub-activity 1.2.2 (b) :

Tasks	2013																			
	August				September				October				November				December			
1.Production of Brochure & Leaflet																				
2.Production of Newsletter																				
3.Production of "Energy Efficiency in Commercial Building Guidebook"																				

1.2.2 (c) Design and Implementation of Awareness Campaigns

BMC will design and conduct awareness campaigns covering at least the four (4) target groups:

1) Building owners
2) Building practitioners
3) Financial institutes
4) EE technologies and application suppliers

The annual EE in Commercial Building seminars shall be conducted by inviting all four key stakeholders and other related groups to participate and share information related to EE technology in Commercial Building.

Focus group meetings will also be conducted in each target group to seek in-dept information and requirement and follow on with specific seminar for each target group as necessary.

Working Schedule for sub-activity 1.2.2 (c) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Arrange focus group meeting																
2.Launch Public Seminar																

Activity 1.2.3 :Implementation of Information Disclosure Program for Commercial Building Energy Consumption

This activity aims at provoking EE consciousness of building owners and managers of large and very large commercial buildings in Thailand through publishing of comparative energy consumption and energy benchmarking (or Specific Energy Consumption-SEC) data of major types of commercial building in Thailand, i.e. Office Buildings, Hotels, Hospitals (public and private) and Retail Buildings. The information Disclosure (ID) program, which will be facilitated and managed by the PEECB project, would involve recruitment of large and very large commercial buildings to join the program, working with building managers to categorize, assess and validate energy consumption and energy benchmarking data for each type and sub-type of commercial buildings in Thailand, and preparation of energy consumption data and conversion into figures/formats that would be more stimulating for the commercial building sector e.g. Carbon Footprint, GHG emission, typical cost required to reduce energy consumption/GHG emissions, and publishing of voluntary disclosure data once a year. During the PEECB project, the ID program will be implemented in a voluntary manner to familiarize commercial building stakeholders with requirements and benefits of the program. A study will be carried out towards the end of the project to determine whether the ID program would be implemented in a mandatory manner after the completion of the PEECB project.

Sub activities

1.2.3 (a) Design Information Disclosure (ID) programme

BMC will design the Information Disclosure (ID) program using PEECB database and the latest information exchanges via seminar, workshop, meeting and training of DEDE's relevant projects to stimulate the EE consciousness of building owners and managers of large and very large commercial building in Thailand.

The publication materials will be designed and ultimately distributed through CBEEC website by BMC with the DEDE's approval. The publication materials will be in various formats in order to communicate with each level of key stakeholders as followings:

- E-Brochures
- E-newsletter
- E-mail
- Etc.

Working Schedule for sub-activity 1.2.3 (a) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Design information disclosure (ID) program structure & flow																
2. Implementation of ID program																
3.Update CBEEC database																

Activity 1.3.1 :Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand
This activity aims to determine the status of the utilization of Building Energy Simulation models (BESM) in the design, retrofitting and energy performance evaluation of commercial buildings in Thailand. This would involve the survey of popular simulation models being used in Thailand, as well as evaluation of pros and cons of features of each model. The survey would also include utilization patterns including, but not necessarily limited to, how existing BESMs are used and for what purpose, major user groups, most frequently used features, popular types of commercial being simulated. Detailed assessment of features and functions of the two (2) most popular simulation models to understand their applicability to the Thai context will be undertaken. In addition, capacity of users and their needs on extra features and functions will also be determined to understand to which extent these models are utilized and ought to be improved.

Sub activities

1.3.1 (a) Assessment of the two (2) most popular simulation models

BMC will conduct the survey through the following organizations and institutes as necessary to determine the most two energy efficient perspectives of Building Energy Simulation Models (BESM) :

- Government & Non-profit authorities related to Energy Efficiency such as DEDE, Thai Green Building Institute (TGBI) etc.
- Design consulting firms
- Academic Institutes (e.g. JGSEE, Chulalongkorn etc.)
- Professional Institutes which involved with the development of guidelines, code and standard such as Engineering Institute of Thailand (EIT), Air Conditioning Association of Thailand (ACAT) etc.

BMC will identify the Pros and Cons of features and the significant affect to the use of the assessed simulation models including:

- Input/Output Structure
- Required Parameters
- User Interface
- Database
- Reliability of the analysis results
- Etc.

Working Schedule for sub-activity 1.3.1 (a) :

Activities	2013																			
	May				June				July				August				September			
1. Initial data collection for most popular programs used.																				
2.Literature review																				
3.Questionnaire design																				
4.Questionnaire distribution																				
5.Data analysis 1																				
6.Focus group interview																				
7.Data analysis 2																				
8.Focus group meeting																				
9.Report																				

Activity 1.3.2 :Development of a Customized BESM for Commercial Buildings in Thailand
Based on findings and results from activity 1.3.1, this activity will develop a customized building simulation model which best suits the requirements of users in Thailand, and also develop additional features, functions and/or plug-in that will address users' needs and utilization patterns. This activity will also involve seeking necessary certifications for the model, preparation of promotional and training programs and an e-Learning module to enhance adoption and utilization of the model.

Sub activities

1.3.2 (a) Selection and Modification of BESM

Base on the assessment results of activity 1.3.1, BMC will define the required additional features and develop a customized **B**uilding **E**nergy **S**imulation **M**odel **(BESM)** which best suits the requirements of users in Thailand.

BMC will set up the develop team consists of Thai Experts and also our international experts from Japan, Nikken Seiki, to work on the development of BESM. Our international experts will provide input on the best practices that have been introduced or implemented in Japan and other countries. While Thai experts will incorporate all inputs from stakeholders and related persons, design and program the new version of BESM.

Before and after developing the new version of BESM, BMC will arrange the focus group meeting for further extend the user's need, the user manual will be incorporated for those changes. The training curriculum for building practitioners, design schools and institutes will also be developed.

Working Schedule for sub-activity 1.3.2 (a) :

Tasks	2013			2014												2015		
	Q4			Q1			Q2			Q3			Q4			Q1		
1.Modification of BESM I																		
2.Model test with different building types																		
3.Modification of BESM II																		
4.Model certification																		

1.3.2 (b) Preparation of Promotional and Training Program

BMC will develop the e-Learning module for the finalized BESM, the class room training will also be developed for the in-depth analysis with the designed curriculum specifically for different type of buildings e.g. office buildings, hotels, hospitals, retails and convention centers. The 3 days training course will be proposed as following agenda:

Day 1 : Basic knowledge of building performance
Day 2 : How to utilize the BESM in design / operation and maintenance practice
Day 3 : BESM workshop (customized into each level of users)

BMC will develop the BESM training programme and training package as following details

- Develop training curriculum for three days training
- Develop training materials for participant as followings
  - Training Workbook
  - Worksheet
  - CD-ROM contains presentation slides, workbook and BESM program
- Develop training materials for trainers as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides
  - Necessary materials to conduct the workshop or exercise during the training course
- Develop the testing or examination procedures and materials to assess the performance of the participant after attending the training course
- Develop evaluation sheet or questionnaire to evaluate the training result and satisfaction

Working Schedule for sub-activity 1.3.2 (b) :

Tasks	2013			2014												2015		
	Q4			Q1			Q2			Q3			Q4			Q1		
1.Prepare materials for classroom training																		
2.Prepare e-learning modules																		

Activity 1.3.3 :Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design

Based on the contents and structures of the promotional and training program designed and agreed upon in Activity 1.3.2, this activity will implement the promotional and training program on EE commercial building design for building practitioners and students in design school and institutes using the customized BESM as a primary tool. It is envisaged that the implementation of the promotional and training program will be undertaken in partnership with selected building design schools and training institutes nationwide. It is expected that the class-room trainings should be organized once a quarter during the second and third year of the PEECB project. Locations of class-room trainings will be determined during the course of project implementation; however it is expected to be in Bangkok and also in major provinces such as Chiangmai, Songkhla and Khon Kaen or Nakorn Ratchasima. The e-Learning course will be made available through the CBEEC website. Post training surveys will be integrated into both class-room training and e-Learning course. This activity will also involve discussion with building design schools attached to universities and institutes to enhance their curriculum using tools and training programs prepared by the PEECB project.

Sub activities

1.3.3 (a) Conduct the BESM training courses

BMC will conduct the training courses once a quarter during the second year and third year of the PEECB project. The 8 times of class-room training will be conducted in Bangkok and regional part of Thailand according to the amount of target commercial buildings covering all types of buildings as BESM objectives. The proposed training courses are as following:

Year 2 : (Class-room training)

- 2 times in Bangkok
- 2 times in Major province (North, East)

Year 3 : (Class-room training)

- 2 times in Bangkok
- 2 times in Major province (North-East, South)

Working Schedule for sub-activity 1.3.3 (a) :

Tasks	2015									2016								
	Q2			Q3			Q4			Q1			Q2			Q3		
1.Conduct quarterly classroom trainings in major provinces with post-training survey (Total 8 trainings @ 20 persons)	2												2					
2.Made e-learning available																		
3.Enhance building design school's curriculum using tools and training program prepared by PEECB project																		

Activity 1.4.1 :Capacity Building Need Assessment for Commercial Building Stakeholder

This will involve the conduct of surveys and assessment of the commercial building sector in Thailand to assess and evaluate the capacity building needs of stakeholders (i.e. building practitioners, building owners/managers, and EE technology and application suppliers) to support and enhance EE investment in commercial building sector. The assessment will enable the prioritization of the different types of training, seminars, workshops and/or conferences that will comprise training programs that will be developed to address the capacity building on EE technologies, techniques and practices in each group of stakeholders. Planning activities for the design of the training program will also be undertaken prior to its implementation, and this would include activities such as the identification of necessary resource speakers, preparation of training materials, as well as the logistics for each training activity to be carried out under the program.

It is envisaged that two(2) major types of training programs will be prepared : 1) specific technical training programs for the technical personnel in office buildings, hotels, hospitals, retail buildings and convention centers (Output1.4) and ; 2) non-technical and financial training programs for commercial building executives and financial institutes (Output1.5). These training programs will be undertaken in collaboration with local universities/vocational institutes, industry associations and professional networks (e.g. Thai Hotels Association, Private Hospital Association, and Hotels and Building Chief Engineering's Club), non-government organizations (e.g. Greenleaf Foundation) and private sector. Findings from the surveys and assessments will be used in developing frameworks and guidelines for design and implementation of these two (2) major types of training programs.

Sub activities

1.4.1 (a) Scoping Study on the Training Programme

BMC will study all related existing training programme on Energy Efficiency in commercial building by coordinating with Bureau of Human Resource Development-DEDE and other outstanding training organizations. The training courses will be prioritized and classified into building types, technical and non technical courses.

Working Schedule for sub-activity 1.4.1 (a) :

Tasks	2013																			
	May				June				July				August				September			
1.Review existing training programme of DEDE																				
2.Review existing training programme of outstanding training organizations																				
3. Finalize scoping study of training programme																				

1.4.1 (b) Identification of Training Activities for Stakeholders

BMC will identify the training activities required from the results in the scoping study. The meeting of key stakeholders will be conducted to gather and validate training needs before setting up the overall training programs.

Working Schedule for sub-activity 1.4.1 (b) :

Tasks	2013																			
	August				September				October				November				December			
1.Organize key stakeholder meeting																				
2.Identify training needs																				
3. Finalize training master plan on energy efficiency in commercial building																				

1.4.1 (c) Development of the Overall Training Programme

BMC will develop the overall training program (work plan) for 2 main target groups :

- Technical Group
  - Building Designer
  - Building Management and Facility Management
- Non-technical/financial Group

A work plan for technical group and non-technical group will be considered as following issues:

- The total numbers of targets to be achieved
- The key success indicators
- Etc.

BMC will contact and coordinate with all stakeholders related with the EE training courses in Thailand and will collaborate with local universities or professional association related to EE in Commercial Building such as Thai Green Building Institute (TGBI) in development of the overall training programme.

Working Schedule for sub-activity 1.4.1 (c) :

Tasks	2013																			
	August				September				October				November				December			
1.Organize key stakeholders meeting																				
2.Develop the overall training programme for technical training courses and non-technical training courses																				

Activity 1.4.2 :Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings

This involves the actual design and implementation of training activities that will be carried out under the training programs. The design will be consistent with the training courses defined in the work plan developed in Activity 1.2.2 (implementation of awareness campaigns) and 1.4.1 (capacity building needs assessment). Where necessary, changes in the work plan such as the profiles of training participants, scheduling and the selection of venues may be made to ensure that the trainings are more realistic and doable. Thus, the training design will involve the validation of the course outline for each training course, development of training modules and other educational materials, target clients per training course, management of training logistics, activity scheduling, and the development of a unified Monitoring and Evaluation (M&E system for the trainings. Training materials are consolidated into CBEEC database for conduct of future trainings.)

Sub activities

1.4.2 (a) Design of Technical Training Courses

BMC will design the technical training courses based on the resource, work plan and target identified in Activity 1.4.1. The following issues will be concerned:

- Objectives of the training course
- Structure of training course
- Content development
- Training duration (days) for each target level
- Training location and area
- Resource speakers and trainers
- Monitoring and Evaluation strategies during and after the training program
- Etc.

The design of Technical Training Courses will cover all aspects of Energy Efficiency Technologies in Commercial Building. The training courses will be designed separately for building designer and building management or facility management team. The following topics will be included in the Technical Training Courses. (at least but not limited to)

1. Introduction to Energy Efficiency Building
2. Building regulation and standard related to Energy Efficiency in Commercial Building
3. Energy Efficiency Technologies in Commercial Building
   a. Building Envelope

b. Building Energy System
   i. Air Conditioning and Ventilation System
   ii. Lighting System
   iii. Lift and Elevator
   iv. Sanitary System
   v. Waste Water Treatment System
   vi. Building Monitoring and Automation System
   vii. Water Recycle System
   viii. Hot Water System
   ix. Renewable Energy
   x. Etc…

4. Management of Building Energy System
   a. Commissioning of Building Energy System
   b. Operation and Maintenance of Building Energy System
   c. Measurement and Verification of Building Energy System
5. Cost and Benefit Analysis
6. Successful case studies on the implementation of Energy Efficiency in Commercial Building
7. Other topics (will be added as necessary)

Working Schedule for sub-activity 1.4.2 (a) :

Tasks	2013-2014																			
	December				January				February				March				April			
1.Develop draft structure & content of training material (for Technical training)																				
2.Organize the meeting with stakeholders																				
3.Finalize structure & content																				

1.4.2 (b) Design and Preparation of Training Materials

BMC will design and develop the technical training programme and training package as following details

- Design and Develop the Technical Training Curriculum on Energy Efficiency in Commercial Building
- Design and Develop the Train the Trainer Course relevant to the Technical Training Curriculum in order to prepare the trainer for the ongoing training activities after completion of PEECB project
- Develop training materials for participant as followings
  - Training Workbook
  - Worksheet
  - CD-ROM contains presentation slides, workbook and BESM program
- Develop training materials for trainers as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides
  - Necessary materials to conduct the workshop or exercise during the training course
- Develop the testing or examination procedures and materials to assess the performance of the participant after attending the training course
- Develop evaluation sheet or questionnaire to evaluate the training result and satisfaction

A technical training materials will be developed as hands-on materials for actual implementation such as checklist and guidelines for energy conservation measures, evaluation matrix etc.

Working Schedule for sub-activity 1.4.2 (b) :

Tasks	2013-2014																			
	December				January				February				March				April			
1.Develop & Prepare Training material for participants																				
2.Develop & Prepare Training material for trainers																				
3.Develop & Prepare examination sheets & evaluation sheets																				

1.4.2 (c) Conduct of Training Program

BMC will conduct the training program as per work plan prepared in Activity 1.4.1. The monitoring and evaluation process will be accommodated to improve the training courses, therefore BMC will arrange a regular specific meeting among all trainers and DEDE to discuss on the evaluation results and reviewing topics.

Working Schedule for sub-activity 1.4.2 (c) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Conduct training																
2.Internal meeting on results																

1.4.2 (d) Certification and Quality Assurance Mechanism

BMC will recommend the mechanism of certification and quality assurance. The certification process of the professional organization such as Thai Green Building Institute (TGBI), Engineering Institute of Thailand (EIT) and the others will be reviewed and adapted to certify the participants who have the competent after attend the training courses.

Working Schedule for sub-activity 1.4.2 (d) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Focus group meeting																
2.Develop criteria for certification																
3.Certification process																

1.4.2 (e) Training Program Monitoring and Evaluation

BMC will monitor and evaluate the training program using evaluation sheets during and after the training period. The questionnaires or on-site visit may be used to document whether the training program's objectives could be achieved.

Working Schedule for sub-activity 1.4.2 (e) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Evaluation during training																
2.Site visit after training																

1.4.2 (f) Sustainable Follow-up Capacity Development for Program Design

BMC will prepare the recommendation on how to conduct the follow-up capacity development for sustainable program design and implementation in order to further develop the program design (next 5 years) for the commercial buildings sector in Thailand.

Lessons identified from the evaluation of the training events under the PEECB project will serve as a background for identification of new strategies to ensure effective implementation of trainings and to expand training services to cater additional clients.

Working Schedule for sub-activity 1.4.2 (f) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Summary of site visit																
2.Develop program design for next 5 yrs.																

Activity 1.5 :Completed training courses on financial assessment of EE application projects in commercial Buildings

This output is expected to be realized from the design and implementation of capacity building activities that will help enhance the capacity of commercial building executives and financial institutes to assess the feasibility EE application projects for commercial buildings. The activities that will be carried out to deliver this output will be designed based on the findings from Activity 1.4.1 (capacity building need assessment for commercial building stakeholders).

Sub activities

1.5 (a) Design of Non-Technical Training Courses

BMC will design the non-technical training courses based on the resource, work plan and target identified in Activity 1.4.1. The following issues will be concerned:

- Objectives of the training course

- Structure of training course
- Content development
- Training duration (days) for each target level
- Training location and area
- Resource speakers and trainers
- Monitoring and Evaluation strategies during and after the training program
- Etc.

The Design of Non-Technical Training Courses will aim to provide necessary information and knowledge on Energy Efficiency in Commercial Building to Developers, Building Owners, Building Executives and Financial Institutes in order to make the proper decision to invest in Energy Efficiency in Commercial Building.

The training courses will cover at least but not limited to the following topics;

1. Introduction to Energy Efficiency Building
2. Building regulation and standard related to Energy Efficiency in Commercial Building
3. Guidelines to conduct the feasibility study for Energy Efficiency Project in Commercial Building
4. Project Cost and Benefic Analysis
5. Successful case study on the implementation of Energy Efficiency Technologies in Commercial Building
6. Other topics (will be added as necessary)

Working Schedule for sub-activity 1.5 (a) :

Tasks	2013-2014																			
	December				January				February				March				April			
1.Develop draft structure & content of training material (for Non-Technical training)																				
2.Organize working group meeting																				
3.Finalize structure & content																				

1.5 (b) Design and Preparation of Training Materials

BMC will design and develop the non-technical training programme and training package as following details

- Design and Develop the Non-Technical Training Curriculum on Energy Efficiency in Commercial Building
- Design and Develop the Train the Trainer Course relevant to the Non-Technical Training Curriculum in order to prepare the trainer for the ongoing training activities after completion of PEECB project
- Develop training materials for participant as followings
  - Training Workbook
  - Worksheet
  - CD-ROM contains presentation slides, workbook and related worksheets
- Develop training materials for trainers as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides

- Necessary materials to conduct the workshop or exercise during the training course

- Develop the testing or examination procedures and materials to assess the performance of the participant after attending the training course
- Develop evaluation sheet or questionnaire to evaluate the training result and satisfaction

A non-technical and financial training materials will also be developed as hands-on materials for actual implementation such as energy saving tips in common practice, operation habits to be avoided which cost energy losses etc.

Working Schedule for sub-activity 1.5 (b) :

Tasks	2013-2014																			
	December				January				February				March				April			
1.Develop & Prepare Training material for participants																				
2.Develop & Prepare Training material for trainers																				
3.Develop & Prepare examination sheets & evaluation sheets																				

1.5 (c) Conduct of Training Program

BMC will conduct the training program as per work plan prepared in Activity 1.4.1. The monitoring and evaluation process will be accommodated to improve the training courses, therefore BMC will arrange a regular specific meeting among all trainers and DEDE to discuss on the evaluation results and reviewing topics.

Working Schedule for sub-activity 1.5 (c) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Conduct training																
2.Internal meeting on results																

1.5 (d) Training Program Monitoring and Evaluation

BMC will monitor and evaluate the training program using evaluation sheets during and after the training period. The questionnaires or on-site visit may be used to document whether the training program's objective could be achieved.

Working Schedule for sub-activity 1.5 (d) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Evaluation during training																
2.Site visit after training																

1.5 (e) Sustainable Follow-up Capacity Development for Program Design

BMC will prepare the recommendation on how to conduct the follow-up capacity development for sustainable program design and implementation to further develop the program design (next 5years) for the commercial buildings sector in Thailand.

Lessons identified from the evaluation of the training events under the PEECB project will serve as a background for identification of new strategies to ensure effective implementation of trainings and to expand training services to cater to additional clients.

Working Schedule for sub-activity 1.5 (e) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Summary of site visit																
2.Develop program design for next 5 yrs.																

<u>Additional Activity</u> Design and Conduct the capacity building – train the trainer programme for DEDE' staffs

Apart from the Technical and Non-Technical Training Programme, BMC will design and develop the capacity building – train the trainer programme and training package for DEDE's staffs as following details

- Design and Develop the Train the Trainer Curriculum for DEDE's Staff – 15 persons
  - Class-room training (in Thailand) – 15 persons
  - Study Tour (in Japan or other country as appropriate) – 5 persons, select 5 top potential participants or as recommended by DEDE
- Develop training materials for DEDE's staffs as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides
  - Necessary materials to conduct the workshop or exercise during the training course

BMC will conduct the train the trainer course for DEDE's staffs (class-room training in Thailand and study tour in Japan or other country as appropriate). The class room training in Thailand aims to provide train the trainer techniques for DEDE's staffs to extend their knowledge and ability to deliver information and knowledge on the implementation of Energy Efficiency Technologies. The study tour in Japan aims to provide further knowledge and experiences of the actual implementation projects in other countries to DEDE's staff. The 5 top potential participants will be selected or as recommended by DEDE to participate in the study tour activity in Japan or other country as appropriate.

Working Schedule for capacity building for DEDE' staffs:

Tasks	2013																			
	August				September				October				November				December			
1.Develop training curriculum for DEDE's staff																				
2. Develop & prepare training material for classroom & site visit																				
3.Conduct training & Site visit																				

Activity 1.6 :Established business linkages between suppliers of EE technologies, building owners, banks and building practitioners

This output is expected to be realized from the utilization of the CBEEC and implementation of supplementary activities. This will include working with domestic professional and industry associations to establish business links among commercial building stakeholders to facilitate the EE investments in the commercial building sector, which will ultimately sustain the among the commercial building stakeholders after the PEECB project.

Sub activities

1.6 (a) Framework study on Energy Efficiency Technologies in Commercial Building business in Thailand

BMC will coordinate with related government agencies, domestic professional and industry associations such as Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy, Department of Business Development (DBD), Ministry of Commerce, Related Engineering and Architectural Professional Associations in Thailand to set up the database of the commercial buildings in Thailand and potential suppliers related to Energy Efficiency Technologies in Thailand.

The database setup will provide useful and important information to prepare framework in establishing of business linkage according to the type of technologies or type of building. The Framework will identify and address the following topics;

- Business linkage strategy
- Appropriate technologies to be promoted
- Related type of buildings of each selected technology
- Numbers of target group for each technology
- Appropriate linkage channel for each technology
- Appropriate business channel
- Baseline and target

Working Schedule for sub-activity 1.6 (a) :

Tasks	2013																			
	August				September				October				November				December			
1. Focus group meeting and situation analysis																				
2. Draft Framework on establishing of business linkage																				
3. Finalize Framework on establishing of business linkage																				

1.6 (b) Establish business linkages

Base on the database and framework set up, variety of linkage channels such as the business seminar and exhibition, call center through CBEEC, technologies fact-sheets, etc , will be recommended, prepared and developed. The meeting, seminar or event to facilitate the business linkage will also be organized as necessary.

Working Schedule for sub-activity 1.6 (b) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Organize business event as identified in the business framework (1.6-a)																
2. Organize focus group meeting																

3.2 Yearly plan for **component 2**

BMC has developed a yearly plan of component 2 according to the overview strategy and its statement of each activity. Methodologies and approaches to prepare yearly plan for each activity of component 2 are described as following:

Activity 2.2.1 :Compilation and Update of Energy Performance Database for building construction materials and electrical equipment for commercial buildings

This activity involves the compilation of available energy performance data of building materials, electrical equipment and perhaps steam boilers and commonly used in commercial buildings in Thailand. These include, but not necessarily limited to, building construction materials (envelope materials, glazing, insulation and painting), as well as electrical equipment and lighting products for commercial buildings in Thailand. The potential information resources will include, but not limited to, DEDE's previous and ongoing studies on Minimum Energy Performance Standards (MEPS) and High Energy Performance Standards (HEPS) for air-conditioners, bricks and Autoclaved Aerated Concrete (AAC) ; EGAT's No.5 Labeling database; and certified testing data available from manufacturers, suppliers and accredited testing laboratories. Findings from this activity will be made available through the CBEEC website for public access, and integrated into the customized building simulation model to be carried out by PEECB.

Sub activities

2.2.1 (a) Data review of BESM

BMC will gather data and information related to the building construction materials and electrical equipment that required by the BESM.

BMC will review database of building construction materials and electrical equipment available in the customized BESM (developed in Activity 1.3.2). All information shall be used to compile and update of energy performance database against Minimum Energy Performance Standards (MEPS), High Energy Performance Standards (HEPS) for air-conditioners and other related equipment etc.

Working Schedule for sub-activity 2.2.1 (a) :

Tasks	2013																			
	August				September				October				November				December			
1.Focus group meetings																				
2.Collect & Review existing Database																				

2.2.1 (b) Compile and update of Energy Performance Database

BMC will compile and update of energy performance database for building construction materials and electrical equipment for commercial buildings by coordinating with relevant agencies and organizations who have been working on the performance of Energy Efficiency material and equipment such as consultant working on specific project for DEDE, EGAT, TGBI, Thai Industrial Standard Institute (TISI), Thai Environment Institute (TSI) – Green Product, etc. All update data and information will be made available through CBEEC website for public access. The certified testing data available from manufacturers, suppliers and accredited laboratories shall also be pre-screened before formally announced.

Working Schedule for sub-activity 2.2.1 (b) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Focus group meetings																
2.Compile & Update of energy performance database (building construction material)																

Activity 2.2.2 :Review and update of DEDE's SEC studies and compilation of building stock data
DEDE has undertaken several Specific Energy Consumption (SEC) studies, and, to date, SEC studies for office buildings, hotels, hospitals and retail buildings have been completed. However, SEC values are generally presented as average values for each type of buildings without comparative performance indication of high EE or low EE buildings of the same type, e.g. average SEC values for the top 20% most energy efficient office buildings. Moreover SEC values for commercial buildings of the same type but different utilizations, such as

4-star hotels accommodation services versus catering services , are not available. Considering this, the activity will involve review past DEDE's SEC studies and similar energy using index studies undertaken in other countries, and conduct additional analysis and assessment as necessary. The review will also include how other countries utilize SEC as indicators and goals to improve EE in commercial buildings and develop recommendations to adapt them to the conditions and needs of Thailand. This activity will also compile commercial building stock data which is currently scattered among different agencies, and introduce a mechanism for periodical updates.

Sub activities

2.2.2 (a) Review the existing Specific Energy Consumption Index (SEC)

BMC will review all existing information relevant to SEC studied by DEDE on commercial building sector in Thailand and other countries which have data available.

Working Schedule for sub-activity 2.2.2 (a) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1. Data collection																
2. Data Analysis																
3.Finalize existing SEC on commercial sector in Thailand																

2.2.2 (b) Update the SEC for Commercial building sector in Thailand

BMC will update the SEC using the annual energy management reports during the past 3 years of designated buildings in Thailand. However, the information might need the statistical analysis to define and interpret of uncertainty among each of building categories such as hotels and service apartments etc. The comparative performance indication of high EE or low EE buildings of each building type will be analyzed. The mechanism for periodical updates of the necessary information through different channel such as annual energy management report, annual survey, etc. will also be assessed and analyzed.

Working Schedule for sub-activity 2.2.2 (b):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Data Collection																
2.Update SEC of Designated Commercial Buildings																

Activity 2.2.3 :Review and assessment of DEDE's M&V scheme and development of an improved M&V protocol for commercial building EE projects

This activity will involve the review and assessment of the Monitoring and Verification (M&V) protocol previously developed by DEDE, as well as common approaches being adopted by ESCOs and EE consulting firms in Thailand. The latest edition of International Performance for Monitoring and Verification Protocol (IPMVP), as well as relevant CDM methodologies (e.g. AMS.II.C and AMS.II.E) for commercial building EE will also be reviewed against the Thai practices. Following the review and assessment, recommendations for improvements of M&V protocol and proposed approach to enhance its utilization will be discussed with relevant stakeholders and DEDE, and the improved M&V protocol will then be prepared together with the promotional action plan, based on the conclusions from the stakeholder discussion. It is envisaged that the improved M&V protocol will be made available through the CBEEC website and will also be used as one of the key training material in all technical training courses. Beside, specific and focused promotional activities will be organized based on the recommendations given in the promotional action plan.

Sub activities

2.2.2 (a) Review existing M&V scheme for completed projects in Thailand

BMC will review existing M&V scheme for completed projects in Thailand e.g. DSM Bidding, ESCO funded by DEDE etc. The study will be formulated into the common practice for project financing and technical assessment in order to minimize the project risk.

The focus group meeting inviting all stakeholders in M&V Scheme such as developer, EE consultant, ESCO, DEDE, Financial Institute etc will be conducted to gather relevant information and sharing on experiences regarding to the implementation of M&V protocol for completed projects in Thailand.

Working Schedule for sub-activity 2.2.3 (a):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Review existing M&V scheme																
2. Finalize existing M&V scheme in Thailand																

2.2.3 (b) Develop recommended M&V scheme for commercial buildings EE projects in Thailand

BMC will develop recommended M&V protocol for commercial building in Thailand based on the reviewed results. The promotional scheme for propose new M&V protocol will also be prepared including the dissemination and training process, the certification of the qualify person, recommended budget to implement the promotional scheme etc.

The international M&V scheme that has been developed by international organizations such as Efficiency Valuation Organization (EVO)- IPMVP will be studied, reviewed and adapted to develop and propose of M&V scheme for Thailand.

The propose M&V Protocol for Thailand will cover several topics such as;

- Objectives
- Introduction to M&V Scheme
- M&V Processes and planning
- M&V Methods
- Examples or Case study
- Etc. (additional topics will be identified as necessary)

The specific means for example, uncertainty sampling and modeling, energy performance accounting etc. will be highlighted for business owner and managers or bankers to get better understanding on technical information given from facility manager or ESCO consulting company.
The promotional package for propose M&V scheme will be recommended. The promotional package will include the development of promotional materials such as leaflet, M&V Protocol guidebook or manual, fact sheet, etc. All promotional materials will be made available on CBEEC website. The focus group meeting or seminar will also be organized to disseminate the information on the propose M&V scheme to related stakeholders. The M&V protocol for Thailand will be included as one of the topics in all training courses developed in component 1 and 3.

Working Schedule for sub-activity 2.2.4 (b):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Focus group meeting																
2.Design promotional packages for M&V scheme																
3. Finalize recommended M&V scheme for commercial buildings																

3.3 Yearly plan for **component 3**

BMC has developed a yearly plan of component 3 according to the overview strategy and its statement of each activity. Methodologies and approaches to prepare yearly plan for each activity of component 3 are described as following:

Activity 3.2.1.1 :Documentation of results of the demonstration projects
This activity involves preparation of the project profiles (as case studies) of the EE demonstrations in commercial buildings that will be carried out under the PEECB project. Wherever possible, a comparison of similar EE implementations in commercial buildings in other countries will be sought and compared. Each project report will be presented as project profiles (or case studies) following and agreed presentation format. These project profiles will be entered into the CBEEC website and database.

Sub activities

3.2.1.1 (a) Collect data and information of demonstration projects

BMC will coordinate with relevant parties in Activity 3.1.1.1 (Conduct of comprehensive feasibility studies and determination of implementation requirements, costing and engineering studies/design of selected demonstration projects) to collect data and information of demonstration projects.

Working Schedule for sub-activity 3.2.1.1 (a):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1. Collect info. of demo cases																
2.Comparison of other Case Studies in other countries																

Note : Working schedule for sub-activity 3.2.1.1(a) will need to be incorporated with the actual implementation schedule of each demonstration site.

3.2.1.1 (b) Documentation of results of the demonstration projects

BMC will prepare the project profiles (as case studies) of the EE demonstrations in commercial building that will be carried out under the PEECB project. The documentation consists of;

- Rationale and objectives of demonstration project
- EE technologies applied
- Energy and Cost saving
- Environmental Impact (e.g. amount of GHG reductions)
- Operation and Maintenance Practice
- Comparison of similar EE implementations in commercial building in other countries (if applicable)
- Etc.

All demonstration projects will be finally presented in the CBEEC database and website.

Working Schedule for sub-activity 3.2.1.1 (b):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Prepare project profiles																
2.CBEEC Database & Website Updates																

Note : Working schedule for sub-activity 3.2.1.1(b) will need to be incorporated with the actual implementation schedule of each demonstration site.

3.2.1.1 (c) Preparation of the promotional package for the demonstration projects

BMC will design and produce the promotional package for the demonstration projects including at least following materials;

1. **The booklet of demonstration projects** ; Documentation of results of the demonstration projects will be presented in the format of booklet that can be disseminated in the annual seminar on EE Technologies as propose in component 1 and also be made available at the CBEEC database and website.
   Number of publishing: 500 sets

2. **Fact Sheets:** The demonstration results of each demonstration project will also be summarized as fact sheets (1 or 2 pages) to provide the key success in the implementation on EE Technologies.
Number of publishing : 1,000 sets

3. **Demonstration Projects CD-ROM:** All documentation of results, fact sheet and any materials produced under the demonstrating project will be prepared as soft files in CD-ROM.
Number of production: 500 sets

Other types of promotional materials will be developed as necessary.

Working Schedule for sub-activity 3.2.1.1 (c) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1. Content preparation																
1.Produce booklets																
2.Produce factsheets																
3.Produce CD-ROM																

Note : Working schedule for sub-activity 3.2.1.1(c) will need to be incorporated with the actual implementation schedule of each demonstration site.

Activity 3.2.1.2 :Documentation of information on the availability and quality of EE technologies and practices applied in Thailand and other countries
This activity involves compilation of availability and quality EE technologies and practices applied in commercial buildings Thailand and other countries. Relevant case studies on the application of these EE . technologies and practices will also be identified and documented. Following the compilation, a comprehensive documentation on EE technologies and practices, as well as a database will be developed and will be integrated into the CBEEC website and database.

Sub activities

3.2.1.2 (a) Review the existing demonstration projects and Case Studies in other countries

BMC will review the existing demonstration projects or case studies in other countries to justify the necessary content and formatting which creates human impact for both managerial and operational level. The available EE technologies and practices are also in consideration as well as project development criteria. The review of the existing demonstration projects or case studies will be focused more on the Japan cases where our partner, Nikken Seiki would be able to search and provide in-dept information for the selected projects. However, the projects or case studies from other parts of the world will also be reviewed as well.

Working Schedule for sub-activity 3.2.1.2 (a):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1. Identify type of case studies from other countries																
2.Review Case Studies in Japan																

3.2.1.2 (b) Documentation of information on the availability and quality of EE technologies and practices applied in Thailand and other countries

BMC will develop the CBEEC database in corporate with the results from demonstration projects under the PEECB project comparatively with other countries. The availability and quality of EE technologies and practice applied in Thailand will consequently be used as common practice for building owners or managers, building practitioners for future projects, etc. The information on the availability and quality of EE technologies will also be utilized as significant contents in the training course that will be developed under activities 3.2.2.1

All documentation developed under this activity will be made available on CBEEC website

Working Schedule for sub-activity 3.2.1.2 (b) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Documentation of EE technology & practice applied in Thailand & other countries																
2.CBEEC Database & Website Updates																

Activity 3.2.1.3 :Dissemination of Successful Case Studies on Demo Projects

This activity involves general dissemination of findings on demo projects to commercial building stakeholders and general public, as well as organization of a seminar/workshop to specifically discuss and promote the results of the demonstration projects. For the general dissemination to commercial building stakeholders and general public, the project aims to employ various communication mechanisms to be established under the PEECB project, such as CBEEC, awareness enhancement activities, capacity building activities, to convey and maintain frequency of the key messages to target audience. Moreover, PEECB project staff and demo project focal points will actively participate in any local and international events related to promoting of EE in commercial buildings, so that the message on the successful case studies will get across.

Following the conclusions of results of all the demo projects, a seminar/workshop will be organized. In the seminar/workshop, the demonstration hosts (i.e. building owners/managers) will present the demonstration project they have implemented highlighting the building EE technology involved, the scheme, the investment involved, results, energy savings achieved, actual project economics, estimated

GHG emission reductions, and their respective recommendations for the building EE technology demonstration under the PEECB project. The workshop will also assess the overall performance of the demonstration program and will come up with recommendations large scale replication of the successes in Thailand.

Sub activities

3.2.1.3 (a) Dissemination of successful case studies on Demo Projects

BMC will conduct the seminar or workshop of successful case studies on Demo projects in Activity 3.2.1.1 (Documentation of results of the demonstration projects). The invited participants will include;

- Commercial building stakeholders
- Professional Organization or Associations
- Government Agencies
- Equipment Manufactures or Suppliers
- Consulting Firms
- Etc.

The successful case study of each demonstration project will be presented by representative from the demonstration sites. The business matching will also be performed during the seminar or workshop to extend business links related in Activity 1.6 with supports by government agencies e.g. DEDE, Ministry of Energy etc.

Working Schedule for sub-activity 3.2.1.3 (a) :

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Identify the target group and preparation works																
2. Organize Public Seminar/Workshop																

Activity 3.2.2.1 :Design and Conduct of Training Courses for Demo Building Personnel

This activity will involve design of relevant training materials based on the identified needs of the personnel attached to each demonstration project. These training courses are expected to specifically focus on EE measures and technologies as well as operation and maintenance issues pertaining to each of the demonstration project site. The training courses will be periodically conducted during the PEECB project implementation period including annual come-back trainings and presentation on M&V results. It is envisaged that the training courses will be conducted as classroom training and hands-on on-the-job training. The M&V protocol for technical training developed under the Component 2 will be employed for the evaluation of the effectiveness of the training courses. This will help maintaining effectiveness of EE implementation in each demo project.

Sub activities

3.2.2.1 (a) Design the training course outline on demo projects (for demo building personnel)

BMC will design the training course outline on demo projects based on the target groups as followings;

- Owner/facility managers
- Operational/technical staffs
- General staffs

The Design of training courses for demo building personnel aims to provide necessary information and knowledge on Energy Efficiency Technologies that have been implemented to the building personnel.

The training courses will cover at least but not limited to the following topics;

1. Introduction to Energy Efficiency in the Building
2. Project Energy and Cost Saving Analysis
3. Operation and Maintenance of the EE Technologies
4. M&V Protocol (as proposed in component 2)
5. Workshop on O&M and M&V practices
6. Other topics (will be added as necessary)

BMC will design and develop the training programme and training package as following details

- Design and Develop the Training Curriculum for demo building personnel
- Develop training materials for building personnel as followings
  - Training Workbook
  - Worksheet
  - CD-ROM contains presentation slides and workbook
- Develop training materials for trainers as followings
  - Trainer manual including Training Programme, Session Plan, Exercise etc.
  - Presentation Slides
  - Necessary materials to conduct the workshop or exercise during the training course
- Develop the testing or examination procedures and materials to assess the performance of the participant after attending the training course
- Develop evaluation sheet or questionnaire to evaluate the training result and satisfaction

Working Schedule for sub-activity 3.2.2.1 (a) :

Tasks	2015																			
	January				February				March				April				May			
1.Develop draft structure & content of training material (for Demo bldg personnel & DEDE's capacity bldg)																				
2.Organize working group meetings																				
3.Finalize structure & content																				
4.Develop & Prepare Training material for participants																				
5.Develop & Prepare Training material for trainers																				
6.Develop & Prepare examination sheets & evaluation sheets																				

3.2.2.1 (b) Conduct the training courses on demo projects (for demo building personnel)

BMC will conduct the training course for demo building personnel. The training course will be conducted at each demo building in order to do the hands-on practice on the actual equipment. BMC will provide the qualify trainer to conduct each training course. Classroom training to learn about the theoretical part of the EE Technologies, M&V Protocol and case studies of other completed projects in Thailand and other counties will also be delivered.

The following topics will also be included in the training course:

- How to set the baseline?
- How to set up M&V Plan?
- How to verify the savings and conditions related to the baseline?
- How to maintain system/equipment efficiency?
- How to report the on-going operation as useful information on regular basis?
- Etc.

The success indicator e.g. % of overall no. of demo building personnel that are gainfully employing learned skilled on EE building design, operation and maintenance will be identified.

Working Schedule for sub-activity 3.2.2.1 (b):

Tasks	2013			2014				2015				2016				2017
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
1.Conduct training																

After preparation of the yearly plan of each component, the overall project yearly plan has been provided. The overall project yearly plan will integrate all activities and sub-activities of all 3 components together and will be inline with the 4 years master plan. The monitoring and evaluation process will be carefully planned and conducted regularly every month. This tracking process will ensure that the progress and quality of the project will be achieved according to the project targets, objectives and milestones.

……..……..……End of Task 3…….……..…….

Task 4 : **Develop Terms of Reference (TOR) for DEDE to engage a consultant on the remaining activities as specified in Full-size Project Document on Promoting Energy Efficiency in Commercial Building (PEECB) in the following items.**

- Component 2 : Activity 2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2 and 2.4
- Component 3 : Activity 3.1.1.1, 3.1.1.2 and 3.3.1.1

Key Methodology

BMC will develop the Term of References (TOR) for DEDE to engage a consultant on the remaining activities of component 2 and 3. The TOR will be developed within the first month of the project to allow appropriate timeframe for the bidding process. The TOR will include EE building policy framework (Component 2) and EE Building Technologies and Applications Demonstrations (Component 3) on the following activities:

- Component 2 : Activity 2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2 and 2.4
- Component 3 : Activity 3.1.1.1, 3.1.1.2 and 3.3.1.1

The TOR shall be clear and fully support to enhance the main components and activities responsible by BMC.

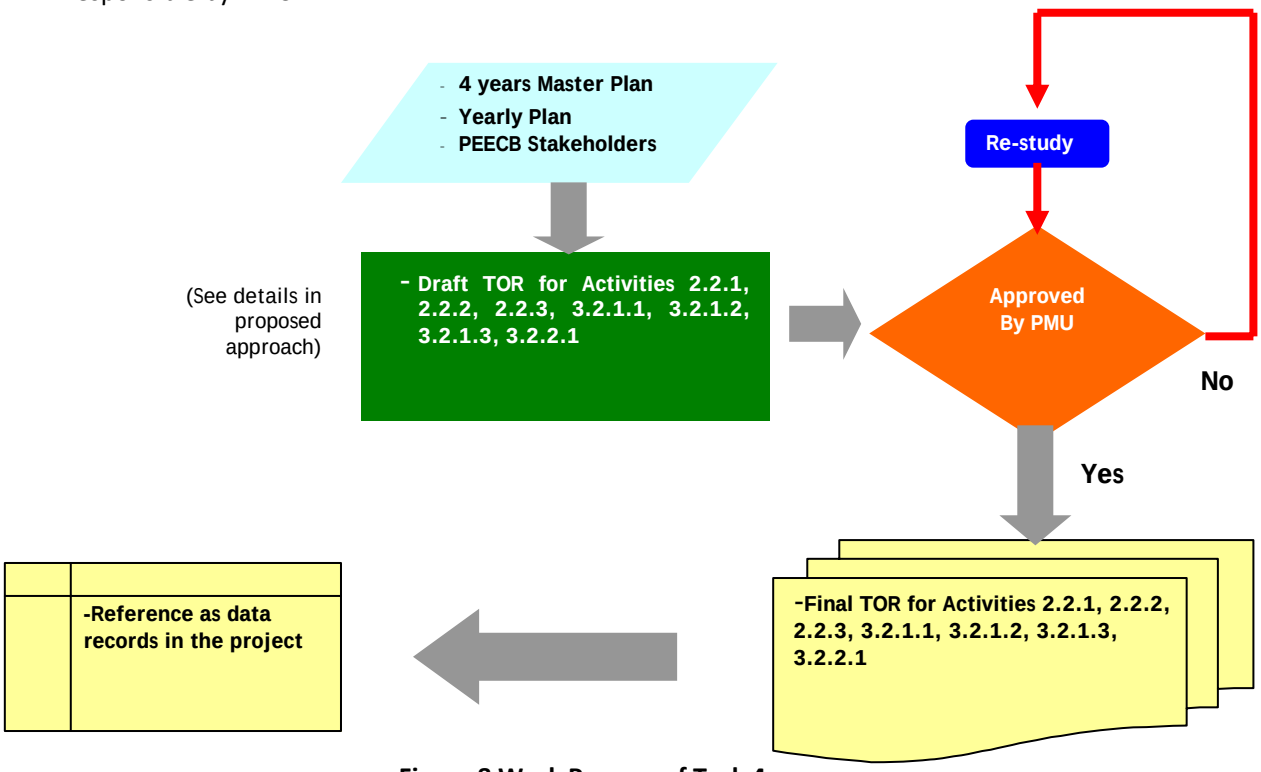


Figure 8 Work Process of Task 4

** Deliverables

Task 4 : Target/Deliverables :

As per Figure 8, the following output shall be achieved to perform for the next task :

- **Final TOR for Activities 2.2.1, 2.2.2, 2.2.3, 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.2.1**

Proposed Approach

4.1 Develop TOR for Activities 2.1.1, 2.1.2, 2.1.3, 2.3.1, 2.3.2, 2.4, 3.1.1.1, 3.1.1.2 and 3.3.1.1

BMC will develop TOR for the remaining activities of the PEECB project according to DEDE general format. The propose structure of TOR will include following topics;

1. Project Rationale
2. Project Objectives
3. Project mission
4. Scope of Works
5. Project timeframe
6. Deliverables
7. Qualification of consultant
8. Qualification of key personnel
9. Term of Payment
10. Proposal submission
11. Proposal evaluation criteria
12. Intellectual property
13. General condition
14. Contractual condition
15. Other topics as required by government bidding process

The draft TOR as provided in ANNEX IV has already been prepared and submitted to DEDE for consideration and further proceeding.

……End of Task 4…….

Task 5 : Arrange the meeting for the demonstration buildings to clarify the project details and preparation for the implementation

Key Methodology

BMC will arrange the meeting between demonstration buildings who have committed as demonstration sites in PEECB project. The internal meeting between PEECB Project team will be organized in order to finalize the project details covering the contribution of co-financing in design, engineering, implementation, maintenance and monitoring of demonstration project activities. The agreed project details, role and responsibility of each stakeholder, implementation process and other related activities will be presented in the meeting.

The follow-up procedures and data summary such as : Minute of Meetings (MOM) will be prepared and distributed to all participants to ensure the clear understanding of the details discussed and agreed in the meeting.

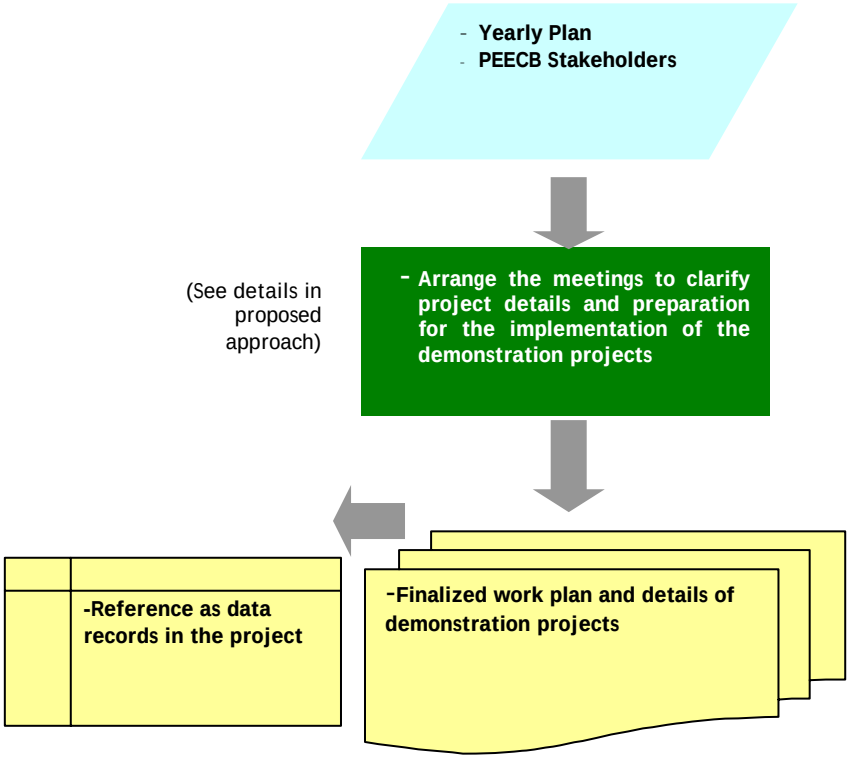


Figure 9 Work Process of Task 5

** Deliverables

Task 5 : Target/Deliverables :

As per Figure 9, the following output shall be achieved to perform for the next task :

- **Finalized work plan and details of demonstration projects**

Proposed Approach

5.1 Arrange the internal meetings between PEECB project team

BMC will co-work with awarded consultant which undertakes the activities 3.1.1.1 : Installed and operational demonstration projects in selected building. The overall work plan for this Task will be prepared to elaborate more on details of client's perception and cost-effective program aiming to achieve on the following success indicators:

- EE technologies Market Penetration as specified for the CO_2 Emission Reduction based on PEECB Scenario.
- Number of new buildings constructed that are partly or entirely based on the information regarding success of the demonstrations by end of project.

The finalized work plan and details of this task shall be distributed to all related parties.

The topics to be discussed in the internal meeting will be as followings;

1. Role and responsibility of each stakeholder
2. Demonstration Project timeframe
3. Implementation process
4. Monitoring and Verification Protocol
5. Information dissemination process
6. Others topics (as necessary)

All discussion topics will be finalized among PEECB Project team before presenting in the meeting with demonstration buildings which will be arranged by BMC.

……End of Task 5…….

Task 6: Organize the inception workshop where attendee comprises of representatives from DEDE, UNDP and other relevant organizations to present the project plan and review logical framework to ensure that the key performance indicators, base year information and target has been set properly.

Key Methodology

BMC will prepare and organize the inception workshop within two months after project starting date. All stakeholders including the representatives from DEDE, UNDP and other relevant organizations will be invited to participate in this inception workshop.

The purpose of the workshop is to provide an opportunity to inform all stakeholders on the overall project planning (4 years master plan), yearly plan of each component, methodologies and approaches to conduct each activity, UNDP project related budgetary planning, budget reviews, resource planning and mandatory budget re-phasing.

The DRAFT Master Plan (4 years) and Yearly Plan of 3 components will be presented in the inception workshop to gather opinion from all stakeholders. The inception workshop will also highlight the project's decision-making structures, including reporting and communication protocol, and conflict resolution mechanisms so that BMC will take this opportunity to set up and finalize project plan and logical framework to ensure that the key performance indicators, base year information and target has been set properly according to the plan.

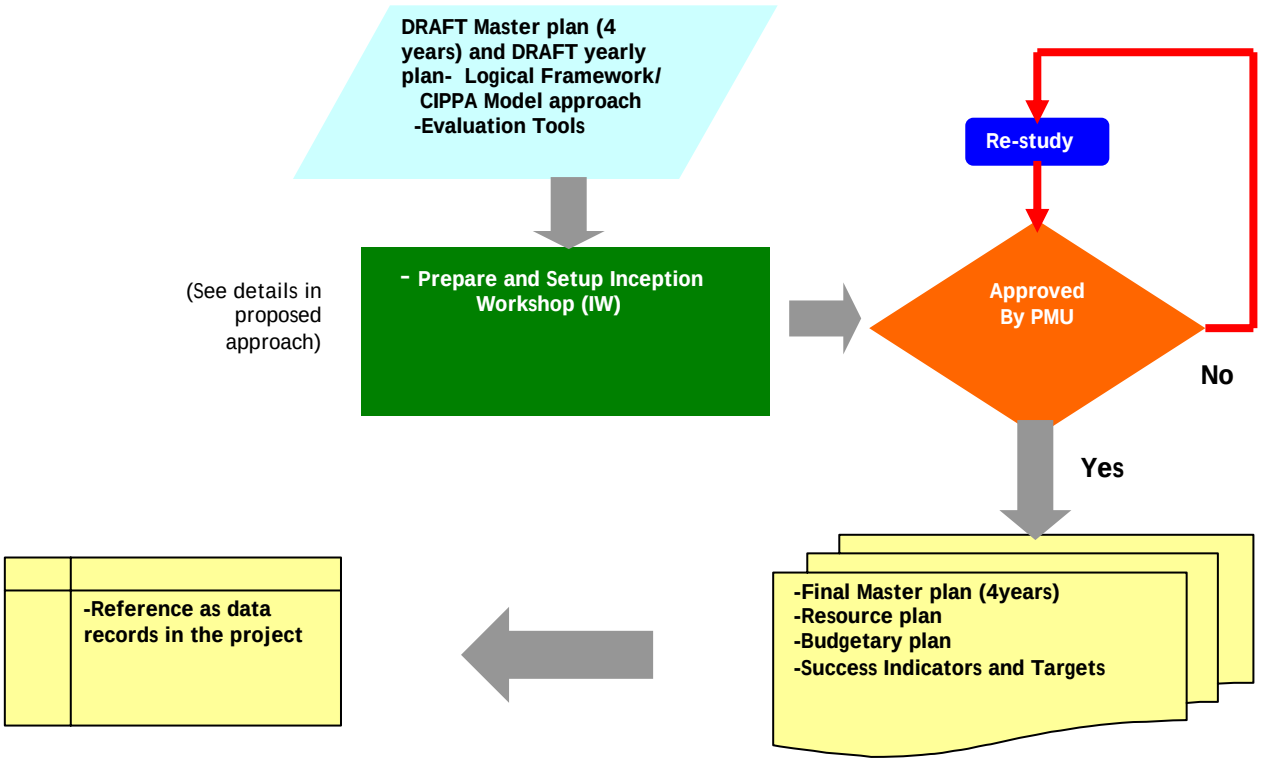


Figure 10 Work Process of Task 6

** Deliverables

Task 2 & 6 : Target/Deliverables :

As per Figure 6&10, the following output shall be achieved to perform for the next task :

- **Final Master Plan (4years)**
- **Resource Plan**
- **Budgetary Plan**
- **Success Indicators and Targets**

Proposed Approach

6.1 Prepare & Set up Inception workshop

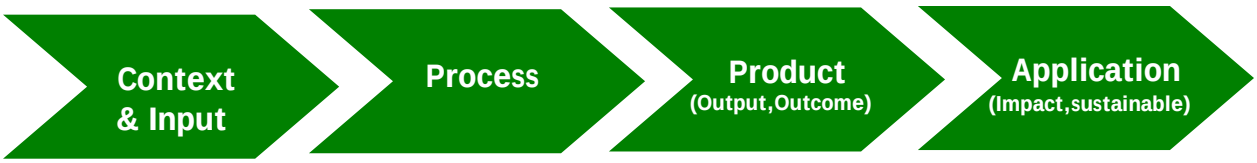
BMC will prepare and organize the inception workshop within two months after project starting date. All stakeholders including the representatives from DEDE, UNDP and other relevant organizations will be invited to participate in this inception workshop. The workshop will be conducted using set of supporting tools such as matrix, spreadsheets etc. to carry out all project aspects during the workshop. The project planning shall be identified and reviewed using **CIPPA Model approach** which could also be on-going track in the following issues :

- Context
- Input
- Process
- Product
  - Output
  - Outcome
- Application
  - Impact

- Sustainable

The review of previous evaluation results on Thailand's Energy Conservation Plan to date will be taken into consideration of what/where/when/how PEECB project will coordinate and support the overall National Policy in short, medium and long term.

The DRAFT Master Plan (4 years), DRAFT Yearly plan for 3 project components and DRAFT Logical Framework will be presented to all stakeholders. After the inception meeting, the draft plan will be revised by incorporating recommendation gather from the meeting to finalize the Master Plan, Yearly Plan and Logical Framework.



……End of Task 6……

Task 7: Manage and facilitate all project activities according to the approved plan in Task 2 under the supervision of DEDE. The regular meeting with DEDE's committee shall be set up to ensure the success of the project.

Key Methodology

BMC will manage and facilitate all project activities according to the approved master plan (4 years) and yearly plan. Allocation of full time staff to work closely with DEDE, arrangement of regular meeting with DEDE and related parties, preparation of weekly, monthly and progress report distributed to all related stakeholders will be organized to ensure the progress and quality of the project will be achieved according to the project objectives, target and milestones.

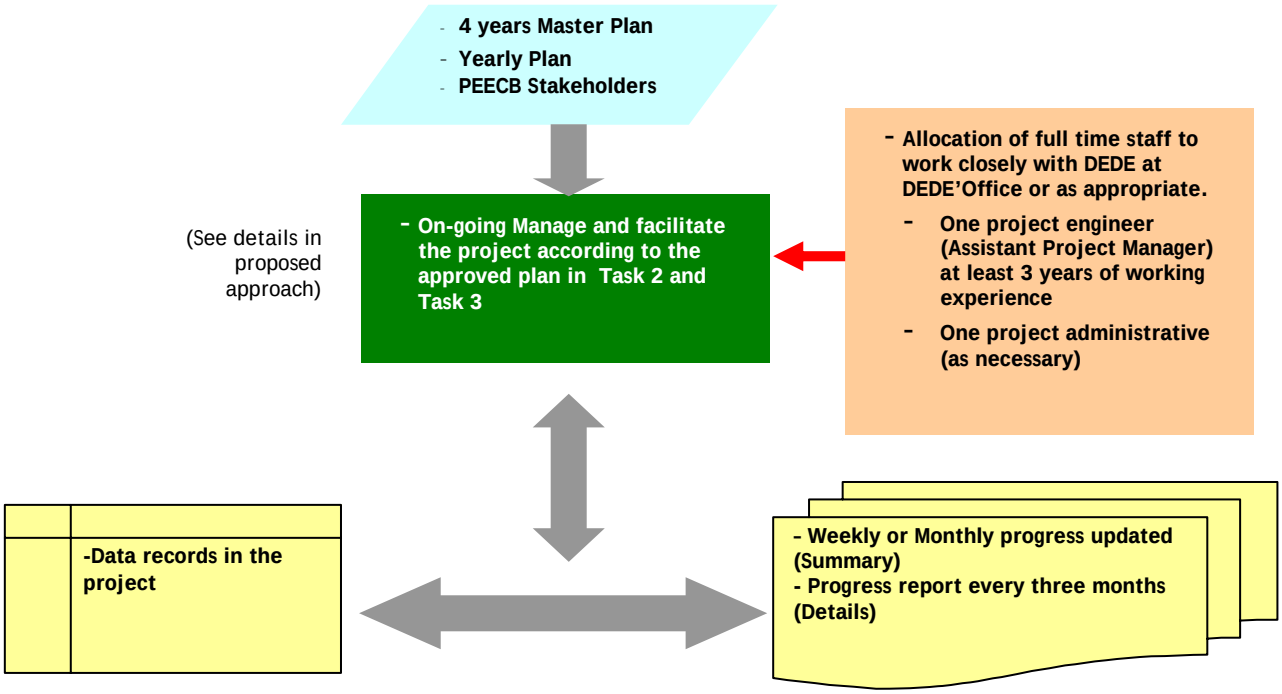


Figure 11 Work Process of Task 7

** Deliverables

Task 7 : Target/Deliverables :

As per Figure 10, the following output shall be achieved :

- Weekly or monthly progress updated (summary)
- Progress report (details report) every three months

Proposed Approach

1.1 Manage and facilitate the project according to approved plan in Task 2 and Task 3

Apart from the key staff to work in this project as required in the TOR and as indicated in this proposal, BMC will allocate additional full time project engineer as assistant project manager (at least 3 years of working experience in managing the energy efficiency project) to work closely with DEDE staff at DEDE office or as appropriate. One administrative staff will also be allocated to work closely at DEDE office if necessary. All office equipment including personnel computers, printer and other necessary office equipment to support our proposed additional staff will be prepared and provided by BMC.

Regular meeting either weekly or monthly meeting with DEDE team and committee will be organized to ensure the progress and quality of the project. Summary report on the project status, progress, obstacles and recommendations will be prepared on weekly and monthly basis as appropriate. The progress report on the details status and project operation will also be prepared and distributed to all related stakeholders every three months.

……End of Task 7…….

Task 8 : Implement all activities as stated in TOR item 4.3. A yearly plan could be revised as necessary but it shall be approved by DEDE's committee prior to proceed.

Key Methodology

BMC will manage, facilitate and implement all activities according to TOR item 4.3 (Task 3), approved master plan and yearly plan of component 1-3.

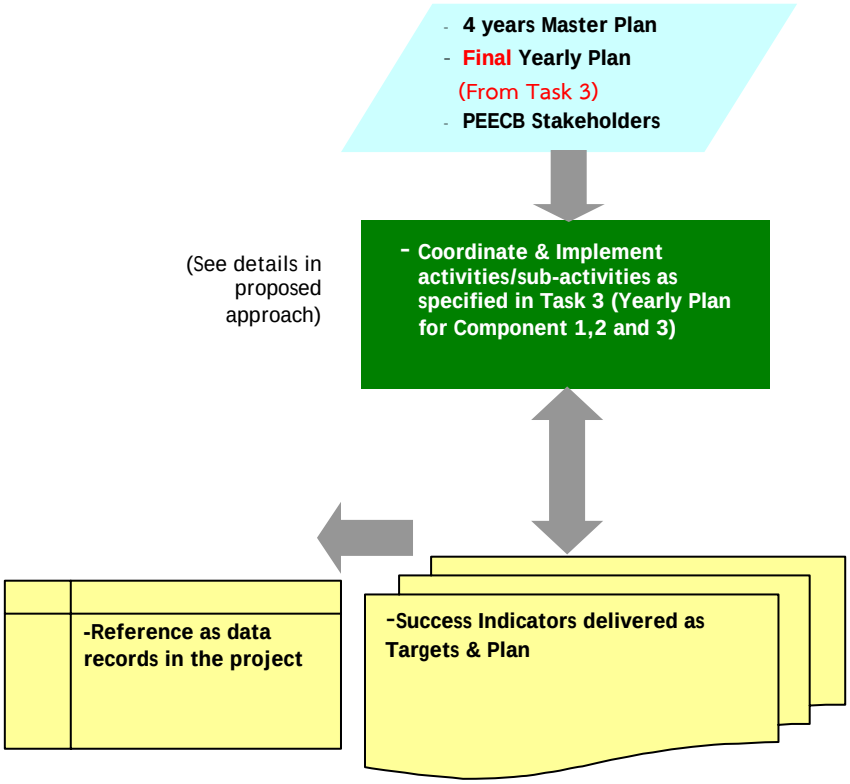


Figure 12 Work Process of Task 8

** Deliverables

Task 8 : Target/Deliverables :

As per Figure 12, the following output shall be achieved to perform for the next task :

- **Success Indicators delivered as Targets & Plan**

Proposed Approach

8.1 Implement all activities as specified in TOR 4.3 - Task 3 (Yearly Plan)

BMC will manage, facilitate and implement all activities according to the approved master plan (4 years plan) and yearly plan. BMC will work closely with DEDE, UNDP and related parties including the **consultant** who will work on the other remaining tasks of component 2 and 3 to ensure the success of the project.

BMC will organize the regular specific meeting with all related parties to coordinate and facilitate all activities to ensure the progress and quality of the project.

……End of Task 8……

Task 9 : Submit the progress reports and other required reports within the project timeframe.

Key Methodology and approach

BMC will prepare the structure of the progress report and submit to DEDE and UNDP for approval within one month after project starting date. Other structure of the required report such as Inception Report, Quarterly Progress Reports, Periodic Thematic Reports, Technical Reports, Annual Project Reports, Project Terminal Report etc. will also be prepared and submitted for approval within the first month of the project.

BMC will regularly collect primary and secondary information as required by each type of reports from all related parties in order to prepare all reports within the project timeframe.

Example of the structure of monthly report will be as following:

- Executive Summary
- Overall progress
- Progress of each activity
- Outstanding issues and Recommendations
- Targets and Deliverables for next period
- Etc.

Weekly and monthly report structure will be prepared as simplify or summary report, however, details of all activities will be reported in the progress report every three months.

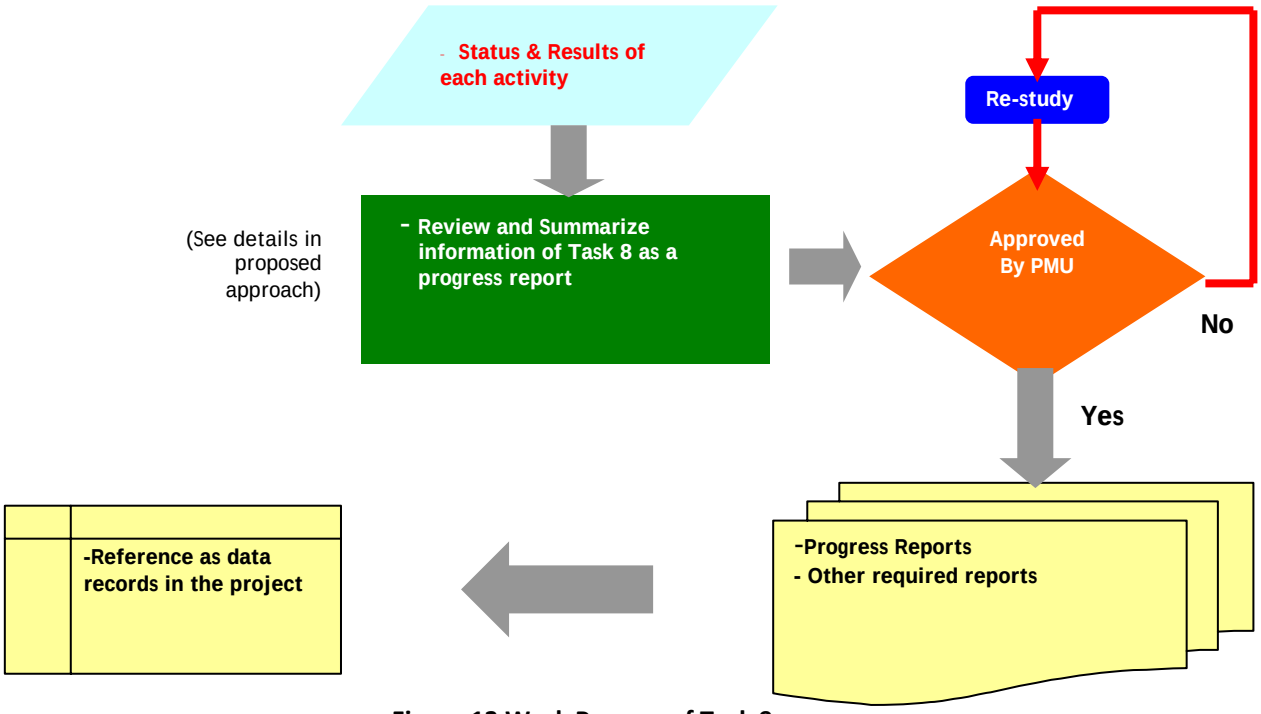


Figure 13 Work Process of Task 9

** Deliverables

Task 9 : Target/Deliverables :

As per Figure 13, the following output shall be achieved :

- Progress Reports
- Other required reports

……End of Task 9……

Task 10 : Review and provide recommendations to DEDE's committee on reports submitted by another consultant, engaged under TOR item 4.4.

Key Methodology and approach

BMC will review and provide recommendations to DEDE's committee on reports submitted by another consultant whom will be engaged under TOR item 4.4 (Task 4) as the following methodology and approach:

- The awarded consultant shall submit all reports required by the TOR to DEDE for approval.
- BMC will review all reports and provide comments and recommendations to DEDE at least on following issues
    - The completeness and correctness of the data or information provided in the report
    - Comparison on the progress of overall project and each activity with the project master plan (4 years) and yearly plan
    - Appropriateness on the project planning for the next period
    - Other issues as requested by DEDE or required by TOR
- The coordination meeting shall be arranged to clarify any outstanding issues or request for report modifications

……End of Task 10…….

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB)
Master Plan (4 Years) : Work Plan and Progress

			% of Payment - Planning by Quarter					5	5	5	5	10	10	10	10	5	5	5	5	5	5	5	5						
			% of Payment - Accumulation					5	10	15	20	30	40	50	60	65	70	75	80	85	90	95	100						
			Actual - By Quarter																										
			Total Actual																										
Item	Details of Activiites/Sub-Activities	Works Portion (%)	Status	Y2013					Y2014				Y2015				Y2016				Y2017								
				% Work Progress																									
				Q1	Q2/1	Q2/2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
PM	Project Management	16.91%																											
			Plan		4.06	0.68																							
			Actual		4.06																								
	PM-A) Project Meeting & Workshop & Seminar																												
	A.1) Project Team Meeting (UNDP & DEDE & BMC (Consultant))	2.54%	Plan		5	5	5	5	10	10	10	10	5	5	5	5	5	5	5		5								
			Actual		5																								
	A.2) Inception Workshop	1.69%	Plan		100																								
			Actual		100																								
	A.3) Meeting with International Expert (Japanese)	3.38%	Plan		5	5	5	5	15	30	30	5																	
			Actual		5																								
	A.4) Project Public Seminar	1.69%	Plan		5	5				35				20				20			15								
			Actual		5																								
	A.5) Stakeholders Meeting	0.85%	Plan		5	5				35				20				20			15								
			Actual		5																								
	PM-B) TOR for DEDE to select the competence consultant for Component 2 & 3																												
	B.1) TOR Development	0.85%	Plan		100																								
			Actual		100																								
	B.2) Bidding Process	0.34%	Plan		100																								
			Actual		100																								
	B.3) Proposal Evaluation	0.34%	Plan		100																								
			Actual		100																								
	PM-C) Project Board & Project Management Unit & Working Group																												
	C.1) Preparation of project document and invitation document	0.17%	Plan		100																								
			Actual		100																								
	C.2) Set up coordination	0.85%	Plan		5	5	5	5	10	10	10	10	5	5	5	5	5	5	5		5								
			Actual		5																								
	C.3) Organize the meeting	0.85%	Plan		5	5	5	5	10	10	10	10	5	5	5	5	5	5	5		5								
			Actual		5																								
	PM-D) Project Administration																												
	D.1) General organization and administration	2.54%	Plan		5	5	5	5	10	10	10	10	5	5	5	5	5	5	5		5								
			Actual		5																								
	D2.) Report Preparation	0.85%	Plan		5	5	5	5	10	10	10	10	5	5	5	5	5	5	5		5								
			Actual		5																								
	Sub-Total PM	16.91%																											
C1	COMPONENT 1 : Awareness Enhancement on Building EE Technologies and Practices	63.28%																											
			Plan		0.91	5.02	8.10																						
			Actual		0.91	0.00																							
	1.1 Establish Commercial Building EE Information Center (CBEEC)																												
	1.1.1 Activity 1.1.1 Establishment of the Commercial Building EE Information Center (CBEEC)																												
	1.1.1 a Conduct of Situation Analysis	3.16%	Plan		5	5	5	5	80																				
			Actual		5																								
	1.1.1 b Design and Development of the CBEEC	1.90%	Plan		1	1	2	2	94																				
			Actual		1																								
	1.1.1 C Administration and Maintenance of the CBEEC	6.33%	Plan		5	5	5	5	5	10	10	10	10	5	10	10	2	2	2		4								
			Actual		5																								
	1.1.1 d Collaboration on Database of the CBEEC	1.90%	Plan			1	1	1	5	10	10	10	5	5	20	12	2	2	2	5	9								
			Actual																										
	1.2 A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders																												
	1.2.1 Activity 1.2.1 Promoting CBEEC as the information portal for the Commercial Bldg. Sector in Thailand																												
	1.2.1 a Design effective promotional scheme	1.27%	Plan		1	1	50	48																					
			Actual		1																								
	1.2.2 Activity 1.2.2 Implementation of Awareness Raising Campaigns																												
	1.2.2 a Review of Profiles and Level of Awareness of Target Audience	1.27%	Plan		1	1	50	48																					
			Actual		1																								
	1.2.2 b Compilation and Production of Marketing and Promotional Tools and Materials	1.90%	Plan		1	1	50	48																					
			Actual		1																								
	1.2.2 c Design and Implementation of Awareness Campaigns	1.90%	Plan			5	5	5	10	10	10	10	5	5	5	5	5	5	5	5	5								
			Actual																										
	1.2.3 Activity 1.2.3 Implementation of Information Disclosure Program for Commercial Bldg. Energy Consumption																												
	1.2.3 a Design Information Disclosure (ID) program & publication materials (link with C2.2)	1.27%	Plan						5	5	5	5	10	5	5	10	10	10	10	10	10								
			Actual																										
	1.3 Development and Promoted Energy Use Simulation Models for Commercial Building Design																												
	1.3.1 Activity 1.3.1 Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand																												
	1.3.1 a Assessment of the two (2) most popular simulation models	3.16%	Plan		10	40	40	10																					
			Actual		10																								
	1.3.2 Activity 1.3.2 Development of a Customized BESM for Commercial Buildings in Thailand																												
	1.3.2 a Selection and Modification of BESM	6.33%	Plan					20	20	20	20	20																	
			Actual																										
	1.3.2 b Preparation of Promotional and Training Program	1.90%	Plan									50	50																
			Actual																										
	1.3.3 Activity 1.3.3 Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design																												
	1.3.3 a Conduct the BESM training courses	1.90%	Plan											10	20	30	15	25											
			Actual																										
	1.4 Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings																												
	1.4.1 Activity 1.4.1 Capacity Building Need Assessment for Commercial Building Stakeholder																												
	1.4.1 a Scoping Study on the Training Program	3.16%	Plan		1	50	45	4																					
			Actual		1																								
	1.4.1 b Identification of Training Activities for Stakeholders	1.27%	Plan		1	40	49	10																					
			Actual		1																								
	1.4.1 c Development of the Overall Training Program	1.27%	Plan		1	40	49	10																					
			Actual		1																								
	1.4.2 Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings																												
	1.4.2 a Design of Technical Training Courses	1.27%	Plan					5	40	55																			
			Actual																										
	1.4.2 b Design and Preparation of Training Materials	1.90%	Plan							25	50	25																	
			Actual																										
	1.4.2 c Conduct of Training Program	1.27%	Plan							10	10	10	10	10	10	10	20	10											
			Actual																										
	1.4.2 d Certification and Quality Assurance Mechanism	1.27%	Plan							10	10	10	10	10	10	10	20	10											
			Actual																										
	1.4.2 e Training Program Monitoring and Evaluation	1.27%	Plan							10	10	10	5	5	10	10	20	10	10										
			Actual																										
	1.4.2 f Sustainable Follow-up Capacity Development Program Design	1.27%	Plan							10	10	10	5	5	10	10	20	10	10										
			Actual																										

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB)
Master Plan (4 Years) : Work Plan and Progress

Item	No.	Details of Activiites/Sub-Activities			Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
		% of Payment - Planning by Quarter			5	5	5	5	10	10	10	10	5	5	5	5	5	5	5	5	
		% of Payment - Accumulation			5	10	15	20	30	40	50	60	65	70	75	80	85	90	95	100	
		Actual - By Quarter																			
		Total Actual																			
					Y2013				Y2014				Y2015				Y2016				Y2017
	1.5	**Completed training courses on financial assessment of EE application projects in commercial buildings**																			
	1.5	**Activity 1.5 Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings**																			
	1.5 a	Design of Non-Technical Training Courses	1.27%	Plan		5	5	5	80	5											
				Actual																	
	1.5 b	Design and Preparation of Training Materials	1.90%	Plan					50	50											
				Actual																	
	1.5 c	Conduct of Training Program	1.27%	Plan							10	10	10	10	20	20	10	10			
				Actual																	
	1.5 d	Training Program Monitoring and Evaluation	1.27%	Plan							5	10	5	10	10	20	10	10	20		
				Actual																	
	1.5 e	Sustainable Follow-up Capacity Development Program Design	0.63%	Plan							5	10	5	10	10	20	10	10	20		
				Actual																	
		Additional Activity : Design and Conduct the Capacity Building - Train the Trainer for DEDE's staff																			
	1	Design and develop the Train the Trainer curriculum for DEDE's staffs	1.27%	Plan		15	80	5													
				Actual																	
	2	Develop and Preparation of Training Materials	1.90%	Plan		5	5	90													
				Actual																	
	3	Conduct of Training Program	1.27%	Plan				100													
				Actual																	
	1.6	**Established business linkages between supplier of EE technologies, building owners, banks and building practitioners**																			
	1.6	**Activity 1.6 Established Business Linkages Between Suppliers of EE Technologies, Building Owners, Banks, and Building Practitioners**																			
	1.6 a	Framework Study of Commercial Building Business in Thailand	3.16%	Plan		5	5	5	85												
				Actual																	
	1.6 b	Establish Business Linkages	1.27%	Plan					5	5	5	5	10	10	10	10	5	5	10	10	10
				Actual																	
		Sub-Total Component 1	**63.28%**																		
C2		**COMPONENT 2 : EE Building Policy Frameworks**	6.86%																		
				Plan	0.0	0.14	0.17														
				Actual	0.0	0.00															
	2.1	**Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings**																			
	2.1.1	**Evaluation and recommendation of effective approaches and incentives for inclusion of building EE technologies and practices in the design and operation of various types of commercial buidlings**																			
	2.1.1.1	Evaluation of Best EE Options for Commercial Buildings		Plan																	
				Actual																	
	2.1.1.2	Modification of Existing and Development of New EE Policy Instruments for Commercial Buildings		Plan																	
				Actual																	
	2.1.1.3	Seeking Approval on New and Modified Policy from Policymakers		Plan																	
				Actual																	
	2.1.2	**Strengthening implementation effectiveness of the new Building Energy Code**																			
	2.1.2.1	Integration of the BEC Requirements with the EIA Approval Process		Plan																	
				Actual																	
	2.1.2.2	Establishment of the BEC Self-Learning Course for Building		Plan																	
				Actual																	
	2.1.2.3	Maintain Ongoing Dialogues with Municipalities and LAOs		Plan																	
				Actual																	
	2.1.2.4	Strengthening the Inter-Ministerial Coordination Process		Plan																	
				Actual																	
	2.1.3	**Assessment of DEDE's building energy labeling scheme and preparation of recommentations for strengthening implementation in buildings**																			
	2.1.3.1	Review of Available Information on Buildings Energy Labeling and Green Building Scheme		Plan																	
				Actual																	
	2.1.3.2	Assessment and Recommendation of Collaboration between the DEDE's Building Energy Label and Other Rating Sche		Plan																	
				Actual																	
	2.2	**Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE**																			
	2.2.1	**Activity 2.2.1 Compilation and Update of Energy Performance Database for Building Construction Materials and Electrical Equipement for Commercial Buildings**																			
	2.2.1 a	Data Review of BESM Software	0.69%	Plan		5	10	15	70												
				Actual																	
	2.2.1 b	Compile and Update of Energy Performance Database	0.69%	Plan					5	15	30	30	20								
				Actual																	
	2.2.2	**Activity 2.2.2 Review and Update of DEDE's SEC Studies and Compilation of Building Stock Data**																			
	2.2.2 a	Review the Existing Specific Energy Consumption Index (SEC)	1.37%	Plan		5	5	5	30	55											
				Actual																	
	2.2.2 b	Update the SEC for Commercial Building Sector in Thailand	2.06%	Plan					5	15	20	25	35								
				Actual																	
	2.2.3	**Activity 2.2.3 Review and Assessment of DEDE's M&V Scheme and Development of an Improved M&V Protocol for Commercial Building EE Projects**																			
	2.2.3 a	Review Existing M&V Scheme for Completed Projects in Thailand	0.69%	Plan		5	5	5	25	60											
				Actual																	
	2.2.3 b	Develop recommended M&V Scheme for Commercial Bldgs EE Project in Thailand	1.37%	Plan					20	20	60										
				Actual																	
	2.3	**Approved and Implemented New and Improved Financing Models for Commercial Buildings**																			
	2.3.1	**Development of new and improved financing models for EE commercial building investments**		Plan																	
				Actual																	
	2.3.2	**Approval and implementation of new fiscal policies to promote EE building design for new existing buildings**																			
	2.3.2.1	Conclusion of New Fiscal Policies to Promote EE building Design for New and Existing Buildings		Plan																	
				Actual																	
	2.3.2.2	Organization and Conduct of EE Building Fiscal Policy Workshop		Plan																	
				Actual																	
	2.3.2.3	Conduct of Targeted Policy Coordination Meetings		Plan																	
				Actual																	
	2.3.2.4	Approval and Implementation of new fiscal policies for EE building Projects		Plan																	
				Actual																	
	2.4	**Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities**																			
	2.4	Preparation of draft energy efficiency promotion Action Plan (Short and long term) to supplement DEDE activities		Plan																	
				Actual																	
		Sub-Total Component 2	**6.86%**																		
C3		**COMPONENT 3 : EE Building Technologies and Applications Demonstration**	12.95%																		
				Plan	0.0	0.0	0.0														
				Actual	0.0	0.0															
	3.1	**Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings**																			
	3.1.1	**Installed and operational demonstration projects in selected buildings**																			
	3.1.1.1	**Conduct of comprehensive feasibility studies and determination of implementation requirement, costing and engineering studies/design of selected demonstration projects**																			
	3.1.1.1a	conduct of Comprehensive Feasibility Studies of Demonstration Projects		Plan																	
				Actual																	
	3.1.1.1b	Determination of PEECB Implementation Requirements for Demonstration Projects		Plan																	
				Actual																	
	3.1.1.1c	Establishment of Baseline Data for the Demonstration Project Sites		Plan																	
				Actual																	
	3.1.1.1d	Finalized Design of Demonstration Projects		Plan																	
				Actual																	

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB)
Master Plan (4 Years) : Work Plan and Progress

				% of Payment - Planning by Quarter					5	5	5	5	10	10	10	10	5	5	5	5	5	5	5	5	
				% of Payment - Accumulation					5	10	15	20	30	40	50	60	65	70	75	80	85	90	95	100	
				Actual - By Quarter																					
				Total Actual																					
Item	**Details of Activiites/Sub-Activities**								**Y2013**				**Y2014**				**Y2015**				**Y2016**				**Y2017**
	3.2	**Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices**																							
	3.2.1	**Documentation on the results of the demonstration projects and available EE technologies in the markets and dissemination of demo project results**																							
	3.2.1.1	**Activity 3.2.1.1 Documentation of Results of the Demonstration Projects**																							
	3.2.1.1 a	Collect Data and Information of Demonstration Projects	**0.65%**	**Plan**									**10**	**10**	**25**	**25**	**30**								
				Actual																					
	3.2.1.1 b	Documentation of Results of the Demonstration Projects	**1.30%**	**Plan**										**5**	**5**	**5**	**5**	**5**	**5**	**5**	**20**	**20**	**20**	**5**	
				Actual																					
	3.2.1.2	**Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices**																							
		Applied in Thailand and Other Countries																							
	3.2.1.2 a	Review the Existing Demonstration Projects and Case Studies in Other Countries	**0.65%**	**Plan**									**10**	**10**	**25**	**25**	**30**								
				Actual																					
	3.2.1.2 b	Documentation of Information on the Availability & Quality of EE Technologies and Practices Applied in Th	**2.59%**	**Plan**										**5**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**5**	
				Actual																					
	3.2.1.3	**Activity 3.2.1.3 Dissemination of Successful Case Studies on Demo Projects**																							
	3.2.1.3 a	Dissemination of Successful Case Studies on Demo Projects	**3.89%**	**Plan**															**10**	**15**	**20**	**20**	**20**	**15**	
				Actual																					
	3.2.2	**Completed training courses for personnel attached to the demo projects**																							
	3.2.2.1	**Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel**																							
	3.2.2.1 a	Design the Training Course Outline on Demo Projects & DEDE's Capacity Building	**2.59%**	**Plan**													**50**	**50**							
				Actual																					
	3.2.2.1 b	Conduct the training Courses on Demo Projects	**1.30%**	**Plan**															**25**	**25**	**25**	**25**			
				Actual																					
	3.3	**Replication of demonstration projects within the commercial building sector**																							
	3.3.1	**Completed project documents/recommendations for EE project replication in the commercial building sector**																							
	3.3.1.1	Preparation of project documents/recommendations for project replication in hotels, hospitals, office buildings and shopping malls		**Plan**																					
				Actual																					
		Sub-Total Component 3	**12.95%**																						
									Q2/1	**Q2/2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**
		Total (Sub Total PM+Sub Total Component 1 + 2 + 3) : For Contract 1 Only	**100%**		**%Plan**				**5.0**	**5.8**	**8.8**	**8.8**	**14.3**	**9.9**	**7.9**	**6.9**	**5.9**	**4.1**	**4.0**	**4.5**	**4.1**	**4.3**	**2.8**	**1.2**	**1.5**
					% Actual				**5.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
					Accumulation	**%Plan**			**5.0**	**10.8**	**19.6**	**28.4**	**42.8**	**52.7**	**60.6**	**67.6**	**73.5**	**77.5**	**81.6**	**86.1**	**90.2**	**94.4**	**97.2**	**98.5**	**100.0**
					Accumulation	**%Actual**			**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**

Note: responsible by the consultant of contract-2

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB)
Master Plan (4 Years)

Item		Details of Activiites/Sub-Activities	Y2013					Y2014				Y2015				Y2016				Y2017			
			Master Plan 4 Years																				
			Q1	Q2/1	Q2/2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
PM		**Project Management**																					
		PM-A) Project Meeting & Workshop & Seminar																					
		A.1) Project Team Meeting (UNDP & DEDE & BMC (Consultant))																					
		A.2) Inception Workshop																					
		A.3) Meeting with International Expert (Japanese)																					
		A.4) Project Public Seminar																					
		A.5) Stakeholders Meeting																					
		PM-B) TOR for DEDE to select the competence consultant for Component 2 & 3																					
		B.1) TOR Development																					
		B.2) Bidding Process																					
		B.3) Proposal Evaluation																					
		PM-C) Project Board & Project Management Unit & Working Group																					
		C.1) Preparation of project document and invitation document																					
		C.2) Set up coordination																					
		C.3) Organize the meeting																					
		PM-D) Project Administration																					
		D.1) General organization and administration																					
		D2.) Report Preparation																					
		Sub-Total PM																					
C1		**COMPONENT 1 : Awareness Enhancement on Building EE Technologies and Practices**																					
	1.1	**Establish Commercial Building EE Information Center (CBEEC)**																					
	1.1.1	**Activity 1.1.1 Establishment of the Commercial Building EE Information Center (CBEEC)**																					
	1.1.1 a	Conduct of Situation Analysis																					
	1.1.1 b	Design and Development of the CBEEC																					
	1.1.1 C	Administration and Maintenance of the CBEEC																					
	1.1.1 d	Collaboration on Database of the CBEEC																					
	1.2	**A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders**																					
	1.2.1	**Activity 1.2.1 Promoting CBEEC as the information portal for the Commercial Bldg. Sector in Thailand**																					
	1.2.1 a	Design effective promotional scheme																					
	1.2.2	**Activity 1.2.2 Implementation of Awareness Raising Campaigns**																					
	1.2.2 a	Review of Profiles and Level of Awareness of Target Audience																					
	1.2.2 b	Compilation and Production of Marketing and Promotional Tools and Materials																					
	1.2.2 c	Design and Implementation of Awareness Campaigns																					
	1.2.3	**Activity 1.2.3 Implementation of Information Disclosure Program for Commercial Bldg. Energy Consumption**																					
	1.2.3 a	Design Information Disclosure (ID) program & publication materials (link with C2.2)																					
	1.3	**Development and Promoted Energy Use Simulation Models for Commercial Building Design**																					
	1.3.1	**Activity 1.3.1 Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand**																					
	1.3.1 a	Assessment of the two (2) most popular simulation models																					
	1.3.2	**Activity 1.3.2 Development of a Customized BESM for Commercial Buildings in Thailand**																					
	1.3.2 a	Selection and Modification of BESM																					
	1.3.2 b	Preparation of Promotional and Training Program																					
	1.3.3	**Activity 1.3.3 Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design**																					
	1.3.3 a	Conduct the BESM training courses																					
	1.4	**Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings**																					
	1.4.1	**Activity 1.4.1 Capacity Building Need Assessment for Commercial Building Stakeholder**																					
	1.4.1 a	Scoping Study on the Training Program																					
	1.4.1 b	Identification of Training Activities for Stakeholders																					
	1.4.1 c	Development of the Overall Training Program																					
	1.4.2	**Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings**																					
	1.4.2 a	Design of Technical Training Courses																					
	1.4.2 b	Design and Preparation of Training Materials																					
	1.4.2 c	Conduct of Training Program																					
	1.4.2 d	Certification and Quality Assurance Mechanism																					
	1.4.2 e	Training Program Monitoring and Evaluation																					
	1.4.2 f	Sustainable Follow-up Capacity Development Program Design																					
	1.5	**Completed training courses on financial assessment of EE application projects in commercial buildings**																					
	1.5	**Activity 1.5 Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings**																					
	1.5 a	Design of Non-Technical Training Courses																					
	1.5 b	Design and Preparation of Training Materials																					
	1.5 c	Conduct of Training Program																					
	1.5 d	Training Program Monitoring and Evaluation																					
	1.5 e	Sustainable Follow-up Capacity Development Program Design																					
		Additional Activity : Design and Conduct the Capacity Building - Train the Trainer for DEDE's staff																					
	1	Design and develop the Train the Trainer curriculum for DEDE's staffs																					
	2	Develop and Preparation of Training Materials																					
	3	Conduct of Training Program																					
	1.6	**Established business linkages between supplier of EE technologies, building owners, banks and building practitioners**																					
	1.6	**Activity 1.6 Established Business Linkages Between Suppliers of EE Technologies, Building Owners, Banks, and Building Practitioners**																					
	1.6 a	Framework Study of Commercial Building Business in Thailand																					
	1.6 b	Establish Business Linkages																					
		Sub-Total Component 1																					
C2		**COMPONENT 2 : EE Building Policy Frameworks**																					
	2.1	**Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings**																					
	2.1.1	**Evaluation and recommendation of effective approaches and incentives for inclusion of building EE technologies and practices in the design and operation of various types of commercial buidlings**																					
	2.1.1.1	Evaluation of Best EE Options for Commercial Buildings																					
	2.1.1.2	Modification of Existing and Development of New EE Policy Instruments for Commercial Buildings																					
	2.1.1.3	Seeking Approval on New and Modified Policy from Policymakers																					
	2.1.2	**Strengthening implementation effectiveness of the new Building Energy Code**																					
	2.1.2.1	Integration of the BEC Requirements with the EIA Approval Process																					
	2.1.2.2	Establishment of the BEC Self-Learning Course for Building																					
	2.1.2.3	Maintain Ongoing Dialogues with Municipalities and LAOs																					
	2.1.2.4	Strengthening the Inter-Ministerial Coordination Process																					
	2.1.3	**Assessment of DEDE's building energy labeling scheme and preparation of recommentations for strengthening implementation in buildings**																					
	2.1.3.1	Review of Available Information on Buildings Energy Labeling and Green Building Scheme																					
	2.1.3.2	Assessment and Recommendation of Collaboration between the DEDE's Building Energy Label and Other Rating Scheme/Awards for Commercial																					
	2.2	**Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE**																					
	2.2.1	**Activity 2.2.1 Compilation and Update of Energy Performance Database for Building Construction Materials and Electrical Equipement for Commercial Buildings**																					
	2.2.1 a	Data Review of BESM Software																					
	2.2.1 b	Compile and Update of Energy Performance Database																					
	2.2.2	**Activity 2.2.2 Review and Update of DEDE's SEC Studies and Compilation of Building Stock Data**																					
	2.2.2 a	Review the Existing Specific Energy Consumption Index (SEC)																					
	2.2.2 b	Update the SEC for Commercial Building Sector in Thailand																					
	2.2.3	**Activity 2.2.3 Review and Assessment of DEDE's M&V Scheme and Development of an Improved M&V Protocol for Commercial Building EE Projects**																					
	2.2.3 a	Review Existing M&V Scheme for Completed Projects in Thailand																					
	2.2.3 b	Develop recommended M&V Scheme for Commercial Bldgs EE Project in Thailand																					

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB)
Master Plan (4 Years)

Item		Details of Activiites/Sub-Activities	Y2013	Y2014	Y2015	Y2016	Y2017
	2.3	**Approved and Implemented New and Improved Financing Models for Commercial Buildings**					
	2.3.1	**Development of new and improved financing models for EE commercial building investments**					
	2.3.2	**Approval and implementation of new fiscal policies to promote EE building design for new existing buildings**					
	2.3.2.1	Conclusion of New Fiscal Policies to Promote EE building Design for New and Existing Buildings					
	2.3.2.2	Organization and Conduct of EE Building Fiscal Policy Workshop					
	2.3.2.3	Conduct of Targeted Policy Coordination Meetings					
	2.3.2.4	Approval and Implementation of new fiscal policies for EE building Projects					
	2.4	**Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities**					
	2.4	Preparation of draft energy efficiency promotion Action Plan (Short and long term) to supplement DEDE activities					
		Sub-Total Component 2					
C3	**COMPONENT 3 : EE Building Technologies and Applications Demonstration**						
	3.1	**Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings**					
	3.1.1	**Installed and operational demonstration projects in selected buildings**					
	3.1.1.1	**Conduct of comprehensive feasibility studies and determination of implementation requirement, costing and engineering studies/design of selected demonstration projects**					
	3.1.1.1a	conduct of Comprehensive Feasibility Studies of Demonstration Projects					
	3.1.1.1b	Determination of PEECB Implementation Requirements for Demonstration Projects					
	3.1.1.1c	Establishment of Baseline Data for the Demonstration Project Sites					
	3.1.1.1d	Finalized Design of Demonstration Projects					
	3.2	**Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices**					
	3.2.1	**Documentation on the results of the demonstration projects and available EE technologies in the markets and dissemination of demo project results**					
	3.2.1.1	**Activity 3.2.1.1 Documentation of Results of the Demonstration Projects**					
	3.2.1.1 a	Collect Data and Information of Demonstration Projects					
	3.2.1.1 b	Documentation of Results of the Demonstration Projects					
	3.2.1.2	**Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices Applied in Thailand and Other Countries**					
	3.2.1.2 a	Review the Existing Demonstration Projects and Case Studies in Other Countries					
	3.2.1.2 b	Documentation of Information on the Availability & Quality of EE Technologies and Practices Applied in Thailand & Other Countries					
	3.2.1.3	**Activity 3.2.1.3 Dissemination of Successful Case Studies on Demo Projects**					
	3.2.1.3 a	Dissemination of Successful Case Studies on Demo Projects					
	3.2.2	**Completed training courses for personnel attached to the demo projects**					
	3.2.2.1	**Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel**					
	3.2.2.1 a	Design the Training Course Outline on Demo Projects & DEDE's Capacity Building					
	3.2.2.1 b	Conduct the training Courses on Demo Projects					
	3.3	**Replication of demonstration projects within the commercial building sector**					
	3.3.1	**Completed project documents/recommendations for EE project replication in the commercial building sector**					
	3.3.1.1	Preparation of project documents/recommendations for project replication in hotels, hospitals, office buildings and shopping malls					

Project : Promoting Energy Efficiency in Commercial Building (PEECB)

Working Plan of Y2013 (B.E.2556)

Item	Details of Activiites/Sub-Activities	Y2013 (B.E.2556)									
		Q1	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM	**Project Management**										
	PM-A) Project Meeting & Workshop & Seminar										
	A.1) Project Team Meeting (UNDP & DEDE & BMC (Consultant))										
	A.2) Inception Workshop										
	A.3) Meeting with International Expert (Japanese)										
	A.4) Project Public Seminar										
	A.5) Stakeholders Meeting										
	PM-B) TOR for DEDE to select the competence consultant for Component 2 & 3										
	B.1) TOR Development										
	B.2) Bidding Process										
	B.3) Proposal Evaluation										
	PM-C) Project Board & Project Management Unit & Working Group										
	C.1) Preparation of project document and invitation document										
	C.2) Set up coordination										
	C.3) Organize the meeting										
	PM-D) Project Administration										
	D.1) General organization and administration										
	D2.) Report Preparation										
C1	**COMPONENT 1 : Awareness Enhancement on Building EE Technologies and Practices**										
	1.1 Establish Commercial Building EE Information Center (CBEEC)										
	1.1.1 Activity 1.1.1 Establishment of the Commercial Building EE Information Center (CBEEC)										
	1.1.1 a Conduct of Situation Analysis										
	1.1.1 b Design and Development of the CBEEC										
	1.1.1 C Administration and Maintenance of the CBEEC										
	1.1.1 d Collaboration on Database of the CBEEC										
	1.2 A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders										
	1.2.1 Activity 1.2.1 Promoting CBEEC as the information portal for the Commercial Bldg. Sector in Thailand										
	1.2.1 a Design effective promotional scheme										
	1.2.2 Activity 1.2.2 Implementation of Awareness Raising Campaigns										
	1.2.2 a Review of Profiles and Level of Awareness of Target Audience										
	1.2.2 b Compilation and Production of Marketing and Promotional Tools and Materials										
	1.2.2 c Design and Implementation of Awareness Campaigns										
	1.2.3 Activity 1.2.3 Implementation of Information Disclosure Program for Commercial Bldg. Energy Consumption										
	1.2.3 a Design Information Disclosure (ID) program & publication materials (link with C2.2)										
	1.3 Development and Promoted Energy Use Simulation Models for Commercial Building Design										
	1.3.1 Activity 1.3.1 Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand										
	1.3.1 a Assessment of the two (2) most popular simulation models										
	1.3.2 Activity 1.3.2 Development of a Customized BESM for Commercial Buildings in Thailand										
	1.3.2 a Selection and Modification of BESM										
	1.3.2 b Preparation of Promotional and Training Program										
	1.3.3 Activity 1.3.3 Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design										
	1.3.3 a Conduct the BESM training courses										
	1.4 Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings										
	1.4.1 Activity 1.4.1 Capacity Building Need Assessment for Commercial Building Stakeholder										
	1.4.1 a Scoping Study on the Training Program										
	1.4.1 b Identification of Training Activities for Stakeholders										
	1.4.1 c Development of the Overall Training Program										
	1.4.2 Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings										
	1.4.2 a Design of Technical Training Courses										
	1.4.2 b Design and Preparation of Training Materials										
	1.4.2 c Conduct of Training Program										
	1.4.2 d Certification and Quality Assurance Mechanism										
	1.4.2 e Training Program Monitoring and Evaluation										
	1.4.2 f Sustainable Follow-up Capacity Development Program Design										
	1.5 Completed training courses on financial assessment of EE application projects in commercial buildings										
	1.5 Activity 1.5 Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings										
	1.5 a Design of Non-Technical Training Courses										
	1.5 b Design and Preparation of Training Materials										
	1.5 c Conduct of Training Program										
	1.5 d Training Program Monitoring and Evaluation										
	1.5 e Sustainable Follow-up Capacity Development Program Design										
	Additional Activity : Design and Conduct the Capacity Building - Train the Trainer for DEDE's staff										
	1 Design and develop the Train the Trainer curriculum for DEDE's staffs										
	2 Develop and Preparation of Training Materials										
	3 Conduct of Training Program										
	1.6 Established business linkages between supplier of EE technologies, building owners, banks and building practitioners										
	1.6 Activity 1.6 Established Business Linkages Between Suppliers of EE Technologies, Building Owners, Banks, and Building Practitioners										
	1.6 a Framework Study of Commercial Building Business in Thailand										
	1.6 b Establish Business Linkages										
C2	**COMPONENT 2 : EE Building Policy Frameworks**										
	2.1 Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings										
	2.1.1 Evaluation and recommendation of effective approaches and incentives for inclusion of building EE technologies and practices in the design and operation of various types of commercial buidlings										
	2.1.1.1 Evaluation of Best EE Options for Commercial Buildings										
	2.1.1.2 Modification of Existing and Development of New EE Policy Instruments for Commercial Buildings										
	2.1.1.3 Seeking Approval on New and Modified Policy from Policymakers										
	2.1.2 Strengthening implementation effectiveness of the new Building Energy Code										
	2.1.2.1 Integration of the BEC Requirements with the EIA Approval Process										
	2.1.2.2 Establishment of the BEC Self-Learning Course for Building										
	2.1.2.3 Maintain Ongoing Dialogues with Municipalities and LAOs										
	2.1.2.4 Strengthening the Inter-Ministerial Coordination Process										

Item		Details of Activiites/Sub-Activities	Y2013 (B.E.2556)
	2.1.3	Assessment of DEDE's building energy labeling scheme and preparation of recommentations for strengthening implementation in buildings	
	2.1.3.1	Review of Available Information on Buildings Energy Labeling and Green Building Scheme	
	2.1.3.2	Assessment and Recommendation of Collaboration between the DEDE's Building Energy Label and Other Rating Scheme/Awards for Commercial	
	2.2	**Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE**	
	2.2.1	**Activity 2.2.1 Compilation and Update of Energy Performance Database for Building Construction Materials**	
		and Electrical Equipement for Commercial Buildings	
	2.2.1 a	Data Review of BESM Software	
	2.2.1 b	Compile and Update of Energy Performance Database	
	2.2.2	**Activity 2.2.2 Review and Update of DEDE's SEC Studies and Compilation of Building Stock Data**	
	2.2.2 a	Review the Existing Specific Energy Consumption Index (SEC)	
	2.2.2 b	Update the SEC for Commercial Building Sector in Thailand	
	2.2.3	**Activity 2.2.3 Review and Assessment of DEDE's M&V Scheme and Development of an Improved M&V Protocol**	
		for Commercial Building EE Projects	
	2.2.3 a	Review Existing M&V Scheme for Completed Projects in Thailand	
	2.2.3 b	Develop recommended M&V Scheme for Commercial Bldgs EE Project in Thailand	
	2.3	Approved and Implemented New and Improved Financing Models for Commercial Buildings	
	2.3.1	Development of new and improved financing models for EE commercial building investments	
	2.3.2	Approval and implementation of new fiscal policies to promote EE building design for new existing buildings	
	2.3.2.1	Conclusion of New Fiscal Policies to Promote EE building Design for New and Existing Buildings	
	2.3.2.2	Organization and Conduct of EE Building Fiscal Policy Workshop	
	2.3.2.3	Conduct of Targeted Policy Coordination Meetings	
	2.3.2.4	Approval and Implementation of new fiscal policies for EE building Projects	
	2.4	Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities	
	2.4	Preparation of draft energy efficiency promotion Action Plan (Short and long term) to supplement DEDE activities	
C3		**COMPONENT 3 : EE Building Technologies and Applications Demonstration**	
	3.1	Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings	
	3.1.1	Installed and operational demonstration projects in selected buildings	
	3.1.1.1	Conduct of comprehensive feasibility studies and determination of implementation requirement, costing and engineering studies/design of selected demonstration projects	
	3.1.1.1a	conduct of Comprehensive Feasibility Studies of Demonstration Projects	
	3.1.1.1b	Determination of PEECB Implementation Requirements for Demonstration Projects	
	3.1.1.1c	Establishment of Baseline Data for the Demonstration Project Sites	
	3.1.1.1d	Finalized Design of Demonstration Projects	
	3.2	**Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices**	
	3.2.1	**Documentation on the results of the demonstration projects and available EE technologies in the markets and dissemination of demo project results**	
	3.2.1.1	**Activity 3.2.1.1 Documentation of Results of the Demonstration Projects**	
	3.2.1.1 a	Collect Data and Information of Demonstration Projects	
	3.2.1.1 b	Documentation of Results of the Demonstration Projects	
	3.2.1.2	**Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices**	
		Applied in Thailand and Other Countries	
	3.2.1.2 a	Review the Existing Demonstration Projects and Case Studies in Other Countries	
	3.2.1.2 b	Documentation of Information on the Availability & Quality of EE Technologies and Practices	
		Applied in Thailand and Other Countries	
	3.2.1.3	**Activity 3.2.1.3 Dissemination of Successful Case Studies on Demo Projects**	
	3.2.1.3 a	Dissemination of Successful Case Studies on Demo Projects	
	3.2.2	**Completed training courses for personnel attached to the demo projects**	
	3.2.2.1	**Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel**	
	3.2.2.1 a	Design the Training Course Outline on Demo Projects & DEDE's Capacity Building	
	3.2.2.1 b	Conduct the training Courses on Demo Projects	
	3.3	Replication of demonstration projects within the commercial building sector	
	3.3.1	Completed project documents/recommendations for EE project replication in the commercial building sector	
	3.3.1.1	Preparation of project documents/recommendations for project replication in hotels, hospitals, office buildings and shopping malls	

Yearly Plan of Y2013

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.1 :**Establishment of the Commercial Building EE Information Center (CBEEC)		**Measures of Effectiveness:** % of overall commercial building stakeholders that are satisfied with availability and quality of CBEEC information services	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.1.1** Establishment of the CBEEC	BMC/WG/PMU/PB	Q2/2017

Note :
PB = Project Board
PMU = Project Management Unit
WG = Working Group
BMC = Bright Management Consulting Co.,Ltd. (Contract#1)
AC = Awarded Contractor (Contract#2)
DEDE = Department of Alternative Energy Development and Efficiency, Ministry of Energy

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.2 :**A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders		**Measures of Effectiveness:** % of overall commercial building stakeholders that agree to greater availability of pertinent information on EE technologies and practices through CBEEC as well as promotional and outreach activities	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design	**Activity 1.2.1** Promoting CBEEC as the information portal for the commercial building sector in Thailand	BMC/WG/PMU/PB	Q3/2013

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.2 :**A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders		**Measures of Effectiveness:** % of overall commercial building stakeholders that agree to greater availability of pertinent information on EE technologies and practices through CBEEC as well as promotional and outreach activities	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.2.2** Implementation of Awareness Raising Campaign	BMC/WG	Q1/2017

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.3 :** Development and Promoted Energy Use Simulation Models for Commercial Building Design		**Measures of Effectiveness:** No.of new buildings that were designed using the modified BESMs by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.3.1** Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand	BMC/WG	Q3/2013

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.4 :** Completed Training Courses on EE technologies and practices , and financial arrangement for commercial buildings		**Measures of Effectiveness:** % of overall no. of trainees that are gainfully employing learned skills on EE building design, operation and maintenance	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.4.1** Capacity building Need Assessment for Commercial Building Stakeholder	BMC/WG	Q3/2013
	Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices and Financial Arrangement for Commercial Buildings	BMC/WG	Q3/2016

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.5 :** Completed Training courses on Financial Assessment of EE application projects in Commercial Buildings		**Measures of Effectiveness:** % of completed training courses on financial assessment of EE application projects in commercial buildings by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.5** Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings	BMC/DEDE	Q3/2016

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.6 :** Established business linkages between supplier of EE technologies, building owners, banks and building practitioners		**Measures of Effectiveness:** No. of EE investment projects facilitated through business links by EOP No.of banks/Financial institutes that have financed EE investment projects through business links by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.6** Established Business Linkages Between Suppliers of EE technologies , Building Owners, Banks and Building Practitioners	BMC/WG/PMU	Q1/2017

Component 2 : EE Building Policy Framework **Output 2.1 :** Updated and More Effective Policy measures on Energy Efficiency in Commercial Buildings		**Measures of Effectiveness:** No.of new policy measures for commercial building EE approved and implemented	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 2.1.1** Evaluation and recommendation of effective approaches and incentive for inclusion of building EE technologies and practices in the design and operation of various types of commercial buildings	AC/WG	Q4/2013
	Activity 2.1.3 Assessment of DEDE's building energy labeling	AC/WG	Q4/2013

Component 2 : EE Building Policy Framework **Output 2.1 :** Updated and More Effective Policy measures on Energy Efficiency in Commercial Buildings		**Measures of Effectiveness:** No.of new policy measures for commercial building EE approved and implemented	
	scheme and preparation of recommendations for strengthening implementation in buildings		

Component 2 : EE Building Policy Framework **Output 2.2 :** Revised and Up-to-date Data and information to Facilitates Policy Implementation of Commercial Building EE		**Measures of Effectiveness:** % of overall commercial buildings stakeholders that are satisfied with availability and quality of the energy performance database	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 2.2.1** Compilation and Update of Energy Performance Database for Building Construction Materials and Electrical Equipment for Commercial Buildings	BMC/WG	Q1/2015
	Activity 2.2.2 Review and Update of DEDE's SEC Studies and Compilation of Building Stock Data	BMC/WG/PMU	Q1/2015
	Activity 2.2.3 Review and assessment of DEDE's M&V Scheme and Development of an Improved M&V Protocol for Commercial Building EE Projects	BMC/WG/PMU	Q3/2014

Component 2 : EE Building Policy Framework **Output 2.3 :** Approved and Implemented New and Improved Financing Models for Commercial Buildings		**Measures of Effectiveness:** No.of fiscal policies approved by DEDE	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 2.3.1** Development of new and improved financing models for EE commercial building investment	AC/WG	Q3/2014
	Activity 2.3.2 Approval and implementation of new fiscal policies to promote EE building design for new existing buildings	AC/WG/PMU/DEDE	Q3/2014

Component 2 : EE Building Policy Framework **Output 2.4 :** Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities		**Measures of Effectiveness:** No.of short and long term action plan for commercial building EE integrated into DEDE's national EE policy by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 2.4** Preparation of draft energy efficiency promotion action plan (Short and long term) to supplement DEDE activities	AC/WG/PMU	Q3/2014

Component 3 : EE Building Technologies and Applications Demonstration **Output 3.1 :** Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings		**Measures of Effectiveness:** No.of commercial building owners/managers expressing interests and commitments in implementing EE investments by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 3.1.1** Installed and operational demonstration projects in selected buildings	AC/WG	Q2/2014
	Activity 3.1.1.1 Conduct of comprehensive feasibility studies and determination of implementation requirement , costing and engineering studies /design of selected demonstration projects	AC/WG	Q2/2014

Yearly Plan of Y2014

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.2 :**A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders		**Measures of Effectiveness:** % of overall commercial building stakeholders that agree to greater availability of pertinent information on EE technologies and practices through CBEEC as well as promotional and outreach activities	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.2.3** Implementation of Information Disclosure Program for Commercial Building Energy Consumption	BMC/WG	Q1/2017

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.3 :** Development and Promoted Energy Use Simulation Models for Commercial Building Design		**Measures of Effectiveness:** No.of new buildings that were designed using the modified BESMs by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.3.2** Development of a Customized BESM for Commercial Building in Thailand	BMC/WG	Q1/2015

Component 2 : EE Building Policy Framework **Output 2.1 :** Updated and More Effective Policy measures on Energy Efficiency in Commercial Buildings		**Measures of Effectiveness:** No.of new policy measures for commercial building EE approved and implemented	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 2.1.2** Strengthening implementation effectiveness of the new building energy code	AC/WG/PMU	Q3/2016

Component 3 : EE Building Technologies and Applications Demonstration **Output 3.2 :** Improved local technical and managerial capacity to design , manage and maintain EE technologies and practices		**Measures of Effectiveness:** % of overall no.of demo building personnel that are gainfully employing learned skills on EE building design, operation and maintenance	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 3.2.1.1** Documentation of Results of the demonstration projects	BMC/WG/PMU/DEDE	Q4/2016
	Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices Applied in Thailand and Other Countries	BMC/WG/PMU/DEDE	Q4/2016

Yearly Plan of Y2015

Component 1 : Awareness Enhancement on Building EE Technologies and Practices **Output 1.3 :** Development and Promoted Energy Use Simulation Models for Commercial Building Design		**Measures of Effectiveness:** No.of new buildings that were designed using the modified BESMs by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Addressing the barriers related to insufficient level of awareness on integrating EE technologies and practices in design and retrofitting commercial buildings among specific groups of stakeholders	**Activity 1.3.3** Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design	BMC/DEDE	Q2/2016

Component 3 : EE Building Technologies and Applications Demonstration **Output 3.2 :** Improved local technical and managerial capacity to design , manage and maintain EE technologies and practices		**Measures of Effectiveness:** % of overall no.of demo building personnel that are gainfully employing learned skills on EE building design, operation and maintenance	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 3.2.1.3** Dissemination of Successful Case Studies on Demo Projects	BMC/WG/PMU/DEDE	Q4/2016
	Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel	BMC/DEDE	Q2/2016

Component 3 : EE Building Technologies and Applications Demonstration **Output 3.3 :** Replication of demonstration projects within the commercial building sector		**Measures of Effectiveness:** No.of new EE Buildings projects designed based on , or influenced by, the results of the demonstration projects by EOP	
Objectives/Main Topics	**Activities Planned to Meet Objectives**	**Staff/Partnership Member(s) Responsible**	**Completed by:**
Assessing the current policy and facilitating the development and improvement of EE policy measures and implementation mechanism for commercial buildings	**Activity 3.3.1** Completed project documents/recommendations for EE project replication in the commercial building sector	AC/WG/PMU/DEDE	Q4/2015

Yearly Plan 2016 of Y2016

Activities in Y2016 continued from Y2013 are :

Activity 1.1.1 Establishment of the CBEEC
Activity 1.2.2 Implementation of Awareness Raising Campaign
Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices and Financial Arrangement for Commercial Buildings
Activity 1.5 Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings
Activity 1.6 Established Business Linkages Between Suppliers of EE technologies , Building Owners, Banks and Building Practitioners

Activities in Y2016 continued from Y2014 are :

Activity 1.2.3 Implementation of Information Disclosure Program
Activity 2.1.2 Strengthening implementation effectiveness of the new building energy code
Activity 3.2.1.1 Documentation of Results of the demonstration projects
Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices Applied in Thailand and Other Countries

Activities in Y2016 continued from Y2015 are :

Activity 1.3.3 Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design
Activity 3.2.1.3 Dissemination of Successful Case Studies on Demo Projects
Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel

Promoting of Energy Efficiency in Commercial Buildings, PEECB

GEF

UNDP

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

การประชุมคณะกรรมการอำนวยการโครงการ
ครั้งที่ 1/2556 และ Inception Workshop
วันพุธที่ 22 พฤษภาคม 2556

กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน

BRIGHT
management consulting
company limited

วาระการประชุมคณะกรรมการอำนวยการโครงการ และ Inception Workshop
วันพุธที่ 22 พฤษภาคม 2556

วาระที่ 1 **เรื่องประธานแจ้งให้ที่ประชุมทราบ**

1.1 การดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB)

วาระที่ 2 **เรื่องแจ้งเพื่อทราบ**

2.1 การแต่งตั้งคณะกรรมการอำนวยการโครงการ (Project Board)

2.2 รายละเอียดโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ

วาระที่ 3 **เรื่องเพื่อพิจารณา**

3.1 แผนดำเนินงานโครงการ และแผนกิจกรรมประจำปี

วาระที่ 4 **เรื่องอื่นๆ**

4.1 กำหนดการประชุมคณะกรรมการฯ ครั้งที่ 2/2556

วาระที่ 1

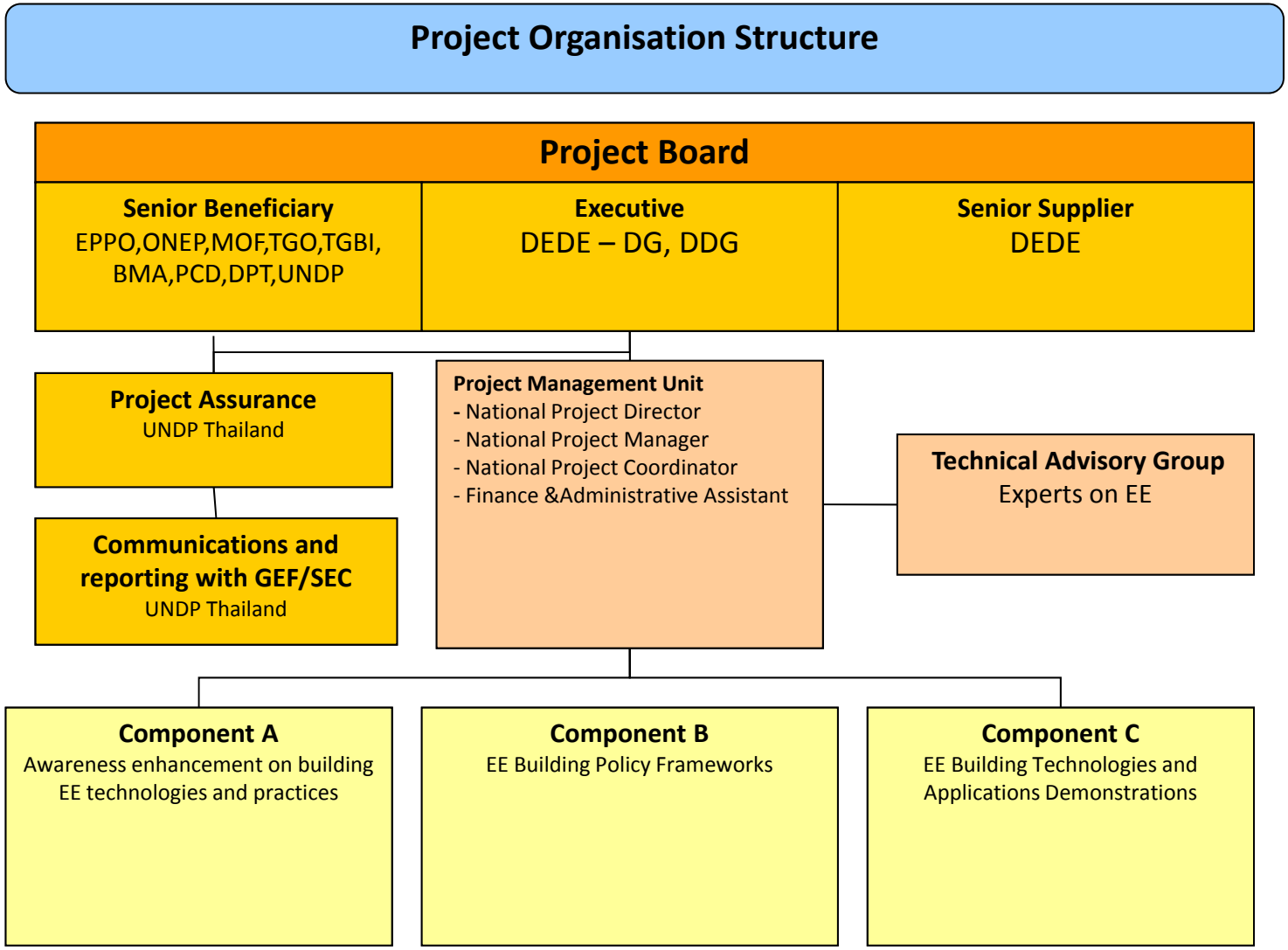
เรื่องประธานแจ้งเพื่อทราบ

วาระที่ 2

เรื่องแจ้งเพื่อทราบ

2.1 การแต่งตั้งคณะกรรมการอำนวยการโครงการ

PEECB Project Management Structure



PEECB Project Board (PB)

องค์ประกอบของ "คณะกรรมการอำนวยการโครงการ (Project Board)"

1.	นายอำนวย ทองสถิตย์ อธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	ประธานกรรมการ
2.	นายทวารัฐ สูตะบุตร รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
3.	นายประมวล จันทร์พงษ์ รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
4.	ผู้แทน สำนักงานนโยบายและแผนทรัพยากรธรรมชาติ และสิ่งแวดล้อม	กรรมการ
5.	ผู้แทน สำนักงานโครงการพัฒนาแห่งสหประชาชาติ	กรรมการ
6.	ผู้แทน สำนักงานนโยบายและแผนพลังงาน	กรรมการ
7.	ผู้แทน กรมโยธาธิการและผังเมือง	กรรมการ
8.	ผู้แทน กรมควบคุมมลพิษ	กรรมการ
9.	ผู้แทน กรมสรรพากร	
10.	ผู้แทน สำนักผังเมือง กรุงเทพมหานคร	กรรมการ
11.	ผู้แทน องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)	กรรมการ
12.	ผู้แทน สถาบันอาคารเขียวไทย	กรรมการ
13.	นางศิรินทร วงศ์เสาวศุภ กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	กรรมการและเลขานุการ
14.	นายกมล ตันพิพัฒน์ บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด	ผู้ช่วยเลขานุการ

PEECB Project Board (PB)

บทบาทหน้าที่

1.กำกับควบคุมการบริหารจัดการโครงการเพื่อให้บรรลุตามวัตถุประสงค์และเป้าหมายของโครงการ

2.ให้ความเห็นชอบแผนปฏิบัติงานของโครงการ แผนปฏิบัติงานประจำปี รวมถึงแผนการเงินของโครงการ และพิจารณาให้ความเห็นชอบการปรับเปลี่ยนแผนที่มีความจำเป็น

3.ให้คำแนะนำ ติดตาม และประเมินผลการดำเนินงาน รวมทั้งให้ความเห็นชอบรายงานผลการดำเนินงานโครงการ

4.แต่งตั้งคณะอนุกรรมการ คณะทำงาน ที่ปรึกษา ได้ตามความจำเป็นและเหมาะสมกับการดำเนินงานโครงการ

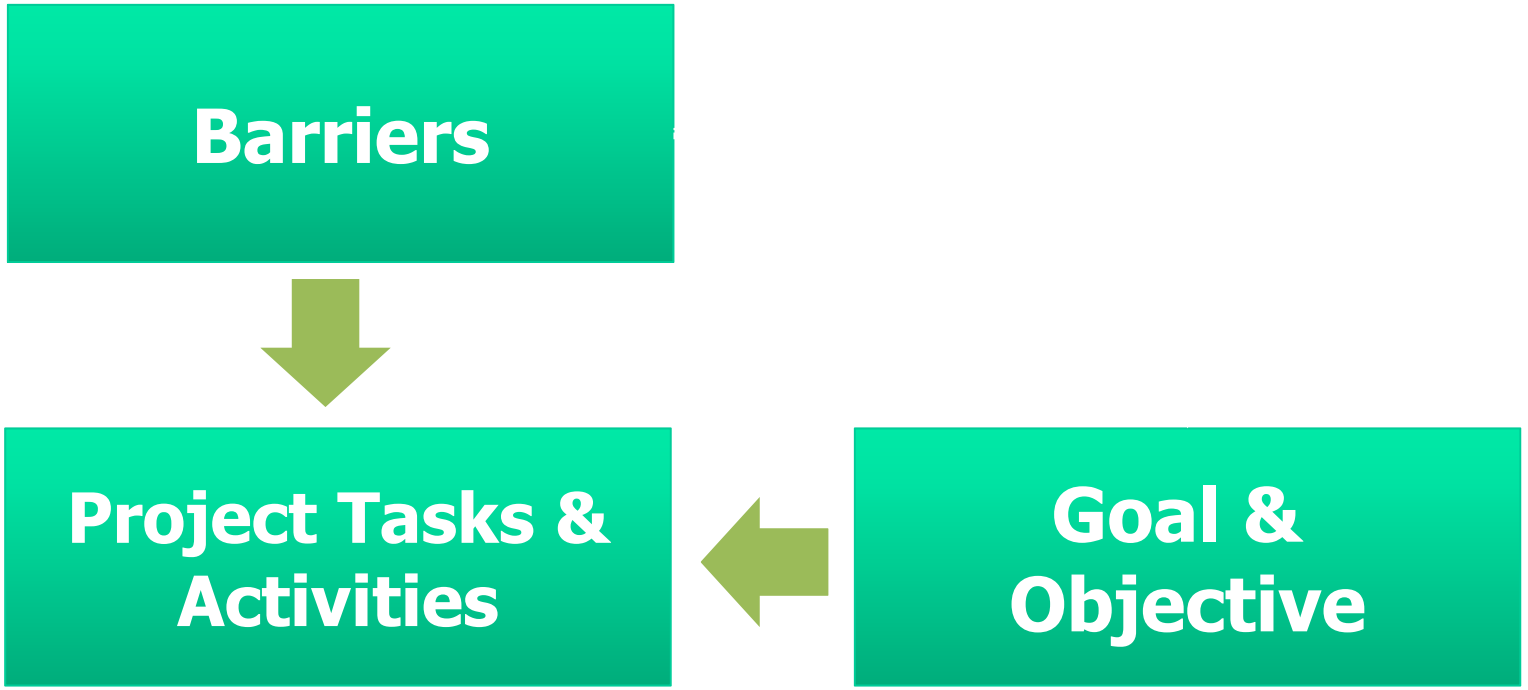
5.ปฏิบัติงานอื่น ๆ ที่เกี่ยวข้อง หรือเป็นประโยชน์ต่อความสำเร็จของโครงการ

วาระที่ 2

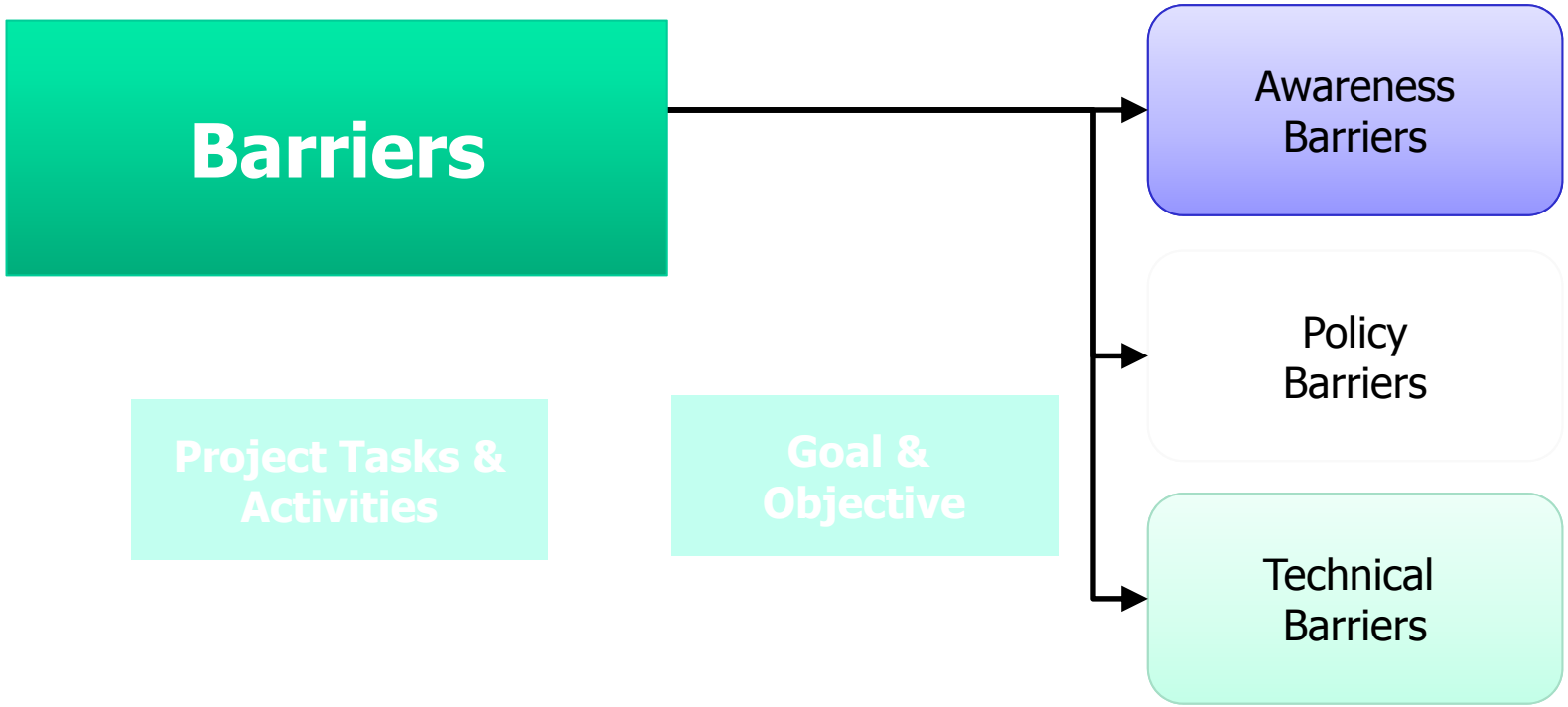
เรื่องแจ้งเพื่อทราบ

2.2 รายละเอียดโครงการ PEECB

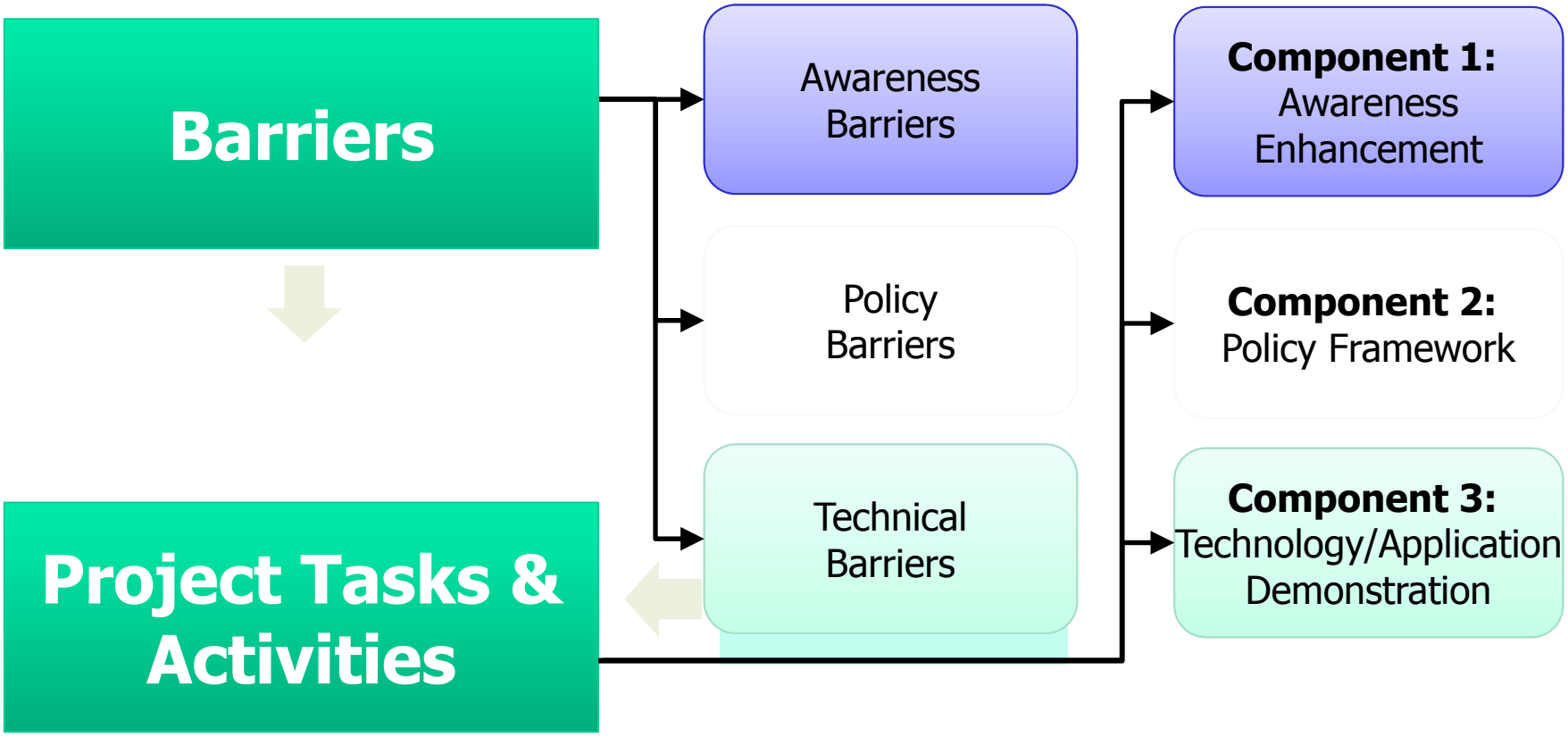
Rational and Conceptual Framework



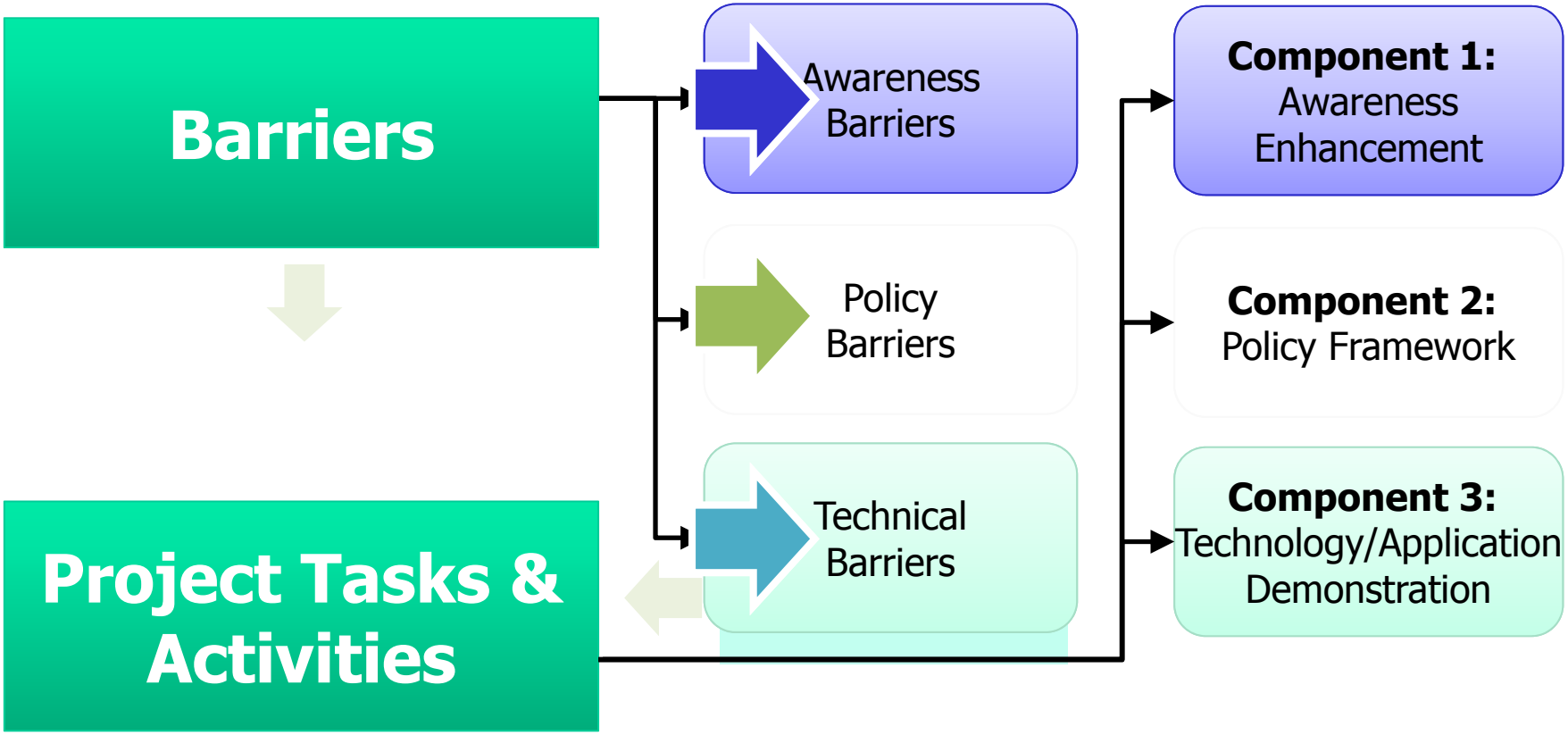
Barriers Identified



Project Approaches



Project Approaches



Project Goal & Objective

Reduce GHG Emissions

Barriers

Project Tasks & Activities

Goal & Objective

Promotion and facilitation of the widespread application of building energy efficiency technologies and practices in commercial buildings in Thailand

Outcome/Output – Component 1

Outcome

Enhanced awareness of the government, building sector and banks on EE technologies and practices

Outputs

1.1:Established Commercial Building **EE Information Center (CBEEC)**

1.2:A system of **information exchange and dissemination** on EE technologies and practices more widely for commercial building stakeholders

1.3:Developed and Promoted **Energy Use Simulation Models** for Commercial Building Design

1.4:Completed **training courses on EE technologies and practices, and financial** arrangement for commercial buildings

1.5:Completed **training courses on financial assessment of EE application projects** in commercial buildings

1.6:Established **business linkages** between suppliers of EE technologies, building owners, banks and building practitioners

Outcome/Output – Component 2

Outcome

Effective implementation of favorable policies that encourage EE technologies and practices for commercial building in Thailand

Outputs

2.1 Updated and more **effective policy measures on energy efficiency** in commercial buildings

2.2 Revised and up-to-date **data and information** to facilitate policy implementation of commercial building EE

2.3 Approved and implemented **new and improved fiscal policies and financing schemes** for commercial buildings

2.4 Approved **energy efficient promotion action plan (short and long term)** to supplement DEDE activities

Outcome/Output – Component 3

Outcomes

EE Building Technologies and Applications Demonstration

Outputs

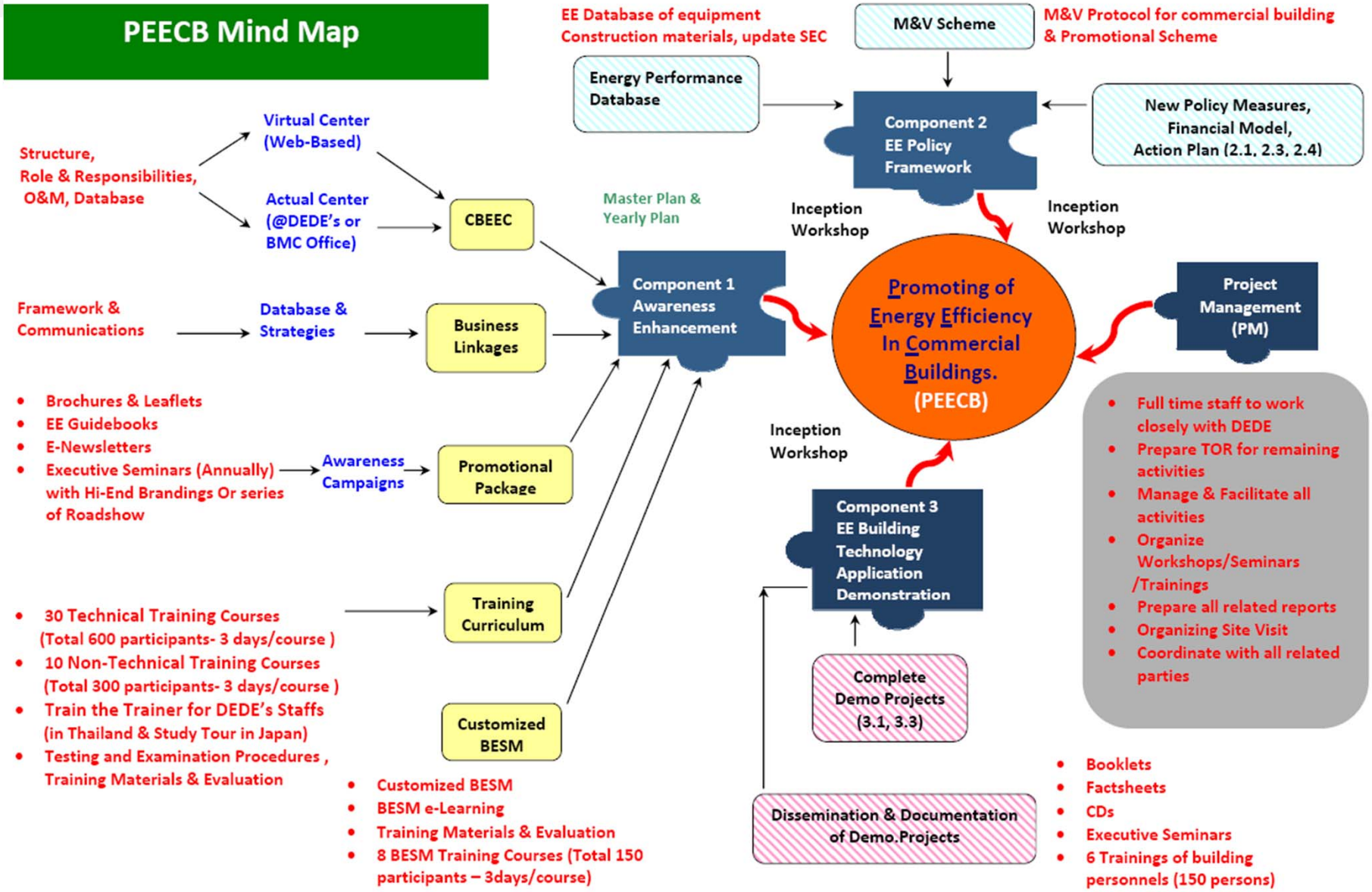
3.1 Installed and operational **demonstration projects** in selected buildings

3.2. - **Documentation of the of the demonstration projects and available EE technologies** in the markets

- Completed **training courses for personnel attached to the demo projects** on the energy conserving operation and maintenance of EE measures in demo buildings

3.3 Completed project documents/**recommendations for replication projects** in the commercial building sector

PEECB Project Overview



GEF
UNDP
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY
BRIGHT

วาระที่ 3

เรื่องเพื่อพิจารณา

3.1 แผนดำเนินงานโครงการ และ แผนกิจกรรมประจำปี

แผนดำเนินงานโครงการ

Item	Details of Activiites/Sub-Activities	Y2013				Y2014				Y2015				Y2016				Y2017			
	% of Work Complete - Planning - By Quarter	5	5	5	10	10	10	10	5	5	5	5	5	5	5	5	5				
	Total Planning	5	10	15	25	35	45	55	60	65	70	75	80	85	90	95	100				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
PM	**Project Management**																				
	PM-A) Project Meeting & Workshop & Seminar																				
	PM-B) TOR for DEDE to select the competence consultant for Component 2 & 3																				
	PM-C) Project Board & Project Management Unit & Working Group																				
	PM-D) Project Administration																				
C1	**COMPONENT 1 : Awareness Enhancement on Building EE Technologies and Practices**																				
	1.1 Establish Commercial Building EE Information Center (CBEEC)																				
	1.2 A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders																				
	1.3 Development and Promoted Energy Use Simulation Models for Commercial Building Design																				
	1.4 Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings																				
	1.5 Completed training courses on financial assessment of EE application projects in commercial buildings																				
	1.6 Established business linkages between supplier of EE technologies, building owners, banks and building practitioners																				
C2	**COMPONENT 2 : EE Building Policy Frameworks**																				
	2.1 Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings																				
	2.2 Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE																				
	2.3 Approved and Implemented New and Improved Financing Models for Commercial Buildings																				
	2.4 Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities																				
C3	COMPONENT 3 : EE Building Technologies and Applications Demonstration																				
	3.1 Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings																				
	3.2 Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices																				
	3.3 Replication of demonstration projects within the commercial building sector																				

แผนดำเนินงานโครงการ

Item	Details of Activiites/Sub-Activities	Y2013				Y2014				Y2015				Y2016				Y2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
C1	**COMPONENT 1 : Awareness Enhancement on Building EE Technologies and Practices**																				
	1.1 Establish Commercial Building EE Information Center (CBEEC)																				
	1.1.1 Activity 1.1.1 Establishment of the Commercial Building EE Information Center (CBEEC)																				
	1.1.1 a Conduct of Situation Analysis																				
	1.1.1 b Design and Development of the CBEEC																				
	1.1.1 C Administration and Maintenance of the CBEEC																				
	1.1.1 d Collaboration on Database of the CBEEC																				
	1.2 A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders																				
	1.2.1 Activity 1.2.1 Promoting CBEEC as the information portal for the Commercial Bldg. Sector in Thailand																				
	1.2.1 a Design effective promotional scheme																				
	1.2.2 Activity 1.2.2 Implementation of Awareness Raising Campaigns																				
	1.2.2 a Review of Profiles and Level of Awareness of Target Audience																				
	1.2.2 b Compilation and Production of Marketing and Promotional Tools and Materials																				
	1.2.2 c Design and Implementation of Awareness Campaigns																				
	1.2.3 Activity 1.2.3 Implementation of Information Disclosure Program for Commercial Bldg. Energy Consumption																				
	1.2.3 a Design Information Disclosure (ID) program & publication materials (link with C2.2)																				
	1.3 Development and Promoted Energy Use Simulation Models for Commercial Building Design																				
	1.3.1 Activity 1.3.1 Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand																				
	1.3.1 a Assessment of the two (2) most popular simulation models																				
	1.3.2 Activity 1.3.2 Development of a Customized BESM for Commercial Buildings in Thailand																				
	1.3.2 a Selection and Modification of BESM																				
	1.3.2 b Preparation of Promotional and Training Program																				
	1.3.3 Activity 1.3.3 Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design																				
	1.3.3 a Conduct the BESM training courses																				
	1.4 Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings																				
	1.4.1 Activity 1.4.1 Capacity Building Need Assessment for Commercial Building Stakeholder																				
	1.4.1 a Scoping Study on the Training Program																				
	1.4.1 b Identification of Training Activities for Stakeholders																				
	1.4.1 c Development of the Overall Training Program																				
	1.4.2 Activity 1.4.2 Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings																				
	1.4.2 a Design of Technical Training Courses																				
	1.4.2 b Design and Preparation of Training Materials																				
	1.4.2 c Conduct of Training Program																				
	1.4.2 d Certification and Quality Assurance Mechanism																				
	1.4.2 e Training Program Monitoring and Evaluation																				
	1.4.2 f Sustainable Follow-up Capacity Development Program Design																				
	1.5 Completed training courses on financial assessment of EE application projects in commercial buildings																				
	1.5 Activity 1.5 Completed Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings																				
	1.5 a Design of Non-Technical Training Courses																				
	1.5 b Design and Preparation of Training Materials																				
	1.5 c Conduct of Training Program																				
	1.5 d Training Program Monitoring and Evaluation																				
	1.5 e Sustainable Follow-up Capacity Development Program Design																				
	Additional Activity : Design and Conduct the Capacity Building - Train the Trainer for DEDE's staff																				
	1 Design and develop the Train the Trainer curriculum for DEDE's staffs																				
	2 Develop and Preparation of Training Materials																				
	3 Conduct of Training Program																				
	1.6 Established business linkages between supplier of EE technologies, building owners, banks and building practitioners																				

แผนดำเนินงานโครงการ

	Details of Activiites/Sub-Activities	Y2013				Y2014				Y2015				Y2016				Y2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
COMPONENT 2 : EE Building Policy Frameworks																					
2.1	*Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings*																				
2.1.1	Evaluation and recommendation of effective approaches and incentives for inclusion of building EE technologies																				
	and practices in the design and operation of various types of commercial buidlings																				
2.1.1.1	Evaluation of Best EE Options for Commercial Buildings																				
2.1.1.2	Modification of Existing and Development of New EE Policy Instruments for Commercial Buildings																				
2.1.1.3	Seeking Approval on New and Modified Policy from Policymakers																				
2.1.2	Strengthening implementation effectiveness of the new Building Energy Code																				
2.1.2.1	Integration of the BEC Requirements with the EIA Approval Process																				
2.1.2.2	Establishment of the BEC Self-Learning Course for Building																				
2.1.2.3	Maintain Ongoing Dialogues with Municipalities and LAOs																				
2.1.2.4	Strengthening the Inter-Ministerial Coordination Process																				
2.1.3	Assessment of DEDE's building energy labeling scheme and preparation of recommentations for strengthening implementation in buildings																				
2.1.3.1	Review of Available Information on Buildings Energy Labeling and Green Building Scheme																				
2.1.3.2	Assessment and Recommendation of Collaboration between the DEDE's Building Energy Label and Other Rating Scheme/Awards for Commercial																				
2.2	*Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE*																				
2.2.1	Activity 2.2.1 Compilation and Update of Energy Performance Database for Building Construction Materials																				
	and Electrical Equipement for Commercial Buildings																				
2.2.1 a	Data Review of BESM Software																				
2.2.1 b	Compile and Update of Energy Performance Database																				
2.2.2	Activity 2.2.2 Review and Update of DEDE's SEC Studies and Compilation of Building Stock Data																				
2.2.2 a	Review the Existing Specific Energy Consumption Index (SEC)																				
2.2.2 b	Update the SEC for Commercial Building Sector in Thailand																				
2.2.3	Activity 2.2.3 Review and Assessment of DEDE's M&V Scheme and Development of an Improved M&V Protocol																				
	for Commercial Building EE Projects																				
2.2.3 a	Review Existing M&V Scheme for Completed Projects in Thailand																				
2.2.3 b	Develop recommended M&V Scheme for Commercial Bldgs EE Project in Thailand																				
2.3	*Approved and Implemented New and Improved Financing Models for Commercial Buildings*																				
2.3.1	Development of new and improved financing models for EE commercial building investments																				
2.3.2	Approval and implementation of new fiscal policies to promote EE building design for new existing buildings																				
2.3.2.1	Conclusion of New Fiscal Policies to Promote EE building Design for New and Existing Buildings																				
2.3.2.2	Organization and Conduct of EE Building Fiscal Policy Workshop																				
2.3.2.3	Conduct of Targeted Policy Coordination Meetings																				
2.3.2.4	Approval and Implementation of new fiscal policies for EE building Projects																				
2.4	*Approved energy efficiency promotion action plan (short and long term) to supplement DEDE Activities*																				
2.4	Preparation of draft energy efficiency promotion Action Plan (Short and long term) to supplement DEDE activities																				

แผนดำเนินงานโครงการ

Item	Details of Activiites/Sub-Activities	Y2013				Y2014				Y2015				Y2016				Y2017			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
C3	COMPONENT 3 : EE Building Technologies and Applications Demonstration																				
	3.1 *Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings*																				
	3.1.1 Installed and operational demonstration projects in selected buildings																				
	3.1.1.1 Conduct of comprehensive feasibility studies and determination of implementation requirement, costing and engineering studies/design of selected demonstration projects																				
	3.1.1.1a conduct of Comprehensive Feasibility Studies of Demonstration Projects																				
	3.1.1.1b Determination of PEECB Implementation Requirements for Demonstration Projects																				
	3.1.1.1c Establishment of Baseline Data for the Demonstration Project Sites																				
	3.1.1.1d Finalized Design of Demonstration Projects																				
	3.2 *Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices*																				
	3.2.1 Documentation on the results of the demonstration projects and available EE technologies in the markets and dissemination of demo project results																				
	3.2.1.1 Activity 3.2.1.1 Documentation of Results of the Demonstration Projects																				
	3.2.1.1 a Collect Data and Information of Demonstration Projects																				
	3.2.1.1 b Documentation of Results of the Demonstration Projects																				
	3.2.1.2 Activity 3.2.1.2 Documentation of Information on the Availability and Quality of EE Technologies and Practices																				
	Applied in Thailand and Other Countries																				
	3.2.1.2 a Review the Existing Demonstration Projects and Case Studies in Other Countries																				
	3.2.1.2 b Documentation of Information on the Availability & Quality of EE Technologies and Practices																				
	Applied in Thailand and Other Countries																				
	3.2.1.3 Activity 3.2.1.3 Dissemination of Successful Case Studies on Demo Projects																				
	3.2.1.3 a Dissemination of Successful Case Studies on Demo Projects																				
	3.2.2 Completed training courses for personnel attached to the demo projects																				
	3.2.2.1 Activity 3.2.2.1 Design and Conduct of Training Courses for Demo Building Personnel																				
	3.2.2.1 a Design the Training Course Outline on Demo Projects & DEDE's Capacity Building																				
	3.2.2.1 b Conduct the training Courses on Demo Projects																				
	3.3 *Replication of demonstration projects within the commercial building sector*																				
	3.3.1 Completed project documents/recommendations for EE project replication in the commercial building sector																				
	3.3.1.1 Preparation of project documents/recommendations for project replication in hotels, hospitals, office buildings and shopping malls																				

แผนกิจกรรมประจำปี

ระยะที่ ๑ (Y2013)

มีนาคม - ธันวาคม พ.ศ.๒๕๕๖

การศึกษา ทบทวน กำหนดรูปแบบและแนวทางในการดำเนินการโครงการ สำหรับภารกิจ (Component) ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)

การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 กำหนดรูปแบบการจัดตั้งศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 กำหนดรูปแบบการรณรงค์เพื่อกระตุ้นการมีส่วนร่วมในงานด้านประสิทธิภาพพลังงานในอาคารจากผู้มีส่วนเกี่ยวข้องในภาคส่วนต่าง ๆ

กำหนดจัดกิจกรรมประชาสัมพันธ์โครงการในปี ๒๕๕๖

๑. จัดงานประชาสัมพันธ์เปิดตัวโครงการ ในระหว่างเดือนกรกฎาคม-สิงหาคม ๒๕๕๖

C-1.3 กำหนดแนวทางการปรับปรุงโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 จัดทำโครงสร้างหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 จัดทำโครงสร้างหลักสูตรฝึกอบรมความรู้ทั่วไปด้านการประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 กำหนดรูปแบบการส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

แผนกิจกรรมประจำปี

ระยะที่ ๑ มีนาคม - ธันวาคม พ.ศ.๒๕๕๖
(Y2013) การศึกษา ทบทวน กำหนดรูปแบบและแนวทางในการดำเนินการโครงการ สำหรับภารกิจ (Component) ต่าง ๆ ดังนี้

ภารกิจที่ ๒ (Component-2, C-2)
การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 วิเคราะห์นโยบายและมาตรการที่เหมาะสมสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคาร

C-2.2 ทบทวนข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกี่ยวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-2.3 กำหนดรูปแบบการส่งเสริมด้านการลงทุนสำหรับโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-2.4 ร่างแนวทางการจัดทำแผนส่งเสริมด้านประสิทธิภาพพลังงานในอาคาร (แผนระยะสั้นและแผนระยะยาว)

แผนกิจกรรมประจำปี

ระยะที่ ๑ (Y2013) มีนาคม - ธันวาคม พ.ศ.๒๕๕๖

การศึกษา ทบทวน กำหนดรูปแบบและแนวทางในการดำเนินการโครงการ สำหรับภารกิจ (Component) ต่าง ๆ ดังนี้

ภารกิจที่ ๓ (Component-3, C-3)

การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 ศึกษาความเป็นไปได้ในการประยุกต์ใช้เทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารที่เข้าร่วมเป็นอาคารสาธิต พร้อมกำหนดค่าฐานการใช้พลังงาน และแบบการปรับปรุงอาคารโดยใช้เทคโนโลยีด้านประสิทธิภาพพลังงาน

รายชื่อหน่วยงานที่แสดงเจตจำนงเข้าร่วมการสาธิตฯ มีดังนี้

๑. โรงพยาบาลลำพูน
๒. สำโรงการแพทย์
๓. การไฟฟ้าส่วนภูมิภาค
๔. กระทรวงสาธารณสุข
๕. โรงแรมเซ็นทารา แอนด์ รีสอร์ต
๖. โรงแรมคาทีน่า
๗. บริษัท เอกชัย ดีสทีบิวชั่น จำกัด (เทสโก้ โลตัส)
๘. Thai Energy Conservation Co.,Ltd.
๙. บริษัท แอร์โค จำกัด (เทรน ประเทศไทย)

แผนกิจกรรมประจำปี

ระยะที่ ๒ (Y2014) มกราคม - ธันวาคม พ.ศ.๒๕๕๗

การพัฒนาเครื่องมือในการดำเนินการโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)

การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 พัฒนา ประชาสัมพันธ์ และดำเนินงานศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 ประชาสัมพันธ์ และจัดกิจกรรมต่าง ๆ เพื่อรณรงค์การมีส่วนร่วมพัฒนาประสิทธิภาพพลังงานในอาคาร จากภาคส่วนต่าง ๆ ตามรูปแบบที่กำหนดในการดำเนินการระยะที่ ๑

C-1.3 พัฒนาและปรับปรุงโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 พัฒนาและจัดฝึกอบรมหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 พัฒนาและจัดฝึกอบรมหลักสูตรฝึกอบรมความรู้ทั่วไปด้านประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 จัดกิจกรรมตามรูปแบบต่าง ๆ ที่กำหนดในการดำเนินโครงการระยะที่ ๑ เพื่อส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

แผนกิจกรรมประจำปี

ระยะที่ ๒ (Y2014) มกราคม - ธันวาคม พ.ศ.๒๕๕๗

การพัฒนาเครื่องมือในการดำเนินการโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๒ (Component-2, C-2)

การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 จัดทำนโยบายและกำหนดมาตรการที่เหมาะสมสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคารตามผลการวิเคราะห์ในโครงการระยะที่ ๑ พร้อมทั้งประสานงานกับหน่วยงานต่าง ๆ เพื่อให้นโยบายและมาตรการที่กำหนดนำไปปฏิบัติได้อย่างเป็นรูปธรรม

C-2.2 ปรับปรุงข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกียวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-2.3 ประสานงาน จัดประชุมเชิงปฏิบัติการ เพื่อรับฟังความเห็นสำหรับรูปแบบการส่งเสริมด้านการลงทุนสำหรับโครงการด้านประสิทธิภาพพลังงานในอาคารที่กำหนดในการดำเนินโครงการระยะที่ ๑

C-2.4 จัดทำแผนส่งเสริมด้านประสิทธิภาพพลังงานในอาคาร (แผนระยะสั้นและแผนระยะยาว)

แผนกิจกรรมประจำปี

ระยะที่ ๒ มกราคม - ธันวาคม พ.ศ.๒๕๕๗

(Y2014) การพัฒนาเครื่องมือในการดำเนินการโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๓ (Component-3, C-3)

การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 สรุปแบบปรับปรุงอาคารโดยใช้เทคโนโลยีประสิทธิภาพพลังงาน

C-3.2 ตรวจสอบและตรวจวัดข้อมูลการใช้พลังงาน และผลการใช้พลังงานก่อนและหลังการปรับปรุงอาคารที่ทำการสาธิตเทคโนโลยีประสิทธิภาพพลังงาน

แผนกิจกรรมประจำปี

ระยะที่ ๓ (Y2015 – Y2016) มกราคม พ.ศ.๒๕๕๘ – พฤศจิกายน พ.ศ.๒๕๕๙ การขยายผลการดำเนินโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)

การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 ประชาสัมพันธ์ และดำเนินงานศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 ประชาสัมพันธ์ และจัดกิจกรรมต่าง ๆ เพื่อรณรงค์การมีส่วนร่วมพัฒนาประสิทธิภาพพลังงานในอาคาร จากภาคส่วนต่าง ๆ ตามรูปแบบที่กำหนดในการดำเนินการระยะที่ ๑

C-1.3 จัดทำและดำเนินการฝึกอบรมหลักสูตรฝึกอบรมการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 จัดฝึกอบรมและติดตามผลหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 จัดฝึกอบรมและติดตามผลหลักสูตรฝึกอบรมความรู้ทั่วไปด้านประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 จัดกิจกรรมตามรูปแบบต่าง ๆ ที่กำหนดในการดำเนินโครงการระยะที่ ๑ เพื่อส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

แผนกิจกรรมประจำปี

ระยะที่ ๓ (Y2015 – Y2016) มกราคม พ.ศ.๒๕๕๘ – พฤศจิกายน พ.ศ.๒๕๕๙
การขยายผลการดำเนินโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๒ (Component-2, C-2)
การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 ประชาสัมพันธ์นโยบายและมาตรการสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคารตามผลการจัดทำในโครงการระยะที่ ๒ พร้อมทั้งประสานงานกับหน่วยงานต่าง ๆ เพื่อให้นโยบายและมาตรการที่กำหนดนำไปปฏิบัติได้อย่างเป็นรูปธรรม

C-2.2 ปรับปรุงข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกียวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

แผนกิจกรรมประจำปี

ระยะที่ ๓ (Y2015 – Y2016) มกราคม พ.ศ.๒๕๕๘ – พฤศจิกายน พ.ศ.๒๕๕๙
การขยายผลการดำเนินโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๓ (Component-3, C-3)
การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 จัดทำเอกสารและสื่อเผยแพร่ผลการสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคาร

C-3.2 จัดกิจกรรมและหลักสูตรฝึกอบรมเพื่อถ่ายทอดผลการสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงาน

C-3.3 จัดเตรียมแผนงานการขยายผลเทคโนโลยีด้านประสิทธิภาพพลังงาน

ระยะที่ ๔ (Y2017) ธันวาคม พ.ศ.๒๕๕๙ - มกราคม พ.ศ.๒๕๖๐
สรุปผลการดำเนินโครงการ

แผนกิจกรรม

Activities	Period	Remark
1. Inception Workshop	22 May 2013	1st PB Meeting
2. Project Board (PB) Meeting	2 times/Y	Q1 & Q4
3. Project Management Unit (PMU) Meeting	Monthly	
4. Working Group Meeting	Monthly	
5. Stakeholder Meeting	To be confirmed	
6. Project Public Seminar	Yearly	
7. Technical Training Course	Q2Y14 – Q2Y16	Activity 1.4.2
8. Non-Technical Training Course	Q3Y14 – Q2Y16	Activity 1.5
9. Building Energy Simulation Model (BESM) Training Course	Q2Y15 – Q2Y16	Activity 1.3.1
10. Demo Project Training Course	Q2Y15-Q2Y16	
11. Train the Trainer Course for DEDE's staff	Q4Y13 & Q2Y16	C-1 & C-3

แผนการเงินของโครงการ

Payment Schedule

Project : Promoting Energy Efficiency in Commercial Buildings (PEECB) Project

	Year					
	2013	2014	2015	2016	2017	Total (Baht)
Component -1 (Baht)	6,298,740	12,347,530	6,298,740	4,974,005	1,714,985	**31,634,000**
Component -2 (Baht)	3,199,810	6,299,640	6,499,900	2,374,975	55,675	**18,430,000**
Component -3 (Baht)	5,749,900	13,499,400	15,499,700	6,374,775	350,225	**41,474,000**
PM (Baht)	2,249,550	2,849,430	1,699,660	1,274,745	378,615	**8,452,000**
Total (Baht)	**17,498,000**	**34,996,000**	**29,998,000**	**14,998,500**	**2,499,500**	**99,990,000**

Contract 1 : PM + Component 1 + Review of Component 2+3

Contract Amount (baht)				Year					
49,990,000	**Estimated Month**		**%**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
If contract signed March 2013	@								
Payment No.1 (Inception)	2	May-13	5	2,499,500					
Payment No.2 (PG-1)	3	Jun-13	5	2,499,500					
Payment No.3 (PG-2)	6	Sep-13	5	2,499,500					
Payment No.4 (PG-3)	9	Dec-13	5	2,499,500					
Payment No.5 (PG-4)	12	Mar-14	10		4,999,000				
Payment No.6 (PG-5)	15	Jun-14	10		4,999,000				
Payment No.7 (PG-6)	18	Sep-14	10		4,999,000				
Payment No.8 (PG-7)	21	Dec-14	10		4,999,000				
Payment No.9 (PG-8)	24	Mar-15	5			2,499,500			
Payment No.10 (PG-9)	27	Jun-15	5			2,499,500			
Payment No.11 (PG-10)	30	Sep-15	5			2,499,500			
Payment No.12 (PG-11)	33	Dec-15	5			2,499,500			
Payment No.13 (PG-12)	36	Mar-16	5				2,499,500		
Payment No.14 (PG-13)	39	Jun-16	5				2,499,500		
Payment No.15 (PG-14)	42	Sep-16	5				2,499,500		
Payment No.16 (Final))	48	Mar-17	5					2,499,500	
Total contract -1			**100**	**9,998,000**	**19,996,000**	**9,998,000**	**7,498,500**	**2,499,500**	**49,990,000**

แผนงบประมาณ

Payment Schedule							
Project : Promoting Energy Efficiency in Commercial Buildings (PEECB) Project							
				Year			
	2013	2014	2015	2016	2017	Total (Baht)
Component -1 (Baht)	6,298,740	12,347,530	6,298,740	4,974,005	1,714,985	**31,634,000**
Component -2 (Baht)	3,199,810	6,299,640	6,499,900	2,374,975	55,675	**18,430,000**
Component -3 (Baht)	5,749,900	13,499,400	15,499,700	6,374,775	350,225	**41,474,000**
PM (Baht)	2,249,550	2,849,430	1,699,660	1,274,745	378,615	**8,452,000**
Total (Baht)	**17,498,000**	**34,996,000**	**29,998,000**	**14,998,500**	**2,499,500**	**99,990,000**

Contract 2 : Main contractor of Component 2+3									
Contract Amount (baht)					Year				
50,000,000.00	Estimated Month		%	2013	2014	2015	2016	2017	Total
If contract signed June 2013	@								
Payment No.1 (Inception)	1	Aug-13	5	2,500,000					
Payment No.2 (PG-1)	3	Sep-13	5	2,500,000					
Payment No.3 (PG-2)	6	Dec-13	5	2,500,000					
Payment No.4 (PG-3)	9	Mar-14	5		2,500,000				
Payment No.5 (PG-4)	12	Jun-14	5		2,500,000				
Payment No.6 (PG-5)	15	Sep-14	5		2,500,000				
Payment No.7 (PG-6)	18	Dec-14	5		2,500,000				
Payment No.8 (PG-7)	21	Mar-15	10		5,000,000				
Payment No.9 (PG-8)	24	Jun-15	10			5,000,000			
Payment No.10 (PG-9)	27	Sep-15	10			5,000,000			
Payment No.11 (PG-10)	30	Dec-15	10			5,000,000			
Payment No.12 (PG-11)	33	Mar-16	10			5,000,000			
Payment No.13 (PG-12)	36	Jun-16	5				2,500,000		
Payment No.14 (Final)	40	Oct-16	10				5,000,000		
Total contract - 2			**100**	**7,500,000**	**15,000,000**	**20,000,000**	**7,500,000**	**0**	**50,000,000**

วาระที่ 4 : เรื่องอื่น ๆ

การประชุมคณะกรรมการอำนวยการโครงการ

(Project Board)

ครั้งที่ 2/2556

ขอบคุณครับ

การจัดตั้ง“คณะกรรมการอำนวยการโครงการ (Project Board)”

โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ
(Promoting Energy Efficiency in Commercial Buildings)
-PEECB-

กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน กระทรวงพลังงาน

เมษายน 2556
การจัดตั้ง "คณะกรรมการอำนวยการโครงการ (Project Board)"

1. ความเป็นมาของโครงการ

ปัญหาการขาดแคลนแหล่งพลังงานและความมั่นคงด้านพลังงานเป็นปัญหาสำคัญยิ่งและทวีความรุนแรงขึ้นเรื่อยๆ จากการศึกษาปริมาณการใช้ไฟฟ้าในภาคธุรกิจในระยะ 10 ปีที่ผ่านมา พบว่ามีอัตราการเจริญเติบโตสูงสุดเมื่อเทียบกับภาคส่วนอื่นๆ ส่งผลโดยตรงต่อการเพิ่มการปลดปล่อยก๊าซเรือนกระจก กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน (พพ.) ซึ่งเป็นหน่วยงานหลักที่รับผิดชอบภารกิจด้านการอนุรักษ์พลังงานและการพัฒนาเทคโนโลยีด้านประสิทธิภาพพลังงาน ได้ร่วมมือกับ สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP) ในการดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นโครงการความร่วมมือระหว่างประเทศที่สนับสนุนและส่งเสริมเทคโนโลยีการใช้พลังงานในอาคารอย่างมีประสิทธิภาพ จุดมุ่งหมายเพื่อลดการปล่อยก๊าซเรือนกระจก โดยโครงการได้รับการสนับสนุนเงินให้เปล่าจากกองทุนสิ่งแวดล้อมโลก (Global Environmental Facility, GEF) และงบประมาณสนับสนุนสมทบจากภาครัฐและภาคเอกชนภายในประเทศ

2. วัตถุประสงค์และเป้าหมายของโครงการ

การดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ในครั้งนี้ มีวัตถุประสงค์หลักดังนี้

2.1 เพื่อเสริมสร้างจิตสำนึกในด้านประสิทธิภาพพลังงานของอาคารในประเทศไทย รวมถึงการจัดตั้งของศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ การฝึกอบรมบุคลากร และการพัฒนาแบบจำลองสภาวะอาคารอนุรักษ์พลังงานที่ถูกกำหนดเพื่ออาคารธุรกิจในประเทศไทย

2.2 เพื่อศึกษาและจัดทำกรอบนโยบาย แผนการดำเนินงานระยะสั้นและระยะยาวเพื่อส่งเสริมประสิทธิภาพพลังงานในอาคารธุรกิจ พร้อมทั้งการประเมินผลและปรับปรุงมาตรการเชิงนโยบายด้านการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ

2.3 เพื่อสาธิตการประยุกต์ใช้เทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารธุรกิจ ซึ่งสามารถเผยแพร่และขยายผลไปยังอาคารอื่นๆ ต่อไป

3. ข้อมูลเกี่ยวกับภารกิจของโครงการ

3.1 ข้อมูลเกี่ยวกับภารกิจของโครงการ

ภารกิจของโครงการ จะเป็นไปตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นข้อตกลงที่ลงนามรับรองโดยผู้บริหารของกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน และ UNDP ทั้งนี้กรอบการดำเนินงานจะแบ่งออกเป็น 3 ภารกิจหลัก (Component) ดังนี้

Component 1: การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร
Component 2: การจัดกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร
Component 3: การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

3.2 ระยะเวลาโครงการ 48 เดือน

3.3 แนวทางการดำเนินการ

3.3.1 จัดตั้งคณะกรรมการอำนวยการโครงการ (Project Board)
3.3.2 จัดเตรียมแผนการดำเนินการโครงการทั้งหมดและนำเสนอต่อ คณะกรรมการอำนวยการโครงการ (Project Board)
3.3.3 ดำเนินโครงการใน 3 ส่วน ตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) โดยมีรายละเอียดกรอบการดำเนินงานสรุปไว้ใน ภาคผนวก ก) แนบท้ายเอกสารฉบับนี้

4. บทบาทและหน้าที่ของคณะกรรมการฯ

คณะกรรมการอำนวยการโครงการ (Project Board) ที่จะจัดตั้งขึ้นภายใต้โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ จะมีบทบาทและหน้าที่หลักดังต่อไปนี้

1. กำกับควบคุมการบริหารจัดการโครงการเพื่อให้บรรลุตามวัตถุประสงค์และเป้าหมายของโครงการ
2. ให้ความเห็นชอบแผนปฏิบัติงานของโครงการ แผนปฏิบัติงานประจำปี รวมถึงแผนการเงินของโครงการ และพิจารณาให้ความเห็นชอบการปรับเปลี่ยนแผนที่มีความจำเป็น
3. ให้คำแนะนำ ติดตาม และประเมินผลการดำเนินงาน รวมทั้งให้ความเห็นชอบรายงานผลการดำเนินงานโครงการ
4. แต่งตั้งคณะอนุกรรมการ คณะทำงาน ที่ปรึกษา ได้ตามความจำเป็นและเหมาะสมกับการดำเนินงานโครงการ
5. ปฏิบัติงานอื่นๆ ที่เกี่ยวข้องและเป็นประโยชน์ต่อความสำเร็จของโครงการ

5. โครงสร้างและรายชื่อของคณะกรรมการฯ

โครงสร้างและรายชื่อของคณะกรรมการอำนวยการโครงการ (Project Board) ภายใต้โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) กำหนดไว้ดังนี้

๑.	นายอำนวย ทองสถิตย์ อธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	ประธานกรรมการ
๒.	นายทวารัฐ สูตะบุตร รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
๓.	นายประมวล จันทร์พงษ์ รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
๔.	ผู้แทน สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม	กรรมการ
๕.	ผู้แทน สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP)	กรรมการ
๖.	ผู้แทน สำนักงานนโยบายและแผนพลังงาน	กรรมการ
๗.	ผู้แทน กรมโยธาธิการและผังเมือง	กรรมการ
๘.	ผู้แทน กรมควบคุมมลพิษ	กรรมการ
๙.	ผู้แทน กรมสรรพากร	กรรมการ
๑๐.	ผู้แทน สำนักผังเมือง กรุงเทพมหานคร	กรรมการ
๑๑.	ผู้แทน องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)	กรรมการ
๑๒.	ผู้แทน สถาบันอาคารเขียวไทย	กรรมการ
๑๓.	นางศิรินทร วงษ์เสาวศุภ ผู้เชี่ยวชาญด้านอนุรักษ์พลังงาน กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	กรรมการและเลขานุการ
๑๔.	นายกมล ตันพิพัฒน์ บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด	ผู้ช่วยเลขานุการ

ภาคผนวก ก)

กรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) สำหรับ 3 ภารกิจหลัก (Component) สรุปได้ดังนี้

1. Component 1: Awareness Enhancement on Building EE Technologies and Practices (การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร)
ประกอบด้วยการดำเนินการดังนี้

1.1: Established Commercial Building EE Information Center (CBEEC)

1.1.1: Establishment of the Commercial Building EE Information Center (CBEEC)
- 1.1.1.1: Conduct of Situation Analysis
- 1.1.1.2: Design and Development of the CBEEC
- 1.1.1.3: Administration and Maintenance of the CBEEC
- 1.1.1.4: Collaboration on Database Partners

1.2: A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders

1.2.1: Promoting CBEEC as the Information Portal for the Commercial Building Sector in Thailand

1.2.2: Implementation of Awareness Raising Campaigns
- 1.2.2.1: Review of Profiles and Level of Awareness of Target Audience
- 1.2.2.2: Compilation and Production of Marketing and Promotional Tools and Materials
- 1.2.2.3: Design and Implementation of Awareness Campaigns

1.2.3: Implementation of Information Disclosure Program for Commercial Building Energy Consumption

1.3: Developed and Promoted Energy Use Simulation Models for Commercial Building Design

1.3.1: Assessment of the Utilization of Building Energy Simulation Models (BESM) in Thailand

1.3.2: Development of a Customized BESM for Commercial Buildings in Thailand
- 1.3.2.1: Selection and Modification of BESM
- 1.3.2.2: Preparation of Promotional and Training Program

1.3.3: Implementation of Sustainable Promotional and Training Program on EE Commercial Building Design

1.4: Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings

1.4.1: Capacity Building Need Assessment for Commercial Building Stakeholder

1.4.1.1: Scoping Study on the Training Program

1.4.1.2: Identification of Training Activities for Stakeholders

1.4.1.3: Development of the Overall Training Program

1.4.2: Design and Implementation of Training Courses on EE Technologies and Practices, and Financial Arrangement for Commercial Buildings

1.4.2.1: Design of Technical Training Courses

1.4.2.2: Design and Preparation of Training Materials

1.4.2.3: Conduct of Training Program

1.4.2.4: Certification and Quality Assurance Mechanism

1.4.2.5: Training Program Monitoring and Evaluation

1.4.2.6: Sustainable Follow-up Capacity Development Program Design

1.5: Completed training courses on financial assessment of EE application projects in commercial buildings

1.5.1: Design and Implementation of Training Courses on Financial Assessment of EE Application Projects in Commercial Buildings

1.5.1.1: Design of Non-Technical Training Courses

1.5.1.2: Design and Preparation of Training Materials

1.5.1.3: Conduct of Training Program

1.5.1.4: Training Program Monitoring and Evaluation

1.5.1.5: Sustainable Training Program Design

1.6: Established business linkages between suppliers of EE technologies, building owners, banks and building practitioners

1.6.1: Establishment of Business Links between Owners/Managers of Commercial Buildings, EE Technology Suppliers, Financial Institutes and Building Practitioners

2. Component 2: EE Building Policy Frameworks
(การจัดกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร)
ประกอบด้วยการดำเนินการดังนี้

2.1: Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings

2.1.1: Evaluation and recommendation of effective approaches and incentives for inclusion of building EE technologies and practices in the design and operation of various types of commercial buildings

2.1.1.1: Evaluation of Best EE Options for Commercial Buildings

2.1.1.2: Modification of Existing and Development of New EE Policy Instruments for Commercial Buildings
2.1.1.3: Seeking Approval on New and Modified Policy from Policymakers

2.1.2: Strengthening implementation effectiveness of the new Building Energy Code

2.1.2.1: Integration of the BEC Requirements with the EIA Approval Process
2.1.2.2: Establishment of the BEC Self-Learning Course for Building Practitioner and LAOs
2.1.2.3: Maintain Ongoing Dialogues with Municipalities and LAOs
2.1.2.4: Strengthening the Inter-Ministerial Coordination Process

2.1.3: Assessment of DEDE's building energy labeling scheme and preparation of recommendations for strengthening implementation in commercial buildings
2.1.3.1: Review of Available Information on Buildings Energy Labeling and Green Building Scheme
2.1.3.2: Assessment and Recommendation of Collaboration between the DEDE's Building Energy Label and Other Rating Schemes/Awards for Commercial Buildings

2.2: Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE

2.2.1: Compilation and Update of Energy Performance Database for building construction materials and electrical equipment for commercial buildings
2.2.2: Review and update of DEDE's SEC studies and compilation of building stock data
2.2.3: Review and assessment of DEDE's M&V scheme and development of an improved M&V protocol for commercial building EE projects

2.3: Approved and Implemented New and Improved Financing Models for Commercial Buildings

2.3.1: Development of new and improved financing models for EE commercial building investments

2.3.2: Approval and implementation of new fiscal policies to promote EE building design for new and existing buildings
2.3.2.1: Conclusion of New Fiscal Policies to Promote EE Building Design for New and Existing Buildings
2.3.2.2: Organization and Conduct of EE Building Fiscal Policy Workshop
2.3.2.3: Conduct of Targeted Policy Coordination Meetings
2.3.2.4: Approval and Implementation of New Fiscal Policies for EE Building Projects

2.4: Approved energy efficient promotion action plan (short and long term) to supplement DEDE activities

2.4.1: Preparation of draft energy efficiency promotion Action Plan (short and long term) to supplement DEDE's activities

3. Component 3: EE Building Technology Applications Demonstration (การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้) ประกอบด้วยการดำเนินการดังนี้

3.1: Improved confidence in the feasibility, performance, energy, environmental and economic benefits of EE technologies and practices in commercial buildings;

3.1.1: Installed and operational demonstration projects in selected buildings

3.1.1.1: Conduct of comprehensive feasibility studies and determination of implementation requirements, costing and engineering studies/design of selected demonstration projects

3.1.1.2: Facilitation and support of procurement and installation of EE measures, operation of demonstration projects, and conduct of M&V

3.2: Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices;

3.2.1: Documentation on the results of the demonstration projects and available EE technologies in the markets and dissemination of demo project results

3.2.1.1: Documentation of results of the demonstration projects

3.2.1.2: Documentation of information on the availability and quality of EE technologies and practices applied in Thailand and other countries

3.2.1.3: Dissemination of Successful Case Studies on Demo Projects

3.2.2: Completed training courses for personnel attached to the demo projects

3.2.2.1: Design and Conduct of Training Courses for Demo Building Personnel

3.3: Replication of demonstration projects within the commercial building sector

3.3.1: Completed project documents/recommendations for EE project replication in the commercial building sector

3.3.1.1: Preparation of project documents/recommendations for project replication in hotels, hospitals, office buildings and shopping malls

PART II: Logical Framework Analysis (Project Planning Matrix)

Project Planning Matrix (PPM)

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
GOAL: Reduced intensity of GHG emissions from the commercial building sector	• Cumulative CO_2 emission reduction from the commercial building sector by End-Of-Project (EOP, Year 2015), kton CO_2eq	0	230	• CBEEC • DEDE's Energy Reports • Annual reports prepared by project partners (Industry/Professional Associations, Commercial Building Managements and Developers)	• GOT's commitment to commercial building EE remains firm • Current economic growth at least remains constant
	• % reduction in GHG emissions from the commercial buildings sector by EOP	0	1.2%		
OBJECTIVE: Promotion and facilitation of the widespread application of building energy efficiency technologies and practices in commercial buildings in Thailand	• Cumulative energy savings from the commercial building sector by Year 2015, GWh	0	396	• CBEEC • DEDE's Energy Reports • Annual reports prepared by project partners (Industry/Professional Associations, Commercial Building Managements and Developers)	• GOT's commitment to commercial building EE remains firm • Current economic growth at least remains constant
	• % Energy savings by EOP	0	1.2%		
	• % of new buildings that are fully compliant with the new Building Energy Code by EOP	20%	60%		
	• % of new buildings in Thailand that are classified as energy efficient buildings by EOP	10%	40%		
COMPONENT 1: Awareness Enhancement on Building EE Technologies and Practices					
OUTCOME 1: Enhanced awareness of the government, building sector and banks on EE technologies and practices	• % of overall commercial building stakeholders that agree to greater availability of pertinent information on EE technologies and practices through the PEECB project activities by Year 2015	0	80% (at least)	• Survey of and documented feedback from network members and users	

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
	• % of overall commercial building stakeholders that are satisfied with availability and quality of information available from the PEECB project by Year 2015	0	70% (at least)		
OUTPUT 1.1: Establishment of the Commercial Building EE Information Center (CBEEC)	• % of overall commercial building stakeholders that are satisfied with availability and quality of CBEEC information services by Year 2015	0	70% (at least)	• Survey of and documented feedback from network members and users	
OUTPUT 1.2: A system of information exchange and dissemination on EE technologies and practices for commercial building stakeholders	• % of overall commercial building stakeholders that agree to greater availability of pertinent information on EE technologies and practices through CBEEC as well as promotional and outreach activities by Year 2015	0	80% (at least)	• Survey of and documented feedback from commercial building stakeholders, network members and users	
	• No. of users of the information exchange system by EOP	0	1,500		
	• No. of satisfied users of the information exchange system each year Starting Year 2012	0	70% (at least)		
OUTPUT 1.3: Developed and Promoted Energy Use Simulation Models for Commercial Building Design	• No. of modified BESMs with additional features (e.g. dual language user interface) by Year 2013	0	1	• Documentation on the improved building simulation model	
	• % of overall no. of trainees that are gainfully employing learned skills on EE building design by Year 2015	0	70% (at least)	• Post training course evaluation reports	
	• No. of new buildings that were designed using the modified BESMs by EOP	0	60	• A survey report on adoption and utilization among building designers	

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
OUTPUT 1.4: Completed training courses on EE technologies and practices, and financial arrangement for commercial buildings	• No. of completed training courses on EE technologies and practices, and financial arrangement for commercial buildings by EOP	0	7	• Documentation on the overall training courses/programs	
	• % of overall no. of trainees that are gainfully employing learned skills on EE building design, operation and maintenance by Year 2015	0	70% (at least)	• Post training course evaluation reports	
	• % of trainees that are engaged in EE building project design, implementation and financing by EOP	0	50%	• A survey report on adoption and utilization knowledge gained from the training	
OUTPUT 1.5: Completed training courses on financial assessment of EE application projects in commercial buildings	• No. of completed training courses on financial assessment of EE application projects in commercial buildings by EOP	0	7	• Documentation on the overall training courses/programs	
OUTPUT 1.6: Established business linkages between suppliers of EE technologies, building owners, banks and building practitioners	• No. of EE investment projects facilitated through business links by EOP	0	20	• List of EE investments in commercial buildings	Growth of the commercial building sector is maintained at the same level as the past 5 years.
	• No. of banks/FIs that have financed EE investment projects through the business links by EOP	0	5		
COMPONENT 2: EE Building Policy Frameworks					
OUTCOME 2: Effective implementation of favorable policies that encourage EE technologies and practices for commercial building in Thailand	• No. of new policy measures for commercial building EE approved and implemented by Year 2015	0	2	• Documentation on policy measures adopted by DEDE	
	• No. of fiscal policies approved by DEDE for implementation by Year 2013	0	1	• DEDE's report and PEECB project report	
	• No. of short and long term action plans for commercial building EE integrated into DEDE's national Energy Conservation Program by EOP	0	1	• Documentation on DEDE's EE policy and action plan	

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
OUTPUT 2.1: Updated and More Effective Policy Measures on Energy Efficiency in Commercial Buildings	• No. of new policy measures for commercial building EE approved and implemented by Year 2015	0	2	• Documentation on policy measures adopted by DEDE	
	• No. of existing policy measures for commercial building EE modified and implemented by Year 2015	0	2		
	• No. of recommendations on improved and innovative implementation approaches for EE rating/labeling/certification for commercial buildings in Thailand by Year 2013	0	2	• Recommendation report on policy options to strengthen EE rating/labeling/ certification for commercial buildings	
OUTPUT 2.2: Revised and Up-to-date Data and Information to Facilitate Policy Implementation of Commercial Building EE	• % of overall commercial building stakeholders that are satisfied with availability and quality of the energy performance database by Year 2015	0	70% (at least)	• Survey of and documented feedback from network members and users	
	• No. of building energy use profiles established by Year 2014	0	4	• Report on the SEC review and update	
	• No. of commercial building EE project referencing the improved M&V schemes by EOP	0	20	• PEECB project report	
OUTPUT 2.3: Approved and Implemented New and Improved Financing Models for Commercial Buildings	• No. of applicable fiscal policies on commercial building EE identified and formulated by Year 2012	0	3	• DEDE's report and PEECB project report	
	• No. of fiscal policies approved by DEDE for implementation by Year 2013	0	1		
	• No. of the approved policies that are implemented by EOP	0	1		
OUTPUT 2.4: Approved energy efficient promotion action plan (short and long term) to supplement DEDE activities	• No. of short and long term action plans for commercial building EE integrated into DEDE's national EE policy by EOP	0	1	• Documentation on DEDE's EE policy and action plan	
	• No. of activities in the action plan that were considered for inclusion in the National Energy Conservation Program by EOP	0	5	• DEDE's report and PEECB project report	
	• No. of activities in the approved action plan incorporated in the National Energy Conservation Program that were implemented by EOP	0	2	• Documentation on DEDE's EE policy and action plan	

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
COMPONENT 3: EE Building Technologies and Applications Demonstrations					
OUTCOME 3.1: Improved confidence in applying EE technologies and practices in commercial buildings in Thailand	• No. of commercial building owners/managers expressing interests and commitments in implementing EE investments by EOP	10	40	• Reports of surveys conducted as parts of information dissemination activities • PEECB project reports	
	• No. of building EE projects that adopted EE measures and designs being demonstrated and promoted by EOP	5	10		
OUTPUT 3.1.1: Installed and operational demonstration projects in selected buildings	• No. of demonstration project implemented and regularly monitored starting Year 2012	0	7	• Documentation of each demonstration project	
	• No of completed M&V exercises in accordance with the M&V guideline updated by the PEECB Project	0	7	• Annual M&V report of each demonstration project being implemented	
OUTCOME 3.2: Improved local technical and managerial capacity to design, manage and maintain EE technologies and practices	• % of overall no. of demo building personnel that are gainfully employing learned skills on EE building design, operation and maintenance by Year 2015	0	70% (at least)	• Post training evaluation report	
	• No. of new buildings constructed that are partly or entirely based on the information regarding success of the demonstrations by EOP	0	20	• PEECB project report	
OUTPUT 3.2.1: Documentation of the demonstration projects and available EE technologies in the markets and dissemination of demo project results	• % of overall no. of building practitioners that are aware of EE technologies/techniques available and applied in demo projects by Year 2015	0	70% (at least)	• PEECB project report	

Strategy	Success Indicator	Baseline	Target	Means of Verification	Assumptions
OUTPUT 3.2.2: Completed training courses for personnel attached to the demo project	• % of overall no. of demo building personnel that are gainfully employing learned skills on EE building design, operation and maintenance by Year 2015	0	70% (at least)	• Post training course evaluation reports	
OUTCOME 3.3: Replication of demonstration projects within the commercial building sector	• No. of new EE building projects designed based on, or influenced by, the results of the demonstration projects by EOP	0	20	• Documentation of completed replication projects	
OUTPUT 3.3.1: Completed project documents/recommendations for EE project replication in the commercial building sector	• No. of identified proven and feasible EE technologies and techniques that are applicable and applied in the Thai commercial building sector by EOP	0	5	• An assessment report	

รายงานการประชุม
คณะกรรมการอำนวยการโครงการ (Project Board)
โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ
(Promoting Energy Efficiency in Commercial Buildings, PEECB)
ครั้งที่ ๑/๒๕๕๖
วันพุธที่ ๒๒ พฤษภาคม พ.ศ. ๒๕๕๖
เวลา ๑๐.๐๐ – ๑๒.๐๐ น.
ห้องประชุมบุญรอด-นิธิพัฒน์ อาคาร ๗ ชั้น ๑๑ กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน

<u>คณะกรรมการฯ ที่เข้าร่วมประชุม</u>

๑. นายอำนวย ทองสถิตย์ ประธานกรรมการ
อธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน

๒. นางณัฏฐนิช อัศวภูษิตกุล กรรมการ
ผู้แทน สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม

๓. ดร.สุธาริน คูณผล กรรมการ
ผู้แทน สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP)

๔. นายศาณิส ยี่โถขาว กรรมการ
ผู้แทน กรมโยธาธิการและผังเมือง

๕. นางสาวอาระยา นันทโพธิเดช กรรมการ
ผู้แทน กรมควบคุมมลพิษ

๖. นางสาวปราณี นันทวโนทยาน กรรมการ
ผู้แทน กรมสรรพากร

๗. นายอาสา ทองธรรมชาติ กรรมการ
ผู้แทน สำนักผังเมือง กรุงเทพมหานคร

๘. นายจักกนิตต์ คณานุรักษ์ กรรมการ
ผู้แทน องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)

๙. ผศ.ดร.อรรจน์ เศรษฐบุตร กรรมการ
ผู้แทน สถาบันอาคารเขียวไทย

๑๐. นางศิรินทร วงษ์เสาวศุภ กรรมการและเลขานุการ
ผู้เชี่ยวชาญด้านอนุรักษ์พลังงาน กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน

๑๑. นายกมล ตันพิพัฒน์ ผู้ช่วยเลขานุการ
บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด

<u>คณะกรรมการฯ ที่ไม่เข้าร่วมประชุม</u>

๑.	นายทวารัฐ	สูตะบุตร	รองประธานกรรมการ
	รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน		
๒.	นายประมวล	จันทร์พงษ์	รองประธานกรรมการ
	รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน		
๓.	นายสิทธิโชติ	วันทวิน	กรรมการ
	ผู้แทน สำนักงานนโยบายและแผนพลังงาน		

<u>ผู้เข้าร่วมประชุม</u>

๑.	นายบรรพต	ดิสกุล	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๒.	นายประกอบ	เอี่ยมสะอาด	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๓.	นายพงศ์พันธุ์	วรสายัณห์	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๔.	นายบวรพงษ์	สุนิภาษา	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๕.	นายสุทธิชาติ	แสงสุวรรณ์	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๖.	นางสาวกฤติยา	เพ็ชรศรี	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๗.	นางสาวกุลศิริ	ศักดิ์ประสิทธิ์	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๘.	นายเสน่ห์	กลิ่นเกษร	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๙.	นางสาววินุชดา	แถลงศรี	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๑๐.	นางสาวนิภาพร	อัศวภัทร	GIZ
๑๑.	นางสาวอัมพวา	มูลเมือง	GIZ
๑๒.	นางสาวธันณี	ศรีสกุลไชยรัก	UNEP
๑๓.	นางสาวดาเรศ	แก้วเกตุ	สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม
๑๔.	นายวัชรไชย	ขมินทกูล	กรมควบคุมมลพิษ
๑๕.	นายจิรยุทธ์	เจริญฉัตรชัย	บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด (ที่ปรึกษาโครงการ)
๑๖.	ผศ.ดร.ชนิกานต์	ยิ้มประยูร	บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด (ที่ปรึกษาโครงการ)
๑๗.	นางสาวปภัสรา	เทียนขาว	บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด (ที่ปรึกษาโครงการ)

วาระที่ ๑ เรื่องประธานแจ้งให้ที่ประชุมทราบ

๑.๑ การดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB)

กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน (พพ.) ซึ่งเป็นหน่วยงานหลักที่รับผิดชอบภารกิจด้านการอนุรักษ์พลังงานและการพัฒนาเทคโนโลยีด้านประสิทธิภาพพลังงาน ได้ร่วมมือกับ สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP) ในการดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นโครงการความร่วมมือระหว่างประเทศที่สนับสนุนและส่งเสริมเทคโนโลยีการใช้พลังงานในอาคารอย่างมีประสิทธิภาพ จุดมุ่งหมายเพื่อลดการปล่อยก๊าซเรือนกระจก โดยโครงการได้รับการสนับสนุนเงินให้เปล่าจากกองทุนสิ่งแวดล้อมโลก (Global Environmental Facility, GEF) และงบประมาณสนับสนุนสมทบจากภาครัฐและภาคเอกชนภายในประเทศ

การดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ในครั้งนี้ มีวัตถุประสงค์หลักดังนี้

๑. เพื่อเสริมสร้างจิตสำนึกในด้านประสิทธิภาพพลังงานของอาคารในประเทศไทย รวมถึงการจัดตั้งศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ การฝึกอบรมบุคลากร และการพัฒนาแบบจำลองสภาวะอาคารอนุรักษ์พลังงานที่ถูกกำหนดเพื่ออาคารธุรกิจในประเทศไทย

๒. เพื่อศึกษาและจัดทำกรอบนโยบาย แผนการดำเนินงานระยะสั้นและระยะยาวเพื่อส่งเสริมประสิทธิภาพพลังงานในอาคารธุรกิจ พร้อมทั้งการประเมินผลและปรับปรุงมาตรการเชิงนโยบายด้านการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ

๓. เพื่อสาธิตการประยุกต์ใช้เทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารธุรกิจ ซึ่งสามารถเผยแพร่และขยายผลไปยังอาคารอื่นๆ ต่อไป

มติที่ประชุม รับทราบ

๑.๒ เนื่องจากประธานติดภารกิจเร่งด่วน จึงมอบหมายให้ คุณอารยา นันทโพธิเดช กรรมการผู้แทนจากกรมควบคุมมลพิษ ทำหน้าที่ประธานในที่ประชุมในวาระต่าง ๆ ต่อไป

มติที่ประชุม รับทราบ

วาระที่ ๒ เรื่องแจ้งเพื่อทราบ

๒.๑ การแต่งตั้งคณะกรรมการอำนวยการโครงการ (Project Board)

ในการดำเนินโครงการฯ ให้มีประสิทธิภาพและเกิดประสิทธิผลสูงสุดต่องานด้านการอนุรักษ์พลังงานในอาคาร และการลดการปล่อยก๊าซเรือนกระจกของประเทศ ในข้อกำหนดของโครงการจึงกำหนดให้จัดตั้งคณะกรรมการอำนวยการโครงการ (Project Board) ขึ้น เพื่อกำกับควบคุมการบริหารจัดการโครงการในด้านต่าง ๆ ให้เป็นไปตามวัตถุประสงค์และเป้าหมายของโครงการ ทั้งนี้ โครงสร้างและรายชื่อของคณะกรรมการอำนวยการแสดงได้ดังนี้

๑๘.	นายอำนวย ทองสถิตย์ อธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	ประธานกรรมการ
๑๙.	นายทวารัฐ สูตะบุตร รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
๒๐.	นายประมวล จันทร์พงษ์ รองอธิบดีกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	รองประธานกรรมการ
๒๑.	ผู้แทน สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม	กรรมการ
๒๒.	ผู้แทน สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP)	กรรมการ
๒๓.	ผู้แทน สำนักงานนโยบายและแผนพลังงาน	กรรมการ
๒๔.	ผู้แทน กรมโยธาธิการและผังเมือง	กรรมการ
๒๕.	ผู้แทน กรมควบคุมมลพิษ	กรรมการ
๒๖.	ผู้แทน กรมสรรพากร	กรรมการ
๒๗.	ผู้แทน สำนักผังเมือง กรุงเทพมหานคร	กรรมการ
๒๘.	ผู้แทน องค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน)	กรรมการ
๒๙.	ผู้แทน สถาบันอาคารเขียวไทย	กรรมการ
๓๐.	นางศิรินทร วงษ์เสาวศุภ ผู้เชี่ยวชาญด้านอนุรักษ์พลังงาน กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน	กรรมการและเลขานุการ
๓๑.	นายกมล ตันพิพัฒน์ บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด	ผู้ช่วยเลขานุการ

คณะกรรมการอำนวยการโครงการ (Project Board) ที่จัดตั้งขึ้นภายใต้โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ จะมีบทบาทและหน้าที่หลักดังต่อไปนี้

๑. กำกับควบคุมการบริหารจัดการโครงการเพื่อให้บรรลุตามวัตถุประสงค์และเป้าหมายของโครงการ
๒. ให้ความเห็นชอบแผนปฏิบัติงานของโครงการ แผนปฏิบัติงานประจำปี รวมถึงแผนการเงินของโครงการ และพิจารณาให้ความเห็นชอบการปรับเปลี่ยนแผนที่มีความจำเป็น
๓. ให้คำแนะนำ ติดตาม และประเมินผลการดำเนินงาน รวมทั้งให้ความเห็นชอบรายงานผลการดำเนินงานโครงการ

๔. แต่งตั้งคณะอนุกรรมการ คณะทำงาน ที่ปรึกษา ได้ตามความจำเป็นและเหมาะสมกับการดำเนินงานโครงการ
๕. ปฏิบัติงานอื่นๆ ที่เกี่ยวข้องและเป็นประโยชน์ต่อความสำเร็จของโครงการ

มติที่ประชุม รับทราบ

๒.๒ รายละเอียดโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB)

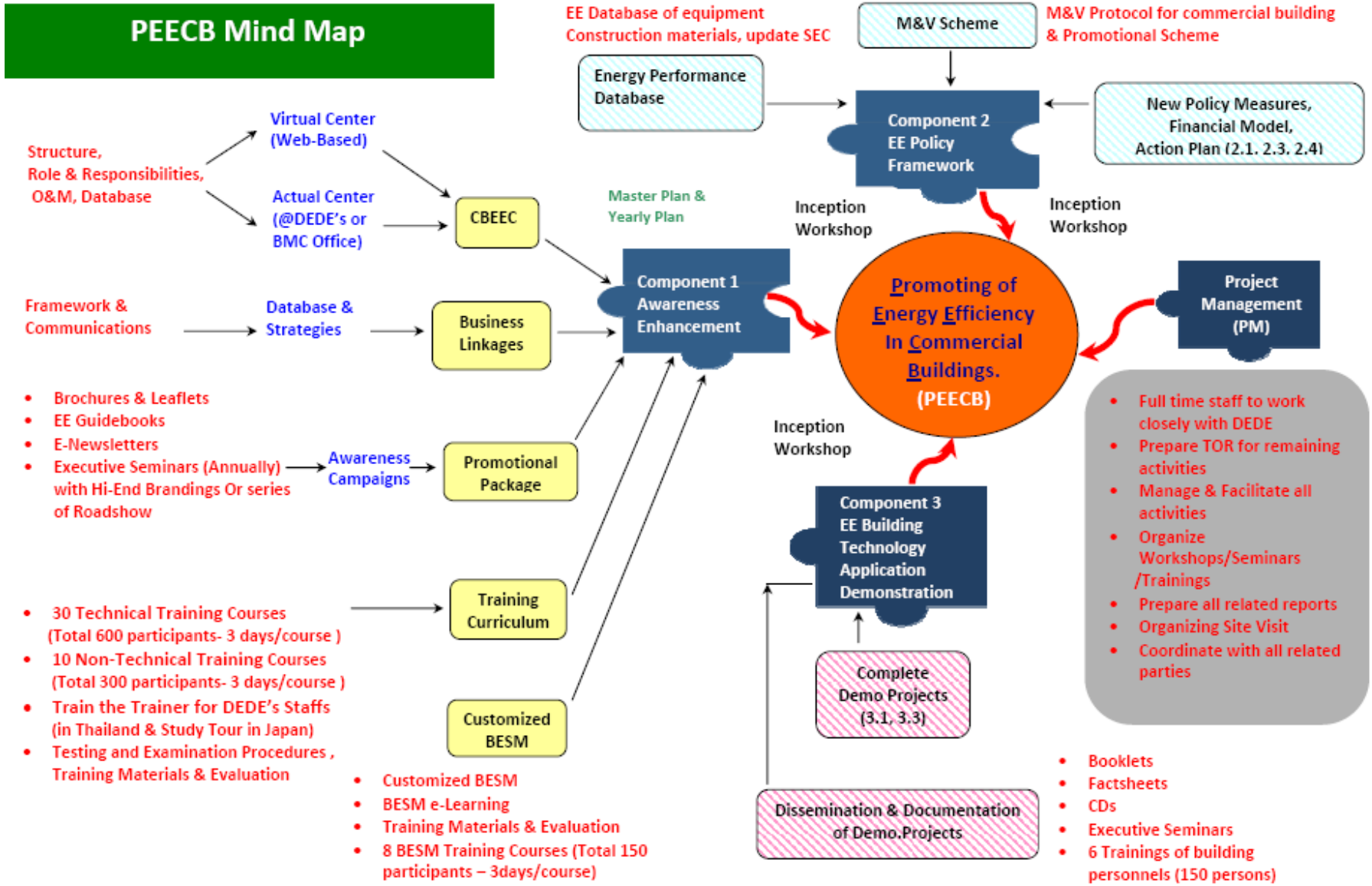
ภารกิจของโครงการ จะเป็นไปตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นข้อตกลงที่ลงนามรับรองโดยผู้บริหารของกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน และ UNDP ทั้งนี้ กรอบการดำเนินงานจะแบ่งออกเป็น ๓ ภารกิจหลัก (Component) ดังนี้

ภารกิจที่ ๑ : การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร
ภารกิจที่ ๒ : การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร
ภารกิจที่ ๓ : การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

การดำเนินโครงการ PEECB มีระยะเวลาดำเนินโครงการทั้งสิ้น ๔๘ เดือน โดยมีแนวทางการดำเนินโครงการกำหนดไว้ดังนี้

๑. จัดตั้งคณะกรรมการอำนวยการโครงการ (Project Board)
๒. จัดเตรียมแผนการดำเนินการโครงการทั้งหมดและนำเสนอต่อ คณะกรรมการอำนวยการโครงการ (Project Board)
๓. ดำเนินโครงการใน ๓ ภารกิจ ตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) โดยสรุปดังนี้ (โปรดดูแผนภูมิโครงการ, PEECB Mind Map ในหน้าถัดไปประกอบ)

มติที่ประชุม รับทราบ


PEECB Mind Map
EE Database of equipment
Construction materials, update SEC
M&V Scheme
M&V Protocol for commercial building
& Promotional Scheme
Energy Performance Database
Component 2
EE Policy Framework
New Policy Measures, Financial Model, Action Plan (2.1. 2.3. 2.4)
Structure, Role & Responsibilities, O&M, Database
Virtual Center (Web-Based)
Actual Center (@DEDE's or BMC Office)
CBEEC
Master Plan & Yearly Plan
Inception Workshop
Inception Workshop
Component 1
Awareness Enhancement
Promoting of Energy Efficiency In Commercial Buildings. (PEECB)
Project Management (PM)
Framework & Communications
Database & Strategies
Business Linkages
Brochures & Leaflets
EE Guidebooks
E-Newsletters
Executive Seminars (Annually) with Hi-End Brandings Or series of Roadshow
Awareness Campaigns
Promotional Package
Inception Workshop
Component 3
EE Building Technology Application Demonstration
Full time staff to work closely with DEDE
Prepare TOR for remaining activities
Manage & Facilitate all activities
Organize Workshops/Seminars /Trainings
Prepare all related reports
Organizing Site Visit
Coordinate with all related parties
30 Technical Training Courses (Total 600 participants- 3 days/course)
10 Non-Technical Training Courses (Total 300 participants- 3 days/course)
Train the Trainer for DEDE's Staffs (in Thailand & Study Tour in Japan)
Testing and Examination Procedures , Training Materials & Evaluation
Training Curriculum
Customized BESM
Complete Demo Projects (3.1, 3.3)
Customized BESM
BESM e-Learning
Training Materials & Evaluation
8 BESM Training Courses (Total 150 participants – 3days/course)
Dissemination & Documentation of Demo.Projects
Booklets
Factsheets
CDs
Executive Seminars
6 Trainings of building personnels (150 persons)

วาระที่ ๓ เรื่องเพื่อพิจารณา

๓.๑ แผนดำเนินงานโครงการ และ แผนกิจกรรมประจำปี

โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ กำหนดแผนดำเนินงานโครงการไว้ทั้งสิ้น ๔๘ เดือน เริ่มโครงการวันที่ ๔ เมษายน ๒๕๕๖ ถึงวันที่ ๓ เมษายน ๒๕๖๐ โดยกำหนดแผนกิจกรรมประจำปีเป็น ๔ ระยะ ดังนี้

ระยะที่ ๑ (Y2013) มีนาคม - ธันวาคม พ.ศ.๒๕๕๖
การศึกษา ทบทวน กำหนดรูปแบบและแนวทางในการดำเนินการโครงการ สำหรับภารกิจ (Component) ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)
การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 กำหนดรูปแบบการจัดตั้งศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 กำหนดรูปแบบการรณรงค์เพื่อกระตุ้นการมีส่วนร่วมในงานด้านประสิทธิภาพพลังงานในอาคารจากผู้มีส่วนเกี่ยวข้องในภาคส่วนต่าง ๆ

กำหนดจัดกิจกรรมประชาสัมพันธ์โครงการในปี ๒๕๕๖

๑. จัดงานประชาสัมพันธ์เปิดตัวโครงการ ในระหว่างเดือนกรกฎาคม-สิงหาคม ๒๕๕๖

C-1.3 กำหนดแนวทางการปรับปรุงโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 จัดทำโครงสร้างหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 จัดทำโครงสร้างหลักสูตรฝึกอบรมความรู้ทั่วไปด้านการประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 กำหนดรูปแบบการส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

ภารกิจที่ ๒ (Component-2, C-2)
การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 วิเคราะห์นโยบายและมาตรการที่เหมาะสมสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคาร

C-2.2 ทบทวนข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกี่ยวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-2.3 กำหนดรูปแบบการส่งเสริมด้านการลงทุนสำหรับโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-2.4 ร่างแนวทางการจัดทำแผนส่งเสริมด้านประสิทธิภาพพลังงานในอาคาร (แผนระยะสั้นและแผนระยะยาว)

ภารกิจที่ ๓ (Component-3, C-3)
การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 ศึกษาความเป็นไปได้ในการประยุกต์ใช้เทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารที่เข้าร่วมเป็นอาคารสาธิต พร้อมกำหนดค่าฐานการใช้พลังงาน และแบบการปรับปรุงอาคารโดยใช้เทคโนโลยีด้านประสิทธิภาพพลังงาน

รายชื่อหน่วยงานที่แสดงเจตจำนงเข้าร่วมการสาธิตฯ มีดังนี้

๑. โรงพยาบาลลำพูน
๒. สำโรงการแพทย์
๓. การไฟฟ้าส่วนภูมิภาค
๔. กระทรวงสาธารณสุข
๕. โรงแรมเซ็นทารา แอนด์ รีสอร์ต
๖. โรงแรมคาทีน่า
๗. บริษัท เอกชัย ดีสทีบิวชั่น จำกัด (เทสโก้ โลตัส)
๘. Thai Energy Conservation Co.,Ltd.
๙. บริษัท แอร์โค จำกัด (เทรน ประเทศไทย)

โครงการฯ จะเริ่มประสานงานกับหน่วยงานที่สนใจเข้าร่วมการสาธิตฯ เพื่อแจ้งสถานะของโครงการฯ ประสานข้อมูลในการดำเนินโครงการกับหน่วยงานต่าง ๆ ในเดือนมิถุนายน ๒๕๕๖

ระยะที่ ๒ (Y2014) มกราคม - ธันวาคม พ.ศ.๒๕๕๗
การพัฒนาเครื่องมือในการดำเนินการโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)
การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 พัฒนา ประชาสัมพันธ์ และดำเนินงานศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 ประชาสัมพันธ์ และจัดกิจกรรมต่าง ๆ เพื่อรณรงค์การมีส่วนร่วมพัฒนาประสิทธิภาพพลังงานในอาคาร จากภาคส่วนต่าง ๆ ตามรูปแบบที่กำหนดในการดำเนินการระยะที่ ๑

C-1.3 พัฒนาและปรับปรุงโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 พัฒนาและจัดฝึกอบรมหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 พัฒนาและจัดฝึกอบรมหลักสูตรฝึกอบรมความรู้ทั่วไปด้านประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 จัดกิจกรรมตามรูปแบบต่าง ๆ ที่กำหนดในการดำเนินโครงการระยะที่ ๑ เพื่อส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

ภารกิจที่ ๒ (Component-2, C-2)
การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 จัดทำนโยบายและกำหนดมาตรการที่เหมาะสมสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคารตามผลการวิเคราะห์ในโครงการระยะที่ ๑ พร้อมทั้งประสานงานกับหน่วยงานต่าง ๆ เพื่อให้นโยบายและมาตรการที่กำหนดนำไปปฏิบัติได้อย่างเป็นรูปธรรม

C-2.2 ปรับปรุงข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกียวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-2.3 ประสานงาน จัดประชุมเชิงปฏิบัติการ เพื่อรับฟังความเห็นสำหรับรูปแบบการส่งเสริมด้านการลงทุนสำหรับโครงการด้านประสิทธิภาพพลังงานในอาคารที่กำหนดในการดำเนินโครงการระยะที่ ๑

C-2.4 จัดทำแผนส่งเสริมด้านประสิทธิภาพพลังงานในอาคาร (แผนระยะสั้นและแผนระยะยาว)

ภารกิจที่ ๓ (Component-3, C-3)
การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 สรุปแบบปรับปรุงอาคารโดยใช้เทคโนโลยีประสิทธิภาพพลังงาน

C-3.2 ตรวจสอบและตรวจวัดข้อมูลการใช้พลังงาน และผลการใช้พลังงานก่อนและหลังการปรับปรุงอาคารที่ทำการสาธิตเทคโนโลยีประสิทธิภาพพลังงาน

ระยะที่ ๓ (Y2015 – Y2016) **มกราคม พ.ศ.๒๕๕๘ – พฤศจิกายน พ.ศ.๒๕๕๙**
การขยายผลการดำเนินโครงการ สำหรับภารกิจ ต่าง ๆ ดังนี้

ภารกิจที่ ๑ (Component-1, C-1)
การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร

C-1.1 ประชาสัมพันธ์ และดำเนินงานศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ

C-1.2 ประชาสัมพันธ์ และจัดกิจกรรมต่าง ๆ เพื่อรณรงค์การมีส่วนร่วมพัฒนาประสิทธิภาพพลังงานในอาคาร จากภาคส่วนต่าง ๆ ตามรูปแบบที่กำหนดในการดำเนินการระยะที่ ๑

C-1.3 จัดทำและดำเนินการฝึกอบรมหลักสูตรฝึกอบรมการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

C-1.4 จัดฝึกอบรมและติดตามผลหลักสูตรฝึกอบรมด้านเทคนิคสำหรับเทคโนโลยีประสิทธิภาพพลังงานในอาคาร

C-1.5 จัดฝึกอบรมและติดตามผลหลักสูตรฝึกอบรมความรู้ทั่วไปด้านประสิทธิภาพพลังงานในอาคารและการวิเคราะห์ด้านการเงินสำหรับการลงทุนในโครงการด้านประสิทธิภาพพลังงานในอาคาร

C-1.6 จัดกิจกรรมตามรูปแบบต่าง ๆ ที่กำหนดในการดำเนินโครงการระยะที่ ๑ เพื่อส่งเสริมธุรกิจด้านประสิทธิภาพพลังงานในอาคาร

ภารกิจที่ ๒ (Component-2, C-2)
การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร

C-2.1 ประชาสัมพันธ์นโยบายและมาตรการสำหรับการส่งเสริมประสิทธิภาพพลังงานในอาคารตามผลการจัดทำในโครงการระยะที่ ๒ พร้อมทั้งประสานงานกับหน่วยงานต่าง ๆ เพื่อให้นโยบายและมาตรการที่กำหนดนำไปปฏิบัติได้อย่างเป็นรูปธรรม

C-2.2 ปรับปรุงข้อมูลดัชนีการใช้พลังงาน วิธีการตรวจติดตามการใช้พลังงาน และข้อมูลที่เกียวข้องกับการใช้งานโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร

ภารกิจที่ ๓ (Component-3, C-3)
การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

C-3.1 จัดทำเอกสารและสื่อเผยแพร่ผลการสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคาร

C-3.2 จัดกิจกรรมและหลักสูตรฝึกอบรมเพื่อถ่ายทอดผลการสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงาน

C-3.3 จัดเตรียมแผนงานการขยายผลเทคโนโลยีด้านประสิทธิภาพพลังงาน

ระยะที่ ๔ (Y2017) **ธันวาคม พ.ศ.๒๕๕๙ - มกราคม พ.ศ.๒๕๖๐**
สรุปผลการดำเนินโครงการ

แผนการเงินของโครงการ

งบประมาณในการดำเนินโครงการทั้งสิ้น ประมาณ ๙๙,๙๙๐,๐๐๐ บาท แบ่งเป็นค่าใช้จ่ายในแต่ละภารกิจแสดงได้ดังนี้

๑. ภารกิจที่ ๑ = ๓๑,๖๓๔,๐๐๐ บาท
๒. ภารกิจที่ ๒ = ๑๘,๔๓๐,๐๐๐ บาท
๓. ภารกิจที่ ๓ = ๔๑,๔๗๔,๐๐๐ บาท
๔. บริหารโครงการ (Project Management) = ๘,๔๕๒,๐๐๐ บาท

โดยมีรายละเอียดแผนการเงินได้ดังนี้

- งบประมาณปี ๒๕๕๖ = ๑๗,๔๙๗,๐๐๐ บาท
- งบประมาณปี ๒๕๕๗ = ๓๔,๙๙๖,๐๐๐ บาท
- งบประมาณปี ๒๕๕๘ = ๒๙,๙๙๘,๐๐๐ บาท
- งบประมาณปี ๒๕๕๙ = ๑๔,๙๙๘,๕๐๐ บาท
- งบประมาณปี ๒๕๖๐ = ๒,๔๔๙,๕๐๐ บาท

มติที่ประชุม คณะกรรมการฯ เห็นชอบแผนดำเนินงานโครงการ แผนกิจกรรมประจำปี และแผนการเงิน ตามที่ฝ่ายเลขาฯ นำเสนอ โดยมีข้อเสนอแนะเพิ่มเติมสำหรับแต่ละภารกิจดังนี้

๑. ภารกิจที่ ๑

๑.๑ ให้กำหนดนิยามของคำว่า อาคารธุรกิจ (Commercial Building) ซึ่งเป็นเป้าหมายหลักของโครงการให้ชัดเจน เพื่อกำหนดลักษณะของอาคารที่จะเข้าร่วมกิจกรรมต่าง ๆ ของโครงการได้โดยถูกต้องตามวัตถุประสงค์ของโครงการ

๑.๒ การจัดทำโปรแกรมจำลองสภาวะการใช้พลังงานในอาคาร ให้พิจารณาเชื่อมโยงเรื่องความปลอดภัยและสิ่งแวดล้อมประกอบด้วย

๒. ภารกิจที่ ๒

๒.๑ ให้ศึกษาและประสานงานการกำหนดนโยบายส่งเสริมประสิทธิภาพพลังงานในอาคารกับหน่วยงานต่าง ๆ ที่มีโครงการสนับสนุนอาคารอนุรักษ์พลังงานและสิ่งแวดล้อม เช่น การให้ FAR Bonus ของสำนักผังเมือง กรุงเทพมหานคร, การให้การรับรองอาคารเขียว ของสถาบันอาคารเขียวไทย ฯลฯ ทั้งนี้ เพื่อให้นโยบายและมาตรการต่าง ๆ สอดประสานกัน

๒.๒ ให้ประสานงานกับสำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม และองค์การบริหารจัดการก๊าซเรือนกระจก (องค์การมหาชน) ในการกำหนดค่าการใช้พลังงานในสภาวะปกติ (Business as Usual – BAU) เพื่อประกอบการจัดทำเป้าหมายการลดก๊าซเรือนกระจกของโครงการให้สอดคล้องกับการดำเนินการด้านอื่นๆ ของประเทศ

๒.๓ การศึกษาและจัดทำวิธีการตรวจวัดและประเมินการใช้พลังงาน ให้พิจารณาเชื่อมโยงกับการจัดทำ MRV (Measurement, Reporting and Verification) ภายใต้ NAMAs (Nationally Appropriate Mitigation Actions) ด้วย

๒.๔ การจัดทำดัชนีการใช้พลังงาน ควรพิจารณาแยกจัดทำตามประเภทของอาคารเพื่อให้สามารถนำข้อมูลไปประยุกต์ใช้งานได้ครอบคลุมตามลักษณะของอาคารประเภทต่างๆ

๓. ภารกิจที่ ๓

๓.๑ ให้กำหนดหลักเกณฑ์การคัดเลือกอาคารที่จะเข้าร่วมเป็นอาคารสาธิตของโครงการ และนำเสนอให้คณะกรรมการพิจารณาต่อไป

๓.๒ ให้ประสานงานกับอาคารที่แสดงเจตจำนงเข้าร่วมเป็นอาคารสาธิตกับโครงการไว้ เพื่อสอบถามความพร้อมในการเข้าร่วมโครงการฯ ต่อไป

วาระที่ ๔ เรื่องอื่นๆ

๔.๑ กำหนดการประชุมคณะกรรมการฯ ครั้งที่ ๒/๒๕๕๖

ฝ่ายเลขาฯ เสนอให้มีการประชุมคณะกรรมการอำนวยการโครงการ (Project Board) ครั้งที่ ๒/๒๕๕๖ เพื่อติดตามผลการดำเนินโครงการ และพิจารณาแผนกิจกรรมประจำปี พ.ศ.๒๕๕๗ ในเดือนธันวาคม ๒๕๕๖ โดยฝ่ายเลขาฯ จะประสานงานกำหนดเวลาและวาระการประชุมกับคณะกรรมการฯ ต่อไป

มติที่ประชุม คณะกรรมการฯ เห็นควรให้จัดประชุมครั้งที่ ๒/๒๕๕๖ ประมาณเดือนสิงหาคม ๒๕๕๖ เพื่อพิจารณาผลการประสานงานกับอาคารที่แสดงเจตจำนงเข้าร่วมเป็นอาคารสาธิตไว้กับโครงการและพิจารณาเกณฑ์การคัดเลือกอาคารเข้าร่วมเป็นอาคารสาธิตของโครงการ และ ให้มีการประชุมครั้งที่ ๓/๒๕๕๖ ประมาณเดือนธันวาคม ๒๕๕๖ เพื่อติดตามผลการดำเนินโครงการและพิจารณาแผนกิจกรรมประจำปี ๒๕๕๗ ทั้งนี้ให้ฝ่ายเลขาฯ ประสานกำหนดเวลาและวาระการประชุมกับคณะกรรมการฯ ต่อไป

ผู้บันทึกรายงานการประชุม

นางสาวปภัสรา เทียนขาว

ผู้ตรวจรายงานการประชุม

นายกมล ตันพิพัฒน์

รายงานการประชุม
การประชุมชี้แจงรายละเอียดการเข้าร่วมเป็นอาคารสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงาน
ภายใต้ โครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ
(Promoting Energy Efficiency in Commercial Buildings, PEECB)
วันศุกร์ที่ ๒๑ มิถุนายน ๒๕๕๖ เวลา ๑๐.๐๐ – ๑๑.๓๐ น.
ณ ห้องประชุม ๖๐๓ อาคาร ๗ ชั้น ๖ กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน (พพ.)

รายนามผู้เข้าร่วมประชุม

๑.	คุณศิรินทร	วงษ์เสาวศุภ	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๒.	คุณมนัสวี	ฮะกีมี	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๓.	ดร.พงศ์พันธุ์	วรสายัณห์	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๔.	คุณกุลศิริ	ศักดิ์ประสิทธิ์	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๕.	คุณกฤติยา	เพ็ชรศรี	กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน
๖.	คุณนิศากร	พวงกำมลาสน์	United Nations Development Programme
๗.	คุณธงไชย	เดิมดา	โรงพยาบาลสำโรงการแพทย์ (บริษัท เอส.เมดิคอล เอ็นเตอร์ไพร์ส จำกัด)
๘.	คุณช่อเพ็ชร	สีทอง	โรงพยาบาลสำโรงการแพทย์ (บริษัท เอส.เมดิคอล เอ็นเตอร์ไพร์ส จำกัด)
๙.	คุณปิยชาติ	ศรีแก้ว	การไฟฟ้าส่วนภูมิภาค
๑๐.	คุณสกล	ทิมกุล	บริษัท เซ็นทารา โฮเทล แอนด์ รีสอร์ท จำกัด
๑๑.	คุณพงศ์กานต์	เปี่ยมสุทธิธรรม	ผู้แทนจาก โรงแรมคาทีน่า ภูเก็ต และ บริษัท เอก-ชัย ดิสทริบิวชั่น ซิสเทม จำกัด
๑๒.	นายกมล	ตันพิพัฒน์	บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด
๑๓.	นางสาวปภัสรา	เทียนขาว	บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด

วาระที่ ๑ รายละเอียดโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ

พพ.และ ที่ปรึกษาโครงการฯ ชี้แจงรายละเอียดโครงการให้ที่ประชุมรับทราบ ดังนี้

กรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน (พพ.) ซึ่งเป็นหน่วยงานหลักที่รับผิดชอบภารกิจด้านการอนุรักษ์พลังงานและการพัฒนาเทคโนโลยีด้านประสิทธิภาพพลังงาน ได้ร่วมมือกับ สำนักงานโครงการพัฒนาแห่งสหประชาชาติ (UNDP) ในการดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นโครงการความร่วมมือระหว่างประเทศที่สนับสนุนและส่งเสริมเทคโนโลยีการใช้พลังงานในอาคารอย่างมีประสิทธิภาพ จุดมุ่งหมายเพื่อลดการปล่อยก๊าซเรือนกระจก โดยโครงการได้รับการสนับสนุนเงินให้เปล่าจากกองทุนสิ่งแวดล้อมโลก (Global Environmental Facility, GEF) และงบประมาณสนับสนุนสมทบจากภาครัฐและภาคเอกชนภายในประเทศ

การดำเนินโครงการส่งเสริมการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ (Promoting Energy Efficiency in Commercial Buildings, PEECB) ในครั้งนี้ มีวัตถุประสงค์หลักดังนี้

๑. เพื่อเสริมสร้างจิตสำนึกในด้านประสิทธิภาพพลังงานของอาคารในประเทศไทย รวมถึงการจัดตั้งศูนย์รวมข้อมูลด้านประสิทธิภาพการใช้พลังงานสำหรับอาคารธุรกิจ การฝึกอบรมบุคลากร และการพัฒนาแบบจำลองสภาวะอาคารอนุรักษ์พลังงานที่ถูกกำหนดเพื่ออาคารธุรกิจในประเทศไทย

๒. เพื่อศึกษาและจัดทำกรอบนโยบาย แผนการดำเนินงานระยะสั้นและระยะยาวเพื่อส่งเสริมประสิทธิภาพพลังงานในอาคารธุรกิจ พร้อมทั้งการประเมินผลและปรับปรุงมาตรการเชิงนโยบายด้านการใช้พลังงานอย่างมีประสิทธิภาพในอาคารธุรกิจ

๓. เพื่อสาธิตการประยุกต์ใช้เทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารธุรกิจ ซึ่งสามารถเผยแพร่และขยายผลไปยังอาคารอื่นๆ ต่อไป

ภารกิจของโครงการ จะเป็นไปตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) ซึ่งเป็นข้อตกลงที่ลงนามรับรองโดยผู้บริหารของกรมพัฒนาพลังงานทดแทนและอนุรักษ์พลังงาน และ UNDP ทั้งนี้ กรอบการดำเนินงานจะแบ่งออกเป็น ๓ ภารกิจหลัก (Component) ดังนี้

ภารกิจที่ ๑ : การเพิ่มการตระหนักถึงประสิทธิภาพพลังงานด้านเทคโนโลยีและแนวปฏิบัติในอาคาร
ภารกิจที่ ๒ : การจัดทำกรอบนโยบายด้านประสิทธิภาพพลังงานในอาคาร
ภารกิจที่ ๓ : การสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงานในอาคารและการนำมาใช้

การดำเนินโครงการ PEECB มีระยะเวลาดำเนินโครงการทั้งสิ้น ๔๘ เดือน โดยมีแนวทางการดำเนินโครงการกำหนดไว้ดังนี้

๑. จัดตั้งคณะกรรมการอำนวยการโครงการ (Project Board)
๒. จัดเตรียมแผนการดำเนินการโครงการทั้งหมดและนำเสนอต่อ คณะกรรมการอำนวยการโครงการ (Project Board)
๓. ดำเนินโครงการใน ๓ ภารกิจ ตามกรอบการดำเนินงานที่กำหนดไว้ในเอกสารโครงการฯ (Full-Size Project Document on Promoting Energy Efficiency in Commercial Buildings, PEECB) โดยสรุปดังนี้ (โปรดดูแผนภูมิโครงการ, PEECB Mind Map ในหน้าถัดไปประกอบ)

วาระที่ ๒ สถานะการดำเนินงานปัจจุบันด้านประสิทธิภาพพลังงานในอาคารที่แสดงเจตจำนงเข้าร่วมเป็นอาคารสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงาน

ผู้แทนสถานประกอบการที่เข้าร่วมประชุม ให้ข้อมูลสถานะการดำเนินงานปัจจุบันด้านประสิทธิภาพพลังงานสำหรับแต่ละอาคาร ดังนี้

๒.๑ โรงพยาบาลลำพูน

โรงพยาบาลลำพูน ไม่มีผู้แทนเข้าร่วมประชุม โดยมีหนังสือมายังโครงการฯ ตามหนังสือเลขที่ ลพ ๐๐๓๒.๒/๔๓๔๐ ลงวันที่ ๑๙ มิถุนายน ๒๕๕๖ แจ้งว่า ในขณะนี้โรงพยาบาลอยู่ระหว่างดำเนินการก่อสร้างและปรับปรุงอาคารต่างๆ ยังไม่มีความพร้อมในการเข้าร่วมโครงการ ดังมีรายละเอียดตามเอกสารแนบหมายเลข ๑

๒.๒ โรงพยาบาลสำโรงการแพทย์ (บริษัท เอส.เมดิคอล เอ็นเตอร์ไพร์ส จำกัด)

โรงพยาบาลสำโรงการแพทย์ ได้ดำเนินการด้านประหยัดพลังงานมาโดยตลอด สรุปได้ดังนี้

๑. รณรงค์ให้มีการประหยัดพลังงานโดยจัดการแข่งขันระหว่างชั้น
๒. เปลี่ยนเครื่องปรับอากาศแบบแยกส่วนเป็นเครื่องใหม่ที่มีสมรรถนะการทำความเย็นที่สูงขึ้น
๓. ศึกษาเรื่องการลดภาระการใช้พลังไฟฟ้าสูงสุดร่วมกับผู้จำหน่ายอุปกรณ์

โรงพยาบาลยังคงประสงค์ที่จะเข้าร่วมโครงการฯ โดยในเบื้องต้นต้องการคำแนะนำด้านเทคนิคเรื่องการลดการใช้พลังงานในระบบปรับอากาศ และ การลดการใช้พลังไฟฟ้าสูงสุด

๒.๓ การไฟฟ้าส่วนภูมิภาค

การไฟฟ้าส่วนภูมิภาค แจ้งว่า เดิมต้องการคำแนะนำด้านเทคนิคจากโครงการในเรื่องการประยุกต์ใช้หลอดไฟ LED แต่ในปัจจุบัน การไฟฟ้าส่วนภูมิภาคได้ดำเนินการติดตั้งและขยายผลการใช้งานหลอดไฟ LED แล้ว อย่างไรก็ตาม การไฟฟ้าส่วนภูมิภาคยังคงประสงค์ที่จะเข้าร่วมโครงการฯ โดยในเบื้องต้นต้องการคำแนะนำด้านเทคนิคในเรื่องการลดการใช้พลังงานในระบบปรับอากาศ โดยการประยุกต์ใช้เทคโนโลยี VSD Chiller, VRF, Absorption Chiller โดยใช้น้ำร้อนเป็นแหล่งความร้อน

๒.๔ กระทรวงสาธารณสุข (Bureau of Energy Efficiency Promotion)

เนื่องจากมีการปรับเปลี่ยนโครงสร้างหน่วยงานในกระทรวงสาธารณสุข ทำให้ไม่มีหน่วยงานที่ดูแลโดยตรงในเรื่องการประหยัดพลังงาน จึงไม่สามารถประสานผู้แทนจากกระทรวงสาธารณสุขได้

๒.๕ บริษัท เซ็นทารา โฮเทล แอนด์ รีสอร์ท จำกัด

โรงแรมในกลุ่มเซ็นทารา ได้ดำเนินการประหยัดพลังงานในอาคารต่าง ๆ มาอย่างต่อเนื่อง โดยเฉพาะโรงแรมเซ็นทารา แกรนด์ กรุงเทพฯ อย่างไรก็ตาม บริษัท เซ็นทารา โฮเทล แอนด์ รีสอร์ท จำกัด ยังคงประสงค์เข้าร่วมโครงการ โดยต้องการคำแนะนำด้านเทคนิคเพื่อปรับปรุงการใช้พลังงานโรงแรมในเครือซึ่งอยู่ในส่วนภูมิภาคต่อไป

๒.๖ โรงแรมคาทีน่า ภูเก็ต

โรงแรมคาทีน่า ภูเก็ต เป็นโรงแรมที่เปิดดำเนินการมาเป็นเวลานาน ประสงค์ที่จะเข้าร่วมโครงการโดยในเบื้องต้นต้องการคำแนะนำในการปรับปรุงระบบผลิตน้ำร้อน และระบบปรับอากาศ

๒.๗ บริษัท เอก-ชัย ดิสทริบิวชั่น ซิสเทม จำกัด

บริษัท เอก-ชัย ดิสทริบิวชั่น ซิสเทม จำกัด มีอาคารในเครือ Tesco Lotus ซึ่งแบ่งกลุ่มอาคารได้เป็นสองกลุ่มคือ Hyper Market (อาคารขนาดใหญ่) และ Market (อาคารขนาดเล็ก) ในเบื้องต้นประสงค์ที่จะเข้าร่วมโครงการโดยต้องคำแนะนำการประหยัดพลังงานในอาคารทั้งสองกลุ่ม

วาระที่ ๓ แนวทางการดำเนินต่อไปสำหรับการเข้าร่วมเป็นอาคารสาธิตเทคโนโลยีด้านประสิทธิภาพพลังงาน

พพ. และที่ปรึกษาโครงการ แจ้งให้ที่ประชุมทราบว่า ในปัจจุบัน พพ.อยู่ระหว่างคัดเลือกที่ปรึกษาที่จะดูแลและให้คำแนะนำด้านเทคนิคกับสถานประกอบการต่างๆ ที่แสดงเจตจำนงเข้าร่วมโครงการ ทั้งนี้ คาดว่าจะสรุปการคัดเลือกได้ภายในเดือนกรกฎาคม ๒๕๕๖ หลังจากนั้น พพ.จะพิจารณาจัดให้มีการลงนามในบันทึกความเข้าใจ (MOU) ระหว่าง พพ. และ สถานประกอบการต่างๆ ที่ประสงค์จะเข้าร่วมโครงการ ในลำดับต่อไป

อย่างไรก็ตาม ในระหว่างนี้ สถานประกอบการต่างๆ สามารถประสานงานเพื่อรับทราบรายละเอียด หรือข้อมูลข่าวสารของโครงการได้ที่ คุณกมล ตันพิพัฒน์ ที่ปรึกษาบริหารโครงการ บริษัท ไบร์ท แมเนจเม้นท์ คอนซัลติ้ง จำกัด

ปิดประชุมเวลา ๑๑.๓๐ น.

ผู้บันทึกรายงานการประชุม นางสาวปภัสรา เทียนขาว
ผู้ตรวจรายงานการประชุม นายกมล ตันพิพัฒน์