EC-ASEAN Energy Facility (EAEF)

Projects 64 and 68
Commencement Meeting

Development of a Comprehensive Database for Building Energy Performance Benchmarking in the ASEAN Region (Project 68)

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INIVE

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1. Background

ASEAN Plan of Action for Energy Cooperation (APAEC) 2004-2009 has been adopted by the ASEAN Energy Ministers' Meeting in July 2003. The programmes include:

- **Continuation of Information Sharing and Networking**
- **Continuation of ASEAN Energy Labeling**
- **Expansion of Private Sector Involvement**
- **Capacity Building**
- **Enhance Business Environment of Energy Services (e-BEES)**

1. Background

The Centre for Total Building Performance of National University of Singapore is nominated as the coordinating centre for e-BEES programme, which comprises of the following actions:

- **Development of Measurement & Verification (M&V) Protocol for ASEAN**
- **Development of Energy Performance Contracting Legal Framework and Standard Form of Contract**
- **Development of Project Management and Institutional Guidelines**
- **Development of Energy Saving Potential Indexes (Benchmarking)**
- **Develop an e-commerce platform for ASEAN Energy Services Sector.**

1. Background

Before a building owner take action to retrofit his building for enhanced energy performance, he must be totally convinced that his building is low in performance with respect to a similar cohort of buildings operating under similar conditions.

The energy and cost saving targets set by an ESCO (Energy Services Company) may not be reliable, without benchmarking database as reference.

1.Background

To date, owing to the lack of resources, and being new in the development of energy efficiency programme, a comprehensive, reliable and independent database has not been developed for the objective and accurate benchmarking of building energy use and efficiency in ASEAN countries. Data from other region are not acceptable.

A Benchmarking Tool-kit for self appraisal and comparative analysis of building energy performance by building owners, designers, managers and public sector agencies is needed.

1. Background

An incentive system to classify, recognise and label, and reward buildings that have made special efforts towards energy efficiency, can only be achieved through a benchmarking system.

2. Objectives

To establish a comprehensive, reliable and accurate database for benchmarking energy consumption and efficiency in commercial buildings. The main deliverables are:

- **An independent, reliable internet based energy benchmarking system accessible by all users.**
- **Document the methodology of the development to serve as guide for extension to other parts of ASEAN.**
- **From the benchmarking, to develop a building energy performance classification system, paving the way for building energy labeling.**

3. Target Groups:

- Building owner
- Energy Services Companies (ESCOs)
- Financial Institutions (e.g. Banker)
- Public agencies
- Professionals (e.g. property managers, energy engineers and building designers)

3.1 Expected Impact on Target Groups:

Building Owners—are aware of energy efficiency and conservation needs, but not sure about their own position with respect to others, and the industry norm.

- **Direct benefit of data collection**
- **A reliable benchmarking tool for direct application**
- **A benchmark for setting targets which are achievable**

3.1 Expected Impact on Target Groups:

ESCOs– have technologies but do not have full local knowledge and database to work on. Their claims of energy and cost saving are often labeled with question marks.

- **Create a transparent and vibrant energy services sector for ESCOs**
- **ESCOs can use Benchmark as reference in persuading to invest in energy retrofit**

3.1 Expected Impact on Target Groups:

Financial Institution– who would invest on energy retrofitting project

- **The benchmark will provide a decision support system for the financing institutions. It also serves to build capacity and save resources.**

3.1 Expected Impact on Target Groups:

Public Agencies– develop incentive schemes and labeling system that would further promote the industry.

- **A professional energy services sector**
- **Enhance energy security**
- **Protecting environment**
- **From benchmarking to building energy performance labeling**

3.1 Expected Impact on Target Groups:

Professionals-- property managers, energy engineers and building designers

The benchmark database can give guidance and targets for their buildings, and the design and construction of new buildings.

4. Main Activities:

1. Data collection
2. Statistical analysis
3. Web-based benchmarking system
4. Documentation
5. Workshop
6. Final report.

5. Tasks / Sub-Tasks

Task 1: Design sample frame and identify buildings for data collection.

Sub-Tasks:

1.1 Project Inception Meeting (CTBP– Leader)

1.2 Develop data procurement form and define terminology (CTBP)

1.3 Design sample frame and identify buildings for data collection (CTBP)

1.4 Investigate parameters (IEN)

5. Tasks / Sub-Tasks

Task 1: Sub-Tasks

1.5 Workshop among members (PTM)

1.6 Document methodology (CTBP)

5. Tasks / Sub-Tasks

Task 2: Conduct field data collection from building owners and selected measurements for verification. Questionnaire survey and energy bill analysis will be made.

Sub-Tasks:

2.1 Seek permission for data collection and preliminary briefing (CTBP-PTM)

2.2 Collection of data and field verifications (CTBP-PTM)

2.3 Processing data and preliminary analysis (CTBP-PTM)

2.4 Documentation (CTBP-PTM)

5. Tasks / Sub-Tasks

Task 3: Develop benchmarking curves and construct web-based benchmarking system.

Sub-Tasks:

3.1 Apply statistical tests to ensure accuracy, validity of data set in representing the entire population of data (CTBP)

3.2 Conduct preliminary benchmark and test for consistency (CTBP-IEN)

3.3 Develop web-based benchmarking and application concepts (CTBP)

3.4 Team workshop (CTBP)

5. Tasks / Sub-Tasks

Task 4: Launch websites and conduct workshop to disseminate the information and training for benchmarking, prepare final report (CTBP)

- **All experienced gained and document prepared will be consolidated into a single comprehensive document.**
- **The final report will be adopted and submitted to ACE for record.**
- **A regional seminar will be organized to disseminate the findings of the project.**

5. Tasks / Sub-Tasks

Responsibility of Partners for All 4 tasks

Partners	Leaders of Tasks
CTBP, NUS	1.1_ 1.2_1.3_ 1.6_ 2.1_ 2.2_ 2.3_ 2.4_3.1_3.2_3.3_3.4_4
PTM, Malaysia	1.5_2.1_2.2_2.3_2.4
IEN Consultants	1.4_3.2
INIVE-EEIG	Advisory: 1.2_1.4_1.6_2.1~2.4_3.1_3.2

Team Organization for the Implementation of Actions

Function	Team Members
Admin. & Management	CTBP,NUS
Data Collection	CTBP,NUS ⇔ PTM ⇔ INIVE-EEIG ⇔ IEN
Energy Analysis	CTBP,NUS ⇔ PTM ⇔ INIVE-EEIG ⇔ IEN
Benchmark Development	CTBP,NUS ⇔ PTM ⇔ INIVE-EEIG ⇔ IEN
Document & Dissemination	CTBP,NUS ⇔ PTM ⇔ INIVE-EEIG ⇔ IEN

Keys:

Coordinating | Active | Advisory

6. Schedule and Targets

The Action's implementation period is 23 months.

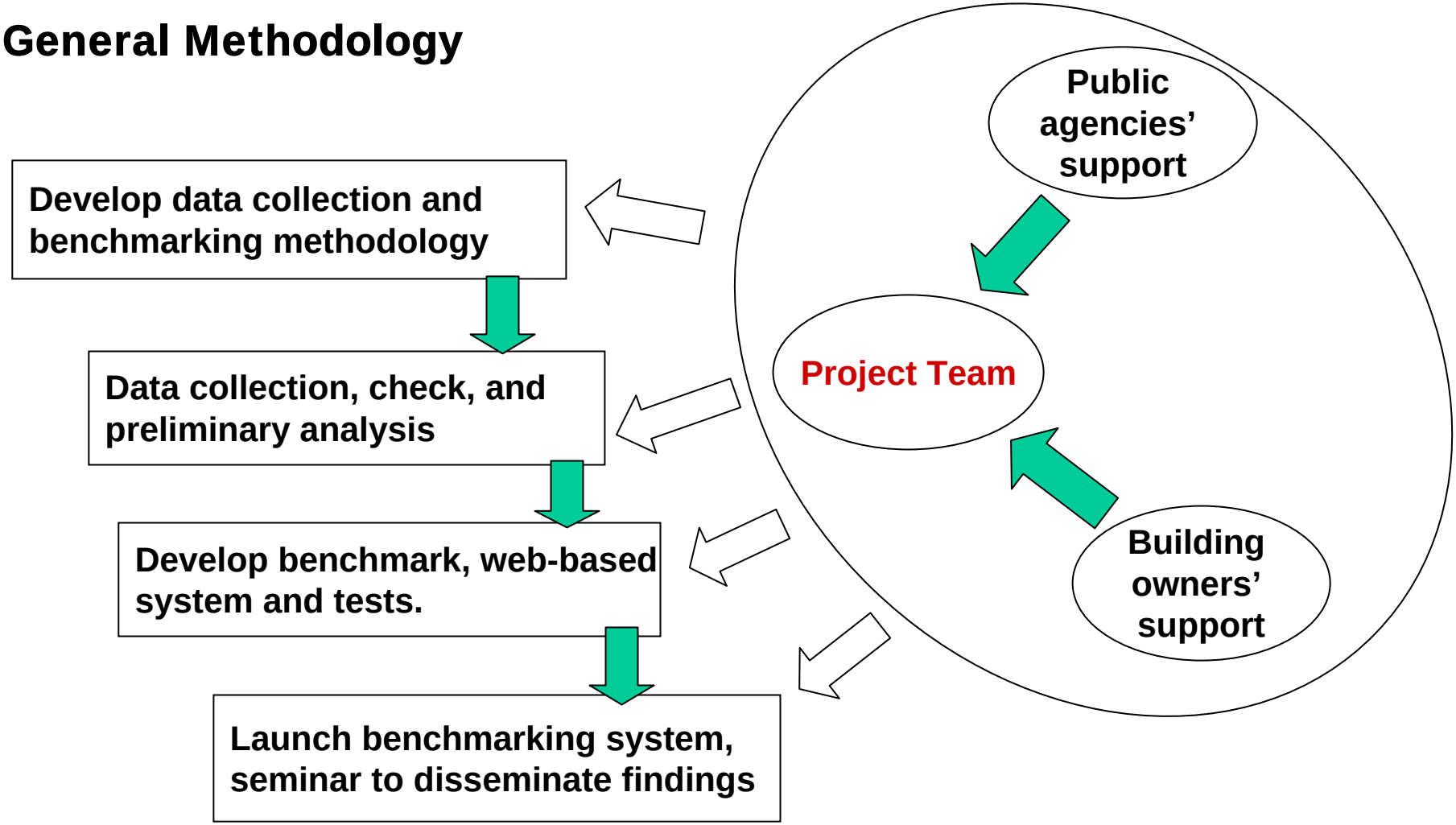
Year 1 and Year 2 of Action

7. Methodology

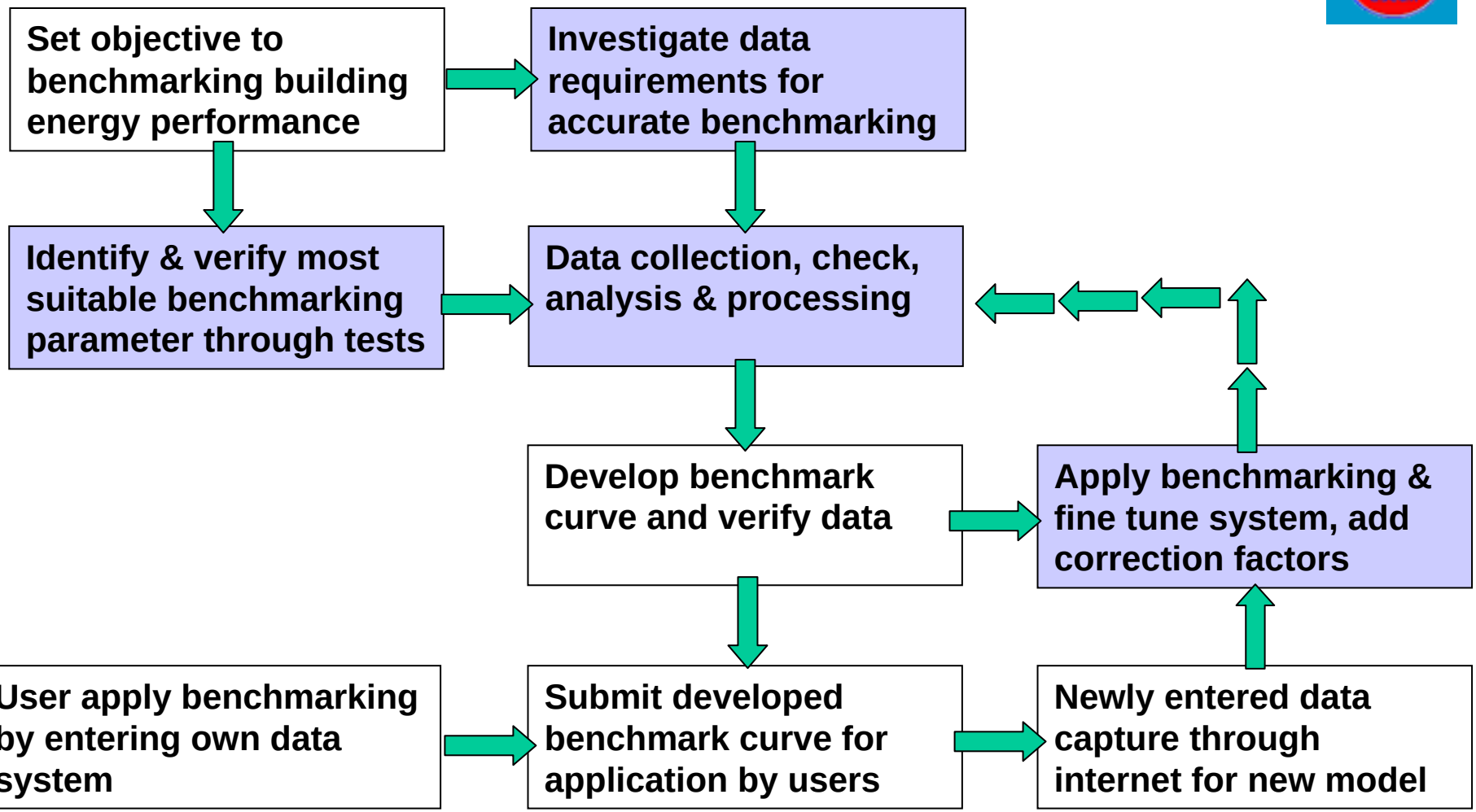
The proposed methodology should have:

- **Technologically sound and up-to-date**
- **The findings should be accurate and tested for practical applications**
- **The deliverables should be relevant to the local context and meet the immediate needs of the target groups**
- **The deliverables should be able to bring about enhanced growth in the energy services sector**

General Methodology



Benchmarking Methodology– Logic Model



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8. Documentation and Publication

Publish Documents:

i. **Building benchmarking development methodology manual**

ii. **Final report**

8. Documentation and Publication

Learned Journals:

i. **Energy benchmarking system design and developments.**

ii. **Energy benchmarking methodology and investigation of parameters.**

iii. **Web-base benchmarking system**

9. Information Centre

Seminar and Workshops:

- At least two seminars and two workshops

On Site Training:

- Bring about enhanced capacity and awareness

Website

- www.esu.com.sg (launched on April 7th)

10. First 6 Months Schedule & Responsibilities

First Year (2005)	CTBP-NUS	PTM	IEN	INIVE (Advisory)
Feb	1.1			
Mar	1.1_1.2	1.2	1.2	1.2
April	1.2_1.3	1.2_1.3	1.2	
May	1.3_2.1	1.3_2.1		2.1
June	1.3_1.4_2.1_ 2.2_3.1	1.3_1.4_2.1_2.2 _3.1	1.4	1.4_2.1_2.2_3.1
July	1.4_1.5_2.1_ 2.2_2.3_3.1	1.4_1.5_2.1_2.2 _3.1	1.4_2.3	1.4_2.1_2.2_2.3 _3.1

Statement

- ***This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of Energy Sustainability Unit (Centre for Total Building Performance) and can under no circumstances be regarded as reflecting the position of the European Union.***

Thank you