

# Country Report (Thailand)



**Coordinating Center for Energy Conservation Building Design**  
**Department of Alternative Energy Development and Efficiency**  
**Ministry of Energy**

**Ms. Kulsiri Sakprasith**



## EEDP 2015 Overview

Implement measures to promote energy efficiency in sectors with the goal to reduce energy intensity by 30%

EEDP 2011 -

**2030  
= 25%**

**Reduction**

EI (2010) actual

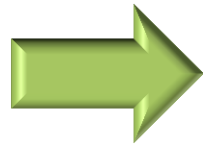
**15.28**

ktoe/billion baht

EI (2013) actual

**14.93**

ktoe/billion baht



EEDP 2015 -

**2036  
= 30%**

**Reduction**

EI (2030) forecast

**11.0**

ktoe/billion baht

EI (2036) forecast

**10.7**

ktoe/billion baht

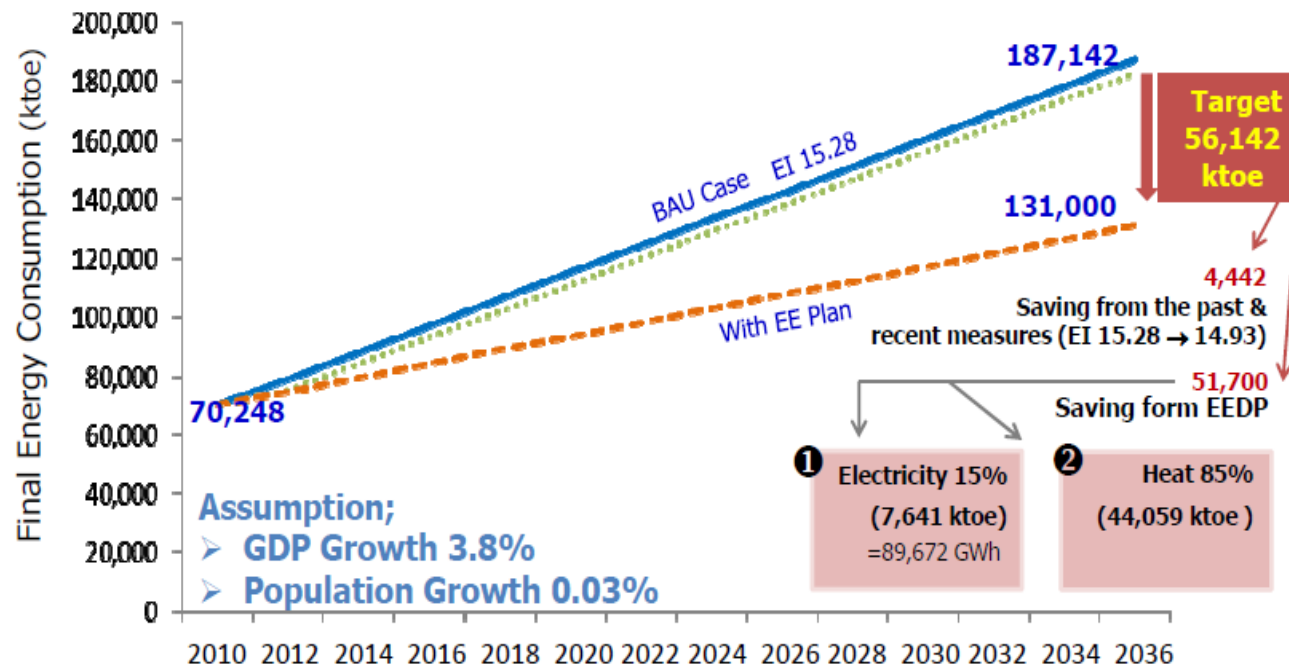
**Concept**



Long-term  
Implementation

Combination of  
Compulsory &  
Voluntary Measures

Performance-based  
Support





## 3 Strategies – 10 Measures

### Compulsory

- Enforcement of energy conservation standard in designated factory/building
- Building Energy Code
- Energy Standard and Labeling (HEPS/MEPS)
- Energy Efficiency Resources Standard (EERS)

### Voluntary

- Financial Incentive
- Promotion of LED (Light Emitting Diode)
- Energy Saving Measures in Transport Sector

### Complementary

- Research and Development in Energy Efficient Technologies
- Human Resources Development
- Promotion of Public Awareness on Energy Conservation



## EEP 2015 Compulsory Measures

### EE1 Energy conservation standard in designated factory/building

- Mandatory on Energy Management based on PDCA concept in Designated factory/building (>1000 kW or > 20 MJ/y) : 8,000 DFs
- Plan to strengthening for more enforcement by establishing energy efficiency standards and possible penalty (in the form of fee - based on energy consumption) for noncompliance.

### EE2 Building Energy Code

- New buildings or retrofitted buildings being constructed which have a total area of 2000 square-meters or more must be designed under specified requirements.

### EE3 Energy Standard and Labeling (HEPS/MEPS)

- Setting energy efficiency standard for equipment and machineries
  - MEPS - Minimum Energy Performance Standard (MEPS) is set to prevent import and production of sub-standard equipment.
  - HEPS – High Energy Performance Standard (HEPS) is given to equipment with high efficiency for promotion purposes.
- Regulating MEPS/HEPS via labeling (MEPS by TISI and HEPS by EGAT and DEDE)

### EE4 Energy Efficiency Resources Standard (EERS)

- Utilities have obligations to help their customers reduce their energy consumption via various energy conservation measures.



## EEP 2015 Voluntary Measures

### EE5 Financial Incentive

- Main Financial incentives are;
  - Co-investing Scheme (ESCO Fund )
  - Soft Loan
  - Tax Incentive
  - Direct Subsidy
  - Energy Service Company (ESCO)

### EE6 Promoting LED (Light Emitting Diode)

- Replacing street lights with LEDs
- Installation of LEDs in government buildings
- Promotion of LED in residential, commercial, and industrial sector via price mechanism

### EE7 Energy Saving Measures in Transport Sector

- Remove subsidies for fossil-fuel to let market prices reflect the true cost of the fuel
- Increase efficiency in cars
- Improve efficiency in trucks and buses
- Improve the infrastructure of transport sector

## EEP 2015 Measures Summary

| Measures/Sector   | Industrial        | Commercial/<br>Governmental | Residential     | Transportation    | Total  | %     |
|---|-------------------|-----------------------------|-----------------|-------------------|--------|-------|
| EE1 Energy conservation standard in designated factory/building | 4,388             | 768                         |                 |                   | 5,156  | 10.0  |
| EE2 Building Energy Code  |                   | 1,166                       |                 |                   | 1,166  | 2.3   |
| EE3 Energy Standard and Labeling (HEPS/MEPS)                    | 749               | 1,648                       | 1,753           |                   | 4,149  | 8.0   |
| EE4 Energy Efficiency Resources Standard (EERS)                 | 202               | 184                         | 114             |                   | 500    | 1.0   |
| EE5 Financial Incentive   | 8,895             | 629                         |                 |                   | 9,524  | 18.4  |
| EE6 Promoting LED (Light Emitting Diode)                        | 281               | 424                         | 286             |                   | 991    | 1.9   |
| EE7 Energy Saving Measures in Transport Sector                  |                   |                             |                 | 3,0213            | 30,213 | 58.4  |
| Total   | 14,515<br>(28.1%) | 4,819<br>(9.3%)             | 2,153<br>(4.2%) | 30,213<br>(58.4%) | 51,700 | 100.0 |

Unit: ktoe

## Road Map

EEP = Energy Efficiency Plan

PDP = Power Development Plan

AEDP = Alternative Energy Development Plan

### 1. Enforcement of the Ministerial Regulation

- Enforcement BEC standard
- Development of BEC auditor training

✓ Tightening BEC standard

✓ In 2018, Starting enforce with new buildings area  $\geq 10,000 \text{ m}^2$

✓ Down to 2019 size in 3 years



Area

### 2. Supporting new energy conservation

- Energy building labels
- Financial incentives, for example government funds or

✓ To support the new projects receive formal low interest personal loans



### 3. Zero Energy Building

- Study green building design, economic value and the climate change of Thailand

Target: Government and private new building total

- Envelop system
- Lighting system
- Air conditioning





# Building Energy Code Standard

## BEC

- ✓ 9 types of new buildings
- ✓ Total area  $\geq 2,000 \text{ m}^2$

## Standards

**OTTV**  
OVERALL THERMAL  
TRANSFER VALUE



**RTTV**  
ROOF THERMAL  
TRANSFER VALUE



**A/C**  
AIR CONDITIONER



**LPD**  
LIGHTING SYSTEM



**RENEW**  
RENEWABLE ENERGY



**WHOLE**  
BUILDING ENERGY



**Group 1**  
Education  
Office

8 Hours/day

$OTTV \leq 50 \text{ W/m}^2$   
 $RTTV \leq 15 \text{ W/m}^2$   
 $LPD \leq 14 \text{ W/m}^2$

**Group 2**  
Theater  
Convection Hall  
Entertainment  
Department Store

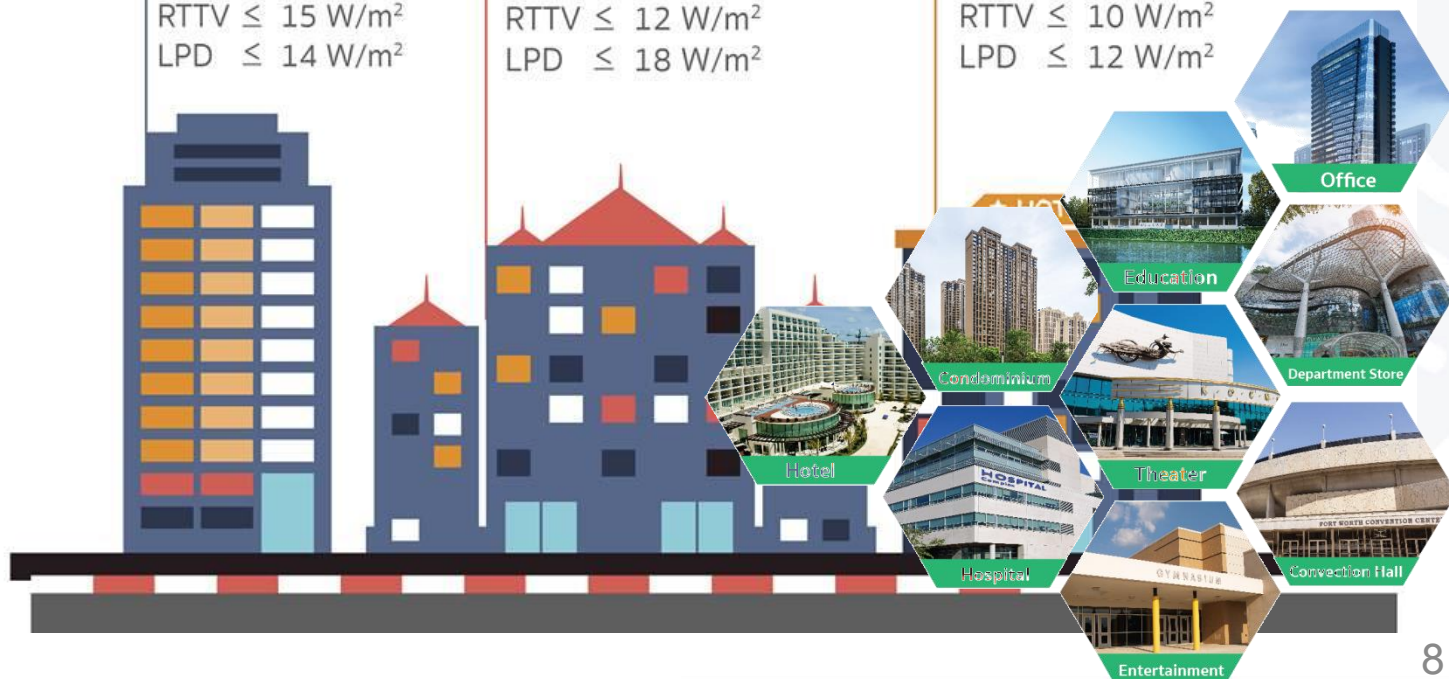
12 Hours/day

$OTTV \leq 40 \text{ W/m}^2$   
 $RTTV \leq 12 \text{ W/m}^2$   
 $LPD \leq 18 \text{ W/m}^2$

**Group 3**  
Hotel  
Hospital  
Condominium

24 Hours/day

$OTTV \leq 30 \text{ W/m}^2$   
 $RTTV \leq 10 \text{ W/m}^2$   
 $LPD \leq 12 \text{ W/m}^2$











## BEC

### Standard for building design

#### 1 System compliance

-  Envelop system ☒
-  Lighting system ☒
-  Air conditioning system ☒
-  Hot water system ☒

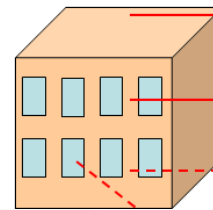
PASSED

#### 2 Whole building compliance

Designed

≤

Reference



RTTV = 17

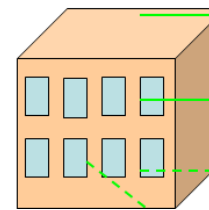
OTTV = 55

Lighting = 7

250,000

kWh/year

≤



RTTV = 15

OTTV = 50

Lighting = 14

300,000

kWh/year



Hot water system

PASSED

FAILED

## BEC

Since

2010

### ◆ “Coordinating Center of Energy Conservation Building Design”



- To provide information to any government sectors, state enterprises, or project stakeholders regarding the evaluation procedures of building plans for energy conservation as required by the Ministerial Regulation

- Evaluation of energy conservation building**
- (2009 – 2017 = 500 building drawing plans)

**BEC's auditor training 2,000 persons**

(Architect, Engineer and Building Owner etc.)

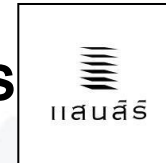
**MOU with municipalities and universities**

(Bangkok, Chiangmai, Pattaya etc.) (KU, TU, CMU, KMITL etc.)

(Engineering institute, Siamese Architects)

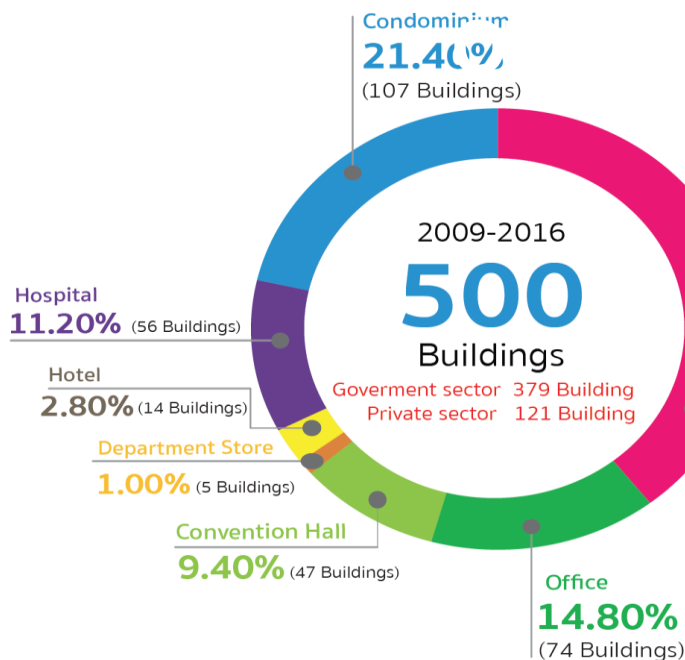
(SCG, CPN, PPN)

**Develop of prototypes for standard government conservation building drawing plans**

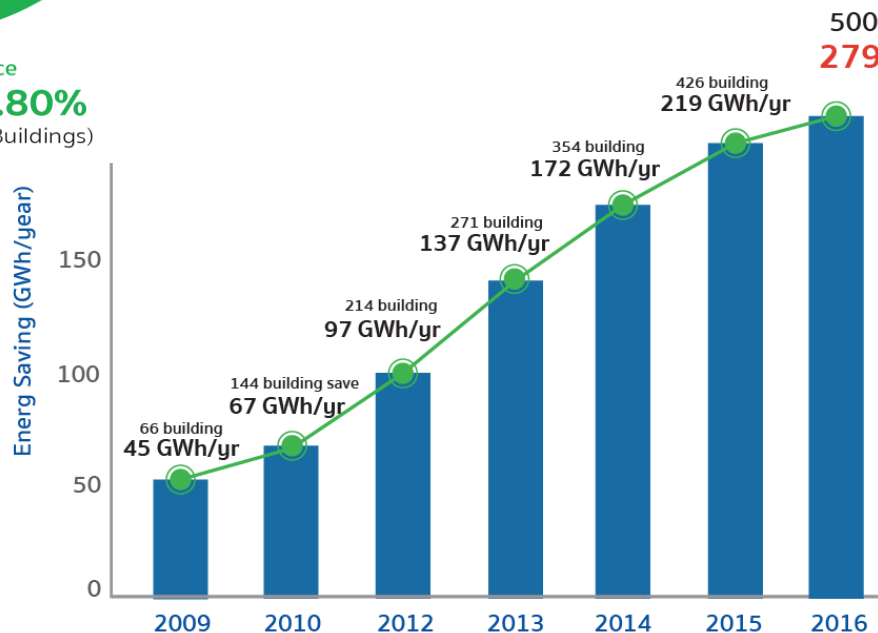




## Result of the Evaluation



Only 32% of Private Building in  
Cooperation with the Promotion of  
BEC from 2009 to 2016



Energy Saving 2009 - 2016

Energy Saving  
278.81 GWh/y



Oil Equipvalent  
23.83 ktoe/y



Cost Value  
975.84 Baht/y



Reduce CO<sub>2</sub>  
161.71 tons





# BEC AWARDS 2017

## Energy conservation

**BEC  
AWARDS  
2017**

Rewards in 2016-2017, 96  
buildings

For the energy conservation  
Grade 49 passing every  
saving system.



Excellent



Very Good



Good



อาคารสินแพทย์เมดิคอลคอมเพล็กซ์  
โรงพยาบาลสินแพทย์

|              | Reference         | Using Energy     |
|--------------|-------------------|------------------|
| OTTV         | ≤ 30              | 27.03            |
| RTTV         | ≤ 10              | 7.68             |
| LPD          | ≤ 12              | 5.03             |
| <b>WHOLE</b> | <b>22,357,500</b> | <b>6,916,800</b> |

- ประเภท: สถานพยาบาล
- ขนาดพื้นที่ 43,000 ตร.ม. (ปรับอากาศ 23,660 ตร.ม.)
- อัตราส่วนพื้นที่กระจกต่อพื้นที่ผนังทั้งหมด (WWR) ร้อยละ: 47

**69% SAVING**





## Evaluation of Thailand Energy

Since 2000

[www.thailandenergyaward.com](http://www.thailandenergyaward.com)

1. Renewable Energy

2. Energy Efficiency

- Building

- Small and Medium Building  
Category (1)

- BEC Category (6)

- New and Existing Building Category  
(3)

-Retrofitted Building Category (3)

-Tropical Building Category (1)

- Industry

- Transportation

3. Personnel

4. Energy Creativity

5. Contributor of Efficiency

Energy  
Consumption





## ASEAN Energy

1. Renewable Energy
2. Energy Management in Building and Industry
  - Small and Medium Building Category
  - Large Building Category (2)
3. Energy Efficiency Buildings
  - Retrofitted Building Category (2)



From AEA 2017, Thailand joined the event in 27 September 2017. There are 19 awards that Thailand entered



โครงการนี้ได้รับการคัดเลือกส่งเข้าประกวด ASEAN Energy Awards 2017 : ASEAN Best Practices Awards for Green Buildings และได้รับรางวัลรองชนะเลิศอันดับ 2 ประเภท Large Building



โครงการนี้ได้รับการคัดเลือกส่งเข้าประกวด ASEAN Energy Awards 2017 : ASEAN Best Practices Awards for Energy Management in Buildings และได้รับรางวัลรองชนะเลิศอันดับ 1 ประเภท Large Building



โครงการนี้ได้รับการคัดเลือกส่งเข้าประกวด ASEAN Energy Awards 2017 : ASEAN Best Practices Awards for Energy Efficiency Buildings และได้รับรางวัลชนะเลิศประเภท Retrofitted Building







# Next step



Reference  
Building

Building  
Energy Code

High Performance  
Standards

Economic  
Building

**Ref.**

**BEC**

**HEPS**

**ECON**

ปีที่ยกบังคับ (B.C.)

2009

2019

2025

2031

OTTV ( $W/m^2$ )

50

50

40

30

RTTV ( $W/m^2$ )

15

10

8

6

LPD ( $W/m^2$ )

14

10

8

4

\*Group 1 Academy and office

Split Type (EER)

Reference : Number 5's label of EGAT\*



Air- cooled  
Chiller (kW/ton)

1.33

1.12

0.8

0.6

Water- cooled  
Chiller (kW/ton)

1.24

0.88

0.6

0.4

**Boiler** Efficiency (%)

80

80

85

90

\*EGAT = Electricity Generating Authority of Thailand



## 1. Communicate with our targets

- Show strength points of AEA.
- Ensure buyer, tenant, owner of the building in terms of value for EEB.
- Promote image in compliance with the law and how much the building is interested in the energy and environment.

2. Increase type of the prize eg. Personal including exclusive person and supporting person, Innovation/Research, Invention, Biofuel, Cogenerator. Everyone can learn the success of those who have succeeded from their visible examples easier than learning from the paper.

3. Increase the value of prize.



## How to promote BEC/GBC in respective Countries by making use of the ECAP14

Participants can share everything that learn and share from this meeting to the stakeholders of each other and apply it.

- Training
- Exhibition, public documents, website.

## How to develop ZEB concept in the Special Award

### Category

ASEAN agreement of ZEB

- Conception
- Measurement/Scorecard
- Score in the Award

In part of Thailand, we have BEC program for evaluation of energy conservation building. And it can be developed as a program to be used under



# THANK YOU



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[www.2e-building.com](http://www.2e-building.com)  
E-mail :