



# Development of energy management in Thailand

**Bureau of Energy Regulation and Conservation**  
**Department of Alternative Energy Development and Efficiency**

- **Thailand's Energy Situation**
- **Development of Legal Framework**
- **Scheme to promote Energy Management**



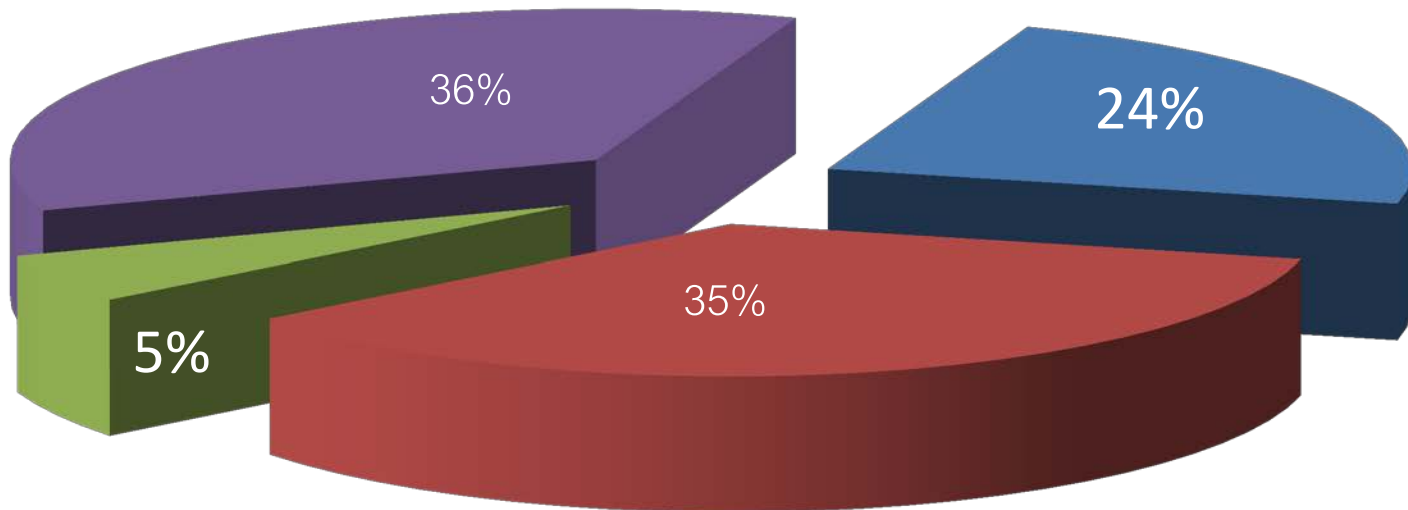
# 1. Thailand's Energy Situation



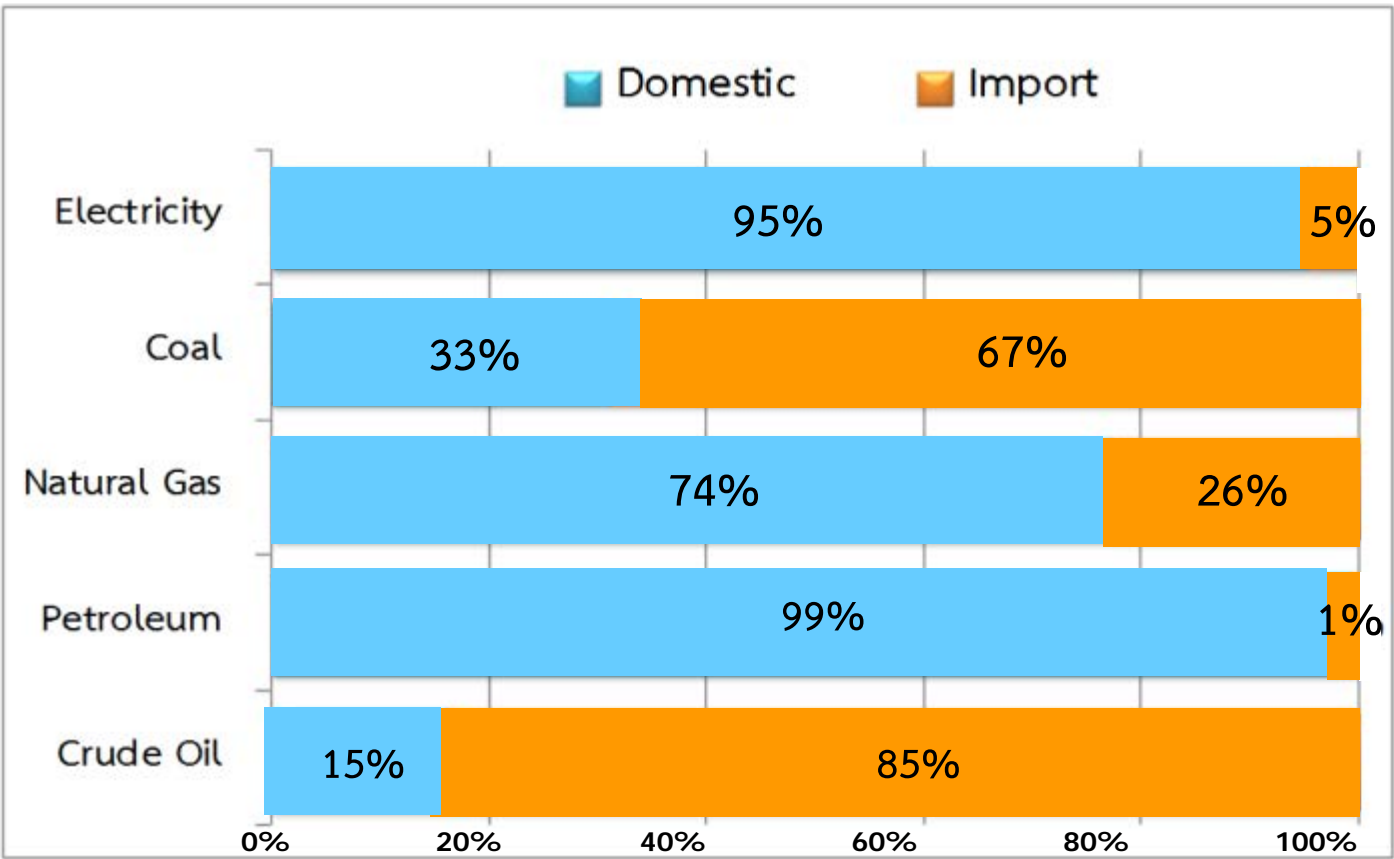


- Total final energy consumption in 2012 is 1.27 million barrels (crude oil equivalent) per day
- Total energy cost in 2012 is approx. 70 billion USD

■ Res. & Com. ■ Transport ■ Agriculture ■ Industry



# Energy Consumption in Thailand



**Value  
(billion Baht)**

**14**

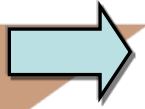
**47**

**140**

**71**

**1,131**

**Total energy import in 2012**



**1,403**

## 2. Development of Legal Framework



# Why having EC Law

- Serving for high demand of energy consumption due to rapid growth in social and economics
- Maximize the efficiency of energy supply and demand for energy security
- Introduce effective systems and measures to conserve the energy in the nation



Energy Conservation Promotion Act (ECP Act)  
( Issued in 1992)



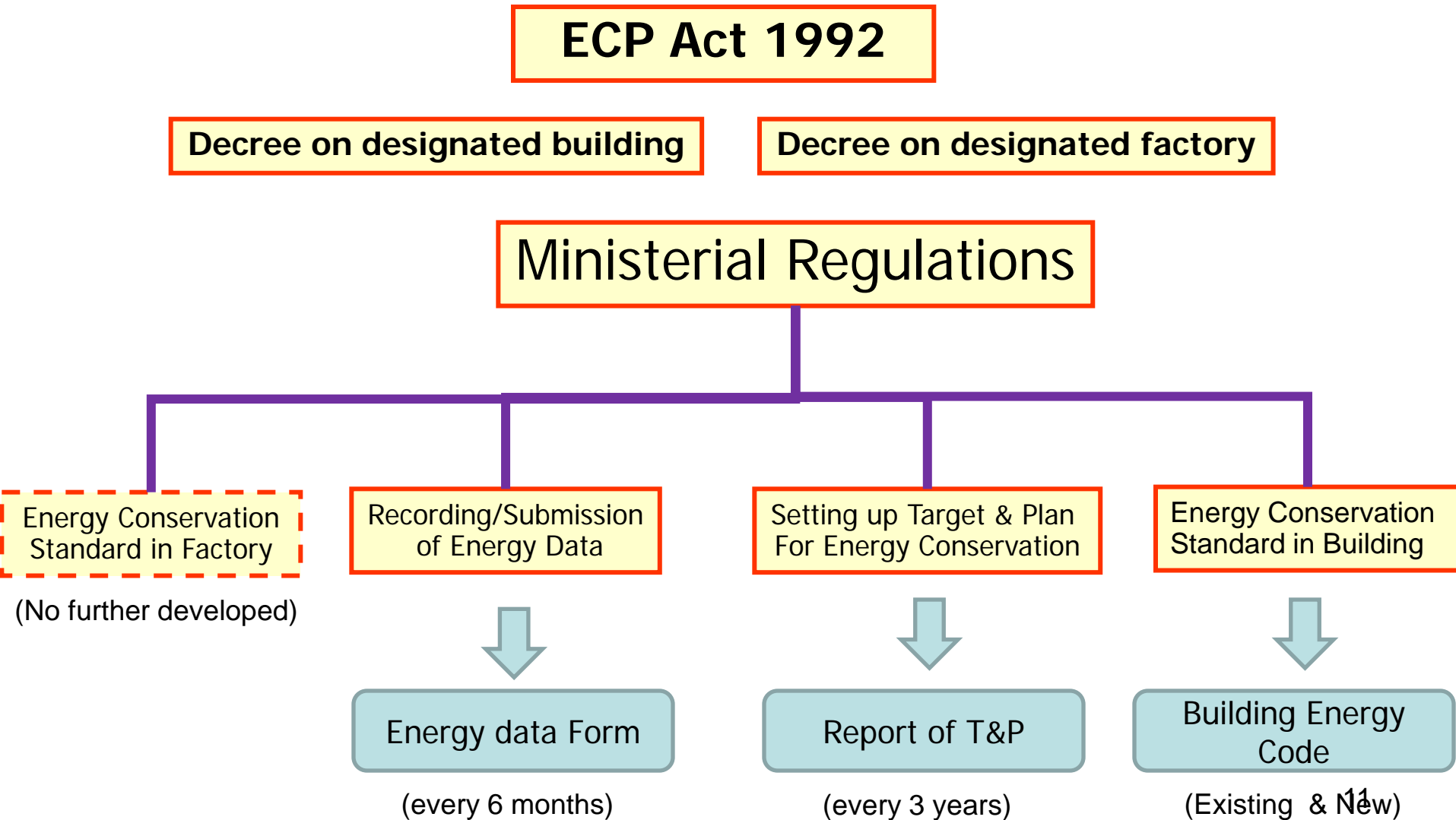
## Objective

- To ensure the production and utilization of the energy in the nation with max. efficiency
- To implement the compulsory program for designated facilities
- To promote the manufacturing and use of energy efficiency equipment and material within the country
- To establish the Energy Conservation Promotion Fund as a financial source to promote EC activities

## Major Contents of ECP Act . 1992

Division	Section	Issue
-	1 - 6	General Issues and Definitions
1	7 - 16	Energy Conservation in Factories
2	17 - 22	Energy Conservation in Buildings
3	23	Energy Conservation in Machinery, Equipment, and Materials
4	24 - 39	Fund for Promotion Energy Conservation
5	40 - 41	Measures for Promotion and Assistance
6	42 – 46	Surcharges
7	47 – 49	Competent Officers
8	50 – 52	Appeals
9	53 - 61	Punishment

# Structure of ECP Act. 1992



**Designated Facilities**

**Buildings/Factories**

- Electric power meter  $\geq 1000$  kW
- Total Installed Transformer  $\geq 1175$  kVA
- Annual Energy Consumption  $> 20$  mill MJ

**Appoint Person Responsible of Energy**

**Record / Submit Energy Data**

**Submit every 6 months**

**Compulsory Energy Audit**

**Preliminary Audit**

**Detailed Audit**

**TARGET&PLAN**

**Submit every 3 years**

**Monitoring on T&P**

**Energy Conservation Promotion Act  
1992**



**First revision in 2003**



**Minor change in process  
of Compulsory Program  
for DFs**

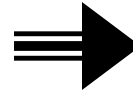


**Second revision in 2007**



**Major change in law  
structure & scheme of  
Compulsory Program  
for DFs**

**Designated Facilities**



## Buildings/Factories

- Electric power meter  $\geq 1000$  kW
- Total Installed Transformer  $\geq 1175$  kVA
- Annual Energy Consumption  $> 20$  mill MJ

**Appoint Person Responsible of Energy**

**Record / Submit Energy Data**

**Submit every 6 months**

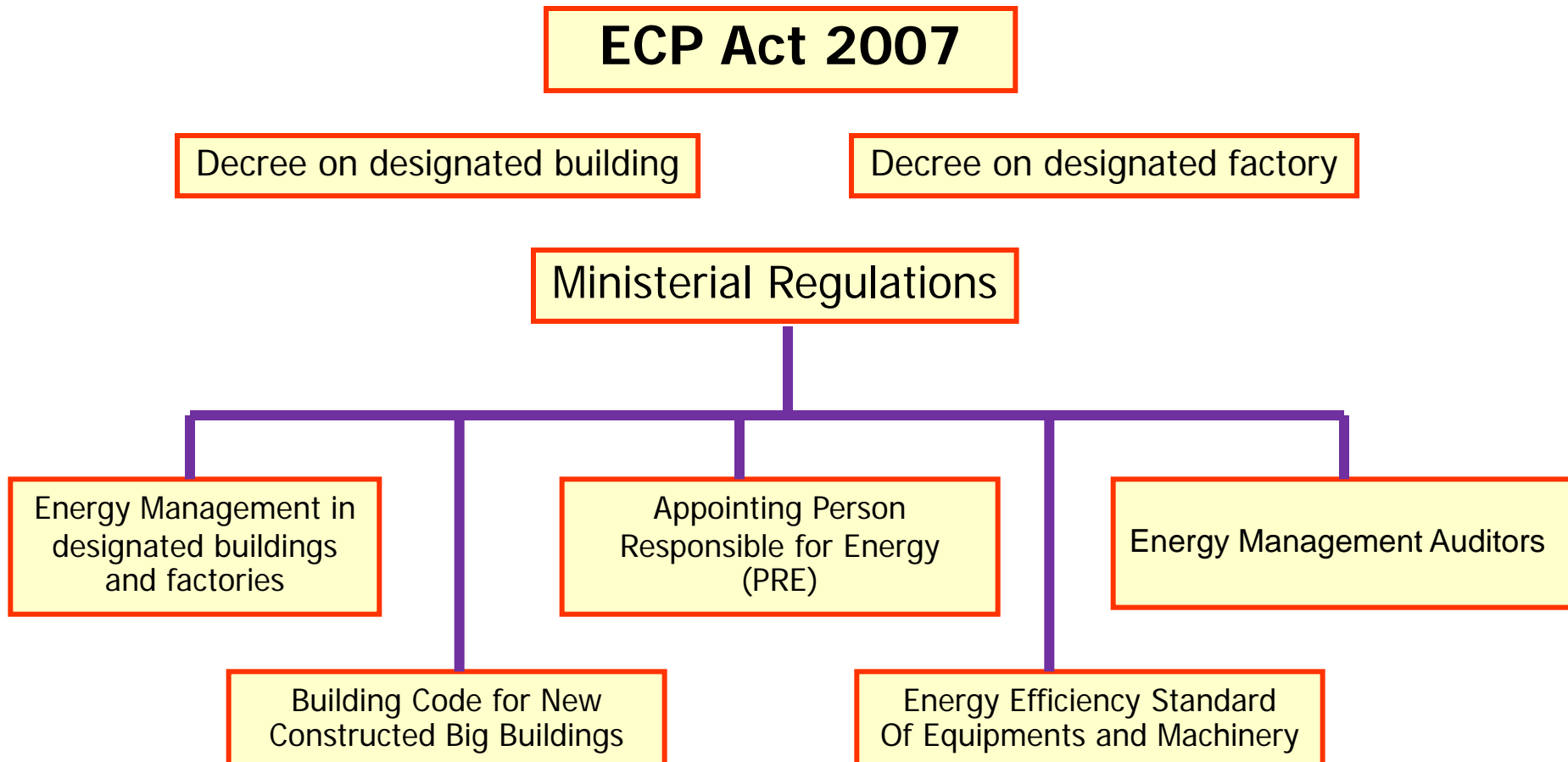
**TARGET&PLAN**

**Submit every 3 years**

**Monitoring on T&P**

**No Compulsory  
Energy Audit**

## Structure of ECP Act. 2007



## Concept & Approach

- To harmonize with current energy situation
- Focus more in systematic management rather than engineering solution (Focus on value of people more than machinery and equipment)
- Paradigm shift from Regulator/Enforcer to Facilitator/Supporter



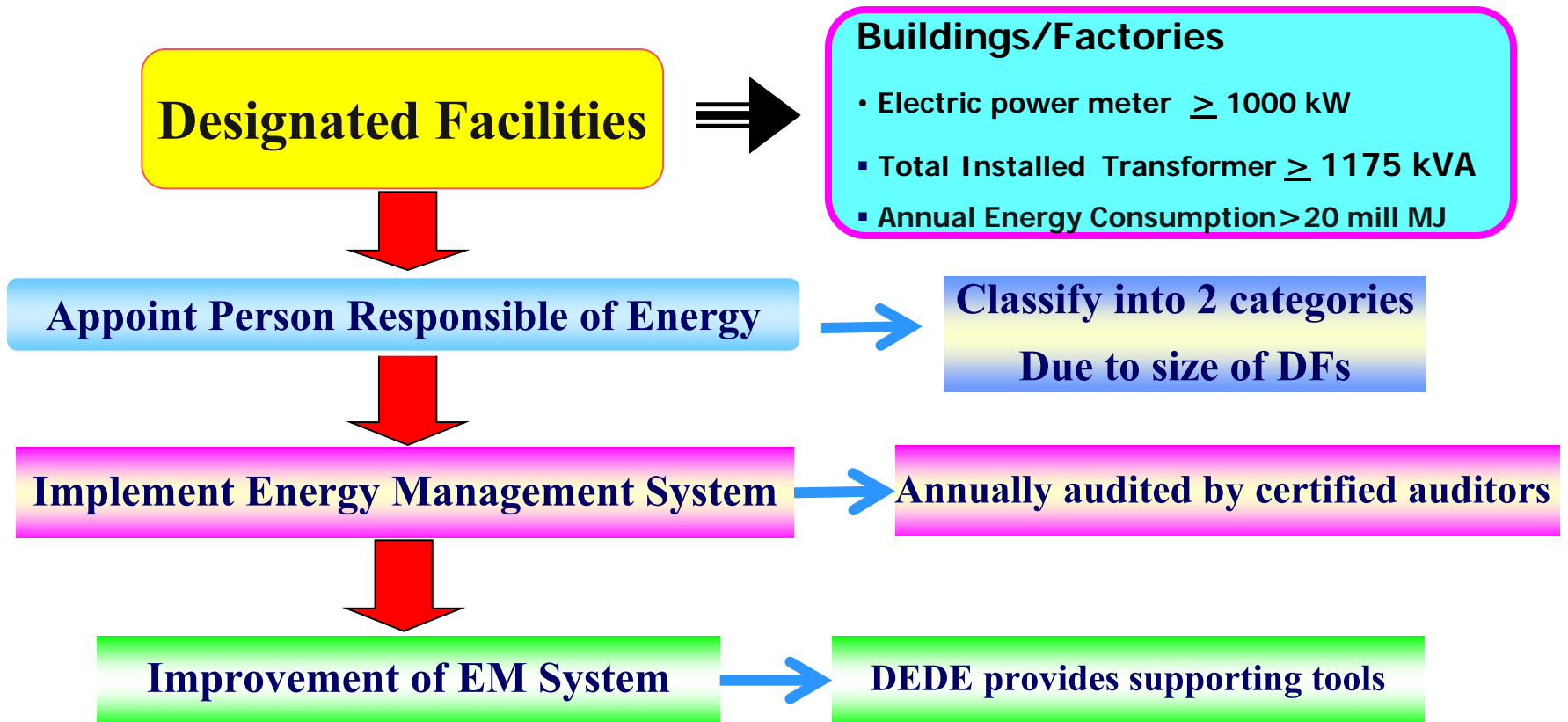
## Summary of major changes

1. Simplify process of issuing or changing minor laws by giving the authority to the Energy Minister
2. Introduce energy management to be the major tool for energy conservation instead of using engineering solution
3. More concentrate on new buildings to compile with the latest revision of the building code



## Summary of major changes

4. Setting up EE Standard of energy-consumed equipments to be visible by consumers
5. Transfer the responsibility of ENCON Fund from the Ministry of Finance to the Ministry of Energy
6. Adjusting the criteria and procedure of collecting the money into the Fund for more convenience and appropriateness
7. Giving more power for competent officers or any certified bodies to be the energy management auditors



**Energy Management  
Is the Key**

## 1. Persons Responsible for Energy (PRE)

- **Objective** : Establishment of a certified system for PRE of designated facilities
- **Target group** : Permanent personnel of designated facilities who is in charge of energy conservation matters (engineer, architect, technician)
- **Effective** : 31 July 2009



## 2. Energy Management in designated facilities

- **Objective** : Establishment a guideline on energy management standard for designated buildings and factories
- **Target group** : Designated buildings and factories
- **Effective** : 20 Nov. 2009

## 3. Energy Management Auditors

- **Objective** : Establishment of a certified system for energy management auditors
- **Target group** : Corporate registered under Thai Law in energy conservation business or Academic Institutes
- **Effective** : 11 May. 2012

## 4. Building Energy Codes for New Buildings

- **Objective** : Setting up a standard of design in new constructed buildings with a concern in energy efficiency
- **Target group** : New constructed buildings with a usable area more than 2000 sq.m.
- **Effective**: 20 June 2009



## 5. Energy Efficient Standard of Equipment and Machinery

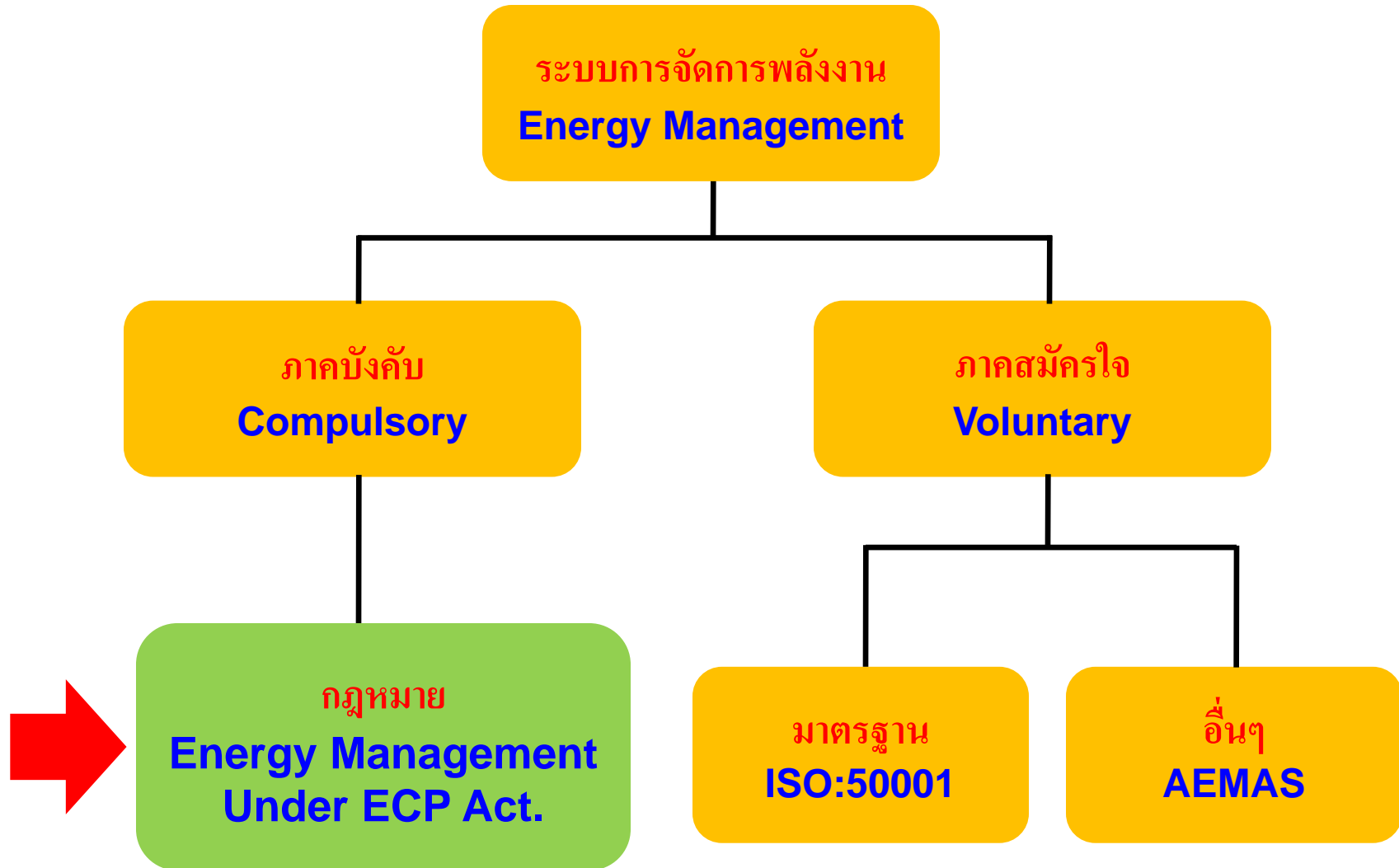
- **Objective** : Setting up a high energy efficient standard for equipment and machinery
- **Target group** : Energy-consumed equipment and machinery (mostly for households)
- **Effective** : 8 April 2009



- **More convenient due to shortening in some procedure and process**
- **More appropriate to the current energy situation**
- **More effective in the result of energy saving**
- **More sustainable in energy conservation**

### 3. Scheme to promote Energy Management



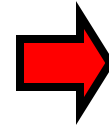


## 3.1 Mandatory Approach



## Concept

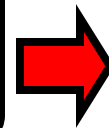
Energy Conservation Promotion Act. 1992



- Focus on Engineering Solutions
- Low attention on Value of People
- A question on Sustainability ?



Energy Conservation Promotion Act. 2007



- Introduce EM system
- Systematic approach of energy conservation
- Sustainability

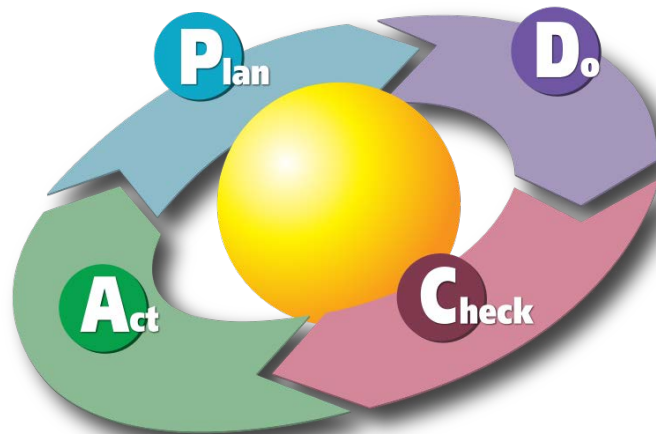
## Approach

- Mandatory for Designated buildings and factories under ECP Act.
- Setting up national guideline of EM through Ministerial Regulation in Energy Management (effective since July 2009)

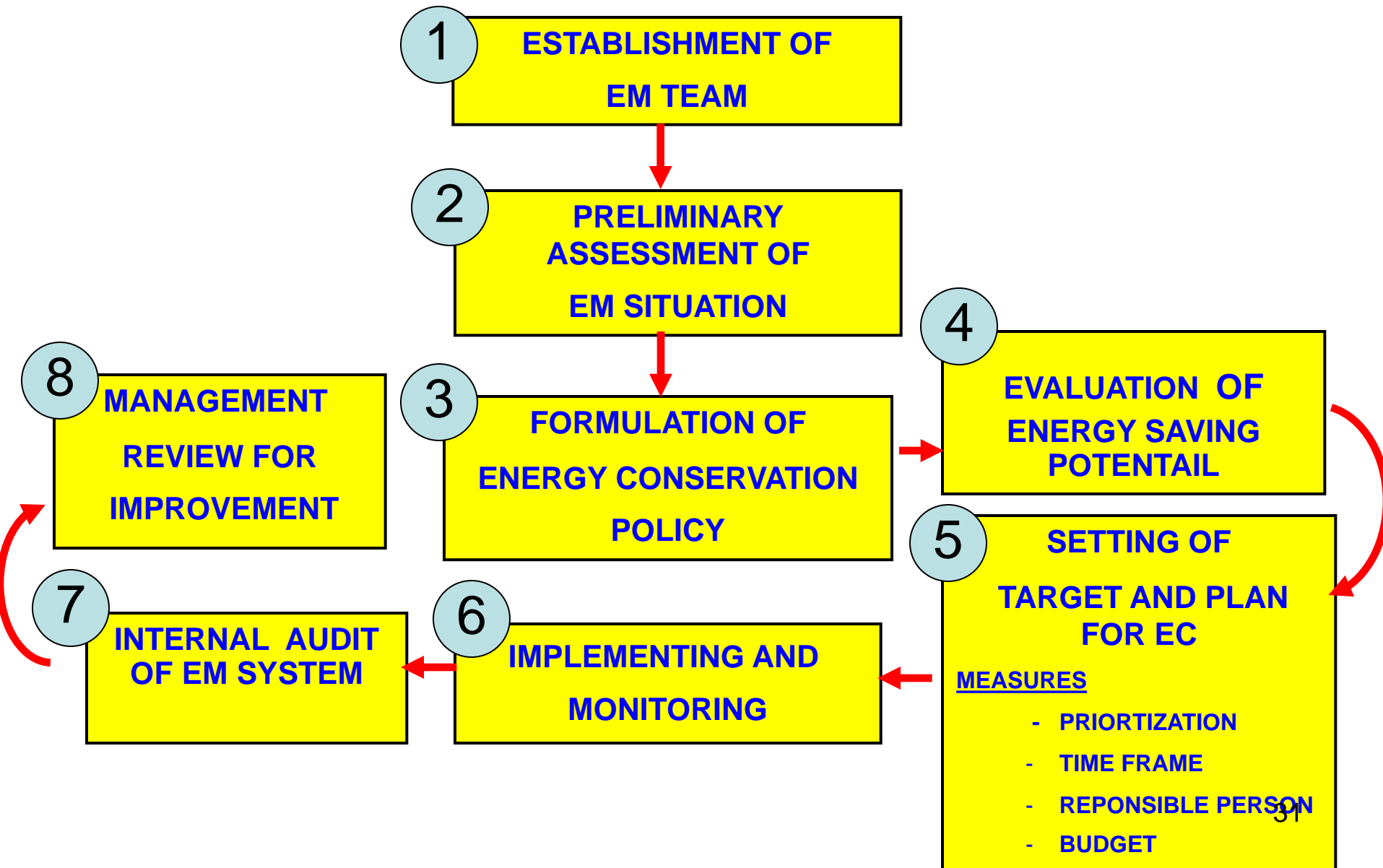
**Energy Management  
is the answer**

## Main Concept

- Systematic approach
- Role and Commitment from Top Management
- Participation from all levels
- Friendly implementation scheme
- Applicable for all designated sectors
- Using international standards as reference

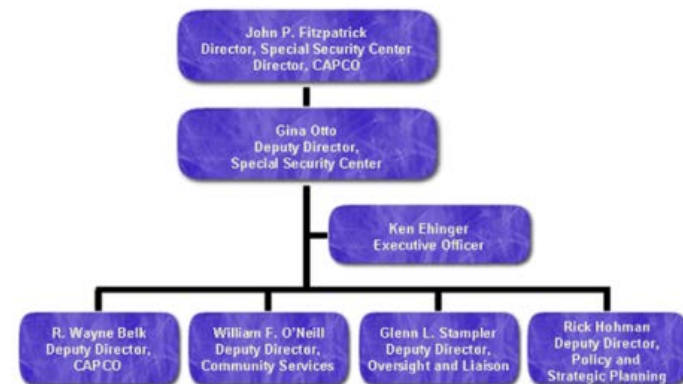


# Thailand EM system



## Step 1: Set up EM Team

- Good structure and participation from all key persons
- Indicating clear role and responsibility
- Appointing of Energy Managers
- Strong commitment and support from top management





## Step 2 : Assessment on EM situation

- To realize for current EM status, strengths or weaknesses
- To identify for EC policy and the direction and plan for EM
- Apply the Energy Management Matrix
- To review for policy and the improvement of EM procedures during the next period

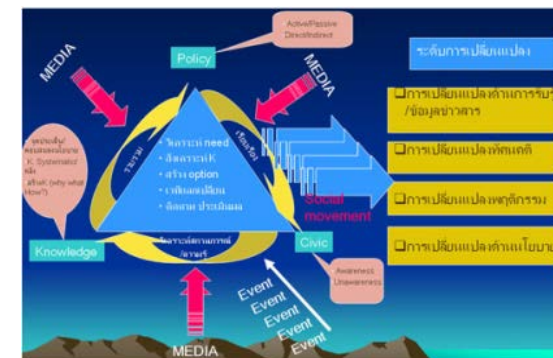
Table 2.1: Energy Management Matrix (EMM)

Level	1. Energy Management Policy	2. Organization Structure	3. Motivation	4. Communication	5. Public Relations	6. Investment
4	1.1 The energy management policy is identified by high-ranking executives and is a part of the company's policy.	2.1 Have organization structure and is a part of the management. The duties and responsibilities are set clearly.	3.1 Coordinate with every personnel responsible for energy and every level of the team regularly.	4.1 Identify broad goals, monitor results, find errors, evaluate and control the use of budget.	5.1 Public Relations of the value of energy saving and performance of energy saving.	6.1 Allocate budgets by considering from importance of projects.
3	1.2 Have policies and obtain support from management occasionally.	2.2 Personnel responsible for energy report directly to Energy Management Steering Committee consisting of head of several units.	3.2 Energy Management Steering Committee is the main channel for operations.	4.2 Inform the outcomes of energy usage from sub-meter to each department but do not inform the outcomes of energy saving.	5.2 Employees acknowledge the energy saving project and the public relations are conducted regularly.	6.2 Payback period is applied as the criteria for investment.
2	1.3 No clear policy from executives.	2.3 Personnel responsible for Energy reports to Ad-Hoc Committee but the chain of command is unclear.	3.3 Ad-Hoc Committee takes actions.	4.3 The evaluation and auditing report is prepared from meter and the Ad-Hoc Committee shall be responsible for budgeting.	5.3 Arrange trainings for employees occasionally.	6.3 investment on projects with short payback period
1	1.4 No guidelines for actions in writing	2.4 Personnel responsible for energy have limited scope of duties and responsibilities.	3.4 Informal communication between personnel responsible for energy and energy users (employees) in the units	4.4 The report of energy usage expenditure is summarized and sued in the engineering department.	5.4 Inform the employees informally to promote the efficient use of energy	6.4 Consider only measures with low investment
0	1.5 No clear policy	2.5 No personnel responsible for energy	3.5 No contacts with energy users	4.5 No system for gathering energy usage data and expenditure	5.5 No support of energy saving	6.5 No investment in the improvement of efficient energy usage.



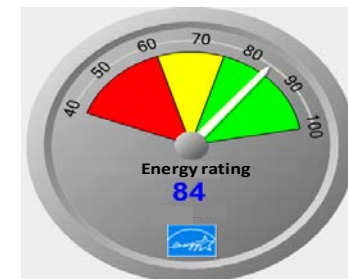
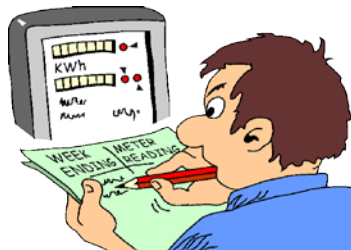
## Step 3 : Formulation of EC Policy

- Harmonizing EM as part of business operations
- Appropriate with characteristic of energy use in organization
- Indicating intension for the compliance with the law
- Indicating intension for continuous improvement
- Indicating intension for sufficient allocation of necessary resources



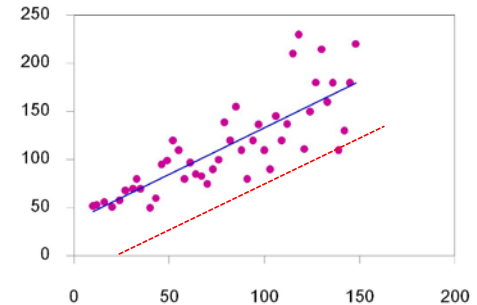
## Step 4 : Evaluation of Energy Saving Potential

- **Evaluation at Organizational Level**
  - ✓ Total energy consumption / By major systems
  - ✓ Compare with data in the past
  - ✓ Compare with data of other facilities in the same category
- **Evaluation at Product or Service Level**
  - ✓ Specific Energy Consumption : SEC  
( Energy use / production or service )
- **Evaluation at Main Machinery or Equipment Level**
  - ✓ Checking of efficiency
  - ✓ Checking of loss



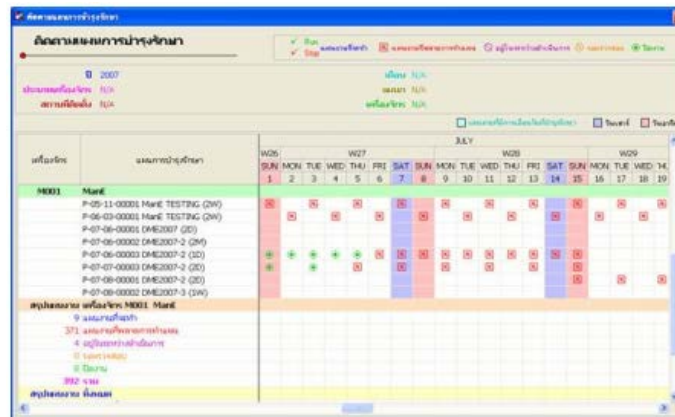
## Step 5 : Setting up Target and Plan

- **Set up EC target** : energy reduction, energy intensity
- **Set up EC Plan** :
  - Measures with implementing detail
  - Expected energy saving
  - Investment
  - Time frame
  - Responsible persons
- **Set up Training Plan and EC Activity** :
  - Training courses or EC activities
  - Target groups
  - Time frame
  - Responsible persons



## Step 6 : Implementing & Monitoring

- Strictly Implementing according to all plans
- Monitored and evaluated by EM Team
- Result analysis with suggestions to be reported to top management



## Step 7 : Internal Auditing of EM system

- Appointing internal Auditing Committee by facility owner
- Consisting of at least two individuals with EM knowledge
- Evaluating of EM implementation within organization to compile with the law
- Making a summary report for EM team and top management

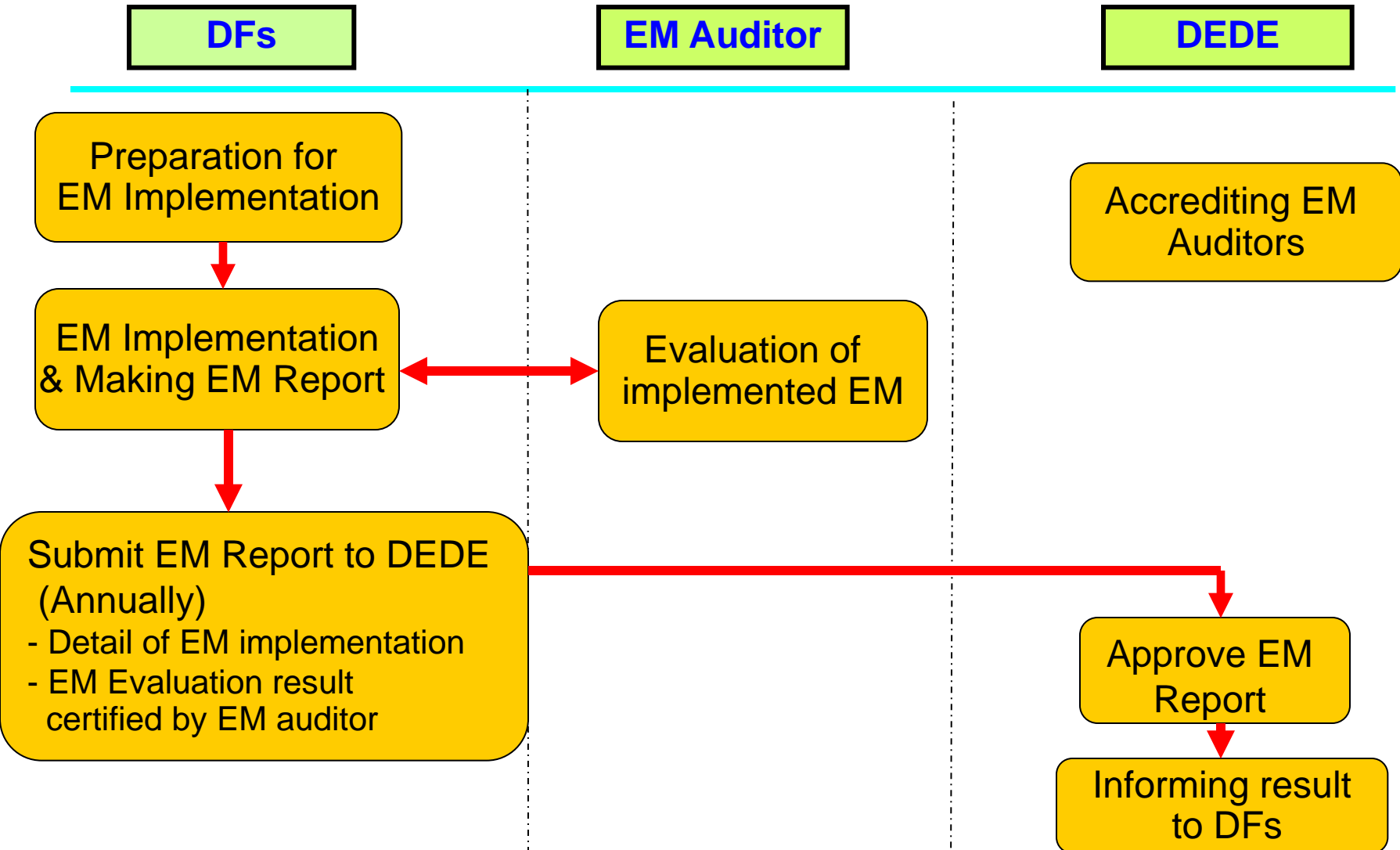


## Step 8 : Management review

- Conducted by EM team by organizing meetings
- Review all actions, result analysis, problem identifying and solutions to be taken
- Disseminate the results and recommendations within the organization for EM improvements over the next period
- The result from the review process must be taken into actions for continual improvement



## EM Implementation Scheme





Year	Submission of EM Reports	Energy saving potential
2011	<ul style="list-style-type: none"> <li>- Factory :2767</li> <li>- Building :1640</li> <li><u>Total</u> : <u>4407</u> (73%)</li> </ul>	260 ktoe/year
2012	<ul style="list-style-type: none"> <li>- Factory :2920</li> <li>- Building :1831</li> <li><u>Total</u> : <u>4751</u> (79%)</li> </ul>	330 ktoe/year
<b>2013*</b> (not completed as of march 2013)	<ul style="list-style-type: none"> <li>- Factory : 2300</li> <li>- Building : 1400</li> <li><u>Total</u> : <u>3700</u> (61%)</li> </ul>	under analysis

## 3.2 Voluntary Approach



## Objective

Promote energy management based on international standard by utilizing the basic approach from existing national EM scheme

## Approach

Voluntary program for designated facilities who comply with the mandatory EM program

## Expected result

- Understanding concept & approach of ISO 50001
- Guidelines to implement ISO 50001 based on practice of national EM system
- Pilot projects for official certified of ISO 50001 as show cases

## Scope of activities (Aug. 12 – Aug. 13)

- Finding gap analysis between Thailand EM system and ISO 50001
- Building capacity of targeted groups through trainings and seminar ( 200 factories/buildings)
- Selecting of 50 pilot facilities for real implementation of ISO 50001 through advisory of experts
- Evaluate and get certified for ISO 50001
- Disseminate the results as through PR activities

## Current achievement

- Completed the capacity building programs
- Under process of on site advisory on ISO 50001 implementation in 50 facilities
- Creating network of ISO 50001 certified bodies

# 1. Promotion of ISO 50001



Training



On site advisory

### Intro of AEMAS

- ASEAN Energy Management Accreditation Scheme
- A project under ASEAN Energy Cooperation to promote energy management in ASEAN
- Partnership program between ASEAN and EU (2010-2013)

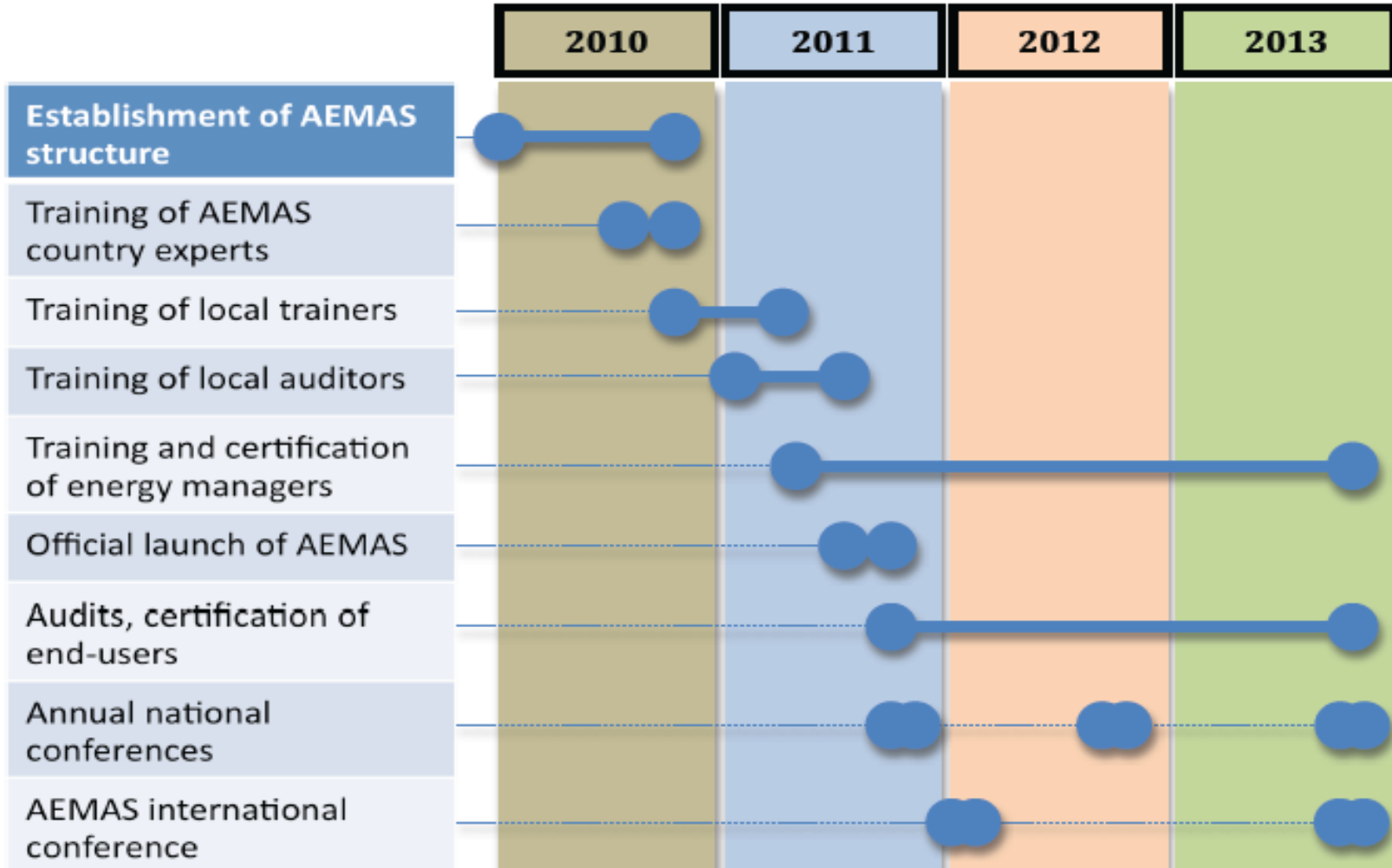
### Objective

- The establishment of an ASEAN-wide certification scheme on energy management
- The training and accreditation of energy managers on a large scale in the various ASEAN countries; and
- The certification of energy end-users in these ASEAN countries.

### Target

- The training and certification of over 3,500 energy managers
- The certification of over 2,500 energy end-users

## Main Activities



### Current achievement



Country	Country Experts	Local Trainers	Local Auditors	Energy End-Users	Energy Managers
Cambodia	2	1	1	-	-
Indonesia	2	25	3	-	87
Lao PDR	2	1	1	-	-
Malaysia	2	14	2	4	338
Myanmar	1	5	-	-	21
Philippines	2	29	-	3	131
Singapore	1	8	-	-	-
<b>Thailand</b>	<b>1</b>	<b>20</b>	<b>31</b>	<b>2</b>	<b>107</b>
Vietnam	2	24	14	-	323
<b>TOTAL</b>	<b>15</b>	<b>108</b>	<b>52</b>	<b>9</b>	<b>1,007</b>
TARGET	16	103	103	1500	2500



- ✓ Good Energy Management is the key for the success for sustainable energy conservation
- ✓ Combination of mandatory and voluntary approach in EM maybe the best solution
- ✓ Strong and continual support from government is very important
- ✓ Energy Management is a never-ending learning process

The real challenge is not how to get succeed but maybe how to get started

