

# THAILAND

## 1. GOALS FOR EFFICIENCY IMPROVEMENT

### 1.1. Overall Energy Efficiency Improvement Goals

The revised Energy Efficiency Plan (EEP), ratified by the National Energy Policy Council (NEPC) in 2015, states an energy intensity reduction target of 30% by 2036 (compared with 2010) from an estimated final demand reduction of 56 Mtoe (compared to business-as-usual (BAU)).

Additionally, Thailand adopted the goal to reduce its energy intensity by at least 45% by 2035 and expressed its intention to reduce greenhouse gas emissions from energy by 7%–20% in accordance with the Thailand Climate Change Master Plan enacted by the Office of Natural Resources and Environmental Policy and Planning (ONEP).

### 1.2. Sectoral Energy Efficiency Improvement Goals

The EEP sets the sectoral energy efficiency targets for all major sectors (see Table 1).

**Table 1:** The EEP sectoral energy efficiency targets

Sector	Reduction by 2036 (ktoe)	Share (%)
Industrial	14,515	28.1
Commercial + government	4,819	9.3
Residential	2,153	4.2
Transport	30,213	58.4
<b>Total (EEP 2015)</b>	<b>51,700</b>	<b>100.0</b>
Energy reduction result during 2010–2014	4,442	
<b>Total</b>	<b>56,142</b>	

### 1.3. Action Plans for Promoting Energy Efficiency

The EEP was ratified in 2015, but it was undergoing minor revisions at the time of writing. The plan is expected to be finalized in 2016.

The EEP features 10 measures classified into three major categories (compulsory, voluntary, and complementary) targeting all major sectors (industrial, commercial and government, residential, and transport) (see Table 2).

Table 2 – EEP-specific sectoral energy efficiency measures breakdown

Measures/Sector	Industry	Commercial/ Government	Residential	Transport	Total	%
<b>Compulsory Measures</b>						
Energy conservation standard in designated factories//buildings	4,388	768	-	-	5,156	10
Building energy code		1,166	-	-	1,166	2
Energy Standard and Labeling (HEPS/MEPS)	749	1,648	1,753	-	4,149	8
Energy Efficiency Resources Standard (EERS)	202	184	114	-	500	1
<b>Voluntary Measures</b>						
Financial incentives	8,895	629	-	-	9,524	18
Promoting LED lights	281	424	286	-	991	2
Energy-saving measures in the transport sector	-	-	-	30,213	30,213	58
<b>Complementary Measures</b>						

Innovation and improvement of energy efficiency tech	-	-	-	-	-	0.0
Capacity building for human resources	-	-	-	-	-	0.0
Energy conservation and awareness promotion	-	-	-	-	-	0.0
<b>Total</b>	14,515 (28.1%)	4,819 (9.3%)	2,153 (4.2%)	30,213 (58.45)	51,700	100.0

Unit: ktoe

#### 1.4. Institutional Structure

The following departments/entities under the Ministry of Energy of the Royal Thai Government deal with energy efficiency policy and programs:

- **Energy Policy and Planning Office (EPPO)** – As the policy and action plans development agency, it examines economy-wide energy conservation policies, management and development plans, and budget allocation, and it coordinates the follow-up and evaluation of policy implementation outcomes.
- **Department of Alternative Energy Development and Efficiency (DEDE)** – As the implementation and regulation agency, its duties include the promotion, support, and monitoring of energy efficiency and conservation activities. It also develops energy efficiency standards and research as well as information dissemination for awareness.
- **National Energy Policy Council (NEPC)** – This is responsible for the oversight of energy agencies to ensure that they operate in accordance with the provisions specified in the ENCON Act (1992) and the management of the Energy Conservation Promotion Fund (ENCON Fund).
- **Electricity Generating Authority of Thailand (EGAT)** – This is the owner-operator of power generation, transmission, and distribution systems economy-wide. It includes a Demand-Side Management Office to promote energy conservation, especially in electrical appliances through standard and labeling schemes. The EGAT is also a significant player in encouraging energy efficiency in major industries via energy service companies (ESCOs).

In addition, the Energy Conservation Center of Thailand (ECCT), established in 1987 (pursuant to a cabinet resolution) as an agency to promote energy conservation activities in the economy, has provided technical expertise and services in energy conservation by working closely with the DEDE.

## 2. MEASURES FOR ENERGY EFFICIENCY IMPROVEMENTS

### 2.1. Government Laws, Decrees, and Acts

#### a) Name

The Energy Conservation Promotion Act, B.E. 2535 (1992) (amended to No. 2, B.E. 2550 (2007))

#### b) Purpose

To enforce energy conservation, particularly in designated factories and buildings.

#### c) Applicable sectors

Economy-wide (industrial, commercial, and government sectors)

#### d) Outline

The NEPC is responsible for the promotion of energy conservation pursuant to the provisions specified in the ENCON Act (1992) and the management of the ENCON Fund. To assist the NEPC, the Energy Conservation Promotion Fund Committee has been established to be responsible for the management of the ENCON Fund and ensure that the allocations are made in compliance with the regulations stipulated in the act. The act stipulates the duties of owners of designated factories/buildings with regard to energy conservation in their facilities and promotes the use of energy-efficient machinery/equipment as well as materials contributing to energy conservation. The act also establishes penalties for noncompliance with the regulations issued under this act.

**e) Financial resources and budget allocation**

The ENCON Fund was established under the ENCON Act to serve as working capital, grants, or subsidies for implementation in energy conservation programs in the public and private sectors. Such programs include renewable and alternative energy, R&D projects, human resource development, and public awareness and education. In FY2011, THB 1.3 billion (approximately USD 40 million<sup>1</sup>) was allocated for the energy efficiency program.

**f) Expected results**

Under the newly developed EEP 2015, the target is to reduce energy intensity by 30% in 2030 compared with 2010.

**2.2. Compulsory Measures**

**2.2.1. Minimum Energy Performance Standards and Labeling (MEPS)**

With collaboration between the DEDE and the Thailand Industrial Standard Institute (TISI), Minimum Energy Performance Standards (MEPS) were implemented to prevent the production and import of substandard equipment. Moreover, equipment that meets a high standard is eligible for certification marks. The certification schemes include mandatory and voluntary certification options for different product classes. Mandatory certification is required for air conditioners and refrigerators, while voluntary certification is optional for the following types of equipment:

- |                                    |                         |
|------------------------------------|-------------------------|
| 1. Air conditioners                | 10. Microwaves          |
| 2. Refrigerators                   | 11. Rice cookers        |
| 3. Double-capped fluorescent lamps | 12. Electric ovens      |
| 4. Self-ballasted lamps            | 13. Motorcycles         |
| 5. Single-capped fluorescent lamps | 14. Electric kettles    |
| 6. LPG cooking stoves              | 15. Irons               |
| 7. Three-phase motors              | 16. Magnetic ballasts   |
| 8. Fiberglass insulation           | 17. Electronic ballasts |
| 9. Diesel engines                  | 18. Water pumps         |

In addition, the government introduced the Energy Efficiency Labeling No. 5 Program (for more information, see Section 2.2.1).

**2.2.2. Compulsory Energy Management Program for Designated Buildings and Factories**

Buildings and factories with installed electricity meters  $\geq 1000$  kW or that consume  $\geq 20$  TJ of energy per year or those with a total transformer capacity of 1,175 kVA or more are required to implement an energy management system as prescribed in the regulations. An energy management report must be submitted to the DEDE in March of each year, starting in

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<sup>1</sup> The official World Bank exchange rate for 2014 was USD 1 : THB 32.48

2010. Energy efficiency improvement is expected to be around 5%–10% from the implementation of this energy management system.

### **2.2.3. Building Energy Code (BEC)**

A mandatory energy code has been set under the Ministerial Regulation Prescribing the Type or Size of Building and Standards, Criteria and Procedures for Designing Buildings for Energy Conservation, B.E. 2552 (2009), with the purpose of improving energy efficiency in the design/construction of new/retrofitted buildings that occupy more than 2,000 m<sup>2</sup>. The code was set for major energy systems, including the building's envelope, lighting, air conditioning and heating system, to promote the concept of energy efficiency design as well as the utilization of highly-efficient equipment and materials. In practice, the regulation will be initially applied to new/retrofitted buildings that occupy more than 10,000m<sup>2</sup> to ensure regulation suitability and provide the time for adaptation. The regulation will be applied to smaller buildings (2,000m<sup>2</sup>) over the next five years.

By implementing this program, it is expected to save approximately 10%-20% of energy, compared to conventional designs.

### **2.2.4. Energy Efficiency Resources Standard (EERS)**

Electric utility companies, under the revised Energy Efficiency Plan (EEP 2015), must help their customers reduce their energy consumption. While the specifics of the measure are still under consideration, the measure is expected to reduce final energy consumption by 0.3%.

## **2.3. Voluntary Measures**

### **2.3.1. High Energy Performance Standards and Labeling (HEPS)**

Thailand established HEPS, known as the Energy Efficiency Labeling No. 5 Program, on a voluntary basis with the purpose of informing consumers that No. 5 labeled appliances/equipment are highly energy efficient and that they will help reduce their electricity bills. This will also enhance competition among manufacturers to further improve the energy efficiency of their products. This program, in operation since 1993, applies to the industrial, commercial, and residential sectors. Concerning financial resources and budget allocation, financing comes from various sources, including GEF grants and the Australian Government (1993–2000), concessional loans from the JBIC (OECD) (1994–2002), reimbursements through the Automatic Electricity Tariff Adjustment Mechanism (Ft) (1993–2000), and since 2000, reimbursement through the base tariff (in EGAT's annual budgeting).

The program's main purpose is to provide consumers with better awareness regarding the importance of energy-efficient appliances and equipment, especially when making purchasing decisions. Thus, it will help to gradually remove low energy-efficient products from the market. The labeling of appliances is the responsibility of EGAT, which has labeled a total of 19 types of typical household appliances.

In 2015, Thailand established another energy efficiency labeling program for non-appliances on a voluntary basis, which is the responsibility of the DEDE. Currently, there are eight products that have been labeled, including liquefied petroleum gas (LPG) cooking stoves (low-pressure), LPG cooking stoves (high-pressure), glazing panes, three-phase motors, variable speed drives, fiberglass insulation, small diesel engines, and small gasoline engines.

### **2.3.2. Financial Measures Taken by the Government**

Various measures have been introduced to boost energy efficiency improvement in the industrial sector, including tax incentives, revolving funds (soft loans), Demand-Side Management by the Bidding Mechanism, and investment promotions via the Board of Investment (BOI). These measures are sought to help achieve the energy-saving target as follows.

#### **2.3.3.1 Tax Scheme**

**a) Name**

Tax incentives (monitored by the DEDE)

**b) Purpose**

To induce operators to invest in the purchase of energy-efficient equipment/machinery as well as the promotion of energy efficiency in businesses.

**c) Applicable sectors**

Various sectors.

**d) Outline**

Two schemes of tax incentives are offered:

- 1) Investments in energy-efficient equipment/machinery can be claimed for an additional 25% of the purchasing cost, which can be deducted in tax calculations during that year.
- 2) For those who invest in EE/RE projects, the Board of Investment provides a waiver of income and import taxes for a maximum of eight years.

**e) Financial resources and budget allocation**

ENCON Fund.

**f) Expected results**

Tax incentives have been available since its inception in 2006. The resulting energy savings is as follows.

	<b>Phase 1 (2006)</b>	<b>Phase 2 (2009–2010)</b>	<b>Phase 3 (2011–2012)</b>	<b>Total</b>
Equipment	53 (number) Measures	19 types (3,887 models)	22 types (7,949 models)	n/a
Energy saving (ktoe/year)	3.31	9.07	16.10	53.65

Tax incentives based on the purchase of energy-efficient equipment are under consideration for a time period extension (Phase 4) as well as a higher tax deduction.

**2.3.2.2 Low-Interest Loans**

**a) Name**

Revolving funds or soft loans (monitored by the DEDE)

**b) Purpose**

This measure is provided to stimulate and expedite energy efficiency investments in large buildings and factories.

**c) Applicable sectors**

Buildings and factories.

**d) Outline**

Provide loans with a 0.5% interest rate and a seven-year final maturity to local commercial banks as an incentive for banks to lend money to RE/EE projects (including ESCOs) at a maximum interest rate of 4%.

The maximum loan size is THB 50 million (USD 1.5 million) per project. The bank will manage all aspects of the loan and report the project’s status to the DEDE. Then, the DEDE will take the following steps: ensure that the projects are genuinely energy-saving projects, not simply equipment replacements; monitor the performance of the bank to ensure that it meets their targets in terms of projects, lending, and repayment; and evaluate the program to measure energy savings.

**e) Financial resources and budget allocation**

Launched in January 2003, with an initial budget of THB 2 billion (approximately USD 58.8 million) allocated from the ENCON Fund. To date, almost THB 6 billion has been allocated for soft loans.

**f) Results**

Since its introduction in 2003, the ENCON Fund has recruited 11 public and commercial banks and extended approximately USD 200 million in loans (via the banks) in support of approximately 300 projects with roughly THB 7 billion (USD 206 million) aggregated project costs. The ENCON Fund has been successful in familiarizing the banks with EE/RE business activities. Since 2012, the revolving fund program has terminated the injection of the government budget into the program. However, the program is encouraging more participation from commercial banks to offer loans for energy efficiency projects (through the market mechanism with some technical assistance provided by the DEDE). The result can be summarized as follows.

(Note that the amount of investment is more than the amount loaned via the bank)

Phase	Year	Amount allocated by ENCON Fund (million Baht)	Amount loaned to bank (million Baht)	Resulting Energy Saving (ktoe/year)
1	Jan. 2003–Jan. 2006	2,000.00	1,850.97	97.61
2	March 2006–Mar. 2009	2,000.00	1,678.13	98.95
3	Aug. 2007–Aug. 2010	2,942.5	2,632.68	93.31
4	Sep. 2009–Sep. 2012	400.0	377.21	13.25
5	June 2010–May 2013	500.0	488.90	17.25
<b>Total</b>		<b>7,842.5</b>	<b>7,027.89</b>	<b>320.37</b>

The program will, in the next phase, provide loans with a 0% interest rate and five-year final maturity to local commercial banks as an incentive for the banks to lend money to RE/EE projects (including ESCOs) at a maximum interest rate of 3.5%.

**2.3.2.3 Co-Investment Program**

**a) Name**

ESCO Fund (monitored by the DEDE)

**b) Purpose**

To encourage investments in EE/RE projects with high technical potential in energy saving, especially those facing limited access to financing.

**c) Applicable sectors**

Buildings, factories, and ESCOs.

**d) Outline**

A co-investment program between public and private entities that utilizes the project-financing scheme to share risks with private developers. The government budget has been allocated as seed funding for selected non-profit organizations (also known as “fund managers”) with the responsibility to search for and manage investments in EE/RE projects, which cover sufficient technical potential and economic return. A seven-year investment period in several project types, such as equity investment, venture capital, equipment leasing, creation of a carbon credit market, and a credit guarantee, will be co-invested by fund managers for a maximum of THB 50 million per project (with appropriate criteria), while being supervised and monitored by the investment committee.

**e) Financial resources and budget allocation**

Launched in 2008 as Phase 1, with an initial budget of THB 500 million (allocated from the ENCON Fund) for project investments within the two-year window. In addition, a total of THB 500 million from the ENCON Fund has been allocated in 2015.

**f) Expected results**

The implementation of the ESCO Fund (Phase 1, 2, and 3) resulted in EE/RE investments for up to 126 projects with the total investment of THB 5 billion (approximately 18% of total investment provided by the ESCO Fund). The total energy saving of up to 40.7 ktoe per year (equivalent to THB 1.1 billion per year) was observed.

	<b>Phase 1 (Oct. 2008 - Sep. 2010)</b>	<b>Phase 2 (Oct 2010 - Mar 2013)</b>	<b>Phase 3 (Mar 2013 - July 2014)</b>	<b>Total</b>
No. of measures	32	68	26	126
Total investment (million Baht)	3,217.2	1,548.5	173.0	4,938.7
Investment from the ESCO Fund (million Baht)	314.8	418.6	161.9	895.2
Energy saving (ktoe/year)	15.1	22.9	2.7	40.7

**2.3.2.4 Subsidies and Budgetary Measures**

**a) Name**

Demand-Side Management by the Bidding Mechanism (monitored by the EPPO) (a new initiative launched in 2008)

**b) Purpose**

The initiative’s main purpose is to provide financial support in order to encourage business operators to invest in higher energy-efficient machines and equipment. In addition, Demand-Side Management by the Bidding Mechanism offers financial support to private sector operators to encourage them to make investments in improving the energy efficiency of their companies by replacing/retrofitting existing machines or equipment, thus reducing energy consumption.

**c) Applicable sectors**

Industrial and commercial.

**d) Outline**

In accordance with the initiative, subsidies are granted based on actual energy savings achieved in a year. The subsidy is defined as “annual energy saving x subsidy rate (as bid by

each company).” With this bidding mechanism, proposals with lower-weighted subsidy rates will be subsidized first. The weighted subsidy rate takes into account not only the bid rate, but also the lifetime of the investment, i.e., how long the investment will result in energy savings.

The maximum subsidy rate set for each energy type is shown in the following table.

**Table 1: Subsidy rates**

<b>Energy Type</b>	<b>Maximum Subsidy Rate</b>
<b>Electricity</b>	THB 1/kWh
<b>Heat from liquid and gas fuels</b> (fuel oil, LPG, natural gas, etc.)	THB 75/MMBtu
<b>Heat from solid fuels</b> (coal, wood, rice husks, sawdust, biogases, and other agricultural waste)	THB 15/MMBtu
<b>Heat from by-product fuels</b> (derived from the production process), e.g., black liquor, distillery slop, etc.	

**e) Financial resources and budgetary allocation**

THB 1.1 billion (approximately USD 35 million) was allocated from the ENCON Fund.

Project duration: 2008–2012, via eight bidding rounds (2008–2010).

**f) Results**

The implementation of 216 proposals from 132 companies has been completed. The actual energy savings is 121.09 ktoe per year, accounting for 162.76% of the target of 74.40 ktoe per year.

**a) Name**

Direct Subsidy (20-80 programs)

**b) Purpose**

The initiative’s main purpose is to provide financial support for designated factories and buildings as well as small- and medium-sized enterprises (SMEs) by providing subsidies of 20% (for designated factories and buildings) or 30% (for SMEs) of the investment, including installation costs. Only the replacement of equipment by high-efficiency equipment is eligible for such subsidies.

**c) Applicable sectors**

Industrial and commercial.

**d) Outline**

A subsidy of 20% (for designated factories and buildings) or 30% (for SMEs) of the investment shall be provided to replace old equipment with high-efficiency equipment after which the payback period must not exceed seven years. The requested subsidy must exceed THB 50,000 with a maximum of THB 3 million. While a list of eligible technologies exists, other technologies are also eligible, if approved by the responsible committee.

**e) Financial resources and budgetary allocation**

During the 2010–2013 time period, approximately THB 319.7 million was allocated from the ENCON Fund.

**f) Results**

A total of 1,462 projects were approved during the 2010–2013 time period with a total investment of THB 2.1 billion (around USD 65 million) (THB 320 million from the ECON Fund), resulting in a total final energy-consumption reduction of 27 ktoe per year.

	Phase 1 (2010–2011)	Phase 2 (2012)	Phase 3 (2013)	Total
Primary target	Factories, Buildings, Agricultures	Factories, Buildings, Agricultures	SMEs	
No. of measures	316	362	190	1,462
Amount of subsidies (million Baht)	127.5	166.5	25.7	319.7
Energy saving (ktoe/year)	10.6	14.2	2.1	26.90

### 2.3.3 Promotion of LEDs

Light-emitting diodes (LEDs) are renowned for their energy efficiency. However, due to their relatively high cost, they are not widely used in most facilities. Under this measure, LEDs will be installed for government buildings and other public facilities such as streetlights. In addition, monetary measures will be used to expedite the affordability of LEDs. The EEP, however, is undergoing revisions and thus, the specifics of the measure cannot be provided at this time.

### 2.3.4 Energy Savings in Transport Sector

Thailand includes a large untapped energy conservation potential in the transport sector, as reflected by the expected energy savings of more than 30,000 ktoe over the course of EEP 2015. The measures that will be implemented in the transport sector consist of the following:

- a) Remove subsidies from fossil fuels, allowing the market prices to reflect the true cost.
- b) Implement CO<sub>2</sub> emission-based excise tax for cars.
- c) Increase efficiency in cars/trucks/buses via energy labeling for tires, eco-driving techniques, and logistic management.
- d) Improve infrastructure e.g., double-track railway, elevated transit systems, etc.
- e) Implement pipeline transport of fuels.

## 2.4 Complementary Measures

### 2.4.1 Research and Development in Energy Efficiency and Conservation

The Thai Government, via the ENCON Fund, supports R&D by allocating more than THB 100 million (approximately USD 3 million) each year for energy conservation technologies. This funding can be accessed by academic institutions, public sector research institutions, and non-profit private institutions. The R&D work under the Energy Conservation Program must demonstrate its practical application in line with the short-term measures designed for energy efficiency improvements.

### 2.4.2 Capacity Building

The implementation of the Strategic Management Program under the ENCON Program includes the following:

- 1) Policy research to provide recommendations, options or situation overviews comprising several dimensions. Examination of the economic, social, and environmental impacts of energy supply/demand, the findings of which can be used to enhance the Energy Efficiency Improvement Program or Renewable

Energy Development Program so that the programs can correspond with the changing situations. The research outcomes can also serve as guides for setting and implementing work priorities and budget allocation.

- 2) Monitoring and management to ensure efficient and effective implementation of the Energy Conservation Program.
- 3) Special tasks to support and enhance implementation that is of particular importance or urgency.

Additional capacity-building measures and policies aimed at the community include the following:

- 1) Development of curriculum and teaching materials that integrate energy efficiency and the environment into the education system in order to increase awareness in younger generations.
- 2) Short-term projects/activities (e.g., school recycling banks, energy conservation competitions) to increase participants' knowledge and understanding of energy conservation, stimulate improvement in their energy consumption behaviors, and share their experiences and knowledge with their peers.
- 3) Short-term human resource development and technical visits abroad.
- 4) Undergraduate and post-graduate scholarships (both local and abroad).
- 5) Provision of funds to encourage students in public and private universities to seriously consider research on energy management, energy efficiency, and renewable energy technologies.
- 6) Public-awareness campaigns on energy saving.

#### **2.4.3 Awareness Raising**

Example of these activities include production of a series of television commercials on energy saving methods and their benefits; dissemination of energy conservation issues through various types of media (newspapers, magazines, energy talks via television programs, etc.); energy mobile units undertaken by regional energy offices; energy camps for students; plays and cultural shows based on energy conservation themes; and the establishment of energy information centers to disseminate materials, posters, and other printed materials regarding issues related to energy conservation and renewable energy.

### **2.5 Other Efforts for Energy Efficiency Improvements**

#### **2.5.1 Cooperation with Non-Government Organizations**

##### **Stand-alone PEA Renewable Energy and Energy Efficiency Project**

The Provincial Electricity Authority (PEA) is collaborating with the Forest Industry Organization (FIO) to invest in a pilot biomass power-generation project (using biomass residuals from FIO plantations) in order to scale up to approximately 100 sites (approximate total capacity of 100 MW) in the next five years, in addition to associated transmission lines and substations. The PEA also includes a plan to improve the energy efficiency of streetlights on highways, with private participation by ESCOs.

In addition, the PEA includes a Master Plan for Energy Conservation that focuses on the following: energy conservation projects for public and street lighting; energy efficiency for PEA buildings (air conditioning and lighting); and consulting services in energy management for PEA customers. The PEA estimates a reduction in energy consumption of at least 300 GWh per year, which is equivalent to THB 750 million (approximately USD 23 million). The financing structure of the energy efficiency activities includes the following items: a public-private partnership scheme to finance energy-efficient street lighting; the turn-key method for building retrofitting; and normal energy efficiency consultancy services for PEA customers.

In order to implement this plan, the PEA has established a subsidiary (100% owned) named, PEA ENCOM International. However, according to the PEA, this subsidiary will be the entity to invest in for the above-mentioned energy-efficient projects, not the PEA mother company.

### **2.5.2 Cooperation through Bilateral, Regional, and Multilateral Schemes**

Thailand has established close relationships in energy efficiency in the areas of capacity-building and technical assistance with neighboring economies, such as Lao PDR, Cambodia, Myanmar, Malaysia, and Vietnam. Regarding multilateral and regional cooperation, Thailand, as ASEAN Chair in 2008, led ASEAN toward the leaders' goal of achieving 8% of energy efficiency improvement by 2015. Energy efficiency support and cooperation from the government of Japan has also been actively implemented.

### **2.5.3 Other Cooperation/Efforts for Energy Efficiency Improvements**

There is financial support from designated banks to support energy audits and investments in energy efficiency for university compounds, hospitals, and public buildings through the ENCON Fund. Other energy efficiency programs also involve joint studies, R&D, and promotional activities to enhance the efficient use of energy in the transport, industrial, and household sectors as well as capacity-building and development of personnel dealing with energy efficiency improvement projects/activities through academic conferences, seminars, training, and technical visits. The latter activities include scholarships to pursue further study at the bachelor's, master's and Ph.D. levels, through the ENCON Fund.

### **2.5.4 Energy Conservation Market Stimulation and Promotion via Energy Service Companies (ESCOs)**

ESCOs are firms with the capabilities to provide consultation and expertise regarding energy conservation and renewable energy under energy management contract (EPC). The Ministry of Energy realizes their importance and assigns the DEDE, in cooperation with the Federation of Thai Industries (FTI), to help promote the utilization of ESCOs. The stimulation and promotion conducted by the DEDE are in the form of awareness promotions through networking and business matching as well as the regulation and improvement of various aspects concerning ESCO standards e.g., Measure and Verification (M&V) methods, Energy Performance Contracts (EPCs), and ESCO Accreditation.

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