



# ENERGY EFFICIENCY FINANCING GUIDELINE IN THAILAND

A step-by-step approach on financing  
energy efficiency projects in Thailand



One Community  
For Sustainable  
Energy

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- ASEAN Centre for Energy (ACE)
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The Guideline has gained valuable insight from the roundtable discussion with representatives from the Department of Alternative Energy Development and Efficiency (DEDE) and other relevant stakeholders including the Energy Conservation Foundation of Thailand and Kasertsart University. Their constructive input and suggestions have immensely helped to enhance the quality and add value to the document. Special thanks and appreciation are extended to the Energy Efficiency and Conservation Sub-Sector Network (EE&C-SSN) Alternate Focal Point of Thailand, Dr. Pongpan Vorasayan, for his continuous support throughout the development of this guideline.

## Disclaimer

The 'Energy Efficiency Financing Guideline in Thailand' was prepared by the ASEAN Centre for Energy (ACE) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH with support from South Pole as consultant.

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# Foreword

As Thailand assumes the role for the ASEAN Chairmanship in 2019, we believe the development of this *Energy Efficiency Financing Guideline in Thailand: A step-by-step approach on financing energy efficiency projects in Thailand* is timely and concurrently echoes the Chairmanship's theme of '*Advancing Partnership for Sustainability*' – particularly sustainability in all dimensions, including the green economy and sustainable development.

As one of the largest economies in ASEAN, Thailand is in the forefront of meeting its primary energy demand to cope with its rising population and their electric power consumption. Since early 1990s, Thailand has identified Energy Efficiency and Conservation (EE&C) as an effective strategy to meet the rising demand for energy and spearheading EE&C initiatives by generating policies, establishing dedicated fund and multiple financing mechanisms.

In 2014, they have tightened their initial 2010 and 2011 target to reduce energy intensity by 30% in 2036 with a 2010 baseline, while simultaneously continuing the joint effort with the national and international stakeholders to unlock various financing schemes.

To further support Thailand's EE&C development, the ASEAN-German Energy Programme (AGEP) - a jointly implemented project by ASEAN Centre of Energy (ACE) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) - has developed this guideline to provide a comprehensive overview of the successful EE financing schemes currently in place, including its background, eligibility criteria and application procedures. In addition, it also present insights on how information and money flow in such mechanisms; procedures for individual proposal; guideline for EE-funding seekers to determine their right financing scheme; and how a self-sustaining, revolving EE financing cycle can be embedded in a government's organisational structure. Lastly, the guideline also corroborates one of the success points from EE&C development in Thailand, the presence of a dedicated umbrella fund, the Energy Conservation Promotion Fund (ENCON Fund), from which EE financing schemes obtain their source of funding.

This guideline would have not been concluded without the immense support we received from the Department of Alternative Energy Development and Efficiency (DEDE), for their valuable insights and active engagement in the review and development of this guideline. We are hopeful that the guideline will not only benefit the EE development in Thailand, but also serve as a resourceful reference to various stakeholders in other countries of the region in financing their EE initiatives, which ultimately support ASEAN's goal to achieve energy security, affordability and accessibility within the framework of sustainable development.

**Maria-José Poddey**  
Principle Advisor for AGEP  
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**Christopher G. Zamora**  
Acting Executive Director  
ASEAN Centre for Energy



Solarfarm 6MWp Nakhon Ratchasima, Thailand  
Credit: GIZ/ AP

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## Acronyms and Abbreviations

ACE	ASEAN Centre for Energy	FGD	Focus Group Discussion
AGEP	ASEAN-German Energy Programme	GDP	Gross Domestic Product
AMS	ASEAN Member States	GHG	Greenhouse gas
APAEC	ASEAN Plan of Action for Energy Cooperation	GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ASEAN	Association of Southeast Asian Nations		
BAU	Business as Usual	KTB	Krung Thai Bank
BAY	Bank of Ayudhya	Ktoe	Kilotonne of oil equivalent
BBL	Bangkok Bank		
BEC	Building Energy Code	M&V	Monitoring and verification
		MJ	Mega Joule
CIMB Thai	Commerce International Merchant Bankers	MoF	Ministry of Finance
		Mtoe	Million Tonnes of Oil Equivalent
DEDE	Department of Alternative Energy Development and Efficiency	PPP	Purchasing Power Parity
DSM	Demand-side Management	PV	Photovoltaic
ECFT	Energy Conservation Foundation of Thailand	SMEs	Small and Medium-sized Enterprises
EE	Energy Efficiency	RE	Renewable Energy
EE&C	Energy Efficiency and Conservation	R&D	Research and Development
EE&C-SSN	Energy Efficiency and Conservation Sub-Sector Network		
EEDP	Energy Efficiency Development Plan	SCB	Siam Commercial Bank
EEFR	Energy Efficiency Revolving Fund	SME	Small to medium-sized enterprise
EEP	Energy Efficiency Plan		
EERF	Energy Efficiency Revolving Fund	TFEC	Total Final Energy Consumption
EforE	Energy for Environment Foundation	THB	Thailand Baht
ENCON	Energy Conservation Promotion	ToRs	Terms of References
EPC	Energy Performance Contract	TPES	Total Primary Energy Supply
EPO	Energy Planning and Policy Office		
ESCO	Energy Service Company		
EXIM	Export-Import Bank of Thailand		



# 1. Introduction

## 1.1 Background

With a gross domestic product (GDP) of USD 455.7 billion in 2017, Thailand is one of the largest economies within the ASEAN countries. Thailand's population and electric power consumption have increased steadily in recent years and currently stand at 69 million people and 2,773 kWh per capita (IAEA, 2017). In 2014, the Government of Thailand set a country-specific target to reduce energy intensity by 30% in 2036 with a 2010 baseline. The Government's strategy has a series of compulsory and voluntary measures that will be applicable to the industrial, commercial, residential and transport sectors.

Thailand has been promoting Energy Efficiency (EE) initiatives since 1990 and has actively generated policies and financing mechanisms to bolster administrative and economic elements associated with EE. Throughout these years, Thailand has worked together with national and international stakeholders to unlock local and international EE finance from the public and private sectors.

## 1.2 Objective

The objectives of this EE financing guideline in Thailand are to:

- 1) Present an overview of successful EE financing schemes currently in place in the country
- 2) Provide detailed, step-by-step guidance on the set-up and processes within EE financing schemes

This guideline provides a comprehensive overview of the EE financing scheme including background, eligibility criteria, and application procedures. It also presents insights on how information and money flow in such mechanisms, how much time individual processes take, how stakeholders looking for EE project funding can determine the right financing scheme for their funding needs, and how a self-sustaining, revolving EE financing cycle can be embedded in a government's organisational structure.

## 1.3 Methodology

The information presented in this EE financing guideline in Thailand has been obtained and validated through the following means:

- **Desk review:** A thorough desk review and mapping of existing EE financing mechanism available in Thailand was conducted. The mapping was based on the information available on the official government's websites, documents, presentations, various case studies and reports, among others. The desk review was further enhanced through inputs from the Thailand Focal Points of Energy Efficiency and Conservation Sub-Sector Network (EE&C-SSN) and through a Focus Group Discussions (FGD) involving additional stakeholders.
- **Collection of information by relevant stakeholders:** Results from the desk review were complemented through discussions with relevant contact persons of each mechanism, and additional experts in the field of EE financing in Thailand.
- **Validation and enhancement:** the assembled information was validated and enhanced through a roundtable discussion with the representatives of the Department of Alternate Energy Development and Efficiency (DEDE)<sup>1</sup>.

<sup>1</sup> The Roundtable meeting took place on 19<sup>th</sup> October 2018 in Bangkok, Thailand



## 1.4 Report Outline

This report is divided into four main chapters:

- Chapter 1 sets the context and objectives of this guideline.
- Chapter 2 presents a snapshot of the current energy landscape in the country, and introduces the existing energy efficiency support framework and the national organisational set up.
- Chapter 3 elaborates on specific information on the available financing schemes in Thailand.
- Chapter 4 provides a decision-making matrix (decision tree) for stakeholders in Thailand seeking suitable EE financing schemes according to their funding needs.



Credit: GLZ



## 2. Current Energy Efficiency Situation in Thailand

According to the 5th ASEAN Energy Outlook, the total final energy consumption (TFEC) in the ASEAN region will increase from 427 million tonnes of oil equivalent (Mtoe) in 2015 to 1,046 Mtoe using a Business-as-Usual (BAU) scenario in 2040 (ACE, 2017). The increase in energy demand is driven by industrial, transport and residential sectors. These sectors, however, provide opportunities for potential energy savings and efficiency gains in the region. In the absence of enhanced EE saving measures and renewable energy (RE), between 2015 and 2040, the total primary energy supply (TPES) will increase to ca. 60%. The 5<sup>th</sup> ASEAN Energy Outlook highlights EE policies that are already in place, or those under consideration today, will lead to savings in TFEC of 10% by 2040, as compared to the BAU scenario (ACE, 2017).

The ASEAN Member States (AMS) agreed on a collective target to reduce energy intensity by 20% by 2020 and 30% by 2025 with a 2005 baseline as stated in the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025. The AMS are committed to achieving the EE&C objective by harmonising EE standards and labelling requirements, aligning building codes stronger with the EE and conservation criteria, and enhancing the participation of private sectors, including Energy Service Companies (ESCOs), as well as financial institutions for EE&C promotion and development (ACE, 2015).

Thailand, as the second largest GDP in the region (2017), is an important contributor in achieving ASEAN's energy intensity reduction target. It has set a national target in 2010 to reduce energy intensity by 25% by 2030, compared to a 2005 baseline. However, after two revisions in 2011 and 2014, the target was revised and aimed to reduce energy intensity by 30% by 2036, compared to a 2010 baseline. The Government's strategy has a series of compulsory and voluntary measures that will be applicable to the industrial, commercial, residential and transport sectors. Thailand has a long history in promoting EE&C measures in the national context. The Government passed the Energy Conservation Promotion Act (ENCON Act) in 1992 and created the Energy Conservation Promotion (ENCON) Fund as a strategy to meet the rising demand for energy. In 2015, the Government of Thailand has also established the 20-Year Energy Efficiency Development Plan (EEDP). The EEDP stipulated that the Government aims to reduce energy intensity by 25% by 2030 compared to a 2005 baseline. Shortly after its inception, the EEDP was revised (2015) and is now called the Energy Efficiency Plan (EEP). The EEP aims to reduce energy intensity by 30% by 2036, compared to a 2010 baseline<sup>2</sup>. This plan focuses strongly on improving electricity security and prioritises the industrial and transport sectors. The EEP addresses the following components: (i) mandatory requirements with rules, regulations and standards; (ii) energy conservation promotion and support; (iii) public awareness creation and behavioural change; (iv) promotion of technology development and innovation; (v) human resources and institutional capability development.

Thailand has actively developed and implemented policy measures to bolster the administrative and economic elements associated with EE&C. The ENCON Fund, which became operational in 1995, serves as the key vehicle to facilitate access to finance for EE&C and RE projects (please see chapter 3.1 for details). The Ministry of Energy is responsible for energy policy, regulation and development, under which DEDE acts as the main agency in charge of promoting national EE measures. Other ministries also play an important role in addressing EE issues, however they focus their involvement primarily within their own sector. These include the Ministry of Finance, Ministry of Transport, the Ministry of Industry, Ministry of Commerce, Ministry of Science and Technology and Ministry of Education, among others.

### 3. Energy Efficiency Financing Mechanism in Thailand under the Energy Conservation Promotion Fund

#### Overview

The Energy Conservation Promotion (ENCON) Fund was established in 1992 by the ENCON Act B.E.2535 and became operational in 1995. It is overseen by a committee of representatives from various ministries and chaired by the Deputy Prime Minister.

The Fund’s objective is to facilitate access to finance for EE and RE projects in Thailand and is financed through a government levy of THB 0.1 per litre on petroleum product sales<sup>3</sup>. The fund raises about USD 200 million annually and had a capital of around USD 1.1 billion in 2017. In the past, only DEDE and EPPO were eligible to request programme funding from the ENCON Fund. In 2018, the fund’s committee changed this eligibility criteria so that other non-profit organizations and academic institutions can also request financial assistance for RE and EE projects.

The committee is responsible for the decision-making of proposed projects and resolving executive-level matters regarding its approved projects, such as changes in project details or requests for project duration extension. Some of the tasks are delegated to various sub-committees established by the main committee. DEDE oversees the progress of endorsed projects and is also responsible for the reporting of their results and outcomes.

The ENCON Fund is the main funding source for some of the most successful EE financing schemes currently available in Thailand, including:

- 1) Direct Subsidies
- 2) Energy Efficiency Revolving Fund (EERF)
- 3) Energy Service Company (ESCO) Revolving Fund (see Figure 1 below).

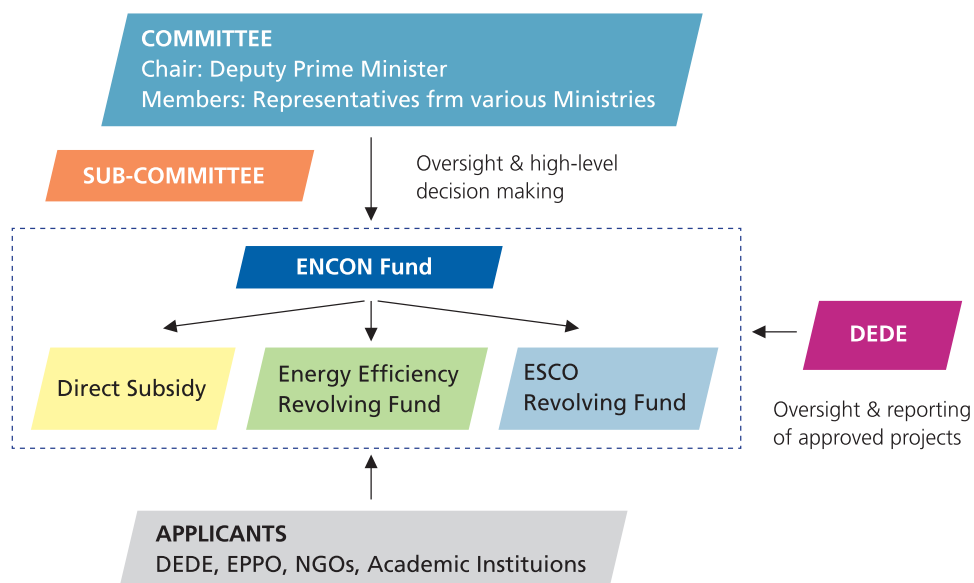


Figure 1: ENCON Fund’s Organisational Set Up and Main Support Mechanisms

<sup>3</sup>Current and previous price structure of petroleum products in Thailand: [http://www.eppo.go.th/index.php/th/petroleum/price/structure-oil-price?issearch=1&isc=1&xf\\_6=17](http://www.eppo.go.th/index.php/th/petroleum/price/structure-oil-price?issearch=1&isc=1&xf_6=17)

## Support Mechanisms

The ENCON fund supports private and government-sector projects with the following programmes, divided into (i) cost-based support, i.e. grant size is based on investment costs, and (ii) performance-based support, i.e. grant size is based on achieved financial savings from EE measures.

### (i) Cost-based programmes, i.e. financial support is determined by investment costs

- Direct Subsidy (see chapter 3.2 for details)
- EERF (see chapter 3.3 for details)
- ESCO Revolving Fund (see chapter 3.4 for details)
- Internet of Things (IoT)

In addition, a tax incentive can be offered under the ENCON Fund's grant support<sup>4</sup> which offers a total of 25% VAT tax exemption over a period of 5 years. Since 2018, this tax incentive is not available but it may be re-activated in the future.

### (ii) Performance-based programmes, i.e. financial support is determined by financial savings from EE measures

- Demand-side Management (DSM) Electricity & Thermal

The monitoring and verification (M&V) of performance-based programmes is conducted by an external consultant hired by DEDE through a public contracting process. Eligible M&V consultants need to register at the Ministry of Finance (MoF) and must demonstrate sufficient expertise and track records to be listed with the MoF.



## Application Process

To apply for ENCON's funding support, applicants are to submit their proposed project to the secretary of the sub-committee, who subsequently presents the project to the sub-committee during the sub-committee meeting<sup>5</sup>. The sub-committee may ask for additional detail or propose modification to the project. Once the sub-committee approves or denies the proposed project, it reports the result to the main committee for final approval.

<sup>4</sup> The funding for the tax incentive does not come from the ENCON Fund but from the Ministry of Finance

<sup>5</sup> The sub-committee meeting generally takes place once or twice a month

## / 3.1 Direct Subsidies /

### 3.1.1 Overview

The Direct Subsidy Scheme is the major grant-arm of the ENCON Fund which exclusively offers grant financing for EE initiatives in Thailand. All direct subsidy programmes run for one fiscal year<sup>6</sup> from 1 October to 30 September.

In 2017, the total budget of direct subsidies was THB 500 million (USD 15 million), of which 100% was disbursed to EE projects. In 2018, the total available budget was slightly lower with THB 300 million. The minimum and maximum funding amount in 2018 was THB 30,000 (USD 900) and THB 1.5 million (USD 45,000) respectively. These funding amounts are revised every fiscal year.

There are three types of direct subsidy schemes currently available:

(i) 20% Direct Subsidy:

- Offers grant finance contribution of 20% of the total EE equipment costs
- Targets large factories or industrial facilities
- Its maximum funding amount is THB 6 million

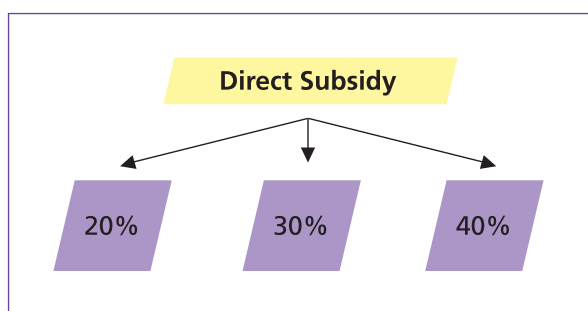
(ii) 30% Direct Subsidy:

- Offers grant finance contribution of 30% of the total EE equipment costs
- Targets small- and medium enterprises (SMEs)
- Its maximum funding amount is THB 6 million

(iii) 40% Direct Subsidy:

- Offers grant finance contribution of 40% of the total EE equipment costs
- Aims to enhance investments in new and innovative technologies (e.g. absorption chiller)
- Its maximum funding amount is THB 6 million

A list of defined, eligible, new and innovative equipment is available at the DEDE website<sup>7</sup> and is updated prior to the start of each new funding cycle. Other equipment that is not included in the list may be funded but is subjected to individual consideration of the DEDE committee.



■ **Figure 2: Direct Subsidy Types**

Source: Author, based on DEDE (2018)

<sup>6</sup> A fiscal year in Thailand starts on 1<sup>st</sup> October and ends 30<sup>th</sup> September.

<sup>7</sup> DEDE Website: <http://weben.dede.go.th/webmax/>

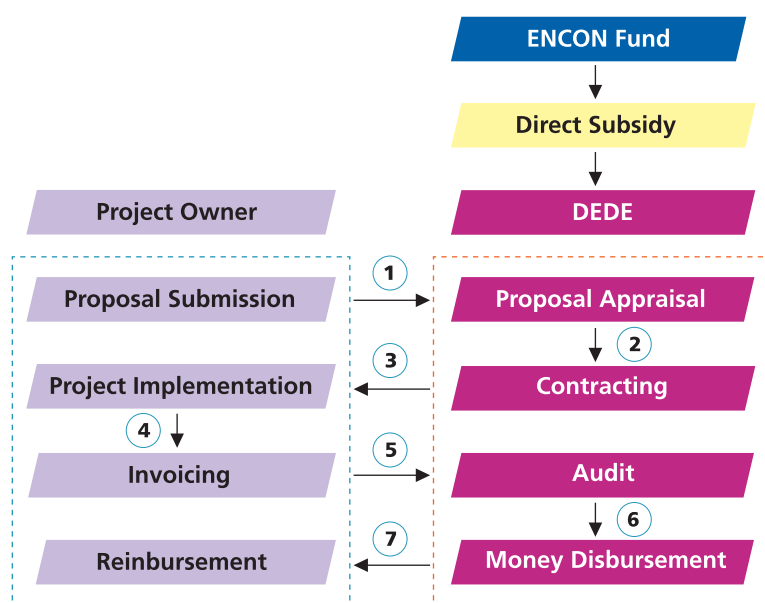
### 3.1.2 Eligibility Criteria

Applicants for the Direct Subsidy Scheme must comply with the following eligibility criteria set by DEDE:

- Eligible parties
  - o Large (also called 'Designated') buildings<sup>8</sup> factories or industrial facilities where 'Large'/'Designated' is defined as any facility fulfilling at least one of the following criteria:
    - Transformer size > 1175 kVA
    - Power Meter size > 1,000 kW
    - Energy usage > 20 million megajoule
  - o SMEs, i.e. everything that is below the above-mentioned criteria for 'large'
- Highly-efficient equipment/machineries
- Payback period of maximum 7 years
- Equipment purchase order must be available

### 3.1.3 Application Process

The application process for the Direct Subsidy is illustrated in Figure 3 below:



**Figure 3: Direct Subsidy - Application Process**

Source: Author's elaboration, based on DEDE (2018)

Explanation on each specific process from Figure 3 above, can be found below:

- 1) Typically, at the first quarter of every year<sup>9</sup>, DEDE announces available Direct Subsidy funding on the official DEDE website. Eligible parties can submit their funding proposal along with the required proposal documents, which include:
  - A filled-in application form (made available upon official announcement on DEDE website)
  - A quotation on the cost of the equipment from the supplier provided by the project developer to DEDE
  - A cost quotation from three different technology providers if new and innovative technology is to be funded.

- 2) DEDE will evaluate the proposal and, if all documents are complete and in line with the determined eligibility criteria, initiate the contracting with the project owner. If the documents are incomplete, the proposal owner will be asked to hand in missing information. The period for proposal screening, assessment and notification of the bidder varies from project to project, but usually takes 1-2 months.
- 3) After approval and contract notification, successful bidders have 6 months, but no later than the end of the fiscal year (i.e. 30 September), to implement the proposed EE measure.
- 4) If implementation has been completed, the project owner can submit the invoice of implementation costs to DEDE with the request for reimbursement.
- 5) DEDE will hire an external consultant to conduct the third-party verification audit to assess the project validity<sup>10</sup>.
- 6) DEDE will transfer the reimbursement to the project owner, once the project results have been verified by the external auditor.
- 7) The reimbursement process can take up to two months after invoice submission. In some cases, for example when the project implementation was delayed, the project finalisation can be extended into the following fiscal year. A special request from the project owner must however be submitted and shall be subject to approval from DEDE.



Credit: ACE

<sup>10</sup>An external consultant will be hired by DEDE to conduct the verification. The selected consultant must be registered with the MoF. A list of eligible external consultants for project verification is available at the Consultant Database Center under the Public Debt Management Office and the Ministry of Finance.

## / 3.2 Energy Efficiency Revolving Fund /

### 3.2.1 Overview

The Energy Efficiency Revolving Fund (EERF) was established in 2003 to encourage private investments in EE and RE projects, and help financial institutions familiarise themselves with financing these types of projects. EERF is funded through the ENCON Fund and works solely through participating financial institutions. The latter receive access to EERF subsidy at a 0% interest rate and on-lends to eligible projects below market interest rates.

EERF has been implemented in several phases since 2003 and is currently in its 6<sup>th</sup> phase running until 2019<sup>11</sup>.

#### PHASES 1-5

Phases 1-5 provided a total funding of THB 7.2 billion (USD 216 million) and supported the implementation of 295 EE and RE projects in Thailand. 60% of its funding went to EE and 40% to RE projects. The EERF support was complemented with significant additional funding from participating financial institutions (THB 8.7 billion/USD 262 million at commercial rates) to enable projects with financing needs above the maximum EERF loan size (THB 50 million/USD 1.6 million) to apply to this loan<sup>12</sup>. EERF provide credit lines to participating banks with an interest rate of 0.5%. The banks, in return, provide concessional loans to project owners with an interest rate of less than 4%. The main EE measures financed during phases 1-5 were investments into more EE machines, followed by replacements of air conditioning systems, manufacturing improvements and boiler changes. The number of participating banks varied during the first 5 phases, with six banks in Phase 1, eleven banks in phase 2 and 3, and nine banks in phase 4 and 5. In its first 5 phases, EERF achieved electrical energy savings of 1,170 MWh per year, fuel savings of 234 million litre per year, and a total costs savings of THB 6.8 billion (USD 204 million).

#### PHASE 6 AND 6+

Phase 6 started in 2015, but due to high funding requests, the phase was enhanced with a parallel phase in 2016 named Phase 6+. In phase 6 (2015-2017), EERF funded 76 projects with a total budget of THB 1.2 billion (USD 36.1 million) resulting in 55,000 MWh per year in electricity savings and THB 236 million (USD 7.1 million) in cost savings per year. The current phase 6+ (2016-2019) has a budget of THB 3 billion (USD 90.2 million) and has, so far, supported 84 projects resulting in 65,000 MWh per year in electricity savings and THB 276 million (USD 8.3 million) in cost savings per year.

Currently, EERF employs six full-time staff focusing on technical proposal verifications, and five part-time staff focusing on marketing and project verifications during its implementation. The EERF teams handles an average of 10 project applications per month.

In both phase 6 and 6+, EERF has emphasised on EE projects and only allows minor funding of RE projects<sup>13</sup>. Under the 6<sup>th</sup> and 6+ phase, EERF provides credit lines to participating banks for free, i.e. 0.0%, while banks provide concessional loans to project owners with a fixed interest rate of 3.5% (the commercial bank lending rate in 2018 is 6-7%). The maximum amount of loans provided under EERF is THB 50 million (USD 1.5 million) per project with a loan term of five years and a maximum payback period of seven years. Eight banks are currently participating in this scheme (see Table 1).

<sup>11</sup> 1<sup>st</sup> Phase: January 2013 – January 2006; 2<sup>nd</sup> Phase: March 2006 – March 2009; 3<sup>rd</sup> Phase: August 2007 – August 2010; 4<sup>th</sup> Phase: September 2009 – September 2012; 5<sup>th</sup> Phase: June 2010 – May 2013; 6<sup>th</sup> Phase: 2015-2017; 6+ Phase: 2016-2019.

<sup>12</sup> RE projects are very capital intensive and financing needs are typically well above EERF's budget limit per project.

<sup>13</sup> Only rooftop PV projects are eligible for EERF support; aligned with the Government's strategy to advance the rooftop PV sector in Thailand



**Table 1: Alphabetical List of Banks Participating in EERF's Phase 6+ (2016-2019)**

NAME OF BANK
1. Bangkok Bank (BBL)
2. Bank of Ayudhya (BAY)
3. CIMB Thai (CIMB)
4. Export-Import Bank of Thailand (EXIM)
5. Kasikorn Bank
6. Krung Thai Bank (KTB)
7. Land and Houses Bank
8. Siam Commercial Bank (SCB)

### 3.2.2 Eligibility Criteria

Private facilities owners, ESCOs and project developers are all eligible to apply for EERF support, with varying project eligibility criteria for the industrial and the building sectors as follows:

- > An industrial sector project is eligible to apply if it includes any of these criteria:
  - o Energy loss prevention
  - o Fuel substitution
  - o Power factor improvement
  - o Waste recycling,
  - o Utilisation of EE machinery or equipment
  - o Other types of energy efficiency measures as stipulated in government regulations
  
- > A building sector project is eligible to apply if it includes any of these criteria
  - o Reduction of heat from sunlight
  - o Efficient air conditioning
  - o Efficient use of light
  - o Utilisation of new machinery and equipment
  - o Utilisation of control system for machinery and equipment
  - o Other types of energy efficiency measures as stipulated in the government regulation.

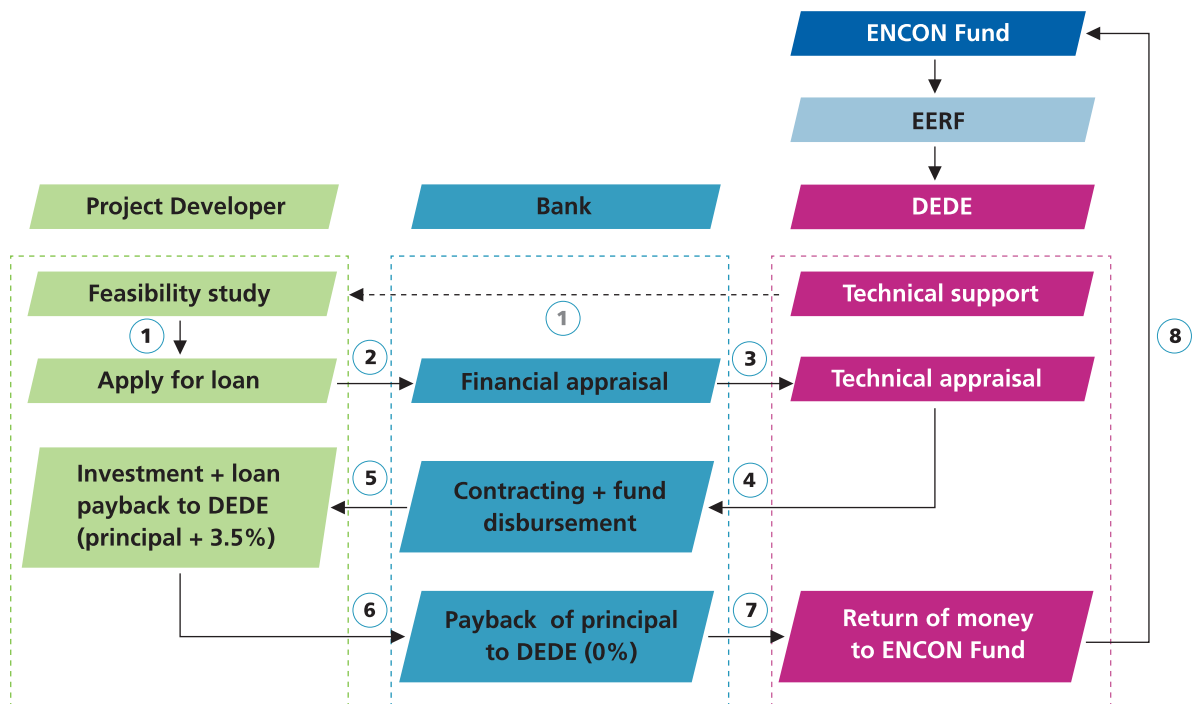
The following types of costs are eligible for EERF support:

- Equipment and installation costs
- Consulting costs including design, control, supervision and guarantee fees
- Civil works, piping or any components specifically necessary for the project
- Any other necessary associated costs such as transportation, taxes, VATs, removal of existing equipment, etc.

Other investment costs such as land costs, land improvement costs, and building construction costs are not eligible under EERF. Costs that are not specifically needed for the project (e.g. sub-station) are also not eligible for the Fund.

### 3.2.3 Application Process

The application process for EERF is illustrated in Figure 4 below:



**Figure 4: Energy Efficiency Revolving Fund - Application Process**

Source: Author's elaboration, based on DEDE (2018)

Explanation on each specific process from Figure 4 above, can be found below:

1) Project owner performs a detailed feasibility study<sup>14</sup> determining the potential energy savings from the project. The study will also reveal whether the proposed energy efficiency measures are technically feasible, and the financial requirements stipulated in EERF can be met. In some cases, if needed, DEDE can provide guidance on the feasibility study and data requirements.

2) If the financial feasibility is approved by the bank, the project owner can then apply for a loan at one of the participating banks (see Table 1). Depending on the intended EE measure, different documents are required for the application.

- The required documents for EE measures targeted at an industrial or commercial building:
  - o Description of background and EE measure
  - o Energy savings calculations
  - o Action Plan
  - o Cost breakdown
  - o Equipment/technology specifications
- The required documents for EE measures targeted at a new building:
  - o Certification that the conservation measure complies with DEDE's Coordination Centre for Energy Conservation Building Energy Code (BEC)
  - o Copies of building permits from relevant ministries
  - o Construction and financing details

<sup>14</sup> According to DEDE, feasibility studies submitted by project owners are often incomplete and do not comply with quality standards. This leads to significant support efforts from DEDE.

- The required documents for EE measures to be implanted by an ESCO:
    - o Description of background and EE measure
    - o Energy savings calculations
    - o Action Plan
    - o Cost breakdown
    - o Equipment/technology specifications
    - o Energy Performance Contract (EPC) between the facility owner and ESCO
    - o ESCO registration certificate under the Institute of Industrial Energy Federal of Thailand Industries
- 3) The bank will perform a financial and technical analysis of the project within 30 days of the application. Two main criteria used by the banks in considering the project applications are (i) the capacity of the applicant in making repayments, and (ii) the value and quality of the collateral from the project owner. If acceptable, the bank will pass the application on to DEDE.
  - 4) Within 30 days, DEDE assesses the project eligibility based on its criteria and perform a technical analysis of the project. DEDE will inform the bank about the results.
  - 5) Once the proposal is accepted, the bank develops a disbursement and repayment plan for the project owner and sets up the contract within 60 days of DEDE's approval. Concurrently, DEDE organises the EERF budget disbursements to the requesting bank. If the bank does not distribute the funds to the project owner within six month of project approval, DEDE will withdraw the money from the bank and reallocate it to other projects.
  - 6) After the project is completed, the project owner repays the loan principal and interest to the bank. If the project developer is unable to pay back the loan as agreed, the bank will follow its typical internal procedures in dealing with the loan default.
  - 7) The bank makes repayment to DEDE within seven days of repayments from the project owner
  - 8) DEDE returns the funds to the ENCON Fund (payback). The payback follows the protocols established by the ENCON Fund and is handled by DEDE and ENCON Fund personnel.

During the project implementation, DEDE is in regular communication with the participating banks and holds biannual meetings between both parties to bring themselves up to date. The participating bank bears responsibility of the capital and financial project oversight, and the funds provided to the bank must be paid back to DEDE regardless of the project's result. Each participating bank has access to an equal earmarked budget; however, this budget may be shifted by DEDE between banks depending on high or low funding demands from individual banks.

### 3.2.4 Challenges

The following challenges for EERF were commonly experienced during the funding disbursement for the implementation of EE measures<sup>15</sup>:

- Incorrect and/or incomplete submission of proposal documents by the project owner or participating bank<sup>16</sup>.
- Limited marketing of EERF itself because participating banks usually bundle their service promotion without emphasis on EERF
- Personnel changes within banks which require DEDE's constant communication, revision and re-coordination of processes



<sup>15</sup> Based on feedback from DEDE

<sup>16</sup> Experiences from previous EERF phases have shown that the application process is complicated and some minor errors are expected

## / 3.3 Energy Service Company Revolving Fund /

### 3.3.1 Overview

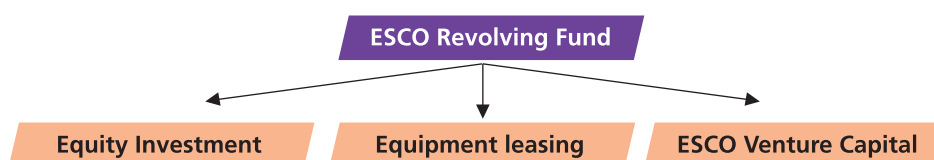
The Energy Service Company Revolving Fund (ESCO) Revolving Fund was established in 2008 to encourage private investments in RE and EE projects, and to further develop and strengthen Thailand's ESCO market. Similar to EERF, the ESCO Revolving Fund is solely supported by the ENCON Fund. The ESCO Revolving Fund particularly targets SMEs and viable projects in RE and EE in need of project financing. The Government has appointed two non-profit organisations namely the Energy for Environment Foundation (EforE) and the Energy Conservation Foundation of Thailand (ECFT) as independent fund managers. Due to specialised know-how within the two fund managers, EforE generally handles support for RE projects while ECFT focuses on EE. Project owners are free to choose which fund manager to approach.<sup>17</sup>

The ESCO Revolving Fund has provided funding in four phases since its inception in 2008<sup>18</sup>. In September 2017, the Fund completed its 4<sup>th</sup> phase with a total budget of THB 500 million (USD 15 million) split between its two fund managers (EforE: THB 300 million; ECFT: THB 200 million). A 5<sup>th</sup> phase is currently under consideration by the Government, but whether this will materialise is uncertain and will depend on future policy and regulatory developments in Thailand.

Since its inception, with a total investment of THB 1 billion (USD 32 million), the ESCO Revolving Fund has successfully generated over THB 5 billion (USD 155 million) of investment in 145 EPC-based projects. These investments resulted in more than THB 1 billion (USD 32 million) in energy savings. In addition, the ESCO Revolving Fund has also contributed to ESCO's growth in Thailand, supporting the creation and registration of 60 ESCOs and the establishment of an ESCO Association<sup>19</sup> (DEDE, 2017).

The ESCO Revolving Fund offers three main financing mechanisms<sup>20</sup>, namely:

- i. **Equity investment:** provides project equity funding and thereby becomes a shareholder of the project;
- ii. **Equipment leasing:** provides long-term leasing service for entrepreneurs to purchase equipment for EE or RE, and allows for constant repayment with low interest rates;
- iii. **ESCO venture capital:** joint-ventures with ESCO companies to raise capital for investments in energy serving projects of ESCO.



■ **Figure 5: ESCO Revolving Fund's Financing Mechanisms**

Source: Author's elaboration, based on DEDE (2018)

<sup>17</sup> Fund managers are selected through a standard public procurement process based on specified Terms of References (ToRs) published by DEDE on its official website. During the first two years, fund managers received a management fee of 5% of approved and disbursed budget. From the third year onwards, the fund manager receives 100% cost coverage capped at 50% of the total money collected from funded ESCO projects.

<sup>18</sup> 1<sup>st</sup> Phase: October 2008 - September 2010; 2<sup>nd</sup> Phase: October 2010-March 2013; 3<sup>rd</sup> Phase: March 2013 – July 2014; 4<sup>th</sup> Phase: October 2015-September 2017.

<sup>19</sup> The ESCO Association was established in 2013.

<sup>20</sup> In addition, the Fund can theoretically support project owners in accessing the carbon credit market, provide credit guarantees, and technical project assistance. However, no such support has ever been asked for or provided by the Fund to date. Therefore, in agreement with DEDE, these mechanisms were not elaborated in this guideline.

### 3.3.2 Eligibility Criteria

The ESCO Revolving Fund targets EE projects factories and buildings with high energy savings potential which lack funding and have only limited collateral required for commercial debt financing. Generally, any EE and RE project in the industrial sectors or from ESCOs resulting in a reduction in energy consumption, increased energy efficiency, fuel switching, or generation of RE can be considered by the ESCO Revolving Fund. Further specific criteria are based on each financing mechanism offered.

#### 1) Equity investment:

- The equity investment size is between 10% and 50% of the project's investment value. The financing size is limited to THB 50 million (USD 1.5 million), in which the ESCO Revolving Fund shall not be the major shareholder.
- The investment period must be less than seven years.
- Exit method: shares sell-back to project owner or other shareholders
- Exit price: the Fund requires a 4% share dividend which is accumulated and paid-out when the Fund exits the projects
- A seat for the fund manager in the Boards of Directors is required.

#### 2) Equipment leasing:

- Up to 100% of total equipment cost can be covered up to a maximum THB 20 million (USD 600,000) per project.
- The repayment duration must be less than five years.
- A flat interest rate of 3.5% per annum is applied.
- The grace period is set at a maximum of six months.

#### 3) ESCO Venture Capital:

- The ESCO venture capital investment size is between 10% and 30% of the registered capital but limited to THB 50 million (USD 1.5 million) per project, in which the ESCO Fund shall not be the major shareholder.
- The investment period must be less than seven years.
- Exit method: shares sell-back to project owner
- Exit price: the Fund requires a 4% share dividend which is accumulated and paid-out when the Fund exits the projects
- A seat for the fund manager in the Boards of Directors is required.

### 3.3.3 Application Process

Applicants can download the application forms (available in Thai language only) online from the fund manager's website<sup>21</sup>. The forms and required documents need to be sent to the fund manager's office in Bangkok. The required documents for the application are as follows:

#### 1) Equity investment & ESCO Venture Capital:

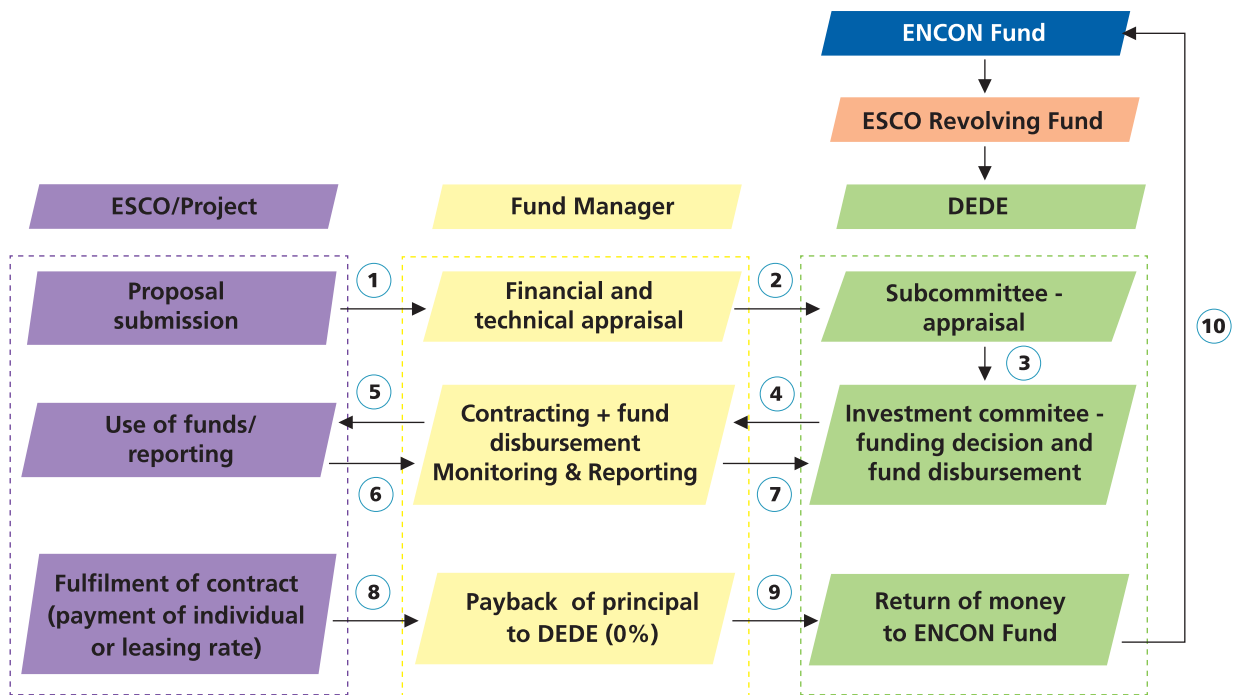
- Feasibility study report that includes information on project costs, technology usage, financial structure, project return and fuel supply management.
- Shareholders' financial statements for the past three years.
- Loan/Credit Facility Agreement or Term Sheet from the bank.
- Environmental Impact Assessment report.

- Community Acceptance Report/Community Acceptance Plan.
- Proof of fuel supply security in the long-term.
- Government license/permit for power plant, community acceptance or related license according to the regulation.
- Proof of an internal rate of return between 13-15% for existing projects and 9-12% for new projects.

## 2) Equipment leasing:

- Feasibility study report that includes project costs, savings calculation method, payback period, project return, equipment working mechanism, specification of equipment and M&V plan.
- EPC contract
- Engineering design document
- Copy of electricity bills for the past three years.
- Entrepreneurs/company's financial statement.
- Potentially personal or bank guarantee

The application process for the ESCO Revolving Fund is illustrated in Figure 6.



**Figure 6: ESCO Revolving Fund - Application Process**

Source: Author's elaboration, based on DEDE and ECFT (2018), EforE (2012)

Elaborate explanation of each process from Figure 6 above can be found below:

- 1) To access the ESCO Revolving Fund, ESCO or the project developer submits a proposal to one of the fund managers. The fund manager will conduct a comprehensive technical and financial appraisal within 30 days of proposal submission. The requirements are determined by the fund manager itself and vary for each fund manager. For example, ECFT focuses on the soundness and validity of the EPC contract between ESCO and the project during its appraisal.
- 2) Once the project satisfies the fund manager's criteria and requirements, the proposal is submitted to a DEDE subcommittee for further appraisal. This process takes up to 30 days.

- 3) If approved, the DEDE subcommittee forwards the proposal to the DEDE investment committee which reviews the proposal, decides if funding is granted and informs the fund manager within three month of proposal submission by the DEDE subcommittee.
- 4) Once approved, the fund manager sets up the contract with ESCO or the project owner and submits the signed contract or shareholders' agreement to DEDE. DEDE will initiate the fund disbursement to the fund manager which takes up to 60 days.
- 5) ESCO or the project owner implements the EE measure and...
- 6) ...reports the progress to the fund manager.
- 7) The fund manager is responsible for monitoring and reporting the project progress and any problems or barriers arising during the project implementation to the DEDE's investment committee. Within the first two years of the project implementation, the fund manager must provide quarterly progress report to DEDE. After five years, when the repayment period starts, this interval shortens, and progress reports are due every month.
- 8) In case of equipment leasing, the project transfers the determined leasing rate regularly to the fund manager. In case of equity or ESCO venture capital investment, a 4% share dividend, accumulated over the agreed investment time, is paid-out when the fund manager exits the projects.
- 9) The fund manager channels the money received back to DEDE. In the first two years of the fund managers' operation under DEDE, the fund manager receives a fixed management fee of 5% of approved and disbursed budget. From the third year onwards, the fund manager receives 100% cost coverage limited at 50% of the total money collected from funded projects.
- 10) At the end, DEDE returns the money to the ENCON Fund.







## 4. Decision-making Matrix for the Selection of EE Financing Support Schemes

As elaborated in the previous chapters, there are several energy efficiency financing support schemes available to stakeholders looking for EE financing in Thailand. Each scheme has its own set-up, requirements, eligibility criteria, funding application process and particular target groups. This chapter contains a decision tree to help stakeholders in Thailand identify and determine the suitable EE financing scheme for their investment needs.

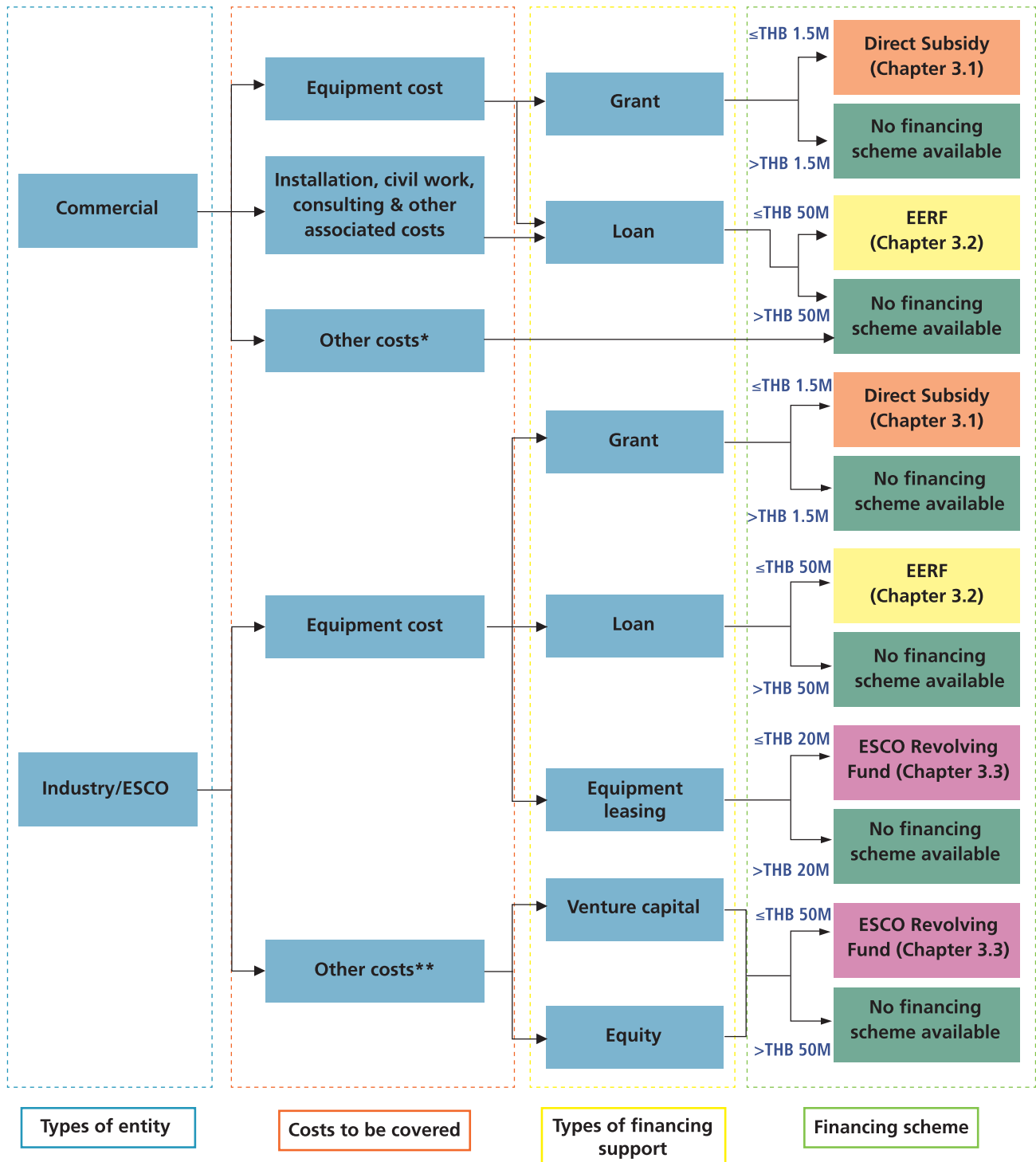
The following key variables in selecting a financing scheme for an EE project must be considered:

- 1) **Type of entity:** various support mechanisms exist for different types of entities i.e. commercial building owners, SMEs, corporates seeking funding to implement EE measures in their facilities, or ESCOs looking for capital for their investment in EPC projects.
- 2) **Type of financing support:** each EE project has specific characteristics, which result in the need for different types of financing support, i.e. equity, market or concessional loans, guarantees or grants.
- 3) **Cost component for which support is needed:** each project has particular funding needs at different stages. For example, during the development phase, a project may need funding for design, control and consultation. During the construction phase, the project may need certain cost coverage for equipment cost and installation or civil works, while support may be needed for energy audit, taxes and transportation during its operation.
- 4) **Project size:** a financing scheme with larger endowment will be able to support a wider range of project types and sizes. In contrast, a smaller financing scheme focuses on a more specific EE project type.

In order to use the decision tree, the user needs to correctly determine all key variables applicable for their individual situation. Some of these variables may not be relevant in all cases, or certain projects may have two available funding options or, in some cases, none.

After identifying the suitable EE financing scheme, the user can refer to the section of the respective financing scheme (see Chapter 3) which provides detailed information about the available financing mechanisms for the project.

Figure 7 shows the decision tree for EE financing support schemes Thailand.



**Figure 7: Decision Tree for EE Financing Support Schemes in Thailand**

Source: Author's elaboration

\*Building construction costs, investment costs, such as land costs and land improvement costs, as well as costs indirectly related to the project.

\*\*Any other costs related to the project, including construction costs.



Credit: ACE





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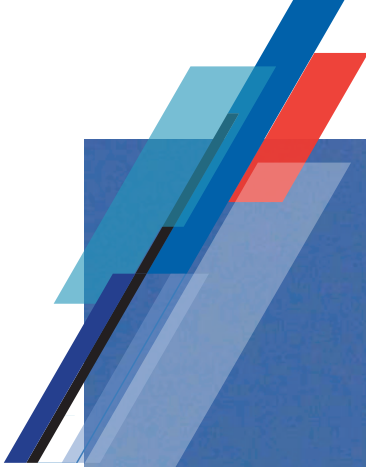
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