



RENEWABLE ENERGY



INDUSTRIAL
ENERGY EFFICIENCY



BUILDING
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Revolving and ESCO Funds for
Renewable Energy and Energy
Efficiency Finance

THAILAND

FUNDING THE FUTURE



The growing might of financing boosts renewable energy and energy efficiency

The demand for energy is growing worldwide and this is especially true for Thailand. By closely examining the energy efficiency and renewable energy sectors, the government developed financial mechanisms to support growth in energy demand while achieving mitigation targets.

Between 1990 and 2010, Thailand's gross domestic product grew at an average rate of 4.5 percent annually, and its energy demand grew nearly as fast at 4.4 percent.¹ The Ministry of Energy projects that energy demand will increase nearly 40 percent over the next decade, reaching 100 million metric tons of oil equivalent per year by 2021.² The rapid growth in energy demand is leading to increased greenhouse gas emissions, with CO₂ emissions due to energy consumption totaling about 278 million metric tons in 2010.³ In addition to growth in greenhouse gas emissions, domestic energy security is a concern as well. As of 2009, Thailand was importing 60 percent of its total energy supply to meet its demand.⁴ Thus, the government has made the management of energy demand a top objective.

To manage the emissions implications of projected growth in energy demand, the government of Thailand has made energy efficiency and renewable energy policy a key part of its climate change mitigation strategy. Thai leaders recognized that project financing was one of the key barriers to increased uptake of energy efficiency and renewable energy opportunities. As a result, the government developed a strategy for raising and disseminating the necessary funding through public-private partnerships.

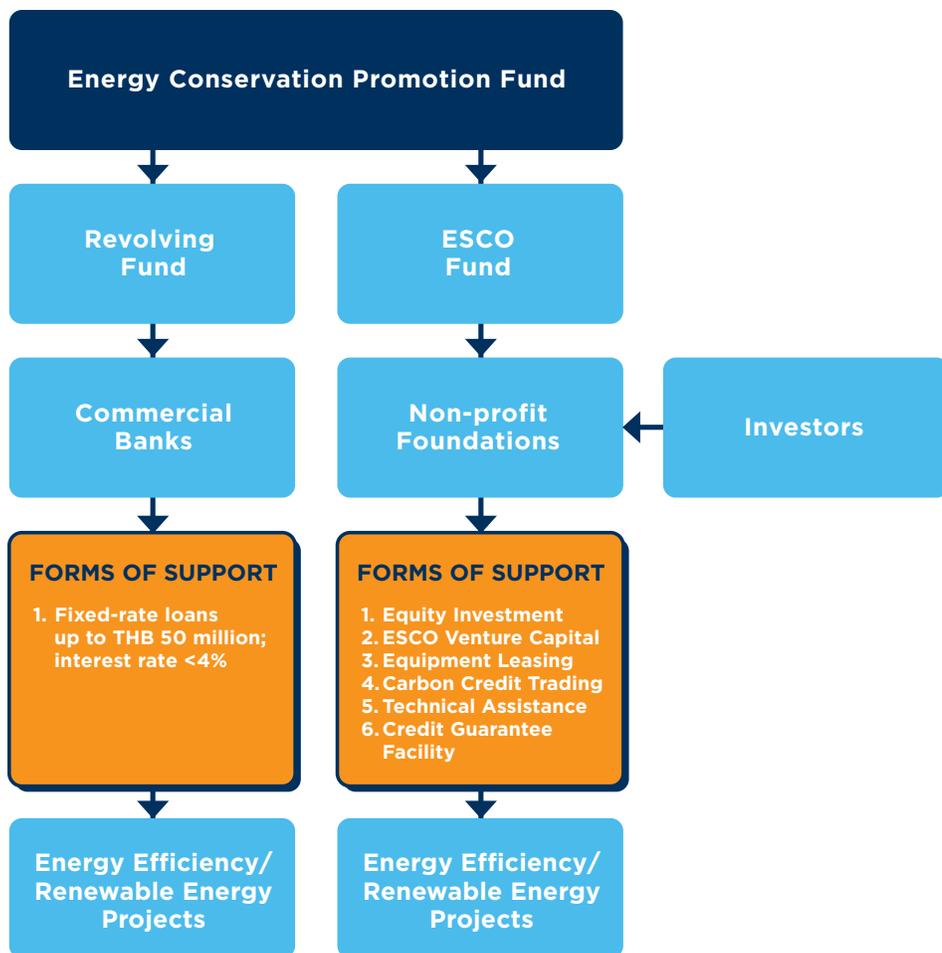
FUNDING AND INCENTIVES BRING SOLUTIONS

Thailand's Energy Conservation Program started 20 years ago, under the Energy Conservation Promotion Act. This master plan for energy efficiency and renewable energy development was implemented in three stages: Phase I (1995-1999), Phase II (2000-2004), and Phase III (2005-2011). The Act applied mandatory energy efficiency and conservation measures to large commercial and industrial facilities and created voluntary initiatives for small- and medium-sized enterprises. During Phase III, Thailand revised its Energy Conservation program and moved toward longer-term strategic planning for energy efficiency and renewable energy.

Notably, the Act established an Energy Conservation Promotion Fund (ENCON Fund) which originated from an initial capital outlay from the existing Oil Fund and

is sustained primarily by a small levy from the sale of specified fossil fuels.^{5,6} The Fund is unusual in that it taxes energy consumption specifically for the purpose of funding energy solutions. The Fund is used to support projects under the Act by government agencies, state enterprises, non-governmental organizations, individuals and businesses.⁷ The Fund has been disbursed through a number of different mechanisms, including grants, subsidies, tax incentives, a feed-in premium for renewable energy, the Revolving Fund and the Energy Services Company (ESCO) Fund. The following discussion focuses on the two financing programs supported by the Fund: the Energy Efficiency Revolving Fund and ESCO Fund. Figure 1 illustrates the differences between these funds.

Figure 1: Overview of the Revolving Fund and ESCO Fund



Source: Adapted from Asia-Pacific Economic Cooperation.

The Energy Efficiency Revolving Fund was launched in 2003 and provided a line of credit to local banks, which were then able to provide low-interest loans to developers for energy efficiency and renewable energy projects.⁸ Local banks were eligible to receive credit lines from the Revolving Fund in the range of USD 2.5 million to USD 10 million to finance energy efficiency and renewable energy projects. During the pilot phase, the Revolving Fund provided local banks with zero percent interest to spur projects. As the financing volume grew, the interest rate was subsequently set at 0.5 percent to cover administrative costs. Local banks were obligated to repay to the Revolving Fund within 10 years.⁹

With access to the Revolving Fund, local banks were able to provide low-interest rate loans which covered up to 100 percent of project costs, with a maximum of THB 50 million (approximately USD 1.6 million) per project.^{10,11} Project developers and ESCOs were eligible for a fixed interest rate loan of zero percent to 4 percent (compared to the market rate of 9 percent), for up to a seven-year period. The local banks were responsible for evaluating loan applications, based on the balance sheets, future cash flows, and savings from the projects. The banks also required land, building(s), or equipment owned by the applicants to serve as collateral for loans. Furthermore, project proponents were required to submit feasibility studies when applying for loans. These requirements lowered the risk that applicants might default on their loans, and because of that, very few applications were rejected.

The total budgeted size of the Revolving Fund was approximately USD 235 million over five funding phases.¹² Funding was available for energy efficiency projects and some types of renewable energy projects, with eligible investments including: equipment and installation costs; consultation costs; civil works, piping, or necessary components; and other associated costs such as removal of existing equipment, transportation, and taxes.^{13,14} The participating banks managed the loans and reported to the government authority, the Ministry of Energy's Department of Alternative Energy Development and Efficiency, which ensured that all projects achieved real energy savings, monitored the banks' performance and measured the program's energy savings.¹⁵ This approach minimized government involvement in the financing process and helped to leverage bank finance. The cost to the government was the time value of money associated with providing zero or low-interest loans to the commercial banks, and participating banks, not the government, carried the risk of participants defaulting on their loans.¹⁶

With the success of the program in building the banks' understanding and capacity to finance energy efficiency and renewable energy, in 2011, Thailand began to phase out the Revolving Fund. Recent lending data from the banks suggests that they have become sufficiently familiar with lending practices and are able to provide financing without government support.

The ESCO Fund provides capital and technical assistance for clean energy, renewable energy, energy efficiency and building retrofit projects. It was organized into two phases (2008-2010 and 2011-2012), each funded by an ENCON grant at a value of USD 16.3 million.¹⁷ The project is sponsored by the Department of Alternative Energy Development and Efficiency and the fund is managed by the government-appointed, non-profit Energy Conservation Foundation of Thailand and Energy for Environment Foundation. Projects are monitored during development, construction and operation.

The primary targets are: small and medium enterprises, including the energy-intensive service and industrial sectors; energy service companies as co-investors, project developers, or technical partners; and domestic and international investors in energy efficiency and renewable energy sectors. The secondary targets are financial institutions providing project loans and credit guarantee agencies. Forms of support include:

- Equity investment – The ESCO Fund can invest between 10-50 percent of a project, up to a maximum of USD 1.6 million for a period of five to seven years. Investors can exit by selling back shares to the entrepreneur, find new strategic partners, or list in Thailand's stock market.
- ESCO venture capital – The ESCO fund can invest up to 30 percent of registered capital, with a maximum of USD 1.6 million. The investment period matures in 5 to 7 years, and investors can exit by selling back shares to the entrepreneur, find new strategic partners, or list in Thailand's stock market.

- Equipment leasing – provides eligible businesses for equipment leasing up to 100 percent of the equipment cost, up to a maximum of USD 0.3 million per project, with a payback of less than 5 years. The associated interest rate is 4 percent per year.
- Carbon credit trading - The ESCO Fund supports project owners in developing Clean Development Mechanism documents, and in accessing the carbon credit market through bundling small projects.
- Technical assistance – up to approximately USD 3,250 per project.
- Credit guarantee facility – Co-financed with other financial institutions, the guarantee of commercial bank loans to project owners up to USD 0.3 million and for no more than five years; owners pay a fee to the guarantor at 1.75 percent per annum of the guarantee amount.^{18,19,20}

UNPRECEDENTED SUCCESS

Thirteen public and commercial banks have participated in the **Energy Efficiency Revolving Fund**, which has resulted in 294 projects, with a total investment of approximately USD 519 million (USD 235 million from the fund and USD 284 million from commercial banks). The total financial savings due to the projects is estimated to be about USD 177 million per year. The expected energy savings will be around 320 thousand tons of oil equivalent (Ktoe) per year, leading to GHG emissions reductions of about 1 million tons CO₂-equivalent annually.²¹

The **ESCO Fund** has successfully engaged commercial banks, energy service companies, and investors in Thailand's energy efficiency and renewable energy development to an unprecedented level. Under the ESCO Fund from 2009 to 2010, USD 17 million of government funding was invested in 39 energy efficiency and renewable energy projects, with a total investment of approximately USD 166 million.²² In the second phase from September 2010 to January 2012, these energy efficiency and renewable energy projects were projected to create energy savings of 24 Ktoe per year and financial savings of USD 30 million per year.²³

Both funds have helped raise the profile of and reduce finance barriers to energy efficiency and renewable energy projects. The ESCO Fund will continue to operate as a finance delivery mechanism under the government's new 10-Year Alternative Energy Development Plan (2012-2021) with a target to increase the share of renewable energy from 9 percent in 2011 to 25 percent in 2021, and 20-Year Energy Efficiency Development Plan with a target to reduce energy intensity by 25 percent in 2030 relative to 2005, which is equivalent to reducing final energy consumption by 20 percent in 2030, or about 30,000 Ktoe.^{24,25}

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ENDNOTES

Note: currencies were converted to US dollars on October 17, 2012 at the exchange rate of 1 USD = 30.73 THB.

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- ¹⁰ Note that all currency conversions to US dollars were calculated in October 2012 using the exchange rate of THB 30.729 = 1 USD (10/17/2012 - www.oanda.com).
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- ¹³ Chotichanathawong, Q. and N. Thongplew. 2012. "Development Trajectories, Emission Profile, and Policy Actions: Thailand." ADBI Working Paper 352. Tokyo: Asian Development Bank Institute. Web. July 2012. <<http://www.adbi.org/working-paper/2012/04/12/5045.dev.trajectories.emission.thailand/>>
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- ²² Chotichanathawong, Q. and N. Thongplew, 2012, *op cit.*
- ²³ Updated data supplied by Wongkot Wongsapai, Assistant Professor, Faculty of Engineering, Department of Mechanical Engineering, Chiang Mai University, personal communication to Catherine Leining on 2 July 2012.
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- ²⁵ Ministry of Energy, Thailand, *op cit.*

Figure Section

Figure 1: Overview of the Revolving Fund and ESCO Fund
Adapted from: Asia-Pacific Economic Cooperation. 2011. "Peer Review on Energy Efficiency in Thailand: Final Report." Web. July 2012. <http://www.ieej.or.jp/aperc/PREE/PREE_Thailand.pdf>