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FINAL REPORT (Draft)

Promotion of Energy Service Company: ESCO

Workshop #1:
21-23 January 2012
Bangkok, Thailand

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26-28 March 2013
Taipei city, Chinese Taipei

Jyukankyo Research Institute Inc.

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Produces by
Asia Pacific Energy Research Center (APERC)
Inui Building Kachidoki 11F, 1-13-1 Kachidoki
Cho-ku, Tokyo 104-0054, Japan
Tel: (81) 3-5144-8551
Fax: (81) 3-5144-8555
Email: master@aperc.ieej.or.jp
Website: http://www.ieej.or.jp/aperc/

In consultation with
Jyukankyo Research Institute Inc.
Kioi-cho Ark Building
3-29, Kioi-cho, Chiyoda-ku, Tokyo 102-0094, JAPAN
Tel: (81) 3-3234-1177
Fax: (81) 3-3234-2226
E-Mail: info@jyuri.co.jp
Website: www.jyuri.co.jp

For
Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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Acronyms

CSR: Corporate Social Responsibility
DSM: Demand Side Management
ESP: Energy Service Provider
FEMP: Federal Energy Management Program
GEF: Global Environment Facility
GSC: Guaranteed Savings Contract

> The client finances the project and makes periodic debt service payments to a financial institution. Client pays the ESCO after implementation based on Performance. ESCO reimburses client for any underperformance.

IGA: Investment Grade Audit
IPMVP: International Performance Measurement & Verification Protocol
IRP: Integrated Resource Planning
LFI: Local Finance Institution
M&V: Measurement and Verification
SME: Small and Medium-sized Enterprise
SPE: Special Purpose Entity
SSC: Shared Savings Contract

> The ESCO organizes the financing of the total upfront capital cost of the project and is totally responsible for repaying the lender. The client pays the ESCO a percentage (or a fixed amount) of its achieved cost savings from the project.

Executive Summary

Background on CEEDS. Phase 4 of the APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) project focused on Energy Service Company (ESCO). The project was organized by the Asia Pacific Economic Research Centre (APERC) with METI, Japan, as the Project Overseer. Like the APEC Peer Review on Energy Efficiency, CEEDS Phase 3 was co-sponsored by all EWG Economies. Previous phases of CEEDS addressed appliance energy standards and labeling (Phase 1), building energy codes (Phase 2) and energy-efficient urban passenger transportation (Phase 3). All three topics are among the high-performance policies identified as having the potential to help APEC economies achieve the energy savings goals adopted by APEC leaders.

For each phase of CEEDS, APEC economies are invited to participate in a series of two workshops. At the first workshop, each economy draws on a policy template provided by APERC to identify the current status of policies and programs, along with barriers and possible solutions to advancing programs and policies in the sector of focus. Comments by invited international experts and from the other participating economies help the delegates from each economy identify proposed next steps. After the first workshop, each delegate shares the workshop findings and proposed next steps with colleagues in the relevant ministries and agencies of their economy. At a second, follow-on workshop (2-4 months after the first), the representatives from each economy report back on progress in implementing the planned actions and any new issues or opportunities identified. Discussions among the economies and invited experts help each economy develop a "fine-tuned" plan of action or roadmap for implementing the policies and programs discussed during the two workshops.

CEES Phase 4 Workshops. The first CEEDS Phase 4 workshop on promotion of Energy Service Company: ESCO was held in Bangkok, Thailand, on 21-23 January 2013. The workshop was organized by APERC and hosted by Thailand and Chinese Taipei, the agenda for "CEEDS Workshop #1" is shown in Appendix 1a. The second workshop of CEEDS Phase 4 was held in Taipei city, Chinese Taipei on 26-28 March 2013; the agenda for "CEEDS Workshop #2 is shown in Appendix 1b.

People's Republic of China, Chile, Malaysia and Thailand participated in the first workshop of CEEDS Phase 4. And Malaysia and Thailand participated in the second workshop of CEEDS Phase 4. The Philippines was registered but was unable to participate in both workshop.

International experts of ESCO industry from several other APEC economies - Japan, Canada, PR China, Thailand, the United States - and Italy provided presentations on the implementation of ESCO promotion policy and programs in their economies and around the world. Together, more than thirty people attended one or both of the CEEDS Phase 4 workshops, including the APEC economy delegates, invited international experts on ESCO industry, representatives of the two host economies (Chinese Taipei and Thailand), Jyukankyo Research Institute experts and the APERC researchers and administrative staff.

Discussion at the two meetings focused on:

- In order to contribute to reduction of greenhouse gas emissions, each participating economy[1] are bringing up ESCO industry which could help to address barriers to the energy conservation;
- Recent energy conservation policies, current situation of ESCO industry development program in participating economies and Chinese Taipei (host economy);
- Effective strategies for development of ESCO industry with a focus on preliminary review, incentive program, development of financial scheme, capacity building, improvement of public awareness, ESCO procurement for government facilities, activity support of ESCO association, registration and accreditation system of ESCOs, evaluation of energy conservation performance and impartiality 3rd party mechanism and database development, on the basis of shared information among the four participating economies and invited expert speakers;
- Status reports and preliminary proposal on next steps to be pursued by each participating economy to promote ESCO industry.

Key Takeaways:. The workshop participants discussed the development of ESCO industry on the basis of their each experience as well as the Policy Template which were

[1] Participating economies in the first workshop were the People's Republic China, Chile, Malaysia and Thailand. And The Philippines was registered but was unable to participate. On the other hand, Chinese Taipei gave presentation. Economies participating in the second workshop were Malaysia and Thailand.

prepared by Jyukankyo Research Institute. And the key takeaways of these discussions are summarized as below.

For development of ESCO industry, support from the government or from international organizations was required at the initial stage of implementation.

Meanwhile, multiple support measures which are provided by governments are taken at the later stage. Furthermore, comprehensive strategies including changes of current business models and support from Government are required as below.

(1) Preliminary review

In the early stages of ESCO implementation, feasibility studies of energy-savings potential and the possibility of promotion of energy savings by ESCO, are carried out.

(2) Development of business

- Implementation of energy audit (corresponding to FS research)
- Implementation of pilot projects
- Introduction of ESCO business into governmental facilities
- Implementation of IRP/DSM programs

(3) Development of capability

- Preparation of technical guidelines
- Preparation of ESCO introduction manuals:
- Performance development for financial institutes:
- Performance development for ESCO enterprisers:

(4) Propagation and enlightenment

- Compile and issue of successful models
- Seminar, conference, exhibition
- Business matching meeting
- Provision of information such as newsletters, websites etc.
- Commendation system for excellent ESCO projects

(5) Establishment of project body/operation support

- Set up of ESCO association/operation support
- Support to set up ESCO providers
- ESCOs register system
- Accreditation system for ESCO providers
- Evaluation of energy conservation performance and impartiality 3rd party mechanism

(6) Financial support

- Develop financing scheme

- Implementation of low interest finance
- Offer of subsidies
- Implementation of loan guarantee programs
- Tax incentive system

(7) Reinforcement of policy/system reformation

- Reinforcement of regulations for energy conservation
- Reformation of expedition regulations to introduce ESCO in governmental facilities

Main Challenges: The workshop participants identified main challenges related to promote ESCO industry that developing APEC economies face. The most significant specific challenges for each of the participating APEC economies are summarized in Appendices 2-7; however, the most common challenges included:

- Lack of recognition of ESCO
- Lack of financial scheme
- Lack of financial institutions' understanding toward ESCO industry
- Delay in capacity building of ESCOs especially M&V, technical knowhow
- Delay in capacity building of financial institutions
- Difficulty in introducing ESCO to government buildings
- Lack of support to ESCO association
- Lack of accreditation or certification system of ESCOs
- Gap between contract society and real business custom

The "fine-tuned" proposals developed by the APEC economy delegates during the CEEDS4 workshops suggest policies and programs designed to address these challenges. These proposals are provided in Appendices 2-7, along with key points from the discussion of the proposals at the second workshop.

Why focus on ESCO industry

The ESCO industry is said to have been born in France 100 years ago, and has grown as a business model in the United States in the wake of the oil crisis. Feature of this business model is in the performance contract that guarantees the energy savings, and this point is different from the energy saving business in general. Organizations which initially entered ESCO industry were the following three.

- Engineering consultant companies aiming to expand their business
- Building energy management equipment manufacturers aiming to expand their business
- Project operators of Demand Side Management (DSM) program from Utilities

Even though specialized know-how of contracts and finance is required in additional to technology on energy conservation, not only the construction industry, but also wide range of various players has entered ESCO industry, which makes the width also a major feature of ESCO industry.

A number of economies believe that promoting ESCO industry leads to promote energy conservation. This is due to the fact that ESCO has the following features.

- It guarantees the energy savings.
- It makes a reliable proposal which is based on energy audit.
- It can sustain the energy-saving performance over a long period of time by providing M&V
- It makes a financial arrangement, and sometime it provides funding.
- Although energy services have been traditionally provided by the supply side, ESCO represents the interests of customers by providing a service from the demand side.

The basis of these features is the guarantee of energy savings realized by performance contracts. Performance contract is a business model to prioritize the interests of customers and to maximize the benefits of ESCO at the same time as it wins a customer trust. Energy audit is a basic analysis to reduce performance risks and to provide comprehensive proposals. By considering a variety of energy-saving measures and proposing a combination of economically-efficient one and inefficient one comprehensively, ESCO can maximize the effect and energy saving benefits. By performing M&V, ESCO can not only verify whether the effect of energy saving achieves the guaranteed level, but can also detect a failure and deterioration of implemented equipment or management, and the workarounds applied to each found trouble will lead to a long-lasting energy saving effect. By arranging the most favorable financing for its customers, it minimizes the expenses of the customers together with the performance risk of ESCO. Having these characteristics, ESCO was given catch-phrases that impress that it is an advantageous service for customers; such as “it can build a Win-Win relationship” or “it provides a One stop service”.

ESCO market is affected by various factors in addition to changes in energy prices. In energy efficiency retrofit projects, it is the first condition to be economically satisfied, however, the need to provide know-how of ESCOs is small in projects whose payout period is short therefore is possible to invest by their own fund. In contrast, in the case where payback period is too long, it will be discussed from a point of view of

promoting energy conservation by regulation or requiring incentives such as subsidies. Additionally, financial support by government helps the overall ESCO market to be expanded, and developing financing scheme makes an important role to the expansion of ESCO market. Promoting to introduce ESCO project to public facilities also helps the market expansion.

As stated above, ESCO market varies depending on government's energy conservation policies, financial environment, and the target field for each company. Therefore, the relationship between government and private sector is important.

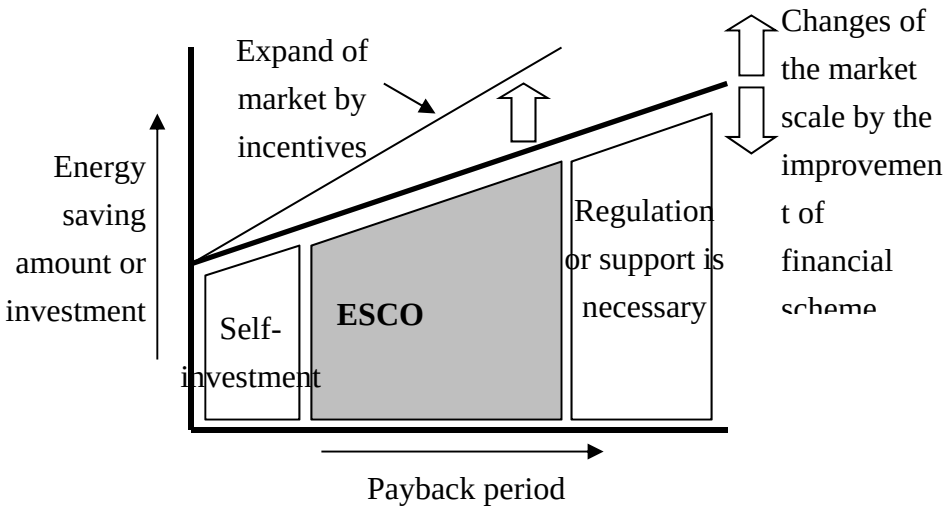

Figure.1 Position of ESCO market and changing factor

Not limited to ESCO market, there are some typical business models to the energy conservation market.

- Regulatory model

  A regulation for energy demand, which is targeting at customers in many cases. Besides this, there is another case where it targets at Utilities. The target customers and Utilities would promote energy conservation business since they would be forced to invest.

- Incentive model

  There are subsidies, low-interest loans, tax incentive and credit trading and so on, and they contribute to the expansion of energy conservation market directly.
- Engineering model

  Service that provides the technical know-how of energy audit, energy saving design, construction, and operation management, etc.
- Value-added service model

  Proposes added values such as performance contract provided by ESCO and turnkey contract.
- Finance model

  Revitalizes businesses by preparing financial scheme, such as project finance and leasing. In addition, loan guarantee for revitalizing by risk hedge for financial institutions is carried out in PR China and other economies. Recently, models like “On Bill Finance” becoming popular in the United States and “Green Deal” of the UK to provide funds for the upfront cost, collecting funds in accordance with utility charges, are also proposed.
- Improving market value model

  A model to improve the market value by evaluating the energy performance of buildings and equipment by rating and labeling and so on.
- Utility model

  This model includes programs like DSM biding program, feedback program, and demand response program, etc. provided by Utilities, which drive energy conservation market due to Utilities’ investment.
- Government facility model

  A model to improve energy efficiency in government facilities, in order to expand the overall energy conservation market.
- CSR (Corporate Social Responsibility) model

  A model to achieve energy savings as a service which helps company’s social contribution.

ESCO is a business model that combines “Engineering model”, “Value-added service model” and “Finance model”. Additionally, it has a strong relationship with “Utility model” and “Government facility model”. At the same time, it is possible to say that ESCO is a wide ranged business model to meet all the above business models. On the other hand, government policies are involved in most of these business models. That

is why it is important to build a close relationship between ESCOs and government to promote ESCO industry and to promote energy savings.

Key government stakeholders in policymaking for promotion of ESCO industry

Government is strongly involved in promoting ESCO industry. Government leadership on the early stages to implement ESCO is especially essential. Government agency responsible for the promotion of ESCO is the department in charge of energy in each economy. On the other hand, promoting ESCO requires development of financing scheme and system design for introducing ESCO to public facilities. Therefore, there might be a case that the department in charge of energy will cooperate with the department in charge of finance in some economies. In addition, for system design to the ESCO implementation to public facilities, there is a case to work with Congress secretariat in order to take measures to Congress, and a case to work with a department responsible for maintenance of government facilities. With respect to measures against Congress, there is an example that personnel were dispatched to the Congress from Federal Energy Management Program (FEMP) office in developing FEMP in the United States, and there is another example that the system design was carried out in cooperation with Ministry of Land, Infrastructure, Transport and Tourism (MLIT) holding jurisdiction over government facilities in Japan.

The government agency responsible for the promotion ESCO industry is as below.

- PR China: National Development and Reform Commission (NDRC)
- Chinese Taipei: Bureau of Energy, Ministry of Economic Affairs
- Chile: Ministry of Energy
- Indonesia: Ministry of Energy and Mineral Resources (KESDM)
- Japan: Ministry of Economy, Trade and Industry (METI)
- Korea: Korean Energy Management Corporation (KEMCO)
- Malaysia: Ministry of Energy, Ministry of Finance
- The Philippines: Department of Energy (DOE)
- Singapore: National Environment Agency (NEA)
- Thailand: Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy
- United States: Department of Energy (DOE)

ESCO association is often established to represent the private ESCOs and to develop the market, cooperating with government. As well as other industry organizations, ESCO association is also established in private sectors in the most cases, however, there are cases where ESCO association is established with the support by international organizations at the time of implementing ESCO. In Asia, PR China and The Philippines correspond to this case. The followings are list of ESCO association in each economy.

- Australia: Australian Energy Performance Contracting Association (AEPCA)
- PR China: ESCO Committee of China Energy Conservation Association (EMCA)
- Chinese Taipei: Taiwan Association of Energy Service Companies (TAESCO)
- Indonesia: Indonesia Supporting Companies Association for Energy Conservation (APKENINDO)
- Japan: Japan Association of Energy Service Companies (JAESCO)
- Korea: Korean Association of ESCO Companies (KAESCO)
- Malaysia: Malaysia Association of Energy Service Companies (MAESCO)
- Singapore: Energy Sustainability Unit
- Thailand: Thai ESCO Association
- United States: National Association of Energy Service Companies (NAESCO)

In addition to the above, ESCO associations are active also in Europe.

- Austria: Association of EPC-Companies Austria
- Belgium: BELESCO
- Denmark: ESCO network – under the Federation of the Danish Industry / Energy Branch
- France: Association of Energy Efficiency Service Companies (CS2E)
- Germany: Association for Heat Supply, ESCO Forum (ZVEI national association for electrical and electronics industry) and VDMA (national association for machinery and industrial equipment manufacturers, subgroup for Building Automation)
- Italy: AGESI, ASSOESCO, and FEDERESCO
- Spain: AMI and ANESE
- Sweden: Forum for Energy Services
- Switzerland: Swiss Contracting
- United Kingdom: Energy Services and Technology Association (ESTA)
- Source: Angelica Marino, Paolo Bertoldi, Silvia Rezessy, and Benigna Boza-Kiss, Energy Service Companies Market in Europe – Status Report 2010 -, European Commission Joint Research Centre Institute for Energy, 2010

Policy/strategy and action plan for promote ESCO industry

The delegates from participating economies and experts discussed policies and programs for the promotion of ESCO industry in each economy at the workshop.

Promotion programs for ESCO industry are as shown in (1) to (7) as below, and similar programs are implemented in most economies.

(1) Preliminary review

In the early stages of ESCO implementation, feasibility studies of energy-savings potential and the possibility of promotion of energy savings by ESCO, are carried out. In Japan, various programs have been deployed for nearly 10 years since a feasibility study was carried out on the initiative of Ministry of Economy, Trade and Industry (METI) in 1996. In Asia, the World Bank and Global Environment Facility (GEF) have been investigated in several economies in the early 1990s. In PR China, the facts that there was a large potential on energy savings and at the same time there was a market barrier were identified by the investigation carried out from 1992 to 1994, therefore a supporting program was performed for 10 years since 1998. In addition, in Thailand, a feasibility study by GEF was carried out and a pilot project of ESCO was implemented.

In a review carried out at the beginning of implementation, examinations of definition of ESCO, characteristics of its contracts, overview of M&V, energy saving potential, and challenges and solutions in the economy are often carried out. In response to the examinations, pilot project, capacity building, support measures and establishment of ESCO association are often performed.

(2) Development of business

Following the initial feasibility studies, energy audit and pilot projects should be performed. Japan also carried out pilot projects using government subsidies in 1998. Also in Thailand, free energy audit with fund from ENCON Fund (Energy Conservation Promotion Fund) was carried out. Energy audit is often carried out by government subsidies because it promotes to save energy of facilities. Although it is difficult to say that free energy audit directly helps the development of ESCO industry because not all facilities which received energy audit take in ESCO project, making energy audit to define the energy consumption and issues contributes to the promotion of the overall energy savings. Promotion to implement ESCO project to government facilities is required to be carried out before developing private market. At the same time as implementation of ESCO projects to government facilities

enhances the credibility of the entire ESCO industry, ESCOs which performs it can accumulate experience. Due to the subsidized energy prices, Malaysia plans to implement ESCO to government buildings first, private sector will follow as the next target.

In addition, performing IRP (Integrated Resource Planning) and DSM (Demand Side Management) contributes to the development and promotion of ESCO project. However, while IRP/DSM was carried out in Europe and the United States, APEC economies have not performed full-blown DSM. Many developing and emerging economies' primary goal had been to develop power sources to deal with increasing electrical demand on the background of economic growth, thus IRP such as dampening electrical demand by promoting energy savings on demand side has not yet become practical in those economies. Therefore, implementation of full-blown IRP/DSM is a task to be challenged in the future.

- Implementation of energy audit (corresponding to FS research)
- Implementation of pilot projects
- Introduction of ESCO business into governmental facilities
- Implementation of IRP/DSM programs

(3) Development of capability

All participating economies regard this as the essential program for promotion of ESCO industry.

- Preparation of technical guidelines:
  Guidelines for Measurement and Verification (M&V) and Standard Contract which are important to perform ESCO project.
- Preparation of ESCO introduction manuals:
  Bidding procedure differing from the usual construction is needed for implementing ESCO project to public facilities. That is because feasibility, energy-saving ratio and the details of contract are important, while bidding price is most focused on in normal construction biddings. While it is preferable to reform the bidding system, it is difficult to do it for public works in many economies. Therefore, a manual for bidding system which can make use of the characteristics of ESCO as much as possible under the current bidding system should be made.
- Performance development for financial institutes:
  Involvement of financial institutions is essential on ESCO project. However, it is difficult for financial institutions to understand ESCO project because they do not have much technical know-how of energy conservation. Thus, a guideline

for financial institutions which showing the overview of ESCO project should be created or a seminar should be held in order to help financial institutions to understand it.

- Performance development for ESCO enterprise:
A various industries such as builders, engineering industries and device manufacturer of measurement equipment, enter into ESCO industry. It is necessary to carry out capacity building in order to bring up good ESCOs quickly.

A various measures have been implemented especially in PR China under the leadership of ESCO association (EMCA) and in Thailand under the leadership of DEDE (Department of Alternative Energy Development and Efficiency) and FTI (Federation of Thai Industry). Among the above preparations and developments, M&V and performance development for financial institutes are most valued. Though M&V plays a central role in services ESCO provides, it is not well recognized. Therefore, it is indicated important to improve the awareness of M&V not only within ESCO, but also within the demanding side. Performance development for financial institute is a program of high interest especially to economies in the early stage of ESCO implementation. In Thailand, the growth of five financial institutions which deal with ESCO fund increased the recognition of M&V by other financial institutions.

(4) Propagation and enlightenment

This is a program taken place most commonly in measures to popularize ESCO industry.

In order to bring up ESCO industry, it is necessary to promote it continuously, not only in the beginning of implementation. It is required to keep carrying out activities like the following.

- Compile and issue of successful models
- Seminar, conference, exhibition: opening of various seminars and conferences for propagation and enlightenment of ESCO business
- Business matching meeting
- Provision of information such as newsletters, websites etc.
- Commendation system for excellent ESCO projects
- Most of these projects are performed by nucleus organizations of ESCO promotion in each economy. For example, PR China's EMCA and Thailand's DEDE and FTI. In Thailand, Thai ESCO Association was established at the end

of 2012 to play a central role to conduct projects. Commendation system for excellent ESCO projects is performed by government, and in Thailand, Ministry of Energy has being doing this. The role of nucleus organizations of ESCO promotion is greatly important.

(5) Establishment of project body/operation support

It is necessary to establish a central authority to promote ESCO industry and to dispatch information. ESCO association is active in many economies to participate in dissemination and public awareness activities. In developed economies, a group of private operators often establishes their associations. However, it is valid to be supported by international institutions or government for establishment in developing economies. In addition, establishment of Pilot ESCOs, which was supported by an international organization in the beginning of implementation, was successfully performed in PR China.

It is also valid to have a registration system or certification system of ESCOs in order to develop their abilities.

- Set up of ESCO association/operation support
- Support to set up ESCO providers
- ESCOs registration system: Registration system to access to incentives such as low interest loan provided by governments. In Thailand, it has been established to access ESCO Fund. It is not a system to judge the abilities of ESCOs.
- Accreditation system for ESCO providers: Preliminary accreditation system to simplify government expedition procedure (Super ESPC in USA, Australia, etc.) and accreditation system (NAESCO etc.) for nurturing excellent ESCO providers are available. The preliminary accreditation system judges the abilities of ESCOs, and performs a selective tendering, which only allows the accredited ESCOs to bit for government buildings. The accreditation system is an unparalleled system in the world, made to examine the abilities of ESCOs. NAESCO's accreditation is highly valued in the U.S market, thus ESCO biddings performed by local governments sometimes set the accreditation of this system as a condition for ESCO providers. Many participating economies are interested in accreditation system for ESCO providers.
- Evaluation of energy conservation performance and impartiality 3rd party mechanism: M&V based on IPMVP has been implemented as method to analyze the effect of energy saving of ESCO project in many economies. And it has been a major feature of ESCO industry. Economies on the early stages of ESCO introduction, they often need an introduction of evaluation by 3rd party. Thailand is an economy with advanced ESCO introduction, but has an interest

in 3rd party evaluation. That is because customers do not trust the result of M&V reported by ESCO, and require evaluation by 3rd party.

(6) Financial support

Financial support by government is extremely important. While the main support is subsidies in Japan, other Asian economies often implement low-interest loans and Tax incentives. Additionally, loan guarantee had helped the promotion of ESCO industry in PR China.

- Develop financing scheme

  Ordinary financing is done by asset-base. Development of utilizable financing scheme is important because utilizable loans are limited in case of energy efficiency investment including ESCO projects. Energy efficiency financing needs to develop the project-base financing by putting up energy savings as a collateral. In addition, in order to reduce transaction cost, utilization of the special purpose entities (SPEs) which aggregate small and medium-sized project (SMP) is also required.

- Implementation of low interest finance

  It is carried out in many economies and intended to provide funds with a few percent lower interest than market interest by government. The feature is that registration system for ESCOs which receive low-interest loans would be introduced at the same time such as in Thailand and Korea. In Thailand, the understanding of ESCO model by banks which deal with low-interest loan by ESCO fund become the start for other financial institutions to gradually improve their ESCO recognition.

- Offer of subsidies

  Subsidies are the major part of financial support in Japan. There is a feature to be very advantageous to the project implementation caused by subsidy rate which is as high as 1/3. On the other hand, it tends to become complicated procedures and to specialize in large-scale projects. In addition, it is often happened that acquiring subsidy becomes a prerequisite of the contract since subsidy is important for ESCOs and customers. Furthermore, we should also consider the fact that subsidies can provoke only a double or triple investment from the amount of government budget.

- Implementation of loan guarantee programs

  This is an insurance to reduce investment risks of financial institutions. It had been introduced in PR China first and also provided by Asia Development Bank. After that, lease insurance was introduced in Japan too. A lot of economies are

paying attention to this program because it can provoke as much as several times investment of insurance government prepares.

- Tax incentive system

  There are two systems. One of the systems exempts taxation for utility costs reduced by implementation of ESCO project, and the other deducts a certain percentage of the cost for introducing high-efficiency equipment. Although incentive of customers to receive is not as much as subsidies, the procedure is simple and it is possible to give incentive regardless of the scale. However, never very high incentive is granted because free riders cannot be cut off.

(7) Reinforcement of policy/system reformation

Basic energy conservation legislation has been carried out in many economies in a different time such as Japan's Energy Conservation Law, PR China's Energy Conservation Law, Thailand's Energy Conservation Promotion Act, Malaysia's Efficient Management of Electrical Energy Regulations, Chile's National Energy Efficiency Program (PPEE) and India's Energy Conservation Act. Energy-saving standard has been established basing on the development of these laws, regulation was started, and support program for energy-saving promotion was carried out. Most of them closely relate to the business growth of ESCO industry.

On the other hand, in United States, related law of energy conservation such as The Energy Policy and Conservation Act of 1975(EPCA), National Energy Conservation Policy Act of 1978(NECPA), and The Energy Policy Act of 1992 (EPAct) was implemented, and system design was carried out by Executive Order 13123, 1999, etc. in implementation of ESCO to public facilities which is the main market in the United States.

ESCO implementation to government buildings is not only effective for ESCO model to acquire the trust of market as stated above, but is also essential to develop the ESCO market since government buildings are an attractive target. This requires reformation of government's procurement system to promote ESCO implementation.

- Reinforcement of regulations for energy conservation
- Reformation of expedition regulations to introduce ESCO in governmental facilities

Key factor for promotion strategies of ESCO industry

There were a lot of discussions about measures to promote ESCO industry between the delegates from each participating economy and experts. From among the discussions, issues and promotion measures of particularly high interest to the participating economies are listed below.

Performance development for financial institutions

Collaboration with Local Finance Institutions (LFIs) is a required condition to implement ESCO projects. Financial institutions are required to understand ESCO model to provide utilizable finance. However, conservativeness of most LFIs has caused a delay in capacity building of them. Not only seminars and business matching meetings targeting at LFIs, but also actions to gain LFIs' understanding through the actual implementation of ESCO are necessary. In Thailand, LFIs which deal with ESCO fund have improved their understanding of ESCO model with experience. It is effective to include capacity building of LFIs in incentive programs involving government.

Performance development especially M&V and evaluation system by 3rd party

M&V is a key element in the services of ESCO provides. M&V education of ESCOs requires seminar and training at first. At the same time, LFIs' understanding of M&V and recognition of its importance will be the basis of their providing utilizable financial scheme for ESCO projects such as project-based financing. It is because a quantitative evaluation of saving effect is required to implement project-based financing. Although customers are also needed to understand M&V at the same time, it will take an extended period because it requires that ESCOs implement good projects and win the trust of market gradually. In order to gain the understanding of market for M&V, it is effective to prepare a manual on M&V for ESCO implementation to government buildings. In the same discussion, establishment of a 3rd party to evaluate M&V result was proposed. For example, adjustment of baseline by use of M&V is needed when the amount of energy consumption increases in response to climate change or production increases. However, when customers do not understand it, conflict may occur between ESCO and customers. The purpose of the 3rd party organization is to accommodate such problems. On the other hand, ESCO association may be expected to play a role to accommodate conflict with customers in some cases. Even though no ESCO association takes on the function of accommodation, it is required to consider how ESCO association should get involved in such conflicts.

Accreditation system for ESCO providers

This is a system based on the concept that accreditation system of ESCOs is effective for ESCO model to acquire the trust of market. In the United-States, accreditation system for ESCO providers has been implemented by ESCO association, and local governments have adopted it as a condition to participate in biddings, which shows that the model has acquired the trust of market. However, in economies undeveloped ESCO industries, only limited ESCOs can achieve accreditation, because newcomers may be unskilled. On the other hand, many of economies have adopted registration system of ESCOs. This system aims to allow ESCOs to access incentive programs by government and to give them eligibility for participation to bidding for government buildings. As for accreditation and registration system, it is realistic to adopt registration system at first, followed by accreditation system after the ESCO providers had much matured.

Development financing scheme

ESCO invests to projects from its working capital and recovers it from savings. Thus reliable and commercially viable long-term project financing is required for ESCO projects to be implemented. At the same time, there is a limit on utilizable working capital because most of ESCOs are SMEs. On the other hand, LFIs are generally conservative and provide asset-based loans. In addition, transaction cost weighs on revenue in case of small-sized projects. Therefore ESCO projects require development of project financing scheme by putting up energy savings as collateral. At the same time, it is needed to establish SPEs which aggregate small and middle-sized projects, and to provide financial support to them.

Reliable guarantee of savings is required when LFIs provide project financing, but performance contract and M&V provided by ESCO can minimize risk for LFIs. Therefore LFIs need to properly understand and evaluate performance contract and M&V.

A development example of project finance is finance program provided by Asian Development Bank for Indonesia Eximbank. This program has the following requirements. Furthermore, it performs capacity building targeting at Eximbank and LFIs.

- Not significantly impact customer’s core credit capacity.
- Have savings from EE projects accepted as primary collateral.
- Generate a net positive cash flow to customer.

Reinforcement of regulation for energy conservation

Standards for energy conservation have been established in each economy. Gradual reinforcement of them has an impact on energy saving business. In Europe, Energy Efficiency Obligation schemes; an energy saving regulation targeting at SMEs, were incorporated in Energy Efficiency Directive (Directive 2012/27/EU) in October 2012. This regulation has been already carried out in Britain, France, Italy and Belgium, and EU directive requests other member states to adopt a corresponding regulation. This regulation obligates energy supplier to perform energy saving on demand side, and especially in Italy, it has contributed to ESCO promotion.

Fill the gap between contract society and real business custom

ESCO guarantees a long-term saving by performance contract. They bear financial risk for a long period especially in case of shared savings contract. ESCO takes performance risk, downside risk and credit risk until they complete invest recovery. Even though they are secured by contract, the default of the contract often occurs in developing and emerging economies. In terms of performance risk, although whether guaranteed amount of saving was achieved or not are evaluated by M&V based on contract, a delay of payback can occur due to customers' incredulity of M&V result. Downside risk is also concerned. In respect of credit risk, bankruptcy law demands that debt collection must be secured at a certain standard. In order to resolve such conflicts between ESCO and customers, the preparation of law solution against conflicts is required as well as making a structure to mediate conflicts.

Appendix 1a: Workshop #1

Workshop on APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) Phase 4
"Promotion of Energy Service Company: ESCO"
21-23 January 2013
Queen Sirikit National Convention Center (QSNCC)
Bangkok, Thailand

DAY 1 – Monday, 21 January 2013		
Venue: Boardroom 1, 3rd Floor, Zone C ,QSNCC		
8:30-9:00	Registration	
9:00-9:35	**1. Opening Session**	
9:00-9:10 9:10-9:20 9:20-9:35	Opening Remarks	Dr. Kazutomo Irie ,APERC Dr. Twarath Sutabutr, Deputy Director General, Department of Alternative Efficiency, Thailand Dr. Jyuung-Shiauu Chern, Chief Energy Affaires Section, Bureau of Energy Ministry of Economic Affairs,Chinese Taipei
9:35-10:10	Coffee Break/ Photo Session	
10:10-12:00	**2. Kick-off Session to share expected outcome of CEEDS workshop**	
10:10-10:25 10:25-10:55	Presentation on "The CEEDS Project – Phase 4 and Workshop Objectives" Presentation on Energy savings Potential	Dr. Kazutomo Irie , APERC (10mins + Q&A 5mins) Mr. Luke Leaver , APERC (20mins + Q&A 10mins)
10:55-12:00	Development programs for ESCO carried out in each country	Dr. Chiharu Murakoshi, Jyukankyo Research Institute (65mins)
12:00- 13:00	Lunch	
13:00- 15:00	**3. Presentations by Experts**	
13.00-13.30	Energy Efficiency Policy and Promotion program in Thailand	Dr Prasert Sinsukparsert, Director of Planning Division, Department of Alternative Energy Development, Ministry of Energy, Thailand (30 mins)
13.30-14.30	Scale up financing of energy efficiency projects for ESCOs in Asia	Mr. Thomas K. Dreessen, Chairman and CEO, EPS Capital Corp.USA (60 mins)
14.30-15.00	ESCOs in Chinese Taipei	Mr. Teng-Yaw Yu, Chairman of the Taiwan Association of Energy Service Companies (TAESCO) and

		CEO of the Taiwan Green Productivity Foundation, Chinese Taipei (30 mins)
15:00-15:20	Coffee Break	
15:20-16:40	**4. Presentations by Participating Economies** **Moderator: Mr. Thomas K. Dreessen**	
15:20-15:40	ESCO Status in Thailand	Mr. Hin Nawawongse, Chairman, ESCO Business Promotion Committee, the Institute of Industrial Energy / Vice Chairman Executive Committee, the Institute of Industrial Energy, the Federation of Thai Industries (FTI), Thailand (20 mins)
15:40-16:00	Energy Efficiency in Chile, Energy Service Companies	Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile (20 mins)
16:00-16:20	The EE Policies and Current Status of ESCO Industry in China	Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center,Energy Research Institute (ERI), National Development and Reform Commission(NDRC), China (20 mins)
16:20-16:40	Energy Efficiency - Malaysia's Experience	Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy , Green Technology and Water , Malaysia (20 mins)
16:40-17:30	**5. Panel Discussion** **Moderator: Mr. Thomas K. Dreessen**	
	Discussion of Common Barriers	Participating Economies
17:30-17:40	**6. Summary Remarks of the discussion on the First Day by APERC**	
	End of the First Day	

DAY 2 – Tuesday, 22 January 2013		
Venue: Ballroom, 1, 3rd Floor, Zone A, QSNCC		
9.00-10.10	Attend Thailand ESCO Fair 2013 Open Ceremony	
Venue: Boardroom 1, 3rd Floor, Zone C		
10:10-10:30	Coffee Break	
10.30-12.00	**7. Presentations by Experts** **Moderator: Dr. Prasert Sinsukprasert**	
10.30-11.00	Measurement and Verification (M&V)	Mr. Pierre Baillargeon, Vice President, Econoler, Canada (30 mins)
11.00-11.30	What is the Key Driver	Ms. Ming Zhao, Vice

	to promote ESCO Industry in China	Director/Secretary General , EMCA (30 mins)
11.30-12.00	Industrial Energy Efficiency Finance in Thailand: A Three-Way Partnership between Bank, ESCOs and Clients	Mr. Mek Meksarikul Vice President, Head of Corporate Credit Solution Management Corporate Credit Product Management Department, Kasikorn Bank (30 mins)
12:00-13:00	Lunch	
13.00-14.00	**8. Brain Storming Session: "What is the next step/road map to develop ESCO Industry for each participating economies** **Moderator: Dr. Prasert Sinsukprasert**	
14.00-14.30	Role of Government to promote ESCO	Mr. Sarat Prakobchart, Senior Engineer, Department of Alternative Energy Development, Ministry of Energy, Thailand (30 mins)
14.30-15.00	Government Fund for ESCO Business (ESCO Fund)	Dr. Watcharee Jornjumrus, Technical Advisor, Energy for Environment Foundation, Thailnd (30 mins)
15.00-15.30	Coffee Break	
Venue: Ballroom, Zone A		
15.30-17.30	Attend ESCO Fair	
18.00-20.00	Dinner Talk hosted by FTI, Thailand	
	End of the Second Day	

DAY 3 – Wednesday, 23 January 2013		
Venue: Boardroom 1, 3rd Floor, Zone C, QSNCC		
9:00-9:10	**9. Recap DAY 1 & DAY 2 Discussion**	Dr Kazutomo Irie, APERC
9:10-11:10	**10. Wrap Up Session 1** **Presentations by five APEC Economy Representatives on the next steps to develop ESCO Industry in Each Economy** **(Moderator: Mr. Pierre Baillargeon)**	
9.10-9.50	The next steps to develop ESCO Industry in Thailand	Mr. Arthit Vechakij, President of Thai ESCO Association (40 mins)
9.50-10.30	The Next Step for Develop ESCOs in the Chilean Econmy	Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile (40 mins)
10.30-11.10	The Proposal of Next Steps to Develop ESCO Industry in China	Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center,Energy Research Institute (ERI), National Development and

		Reform Commission(NDRC), China (40 mins)
11:10-11:30	Coffee Break	
11:30- 12:10	**11. Wrap Up Session 2 Presentations by five APEC Economy Representatives on the next steps to develop ESCO Industry in Each Economy**	
11.30-12:10	Energy Efficiency/ Conservation Incentives ESCO Development, Malaysia	Mr Zulkiflee Umar,, Head of Demand Side Management Unit, Ministry of Energy , Green Technology and Water , Malaysia (40 mins)
12:10-13:10	Lunch	
13:10-13:40	**12. Presentation on the effect of energy savings and CO2 reduction by ESCO project -Case study of Japan-**	**Dr. Chiharu Murakoshi, Jyukankyo Research Institute**
13:40-15:00	**13. Closing Session**	
13.40-14.30	Summary presentation based on presented fine tuned road maps and findings from whole workshop.	Dr. Chiharu Murakoshi, Jyukankyo Research Institute (50 mins)
14:30-14:45	Closing Remarks	Mr. Kazutomo Irie, APERC (15 mins)
14:45-15:00	Closing Remarks	Dr Twarath Sutabutr, Deputy Director General, Department of Alternative Efficiency, Thailand (15 mins)
	End of Workshop	

Appendix 1b: Workshop #2

Workshop on APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) Phase 4
"Promotion of Energy Service Company: ESCO"
26-28 March 2013
Howard Civil Service International
Taipei, Chinese Taipei

DAY 1 – Tuesday, 26 March 2013		
Venue: 14F VIP Room, Howard Civil Service International		
8:30 – 9:00	Registration	
9:00-9:40	**1. Opening Session**	
9:00-9:10	1.1 Welcome Remarks	Dr. Jyuung-Shiauu Chern, Section Chif, Bureau of Energy, Mnistry of Economic Affairs, Chinese Taipei
9:10-9:20	1.2 Opening Remarks	Ms. Amaraporn Achavangkool, Senior Scientist, Technical and Efficeincy Promotion Devision, Beareau of Energy Regulation and Conservation, Department of Alternative Energy Development and Efficiency, Thailand
9:20-9:30	1.3 Opening Remarks	Dr. Kazutomo Irie, APERC
9:30-9:40	Group Photo Session	
9:40-10:20	**2. Kick- off Session to share expected outcome of CEEDS Workshop**	
9:40-9:55	2.1 Expected Outcome	Dr Kazutomo Irie, APERC (15 mins)
9:55-10:20	2.2 Energy savings impacts of ESCO Industry	Mr. Luke Leaver, APERC (25 mins)
10:20-10:40	Coffee Break	
10:40-12:10 **13:10-14:40**	**3. Presentation by Experts** Moderator: Dr. Hidetoshi Nakagami	
10:40-11:25	3.1 European Experience to develop ESCO Industry and role of policy makers	Dr. Nicola Labanca, Senior Researcher EC ,Joint Research Center (45 mins)
11:25-12:10	3.2 The business model of energy service provider in Japan and Asian economies	Mr. Kentaro Horisaka, Manager, Overseas Business Development, Energy Advance (45 mins)
12:10-13:10	Lunch	
13:10-13:55	3.3 ESCO Capacity building Certification	Mr. Pierre Baillargeon, Vice President, Econoler (45 mins)
13:55-14:25	3.4 The Role of ESCO Association	Mr.Teng-Yaw Yu, Chairman,

	in Chinese Taipei	TAESCO (30 mins)
14:25-14:40	3.5 The Role of ESCO Association in Japan	Mr. Takuya Yamamoto, Auditor, JAESCO (15 mins)
14:40-15:00	Coffee Break	
15:00-18.00	**4. Next steps for each participating economy** Moderator: Dr. Nicola Labanca	
15:00-16:30	4.1 Thailand: The Policies to promote ESCO industry Discussion & Summary	Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand (90 mins)
16:30-18:00	4.2 Malaysia: The development of ESCO in Malaysia Discussion & Summary	Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Malaysia (90 mins)

DAY 2 – Wednesday, 27 March 2013		
Venue: 14F VIP Room, Howard Civil Service International		
9:00-10:00	**5. Group Discussion to work out fine-tuned proposal on the next steps for participating economy** Moderator: Mr. Pierre Baillargeon	
10:00-10:20	Coffee Break	
10:20-12:20	**6. Individual Refinement work with Experts** Moderator: All experts	
12:20-13:20	Lunch	
13:20-15:55	**7. Wrap-up Session** Moderator: Dr. Nicola Labanca	
13:20-14:20	7.1 Thailand Presentation on fine-tuned proposal on next step by delegate Discussion & Summary	Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand (60 mins)
14:20-14:40	Coffee Break	
14:40-15:40	7.2 Malaysia Presentation on fine-tuned proposal on next step by delegate Discussion & Summary	Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Malaysia (60 mins)
15:40-17:00	**8. Group Discussion** Moderator: Mr. Pierre Baillargeon	
17:30-20:00	Dinner or Reception	

DAY 3 – Thursday, 28 March 2013		
Venue: 14F VIP Room, Howard Civil Service International		
9:30-11.00	**9. Closing Session**	
9:30-10:30	9.1 Wrap up of fine tuned presentations and summary of whole workshop	Dr. Chiharu Murakoshi, Jyukankyo Research Institute (60 mins)
10:30-10:45	9.2 Closing Remarks	Mr. Shiaw-Jium Bor, Director

		Legal Affairs Office, Bureau of Energy, Ministry of Economy Affairs, Chinese Taipei (15 mins)
10:45-11:00	9.3 Closing Remarks	Dr Kazutomo Irie, APERC (15 mins)
11:00-13:00	Lunch	
13:00-15:00	Site Visit: the Grand Hyatt Taipei	

Appendix 2 : Chile

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile

1. Market size of ESCO industry

No available market data.

2. Ongoing strategy

· Basic energy efficiency policy

Energy conservation plan in Chile has been promoted based on National Energy Efficiency Program (PPEE).

The strategic objectives of the PPEE are to:

1) establish the institutional foundations and regulatory framework for energy efficiency
2) develop incentives and support tools for energy efficiency
3) develop useful and accessible information for making public and private decisions, as well as collective and individual ones
4) position and introduce energy efficiency in all levels of training, both formal and informal
5) take advantage of international experiences and instruments to accelerate the development of energy efficiency and measure the reduction in generated emissions
6) strengthen institutional management through process quality

· Preliminary review

Chilean Energy Efficiency Agency (ACHEE) are developing a project called "Promoting the creation and consolidation of a market for energy services (ESCOs) in Chile." with financial support from the Global Environment Facility (GEF).

· Incentive program

✓ Offer of subsidies

Consultancy subsidy available for energy efficiency audits, plans for implementing energy efficiency measures, and development of an investment project that can be presented to

financing providers.

Subsidy on electric motors.

- ✓ Low interest loan

  Although subsidy for adopting energy saving system is available, it is not specialized in ESCO only.

· Activity support of ESCO association

National Association of Energy Efficiency Chile (ANESCO Chile) was established in 2009.

3. Goals in 2020

- ✓ 6 banks participating in the project.
- ✓ 120 Guaranteed projects.
- ✓ 120 energy efficiency projects with energy baseline established.
- ✓ 120 projects with energy efficiency measures and savings checks made.

4. Main Issues

- ✓ Lack of local funding available to projects, no real guarantees lines.
- ✓ Lack of measurement and control system available in the local market.
- ✓ Lack of market knowledge of the general model of ESCOs

5. Next Step

- ✓ Define the technical and economy potential of the ESCOs model in Chile for the 2020.
- ✓ Work for the accreditation of ESCOs (design a Check List).
- ✓ Standardization of EPC contracts, validated by the government, this delivers peace of mind to the end customer.
- ✓ Develop pilot project financing for the government with the ESCOs accredited and the contracts validated.
- ✓ Coordination of actors for financing (bank and project developers).
- ✓ Training programs of M&V.
- ✓ Maintain relationships with international organizations to upgrade and meet new measures and programs for the promotion of ESCOs (ex: CEEDS).
- ✓ Provide scholarships for young professionals to do their professional practices in accredited ESCOs.
- ✓ Send the ESCO Awards, Project ESCO Awards and the ESCO excellent supporter Bank Awards.

Appendix 3 : People's Republic of China

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center, Energy Research Institute (ERI), National Development and Reform Commission (NDRC), PR China

1. Market size of ESCO industry

Growing 20% a year, the market size of performance contract-based ESCO reached CNY 50.572 Billion (USD 8.5 Billion) and is the biggest market in the world. The amount of energy savings by ESCO is 18.28 Million tce, and the amount of CO2 reduction is 45.7 Million ton-CO2.

2. Ongoing Strategy

· Basic energy efficiency policy

Under Energy Conservation Law, facilities who consume more than 10,000 tce (7,000 kLoe) a year are designated as energy management factory, and who consume more than 5,000 tce a year can be designated as energy management factory. Designated facilities are obligated to have a facility audit/on-site investigation and measurement and evaluation of energy saving, and to appoint an energy manager.

· Preliminary review

The below programs have been done since World Bank carried out feasibility study in 1996.

✓ Since 1998: Establishment of three pilot ESCOs
✓ Since 2002: Implementation of loan guarantee and establishment of ESCO association
✓ Since 2008: Establishment of low-interest loan fund by World Bank
✓ Since 2011: Adoption of incentive program by central and local governments

· Incentive program

✓ Offer of subsidies

1.24 billion CNY for subsidies provided by central finance in 2010 for the EPC projects.

✓ Tax incentive

Business tax exemption for ESCOs, value added tax exemption for business owner of EPC project, corporate income tax exemption during the first 3 years and 50% tax reduction during the next 3 years for ESCOs

- ✓ Improve the related accounting system

  Clarify the rule how to deal with the budget and assets of EPC projects in public institutes.

  Take the budget of EPC projects in government as the budget of energy.
- ✓ Improve financial services
- ✓ Green credit, Loan guarantee program and Low-interest loans

· Capacity building

- ✓ Capacity building of M&V
- ✓ Development of third-party bodies for accreditation of M&V

· Improve awareness

A lot of programs are ongoing such as seminar, conference and exhibition

· ESCO association

China ESCO industry association (EMCA)

· Database development

EMCA working out market survey every year

3. Goals

- ✓ Improve the ESCO policies

  Capacity building, M&V, development of third-party for accreditation
- ✓ Expand ESCO business (in 2015)

  Super large comprehensive ESCOs 20

  Demonstrate excellent EPC projects 100

  Output value of ESCO industry would be 300 billion CNY

  Investment size of EPC projects would be more than 180 billion CNY

  Employment 500,000 Professional talent 10,000

  Energy savings capacity of EPC projects would be 60 million tce

4. Main Issues

- ✓ Financing difficult

ESCOs are usually technical enterprises, there are no enough fixed assets to mortgage for loan.

It's difficult for banks to assess the return and risk of energy service project.

- ✓ Measurement and Verification of energy saving

  The energy measurement and statistical work is not perfect in some business owner.

  There is no uniform and clarified method to evaluate the energy savings.

  There're 26 third-party bodies for accreditation so far in PR China, but sometime the evaluated result of energy saving on some projects by different bodies is inconsistency.

- ✓ Business integrity

  ESCOs sometime couldn't receive the return after providing energy service, e.g. business owner would carry out the EE retrofit project by themselves after ESCOs finished the work of energy audit or making a reliable proposal, but no paid to ESCOs.

- ✓ Capacity building

  Some ESCOs are too small, lack of professional talent, technology, capital or experience of EPC projects.

- ✓ Policies awareness

  Some ESCOs couldn't understand the policies of energy conservation and emission reduction or any incentive policies very well.

5. Next Step

- ✓ Reinforcement of EE policy
- ✓ Innovate in the financing mode
- ✓ Implement ESCO projects to government facilities
- ✓ Improve the knowledge of measurement and verification
- ✓ Improve the accreditation system
- ✓ Survey ESCO industry in national wide
- ✓ Enhance the capacity building
- ✓ Improve the public awareness

Appendix 4 : Malaysia

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Green Technology and Water, Malaysia

1. Market size of ESCO industry

No available data of ESCO market.

2. Ongoing strategy

· Basic energy efficiency policy

Under Efficient Management of Electrical Energy Regulations 2008, facilities which consume electricity more than 3MWh are obligated to check and report their energy consumption, to appoint an electrical energy manager and to perform energy audit.

· Preliminary review

Carrying out Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP) with funds by Global Environment Facility (GEF), government and private sector, a comprehensive study for promoting energy savings was performed. This project contains (performs)survey and evaluation of domestic ESCO, providing information relating to foreign ESCO industry, holding workshops (workshop on ESCO business development, workshop on ESCO comprehensive development, workshop on ESCO technologies, etc.) and support for establishment of ESCO association.

· Incentive program

✓ Tax incentive

Sales Tax Exemption for 5-Star Rated Product
Import Duty Exemption for energy efficient products which are not available locally
Investment Tax Allowance or Pioneer Status for companies implementing energy efficiency projects

· Improve awareness

✓ Promoting good practices through efficient energy pricing and public awareness programmers

· Activity support of ESCO association

Malaysian Association of ESCOs (MAESCO)

· Registration and Accreditation System of ESCOs

✓ All ESCOs are required to register with the Ministry of Finance (MOF) to qualify them as EPC contractor, consultant or supplier.

✓ MOF requires that ESCOs applying for registration under the Green Technology Services Code (222801) must be registered with the Energy Commission.

3. Goals

✓ First

Implement ESCO to 25 headquarters of Ministries.

✓ Second

Implement ESCO to some selected buildings from among government buildings.

✓ Third

Implement ESCO to local governments.

✓ Forth

Promote ESCO to private sector.

4. Goals and strategy

■ First Goal : Implement ESCO to 25 headquarters of Ministries.

✓ Government to lead by example (setting up an EE KPI for each Ministry).

✓ Implementation of Energy Performance Contracting (Shared Saving Scheme) in Government Sector (approved by the Cabinet in January).

✓ ESCOs participation is required in implementing EPC in government sector.

✓ A steering and implementation committee will be established.

· To propose a working mechanism.

· To propose a fund to support and finance the EE project by ESCOs and the development of ESC).

· Participation of Local Financial Institution with the assistance of the Ministry of Energy, Green Technology and Water and Ministry of Finance.

✓ Energy Commission of Malaysia will be the implementing agency in terms of:

· Registration of ESCOs.

· Measurement and Verification (a joint effort by Energy Commission and the Public

Works Department of Malaysia – building's facility owner).

- Promotion and Development.

- Second Goal : Implement ESCO to some selected buildings within government buildings.
- Third Goal : Implement ESCO to local governments.

✓ Above strategy would be effective also after first goal achieved.

- Forth Goal : Promote ESCO to private sector.

✓ Encourage EE project to be implemented via EPC.

✓ Funds to assist and finance the project are from:

- Investment Tax Allowance (Capital Investment in EE Project).
- Green Technology Funding Scheme (GTFS).
- Local Financial Institutions.

✓ Energy Commission of Malaysia will be the implementing agency in terms of:

- Registration of ESCOs.
- Promotion and Development.
- Measurement & Verification (by Registered Electrical Energy Manager).
- Enforcement of the Efficient Management of Electrical Energy 2008.

5. Main Issues

✓ Lack of participation or interest from the industry to adopt EE measures.

✓ Lack of participation from the Local Financial Institution.

✓ Unavailability of funds to promote and develop ESCOs.

✓ Accreditation, promotion and recognition of ESCOs.

✓ Strengthening the current regulations for EE.

3. Next Step

- First Goal: Implement ESCO to 25 headquarters of Ministries.
- In order to achieve the target,
  - Set up guidelines and mechanisms to achieve the KPIs.
  - Create funds to assist and finance the EE project involving ESCOs.
  - Promote and educate the local financial institutions (Government link).
  - Set up registration system of ESCO.
- Second Goal: Implement ESCO to some selected buildings within government buildings.
- Third Goal: Implement ESCO to local governments.

✓ To strongly promote, develop and monitor EE measures and projects. (All government buildings and 1800 installations subjected under the regulations).

- Forth Goal: Promote ESCO to private sector.

- ✓ Financial incentive
  - · To promote about the existence of the current fiscal incentives (GTFS and ITA) with the involvement of ESCOs.
  - · To propose fiscal incentives (equipment).
- ✓ Raise awareness
  - · To promote and get the participation of ESCOs in the annual International Green Technology and Eco Products Exhibition and Conference Malaysia.
  - · To recognize ESCOs and industry players who actively promoting and adopt EE via a Energy Industry Awards organized by Energy Commission.
  - · To have a continuous awareness and education programs for the industry and commercial sector (management) to understand and adopt EE.

■ Reinforcement of policy

- ✓ To further enhance the Acts and Regulations to promote EE (current task of Energy Commission).

■ Inter-agency collaboration

- ✓ Collaboration between Ministry of Energy, Green Technology and Water, Ministry of Finance, Energy Commission of Malaysia and Public Works Department of Malaysia will strongly support to promote ESCO projects.

Appendix 5 : The Philippines

Status Report and Next Step
Promotion of Energy Service Company: ESCO

MR. Antonio M. Nabong, Energy Efficiency and Conservation Division, Energy Utilization Management Bureau, Department of Energy, Philippines
(Only presentation slide)

1. Market size of ESCO industry

No available data of ESCO market.

2. Ongoing strategy

· Registration and Accreditation System of ESCOs

Establish a Register of Accredited ESCOs and enhance the professionalism of ESCOs practices.

All Energy Service Companies (ESCOs) and Energy Service Providers (ESPs) are hereby required to secure accreditation from the Department of Energy following the Accreditation Criteria.

Accredited ESCO shall submit, thereafter, reports on status of the projects undertaken thereof.

3. Goals

Intensify collaboration effort with the private sector in implementing energy efficiency programs through ESCOs and other voluntary agreements;

4. Main Issues

No information

5. Next Step

- Improve ESCO Awareness
  - ✓ Introduction of ESCO Business Activities
  - ✓ Workshops and Seminars on ESCO for Financing Institutions
- Improve reliability of ESCO & Accreditation
  - ✓ Standardization of EPC
  - ✓ Improvement of Department of Energy (DOE) ESCO Website

- ✓ Workshops or seminars on ESCO Financing
- ✓ Upgrading of ESCO Accreditation

- ➢ Improve technical level of ESCO
- ➢ Enhance incentives
- ➢ Enhance financing

Appendix 6 : Chinese Taipei (host economy)

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Teng-Yaw Yu, Chairman of the Taiwan Association of Energy Service Companies (TAESCO) and CEO of the Taiwan Green Productivity Foundation, Chinese Taipei

1. Market size of ESCO industry

The estimated 2007 to 2010 average annual amount invested of ESCO was NTD22.3 Billion (USD 760 Million). However, it might include the amount of investment for general energy-saving renovation, which doesn't show market size of performance contract-based ESCO.

2. Ongoing strategy

· Basic energy efficiency policy

Under Energy Management Law, industrial facilities who consume more than a certain amount (e.g. Coal: more than 6,000 ton, Fuel oil: more than 6,000kL, etc and commercial facilities who consume electricity more than 800 kW) must report their energy consumption and to appoint an energy manager.

· Preliminary review

Activity to improve awareness, establishment of ESCO association, IPMVP training, and so on have been done since survey for introducing ESCO was carried out in 1998.

· Incentive program

✓ Offer of subsidies

2006-2012 subsidies to the public sector, hospitals, schools, communities and services totaled 91 cases.

In 2010 and 2012, commercial offices, buildings, chain stores, and industrial and commercial energy users (with paid-in capital exceeding NTD80 million) were given subsidies.

✓ Promote low-interest loans

· Development of financial scheme

✓ Establish credit guarantee financing system

· Capacity building

✓ ESCO certification system

✓ IPMVP energy saving performance measurement and verify the licenses of specialists

✓ “ESCO Project Development Technology” training course

✓ Set up a third impartial office for measurement verification

✓ Strategic alliances between equipment manufacturers, engineering companies and financial institutions

✓ The inclusion of ESCO courses in college curriculum

· Improve awareness

✓ Through the Commend of excellence ESCOs disclose information of excellence ESCOs for reference by energy users.

✓ A lot of programs are ongoing such as seminar, conference and exhibition.

· ESCO procurement for government buildings

✓ In 2012, The “Energy Saving Performance Project Turnkey Engineering Procurement Model Contract” was announced by the Public Construction Commission.

✓ In 2012, The “Energy Saving Performance Project Procurement and Implementation Standard Operating Procedures Template” was issued by the Taiwan Green Productivity Foundation.

· Activity support of ESCO association

✓ Two ESCO associations established.

3. Goals

Using the ESCO model to cross over into other fields and combine diversified services, the overall industrial output value doubled in 2015, reaching 50 billion NT dollars while the number of people employed jumped from 3,800 to 9,500 persons.

4. Main Issues

✓ Low price of electricity, long payback years on projects, high financial pressure on ESCOs.

✓ Most ESCOs are SMEs, poor funding and difficult to get financing.

✓ Customers are not familiar with ESCO, projects take a long time to formulate.

✓ Information on ESCOs is not very transparent, and users lack of confidence among users.

5. Next Step

- ✓ ESCOs servicing capacity registration
- ✓ Set up a third impartial office for measurement verification
- ✓ Strategic alliances between equipment manufacturers, engineering companies and financial institutions
- ✓ Energy audit of colleges and universities
- ✓ Promoting PV-ESCO
- ✓ Develop project financing system
- ✓ Nurture ESCO talent
- ✓ Promote industry project financing
- ✓ Promote the Revolving Fund

Appendix 7 : Thailand (host economy)

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Dr Prasert Sinsukprasert, Director of Planning Division, Department of Alternative Energy Development, Ministry of Energy, Thailand
&
Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand

1. Market size of ESCO industry

The market size of performance contract-based ESCO was 2,008 Million Baht (USD 66.3 Million) in 2011, growing at 60 to 70 percent annually since 2009.

2. Ongoing strategy

- Basic energy efficiency policy

  Under Energy Conservation and Promotion Act, facilities whose contract capacity of electricity is bigger than 1,000kW and the amount of energy consumption a year is more than 20 Million MJ are obligated to report their energy consumption and to appoint an energy manager.

- Preliminary review

  DEDE performed feasibility study to introduce ESCO with support of World Bank and Global Environment Facility (GEF), and at the same time, Electricity Generating Authority (EGAT) performed energy audit and one pilot ESCO project.

  - 1999: Introduction of ESCO Concept as a tool for doing EE projects
    - ✓ The first ESCO pilot project by DEDE, EGAT with support from World Bank
  - 2003-2004: Boosting ESCO business by Gov. incentive schemes
    - ✓ Low interest loan program for EE projects
    - ✓ Tax incentive for ESCO business
  - 2007: Establishment of P PP program for effective ESCO promotion
    - ✓ A Cooperation program between DEDE ,FTI and ESCOs for promoting ESCO
  - 2010: Indicating ESCO as a major strategy for long term EE Promotion
    - ✓ Putting ESCO as one of the main strategies under the 20 yrs EEDP (2010-2030)

- Incentive program

ESCO Fund established by DEDE in 2008 under the financial support from Energy Conservation Promotion Fund (ENCON Fund). ESCO Fund was injected 500 Million Baht each at two phases of Oct 2008-Sep 2010 and Oct 2010-Dec 2012, and will be injected again 500 Million Baht in 2013. The below financial incentives have been performed on ESCO Fund.

- ✓ Tax Incentive for EE products
- ✓ Tax Incentive for EE Investment
- ✓ 20% -40% direct Subsidy
- ✓ Low interest loan by revolving fund
- ✓ ESCO venture capital
- ✓ Equity investment
- ✓ Equity leasing
- ✓ Carbon Credit Facility
- ✓ Credit guarantee facility

· Development of financial scheme

Cost reduction by ESCO project is guaranteed by performance contract. Therefore, financing scheme based on cash flow derived by the reduction is under consideration.

· Capacity building

✓ Education and demonstration programs

Human resource development: Seminar and Training on energy efficiency

Practical training center (Mini-plant)

✓ ESCO Project Award, Excellent ESCO Award

✓ ESCO - Bank Networking, Site Visit

· Improve awareness

✓ Website : www.thaiesco.org

✓ Seminars, Workshop

✓ ESCO Fair: conference and exhibition

✓ ESCO Business Matching

✓ Thai ESCOs networking

· Activity of ESCO association

ESCO information center has provided information under DEDE, and The Institute of Industrial Energy, Federation of Thai Industry (FTI) has been played a role of

ESCO association. In addition, ESCO association has been established in December 2012.

· Registration system of ESCOs

✓ Registration system to access ESCO Fund

· Database development

Institute of Industrial Energy, Federation of Thai Industry (FTI) has been performed a market survey.

3. Goals

- ✓ Strengthening the nascent ESCO industry through the Thai ESCO Association
- ✓ Create demand on high quality and professional ESCO on both government and private sector
- ✓ Strengthen the market confidence in the ESCO services through the association
- ✓ Providing consistent and new initiatives incentives especially for ESCO market development such as, Specific ESCO Fund, ESCO Pilot Project, Grant for high qualified IGA & M&V, etc.

4. Main Issues

- ✓ Not all ESCO are currently members of the association. Needs to harmonize the approach.
- ✓ Very low demand in the market. Low demand from government sector as there is still issue with regulation/procedures. The private sector is still low because private sector has low understanding of ESCO business. Low understanding on EPGC.
- ✓ Difficulty for customer to identify qualified ESCO. Lack of confidence from market actors.
- ✓ Current ESCO fund manager do not fully comprehend the risk/benefit of EPGC offering. Not qualified to take calculated risk and go beyond financial institution business as usual loan evaluation.

5. Goal/ Barrier/ Strategy

- ■ Goal: Strengthening the nascent ESCO industry through the Thai ESCO Association
- ■ Barrier: Not all ESCO are currently members of the association. Needs to harmonize the approach.
- ■ Strategies:
- ✓ Have exclusive access to government projects and special access to government incentives programs for members (all serious ESCO then will join the association)
- ✓ Create typical documents to facilitate ESCO business and reduce transaction cost. Ex:

Typical contract & guidelines. Typical M&V plan.

- ✓ Contract must stay flexible as a fixed model is not effective most of the time during customer's negotiation.
- ✓ Capacity building on ESCO operation and M&V. Special pricing for members.

- Goal: Create demand on high quality and professional ESCO on both government and private sector
- Barrier: Very low demand in the market. Low demand from government sector as there is still issue with regulation/procedures. The private sector is still low because private sector has low understanding of ESCO business. Low understanding on EPGC.
- Strategies:

- ✓ Public sector program for EE ; Only for ESCO members of the Association and having signed letter of conduct.
  - · Creating template of bidding documents, ESCO selection procedures and associated purchase regulation that are applicable to all ministries. Preselection stage. Preparation of site information (list of equipment, schedule, operation mode, billing by a consultant prior to bidding).
  - · Role of DEDE for the public sector to provide support to ministries (promotion, education, help during the bidding process and for the M&V)
- ✓ Develop a special incentive program for the private sector.
- ✓ Disseminate the results of a pilot program case studies (more on that later)
- ✓ Seminars, Business Breakfast, Young Tycoon, CEO&CFO forums, newsletters

- Goal: Strengthen the market confidence in the ESCO services through the association
- Barrier: Difficulty for customer to identify qualified ESCO. Lack of confidence from market actors.
- Strategies:

- ✓ Adoption of a voluntary code of conduct (minimum requirement for M&V, contract outline, at least one resource with CMVP certification and ESCO specialist certification etc.)
- ✓ See if CMVP sessions can be provided
- ✓ In 2-3 years, development of a more formal accreditation
- ✓ Pilot project to develop case studies and demonstrate experience

- Goal: Providing consistent and new financial initiatives for ESCO market development.
- Barrier: Current ESCO fund manager do not fully comprehend the risk/benefit of EPGC

offering. Not qualified to take calculated risk and go beyond financial institution business as usual loan evaluation.

- Strategies:

✓ Develop an ESCO fund mechanism using senior financial and technical resources twinned at the beginning with international experts to evaluate risk of projects. The ESCO fund should go beyond the current financial institution offering for EE projects.

✓ Creating an ESCO pilot project with higher financial incentives than current programs. Ex: IGA supported 70%, M&V supported 50%.

6. Next Steps

- Role of Government (DEDE)

✓ Raise awareness of budget sponsor and communicate to each committee.

✓ Regulate to apply M&V with all government building's energy saving project.

✓ Directly issue new privileges & subsidy program to qualified ESCO projects with M&V, both government project and private project such as

- The Pilot ESCO Private EE/RE Project
- The Pilot ESCO Government EE Project
- Etc.

- Role of FTI

✓ Raise awareness and communicate to each target group.

✓ Create the attractive event & provide tangible benefit to each target group.

✓ Pursue top management level of potential target customer to join the event.

- Role of ESCO Association

✓ Capacity building

- Administration, Membership, ESCO trainings

✓ Accreditation system

- Standard M&V, Standard EPC, Qualified professional ESCOs

✓ 3rd party Verification

✓ Market promotion

- Special Seminars i.e. Breakfast Business Talk, Young Tycoon, CEO&CFO Forum etc, Professional ESCO Pilot Projects, PR Medias

✓ Database management

- Successful Cases, EE/RE Supplier Technologies Information Center, Thai ESCO Ass. Website

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The 46th Meeting of APEC Energy Working Group (EWG)
Da Nang, Viet Nam, 19-20 November 2013

10.b. Cooperative Energy Efficiency Design for Sustainability (CEEDS)

Kazutomo IRIE
General Manager, APERC

Asia-Pacific Economic Cooperation

10.b. (5) Objectives and Activities of CEEDS Phase 4

Objectives of CEEDS

- To promote "high-performance" energy efficiency policy measures in developing economies in the APEC region.
- To assist developing economies who wish to design and implement measures for achieving energy efficiency improvements in a specified sector.

Activities of CEEDS:

- Analysis / Study on energy saving potential
- A set of two workshops to study on how the best practice policy measures might be implemented in the selected sector

10.b. (6) Work Plan on CEEDS

Work Plan on CEEDS:

- CEEDS Phase 1 on "Appliance Energy Efficiency Standards and Labelling "
- CEEDS Phase 2 on "Building Energy Efficiency Codes and Labelling "
- CEEDS Phase 3 on "Energy Efficiency for Urban Passenger Transportation"
- CEEDS Phase 4 on "Promotion of Energy Service Companies (ESCOs)"

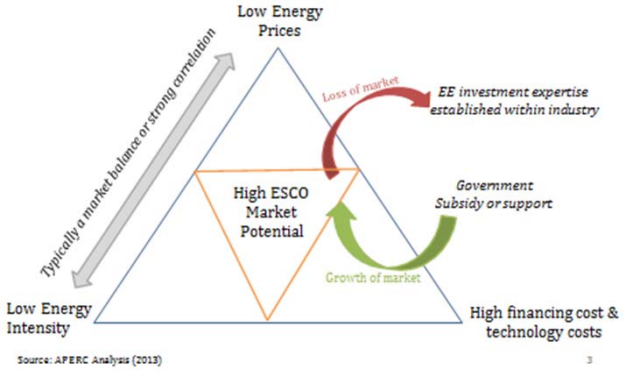
10.b. (7) CEEDS Phase 4

- The first workshop of CEEDS Phase 4 was hosted by Thailand in 21-23 January 2013. Chile, China, Malaysia, and Thailand participated in the first workshop.

- The second workshop for CEEDS Phase 4 was hosted by Chinese Taipei on 26-28 March 2013. Only Malaysia and Thailand participated in the second workshop.

10.b. (7) CEEDS Phase 4

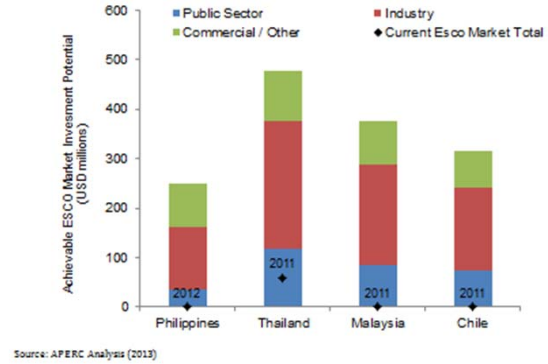
ESCO Market Potential Balances



EWG46 10.b. PREE & CEEDS - 5/8

10.b. (7) CEEDS Phase 4

ESCO Market Potential Today



EWG46 10.b. PREE & CEEDS - 6/8

10.b. (8) Possible Option for future CEEDS

- CEEDS is a very complicated project:
  - ✓ Two workshops in two different economies
  - ✓ The same participating delegates and expert speakers for both workshops in principle.
- Given the resource constraints of APERC, it is necessary to much simplify the scope of the project .

  Two workshops only for the several participating economies, inviting several experts twice

  ↓

  One workshop open to the all APEC economies, inviting fewer experts at once

10.b. (8) Possible Option for future CEEDS

- This Workshop is
  - ➢ To be integrated into PREE (i.e. no longer an independent project)
  - ➢ To be renamed

    ex. “Energy Efficiency (EE) Policy Workshop”
  - ➢ To select the topics from the key issues highlighted in the previous PREEs
  - ➢ To be held in conjunction with one of the two bi-annual meetings of EGEE&C (Expert Group of Energy Efficiency and Conservation)

FINAL REPORT
APEC Cooperative Energy Efficiency Design for Sustainability, Phase 4

APEC Energy Working Group

June 2013

Asia-Pacific
Economic Cooperation

APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS); Phase 4

FINAL REPORT

Promotion of Energy Service Company: ESCO

Workshop #1:
21-23 January 2012
Bangkok, Thailand

Workshop #2:
26-28 March 2013
Taipei city, Chinese Taipei

Jyukankyo Research Institute Inc.

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Asia Pacific Energy Research Centre (APERC)
Inui Building Kachidoki 11F, 1-13-1 Kachidoki
Cho-ku, Tokyo 104-0054, Japan
Tel: (81) 3-5144-8551
Fax: (81) 3-5144-8555
Email: master@aperc.ieej.or.jp
Website: http://www.ieej.or.jp/aperc/

In consultation with
Jyukankyo Research Institute Inc.
Kioi-cho Ark Building
3-29, Kioi-cho, Chiyoda-ku, Tokyo 102-0094, JAPAN
Tel: (81) 3-3234-1177
Fax: (81) 3-3234-2226
E-Mail: info@jyuri.co.jp
Website: www.jyuri.co.jp

For
Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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Acronyms

CSR: Corporate Social Responsibility

DSM: Demand Side Management

ESP: Energy Service Provider

FEMP: Federal Energy Management Program

GEF: Global Environment Facility

GSC: Guaranteed Savings Contract

The client finances the project and makes periodic debt service payments to a financial institution. Client pays the ESCO after implementation based on Performance. ESCO reimburses client for any underperformance.

IGA: Investment Grade Audit

IPMVP: International Performance Measurement & Verification Protocol

IRP: Integrated Resource Planning

LFI: Local Finance Institution

M&V: Measurement and Verification

SME: Small and Medium-sized Enterprise

SPE: Special Purpose Entity

SSC: Shared Savings Contract

The ESCO organizes the financing of the total upfront capital cost of the project and is totally responsible for repaying the lender. The client pays the ESCO a percentage (or a fixed amount) of its achieved cost savings from the project.

Executive Summary

Background on CEEDS.

Phase 4 of the APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) project focused on Energy Service Company (ESCO). The project was organized by the Asia Pacific Economic Research Centre (APERC) with METI, Japan, as the Project Overseer. Like the APEC Peer Review on Energy Efficiency, CEEDS Phase 3 was co-sponsored by all EWG Economies. Previous phases of CEEDS addressed appliance energy standards and labeling (Phase 1), building energy codes (Phase 2) and energy-efficient urban passenger transportation (Phase 3). All three topics are among the high-performance policies identified as having the potential to help APEC economies achieve the energy savings goals adopted by APEC leaders.

For each phase of CEEDS, APEC economies are invited to participate in a series of two workshops. At the first workshop, each economy draws on a policy template provided by APERC to identify the current status of policies and programs, along with barriers and possible solutions to advancing programs and policies in the sector of focus. Comments by invited international experts and from the other participating economies help the delegates from each economy identify proposed next steps. After the first workshop, each delegate shares the workshop findings and proposed next steps with colleagues in the relevant ministries and agencies of their economy. At a second, follow-on workshop (2-4 months after the first), the representatives from each economy report back on progress in implementing the planned actions and any new issues or opportunities identified. Discussions among the economies and invited experts help each economy develop a "fine-tuned" plan of action or roadmap for implementing the policies and programs discussed during the two workshops.

CEES Phase 4 Workshops

The first CEEDS Phase 4 workshop on promotion of Energy Service Company: ESCO was held in Bangkok, Thailand, on 21-23 January 2013. The workshop was organized by APERC and hosted by Thailand and Chinese Taipei, the agenda for "CEEDS Workshop #1" is shown in Appendix 1a. The second workshop of CEEDS Phase 4 was held in Taipei city, Chinese Taipei on 26-28 March 2013; the agenda for "CEEDS Workshop #2 is shown in Appendix 1b.

China, Chile, Malaysia and Thailand participated in the first workshop of CEEDS Phase 4. And Malaysia and Thailand participated in the second workshop of CEEDS Phase 4. The Philippines was registered but was unable to participate in both workshop.

International experts of ESCO industry from several other APEC economies - Canada,

China, Japan, Thailand, the United States - and Italy provided presentations on the implementation of ESCO promotion policy and programs in their economies and around the world. Together, more than thirty people attended one or both of the CEEDS Phase 4 workshops, including the APEC economy delegates, invited international experts on ESCO industry, representatives of the two host economies (Chinese Taipei and Thailand), Jyukankyo Research Institute experts and the APERC researchers and administrative staff.

Discussion at the two meetings focused on:

- In order to contribute to reduction of greenhouse gas emissions, each participating economy[1] is strengthening their ESCO industry to improve energy conservation;
- Recent energy conservation policies, current situation of ESCO industry development program in participating economies and Chinese Taipei (host economy);
- Effective strategies for development of ESCO industry with a focus on preliminary review, incentive program, development of financial scheme, capacity building, improvement of public awareness, ESCO procurement for government facilities, activity support of ESCO association, registration and accreditation system of ESCOs, evaluation of energy conservation performance and impartiality 3rd party mechanism and database development, on the basis of shared information among the four participating economies and invited expert speakers;
- Status reports and preliminary proposal on next steps to be pursued by each participating economy to promote ESCO industry.

Key Takeaways

The workshop participants discussed the development of ESCO industry on the basis of their each experience as well as the Policy Template which were prepared by Jyukankyo Research Institute. And the key takeaways of these discussions are summarized as below.

For development of ESCO industry, support from the government or from international organizations was required at the initial stage of implementation. Meanwhile, multiple support measures which are provided by governments are taken at the later stage. Furthermore, comprehensive strategies including changes of current business models and support from Government are required as below.

[1] Participating economies in the first workshop were China, Chile, Malaysia and Thailand. And The Philippines was registered but was unable to participate. On the other hand, Chinese Taipei gave presentation. Economies participating in the second workshop were Malaysia and Thailand.

(1) Preliminary review

In the early stages of ESCO implementation, feasibility studies of energy-savings potential and the possibility of promotion of energy savings by ESCO, are carried out.

(2) Development of business

- Implementation of energy audit (corresponding to FS research)
- Implementation of pilot projects
- Introduction of ESCO business into governmental facilities
- Implementation of IRP/DSM programs

(3) Development of capability

- Preparation of technical guidelines
- Preparation of ESCO introduction manuals:
- Performance development for financial institutes:
- Performance development for ESCO enterprisers:

(4) Propagation and enlightenment

- Compile and issue of successful models
- Seminar, conference, exhibition
- Business matching meeting
- Provision of information such as newsletters, websites etc.
- Commendation system for excellent ESCO projects

(5) Establishment of project body/operation support

- Set up of ESCO association/operation support
- Support to set up ESCO providers
- ESCOs register system
- Accreditation system for ESCO providers
- Evaluation of energy conservation performance and impartiality 3rd party mechanism

(6) Financial support

- Develop financing scheme
- Implementation of low interest finance
- Offer of subsidies
- Implementation of loan guarantee programs
- Tax incentive system

(7) Reinforcement of policy/system reformation

- Reinforcement of regulations for energy conservation
- Reformation of expedition regulations to introduce ESCO in governmental facilities

Main Challenges

The workshop participants identified main challenges related to promote ESCO industry that developing APEC economies face. The most significant specific challenges for each of the participating APEC economies are summarized in Appendices 2-7; however, the most common challenges included:

- Lack of recognition and understanding of the ESCO industry
- Lack of financial scheme
- Lack of understanding from financial institutions toward the ESCO industry
- Poor technical understanding of Measurement and Verification knowhow
- Slow development of participation from private financial institutions
- Difficulty in introducing ESCO projects to government buildings
- Lack of government support to the ESCO association
- Lack of accreditation or certification in the ESCO industry
- Gap between contract society and real business custom

The “fine-tuned” proposals developed by the APEC economy delegates during the CEEDS4 workshops suggest policies and programs designed to address these challenges. These proposals are provided in Appendices 2-7, along with key points from the discussion of the proposals at the second workshop.

1. Why focus on ESCO industry

The ESCO industry is said to have been born in France 100 years ago, and has grown as a business model in the United States in the wake of the oil crisis. Feature of this business model is in the performance contract that guarantees the energy savings, and this point is different from the energy saving business in general. Organizations which initially entered ESCO industry were the following three.

- Engineering consultant companies aiming to expand their business
- Building energy management equipment manufacturers aiming to expand their business
- Project operators of Demand Side Management (DSM) program from Utilities

Even though specialized know-how of contracts and finance is required in additional to technology on energy conservation, not only the construction industry, but also wide range of various players has entered ESCO industry, which makes the width also a major feature of ESCO industry.

A number of economies believe that promoting ESCO industry leads to promoting energy conservation. This is due to the fact that ESCO have the following features.

- It guarantees the energy savings.
- It makes a reliable proposal which is based on energy audit.
- It can sustain the energy-saving performance over a long period of time by providing M&V.
- It makes a financial arrangement, and sometime it provides funding.
- Although energy services have been traditionally provided by the supply side, ESCO represents the interests of customers by providing a service from the demand side.

The basis of these features is the guarantee of energy savings realized by performance contracts. Performance contract is a business model to prioritize the interests of customers and to maximize the benefits of ESCO at the same time as it wins a customer trust. Energy audit is a basic analysis to reduce performance risks and to provide comprehensive proposals. By considering a variety of energy-saving measures and proposing a combination of economically-efficient and inefficient ones, ESCO can maximize energy saving benefits. By performing M&V, ESCO can not only verify whether the effect of energy saving achieves the guaranteed level, but can also detect a failure and deterioration of implemented equipment or management, and the workarounds applied to each found trouble will lead to a long-lasting energy saving effect. By arranging the most favorable financing for its customers, it minimizes the expenses of the customers together with the performance risk of ESCO. Having these characteristics, ESCO use catch phrases such as “it can build a Win-Win relationship” or “it provides a One stop service”.

The ESCO market is affected by various factors in addition to changes in energy prices. In energy efficiency retrofit projects, the first condition is to be economically viable. However, the need for technical understanding is relatively low in projects whose payout period is short and therefore is possible to self-fund such projects. In contrast, in the case where the payback period is long, the project often requires incentives such as subsidies to reduce the risk and increase the economies of investment. Additionally, financial support by government helps the overall ESCO market expand and developing financing scheme is an important step to the expansion of the ESCO market. Promoting ESCO projects in public facilities also helps to lead the market expansion.

As stated above, ESCO market varies depending on each government energy conservation policies, the financial environment, and the target field for each company. Therefore, the relationship between the government and private sector is an important one.

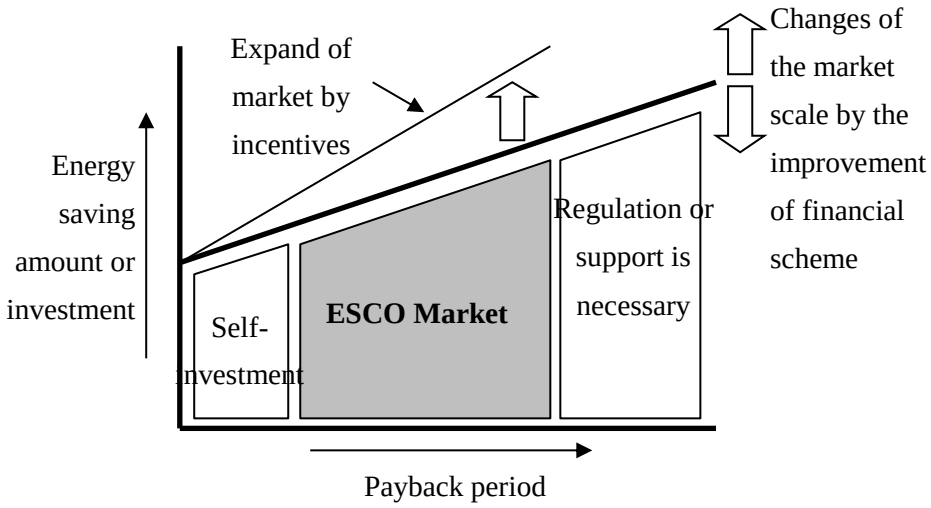

Figure1 Position of ESCO market and changing factor

Not limited to ESCO market, there are also some typical business models to the energy conservation market.

(1) Regulatory model

Regulate energy demand, to reduce the customer demand. Besides this, there is another case where it targets the Utilities instead. The target customers and Utilities would promote the energy conservation business since they would be forced to invest to meet imposed regulations.

(2) Incentive model

There are subsidies, low-interest loans, tax incentive and credit trading and so on, and they contribute to the expansion of energy conservation market directly.

(3) Engineering model

Service that provides the technical know-how of energy audit, energy saving design, construction, and operation management, etc.

(4) Value-added service model

Propose added values such as performance contract provided by ESCO and turnkey contract.

(5) Financial model

Revitalize businesses by preparing financial scheme, such as project finance and leasing. In addition, loan guarantee for revitalizing by risk hedge for financial institutions is carried out in China and other economies. Recently, models like “On Bill Finance” becoming popular in the United States and “Green Deal” of the UK to provide funds for the upfront cost, collecting funds in accordance with utility charges, are also proposed.

(6) Improving market value model

A model to improve the market value by evaluating the energy performance of buildings and equipment by rating and labeling and so on.

(7) Utility model

This model includes programs like DSM biding program, feedback program, and demand response program, etc. provided by Utilities, which drive the energy conservation market.

(8) Government facility model

A model to improve energy efficiency in government facilities, in order to expand the overall energy conservation market.

(9) CSR (Corporate Social Responsibility) model

A model to achieve energy savings as a service which helps company’s social contribution.

ESCO is a business model that combines “Engineering”, “Value-added services” and “Financing”. Additionally, it has a strong relationship with “Utilities” and “Government facilities”. At the same time, it is possible to say that the ESCO industry is a wide ranging business model to meet all the above factors. On the other hand, government policies are involved in most of these factors. That is why it is important to build a close relationship between ESCOs and government to promote ESCO industry and to promote energy savings.

2. ESCO Market Potential

A key reason for aggressively supporting the private ESCO market is the large potential for profitable investment in energy efficiency. There are various market failures at the end use side which prevent investment into profitable energy efficiency ventures. The market failures which ESCOs are especially crucial in addressing are:

- Lack of technical personnel and technical capability

- Lack of commercial awareness
- Poor understanding of project risk and reward
- Lack of access to financing

The energy efficiency potential is often highest when market failures or barriers are greatest. Although ESCOs are not a complete solution to removing market barriers, they certainly reduced them. The market potential for ESCOs is highly changeable and varies greatly between economies depending on market conditions such as energy prices, the energy intensity of energy used and of course financing. In addition, the ESCO market potential is often increased through attractive federal or local incentives. Figure 2 show a schematic pyramid diagram of the optimum ESCO market conditions.

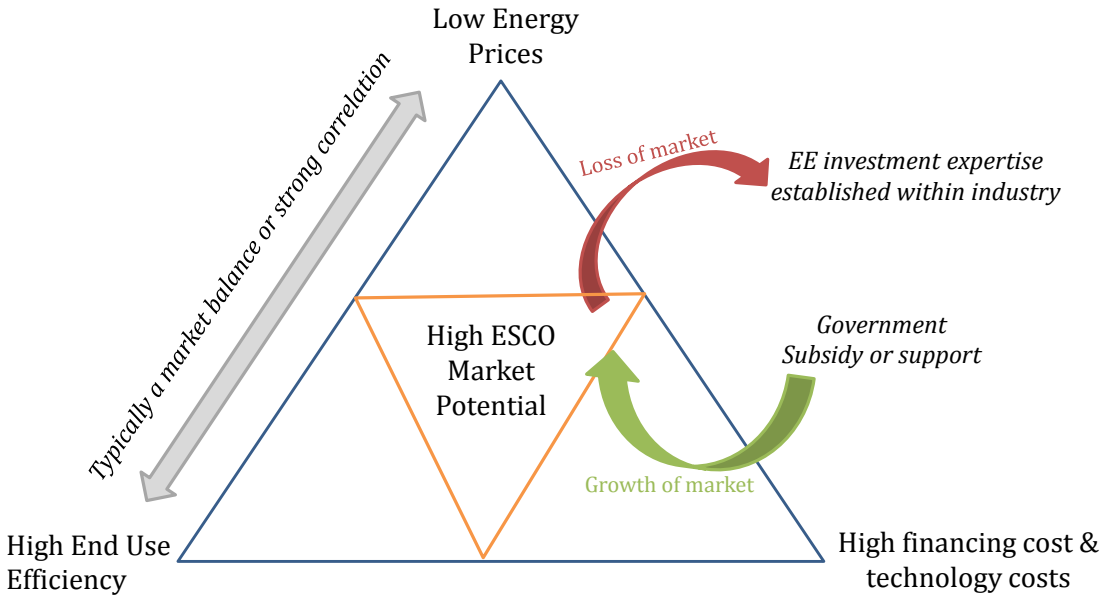

Figure 2 Optimal market conditions for ESCOs

The ESCO market may also be artificially small even with a high market potential if much of the energy investment into efficiency is already well established with the end use industries. This may be prevalent in many developed economies owing to their advance technical capabilities, but in developing economies this affect is likely to be less prominent. It is possible to quantify the market potential of energy prices to energy intensity by looking at the energy expenditure per unit of GDP. Figure 3 shows the energy expense to GDP and the current annual investment by ESCOs.

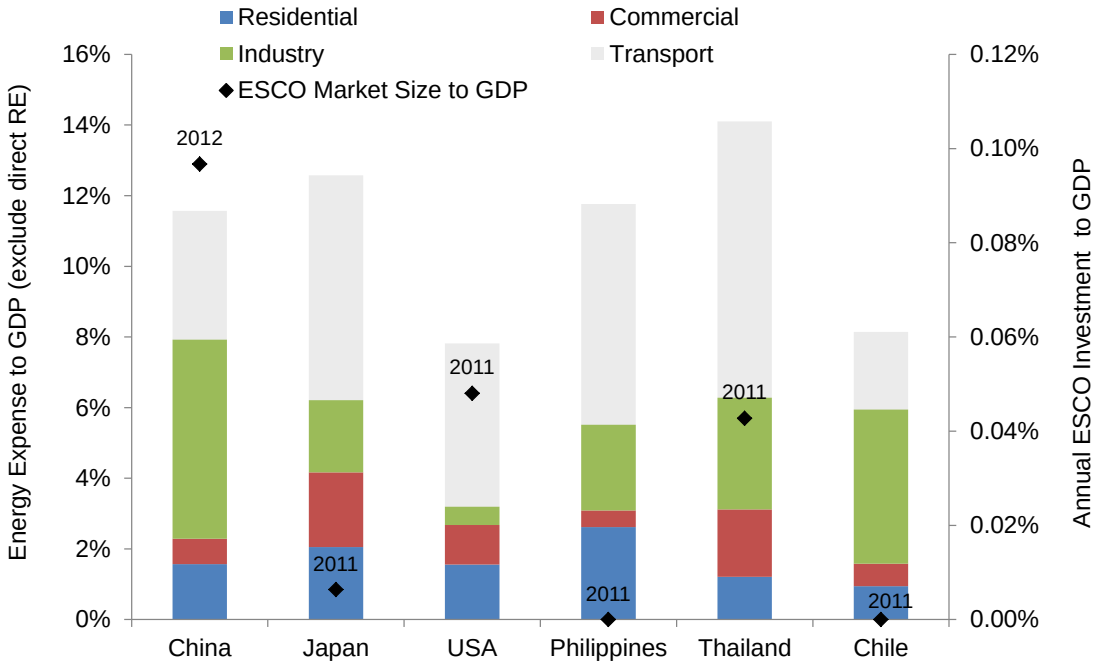

Figure 3 Energy expense to GDP ratio relative to current ESCO investment to GDP

China, Japan, the United States and Thailand have mature ESCO industries although the types of ESCO projects vary greatly depending on the economy. Although no ESCO industry has been established in the Philippines or Chile, Figure 3 suggests there are no major economic barriers in comparison to the economic potential of mature ESCO economies. For the case of Malaysia, there was insufficient data to conduct this analysis; however subsidies in the domestic gas price may inhibit the ESCO market potential.

As mentioned no ESCO industry is the same and in that sense policies form a strong part of the structure of the industry. For the US there are strong policies to implement the ESCO business model in government buildings including schools, hospitals and municipalities. In China, much of the ESCO investment has been in the industry sector driven by strong financial support and equally strong market opportunities. Figure 4 shows the ratio of ESCO investment to GDP across the public, industrial and commercial/other sectors within China, Japan, the United States and Thailand

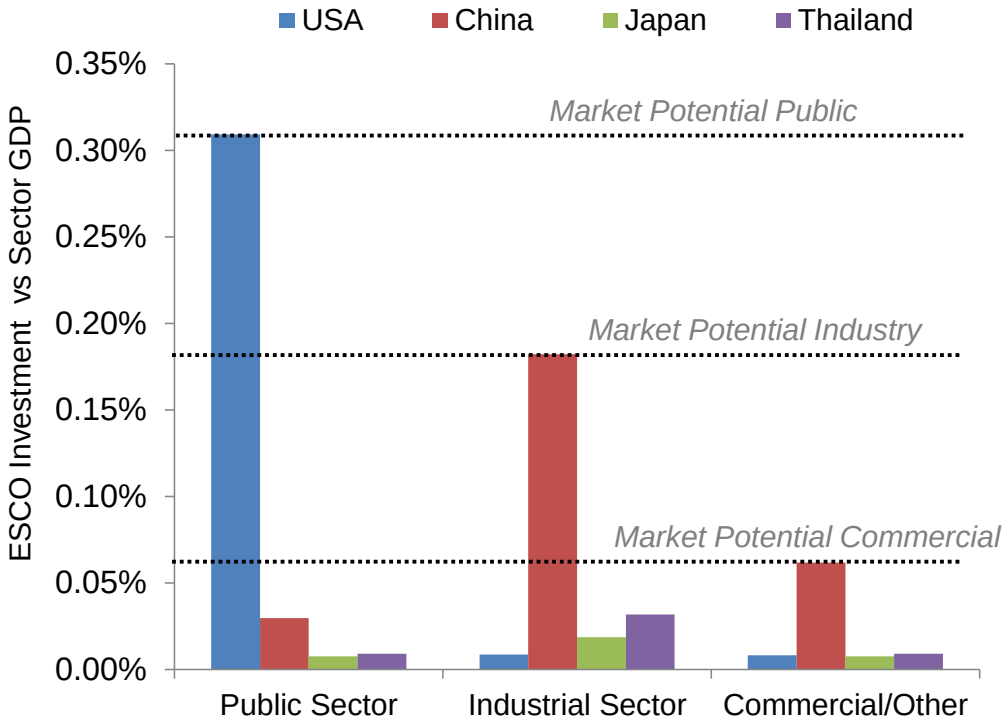

Figure 4 Optimal market conditions for ESCOs

In the public sector the US is the leader in the size of the ESCO investment relative to GDP. Across Industry and Commercial/Other China has the leading ESCO market investment. A conservative estimation to the market potential of ESCOs is to assume that all economies could achieve the market potential in proportion to GDP as leading economies. It should be noted however, that the ESCO markets in both China and the US are growing quickly and that market conditions are changeable. Figure 5 shows the expected achievable market potential of ESCOs in developing APEC economies as part of CEEDS Phase 4.

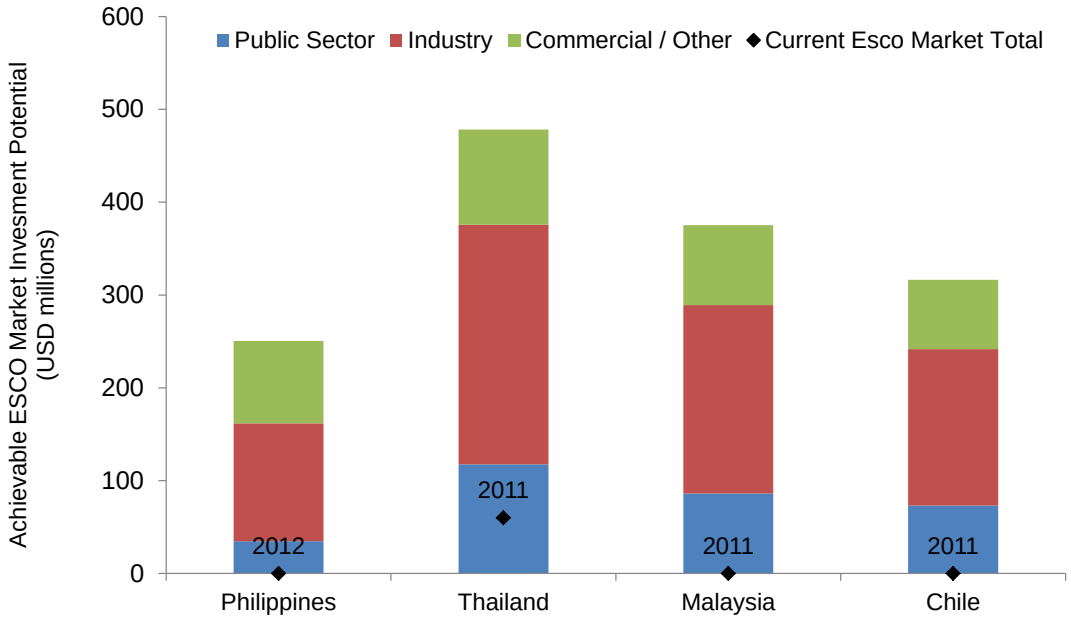

Figure 5 Expected achievable market potential of ESCOs

The largest opportunities are within the large energy industrial users owing to their high energy costs. It should also be noted that the ESCO market is just one segment of the broader investment potential into energy efficiency. For Thailand, the market potential may be 5 times larger than its current ESCO market or an investments totally USD 500 million per year under current market conditions.

3. Key government stakeholders in policymaking for promotion of ESCO industry

The government is strongly involved in promoting ESCO industry. Government leadership on the early stages to implement ESCO is especially essential. The Government agency responsible for the promotion of ESCO is the department in charge of energy in each economy. On the other hand, promoting ESCO requires the development of a financing scheme and a system for introducing ESCO to public facilities. Therefore, there might be a case that the department in charge of energy will cooperate with the department in charge of finance in some economies. In addition, for the system to use ESCO in public facilities, cooperation is required between the Congress secretariat in order to take measures to Congress, and between the department responsible for maintenance of government facilities. With respect to measures with Congress, one example is that personnel were dispatched to Congress from the Federal Energy Management Program (FEMP) office in developing FEMP in the United States, and another

example is that a system was carried out in cooperation with Ministry of Land, Infrastructure, Transport and Tourism (MLIT) holding jurisdiction over government facilities in Japan.

The government agency responsible for the promotion ESCO industry is as below.

- China: National Development and Reform Commission (NDRC)
- Chinese Taipei: Bureau of Energy, Ministry of Economic Affairs
- Chile: Ministry of Energy
- Indonesia: Ministry of Energy and Mineral Resources (KESDM)
- Japan: Ministry of Economy, Trade and Industry (METI)
- Korea: Korean Energy Management Corporation (KEMCO)
- Malaysia: Ministry of Energy, Ministry of Finance
- The Philippines: Department of Energy (DOE)
- Singapore: National Environment Agency (NEA)
- Thailand: Department of Alternative Energy Development and Efficiency (DEDE), Ministry of Energy
- United States: Department of Energy (DOE)

ESCO association is often established to represent the private ESCOs and to develop the market, cooperating with government. As well as other industry organizations, ESCO association is also established in private sectors in the most cases, however, there are cases where ESCO association is established with the support by international organizations at the time of implementing ESCO. In Asia, China and The Philippines correspond to this case. The followings are list of ESCO association in each economy.

- Australia: Australian Energy Performance Contracting Association (AEPCA)
- China: ESCO Committee of China Energy Conservation Association (EMCA)
- Chinese Taipei: Taiwan Association of Energy Service Companies (TAESCO)
- Indonesia: Indonesia Supporting Companies Association for Energy Conservation (APKENINDO)
- Japan: Japan Association of Energy Service Companies (JAESCO)
- Korea: Korean Association of ESCO Companies (KAESCO)
- Malaysia: Malaysia Association of Energy Service Companies (MAESCO)
- Singapore: Energy Sustainability Unit
- Thailand: Thai ESCO Association
- United States: National Association of Energy Service Companies (NAESCO)

In addition to the above, ESCO associations are active also in Europe.

- Austria: Association of EPC-Companies Austria
- Belgium: BELESCO
- Denmark: ESCO network – under the Federation of the Danish Industry / Energy Branch
- France: Association of Energy Efficiency Service Companies (CS2E)
- Germany: Association for Heat Supply, ESCO Forum (ZVEI national association for electrical and electronics industry) and VDMA (national association for machinery and industrial equipment manufacturers, subgroup for Building Automation)
- Italy: AGESI, ASSOESCO, and FEDERESCO
- Spain: AMI and ANESE
- Sweden: Forum for Energy Services
- Switzerland: Swiss Contracting
- United Kingdom: Energy Services and Technology Association (ESTA)
- Source: Angelica Marino, Paolo Bertoldi, Silvia Rezessy, and Benigna Boza-Kiss, Energy Service Companies Market in Europe – Status Report 2010 -, European Commission Joint Research Centre Institute for Energy, 2010

4. Policy/strategy and action plan for promote ESCO industry

The delegates from participating economies and experts discussed policies and programs for the promotion of ESCO industry in each economy at the workshop.

Promotion programs for ESCO industry are as shown in 4.1 to 4.7 as below, and similar programs are implemented in most economies.

4.1 Preliminary review

In the early stages of ESCO implementation, feasibility studies of energy-savings potential and the possibility of promotion energy savings by ESCO were carried out. In Japan, various programs have been deployed for nearly 10 years since a feasibility study was carried out on the initiative of the Ministry of Economy, Trade and Industry (METI) in 1996. In Asia, the World Bank and Global Environment Facility (GEF) have been investigated in several economies in the early 1990s. In China, the facts that there was a large potential on energy savings and at the same time there was a market barrier were identified by the investigation carried out from 1992 to 1994, therefore a supporting program was performed for 10 years since 1998. In addition, in Thailand, a feasibility study by GEF was carried out and a pilot project of ESCO was implemented.

A review is often carried out at the beginning of implementation, examines the definition of ESCO, such as the characteristics of its contracts, overview of M&V, energy saving potential, and

challenges and opportunities in the economy. In response to such a review pilot projects, capacity building, support measures and the establishment of an ESCO association is often undertaken.

4.2 Development of business

Following the initial feasibility studies, energy audit and pilot projects should be performed. Japan also carried out pilot projects using government subsidies in 1998. Also in Thailand, a free energy audit with funds from the ENCON Fund (Energy Conservation Promotion Fund) was available. Energy audits are often carried out by government subsidies because it promotes energy savings. Although it is difficult to say that free energy audits directly help the development of the ESCO industry. This is because not all facilities which received the energy audit use an ESCO partner, instead an energy audit may lead to general energy saving promotion by identifying opportunities other than technical ones. Promoting ESCO projects in government facilities is generally required before developing a private market. At the same time as the implementation of ESCO projects to government facilities enhances, the credibility of the entire ESCO industry also improves. Thus the ESCO industry accumulates experience. Due to subsidized energy prices, Malaysia plans to implement ESCO in government buildings first, the private sector will follow as the next target.

In addition, performing IRP (Integrated Resource Planning) and DSM (Demand Side Management) contributes to the development and promotion of ESCO projects. However, while IRP/DSM was carried out in Europe and the United States, APEC economies have not performed full-blown DSM. Many developing and emerging economies' primary goal has been to develop power capacity to deal with increasing electrical demand and support economic growth, thus IRP such as dampening electrical demand by promoting energy savings on demand side has not yet become practical in those economies. Therefore, implementation of full-blown IRP/DSM is a task to be challenged in the future.

- Implementation of energy audit (corresponding to FS research)
- Implementation of pilot projects
- Introduction of the ESCO business into governmental facilities
- Implementation of IRP/DSM programs

4.3 Development of capability

All participating economies regard this as the essential program for promotion of ESCO industry.

(1) Preparation of technical guidelines

Guidelines for Measurement and Verification (M&V) and Standard Contract which are important in performing an ESCO project.

(2) Preparation of ESCO introduction manuals

Bidding procedures differ from those seen in the construction industry and further work is needed for bidding of ESCO projects to public facilities. That is because project feasibility, energy-savings ratio and contract details are important, while the bidding price is most important in normal construction biddings. While it is preferable to reform the bidding system, it is difficult to do it for public works in many economies. Therefore, a manual for bidding system which can make use of the characteristics of an ESCO as much as possible under the current bidding system should be made.

(3) Performance development for financial institutes

Involvement of financial institutions is essential in ESCO projects. However, it is difficult for financial institutions to understand ESCO projects because they do not have much technical know-how of energy conservation. Thus, a guideline for financial institutions which shows the overview of the ESCO project should be created and a seminar should be held in order to help financial institutions understand it.

(4) Performance development for ESCO enterprise

Various industries such as builders, professional engineers and manufacturers of measurement equipment, enter into ESCO industry. It is necessary to carry out capacity building in order to support best practices in the ESCO industry quickly.

Various measures have been implemented especially in China under the leadership of ESCO association (EMCA) and in Thailand under the leadership of DEDE (Department of Alternative Energy Development and Efficiency) and FTI (Federation of Thai Industry). Among the above preparations and developments, M&V and performance development for financial institutes are most valued. Though M&V plays a central role in the services ESCO provide, it is not well recognized. Therefore, it is especially important to improve the awareness of M&V not only within ESCO, but also within on the customer demand side. Performance development for financial institutions is a program of high interest especially to economies in the early stage of ESCO implementation. In Thailand, the growth of five financial institutions which deal with ESCO fund increased the recognition of M&V by other financial institutions.

4.4 Propagation and enlightenment

This is a program taken place most commonly in measures to popularize the ESCO industry.

In order to bring up the ESCO industry, it is necessary to promote it continuously, not only in the beginning of implementation. It is required to keep carrying out activities like the following.

- Compile and issue successful models
- Provide seminars, conferences and exhibitions, which promote the ESCO business
- Business and network matching meetings
- Provision of information such as newsletters, websites etc.
- Commendation system for excellent in ESCO projects

Most of these projects are performed by nucleus organizations of ESCO promotion in each economy. For example, China's EMCA and Thailand's DEDE and FTI. In Thailand, Thai ESCO Association was established at the end of 2012 to play a central role to conduct projects. Commendation system for excellent ESCO projects is performed by the government, and in Thailand, the Ministry of Energy has being taking this role. The role of a nucleus organization for ESCO promotion is of great importance.

4.5 Establishment of project body/operation support

It is necessary to establish a central authority to promote the ESCO industry and to dispatch information. The ESCO association is active in many economies to participate in the dissemination and public promotion of ESCO. In developed economies, a group of private operators often establishes their own associations. However, it is best to be supported by international institutions or by government for greater recognition in developing economies. In addition, the establishment of Pilot ESCOs, which was supported by an international organization in the beginning of implementation, was successfully performed in China.

It is also valid to have a registration system or certification system of ESCOs in order to develop their professionalism.

- Set up of ESCO association/operation support
- Support to set up ESCO providers
- ESCOs registration system: A registration system to access policy incentives such as low interest loan provided by governments. In Thailand, an ESCO fund has been established. It is not intended to be a system to judge the abilities of ESCOs.
- Accreditation system for ESCO providers: Preliminary accreditation system to simplify government expedition procedure (Super ESPC in USA, Australia, etc.) and accreditation system (NAESCO etc.) for nurturing excellent ESCO providers are available. The preliminary accreditation system judges the abilities of ESCOs, and performs a selective tendering, which only allows the accredited ESCOs to bid for government buildings.

The accreditation system is an unparalleled system in the world, made to examine the abilities of ESCOs. NAESCO's accreditation is highly valued in the U.S market, thus ESCO biddings performed by local governments sometimes set the accreditation of this system as a condition for ESCO providers. Many participating economies are interested in accreditation system for ESCO providers.

- Evaluation of energy conservation performance and impartiality 3rd party mechanism: M&V based on IPMVP has been implemented as a method to analyze the effect of energy savings of ESCO projects in many economies. This has been a major feature of the successful ESCO industries. Economies in the early stages of ESCO introduction often need an introduction to evaluation by a 3rd party. Thailand is an economy with an advanced ESCO introduction, but has an interest in 3rd party evaluation. That is because customers do not trust the results of M&V reported by an ESCO, and prefer an evaluation by a 3rd party.

4.6 Financial support

Financial support by government is extremely important. While the main support is subsidies in Japan, other Asian economies often implement low-interest loans and Tax incentives. Additionally, loan guarantee had helped the promotion of ESCO industry in China.

(1) Develop financing scheme

Ordinary financing is done by asset-base. Development of utilizable financing scheme is important because utilizable loans are limited in the case of energy efficiency investment including ESCO projects. Energy efficiency investment typically secures project financing by using the potential energy savings as collateral. In addition, in order to reduce transaction costs, special purpose entities (SPEs) which aggregate small and medium-sized project (SMP) are often required.

(2) Implementation of low interest finance

It is carried out in many economies and intended to provide funds with a few percent lower interest than market interest received by the government. The condition is that the registration system for ESCOs which receive the low-interest loans would be introduced at the same time such as in Thailand and Korea. In Thailand, the understanding of the ESCO model by banks which deal with low-interest loan from the ESCO fund become a starting point for other financial institutions to gradually improve their ESCO recognition.

(3) Offer of subsidies

Subsidies are the major part of financial support in Japan. This feature is very

advantageous to the project implementation since the subsidy rate can be as high as 1/3 of the project cost. On the other hand, it tends to become a complicated procedure and one which is only given in large-scale projects. In addition, it is often a prerequisite of the contract since the subsidy is important for ESCOs and customers. Furthermore, we should also consider the fact that subsidies can provoke only a doubling or tripling of investment from the amount of government budget.

(4) Implementation of loan guarantee programs

This is insurance to reduce investment risks of financial institutions. It had been introduced in China first and also provided by Asia Development Bank. After that, lease insurance was introduced in Japan too. A lot of economies are paying attention to this program because it can provoke as much as several times investment of insurance government prepares.

(5) Tax incentive system

There are two systems. One of the systems exempts taxation for utility costs reduced by implementation of ESCO project, and the other deducts a certain percentage of the cost for introducing high-efficiency equipment. Although incentives given to customers is not as much as subsidies, the procedure is simple and it is possible to give incentive regardless of the scale. However, the incentive is limited to prevent free riders.

4.7 Reinforcement of policy/system reformation

Basic energy conservation legislation has been carried out in many economies at different times such as Chile's National Energy Efficiency Program (PPEE), China's Energy Conservation Law, India's Energy Conservation Act, Japan's Energy Conservation Law, Malaysia's Efficient Management of Electrical Energy Regulations, and Thailand's Energy Conservation Promotion Act. Energy-saving standards have been established based on the development of these laws. Most of them closely relate to the business growth of ESCO industry.

On the other hand, in United States, related law of energy conservation such as The Energy Policy and Conservation Act of 1975(EPCA), National Energy Conservation Policy Act of 1978(NECPA), and The Energy Policy Act of 1992 (EPAct) was implemented, and a system was implemented by Executive Order 13123, 1999, etc. to promote public facilities which is the main market in the United States.

ESCO implementation to government buildings is not only an essential area for ESCOs to acquire the trust of the broader market as stated above, but also to develop the ESCO market since government buildings are an attractive target. This requires redevelopment of government

procurement systems to promote ESCO implementation.

- Reinforcement of regulations for energy conservation
- Reformation of expedition regulations to introduce ESCO in governmental facilities

5. Key factor for promotion strategies of ESCO industry

There were a lot of discussions about measures to promote ESCO industry between the delegates from each participating economy and experts. From among the discussions, issues and promoting measures of high interest to the participating economies are listed below.

5.1 Performance development for financial institutions

Collaboration with Local Finance Institutions (LFIs) is a required condition to implement ESCO projects. Financial institutions are required to understand the ESCO model to provide utilizable finance. However, conservativeness of most LFIs has caused a delay in capacity building of them. Not only seminars and business matching meetings targeting at LFIs, but also actions to gain LFIs' understanding through the actual implementation of ESCO are necessary. In Thailand, LFIs which deal with ESCO fund have improved their understanding of ESCO model with experience. It is effective to include capacity building of LFIs in incentive programs involving government.

5.2 Performance development especially M&V and evaluation system by 3rd party

M&V is a key element in the services of ESCO provides. M&V education of ESCOs requires seminar and training at first. At the same time, LFIs' understanding of M&V and recognition of its importance will be the basis to providing utilizable financial schemes for ESCO projects such as project-based financing. It is because a quantitative evaluation of saving effect is required to implement project-based financing. Although customers are also needed to understand M&V at the same time, it will take an extended period because it requires that ESCOs implement good projects and win the trust of market gradually. In order to gain the understanding of market for M&V, it is effective to prepare a manual on M&V for ESCO implementation to government buildings. In the same discussion, establishment of a 3rd party to evaluate the M&V results was proposed. For example, adjusting of baseline by use of M&V is needed when the amount of energy consumption increases in response to climate change or production increases. However, when customers do not understand it, conflict may occur between the ESCO and the customer. The purpose of the 3rd party organization is to accommodate such problems. On the other hand, the ESCO association may be expected to play

a role to accommodate conflict with customers in some cases. Even though no ESCO association takes on the function of accommodation, it is required to consider how the ESCO association should get involved in such conflicts.

5.3 Accreditation system for ESCO providers

This is a system based on the concept that an accreditation system of ESCOs is effective for the ESCO model to acquire the trust of market. In the United-States, accreditation system for ESCO providers has been implemented by ESCO association, and local governments have adopted it as a condition to participate in biddings, which shows that the model has acquired the trust of market. However, in economies undeveloped ESCO industries, only limited ESCOs can achieve accreditation, because newcomers may be unskilled. On the other hand, many of economies have adopted registration system of ESCOs. This system aims to allow ESCOs to access incentive programs by government and to give them eligibility for participation to bidding for government buildings. As for accreditation and registration system, it is realistic to adopt registration system at first, followed by accreditation system after the ESCO providers had much matured.

5.4 Development financing scheme

ESCO invests in projects from its working capital and recovers it from savings. Thus reliable and commercially viable long-term project financing is required for ESCO projects to be implemented. At the same time, there is a limit on utilizable working capital because of the small size of most of ESCOs are SMEs. On the other hand, LFIs are generally conservative and provide asset-based loans. In addition, transaction cost weighs on revenue in case of small-sized projects. Therefore ESCO projects require development of project financing scheme by putting up energy savings as collateral. At the same time, it is needed to establish SPEs which aggregate small and middle-sized projects, and to provide financial support to them.

Reliable guarantee of savings is required when LFIs provide project financing, but performance contract and M&V provided by ESCO can minimize risk for LFIs. Therefore LFIs need to properly understand and evaluate performance contract and M&V.

A development example of project finance is finance program provided by the Asian Development Bank for Indonesia Eximbank. This program has the following requirements. Furthermore, it performs capacity building targeting at Eximbank and LFIs.

- Not significantly impact customer’s core credit capacity.
- Have savings from EE projects accepted as primary collateral.

- Generate a net positive cash flow to customer.

5.5 Reinforcement of regulation for energy conservation

Standards for energy conservation have been established in each economy. Gradual reinforcement of them has had an impact on the energy saving business. In Europe, Energy Efficiency Obligation schemes; an energy saving regulation targeting at SMEs, were incorporated in Energy Efficiency Directive (Directive 2012/27/EU) in October 2012. This regulation has been already carried out in Britain, France, Italy and Belgium, and EU directive requests other member states to adopt a corresponding regulation. This regulation obligates energy supplier to perform energy saving on demand side, and especially in Italy, it has contributed to ESCO promotion.

5.6 Fill the gap between contract society and real business custom

ESCO guarantees long-term saving by performance contract. They bear financial risk for a long period especially in case of shared savings contract. ESCO takes performance risk, downside risk and credit risk until they complete invest recovery. Even though they are secured by contract, the default of the contract often occurs in developing and emerging economies. In terms of performance risk, although whether guaranteed amount of saving was achieved or not are evaluated by M&V based on contract, a delay of payback can occur due to customers' incredulity of M&V result. Downside risk is also concerned. In respect of credit risk, bankruptcy law demands that debt collection must be secured at a certain standard. In order to resolve such conflicts between ESCO and customers, the preparation of law solution against conflicts is required as well as making a structure to mediate conflicts.

Appendix 1a: Workshop #1

Workshop on APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) Phase 4
"Promotion of Energy Service Company: ESCO"

21-23 January 2013

Queen Sirikit National Convention Center (QSNCC)

Bangkok, Thailand

DAY 1 – Monday, 21 January 2013		
Venue: Boardroom 1, 3rd Floor, Zone C ,QSNCC		
8:30-9:00	Registration	
9:00-9:35	**1. Opening Session**	
9:00-9:10 9:10-9:20 9:20-9:35	Opening Remarks	Dr. Kazutomo Irie ,APERC Dr. Twarath Sutabutr, Deputy Director General, Department of Alternative Efficiency, Thailand Dr. Jyuung-Shiauu Chern, Chief Energy Affaires Section, Bureau of Energy Ministry of Economic Affairs,Chinese Taipei
9:35-10:10	Coffee Break/ Photo Session	
10:10-12:00	**2. Kick-off Session to share expected outcome of CEEDS workshop**	
10:10-10:25 10:25-10:55	Presentation on "The CEEDS Project – Phase 4 and Workshop Objectives" Presentation on Energy savings Potential	Dr. Kazutomo Irie , APERC (10mins + Q&A 5mins) Mr. Luke Leaver , APERC (20mins + Q&A 10mins)
10:55-12:00	Development programs for ESCO carried out in each country	Dr. Chiharu Murakoshi, Jyukankyo Research Institute (65mins)
12:00- 13:00	Lunch	
13:00- 15:00	**3. Presentations by Experts**	
13.00-13.30	Energy Efficiency Policy and Promotion program in Thailand	Dr Prasert Sinsukparsert, Director of Planning Division, Department of Alternative Energy Development, Ministry of Energy, Thailand (30

		mins)
13.30-14.30	Scale up financing of energy efficiency projects for ESCOs in Asia	Mr. Thomas K. Dreessen, Chairman and CEO, EPS Capital Corp.USA (60 mins)
14.30-15.00	ESCOs in Chinese Taipei	Mr. Teng-Yaw Yu, Chairman of the Taiwan Association of Energy Service Companies (TAESCO) and CEO of the Taiwan Green Productivity Foundation, Chinese Taipei (30 mins)
15:00-15:20	Coffee Break	
15:20-16:40	**4. Presentations by Participating Economies** **Moderator: Mr. Thomas K. Dreessen**	
15:20-15:40	ESCO Status in Thailand	Mr. Hin Nawawongse, Chairman, ESCO Business Promotion Committee, the Institute of Industrial Energy / Vice Chairman Executive Committee, the Institute of Industrial Energy, the Federation of Thai Industries (FTI), Thailand (20 mins)
15:40-16:00	Energy Efficiency in Chile, Energy Service Companies	Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile (20 mins)
16:00-16:20	The EE Policies and Current Status of ESCO Industry in China	Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center,Energy Research Institute (ERI), National Development and Reform Commission(NDRC), China (20 mins)
16:20-16:40	Energy Efficiency - Malaysia's Experience	Mr. Zulkflee Umar, Head of Demand Side Management Unit, Ministry of Energy , Green Technology and Water , Malaysia (20 mins)
16:40-17:30	**5. Panel Discussion** **Moderator: Mr. Thomas K. Dreessen**	
	Discussion of Common Barriers	Participating Economies
17:30-17:40	**6. Summary Remarks of the discussion on the First Day by APERC**	

	End of the First Day

DAY 2 – Tuesday, 22 January 2013		
Venue: Ballroom, 1, 3rd Floor, Zone A, QSNCC		
9.00-10.10	Attend Thailand ESCO Fair 2013 Open Ceremony	
Venue: Boardroom 1, 3rd Floor, Zone C		
10:10-10:30	Coffee Break	
10.30-12.00	**7. Presentations by Experts** **Moderator: Dr. Prasert Sinsukprasert**	
10.30-11.00	Measurement and Verification (M&V)	Mr. Pierre Baillargeon, Vice President, Econoler, Canada (30 mins)
11.00-11.30	What is the Key Driver to promote ESCO Industry in China	Ms. Ming Zhao, Vice Director/Secretary General , EMCA (30 mins)
11.30-12.00	Industrial Energy Efficiency Finance in Thailand: A Three-Way Partnership between Bank, ESCOs and Clients	Mr. Mek Meksarikul Vice President, Head of Corporate Credit Solution Management Corporate Credit Product Management Department, Kasikorn Bank (30 mins)
12:00-13:00	Lunch	
13.00-14.00	**8. Brain Storming Session: "What is the next step/road map to develop ESCO Industry for each participating economies** **Moderator: Dr. Prasert Sinsukprasert**	
14.00-14.30	Role of Government to promote ESCO	Mr. Sarat Prakobchart, Senior Engineer, Department of Alternative Energy Development, Ministry of Energy, Thailand (30 mins)
14.30-15.00	Government Fund for ESCO Business (ESCO Fund)	Dr. Watcharee Jornjumrus, Technical Advisor, Energy for Environment Foundation, Thailnd (30 mins)
15.00-15.30	Coffee Break	
Venue: Ballroom, Zone A		
15.30-17.30	Attend ESCO Fair	

18.00-20.00	Dinner Talk hosted by FTI, Thailand
	End of the Second Day

DAY 3 – Wednesday, 23 January 2013		
Venue: Boardroom 1, 3rd Floor, Zone C, QSNCC		
9:00-9:10	**9. Recap DAY 1 & DAY 2 Discussion**	Dr Kazutomo Irie, APERC
9:10-11:10	**10. Wrap Up Session 1** **Presentations by five APEC Economy Representatives on the next steps to develop ESCO Industry in Each Economy** **(Moderator: Mr. Pierre Baillargeon)**	
9.10-9.50	The next steps to develop ESCO Industry in Thailand	Mr. Arthit Vechakij, President of Thai ESCO Association (40 mins)
9.50-10.30	The Next Step for Develop ESCOs in the Chilean Econmy	Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile (40 mins)
10.30-11.10	The Proposal of Next Steps to Develop ESCO Industry in China	Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center, Energy Research Institute (ERI), National Development and Reform Commission(NDRC), China (40 mins)
11:10-11:30	Coffee Break	
11:30- 12:10	**11. Wrap Up Session 2** **Presentations by five APEC Economy Representatives on the next steps to develop ESCO Industry in Each Economy**	
11.30-12:10	Energy Efficiency/ Conservation Incentives ESCO Development, Malaysia	Mr Zulkflee Umar,, Head of Demand Side Management Unit, Ministry of Energy , Green Technology and Water , Malaysia (40 mins)
12:10-13:10	Lunch	
13:10-13:40	**12. Presentation on the effect of energy savings and CO2 reduction by ESCO project -Case study of Japan-**	**Dr. Chiharu Murakoshi, Jyukankyo Research Institute**
13:40-15:00	**13. Closing Session**	
13.40-14.30	Summary presentation based	Dr. Chiharu Murakoshi, Jyukankyo

	on presented fine tuned road maps and findings from whole workshop.	Research Institute (50 mins)
14:30-14:45	Closing Remarks	Mr. Kazutomo Irie, APERC (15 mins)
14:45-15:00	Closing Remarks	Dr Twarath Sutabutr, Deputy Director General, Department of Alternative Efficiency, Thailand (15 mins)
	End of Workshop	

Appendix 1b: Workshop #2

Workshop on APEC Cooperative Energy Efficiency Design for Sustainability (CEEDS) Phase 4
"Promotion of Energy Service Company: ESCO"

26-28 March 2013

Howard Civil Service International

Taipei, Chinese Taipei

DAY 1 – Tuesday, 26 March 2013		
Venue: 14F VIP Room, Howard Civil Service International		
8:30 – 9:00	Registration	
9:00-9:40	**1. Opening Session**	
9:00-9:10	1.1 Welcome Remarks	Dr. Jyuung-Shiauu Chern, Section Chif, Bureau of Energy, Mnistry of Economic Affairs, Chinese Taipei
9:10-9:20	1.2 Opening Remarks	Ms. Amaraporn Achavangkool, Senior Scientist, Technical and Efficeincy Promotion Devision, Beareau of Energy Regulation and Conservation, Department of Alternative Energy Development and Efficiency, Thailand
9:20-9:30	1.3 Opening Remarks	Dr. Kazutomo Irie, APERC
9:30-9:40	Group Photo Session	
9:40-10:20	**2. Kick- off Session to share expected outcome of CEEDS Workshop**	
9:40-9:55	2.1 Expected Outcome	Dr Kazutomo Irie, APERC (15 mins)
9:55-10:20	2.2 Energy savings impacts of ESCO Industry	Mr. Luke Leaver, APERC (25 mins)
10:20-10:40	Coffee Break	
10:40-12:10 **13:10-14:40**	**3. Presentation by Experts** Moderator: Dr. Hidetoshi Nakagami	
10:40-11:25	3.1 European Experience to develop ESCO Industry and role of policy makers	Dr. Nicola Labanca, Senior Researcher EC ,Joint Research Center (45 mins)
11:25-12:10	3.2 The business model of energy	Mr. Kentaro Horisaka, Manager,

	service provider in Japan and Asian economies	Overseas Business Development, Energy Advance (45 mins)
12:10-13:10	Lunch	
13:10-13:55	3.3 ESCO Capacity building Certification	Mr. Pierre Baillargeon, Vice President, Econoler (45 mins)
13:55-14:25	3.4 The Role of ESCO Association in Chinese Taipei	Mr.Teng-Yaw Yu, Chairman, TAESCO (30 mins)
14:25-14:40	3.5 The Role of ESCO Association in Japan	Mr. Takuya Yamamoto, Auditor, JAESCO (15 mins)
14:40-15:00	Coffee Break	
15:00-18.00	**4. Next steps for each participating economy** Moderator: Dr. Nicola Labanca	
15:00-16:30	4.1 Thailand: The Policies to promote ESCO industry Discussion & Summary	Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand (90 mins)
16:30-18:00	4.2 Malaysia: The development of ESCO in Malaysia Discussion & Summary	Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Malaysia (90 mins)

DAY 2 – Wednesday, 27 March 2013	
Venue: 14F VIP Room, Howard Civil Service International	
9:00-10:00	**5. Group Discussion to work out fine-tuned proposal on the next steps for participating economy** Moderator: Mr. Pierre Baillargeon
10:00-10:20	Coffee Break
10:20-12:20	**6. Individual Refinement work with Experts** Moderator: All experts
12:20-13:20	Lunch
13:20-15:55	**7. Wrap-up Session** Moderator: Dr. Nicola Labanca
13:20-14:20	7.1 Thailand Presentation on fine-tuned proposal on next step by delegate Discussion & Summary	Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand (60 mins)

14:20-14:40	Coffee Break	
14:40-15:40	7.2 Malaysia Presentation on fine-tuned proposal on next step by delegate Discussion & Summary	Mr. Zulkiflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Malaysia (60 mins)
15:40-17:00	**8. Group Discussion** Moderator: Mr. Pierre Baillargeon	
17:30-20:00	Dinner or Reception	

DAY 3 – Thursday, 28 March 2013		
Venue: 14F VIP Room, Howard Civil Service International		
9:30-11.00	**9. Closing Session**	
9:30-10:30	9.1 Wrap up of fine tuned presentations and summary of whole workshop	Dr. Chiharu Murakoshi, Jyukankyo Research Institute (60 mins)
10:30-10:45	9.2 Closing Remarks	Mr. Shiaw-Jium Bor, Director Legal Affairs Office, Bureau of Energy, Ministry of Economy Affairs, Chinese Taipei (15 mins)
10:45-11:00	9.3 Closing Remarks	Dr Kazutomo Irie, APERC (15 mins)
11:00-13:00	Lunch	
13:00-15:00	Site Visit: the Grand Hyatt Taipei	

Appendix 2 : Chile

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Mauricio Utreras, Energy Efficiency Division, Ministry of Energy, Chile

1. Market size of ESCO industry

No available market data.

2. Ongoing strategy

· Basic energy efficiency policy

Energy conservation plan in Chile has been promoted based on National Energy Efficiency Program (PPEE).

The strategic objectives of the PPEE are to:

1) establish the institutional foundations and regulatory framework for energy efficiency
2) develop incentives and support tools for energy efficiency
3) develop useful and accessible information for making public and private decisions, as well as collective and individual ones
4) position and introduce energy efficiency in all levels of training, both formal and informal
5) take advantage of international experiences and instruments to accelerate the development of energy efficiency and measure the reduction in generated emissions
6) strengthen institutional management through process quality

· Preliminary review

Chilean Energy Efficiency Agency (ACHEE) are developing a project called "Promoting the creation and consolidation of a market for energy services (ESCOs) in Chile." with financial support from the Global Environment Facility (GEF).

· Incentive program

✓ Offer of subsidies

Consultancy subsidy available for energy efficiency audits, plans for implementing energy efficiency measures, and development of an investment project that can be presented to financing providers.

Subsidy on electric motors.

✓ Low interest loan

Although subsidy for adopting energy saving system is available, it is not specialized in ESCO only.

· Activity support of ESCO association

National Association of Energy Efficiency Chile (ANESCO Chile) was established in 2009.

3. Goals in 2020

- ✓ 6 banks participating in the project.
- ✓ 120 Guaranteed projects.
- ✓ 120 energy efficiency projects with energy baseline established.
- ✓ 120 projects with energy efficiency measures and savings checks made.

4. Main Issues

- ✓ Lack of local funding available to projects, no real guarantees lines.
- ✓ Lack of measurement and control system available in the local market.
- ✓ Lack of market knowledge of the general model of ESCOs

5. Next Step

- ✓ Define the technical and economy potential of the ESCOs model in Chile for the 2020.
- ✓ Work for the accreditation of ESCOs (design a Check List).
- ✓ Standardization of EPC contracts, validated by the government, this delivers peace of mind to the end customer.
- ✓ Develop pilot project financing for the government with the ESCOs accredited and the contracts validated.
- ✓ Coordination of actors for financing (bank and project developers).
- ✓ Training programs of M&V.
- ✓ Maintain relationships with international organizations to upgrade and meet new measures and programs for the promotion of ESCOs (ex: CEEDS).
- ✓ Provide scholarships for young professionals to do their professional practices in accredited ESCOs.
- ✓ Send the ESCO Awards, Project ESCO Awards and the ESCO excellent supporter Bank Awards.

Appendix 3 : China

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Zhang Jianguo, Associate Professor, Energy Efficiency Center, Energy Research Institute (ERI), National Development and Reform Commission (NDRC), China

1. Market size of ESCO industry

Growing 20% a year, the market size of performance contract-based ESCO reached CNY 50.572 Billion (USD 8.5 Billion) and is the biggest market in the world. The amount of energy savings by ESCO is 18.28 Million tce, and the amount of CO2 reduction is 45.7 Million ton-CO2.

2. Ongoing Strategy

· Basic energy efficiency policy

Under Energy Conservation Law, facilities who consume more than 10,000 tce (7,000 kLoe) a year are designated as energy management factory, and who consume more than 5,000 tce a year can be designated as energy management factory. Designated facilities are obligated to have a facility audit/on-site investigation and measurement and evaluation of energy saving, and to appoint an energy manager.

· Preliminary review

The below programs have been done since World Bank carried out feasibility study in 1996.

✓ Since 1998: Establishment of three pilot ESCOs
✓ Since 2002: Implementation of loan guarantee and establishment of ESCO association
✓ Since 2008: Establishment of low-interest loan fund by World Bank
✓ Since 2011: Adoption of incentive program by central and local governments

· Incentive program

✓ Offer of subsidies

1.24 billion CNY for subsidies provided by central finance in 2010 for the EPC projects.

✓ Tax incentive

Business tax exemption for ESCOs, value added tax exemption for business owner of EPC project, corporate income tax exemption during the first 3 years and 50% tax reduction during the next 3 years for ESCOs

✓ Improve the related accounting system

Clarify the rule how to deal with the budget and assets of EPC projects in public institutes.

Take the budget of EPC projects in government as the budget of energy.

- ✓ Improve financial services
- ✓ Green credit, Loan guarantee program and Low-interest loans

· Capacity building

- ✓ Capacity building of M&V
- ✓ Development of third-party bodies for accreditation of M&V

· Improve awareness

A lot of programs are ongoing such as seminar, conference and exhibition

· ESCO association

China ESCO industry association (EMCA)

· Database development

EMCA working out market survey every year

3. Goals

- ✓ Improve the ESCO policies

  Capacity building, M&V, development of third-party for accreditation
- ✓ Expand ESCO business (in 2015)

  Super large comprehensive ESCOs 20

  Demonstrate excellent EPC projects 100

  Output value of ESCO industry would be 300 billion CNY

  Investment size of EPC projects would be more than 180 billion CNY

  Employment 500,000 Professional talent 10,000

  Energy savings capacity of EPC projects would be 60 million tce

4. Main Issues

- ✓ Financing difficult

  ESCOs are usually technical enterprises, there are no enough fixed assets to mortgage for loan.

  It's difficult for banks to assess the return and risk of energy service project.
- ✓ Measurement and Verification of energy saving

  The energy measurement and statistical work is not perfect in some business owner.

There is no uniform and clarified method to evaluate the energy savings.

There're 26 third-party bodies for accreditation so far in China, but sometime the evaluated result of energy saving on some projects by different bodies is inconsistency.

- ✓ Business integrity

  ESCOs sometime couldn't receive the return after providing energy service, e.g. business owner would carry out the EE retrofit project by themselves after ESCOs finished the work of energy audit or making a reliable proposal, but no paid to ESCOs.

- ✓ Capacity building

  Some ESCOs are too small, lack of professional talent, technology, capital or experience of EPC projects.

- ✓ Policies awareness

  Some ESCOs couldn't understand the policies of energy conservation and emission reduction or any incentive policies very well.

5. Next Step

- ✓ Reinforcement of EE policy
- ✓ Innovate in the financing mode
- ✓ Implement ESCO projects to government facilities
- ✓ Improve the knowledge of measurement and verification
- ✓ Improve the accreditation system
- ✓ Survey ESCO industry in national wide
- ✓ Enhance the capacity building
- ✓ Improve the public awareness

Appendix 4 : Malaysia

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Zulkflee Umar, Head of Demand Side Management Unit, Ministry of Energy, Green Technology and Water, Malaysia

1. Market size of ESCO industry

No available data of ESCO market.

2. Ongoing strategy

· Basic energy efficiency policy

Under Efficient Management of Electrical Energy Regulations 2008, facilities which consume electricity more than 3MWh are obligated to check and report their energy consumption, to appoint an electrical energy manager and to perform energy audit.

· Preliminary review

Carrying out Malaysian Industrial Energy Efficiency Improvement Project (MIEEIP) with funds by Global Environment Facility (GEF), government and private sector, a comprehensive study for promoting energy savings was performed. This project contains (performs)survey and evaluation of domestic ESCO, providing information relating to foreign ESCO industry, holding workshops (workshop on ESCO business development, workshop on ESCO comprehensive development, workshop on ESCO technologies, etc.) and support for establishment of ESCO association.

· Incentive program

✓ Tax incentive

Sales Tax Exemption for 5-Star Rated Product
Import Duty Exemption for energy efficient products which are not available locally
Investment Tax Allowance or Pioneer Status for companies implementing energy efficiency projects

· Improve awareness

✓ Promoting good practices through efficient energy pricing and public awareness programmers

· Activity support of ESCO association
  Malaysian Association of ESCOs (MAESCO)
· Registration and Accreditation System of ESCOs

✓ All ESCOs are required to register with the Ministry of Finance (MOF) to qualify them as EPC contractor, consultant or supplier.
✓ MOF requires that ESCOs applying for registration under the Green Technology Services Code (222801) must be registered with the Energy Commission.

3. Goals

✓ First
  Implement Energy Efficiency Project using EPC concept and ESCOs at 25 Ministries Headquarters.
✓ Second
  Implement Energy Efficiency Project using EPC concept and ESCOs at other government buildings.
✓ Third
  Implement Energy Efficiency Project using EPC concept and ESCOs at local government.
✓ Forth
  Promote EPC and ESCO to the private sector.

4. Goals and strategy

■ First Goal : Implement Energy Efficiency Project using EPC concept and ESCOs at 25 Ministries Headquarters.
✓ Government to lead by example (setting up an EE KPI for each Ministry).
✓ Implementation of Energy Performance Contracting (Shared Saving Scheme) in Government Sector (approved by the Cabinet in January).
✓ ESCOs participation is required in implementing EPC in government sector.
✓ A steering and implementation committee will be established.
  · To propose a working mechanism.
  · To propose a fund to support and finance the EE project by ESCOs and the development of ESC).
  · Participation of Local Financial Institution with the assistance of the Ministry of Energy, Green Technology and Water and Ministry of Finance.
✓ Energy Commission of Malaysia will be the implementing agency in terms of:
  · Registration of ESCOs.

- Measurement and Verification (a joint effort by Energy Commission and the Public Works Department of Malaysia – building's facility owner).
- Promotion and Development.

- Second Goal : Implement Energy Efficiency Project using EPC concept and ESCOs at other government buildings.
- Third Goal : Implement Energy Efficiency Project using EPC concept and ESCOs at local government.

✓ Above strategy would be effective also after first goal achieved.

- Forth Goal : Promote EPC and ESCO to the private sector.

✓ Encourage EE project to be implemented via EPC.

✓ Funds to assist and finance the project are from:

- Investment Tax Allowance (Capital Investment in EE Project).
- Green Technology Funding Scheme (GTFS).
- Local Financial Institutions.

✓ Energy Commission of Malaysia will be the implementing agency in terms of:

- Registration of ESCOs.
- Promotion and Development.
- Measurement & Verification (by Registered Electrical Energy Manager).
- Enforcement of the Efficient Management of Electrical Energy 2008.

5. Main Issues

✓ Lack of participation or interest from the industry to adopt EE measures.

✓ Lack of participation from the Local Financial Institution.

✓ Unavailability of funds to promote and develop ESCOs.

✓ Accreditation, promotion and recognition of ESCOs.

✓ Strengthening the current regulations for EE.

3. Next Step

- First Goal: Implement Energy Efficiency Project using EPC concept and ESCOs at 25 Ministries Headquarters.
- In order to achieve the target,
  - Set up guidelines and mechanisms to achieve the KPIs.
  - Create funds to assist and finance the EE project involving ESCOs.
  - Promote and educate the local financial institutions (Government link).
  - Set up registration system of ESCO.
- Second Goal: Implement Energy Efficiency Project using EPC concept and ESCOs at other

government buildings.

- Third Goal: Implement Energy Efficiency Project using EPC concept and ESCOs at local government.

✓ To strongly promote, develop and monitor EE measures and projects. (All government buildings and 1800 installations subjected under the regulations).

- Forth Goal: Promote EPC and ESCO to the private sector.

✓ Financial incentive

· To promote about the existence of the current fiscal incentives (GTFS and ITA) with the involvement of ESCOs.

· To propose fiscal incentives (equipment).

✓ Raise awareness

· To promote and get the participation of ESCOs in the annual International Green Technology and Eco Products Exhibition and Conference Malaysia.

· To recognize ESCOs and industry players who actively promoting and adopt EE via a Energy Industry Awards organized by Energy Commission.

· To have a continuous awareness and education programs for the industry and commercial sector (management) to understand and adopt EE.

- Reinforcement of policy

✓ To further enhance the Acts and Regulations to promote EE (current task of Energy Commission).

- Inter-agency collaboration

✓ Collaboration between Ministry of Energy, Green Technology and Water, Ministry of Finance, Energy Commission of Malaysia and Public Works Department of Malaysia will strongly support to promote ESCO projects.

Appendix 5 : The Philippines

Status Report and Next Step
Promotion of Energy Service Company: ESCO

MR. Antonio M. Nabong, Energy Efficiency and Conservation Division, Energy Utilization Management Bureau, Department of Energy, Philippines
(Only presentation slide)

1. Market size of ESCO industry

No available data of ESCO market.

2. Ongoing strategy

· Registration and Accreditation System of ESCOs

Establish a Register of Accredited ESCOs and enhance the professionalism of ESCOs practices.

All Energy Service Companies (ESCOs) and Energy Service Providers (ESPs) are hereby required to secure accreditation from the Department of Energy following the Accreditation Criteria.

Accredited ESCO shall submit, thereafter, reports on status of the projects undertaken thereof.

3. Goals

Intensify collaboration effort with the private sector in implementing energy efficiency programs through ESCOs and other voluntary agreements;

4. Main Issues

No information

5. Next Step

- Improve ESCO Awareness
  - ✓ Introduction of ESCO Business Activities
  - ✓ Workshops and Seminars on ESCO for Financing Institutions
- Improve reliability of ESCO & Accreditation
  - ✓ Standardization of EPC
  - ✓ Improvement of Department of Energy (DOE) ESCO Website

- ✓ Workshops or seminars on ESCO Financing
- ✓ Upgrading of ESCO Accreditation

- ➢ Improve technical level of ESCO
- ➢ Enhance incentives
- ➢ Enhance financing

Appendix 6 : Chinese Taipei (host economy)

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Mr. Teng-Yaw Yu, Chairman of the Taiwan Association of Energy Service Companies (TAESCO) and CEO of the Taiwan Green Productivity Foundation, Chinese Taipei

1. Market size of ESCO industry

The estimated 2007 to 2010 average annual amount invested of ESCO was NTD22.3 Billion (USD 760 Million). However, it might include the amount of investment for general energy-saving renovation, which doesn't show market size of performance contract-based ESCO.

2. Ongoing strategy

· Basic energy efficiency policy

Under Energy Management Law, industrial facilities who consume more than a certain amount (e.g. Coal: more than 6,000 ton, Fuel oil: more than 6,000kL, etc and commercial facilities who consume electricity more than 800 kW) must report their energy consumption and to appoint an energy manager.

· Preliminary review

Activity to improve awareness, establishment of ESCO association, IPMVP training, and so on have been done since survey for introducing ESCO was carried out in 1998.

· Incentive program

✓ Offer of subsidies

2006-2012 subsidies to the public sector, hospitals, schools, communities and services totaled 91 cases.

In 2010 and 2012, commercial offices, buildings, chain stores, and industrial and commercial energy users (with paid-in capital exceeding NTD80 million) were given subsidies.

✓ Promote low-interest loans

· Development of financial scheme

✓ Establish credit guarantee financing system

· Capacity building

✓ ESCO certification system

✓ IPMVP energy saving performance measurement and verify the licenses of specialists

✓ “ESCO Project Development Technology” training course

✓ Set up a third impartial office for measurement verification

✓ Strategic alliances between equipment manufacturers, engineering companies and financial institutions

✓ The inclusion of ESCO courses in college curriculum

· Improve awareness

✓ Through the Commend of excellence ESCOs disclose information of excellence ESCOs for reference by energy users.

✓ A lot of programs are ongoing such as seminar, conference and exhibition.

· ESCO procurement for government buildings

✓ In 2012, The “Energy Saving Performance Project Turnkey Engineering Procurement Model Contract” was announced by the Public Construction Commission.

✓ In 2012, The “Energy Saving Performance Project Procurement and Implementation Standard Operating Procedures Template” was issued by the Taiwan Green Productivity Foundation.

· Activity support of ESCO association

✓ Two ESCO associations established.

3. Goals

Using the ESCO model to cross over into other fields and combine diversified services, the overall industrial output value doubled in 2015, reaching 50 billion NT dollars while the number of people employed jumped from 3,800 to 9,500 persons.

4. Main Issues

✓ Low price of electricity, long payback years on projects, high financial pressure on ESCOs.

✓ Most ESCOs are SMEs, poor funding and difficult to get financing.

✓ Customers are not familiar with ESCO, projects take a long time to formulate.

✓ Information on ESCOs is not very transparent, and users lack of confidence among users.

5. Next Step

- ✓ ESCOs servicing capacity registration
- ✓ Set up a third impartial office for measurement verification
- ✓ Strategic alliances between equipment manufacturers, engineering companies and financial institutions
- ✓ Energy audit of colleges and universities
- ✓ Promoting PV-ESCO
- ✓ Develop project financing system
- ✓ Nurture ESCO talent
- ✓ Promote industry project financing
- ✓ Promote the Revolving Fund

Appendix 7 : Thailand (host economy)

Status Report and Next Step
Promotion of Energy Service Company: ESCO

Dr Prasert Sinsukprasert, Director of Planning Division, Department of Alternative Energy Development, Ministry of Energy, Thailand
&
Mr. Arthit Vechakij, President of Thai ESCO Association, Thailand

1. Market size of ESCO industry

The market size of performance contract-based ESCO was 2,008 Million Baht (USD 66.3 Million) in 2011, growing at 60 to 70 percent annually since 2009.

2. Ongoing strategy

- Basic energy efficiency policy

  Under Energy Conservation and Promotion Act, facilities whose contract capacity of electricity is bigger than 1,000kW and the amount of energy consumption a year is more than 20 Million MJ are obligated to report their energy consumption and to appoint an energy manager.

- Preliminary review

  DEDE performed feasibility study to introduce ESCO with support of World Bank and Global Environment Facility (GEF), and at the same time, Electricity Generating Authority (EGAT) performed energy audit and one pilot ESCO project.

  - 1999: Introduction of ESCO Concept as a tool for doing EE projects
    - ✓ The first ESCO pilot project by DEDE, EGAT with support from World Bank
  - 2003-2004: Boosting ESCO business by Gov. incentive schemes
    - ✓ Low interest loan program for EE projects
    - ✓ Tax incentive for ESCO business
  - 2007: Establishment of P PP program for effective ESCO promotion
    - ✓ A Cooperation program between DEDE ,FTI and ESCOs for promoting ESCO
  - 2010: Indicating ESCO as a major strategy for long term EE Promotion
    - ✓ Putting ESCO as one of the main strategies under the 20 yrs EEDP (2010-2030)

- Incentive program

ESCO Fund established by DEDE in 2008 under the financial support from Energy Conservation Promotion Fund (ENCON Fund). ESCO Fund was injected 500 Million Baht each at two phases of Oct 2008-Sep 2010 and Oct 2010-Dec 2012, and will be injected again 500 Million Baht in 2013. The below financial incentives have been performed on ESCO Fund.

- ✓ Tax Incentive for EE products
- ✓ Tax Incentive for EE Investment
- ✓ 20% -40% direct Subsidy
- ✓ Low interest loan by revolving fund
- ✓ ESCO venture capital
- ✓ Equity investment
- ✓ Equity leasing
- ✓ Carbon Credit Facility
- ✓ Credit guarantee facility

· Development of financial scheme

Cost reduction by ESCO project is guaranteed by performance contract. Therefore, financing scheme based on cash flow derived by the reduction is under consideration.

· Capacity building

✓ Education and demonstration programs

Human resource development: Seminar and Training on energy efficiency

Practical training center (Mini-plant)

✓ ESCO Project Award, Excellent ESCO Award

✓ ESCO - Bank Networking, Site Visit

· Improve awareness

✓ Website : www.thaiesco.org

✓ Seminars, Workshop

✓ ESCO Fair: conference and exhibition

✓ ESCO Business Matching

✓ Thai ESCOs networking

· Activity of ESCO association

ESCO information center has provided information under DEDE, and The Institute of Industrial Energy, Federation of Thai Industry (FTI) has been played a role of ESCO

association. In addition, ESCO association has been established in December 2012.

· Registration system of ESCOs

✓ Registration system to access ESCO Fund

· Database development

Institute of Industrial Energy, Federation of Thai Industry (FTI) has been performed a market survey.

3. Goals

- ✓ Strengthening the nascent ESCO industry through the Thai ESCO Association
- ✓ Create demand on high quality and professional ESCO on both government and private sector
- ✓ Strengthen the market confidence in the ESCO services through the association
- ✓ Providing consistent and new initiatives incentives especially for ESCO market development such as, Specific ESCO Fund, ESCO Pilot Project, Grant for high qualified IGA & M&V, etc.

4. Main Issues

- ✓ Not all ESCO are currently members of the association. Needs to harmonize the approach.
- ✓ Very low demand in the market. Low demand from government sector as there is still issue with regulation/procedures. The private sector is still low because private sector has low understanding of ESCO business. Low understanding on EPGC.
- ✓ Difficulty for customer to identify qualified ESCO. Lack of confidence from market actors.
- ✓ Current ESCO fund manager do not fully comprehend the risk/benefit of EPGC offering. Not qualified to take calculated risk and go beyond financial institution business as usual loan evaluation.

5. Goal/ Barrier/ Strategy

- ■ Goal: Strengthening the nascent ESCO industry through the Thai ESCO Association
- ■ Barrier: Not all ESCO are currently members of the association. Needs to harmonize the approach.
- ■ Strategies:
- ✓ Have exclusive access to government projects and special access to government incentives programs for members (all serious ESCO then will join the association)
- ✓ Create typical documents to facilitate ESCO business and reduce transaction cost. Ex: Typical contract & guidelines. Typical M&V plan.

- ✓ Contract must stay flexible as a fixed model is not effective most of the time during customer's negotiation.
- ✓ Capacity building on ESCO operation and M&V. Special pricing for members.

- ■ Goal: Create demand on high quality and professional ESCO on both government and private sector
- ■ Barrier: Very low demand in the market. Low demand from government sector as there is still issue with regulation/procedures. The private sector is still low because private sector has low understanding of ESCO business. Low understanding on EPGC.
- ■ Strategies:
- ✓ Public sector program for EE ; Only for ESCO members of the Association and having signed letter of conduct.
  - · Creating template of bidding documents, ESCO selection procedures and associated purchase regulation that are applicable to all ministries. Preselection stage. Preparation of site information (list of equipment, schedule, operation mode, billing by a consultant prior to bidding).
  - · Role of DEDE for the public sector to provide support to ministries (promotion, education, help during the bidding process and for the M&V)
- ✓ Develop a special incentive program for the private sector.
- ✓ Disseminate the results of a pilot program case studies (more on that later)
- ✓ Seminars, Business Breakfast, Young Tycoon, CEO&CFO forums, newsletters

- ■ Goal: Strengthen the market confidence in the ESCO services through the association
- ■ Barrier: Difficulty for customer to identify qualified ESCO. Lack of confidence from market actors.
- ■ Strategies:
- ✓ Adoption of a voluntary code of conduct (minimum requirement for M&V, contract outline, at least one resource with CMVP certification and ESCO specialist certification etc.)
- ✓ See if CMVP sessions can be provided
- ✓ In 2-3 years, development of a more formal accreditation
- ✓ Pilot project to develop case studies and demonstrate experience

- ■ Goal: Providing consistent and new financial initiatives for ESCO market development.
- ■ Barrier: Current ESCO fund manager do not fully comprehend the risk/benefit of EPGC offering. Not qualified to take calculated risk and go beyond financial institution business as usual loan evaluation.

- Strategies:

✓ Develop an ESCO fund mechanism using senior financial and technical resources twinned at the beginning with international experts to evaluate risk of projects. The ESCO fund should go beyond the current financial institution offering for EE projects.

✓ Creating an ESCO pilot project with higher financial incentives than current programs. Ex: IGA supported 70%, M&V supported 50%.

6. Next Steps

- Role of Government (DEDE)

✓ Raise awareness of budget sponsor and communicate to each committee.

✓ Regulate to apply M&V with all government building's energy saving project.

✓ Directly issue new privileges & subsidy program to qualified ESCO projects with M&V, both government project and private project such as

· The Pilot ESCO Private EE/RE Project

· The Pilot ESCO Government EE Project

· Etc.

- Role of FTI

✓ Raise awareness and communicate to each target group.

✓ Create the attractive event & provide tangible benefit to each target group.

✓ Pursue top management level of potential target customer to join the event.

- Role of ESCO Association

✓ Capacity building

· Administration, Membership, ESCO trainings

✓ Accreditation system

· Standard M&V, Standard EPC, Qualified professional ESCOs

✓ 3rd party Verification

✓ Market promotion

· Special Seminars i.e. Breakfast Business Talk, Young Tycoon, CEO&CFO Forum etc, Professional ESCO Pilot Projects, PR Medias

✓ Database management

· Successful Cases, EE/RE Supplier Technologies Information Center, Thai ESCO Ass. Website

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Produces by
Asia Pacific Energy Research Centre (APERC)
Inui Building Kachidoki 11F, 1-13-1 Kachidoki
Cho-ku, Tokyo 104-0054, Japan
Tel: (81) 3-5144-8551
Fax: (81) 3-5144-8555
Email: master@aperc.ieej.or.jp
Website: http://www.ieej.or.jp/aperc/

In consultation with
Jyukankyo Research Institute Inc.
Kioi-cho Ark Building
3-29, Kioi-cho, Chiyoda-ku, Tokyo 102-0094, JAPAN
Tel: (81) 3-3234-1177
Fax: (81) 3-3234-2226
E-Mail: info@jyuri.co.jp
Website: www.jyuri.co.jp

For
Asia Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

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