Current state of ESCO activities in Asia: ESCO industry development programs and future tasks in Asian countries

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Overview of Presentation

- Definition of ESCO in this paper
- Market size of ESCO industry in Asia
- Promotion program of ESCO industry in Asia
- Conclusion
Definition of ESCO in this paper
The definition of ESCO in this paper is simple.

ESCOs provide energy efficient retrofit projects with performance contracts that guarantee energy savings.

Introduction of ESCOs to Asia took place in the 1990s.

Almost all countries learned the ESCO concept from USA.

The definition of an ESCO in Asian countries is similar to the traditional ESCO concept in USA (before utility restructuring).
Market size of ESCO industry in Asia
Market size of ESCO Industry in Asia

- Japan, South Korea, China and Thailand is limited performance contract based, and 69% is performance contract projects in USA.
- Annual growth is around 20% in China, Thailand and USA, increase in Japan and decrease in South Korea recently.
Market size of ESCO industry in Japan

Data source: JAESCO survey, 2008
Chinese EE Investment

- Investment for EE projects with PC in 2006: 237 Million USD
- Energy savings in 2006: overall investment in EE as 4.16 Mtce/year, investment in EE with PC as 2.69 Mtce/year
- Industrial sector is major (76%).
- Investment per project: 1.43 Million USD for Industrial sector/ 280 thousand USD for Commercial sector.

Data: Zhao Ming: EMCA and ESCO development in China, Proceedings of 2nd Asia ESCO Conference, Beijing, September 2007

Data: EMCA survey, 2006
Market trends of ESCO industry in Thailand

Investment for EE projects with Performance Contract

(Thailand USD)
ESCO market trend in South Korea

Dada: Korean Association for Energy Service Companies (2008)
Promotion program of ESCO industry in Asia
The step of market development of ESCO industry in Japan

- **1996/2001**: Target of EE policy
- **1998**: Subsidy Program
- **1998**: Market promotion
- **1997**: FS
- **1998**: Pilot projects
- **1999**: JAESCO established
- **2000/2005**: Strengthen EE policy
- **2002/2005**: Market development
- **2005**: Kyoto Protocol effected
- **2008**: EC Law revised

Additional items:
- **What is ESCO?**
- **Standard contract (1998)**
- **Potential market scale (1997)**
- **Case study (2000-)**
- **Commendation Program (2005-)**
- **Asia ESCO Conference (2005/2007)**
- **Market database (2001-)**
- **ESCO introduction manual (2004)**
Programs which had not adopted in Japan

- Tax incentive
- Low interest loan
- Loan guarantee program
- Reform of the procurement system in the national government
Brief trends of ESCO industry in China

- **1992-1994:** Survey by WB/GEF: China Issues and Option in GHG Emissions Control
- **1998:** Enforced Energy Conservation Law
- **1998:** WB/GEF “The China Energy Efficiency Project (CEEP)” started
  - 1998-2003: First phase
    - Established 3 pilot ESCOs (1996) and NECIDC
  - 2003-2008: Second phase
    - Loan Guarantee Program, EMCA (ESCO association)
- **2006:** 11th Five-year Development Guidelines, 20% reduce energy consumption per GDP until 2010
- **2007:** Strengthened Energy Conservation Law
International Financial Support on First phase

<table>
<thead>
<tr>
<th>Funding Organization</th>
<th>Type of support</th>
<th>Amount</th>
<th>Allocation to each EMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>WB/IBRD</td>
<td>Loan</td>
<td>63 Million UDS</td>
<td>21 Million UDS</td>
</tr>
<tr>
<td>GEF</td>
<td>Subsidy</td>
<td>22 Million USD</td>
<td>5 Million UDS</td>
</tr>
<tr>
<td>EU</td>
<td>Subsidy</td>
<td>4 Million Euro</td>
<td>1 Million Euro</td>
</tr>
<tr>
<td>England</td>
<td>Subsidy</td>
<td>1.91 Million Pound</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89.4 Million USD</strong></td>
<td><strong>26.8 Million UDS</strong></td>
<td></td>
</tr>
</tbody>
</table>

Note: Using 1996 exchange rates: 1.269 USD/Euro, 1.578 USD/Pound
Support on Second phase

- Set up ESCO association (EMCA)
  - Become independent until 2008

- Implemented “loan guarantee program”. Managed by CNI & G
  - Let financial organizations avoid 90% credit risk

 Gef subsidy (22 Million USD)  
 The rest the fund is used for other energy efficiency projects

EMC loan guarantee special fund (CNI & G)

Financing to EMC from banks

Increase to 5 to 10 times of resource fund by loan guarantee program
Brief trends of ESCO Industry in Thailand

- Energy audit carried out at 4 sites in 1996 supported by GEF (6 Million Thai Bath).
- Only one factory carried out ESCO project (190 Million Thai Bath, SPP = 4.9 year). Subsidized 30% by ENCON Fund.
- EGAT had supported to promote ESCO. And EGAT tried to establish ESCO company, but it had stopped.
- FTI (The Federation of Thai Industries) support to promote ESCO as ESCO association, now.
- 56 ESCOs registered to ESCO Fund.
Activities of Thai ESCOs

56 ESCOs in Thailand


- Hitach, Ltd. from Japan

- Market scale of EPC is 3.2 Billion Thai Bath (86.9 Million USD) in 2006

- FTI (The Federation of Thai Industries)

- FTI support to promote ESCO industry as ESCO association

- ESCO Fund

- Low interest loan provided by ENCON Fund
Promotion program of ESCO industry (1)

- Market development programs carried out can be categorized:
  - (1) baseline surveys/feasibility studies
  - (2) skill development
  - (3) public awareness campaigns
  - (4) founding of core businesses and support for operations
  - (5) project development
  - (6) financial support
  - (7) strengthening of policies and systemic reforms

- In general, through providing such programs, it is possible to initiate an ESCO industry.
Success factors of ESCO in Asian countries(1)

- Similar programs had been in effect in Japan, China, Thailand and India, but success factors of these four main countries vary.
  - Japanese case: most active in Asia
    - government initiative, regulation for energy efficiency (ECL), and the contributions of JAESCO and leasing companies as private sector participants
  - Chinese case: most active in Asia
    - initiative and intensive investment by WB/GEF to pilot ESCOs and a loan guarantee program
Success factors of ESCO in Asian countries (2)

- Indian case: still very small market
  - initiative by international organizations
  - initiatives of international organizations were concentrated in China, but dispersed in India
- Thai case: middle developed in Asia
  - government initiative, regulation for energy efficiency (ENCON Act), and financial incentives
Asian EE market leached turning point

- EE market would be increase under steady economic growth condition
  - Target of EE: increase profitability
    - Bakery with long line: Focus investment to increase products
    - Bakery with no line: Focus investment to increase profitability and quality
  - It would be leached turning point in Asia
- Jump in oil price
- Strengthen EE policy and regulation
  - Set up production by investment to EE
  - Reinforcement of competitiveness and increase employment by development of EE innovation
Asian countries introduced ESCO, with reference to the US model. In this process, measures to introduce and spread ESCO have been carried out in each country.


This data limited performance contract based in Asian countries and 69% is performance contract projects in USA. Annual growth is around 20% in China, Thailand and USA, increase in Japan and decrease in Korea recently.
Market development programs can be categorized as (1) baseline surveys/feasibility studies, (2) skill development, (3) public awareness campaigns, (4) founding of core businesses and support for operations, (5) project development, (6) financial support, and (7) strengthening of policies and systemic reforms.

In general, through providing such programs, it is possible to initiate an ESCO industry.

It is important to strengthen energy efficiency policy, reform procurement systems of government, develop financial mechanisms, receive intensive investment by government or international organizations and develop an ESCO association.
Asian EE market leached turning point.

Amid the current global financial crisis, we wonder if energy efficiency investment will be reduced.

But, we would like to insist that now is a good chance to invest in energy efficiency and ensure future profitability.

Thank you for Listening!!

Idea source: Thomas Friedman “Green Revolution”
Thank You for Listening!

http://www.jyuri.co.jp

Help! I need some ESCO!
Back ground slides
Share by type of contract

Data source: JAESCO survey, 2008
Energy-efficiency retrofit projects

(Data source: J AESCO survey, 2008)
Investment per project

Performance contract projects

Data source: JAESCO survey, 2008
Conclusion(1)

- It has been 13 years since the approach toward the ESCO business in Japan started in 1996.
- The ESCO business is expanding the market with strengthening of governmental support.
- ESCO (EPC) market are extending doubling annually, it grew up into $353 Million in 2007.
- Shared savings contracts are over 90% in 2003, 70% in 2004, 90% in 2005, 70% in 2006 and 90% in 2007.
- Average rate of energy savings is at 12-13% for both commercial and industrial facilities.
- Average simple payback period for PC projects is at 9 years for both commercial and industrial facilities.
Private sector building hold the major market share

ESCO business have mainly been “blue chip” companies in good standing

In the meantime, the number of entities who enter into ESCO business are increasing primarily with the participation from the large companies

Financial environment for ESCO business is delay

Japan is pressed to promote energy saving measures toward the ratification of the Kyoto Protocol

The ESCO business is expected to play one of the important roles with government’s countermeasures against the global warming
The step of market development of ESCO industry in Japan
Roughly categorized of ESCO promotion programs (1)

- Improving policy infrastructure
  - Elaboration of the warming countermeasures and energy-saving policies (various laws and systems and action plan)
  - Positioning ESCO in energy-saving policies, and taking measures to support ESCO (the energy consumption curtailment target for ESCOs, subsidies, etc.)
- Supporting ESCO in starting stage (Introductory study, feasibility investigation, experimental project, market research)
Roughly categorized of ESCO promotion programs(2)

- Capacity building (measurement & verification guideline, standard contract, introduction guideline for local authorities)
- Engaged in spread and enlightenment activity (explanatory meeting, conference, exhibition, commendation system)
- Promoting of public facility Introduction
- Establishing and fostering of propulsive organization
Adopted programs to promote ESCO industry in Japan (1)

- Initiation of ESCO introductory study (1996)
- Implementation of feasibility study (1997)
- Establishment of the Japan Association of Energy Service Companies (JAESCO) (1999)
- ESCO explanatory meeting and distribution of case study (2000 - Present)
Adopted programs to promote ESCO industry in Japan(2)

- Introduction of full-scale ESCO projects to local authorities (2001)
- ESCO promotion as a policy target (2001)
- ESCO market size survey start (2001 - Present)
- Preparation of guideline to introduce ESCO projects to local authorities (2004)
Adopted programs to promote ESCO industry in Japan (3)

- ESCO project introduction start to local authorities under the PFI Law (2003)
- ESCO project Introduction to national facilities (2004)
- The Kyoto Protocol effectuation (2005)
- The First Asia ESCO Conference (2005)
- Start of Superior ESCO Project Commendation (2005)
- The Second Asia ESCO Conference (2007)
- The Law Concerning Environmental Consideration Contracting (2007)
- The Energy Conservation Law was revised (2008)
The diagram illustrates the organization chart of the World Bank/GEF China Energy Efficiency Project. Key components include:

- **WB, GEF**: The World Bank and the Global Environment Facility
- **NDRC**: National Development and Reform Commission
- **PMO**: Project Management Office
- **EMCA**: Loan guarantee Implementing agency
- **Financial department in China**: Financial institutions
- **NECIDC**: NDRC Energy Conservation Information Dissemination Center

Implementation agencies include:

- Beijing EMC
- Liaoning EMC
- Shangdong EMC
- New EMC (multiple instances)

The chart is divided into two phases:

- **The first phase**: NDRC to Financial department in China
- **The second phase**: EMCA to Financial institutions

**Note:**
- NDRC: National Development and Reform Commission
- PMO: Project Management Office
- NECIDC: NDRC Energy Conservation Information Dissemination Center
Measures to promote and expand ESCO in China

- Systematization of financial system by Government
  - Systematization of recovery after bankruptcy

- Reform of business customs for acquire trust from market
  - Develop and promote standard contract/ Regulation of non-fulfillment of a contract
  - Promote original ESCO concept to ESCOs, customers and financial organizations
  - Implement a system to recognize superior ESCOs

- Capacity Building of ESCOs
  - Develop guideline of M&V/ Training of energy audit, EE skills, Technology information, M&V and contract

- Develop data base
Promotion program of ESCO industry in Asia
<Preliminary review>

- Basic research for ESCO introduction: Description of ESCO business, issues to address for introduction, review of introduction program
  
  - China with the support of WB/GEF
  
  - India with the support of USAID
<Capacity building>

- Preparation of technical guidelines: guidelines on M&V, standard contract, etc.
- Preparation of ESCO introduction manuals: manuals for customers to explain method of introducing ESCO
- Capacity building for financial institutes: proved information, guideline for method of evaluating energy efficiency, support for development of finance products
- Capacity building for ESCOs: lecture, trainings, technical instruction
- 3-CEE project (countries in scope are China, India and Brazil) supported by the WB group.
- Capacity building for ESCOs.

Also, in several countries including India, technical trainings are provided by USAID, etc.
<Promotion program>

- Publish successful case studies.
- Seminar, conference, exhibition
- Provide information such as newsletters, websites etc.
- Commendation program for excellent ESCO projects

✓ In India was supported by USAID and 3-CEE.
✓ In China, EMCA was supported by GEF.

On the other hand, like in Malaysia or Thailand, government or governmental organization play a main role in these activities, because there is not ESCO association.
<Establishment of project body/ operation support>

- Set up of ESCO association/operation support
- Support to set up ESCOs
- Accreditation program for ESCOs: BEE in India. Preliminary accreditation system to simplify government expedition procedure (Super ESPC in USA, Australia, etc.) and accreditation system (NAESCO etc.) for nurturing excellent ESCOs are available.

- The typical program for it is the supports to establishment of ESCO providers in China by GEF.

- In India, USAID supports operators by supplying supports to ESCOs in information business. In addition, supports to establish ESCO association is being provided by 3-CEE project (ICPEEB: Indian Council for Promotion of Energy Efficiency Business).
<Development of business>

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

- Energy audit is conducted by GEF in Malaysia
- The pilot project is implemented aided by low interest financing by GEF fund.
- In Thailand, the energy audit is conducted by GEF and the subsidy from ENCON Fund is allocated for pilot projects.

While no pilot project is conducted in China, GEF supports to establishment of ESCOs and the low interest financing by the WB have sufficiently covered the demands.
<Finance support>

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

✓ The low interest loan and loan guarantee are the main part of it.

✓ Low interest finance: by WB in China/ by WB, ADB, JBIC, USAID, etc. in India/ and by GEF in Malaysia.

✓ Loan guarantee: by GEF In China, 3-CEE in India

✓ Governmental subsidy program: by the national fund based on ENCON fund in Thailand

✓ Tax rebate: in Thailand and China
Promotion program of ESCO industry (7)

<Reinforcement of policy/ reformation of acquisition regulation>

➢ Reinforcement of regulations for energy conservation
➢ Reformation of acquisition regulations to introduce ESCO in governmental facilities
## Promotion program of ESCO industry (2)

<table>
<thead>
<tr>
<th>Program</th>
<th>China</th>
<th>Thailand</th>
<th>India</th>
<th>Malaysia</th>
<th>Philippines</th>
<th>Japan</th>
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<td></td>
<td>USAID</td>
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<td>METI</td>
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<td>Technical guideline</td>
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<td>EGAT</td>
<td>3-CEE</td>
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<td>ECCJ</td>
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<td>Capacity building for financial institutes</td>
<td>3-CEE</td>
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<td>EGAT</td>
<td></td>
<td>USAID/3-CEE</td>
<td>PTM</td>
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<td><strong>Promotion program</strong></td>
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<tr>
<td>Publish successful case studies</td>
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<tr>
<td>Seminar, conference, exhibition</td>
<td>EMCA/JAESCO</td>
<td>DEDE/JAESCO</td>
<td>PRCA/FICC</td>
<td>PTM</td>
<td></td>
<td>ECCJ</td>
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<tr>
<td>Newsletters, website etc</td>
<td>EMCA/3-CEE</td>
<td>DEDE</td>
<td>3-CEE</td>
<td>PTM</td>
<td></td>
<td>ECCJ</td>
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<td>Commendation program for ESCO projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Setup ESCO association/operation support</td>
<td>GEF</td>
<td>FTI</td>
<td>3-CEE</td>
<td>PTM</td>
<td>DOE</td>
<td>ECCJ</td>
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<td>USAID</td>
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<td><strong>Development of business</strong></td>
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<td>Energy audit</td>
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<td>GEF/ENCON Fund</td>
<td>USAID</td>
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<td>GEF</td>
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<td>Pilot projects</td>
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<td>USAID</td>
<td>GEF</td>
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<td>Introduction ESCO projects into government</td>
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<td>NEDO</td>
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<td>3-CEE</td>
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<td>Tax rebate</td>
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<td><strong>Reinforcement of policy</strong></td>
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<td>Reinforcement of regulations for EE</td>
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<td>DEDE</td>
<td>BEE</td>
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<td>DOE</td>
<td>METI</td>
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<td>Reformation of acquisition regulations</td>
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</tr>
</tbody>
</table>

Note: The blank cells represent unavailability of the corresponding program.

PTM: Pusat Tenaga Malaysia, MIDF: Malaysian Industrial Development Finance Bhd, IFC: International Finance Corporation

3-CEE is supported by UNDP and funded by UNF, ESMAP, ASTAE and DFID
EE Business is net-work business

- Develop maintenance net-work system which keep up with on time
  - Design services is first step
  - Energy audit
  - Management of construction or installation
  - Provide maintenance services
  - M&V
  - Financial arrangement
- Provide comprehensive services to keep EE performance long term
- Establish brand image
Detail survey for ESCO activities from 2001 to 2007 year

PC: Performance Contract

- Commercial PC: 5%
- Commercial non PC: 11%
- Industrial PC: 13%
- Industrial non PC: 20%
- Public sector: 19% (n=310)
- Private sector: 81% (n=1,357)
- Commercial PC: 21%
- Commercial non PC: 30%
- Others: 0%

Data source: JAESCO survey, 2008
Ratio of energy savings

<table>
<thead>
<tr>
<th>Category</th>
<th>Average Energy Savings (%)</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>13.4</td>
<td>60</td>
</tr>
<tr>
<td>Hospital</td>
<td>18.1</td>
<td>67</td>
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<td>Hotel</td>
<td>12.8</td>
<td>22</td>
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<tr>
<td>Shopping</td>
<td>8.2</td>
<td>65</td>
</tr>
<tr>
<td>School</td>
<td>11.0</td>
<td>26</td>
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<tr>
<td>Welfare center</td>
<td>15.2</td>
<td>4</td>
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<tr>
<td>Others</td>
<td>19.4</td>
<td>62</td>
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<tr>
<td>Average</td>
<td>13.5</td>
<td>276</td>
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</table>

Data source: JAESCO survey, 2008
### Simple pay-back period

#### Performance Contract

**Project of commercial buildings**

<table>
<thead>
<tr>
<th></th>
<th>GSC</th>
<th>SSC</th>
<th>PC Ave</th>
<th>non PC</th>
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<tr>
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<td>10.6</td>
<td>8.6</td>
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<tr>
<td><strong>Industrial</strong></td>
<td>6.9</td>
<td>10.1</td>
<td>8.7</td>
<td>6.9</td>
</tr>
</tbody>
</table>

**Data source:** JAESCO survey, 2008

**Ave:** 3.6 years, n=432

**Average pay-back period**

- **Under 1 year:** 3.9%
- **2-3 years:** 10.6%
- **3-4 years:** 12.7%
- **4-5 years:** 12.7%
- **5-6 years:** 8.8%
- **6-7 years:** 8.8%
- **8-9 years:** 9.7%
- **9-10 years:** 11.6%
- **Up to 10 years:** 11.6%
- **Unknown:** 42.6%
Energy efficiency measures for commercial sector PCPs

Data source: JAESCO survey, 2008

<table>
<thead>
<tr>
<th>Category</th>
<th>Measures</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Air Conditioning</td>
<td>Pump/Fan INV</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>VAV, VAVV</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Air to air heat exchangers</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Open air-AC</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Control of open air load</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>CO2 Controller by CO2 sensor</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Intermittent control</td>
<td>2</td>
</tr>
<tr>
<td>Boiler &amp; Freezer</td>
<td>CO2 Controller by CO2 sensor</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Renewal of a boiler</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Renewal of a freezer</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>On/Off control</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>HF Inv</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Compact Lighting</td>
<td>4</td>
</tr>
<tr>
<td>Lighting</td>
<td>HD lamp</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Occupancy censor</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Lighting</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>High efficiency lead lamp</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Other lighting</td>
<td>2</td>
</tr>
<tr>
<td>Electric power and control</td>
<td>High efficiency transformer</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>High efficiency motor</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>BEMS</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Demand control</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Water conservation</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: The chart indicates the percentage of measures implemented in the commercial sector, with a total of 432 cases surveyed. The measures are categorized by their effect on energy efficiency.
### Energy efficiency measures for industrial sector PCPs

**Data source:** JAESCO survey, 2008

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Conditioner</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump/Fan INV</td>
<td>10.8%</td>
<td>22</td>
</tr>
<tr>
<td>VAV,WWV</td>
<td>0.5%</td>
<td>1</td>
</tr>
<tr>
<td>Air to air heat exchangers</td>
<td>0.5%</td>
<td>1</td>
</tr>
<tr>
<td>CO2 Controller by CO2 censor</td>
<td>0.9%</td>
<td>2</td>
</tr>
<tr>
<td><strong>Boiler &amp; Freezer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cogeneration</td>
<td>14.6%</td>
<td>31</td>
</tr>
<tr>
<td>Renewal of a boiler</td>
<td>4.7%</td>
<td>10</td>
</tr>
<tr>
<td>Renewal of a freezer</td>
<td>7.5%</td>
<td>16</td>
</tr>
<tr>
<td>On/Off control</td>
<td>1.4%</td>
<td>3</td>
</tr>
<tr>
<td><strong>Lighting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP Inv</td>
<td>3.3%</td>
<td>7</td>
</tr>
<tr>
<td>Compact Lighting</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>HID lamp</td>
<td>3.3%</td>
<td>7</td>
</tr>
<tr>
<td>Inv lighting</td>
<td>6.1%</td>
<td>13</td>
</tr>
<tr>
<td><strong>Electric Power</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High efficiency transformer</td>
<td>0.9%</td>
<td>2</td>
</tr>
<tr>
<td>High efficiency motor</td>
<td>0.9%</td>
<td>2</td>
</tr>
<tr>
<td>BEMS</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Industrial Process</td>
<td>2.8%</td>
<td>6</td>
</tr>
</tbody>
</table>

Total respondents: 215
Distribution of floor area in commercial facilities

Performance contract projects

- Unknown: 26%
- 1,000 m²: 0%
- 1,000-4,999 m²: 6.8%
- 5,000-9,999 m²: 7%
- 10,000-49,999 m²: 40%

Ave: 40,077 m²
n=432

Non-Performance contract projects

- Unknown: 38%
- 1,000 m²: 1%
- 1,000-4,999 m²: 6.8%
- 5,000-9,999 m²: 10%
- 10,000-49,999 m²: 33%

Ave: 30,966 m²
n=695

Data source: JAESCO survey, 2008
Floor area of commercial building’s PC projects

Data source: JAESCO survey, 2008
### Project scale

#### Performance Contract Projects

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>2,196</td>
<td>1,701</td>
</tr>
<tr>
<td>Hospital</td>
<td>2,762</td>
<td></td>
</tr>
<tr>
<td>Hotel</td>
<td>864</td>
<td></td>
</tr>
<tr>
<td>Shopping</td>
<td>868</td>
<td></td>
</tr>
<tr>
<td>School</td>
<td>4,360</td>
<td></td>
</tr>
<tr>
<td>Welfare center</td>
<td>2,821</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>1,043</td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
- GSC: Guaranteed Savings Contract
- SSC: Shared Savings Contract

Data source: JAESCO survey, 2008
Ratio of energy savings of PC projects

Commercial buildings

Average: 13.5%
Number of cases: 276

15-20%: 14.1%
10-15%: 21%
20-30%: 24.6%
30%+: 6.9%

5-10%: 16.7%
-5%: 16.7%

Industrial facilities

Average: 12.7%
Number of cases: 90

15-20%: 13.3%
10-15%: 25.6%
5-10%: 26%
-5%: 20.0%

Data source: JAESCO survey, 2008
Simple pay-back period of PC projects

Commercial buildings

- Under 1 year: 3.9%
- 2-3 years: 10.6%
- 4-5 years: 12.7%
- 6-7 years: 8.8%
- 8-9 years: 9.7%
- 10+ years: 9.7%
- Unknown: 53.5%
- Total: 42.6%

Average: 8.6 years

n=432

Industrial facilities

- Under 1 year: 0.9%
- 2-3 years: 5.6%
- 4-5 years: 13.5%
- 6-7 years: 8.8%
- 8-9 years: 7.0%
- 10+ years: 10.7%
- Unknown: 53.5%
- Total: 11.6%

Average: 8.7 years

n=215

Data source: JAESCO survey, 2008
Contract period

Data source: JAESCO survey, 2008
Contract period of PC projects

Commercial buildings

- Under 1 year: 2.8%
- 2-3 years: 18.8%
- 4-5 years: 10.4%
- 6-7 years: 11.1%
- 8-9 years: 16.2%
- up to 10 years: 29.4%
- unknown: 11.3%

Ave: 7.8 years
n=432

Industrial facilities

- Under 1 year: 1.9%
- 2-3 years: 16.7%
- 4-5 years: 9.8%
- 6-7 years: 8.8%
- up to 10 years: 37.2%
- 8-9 years: 8.8%
- unknown: 16.7%

Ave: 8.1 years
n=215

Data source: JAESCO survey, 2008
Thai ESCO market leached turning point

- There are many big Japanese companies
  - We thought Japanese ESCOs would on advantage
  - Japanese ESCO started in 2003 and left in 2007
  - Many Thai ESCOs started to provide ESCO services to Japanese companies
  - Based on close connection with Japanese companies and Thai companies
- Main players to develop EE market is local companies
- It is better that Japanese Government support local players direct
Brief introduction of JAESCO

http://www.jaesco.gr.jp
Objectives of J AESCO

- J AESCO was established to support development of ESCO market
- as well as ensure sound evolution of ESCO industry
- to provide customers energy efficiency with comprehensive services of high cost-performance
- thereby, resulting in progress of energy conservation and global environment protection.
Organisation

Executive board
- President
- Vice president
- Directors
- Auditor

Committee on examination of membership qualification
- Committee members for Eastern region
- Committee members for Western region

Committee on market transformation
- Project committee

Committee on public information

Financial Forum
- JAESCO office
  - Jyukankyo Research Institute
  - Energy Conservation Center Japan
Activities of committees

Committee on market transformation

- Aiming at the most effective evolution of ESCO industry and its contribution to society by exploring and advising measures to improve business environment surrounding ESCOs
- Exploring measures to encourage adoption of ESCO projects by governments as well as seeking solution to difficulties confronted for introduction of ESCO projects
- Fulfilling data based on a in-depth market survey and collecting actual performance data of member’s ESCO projects
- Examine how to manage the association
Activities of committees: continue

**Project committee**

**Seminar WG**
Holding seminars for members on the latest activity close about ESCOs three or four times annually, taken part by 100-200 members

**Training WG**
Planning two or three days training for members

**ENEX WG**
Running booths at ENEX (Energy & Environment Exhibition) held by the Energy Conservation Center Japan in Tokyo and Osaka

**Exhibition WG**
Holding ESCO exhibition and provide members with opportunities to exchange information among members and with parties concerned
Committee on public information

Carrying out plans to popularize ESCO industry such as advertising via mass media, cooperating to news reporters and taking part in various related projects

Conference WG

Holding annual conference & vendors showcase on the latest activity surrounding ESCO industry.

Lectures and panel discussion are held with leader of each business world and professionals.

Wide-ranging discussion is extended together with more than 300 participants on topics directly linked to business including governmental policies & programs, technology, finance and contracts.
Financial Forum
Making discussion about new financial scheme for ESCO projects

News letter WG
Publish news latter for members
Feature of JAESCO Members

- JAESCO established with 16 members in 1999
- 137 members have joined in 2008
- Large companies most members and all most utilities have joined JAESCO
- Over 50 ESCOs which is experienced in PC
Objectives of AEA-Net

- Shear information about activities of ESCO industries in the world
- Support upbringing ESCO industry of each countries
- Built international relationship of ESCO associations to cope with countermeasure against global warming, especially Asia
Asia ESCO Associations Network: AEA-Net: continue

Role of AEA-Net

- 1st meeting on Feb 2007 in Tokyo.
- 2nd meeting on Sep 2007 in Beijing.
- Each association's directors or representative attend the meeting.
- Each members give a presentation for activities of ESCO industry.
- Discuss how to develop ESCO market in Asia and possibility of relationship of ESCO associations.
- JAESCO host the meeting.