ESCOs in China

ESCO Workshop
Sponsored by Nexant and
King Mongkut's University of Technology Thonburi
Bangkok, 28 November 2014

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About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

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Agenda

- What is an ESCO?
- Lessons from international experience
- ESCOs in China

What is an ESCO?

What Do ESCOs Do? (1)

- ESCOs develop, install, and arrange financing for projects that improve the energy efficiency of facilities
- ESCOs accept some degree of technical and financial risk
- ESCOs generally act as project developers and undertake a wide range of tasks

What Do ESCOs Do? (2)

- Develop, design, and arrange financing for energy efficiency projects
- Install and maintain energy-efficient equipment
- Measure, monitor, and verify the energy savings achieved through projects
- Take on all or part of the risk that each project will achieve a specified level of energy savings

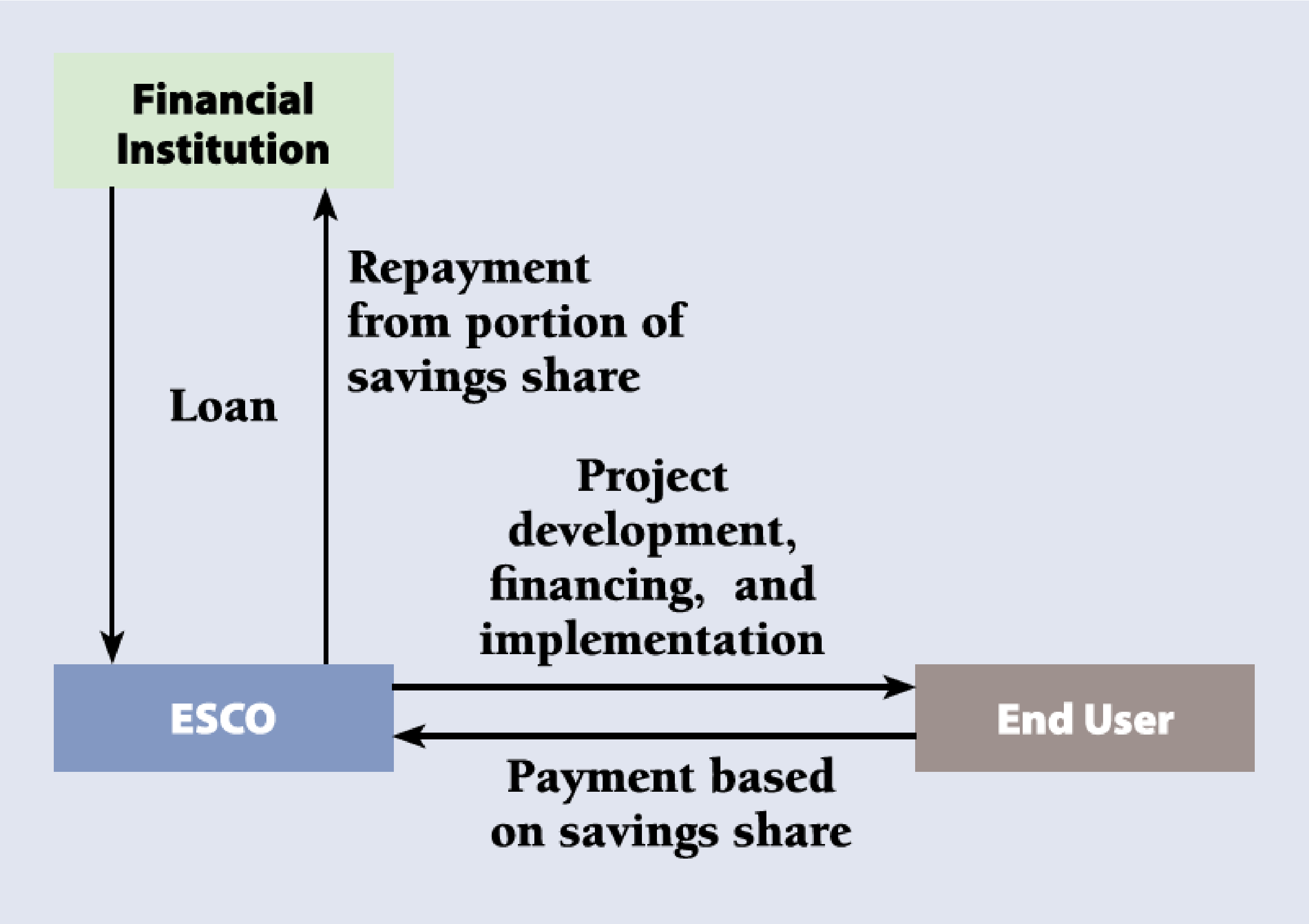
How Do ESCOs Operate?

- An ESCO's compensation is usually directly linked, under an Energy Performance Contract (EPC), to the amount of energy that is actually saved
- ESCOs typically carry out projects under one or more of three types of contracts
  - shared savings contracts
  - guaranteed savings contracts
  - fee for service contracts

Shared Savings Contracts (1)

- In shared savings contracts, the **cost savings** from implementing energy efficiency measures are shared between the ESCO and the facility owner at agreed percentages for a fixed number of years

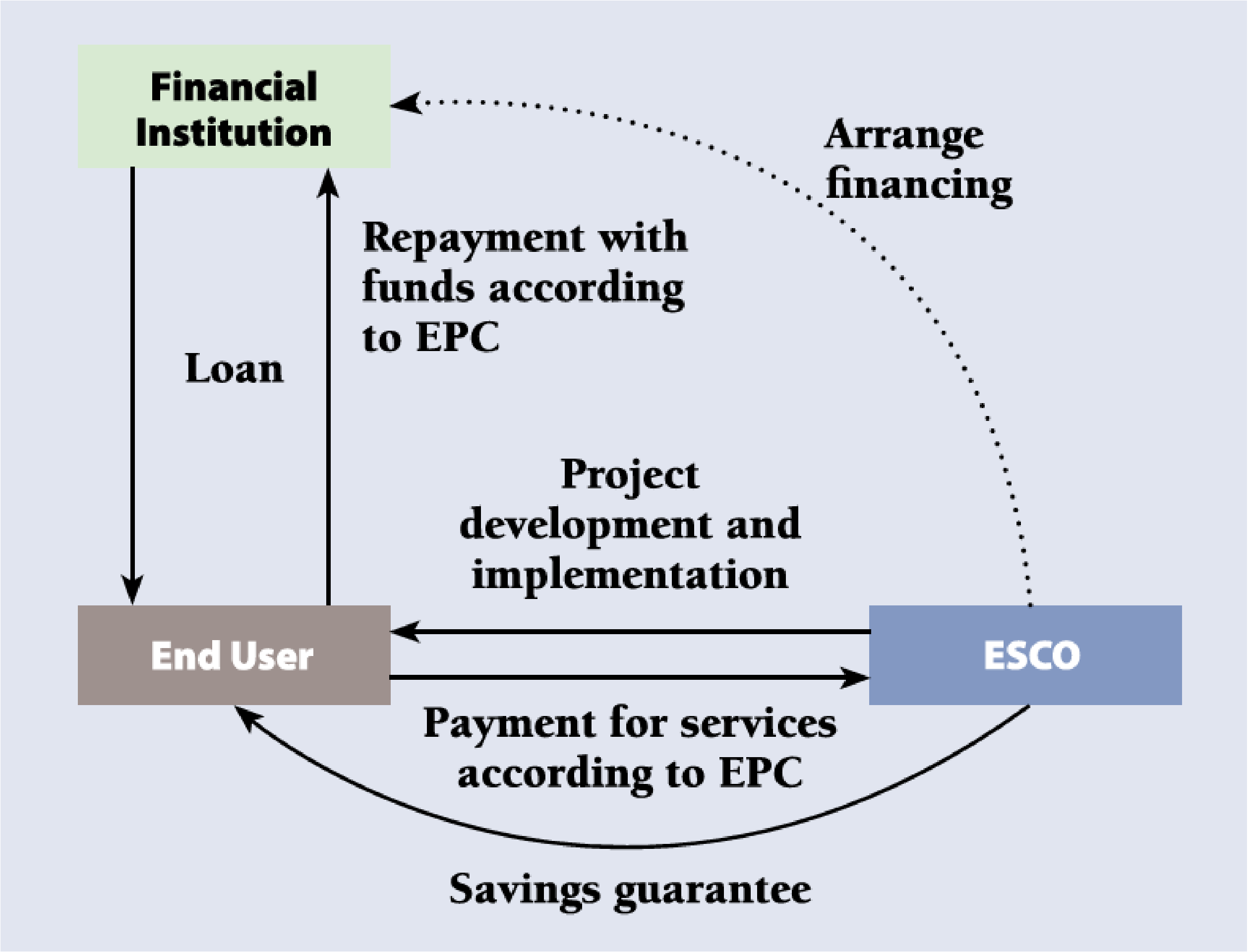
Shared Savings Contracts (2)



Guaranteed Savings Contracts (1)

- In guaranteed savings contracts, the ESCO guarantees to the facility owner a specified level of **energy savings**
- Some or all of any **cost savings** resulting from energy savings in excess of the specified level are taken by the ESCO

Guaranteed Savings Contracts (2)



Fee for Service Contracts

- In fee for service contracts, the ESCO provides specified energy efficiency services for an agreed fee
- The facility owner takes all the **cost savings** and there is no sharing of savings between the ESCO and the facility owner
- This type of contract is not performance-based

Lessons from International Experience

Advantages of the ESCO Business Model (1)

- ESCOs are attractive to facility owners
- ESCOs:
  - carry out project design and management
  - take on some or all of the project technical risks
  - provide off-balance-sheet financing
  - seek payment only from the cash flow generated by energy savings

Advantages of the ESCO Business Model (2)

- ESCOs can assure both the facility owner and the financier that the cash flow from a project will happen
- ESCOs can aggregate projects, enabling financial institutions to provide financing for a package of projects
- Aggregation can also achieve economies of scale across similar projects

Disadvantages of the ESCO Business Model (1)

- Energy performance contracts require understanding and acceptance of the concept by the parties to the contracts
- Financial institutions may be unwilling to provide funds for energy efficiency projects because they usually do not understand such projects

Disadvantages of the ESCO Business Model (2)

- Some large companies engage ESCOs only to identify energy efficiency opportunities and then proceed to finance and implement projects themselves
- Some industrial companies are reluctant to allow ESCOs to audit core industrial processes

Limited Scope of ESCO Operations (1)

- Operating an ESCO is not simple
- To become a successful and profitable business, an ESCO requires:
  - staff with a complex mix of skills, and
  - a substantial level of equity capital

Limited Scope of ESCO Operations (2)

- ESCOs often manage risks by limiting the scope of their operations
- ESCOs usually undertake only relatively small projects and operate only in some parts of the market
- ESCOs often implement only simple and low cost energy efficiency measures, and ignore more complex measures at the same site

ESCOs in China

History of ESCOs in China (1)

- The ESCO industry in China was launched in the mid-1990s as part of a deliberate plan by the Chinese central government, with support from the World Bank
- In 1995-1996 the World Bank and the Chinese government agreed to mobilise technical and financial assistance to introduce and develop energy performance contracting in China

History of ESCOs in China (2)

- Funding was provided to three new pilot Chinese ESCOs that were started with assistance from the Liaoning and Shandong provincial governments and the Beijing municipal government
- This funding provided the three ESCOs with a dedicated large line of credit from the start, enabling them to focus on making the new energy performance contracting business model actually work

History of ESCOs in China (3)

- The ESCO industry grew slowly at first and then more rapidly so that by 2011, there were about 3,900 ESCOs in China
- Many of these are small companies with registered capital of less than CNY 5 million (USD 0.8 million), and many have tried only one or two EPC projects
- There are also about 20 very large ESCOs with registered capital of more than CNY 100 million (USD 16 million)

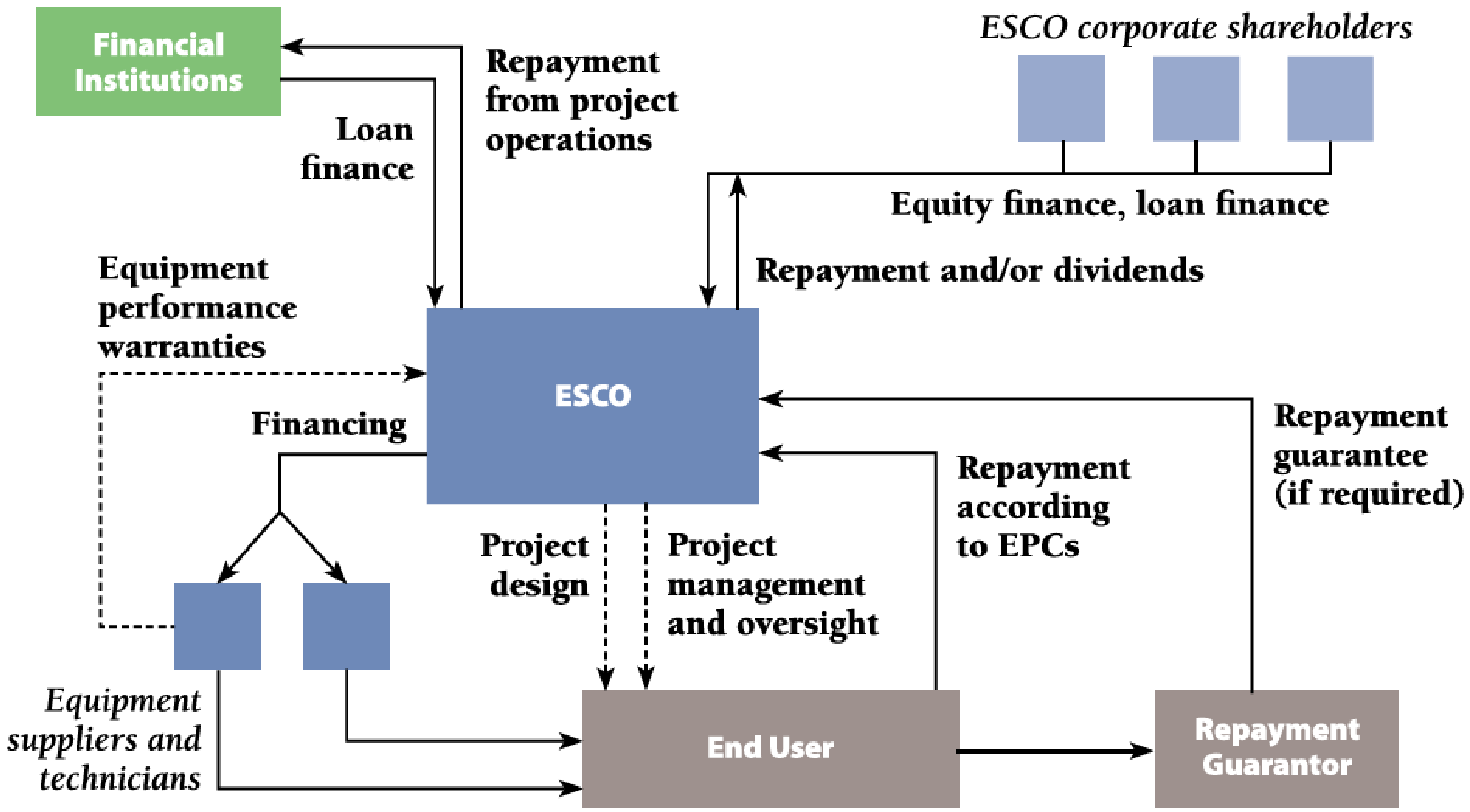
What Do ESCOs Do in China?

- ESCOs in China undertake detailed project design, manage most project implementation aspects, and guarantee energy savings performance
- Financing, contractual, and asset ownership arrangements vary
- In China, energy performance contracts are classified into three types:
  - shared savings contracts
  - guaranteed savings contracts
  - outsourcing contracts

Shared Savings Contracts in China (1)

- In the shared savings contract used in China, ESCOs provide the bulk of project financing
- This financing may be supported by a loan to the ESCO from a financial institution, a repayment guarantee from a guarantee company, or funding from the ESCO's own corporate shareholders
- ESCOs are compensated by the facility owner from a portion of the cost savings resulting from the project

Shared Savings Contracts in China (2)



Shared Savings Contracts in China (3)

- The minimum cost savings stream from the project is estimated by the ESCO, usually conservatively, agreed by the facility owner, and included in the contract
- Usually, the contract provides for payment streams to the ESCO based on an agreed percentage share of the estimated cost savings stream, subject to verification that at least the agreed level of energy savings has been achieved
- Any additional cost savings are usually taken by the facility owner

Shared Savings Contracts in China (4)

- As long as the project is implemented as originally designed, and the estimated energy savings are achieved, these contracts typically result in a predictable payment stream to the ESCO
- Hence, most Chinese shared savings contracts are actually not the same as the traditional "shared savings" contracts used in international markets
- In addition, the assets created by the project are owned by the ESCO until contract completion, when they are transferred to the facility owner, usually for no charge

Guaranteed Savings Contracts in China

- Facility owners provide the bulk of project financing themselves
- Assets created by the project belong to the facility owner
- As well as providing design and implementation, ESCOs guarantee the energy savings from the project, and may receive a share of the cost savings

Outsourcing Contracts in China (1)

- ESCOs finance and install energy saving assets within the owner's facility and operate the assets over an extended period for agreed compensation
- Compensation is linked to the energy savings achieved
- ESCOs own the assets, and transfer them to the client at the end of the contract, which may be 8 to 10 years

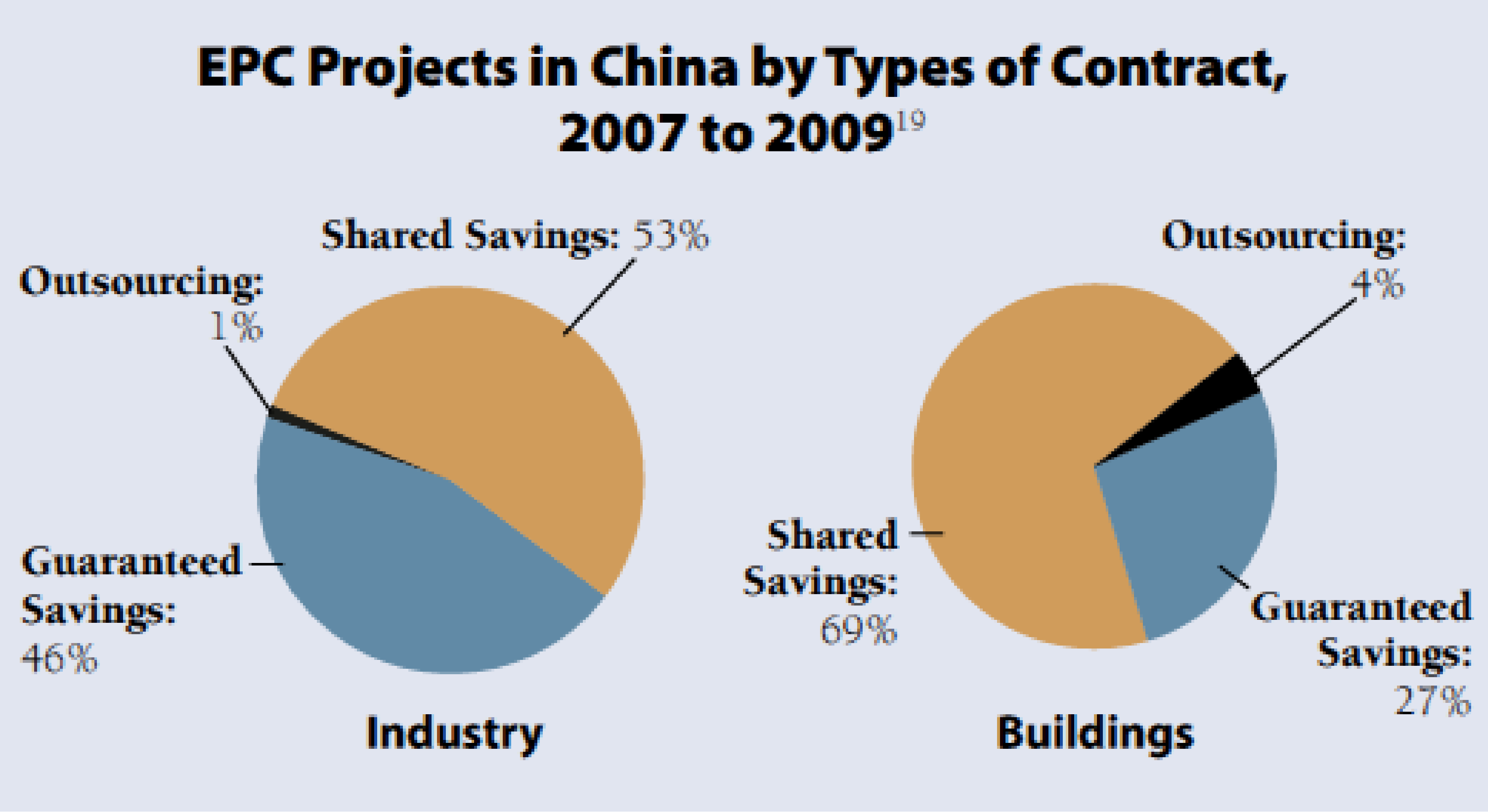
Outsourcing Contracts in China (2)

- One common example is the installation of on-site "build-own-transfer" power generating equipment using waste heat or byproduct gas from the manufacturing process located at the site
- An ESCO constructs and operates the generating equipment, purchases the process energy resource for a small fee or no charge, and sells the electricity to the facility owner at a rate below the cost of purchasing electricity from the grid

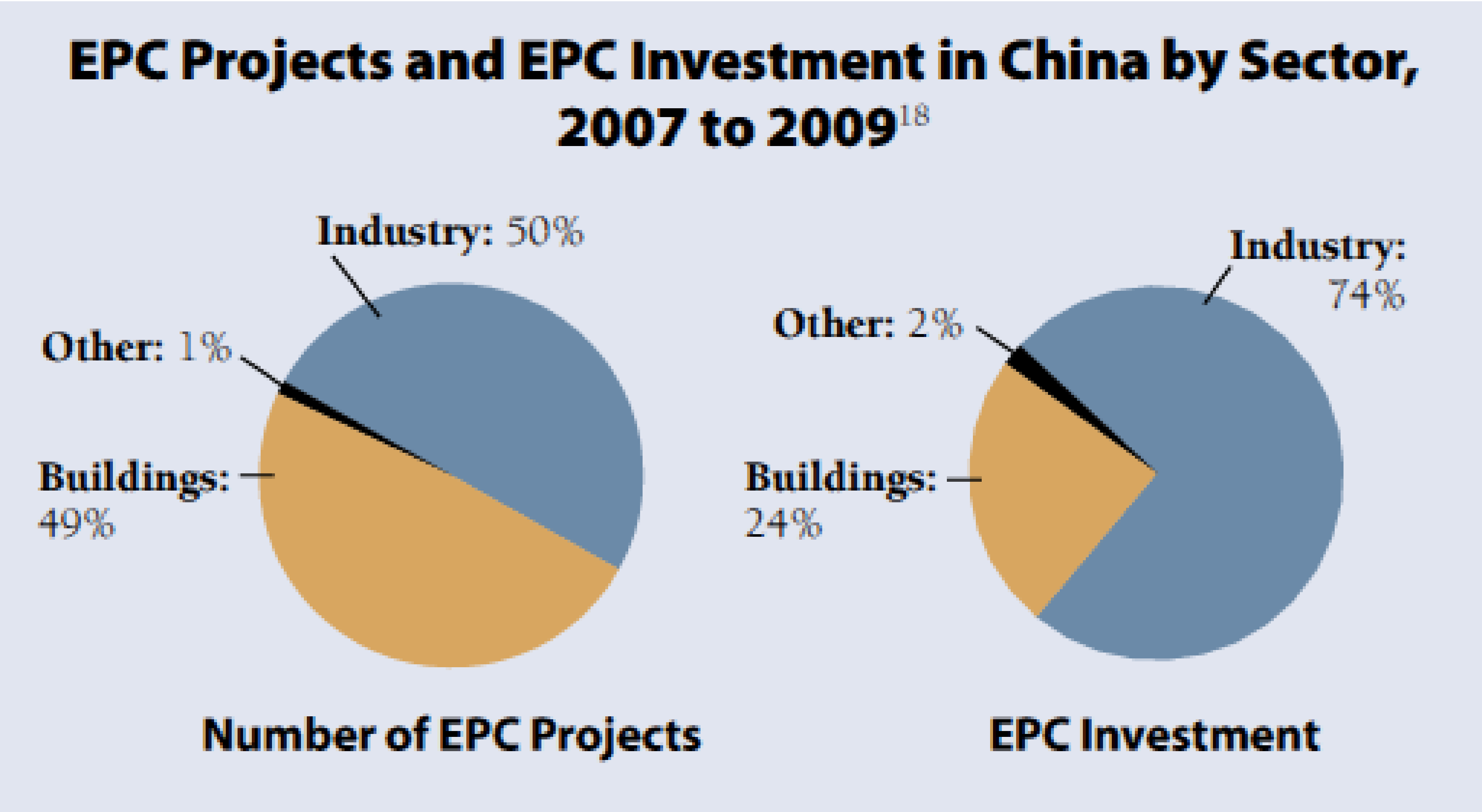
ESCO Markets in China (1)

- The two main markets for ESCOs in China are:
  - industry; and
  - commercial buildings
- Industrial projects are generally equipment-focused, including boilers, motor drive systems and cooling systems
- Commercial building projects focus primarily on HVAC systems

ESCO Markets in China (2)



ESCO Markets in China (3)



ESCO Markets in China (4)

- Facility owners in China prefer shared-savings contracts, if they can be provided at reasonable cost
- The ESCO provides the financing off the facility owner's balance sheet
- Facility owners need not provide most of the funds nor pay the ESCO if the energy savings are not achieved

Government Support for ESCOs in China (1)

- In April 2010, China's State Council endorsed policy initiatives supporting the development of ESCOs, including various provisions relating to qualified EPC projects:
  - financial incentives;
  - various tax exemptions;
  - government entities to include EPC payments under energy costs;
  - local governments to support ESCO operation

Government Support for ESCOs in China (2)

- In June 2010, the Ministry of Finance and the National Development and Reform Commission announced new financial incentives for projects under shared savings contracts
- Qualified shared savings EPC projects receive from the central government CNY 240 (USD 40) per ton of coal equivalent energy saved plus at least CNY 60 (USD 10) per tce from provincial and municipal governments （1 tce = 29.3 GJ)

Grid Company ESCOs in China (1)

- In 2011, the Chinese government placed an energy efficiency obligation (EEO) on the grid companies that operate electricity transmission and distribution grids and supply electricity to end-users
- The EEO requires the grid companies to achieve energy savings of at least 0.3 percent in sales volumes and demand savings of at least 0.3 percent in maximum load, both compared with the previous year's results

Grid Company ESCOs in China (2)

- The grid companies have all established ESCOs as subsidiary companies to enable them to meet their energy savings and demand reduction targets
- This use of ESCOs locates the main delivery mechanism for energy efficiency in a separate, subsidiary business unit outside the grid company core business rather than incorporating energy efficiency into the grid company business model

Grid Company ESCOs in China (3)

- The use of ESCOs to meet EEO targets raises questions about the commitment of the grid companies to achieving the targets and suggests that the EEO mechanism may not continue over the long term without further policy action by government
- Alternatively, by building energy efficiency delivery more closely into their operations, grid companies could change their business models to provide complete energy services to their customers, thereby developing a new source of revenue and also reducing operating costs

Resources

- This presentation is based on the following publication *ESCOs as a Delivery Mechanism for Grid Company DSM in China* available on the RAP website: **www.raponline.org/document/download/id/6443**
- Also see this website for other RAP publications: **www.raponline.org**