Promoting EPC Mechanism and Strengthening Northeast Asian Energy Conservation Cooperation

Shen Longhai
Senior Adviser, National Development and Reform Commission Energy Research Institute
Director, EMCA
October 2007

Overview

- Importance and urgency of energy conservation in China
- Basic concept and model of EPC energy conservation mechanism
- China Energy Conservation Promotion Project
- Suggestions

Importance and urgency of energy conservation in China

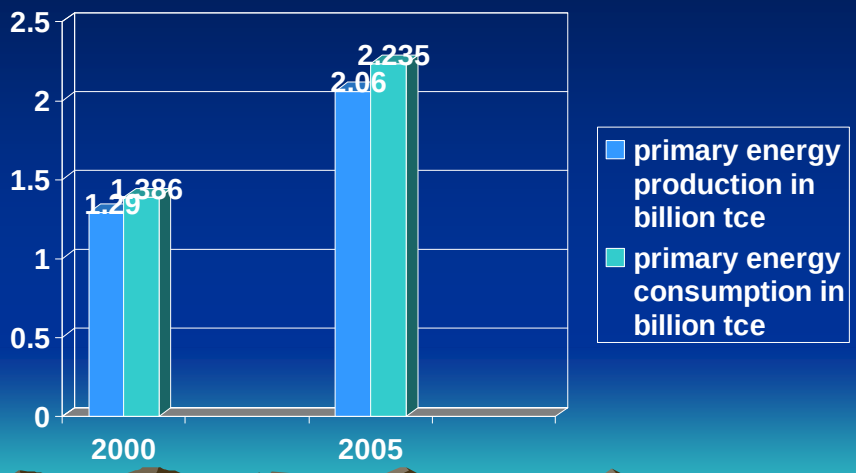
- China faces rising constraints imposed by the shortage of energy resources supply, growing supply-demand contradictions, and serious environmental pollution.

  China's huge challenge: saving energy resources, protecting ecosystem, reducing energy consumption as well as pollution.

Importance and urgency of energy conservation in China

- China's exploitable energy reserve per capita stands far below the world average. As of the end of 2002, proven reserves of coal, oil, and natural gas per capita were about 56%, 8.4%, and 5% of the world average, respectively.

Importance and urgency of energy conservation in China



Importance and urgency of energy conservation in China

- As indicated by the graph, China is currently the 2nd largest producer and consumer of primary energy following the United States. Its energy consumption coefficient of elasticity reached 1.05 during the 2000-2005 period.

Importance and urgency of energy conservation in China

- With coal being the leading source of energy, China is the 2nd largest emitter of CO_2 in the world. 70% of CO_2 and 90% of SO_2 emissions come from coal burning. SO_2 has caused one third of China's land to be encroached by acid rain.

Importance and urgency of energy conservation in China

- China's growth and energy consumption

2006	2007 (1st half)
GDP growth: 10.7% ↑	GDP growth: 11.5% ↑
Energy consumption: 9.61% ↑	
Energy use per GDP unit output: 1.33% ↓	Energy use per GDP unit output: 2.78% ↓

Importance and urgency of energy conservation in China

- Conserving energy and promoting efficient use and re-use of energy resources will be key to easing up supply-side constraints, reducing the pressure on ecosystem brought by increased energy use, and building a well-off, conservation-oriented, environment-friendly society with sustained economic growth.

Importance and urgency of energy conservation in China

Chinese leaders attach great importance to energy conservation

---- Resources conservation is one of China's basic national policies;

---- Chinese government has formulated <Medium- and Long-term Plans on Energy Conservation> in 2004;

Importance and urgency of energy conservation in China

----Chinese government laid out the goal of reducing energy consumption per unit of GDP output value by some 20% during the <Eleven Five Plan>(from 2006 to 2010);

----Chinese government has formulated <Decision on Strengthening Energy Conservation> in 2006.

Importance and urgency of energy conservation in China

----The State council has made the <Leading Group on Energy Conservation and Pollution Reduction> and <Integrating Implementing Project on Energy Conservation and Pollution Reduction>.

Importance and urgency of energy conservation in China

- In his 2007 report on government work, Premier Wen Jiabao proposed eight measures aimed at
  - improving energy efficiency,
  - protecting environment,
  - improving energy conservation policies and regulations,
  - reducing pollution,

Importance and urgency of energy conservation in China

  - developing technology,
  - reinforcing laws,
  - strengthening supervision, and implementing a system of accountability and responsibility for every facility in saving energy and protecting environment.

Importance and urgency of energy conservation in China

- In April, Wen decided to form an energy conservation and emission reduction task team in the government to tackle the following 10 issues:

  1, Effectively control the growth of sectors with high consumption and high pollution;

  2, Speed up the phase-out of old technology and equipment;

Importance and urgency of energy conservation in China

3,Fully implement key energy conservation and emission reduction projects;

4,Focus on key corporations' implementation;

5,Promote technology and innovation;

6,Develop cyclic economy;

Importance and urgency of energy conservation in China

7, Improve systems and policies;

8, Increase spending on energy conservation and emission reduction;

9, Improve legislations and law enforcement; and

10,Strengthen monitoring and management.

Importance and urgency of energy conservation in China

- Main problems and obstacles:

  China has not yet established a new energy conservation mechanism that adapts to market economy. Some mechanisms widely adopted overseas only have pilot projects or are still in try-out stage in China. For example, EPC -- Energy Performance Contracting --was introduced in 1998 but its nationwide adoption has not been realized.

Basic concept and model of EPC energy conservation mechanism

- What is EPC?

  EPC, introduced in developed countries in the wake of oil crisis in the 1970s, is a practical and effective way to finance and install proven energy-efficient technologies, improve the energy performance of your building or facility, and save your money and energy.

Basic concept and model of EPC energy conservation mechanism

Your energy efficiency plan is typically designed and installed by an energy service company, or ESCO. You pay the ESCO through reduced energy bills, typically sharing the energy cost savings over a predetermined length of time, after which all of the energy savings revert to you, the facility owner.

Basic concept and model of EPC energy conservation mechanism

- What is ESCO?

  Also known in China as EMCo or energy management companies, is a business that designs, installs, maintains, and in many cases finances retrofit and upgrade projects to improve energy efficiency of buildings and facilities. EMCo typically use performance contracting as a way to finance and implement energy efficiency contracts, which will result in not only profits but social and environmental benefits.

Basic concept and model of EPC energy conservation mechanism

- **There are three EPC models currently adopted in China.**

  1) Energy conservation profit sharing – ESCO finances and implements energy efficiency contract and shares profits with client in line with agreement. All equipment and profits will belong to client after contract expires.

Basic concept and model of EPC energy conservation mechanism

2) Energy conservation guarantee – ESCO implements contract financed by client and makes profits from guaranteed energy savings. ESCO is obliged to compensate client if the energy savings do not reach the level guaranteed in the contract.

Basic concept and model of EPC energy conservation mechanism

- *3) Energy fee trusteeship – ESCO manages and upgrades energy equipment and systems for client. Both will benefit from reduced energy costs.*

China Energy Conservation Promotion Project

- China's largest energy saving project in partnership with World Bank and Global Environment Fund aims at improving energy efficiency, reducing greenhouse gas emissions, and protecting global environment. The project is divided into two phases.

China Energy Conservation Promotion Project

- Phase I: 1998 - June 2006

  Three pilot energy service companies:

  Beijing EMCo

  Liaoning EMCo

  Shandong EMCo

China Energy Conservation Promotion Project

No. of clients	Total projects	Total investment	Net earnings
405	475	RMB 1.33 bln	EMCo: RMB 480 mln Clients: 8-10 x RMB 480 mln

China Energy Conservation Promotion Project

- The Project has brought in both energy conservation and environmental benefits:

  -- annual energy saving of 1.49 million tce

  -- annual carbon dioxide reduction of 1.45 million tons

China Energy Conservation Promotion Project

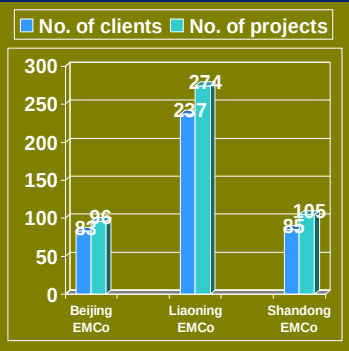
- Areas of focus of energy conversation projects implemented by the three pilot EMCo

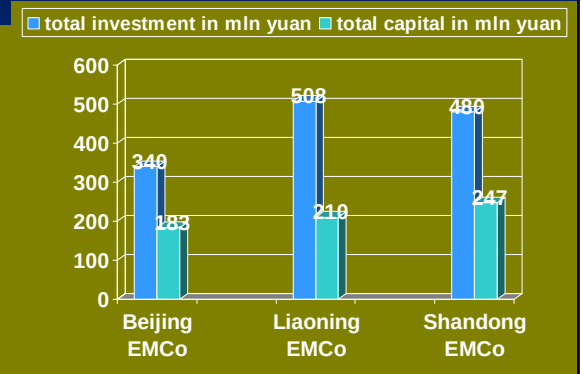
  Beijing EMCo: buildings

  Liaoning EMCo: industrial boilers, steam heating systems, etc.

  Shandong EMCo: industrial boiler retrofit, district cogeneration, etc.

China Energy Conservation Promotion Project





China Energy Conservation Promotion Project

- Phase II: 2003 – 2008

  The objective of Phase II is to promote the adoption of EPC energy saving mechanism, foster and develop energy service industry, expand investment in energy efficiency projects, and reduce carbon dioxide emissions and other pollution.

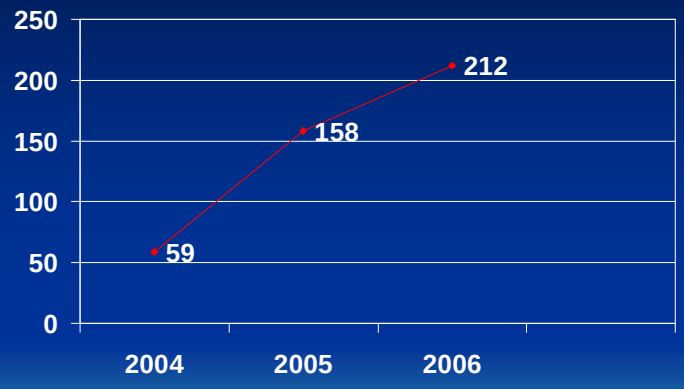
China Energy Conservation Promotion Project

- Phase II includes two subprojects –

  1) a Loan Guarantee Special Fund was established to help EMCo secure loans from commercial banks to implement energy efficiency projects.

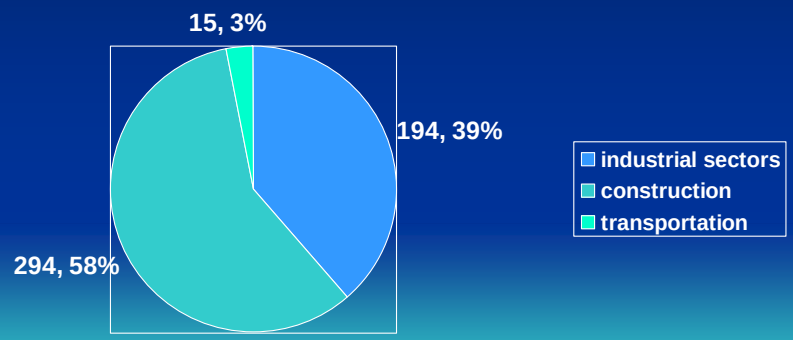
  2) the Energy Management Company Association (EMCA) was created in April 2004 to facilitate the operation of EPC in China.

China Energy Conservation Promotion Project



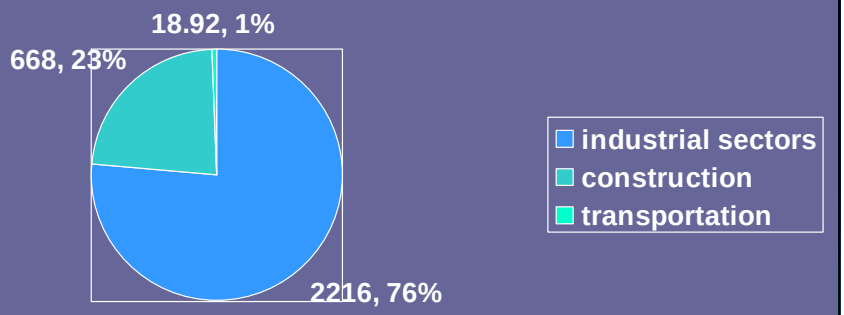
China Energy Conservation Promotion Project

Energy conservation projects implemeted by EMCA members between 2004 and 2005



China Energy Conservation Promotion Project

Capital spending in the EMCA projects in 2004-2005 (in mln yuan)



China Energy Conservation Promotion Project

- **The Loan Guarantee Special Fund funded 85 projects between 2004 and 2006.**

  total investment: 440 million yuan
  amount loaned: 274 million yuan
  amount guaranteed: 247 million yuan

China Energy Conservation Promotion Project

----annual energy conservation: 261,000 tce

----annual reduction of carbon dioxide emission: 168,000 tons

Suggestions

1) Strengthen energy conservation cooperation among each Northeast Asian country.

- Since there exist no differences among Northeast Asian governments in terms of energy conservation cooperation, we should deepen our cooperation both bilaterally and multilaterally.

Suggestions

- Companies with high energy consumptions, energy service companies and financial institutions should further collaborate in this area. Many firms in Japan, South Korea, and China should use their technology, products, and management skills and experiences to promote such cooperation and exchange.

Suggestions

2) Strengthen cooperation in energy saving technology, products and management.

- China and Japan should work together on the development of clean coal technology.
- We should increase explorations and efficient use of natural gas, liquefied natural gas, and coal-bed gas.

Suggestions

- Japan has complete energy conservation laws and regulations as well as expertise and management skills, and therefore we should strengthen our cooperation with Japan.

Suggestions

3) Strengthen cooperation in promoting EPC and Electricity Demand-side Management mechanisms.

- It is essential that we continue to develop the energy conservation industry and promote such concepts as EPC and DSM in Northeast Asia. Multilateral cooperation among China, Japan, and South Korea is especially important.

Suggestions

- With the 2nd Asia ESCO Conference held in Beijing in September, we should continue to promote cooperative relations among energy service companies in the region. EMCA and JAESCO have signed the cooperation agreement on ESCO in Sep.27,2007 in Beijing.

Suggestions

4) **Strengthen cooperation in technological exchange and personnel training.**

- We should in particular further collaborate over energy auditing, measurement and verification on energy saving.

Suggestions

5) Strengthen cooperation in energy development and consumption to reduce green house gas emissions and contribute to global environmental protection.

Each Northeast Asian nation should further work together on the overall process of energy conservation and environmental protection

Suggestions

- involving exploration, transportation, consumption, and transfer of energy, fossil energy in particular. They should also jointly develop new technology and products and implement more projects in an effort to reduce green house gas emissions.

Suggestions

6) **Strengthen cooperation in the development of renewable energy and use less and phase out fossil energy.**

In recent years, China has made much progress in the development and use of wind power, solar energy, geothermal energy, and biomass energy.

Suggestions

- It should deepen cooperation with regional members, Japan and South Korea in particular, in the development of renewable energy.

Contact Us

--Addr: Floor 12B, Gate 7, Dacheng Plaza,
No.28 West St. Xuanwumen,
Beijing 100053, P.R.China
--Tel: (8610) 63600182
--Fax:(8610) 63600459
Email: slh@emca.cn
Website: www.emca.cn

THANK YOU

THANK YOU