

Promoting EPC Mechanism and Strengthening Energy Conservation Cooperation in Northeast Asia

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This presentation is divided into the following four sections:

1. Importance and urgency of energy conservation in China
2. Basic concept and model of EPC energy conservation mechanism
3. China Energy Conservation Promotion Project
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Importance and urgency of energy conservation in China

As China continues to grow, it faces rising constraints imposed by the shortage of energy resources supply, growing supply-demand contradictions, and serious environmental pollution. Its leaders must deal with the huge challenge of saving energy resources, protecting ecosystem, reducing energy consumption and pollution, and protecting environment.

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.

China is currently the 2nd largest producer and consumer of primary energy following the United States. In 2005, its primary energy consumption totaled 2.25 billion tce as opposed to 2.06 billion tce in primary energy production, accounting for 14.8% and 13.7% of world respectively. The country's energy consumption coefficient of elasticity reached 1.05 during the period of 2000-2005.

With coal being the leading source of energy, China is the 2nd largest emitter of CO₂ in the world. 70% of CO₂ and 90% of SO₂ emissions come from coal burning. SO₂ has caused one third of China's land to be encroached by acid rain.

As China needs to solve so many problems as mentioned above, 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.

Realizing the importance and urgency of the matter, Chinese leaders have set resources conservation as one of China's basic national policies by placing high priority on energy conservation. The NDRC has formulated "China Medium- and Long-Term Energy Conservation Plan" in 2004. The government has laid out "Eleven Five Plan" in a bid to achieve the goal of reducing energy consumption per unit of GDP output value by some 20% within five years.

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

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;
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;
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.

Chinese government has made the key fields of energy conservation, and has implemented ten key projects of energy conservation and energy conservation activities for one thousand enterprises.

However, it must be pointed out that 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

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.

The basic concept and model of EPC is this: 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.

ESCO, or energy service companies, 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.

There are three EPC models currently adopted in China, and they are --

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

China Energy Conservation Promotion Project

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

During Phase I (from 1998 to June 2006), three pilot energy service companies were created: Beijing EMCo, Liaoning EMCo, and Shandong EMCo. They altogether have established client-provider relationships with 405 users, implemented 475 projects, and invested 1.33 billion Chinese dollars.

The project has brought in both energy conservation and environmental benefits: capacity of an annual energy saving of 1.49 million tce plus capacity of an annual carbon dioxide reduction of 1.45 million ton-c.

Areas of focus of energy conservation projects implemented by the three pilot EMCo are:

- Beijing EMCo: buildings
- Liaoning EMCo: industrial boilers, steam heating systems, etc.
- Shandong EMCo: industrial boiler retrofit, district cogeneration, etc.

Phase II refers to the period of 2003-2008. The objective of Phase II is to promote the adoption of EPC energy saving mechanism, foster and develop energy conservation service industry, expand investment in energy efficiency projects, and reduce carbon dioxide emissions and other pollution. 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 and development of energy conservation industry in China.

The Loan Guarantee Special Fund funded 85 projects between 2004 and 2006. Specifically, it invested total 440 million Chinese dollars, loaned 274 million Chinese dollars, guaranteed 247 million Chinese dollars, saved 261,000 tce in energy annually, and reduced 168,000 ton-c of carbon dioxide emission each year.

Meanwhile, EMCA members increased from 59 to 212 in the end of 2006 and implemented many energy conservation projects in the nation's industrial, construction, and transportation sectors.

Suggestions

1. Strengthen energy conservation cooperation among each Northeast Asian country. Since there are no differences among Northeast Asian governments in terms of energy conservation cooperation, we should deepen our cooperation both bilaterally and multilaterally.

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.

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.

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

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

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

With the 2nd Asia ESCO Conference held in Beijing in September, we should continue to promote cooperative relations among energy conservation service companies in the region.

4. Strengthen cooperation in technological exchange and personnel training.

We should in particular further collaborate over personnel training to create managers who are armed with strong skills for energy auditing and energy conservation measurement and verification.

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

All Northeast Asian nations should further work together on the overall process of energy conservation and environmental protection 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.

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