

# **Overview of Energy Performance Contracting**

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- Background for EPC opportunities
- Pilot EPC projects by EMSD
- Experience gained
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## Reducing Energy Intensity

2005



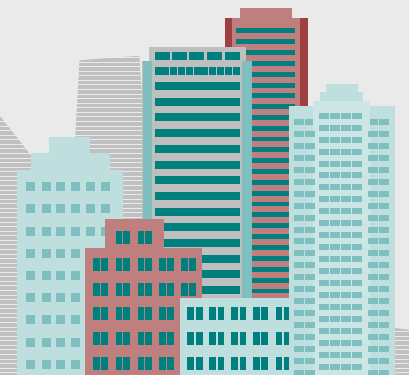
2030



The HKSAR as a member of the APEC, committed to reduce the energy intensity by at least 25% before year 2030 based on the energy intensity in year 2005, as pledged in the 2007 APEC Leaders' Declaration on Climate Change, Energy Security and Clean Energy

# Energy Saving Opportunities

## The Proposal on Mandatory Implementation of Building Energy Codes



- Public consultation ended on 31 March 2008 and received supports from the general public
- Planned to introduce the proposal to the Legislative Council within 2009/10
- Most existing commercial buildings would be required to carry out energy audit regularly

# Energy Audits

- ☀ Many energy saving opportunities could be identified in existing buildings during energy audits
- ☀ Implementing energy saving opportunities
  - ✿ Some energy saving projects may involve significant capital investment
  - ✿ Facility owners may not wish to pay or cannot afford large capital investment



# Energy Performance Contracting (EPC)

- Owners utilize their plant or equipment energy saving potential to seek for financial resources to upgrade its energy efficiency and achieve environmental protection purposes.



# Energy Performance Contracting (EPC)

- Performance Contracting (PC) contractor also known as Energy Service Company (ESCO) can provide the owners with both financial and technical support to upgrade their premises comprising of
  - (i) project and account management;
  - (ii) facilities auditing;
  - (iii) energy saving proposals;
  - (iv) construction management;
  - (v) commissioning and maintenance; and
  - (vi) training upon work completion.



# Energy Performance Contracting (EPC)

## ☀ Suitable for

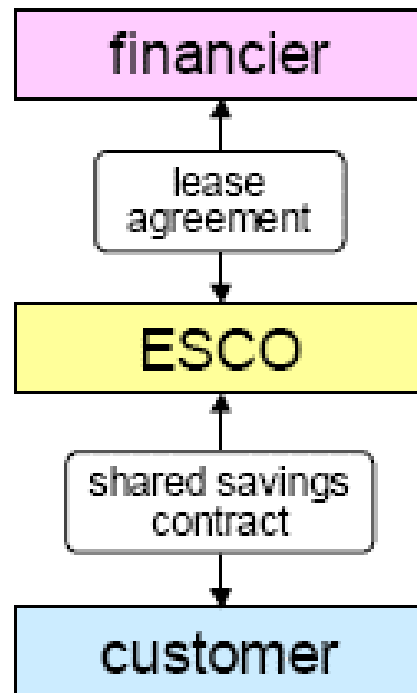
- (i) venues with high energy saving potential under steady use;
- (ii) owner is willing to adopt new technologies

## ☀ Not suitable for

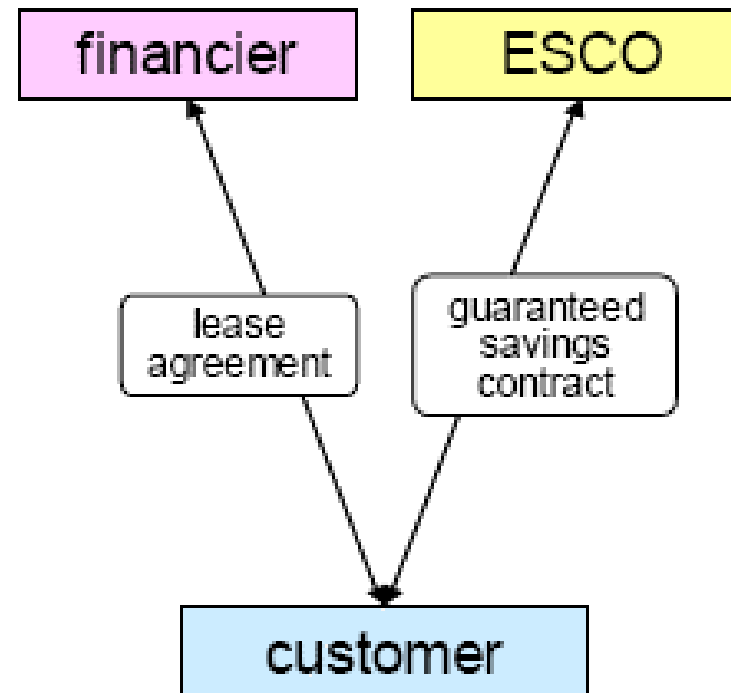
- (i) recently completed new building projects, unless the owner foresees a major change in the building usage substantially different from the original design criteria and concepts;
- (ii) site with frequent activity changes such that the energy savings is difficult to estimate and monitor

# Types of EPC

## Shared Savings



## Guaranteed Savings



## Types of EPC

### ☀ Shared Saving

- The ESCO obtains project funds from a third party financier and take up the financial risks
- There is no contractual obligation between the owners and the financier
- The owner pays the ESCO its share of savings as specified under the shared-savings contract (usually more than 50%) between the ESCO and the owner
- The ESCO makes profit if its share of savings exceeds the loan repayment to the financier

# Types of EPC

## ☀ Guaranteed Saving

- The owners obtains project funds directly from a third party financier and take up the financial risks
- The ESCO gets payment for providing all necessary supports to the project and guarantees a minimum level of savings to the owner
- If there is a shortfall in savings, the ESCO will reimburse the owner.
- If savings exceed the ESCO's guarantee, the owner typically keeps the excess.

## Pilot EPC Projects (1)

### ☀ Police Station A

- The 1st pilot project
- Scope of work: a number of innovative energy efficient installations, such as energy efficient lighting, occupancy sensors, proper air-conditioning control etc.
- Completion date: April 2001
- Project sum: HK\$500,000
- Guaranteed annual energy savings: 148,400 kWh

## Pilot EPC Projects (2)

### ☀ Police Station B

- Scope of work: To replace boilers with heat pumps for the hot water supply at the Barrack Block of the station
- Commissioning date of heat pumps: Nov 2003
- Project sum: HK\$450,000
- 90% of project cost paid to ESCO after satisfactory completion of the installation; remaining 10% paid one year later after the guaranteed performance has been verified.
- Actual annual energy cost savings: HK\$82,499 (179% of guaranteed savings HK\$46,200)

## Pilot EPC Projects (3)

### ☀ A Hospital

- ☀ Scope of work: Installation of heat pump system for hydrotherapy pool heating
- ☀ Commissioning date : May 2002
- ☀ Contract period of EPC: 4 years
- ☀ Project sum: HK\$570,000
- ☀ No need to pay ESCO project cost in the 1st year but to settle the payment in the subsequent 3 years
- ☀ Actual energy cost savings in the 1st year: HK\$150,646 against the guaranteed annual energy cost savings: HK\$150,000

## Pilot EPC Projects (4)

### ★ A Games Hall

- Scope of work: Installation of heat pump for supplying hot water for showers
- Commissioning date of heat pump: May 2003
- Contract period of EPC: 30 months
- Project sum: HK\$380,000;
- Payment made to ESCO in 10 installments
- Guaranteed annual energy cost savings: HK\$152,000

## Experience gained from the pilot EPC projects

- Capital cost including interest premium
- Duration of EPC contract longer than normal 'supply and install' contract
- Defined scope of energy saving work to enable open tender
- Motivation to ESCO to provide cost effective proposal to achieve the guaranteed energy saving
- Proven measurement and verification methodology
- Professional agency to facilitate EPC

## Discussions

- Accurate verification of energy savings in EPC is always a concern to customers. ESCO & customer need to mutually agree on a reasonably practicable measurement & verification method at the very beginning.
- Due to the wide variety in EMOs, guaranteed savings, duration of contract and payment terms, it is not practical to have explicit EPC tender specifications and suitable methodology for assessing tenders prior to tender invitation. In this regard, common overseas practice is to award EPC through negotiation.



## Discussions

- Overseas experience suggested that EPC could be an effective tool to finance energy improvements in existing buildings.
- However, EPC is still a new concept in HK. The market is small and there are limited nos. of ESCO.
- More facility owners adopt EPC, the more energy savings can be achieved and the more business opportunities.
- Well-structured EPC offers a win-win situation for facilities owners, ESCO and the community.



Thank you