Briefing on Buildings Energy Efficiency Ordinance (Cap. 610)

Energy Efficiency Office
EMSD, the Government of HKSAR
Enhancement of Energy Efficiency in Buildings

Total annual electricity consumption of HK in 2009: about 41.5 billion kWh (equivalent to the consumption by 9 millions of families annually)

About 90% of the electricity consumed by buildings

Enhancement of buildings energy efficiency will be an effective means to reduce energy consumption
The Hong Kong Energy Efficiency Registration Scheme for Buildings

- Launched since 1998 to promote the voluntary compliance with BEC to enhance building energy efficiency
- Up to Dec 2011, around 1,300 buildings have been registered
- Registered buildings included commercial, industrial and residential buildings
- Participation rate of the private sector is very low (only around 30% of the registered buildings)
Mandatory Implementation of Building Energy Code (BEC)

- As voluntary compliance with a higher energy efficiency standard appears not to be forthcoming in Hong Kong and amidst the growing environmental concerns, we consider it an opportune time to pursue mandatory implantation of the BECs to accompany market driven changes.

- In order to combat climate change, mandatory implementation of minimum energy efficiency standard in buildings by legislation has been widely adopted by overseas and Mainland China.

- The mandatory BEC is formulated with the existing voluntary BEC 2007 Edition as the blueprint.
Milestone of the Buildings Energy Efficiency Ordinance (BEEO)

- 21/03/2011
  Registration of Registered Energy Assessors (REA) came into operation

- 03/12/2010
  BEEO was gazetted

- 21/09/2012
  BEEO will come into full operation
Structure of Legislative Framework

Buildings Energy Efficiency Ordinance (BEEO)

- Buildings Energy Efficiency (Fees) Regulation
- Buildings Energy Efficiency (Registered Energy Assessors) Regulation

Energy Audit Code (EAC)
Building Energy Code (BEC)

Code of Practice
Coverage – Prescribed Buildings (Schedule 1 of BEEO)

13 Types of prescribed buildings

1. Commercial building (e.g. office building, shopping mall, etc.) - also incl. recreational clubs
2. A portion of a composite building that is not for residential or industrial use (e.g. shops in a residential building, etc.)
3. Hotel & guesthouse
4. Common area of a residential building (e.g. car park, clubhouse, corridor, staircase, etc.)
5. Common area of a portion of a composite building that is for residential or industrial use
6. Common area of an industrial building
7. Educational building (e.g. school, university, etc.)
8. Community building (e.g. community center, elderly home, youth centre, etc.)
9. Municipal services building (e.g. market, library, etc.)
10. Medical building (e.g. hospital, rehabilitation centre, etc.)
11. Government building (e.g. government office building, police station, fire station, etc.)
12. Passenger terminal building of an airport
13. Railway station
Control Regimes
Control Regimes

- Mainly control the design but not the daily operation and settings of the concerned building services installations.

- Need to comply with the minimum energy efficiency standards for all the concerned 4 types of building services installations namely lighting, air-conditioning, electrical, and lift and escalator installation.

- Not affecting the application of occupation permits nor any other licensing requirements.

- No restriction on import and sale of any equipment in Hong Kong.
Control Regimes (cont’d)

• **Newly constructed buildings** will be required to comply with the minimum energy efficiency standards and requirements as specified in BEC under BEEO

• **Existing buildings** will be required to comply with BEC only when major retrofitting works are carried out

• **Commercial buildings and commercial portions of composite buildings** will be required to carry out energy audits in accordance with the technical requirements as specified in EAC under BEEO
Different regulatory mechanisms for “newly constructed building after the commencement of the legislation” and “existing building before the commencement of the legislation”

**Newly constructed building after the commencement of the legislation** –
Buildings having obtained the consent to the commencement of building works for superstructure construction from Building Authority after the legislation comes into full operation (i.e. 21 Sep 2012)

**Existing building before the commencement of the legislation** –
Buildings that have obtained the consent on or before the legislation comes into full operation (i.e. 21 Sep 2012)

*Remarks: The above two terms are for publicity purpose only and do not appear in BEEO.*
Control Regimes (cont’d)

- The control regimes for existing building are different from newly constructed building:
  - Only regulating major retrofitting works prescribed in BEEO
  - No retrospective effect on existing installations
COCR

- Only applicable to newly constructed building
  - The developer of a building, upon completion of the building is required to submit a declaration to EMSD to apply for a Certificate of Compliance Registration (COCR)
  - The declaration is to declare that all the building services installations provided by the developer comply with the Building Energy Code (BEC)
  - The developer is required to engage a Registered Energy Assessor (REA) to certify his/her declaration before submission to EMSD
  - Then, EMSD will issue a COCR after verifying the developer’s submission
  - COCR valid for 10 years only - subsequently, the owner is required to engage a REA to make similar certification every 10 years and submit application to EMSD for renewal of COCR
### Newly Constructed Building (Part 2 & 3 of BEEO)

<table>
<thead>
<tr>
<th>Newly constructed buildings</th>
<th>Central BS installations</th>
<th>Other BS installations serving an individual unit with internal floor area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Need to comply with BEC always?</strong></td>
<td>✓ (occupation approval stage)</td>
<td>✓ (with internal floor area &lt; 500 m²)</td>
</tr>
<tr>
<td><strong>Need to obtain a COCR from EMSD?</strong></td>
<td>✓* (10-year renewal)</td>
<td>✓* (10-year renewal) (only for installations provided by developers)</td>
</tr>
<tr>
<td><strong>Need to obtain a FOC from REA?</strong></td>
<td>✓ (within 2 months after completion of major retrofitting works)</td>
<td>✓ (within 2 months after completion of major retrofitting works)</td>
</tr>
</tbody>
</table>

*Stage 1 declaration within 2 months after issue of “consent to commencement”; stage 2 declaration within 4 months after issue of OP.

**Responsible persons** (who holds or are in possession or control of the building or units, such as owners, tenants, occupiers, etc.)

<table>
<thead>
<tr>
<th></th>
<th>Owners</th>
<th>Developers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsible persons</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
- Major retrofitting works for units or common areas in both newly constructed and existing buildings
  - The responsible person (e.g. owner, tenant, occupiers, etc) of a unit or common area, upon completion of “major retrofitting works”, is required to engage a REA to certify that the retrofitted building services installations comply with BEC
  - The responsible person is then required to obtain a Form of Compliance (FOC) issued by REA
  - Further endorsement on FOC by EMSD and renewal of FOC is not required
  - The REA is also required to submit the copy of FOC to EMSD and the property management company for record (sample checking may be conducted by EMSD)
## Existing Building (Part 3 of BEEO)

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<th>Existing buildings</th>
<th>Central BS installations</th>
<th>Other BS installations serving individual unit</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>with internal floor area &lt; 500 m²</td>
</tr>
<tr>
<td>Need to comply with the BEC always?</td>
<td>✓ (for major retrofitting works only)</td>
<td>✗</td>
</tr>
<tr>
<td>Need to obtain a FOC from REA?</td>
<td>✓# (within 2 months after completion of major retrofitting works)</td>
<td>✗</td>
</tr>
</tbody>
</table>

#REA to copy the FOC to EMSD and property management company (if no such company, to the owner)

- **Owners**: Responsible persons (who holds or are in possession or control of the building or units, such as owners, tenants, occupiers, etc.)
Major Retrofitting Works
(Schedule 3 of BEEO)

**Works Area**

Addition/replacement of a BS installation specified in BEC at the following conditions –

- total floor area covered by the works (i.e. works area) $\geq 500 \text{ m}^2$ in a unit or a common area; and

- if the works are conducted as a same series of works in phases or at different places in a unit or a common area, total floor area covered by these works (i.e. works area) within 12 months aggregating to $\geq 500 \text{ m}^2$

**Central BS installation**

Addition/replacement of a **main component** of a central BS installation, incl. –

- a complete electrical circuit at rating $\geq 400\text{A}$; or

- a unitary air-conditioner or a chiller at rating $\geq 350\text{kW}$ (cooling or heating); or

- motor drive + mechanical drive of a lift, escalator or passenger conveyor

OR
Energy Audit

Only applicable to central BS installations of commercial buildings and commercial portions of composite buildings

- The owner of a building is required to engage a REA to conduct Energy Audit every 10 years
- The owner is required to obtain an Energy Audit Form and an energy audit report from the REA
- The REA is required to submit a copy of Energy Audit Form and the energy audit report to EMSD for record
- The owner is required to exhibit the valid Energy Audit Form in a conspicuous position at the main entrance of the building
Schedule of Energy Audit

• Newly constructed building
  (Section 22(2) of BEOE)
  ◆ 1st energy audit within 10 yrs after the issue of the 1st COCR

• Existing building
  (Schedule 5 of BEOE)
  ◆ 1st round of energy audits will be completed in phases within 4 years
  ◆ The newer the building (according to the issue date of the occupation permit issued by Buildings Department), the earlier the energy audit should be carried out
Overview of Building Energy Code
Key Energy Efficiency Requirements in BEC

**Lighting Installation**
- Max Allowable Lighting Power Density
- Lighting Control

**Electrical Installation**
- Motor Efficiency
- Power Distribution Loss
- Power Quality
- Energy Metering

**Air-conditioning Installation**
- COP
- Air Distribution System Fan Power
- Piping System Frictional Loss
- Thermal Insulation
- Energy Efficiency System Control
- Energy Metering

**Lift and escalator installation**
- Electrical Power
- Power Quality
- Energy Metering
- Lift Decoration Load
- Idling
Registered Energy Assessors
Qualifications of Registered Energy Assessors

- **Registered Professional Engineer** under Engineers Registration Ordinance (Cap. 409) – electrical, mechanical, building services or environmental discipline
  - at least 2 years post qualification practical experience
  - has the knowledge for the performance of the duties and functions under BEEEO

Or

- **Corporate member of HKIE** in electrical, mechanical, building services or environmental discipline or equivalent qualification
  - at least 3 years post qualification practical experience
  - has the knowledge for the performance of the duties and functions under BEEEO
Registers
Registers
(Sections 11 & 31 of BEEO)

EMSD to maintain the following registers –

◆ Buildings issued with COCR

◆ Registered Energy Assessors
Benefits brought by BEEO

• After BEEO has come into full operation on 21 September 2012, the key building services installations (such as lighting and air-conditioning installations etc.) are required to comply with the energy efficiency design standards stipulated in BEC.

• Therefore, building energy efficiency can be enhanced, leading to:
  – Reduction of carbon emissions
  – Saving in electricity bill
Advantages of using energy efficient equipments
- Use T5 / T8 fluorescent lamps

- Replacing conventional T10 / T12 lamps with T8 / T5 lamps can save electricity consumption by 10%.
Advantages of using energy efficient equipments (cont’d)
- Use Grade 1 energy label room air conditioner

• Consider there are two room air conditioners which have the same cooling capacity of 2.6 kW (1 HP) but are of Grade 1 and Grade 3 energy label, respectively
• Assume the two air conditioners operate for 1,200 hours every summer
• A Grade 1 room air conditioner can save up to $200 in electricity cost when compared to a Grade 3 model
• Every little helps. If all existing room air conditioners are replaced with Grade 1 ones, electricity consumption of room air-conditioners can be greatly reduced, thereby saving more electricity cost
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