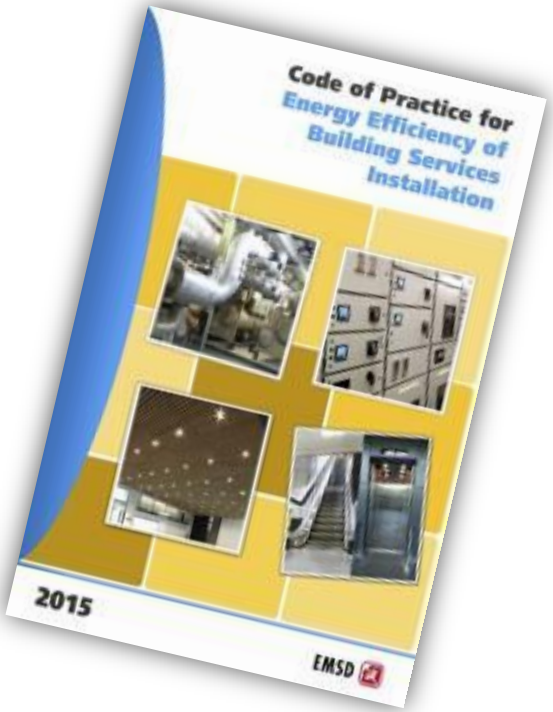
# Buildings Energy Efficiency Ordinance & Building Energy Code 2015 (BEEO & BEC 2015)

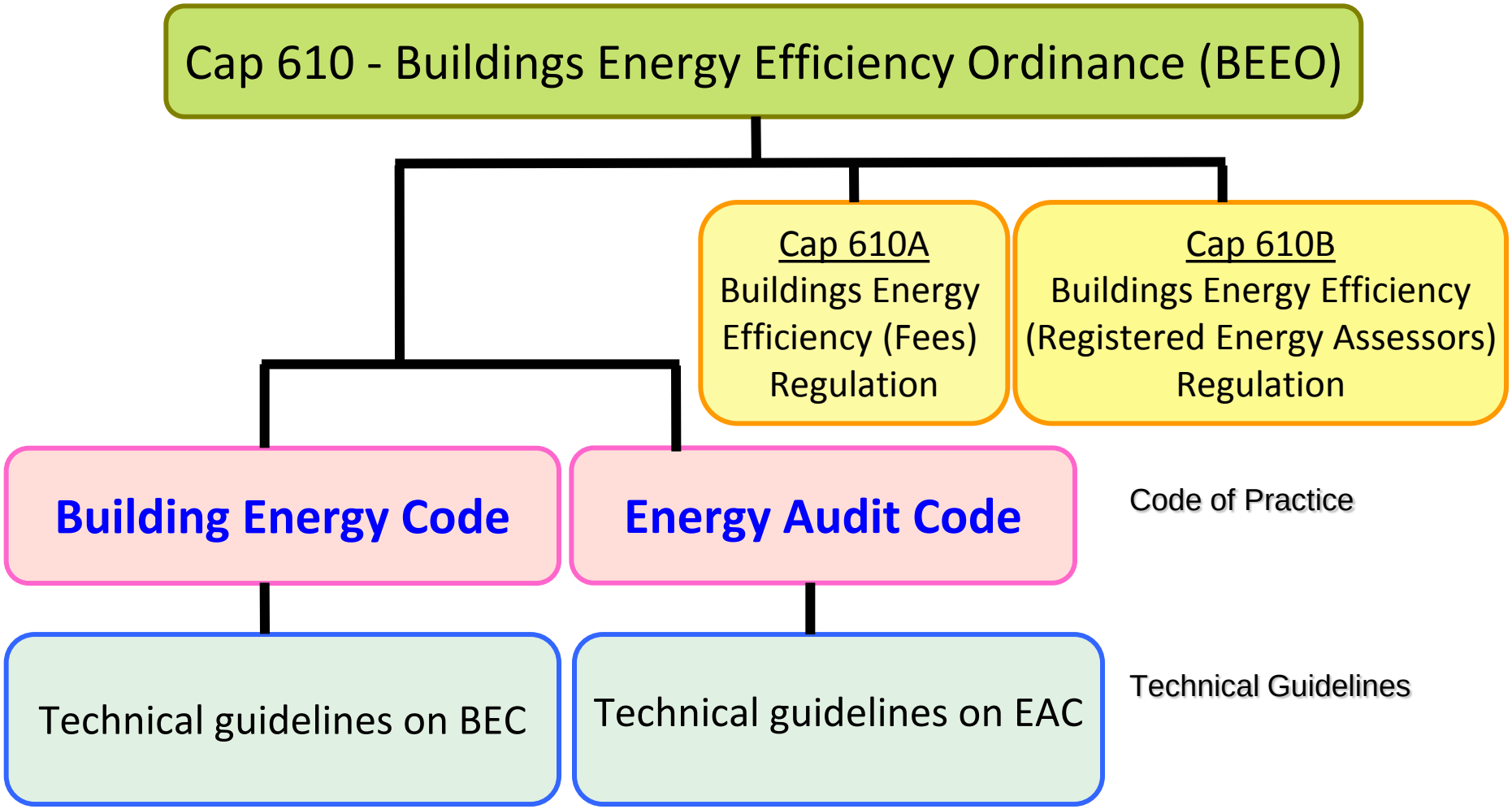




Nov. 2016

# Topics

1. BEEO
2. BEC 2015
   a. Lighting Installation
   b. Electrical Installation
   c. Air-conditioning Installation
   d. Lift and Escalator Installation
   e. Performance-Based Approach
3. BEC Editions
4. EAC
5. Way Forward
6. Information Source

# Building Coverage



# Legislative Framework

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## BEC

1) Commercial building
2) Industrial building - common area
3) Residential building - common area
4) Composite building - commercial portion
5) Composite building - common area of portion for residential or industrial use
6) Hotel & guesthouse
7) Educational building
8) Community building
9) Municipal services
10) Hospitals & clinics
11) Government building
12) Airport passenger building
13) Railway station

## EAC

- Commercial building
- Composite building – commercial portion

# Certificate of Compliance Registration (COCR)

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- Applicable to 13 types prescribed buildings in Schedule 1

- **Stage 1 Declaration (by Developer)**
  - Within **2 months** after ***consent date of commencement of superstructure works***
  - Prescribed BSIs will comply with the BEC Code

- **Stage 2 Declaration (by Developer)**
  - Within **4 months** after ***Occupation Permit*** date
  - Prescribed BSIs have been **designed**, **installed** and **completed** with BEC edition of not lower than the declaration in Stage 1

# Form of Compliance (FOC)

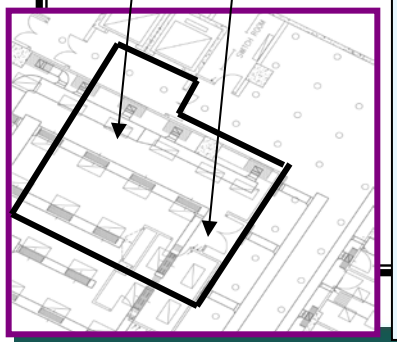
## Major Retrofitting Works (MRW) - Table 10.1

### Works Area

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

- total floor area covered by the works (i.e. works area) ≥ 500 m² in a unit or a common area

- Works conducted as a same series of works in phases or at different places, total floor area covered by these works (i.e. works area) within 12 months aggregating to ≥ 500 m²



OR

### Central BS installation

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

a complete electrical circuit at rating ≥ 400A;

a unitary air-conditioner or a chiller at rating ≥ 350kW (cooling or heating);

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

# Form of Compliance (FOC)

## Major Retrofitting Works (MRW)
## Same series of works

All relevant factors **:

1. a single contractor;
2. a single arrangement;
3. a single works order;
4. time and period of the works;
5. contractor's payment manner; and
6. if the works are treated as a **single project** in the **plans and works programme.**

(**) Notes (3), Schedule 3 of the BEEO

# Form of Compliance (FOC)

## Enforcement actions on low compliance rate of FOC

- Liaise with government departments (LCSD, FEHD) for information of MRW
- Outreaching Programme
- List of New / Modification of Lift & Escalator Installation
- Cooling Tower, application for water connection (potential MRW when involving chiller replacement also)
- Sampling Inspection

# Prosecution Action under BEEO

| | |
|---|---|
| ➢ **No. of issued Improvement Notice** | Over 150 |
| ➢ **No. of prosecution** | 5 |
| ➢ **Fine for each prosecution case** | $2,000 - $21,000 |

EMSD will progressively proceed enforcement action towards developer / building owners / Responsible Person / REA who contravene the BEEO requirement

# Review of the BEC and EAC

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- Review in a **3-year** interval

- Making reference to:
  - **the latest technology development**;
  - **recognized international standards** from other countries including Mainland China, *USA, UK, Singapore and Australia*

- By the Technical Taskforce and its 6 Working Groups consists of 31 representative organizations

# TG-BEC2015 Contents

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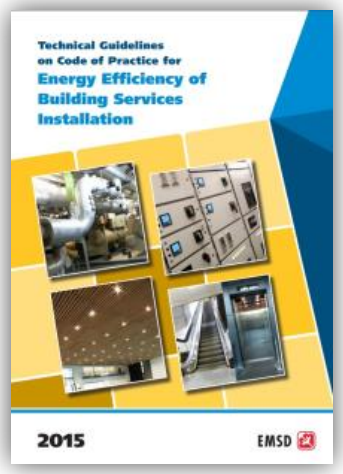
- BEC 2015 issued on 11 Dec 2015
- 6-month & 9-month grace periods
- TG-BEC2015 issued on 30/6/2016
- Elaborates BEEO & BEC 2015 contents (including tightened and new requirement)
- Technical enquiry consolidated
- Good Practice – to exceed min. requirements in BEC









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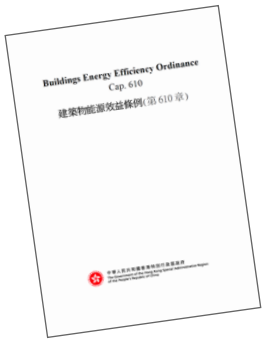
# TG-BEC2015 Contents

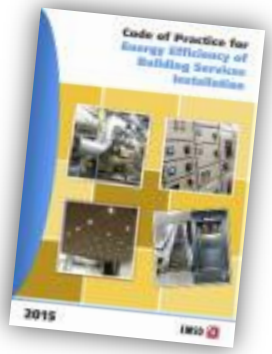
ENERGY SAVING FOR ALL 全民節能

- 10 sections
  - 1 - Introduction
  - 2 - Interpretations & Abbreviations
  - 3 - Application
  - 4 - Technical Compliance with BEEO




Overview & explanation of BEEO compliance process

  - 5 - Lighting
  - 6 - Air-conditioning
  - 7 - Electrical
  - 8 - Lift & Escalator
  - 9 - Performance-based Approach
  - 10 - ***Major Retrofitting Works (MRW)***




Explanations of BEC's technical requirements with examples



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# Lighting Installation

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**Summary**

- LPD requirement covers new spaces
- LPD requirement of certain spaces tightened
- Lighting control point to all spaces
- **Automatic lighting control** (new requirement)
- **Daylight responsive control** (new requirement)

# Lighting Installation

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## Definition

### *Lighting Installation*

***lighting installation*** (照明裝置), in relation to a building, means a fixed electrical lighting system in the building including—

(a) general lighting that provides a substantially uniform level of illumination throughout an area; or

(b) maintained type emergency lighting,

but does not include non-maintained type emergency lighting;

### *Applicability*

| Schedule: | 2 | **BUILDING SERVICES INSTALLATIONS TO WHICH THIS ORDINANCE DOES NOT APPLY** |
|---|---|---|

6. A lighting installation that is solely used for—

(a) illumination of an exhibit or product on display including special lighting for illuminating merchandise or art work;

(b) decoration including special lighting for architectural feature or festival decoration effect;

(c) visual production including special lighting for performance, entertainment or television broadcasting; or

(d) any combination of the purposes specified in paragraphs (a), (b) and (c).

# Lighting Installation

## Definition

### *Lighting Power Density*

'lighting power density (LPD) (unit : $W/m^2$)' means the maximum circuit wattage consumed by fixed lighting installations per unit floor area of an illuminated space.

(In equation form, the definition of LPD is given by:

$$LPD = \frac{\text{Total circuit wattage of the fixed lighting installations}}{\text{Internal floor area of that space}}$$

, where the total circuit wattage should be taken at the full lighting output condition. )

Circuit wattage:

counting also the loss from driver, dimmer and step-down Tx.

Full lighting output:

Dim-and-fix ***not*** permissible.

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## Table 5.4
## LPD Requirement Covers New Spaces

| | BEC 2015 |
|---|---|
| Type of space | LPD ($W/m^2$) |
| Computer Room / Data Centre | 15 |
| Court Room | 15 |
| Passenger Terminal Building | 13 -18 |
| Refuge Floor | 11 |
| School Hall | 14 |

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**Table 5.4**
**LPD Requirement of Certain Spaces Tightened**

| Type of Space | BEC 2012 (Rev. 1) ( W/m² ) | BEC 2015 ( W/m² ) |
|---|---|---|
| Classroom / Training Rm | 13 | 12 |
| Loading & Unloading Area | 10 | 8 |
| Office | 13 | 12 |
| Plant Room | 11 | 10 |

# Lighting Installation

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**Clause 5.4.1**
**Exception on LPD requirement**

| BEC 2012 (Rev. 1) | BEC 2015 |
|---|---|
| Does not exceed 100W | Does not exceed **70W** |

# Lighting Installation

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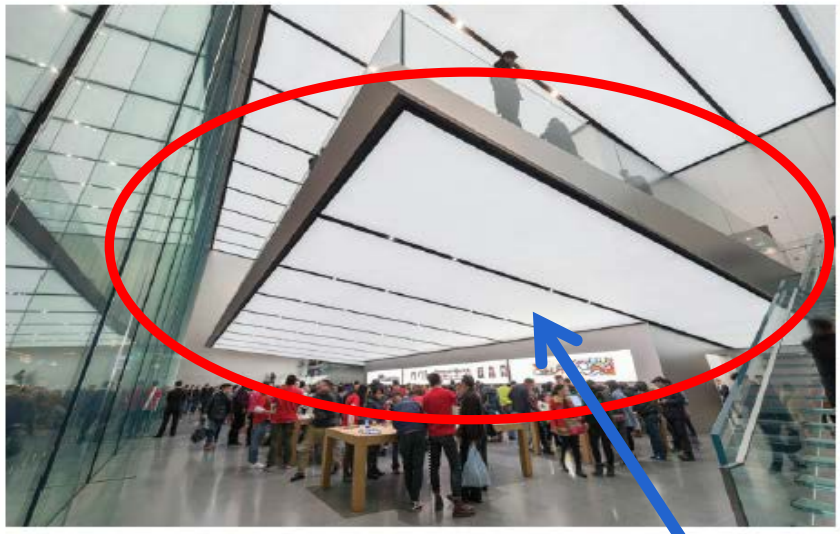
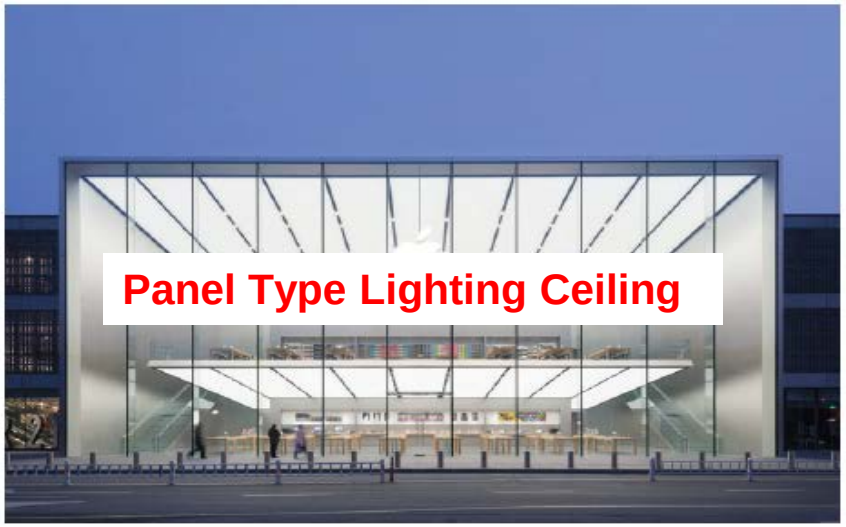
**Special cases for discussion:**

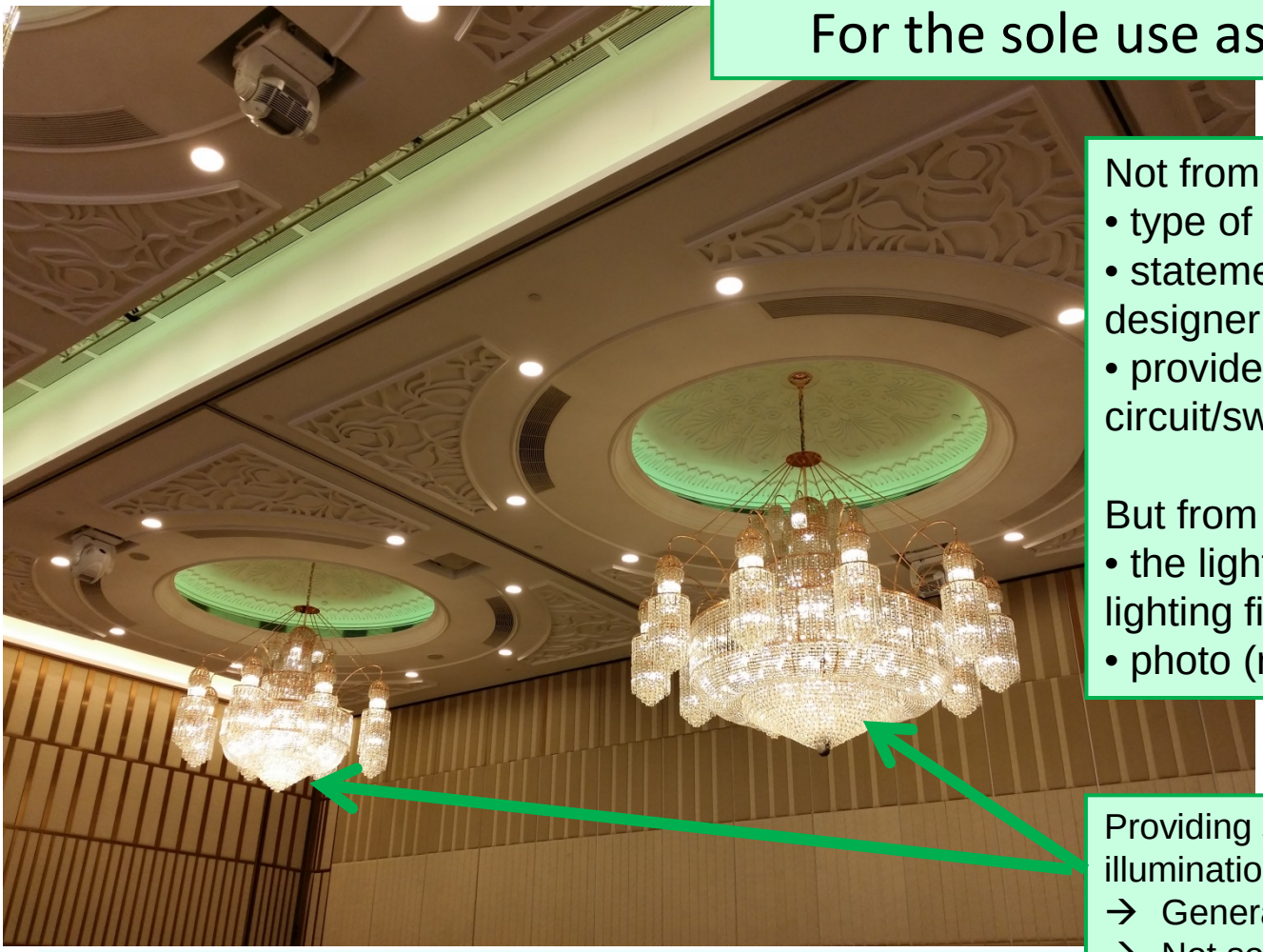





**Providing substantially uniform level of illumination throughout an area**
**→ General lighting;**
**→ Not solely used for decoration.**

# Lighting Installation





For the sole use as decorative light?

Not from:
- type of luminaire
- statement or declaration from the designer;
- provided with separated circuit/switch

But from the nature and usage:
- the lighting layout (relation w/ other lighting fittings);
- photo (relation w/ the space)

Providing substantially uniform level of illumination throughout an area
→ General lighting;
→ Not solely used for decoration

# Lighting Installation

For the sole use as decorative light?

(Mirror-wall Interface)

Drawings to show lightings at vertical plane surface

# Lighting Installation

**Clause 5.5**
**Lighting control point**
**(requirement extended to other spaces)**

| | BEC 2012 (Rev. 1) | BEC 2015 |
|---|---|---|
| Office | According to Table 5.5 ($15m^2$; $30m^2$ or $50m^2$ per point) | **No change** |
| Other Spaces | Not Specified | **A control point covers ≤ 500 $m^2$** |

**Exception:**
**Space with lighting installation designed of 7-day & 24-hour operation.**

# Lighting Installation

**Clause 5.6 and Table 5.4**

**New requirement on automatic lighting control**

| Spaces Requiring Automatic Lighting Control | |
|---|---|
| Atrium | Lecture Theatre |
| Carpark (parking spaces only) | Lift Lobby |
| Classroom / Training Room | Loading and Unloading Area |
| Computer Room / Data Center | Office, enclosed and open plan |
| Conference / Seminar Room | Public Circulation Area |
| Corridor | Refuge Floor |
| Court Room | School Hall |
| Dormitory | Storeroom / Cleaner |
| Entrance Lobby | Toilet / Washroom / Shower Room |
| Gymnasium / Exercise Room | |

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## Clause 5.6 Automatic Lighting Control

| | |
|---|---|
| 5.6.1 | The Basic Provision |
| 5.6.2 | Daylight Responsive Control thro' Fenestrations on Exterior Wall |
| 5.6.3 | Daylight Responsive Control thro' Overhead Skylight |

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## Clause 5.6.1 The Basic Provision

**Automatic Lighting Control:**

- To shut off or reduce the general lighting power by at least ***50% automatically***

- Control devices/systems :

  < **2000 m²**;

- Weekend & holiday operation pattern -
  Except **7-day 24-hour** operation lighting; and

- Serve only one floor, unless the floors are -
  - of similar configuration;
  - With similar lighting layout; and
  - of lighting installations under same owner.

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## Clause 5.6.1

### Automatic Lighting Control: (Cont'd)

Selection of automatic control system under the designer's discretion:

- Occupant sensor
- Automatic Time Scheduling (e.g. thro' BMS)
- Photo sensor/ Timer switch
- Others……

# Lighting Installation

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## Clause 5.6.1

### Automatic Lighting Control: (Cont'd)

- Any overriding control by the space occupant, ***if provided*** :
  - ≤ ***500 m²*** ; and
  - ≤ ***2 hours*** per activation

- When using occupant sensors:
  - Activate within ***15 minutes*** when all occupants left

- Exception from automatic lighting control requirement:
  ***Space*** of fixed lighting ≤ ***150W***

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## Clause 5.6.2 and 5.6.3 Daylight Responsive Control

| Thro' Fenestrations on Exterior Wall | Overhead Skylight |
|---|---|
| ◆ Area of Fenestration(s) ***≥ 5m²*** | |
| ◆ A discrete fenestration or a series of fenestrations serves one ***lighting zone*** | |
| ◆ Separated control device for each ***lighting zone*** | |
| ◆ Shut off or reduce lighting power to ***50% or less*** | |
| ***Lighting zone's*** area<br>• ***≥ 2*** x fenestration area (discrete);<br>• ***≥ 2*** x sum of fenestration areas | ***Lighting zone's*** area<br>• ***≥ 5*** x fenestration area (discrete);<br>• ***≥ 5*** x sum of fenestration areas |

# Lighting Installation

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## Clause 5.6.2 and 5.6.3
## Daylight Responsive Control

| Thro' Fenestrations on Exterior Wall | Overhead Skylight |
|---|---|

Exception:

- **Non-see-through** fenestration;
- Fixed lightings ≤ ***150W*** (wholly or partially within ***a lighting zone***);
- Overlapped area of any lighting zone assigned under other daylight responsive control

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**Table 7.5.1**
**Update requirement on motor efficiency**

| | BEC 2012 | BEC 2015 | % of change |
|---|---|---|---|
| 7.5 to 18.5 kW | 88.7 – 91.2 | 90.4 – 92.6 | 1.9 – 1.5 |
| 22 to 45 kW | 91.6 – 93.1 | 93.0 – 94.2 | 1.5 – 1.2 |
| 55 to 75 kW | 93.5 – 94.0 | 94.6 – 95.0 | 1.2 – 1.1 |
| 90 kW or above | 94.2 – 95.1 | 95.2 – 96.0 | 1.1 – 0.9 |
| | (IE2 Motors) | (IE3 Motors)<br>(IE2 < 7.5 kW) | |



**Only 4-pole motor shown as illustration**

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## Section 7.7
## Update requirement on Metering and Monitoring Facilities

**Metering for energy, current, power factor, harmonics etc. measure**

| | |
|---|---|
| **BEC 2012** | ***Clause 7.7.2*** Specified feeder or sub-main circuit **exceeding 200A** to be provided with metering device |
| **BEC 2015** | ***Clause 7.7.3 (New Requirement)*** Additional requirement to provide separate metering devices for **each of the CBSI** (i.e. chiller plants, all lifts etc.) |

# Air-conditioning Installation

| ***Tightening Requirement*** | ***New Requirement*** | ***Unchanged*** |
|---|---|---|
| • Chiller / VRF System / Unitary Air-conditioner COP | ➢ CAV with low speed mode | ✓ Thermal insulation |
| • VAV fan motor power at min. speed | ➢ Mechanical ventilation system fan motor power | ✓ Temperature / Humidity / Zone / Off-hour Control |
| • Exception of system fan power | ➢ Cooling tower fan performance | ✓ Ductwork leakage limit |
| • Pipe Sizing | ➢ Demand control ventilation | ✓ Energy metering |
| • Chilled water pump power consumption at reduced speed | ➢ Air dampers at FA intake and EA discharge outlets | ✓ Separate air distribution system for process zone |
| | ➢ Direct digital control | ✓ System load calculation |
| | ➢ Isolation of zone | |

# Air-conditioning Installation

**Clause 6.7**

**Tightening requirement on Air Distribution System Fan Power (Conditioned Space)**


**BEC 2012 (Rev. 1)** **BEC 2015**

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## Clause 6.7
## Tightening requirement on Air Distribution System Fan Power (Un-conditioned Space)

**Clause 6.7.6 (NEW)**

Mechanical ventilation system fan motor power requirement

**BEC 2012 (Rev. 1)**

- Not specified

**BEC 2015**

- for system fan motor power $\geq$ 2.5kW
- $\leq 1.1\ W/L \cdot s$
- Deduct pressure drop across:
  - Grease Filter;
  - Water spray hood;
  - Activated carbon filter; or
  - Venturi scrubber etc.

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## Clause 6.7.4

## New & Revised requirements on CAV & VAV Air Distribution Systems

| BEC 2012 | |
|---|---|
| Clause 6.7.4 | SAF/RAF for VAV flow (≥ 5 kW):<br>• @ **50%** flow, consume ≤ **55%** full speed power |

| BEC 2015 | | |
|---|---|---|
| Clause 6.7.4 | 6.7.4.1 | CAV Low-speed operation:<br>• @ ≤ ***66%*** full speed; and<br>• consumes ≤ ***40%*** full speed power |
| | 6.7.4.2 | VAV minimum fan speed:<br>• @ ≤ ***50%*** full speed; and<br>• consumes ≤ ***30%*** full speed power |
| | 6.7.4.3 | Conditioned space fresh air requirement take preference. |
| Exception: fan motor power < 1.0 kW (e.g. FCU) | | |

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## Clause 6.8
## Update requirement on Pumping System Variable Flow

Restriction on pump power at part load of pump for variable flow system

Clause 6.8.2

### BEC 2012 (Rev. 1)

- for variable speed pump ≥ **5kW**
- pump motor consumes ≤ **55%** full power @ **50%** deign water volume flow

### BEC 2015

- Chilled water pump motor output power > ***3.7 kW***, → variable speed drive
- pump motor consumes ***< 30%*** full power @ ***50%*** design water volume flow
- Exception:
  - with supply chilled water temp. reset;
  - ≤ **350 kW** cooling capacity

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## Clause 6.10.7
## New requirement on Demand Control Ventilation

| | |
|---|---|
| **Carpark**<br>provide staging or modulation of fan for ventilation system | *Clause 6.10.7.1*<br>down to **≤ *50%*** design capacity based on the detected contaminant level |
| **AC system**<br>provision of demand control | *Clause 6.10.7.3*<br>fresh air rate **≥ *1400 L/s*** |
| | *Clause 6.10.7.4*<br>FA dampers shall be modulated based on the $CO_2$ level of the conditioned space |

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## Clause 6.12
## Update Minimum COP for different equipment type

| *Equipment Type* | | BEC 2012 (Rev. 1) | BEC 2015 |
|---|---|---|---|
| **Unitary Air-conditioner (U-A/C) – (cooling mode)** | | | |
| | | ***Table 6.12a*** | ***Table 6.12a – Part 1*** |
| Air-cooled | ≤ 7.5 kW | 2.1 (non-split type) | 2.3 |
| | ≤ 7.5 kW | 2.4 (split type) | 2.6 |
| **Variable Refrigerant Flow (VRF) System (cooling mode)** | | | |
| | | ***Table 6.12a*** | ***Table 6.12a – Part 2*** |
| Air-cooled | | 2.9 – 3.0 (*) | 3.3 |
| Water-cooled | | 3.0 (*) | 4.3 |

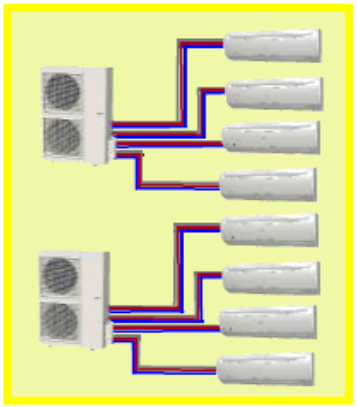
(*) Under U-A/C with variable refrigerant flow (BEC 2012)

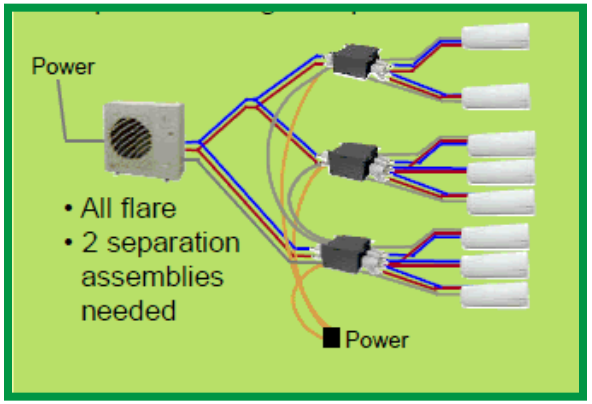
# Air-conditioning Installation

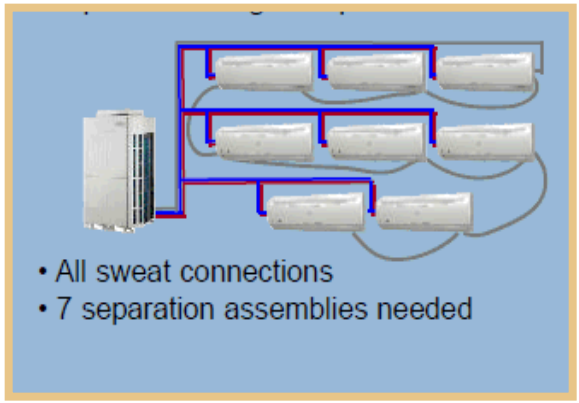
**Clause 6.12**

**Update Min. COP for different equipment type**

**U-A/C Vs VRF system**






| Typical multi-split | Hybrid multi-split | Typical VRF System |
|---|---|---|

Unitary Air-Conditioner

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## Clause 6.12
## Update Minimum COP for different equipment type

| *Equipment Type* | | BEC 2012 (Rev. 1) | BEC 2015 | | |
|---|---|---|---|---|---|
| **Chiller - Water Cooled** | | *Table 6.12b* | *Table 6.12b* | | |
| **Reciprocating / Scroll** | 500 to 1000kW | 4.6 | 4.7 / 5.0 | | |
| | Above 1000 kW | 5.2 | 5.3 / 5.5 | | |
| **Screw or VSD screw** | 500 to 1000kW | 4.7 | 5.0 | 4.9 (1) | 6.3 (2) |
| | Above 1000 kW | 5.5 | 5.5 | 5.2 (1) | 6.7 (2) |
| **Centrifugal or VSD Centrifugal** | 1000 to 3000 kW | 5.6 - 5.7 | 5.7 | 5.5 (1) | 7.1 (2) |
| | Above 3000 kW | 5.7 | 5.8 | 5.6 (1) | 7.2 (2) |

(1) VSD at full load
(2) VSD at 75% load

**Clause 6.12**

**Update Minimum COP for different equipment type**

| Part Load COP of VSD Chiller | Air Cooled | Water-Cooled |
|---|---|---|
| Loading Condition | 75% FL | 75% FL |
| Standard Rating Condition | 27 deg.C (Ambient air temperature) | 24 deg.C (condensing water in ) |
| Applicable also to:<br>Oil free chiller / Magnetic Bearing Chiller | | |

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## Other Requirements

| Clause No. | Requirement |
|---|---|
| 6.12.4 | Cooling Tower (open circuit) Fan:<br>For each kW (motor nameplate power) to achieve –<br>≥ 1.7 L/s condensing water flow (centrifugal);<br>≥ 3.4 L/s condensing water flow (propeller or axial) |
| 6.13.5 | Metering devices for:<br>AHU ≥ ***5.0 kW*** rated motor and inside plant room |

# Lift and Escalator Installation

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Max. allowable traction lift electrical power ⇩ **3 ~ 5 %**

Table 8.4.1 of BEC 2012
→ Table 8.4.1a and Table 8.4.1b of BEC 2015

Code of Practice for Energy Efficiency of Building Services Inst

Table 8.4.1a : Maximum Electrical Power (kW) of Traction Drive Lift at Rated Load for Various Ranges of Rated Speed (applicable to new building)

| Rated Load L (kg) | Rated Speed Vc (m/s) | | | | |
|---|---|---|---|---|---|
| | Vc < 1 | 1 ≤ Vc < 1.5 | 1.5 ≤ Vc < 2 | 2 ≤ Vc < 2.5 | 2.5 ≤ Vc < 3 |
| L < 750 | 6.5 | 9.2 | 11.1 | 14.7 | 16.6 |
| 750 ≤ L < 1000 | 9.2 | 11.1 | 15.7 | 19.4 | 22.1 |
| 1000 ≤ L < 1350 | 11.1 | 15.7 | 20.3 | 24.9 | 29.5 |



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# Lift and Escalator Installation

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Table 8.4.1 of BEC 2012
→ Table 8.4.1a and Table 8.4.1b of BEC 2015

Table 8.4.1b : Maximum Electrical Power (kW) of Traction Drive Lift at Rated Load for Various Ranges of Rated Speed
(applicable to major retrofitting works in an existing building)

| Rated Load L (kg) | Rated Speed Vc (m/s) | | | | |
|---|---|---|---|---|---|
| | Vc < 1 | 1 ≤ Vc < 1.5 | 1.5 ≤ Vc < 2 | 2 ≤ Vc < 2.5 | |
| L < 750 | 6.7 | 9.5 | 11.4 | 15.2 | 17.1 |
| 750 ≤ L < 1000 | 9.5 | 11.4 | 16.2 | 20 | 22.8 |
| 1000 ≤ L < 1350 | 11.4 | 16.2 | 20.9 | 25.7 | 30.4 |
| 1350 ≤ L < 1600 | 14.3 | 19 | 25.7 | 30.4 | 36.1 |
| 1600 ≤ L < 2000 | 16.2 | 23.8 | 30.4 | 37.1 | 43.7 |
| 2000 ≤ L < 3000 | 23.8 | 35.2 | 44.7 | 56.1 | 66.5 |

**Requirements the same as BEC 2012**

# Lift and Escalator Installation

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- Max. allowable hydraulic lift electrical power ⇩ **5 %**
- Max. allowable escalator electrical power ⇩ **2 %**
- Max. allowable passenger conveyer electrical power ⇩ **2 %**

# Lift and Escalator Installation

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Max. lift decoration load ⇩ **10 %**

| Table 8.5.2 : Maximum Lift Decoration Load | |
|---|---|
| Lift Rated Load L (kg) | Allowable Decoration Load D (kg) |
| L < 1800 | D = 0.5 x L, or 540 whichever is smaller |
| L ⩾ 1800 | D = 0.3422 x L – 0.00002344 x $L^2$, or 1125 whichever is smaller |

**Example**

- Capacity: 1200kg.

  Maximum Decoration load : From 600kg to 540kg

# Lift and Escalator Installation

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## New Requirement – Lift Installation

- Lift car ventilation fan power consumption: ≤ **0.7 W per L/s**
- Lift car automatic lighting control:

  Automatic cut lighting power to 50% or less

  (**15-min. or longer idling**)
- Regenerative braking system for lift of:

  ***Speed ≥ 3m/s; &***

  ***Capacity ≥ 1000 kg***

# Lift and Escalator Installation

ENERGY SAVING FOR ALL 全民節能

**Automatic Speed Reduction**

# Performance-based Approach

**BEC 2012**

**Only three trade-off items under two installations**

| |
|---|
| **Lighting installations** |
| Lighting power density (LPD) |
| **Air-conditioning installations** |
| Air-conditioning equipment efficiency |
| System Fan Power |

# Performance-based Approach

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**BEC 2015**

**Trade-off items cover all the four BS installations (15% Threshold)**

| |
|---|
| Lighting installation |
| 3 Items |
| LPD; Lighting Control Point and Automatic Lighting Control |
| Air-conditioning installation |
| 9 Items |
| e.g. Insulation Thickness & Pipe Friction Loss etc. |
| Electrical installation |
| 3 Items |
| Motor Efficiency; Cu Loss & Power Quality |
| Lift and escalator installation |
| 3 Items |
| Electrical power; Utilization of Power & Total Harmonic Distortion |

# Performance-based Approach

15% Threshold:
Energy efficiency performance of trade-off item(s) should not *15%* below the prescriptive standard.

Different ownership of trade-off item:
Energy source from other parties (e.g. service provider of DCS, central plant in a campus-like developments)

No limit on the contribution of energy reduction by better OTTV (5% limitation in BEC 2012)

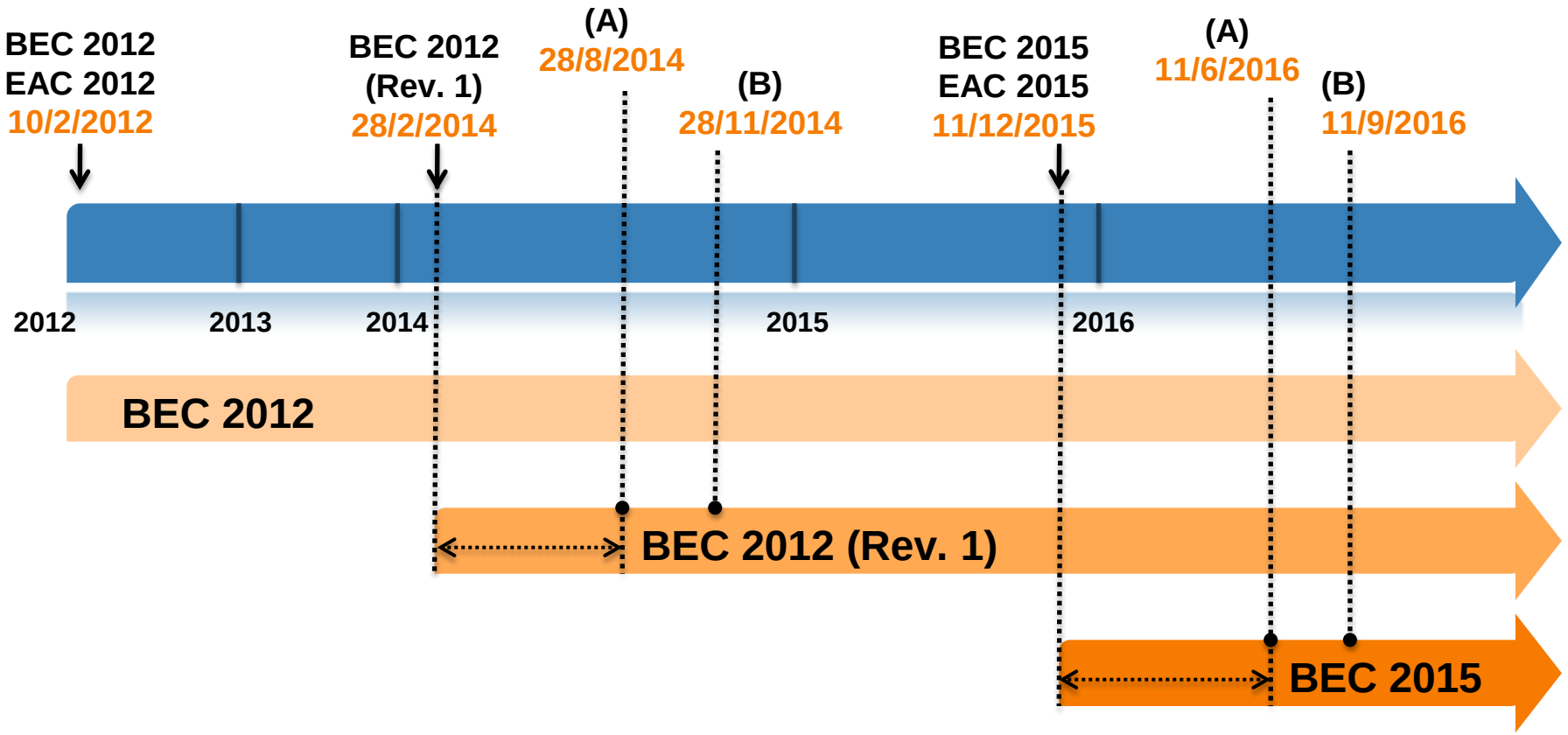
No limit on the contribution from on-site recovery /renewable energy
(5% limitation in ASHRAE 90.1 – 2013)

# Editions of the BEC

***11 December 2015***: BEC 2015 Gazette Date

| Submission | Date |
|---|---|
| Stage One Declaration | *11 June 2016*<br>(Signed by the developer on or after 11.06.2016) |
| Form of Compliance | *11 September 2016*<br>(Signed by the REA on or after 11.09.2016) |

# Editions of the BEC




**Developer signs the Stage One Declaration on or thereafter**
**REA signs the FOC on or thereafter**

Bare shell Building units

IFA of each unit > 500m²

Stage One BEC 2012

CBSI by developer and the fully fit-out lobby, corridor & entrance, with the rest of the floors w/o fitting out.

COCR BEC 2012

Ten. D
Ten. C
Ten. B
Ten. A

FOC (MRW) BEC 2012 (Rev. 1)

Other BSIs BEC 2012

FOC (MRW) BEC 2015

Other BSIs BEC 2012

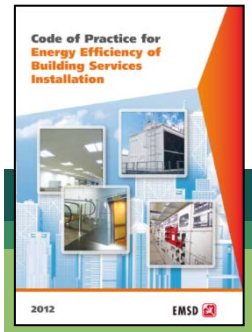
2012 2013 2014 2015 2016

10/2 28/2 28/8 28/11 11/12 11/6 11/9

BEC 2012

BEC 2012 (Rev. 1)

BEC 2015





Ten. X: Tenant X fully fit-out an unit and move in.

機電工程署 EMSD

# TG-EAC2015 Contents

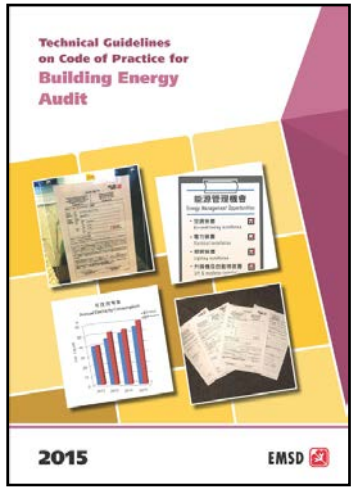
- 9 sections

1 - Introduction
2 - Interpretations & Abbreviations
3 - Application
4 - Technical Compliance with BEEO

Overview & explanation of BEEO compliance process

5 – Objectives of EA
6 – Overview of EA
7 – EA Requirements
8 – EA Report
9 – EA Form

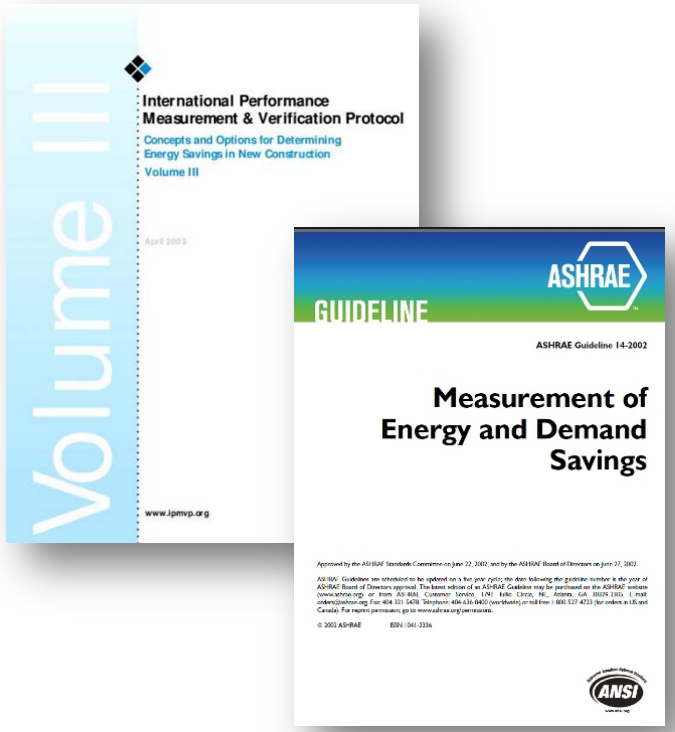
Explanations of EAC's technical requirements with examples



# TG-EAC2015 Contents

## On-Site Measurement

- **Might make reference to :**
  - ❖ International performance measurement & verification protocol volume III
  - ❖ ASHRAE 14 Measurement of Energy and Demand Saving



# Anticipated Energy Saving

- ✓ Further improvement in energy efficiency: **10%**
- ✓ The saving of **5 billion kWh** for newly constructed buildings up to 2025

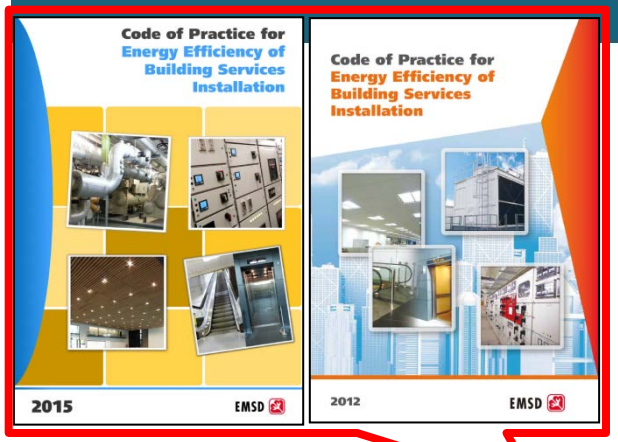
- The total reduction of $CO_2$ emission: **3.5 million tonnes**
- Equivalent to total annual electricity consumption by about **1 million households**

# Way Forward

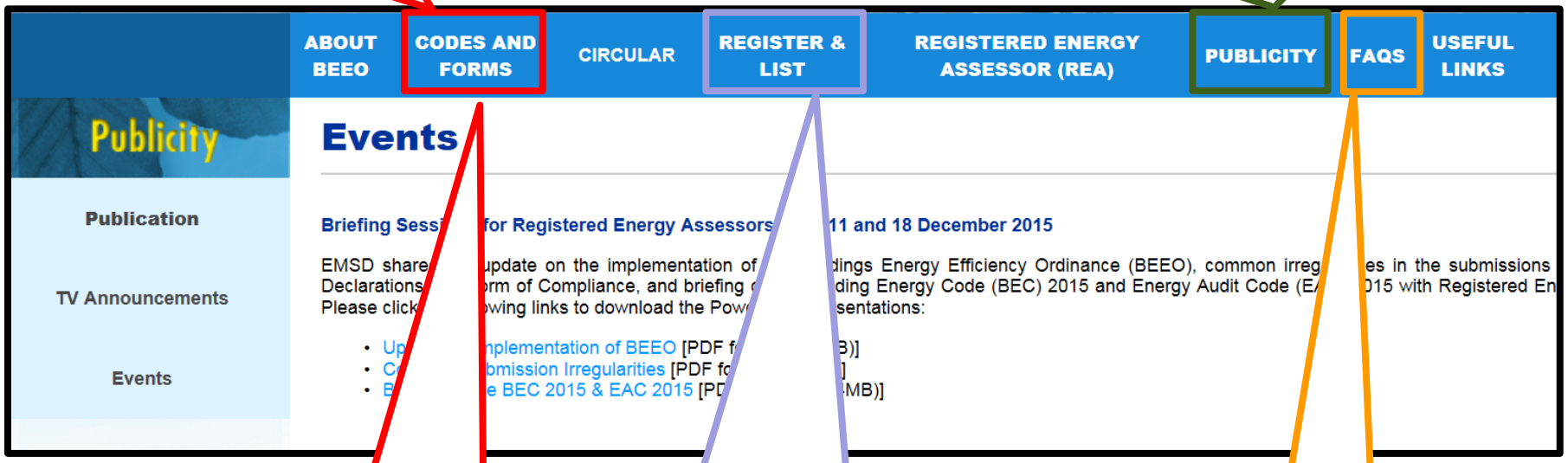
- The Technical Taskforce will continue to review the BEC on a regular basis.
- Update the pertinent requirements where necessary through addendum before the next round of comprehensive review.
- Comprehensive review to be conducted in 2018, 2021 and 2024.

# Information

http://www.beeo.emsd.gov.hk/








- Specified Forms
- Technical guidelines

- Register of REA and COCR
- List of Stage One Declaration, FOC, EA Form and IN

Frequently Asked Questions

# Thank You

Energy Efficiency Office
能源效益事務處