



Briefing on the BEC 2015 and EAC 2015

REA Briefing Sessions:

07 Dec 2015

11 Dec 2015

18 Dec 2015



Review on the BEC

- Review in a **3-year** interval
- Making reference to:
 - a) the latest technology development;
 - b) recognized international standards from other countries including Mainland China, *USA, UK, Singapore and Australia*

珍惜資源 全民節能



Review on the BEC

- Review by the Technical Taskforce and its **6** Working Groups consists of **31** representative organizations:
 - a) 13 Professional Institutions including green groups**
(e.g. ASHRAE, HKIE & CIBSE etc.)
 - b) 13 Trade associations, consultant/contractor associations**
(e.g. ACRA, HKFEMC, LECA & BSOMES etc.)
 - c) 3 University Academia (HKU, HKPU, HKUST)**
 - d) 2 Government departments**

Preparation of the Codes



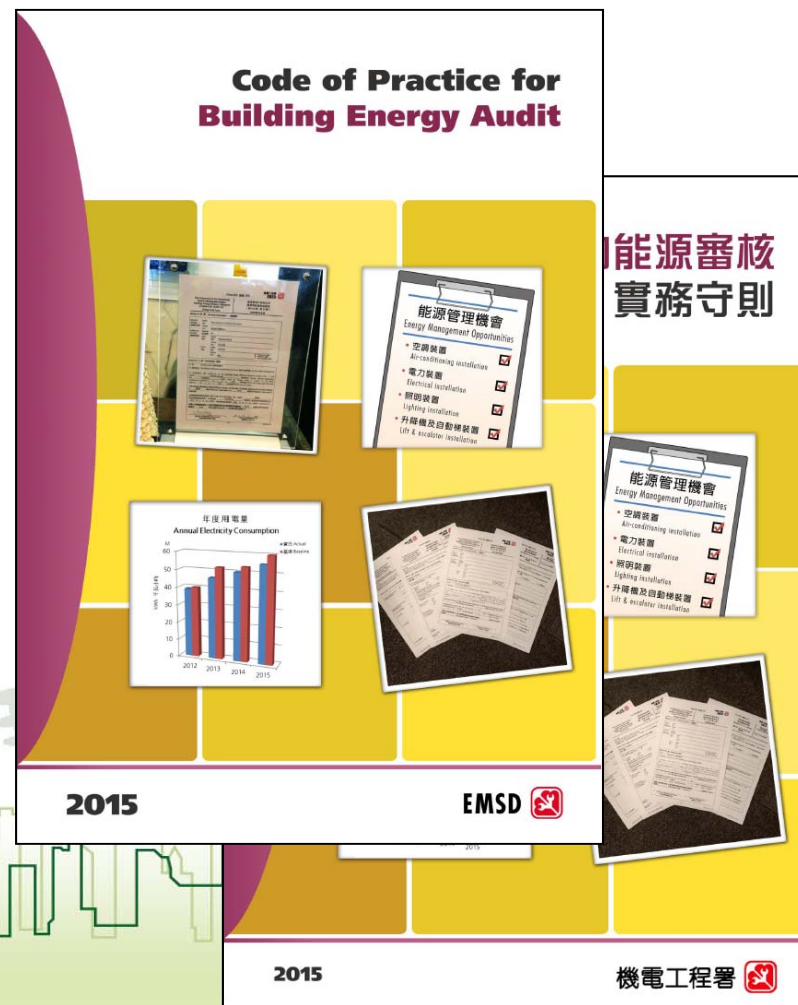
Event / Activity	Timing
1st round of meetings with the Working Groups (WG)	Sept. 2014
Consultation with LECA	Oct. 2014
2nd round of meetings with the WGs	Dec. 2014 - Jan. 2015
3rd meeting with AC & EA WGs	Feb. 2015
Meeting/consultation with chiller & VRF system vendors through ACRA	April – May 2015
Seeking support from WG Chairmen on the first draft of the codes	June 2015

Preparation of the Codes



Event / Activity	Timing
1 st draft to all the Members of WGs	June – July 2015
2 nd draft to all the Members of WGs	10 July 2015 (BEC only)
Circulate among Members of Technical Taskforce	31 July 2015
Endorsement by the Technical Taskforce	8 Sept 2015
Follow-up consultation with AC & LE WGs	End Sept 2015
Final draft and the Chinese version of the Codes	Oct – Nov 2015
Presentation to the EE & C Committee	Nov 2015
Gazette of the Codes	11 Dec 2015

The Codes



Review on the BEC



Lighting Installation



Electrical Installation

Air-conditioning Installation



Lift and Escalator Installation



BEC 2015 - Lighting Installation



- **Lighting Power Density (W/m²)**
- **Lighting Control Point**
- **Automatic Lighting Control**



Lighting Installation



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



Definition

Lighting Power Density

'lighting power density (LPD) (unit : W/m²)' 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:

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

,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.

Lighting Installation



Table 5.4
LPD Requirement Covers New Spaces

	BEC 2015
<u>Type of space</u>	LPD (W/m ²)
Computer Room / Data Centre	15
Court Room	15
Passenger Terminal Building	13 -18
Refuge Floor	11
School Hall	14
Server Room / Hub Room	10

Lighting Installation



Table 5.4
LPD Requirement of Certain Spaces Tightened

Type of Space	BEC 2012 (Rev. 1) (W/m ²)	BEC 2015 (W/m ²)
Classroom / Training Rm	13	12
Loading & Unloading Area	10	8
Office	13	12 (>15 m ²) 13 (≤ 15 m ²)
Plant Rm/ Machine Rm/ Switch Rm	11	10
Workshop	14	13

Lighting Installation



Clause 5.4.1 Exception on LPD requirement

BEC 2012 (Rev. 1)

Does not exceed 100W

BEC 2015

Does not exceed **70W**

Lighting Installation



Clause 5.5

Lighting control point

(requirement extended to other spaces)

	<u>BEC 2012 (Rev. 1)</u>	<u>BEC 2015</u>
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

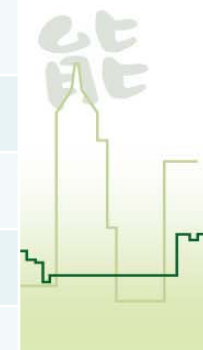


Clause 5.6 and Table 5.4

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	



Lighting Installation



Clause 5.6 Automatic Lighting Control

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

Lighting Installation



Clause 5.6.1 The Basic Provision

Automatic Lighting Control:

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

Space with fenestration or skylight:
→ Daylight responsive controls

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

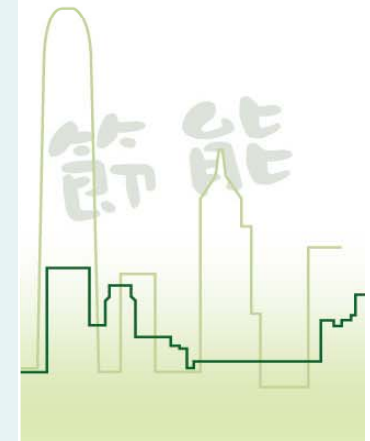


Clause 5.6.1

Automatic Lighting Control: (Cont'd)

Control devices/systems :

- $\leq 2000 \text{ m}^2$;
- 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.



Lighting Installation



Clause 5.6.1

Automatic Lighting Control: (Cont'd)

Any overriding control by the space occupant, **if provided** :

- $\leq 500 m^2$; 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 $\leq 150W$



Lighting Installation



Clause 5.6.2

Daylight Responsive Control thro' Fenestrations on Exterior Wall



Side window fenestration(s) $\geq 5m^2$;

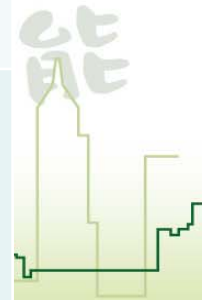
A discrete fenestration or a series of fenestrations serves one lighting zone

Separated control device for each *lighting zone*.

Shut off or reduce lighting power to **50% or less** based on available daylight

Lighting zone's area

- ≥ 2 x fenestration area (discrete);
- ≥ 2 x sum of fenestration areas (a series of fenestrations); or
- the entire space



Lighting Installation



Clause 5.6.2

Daylight Responsive Control thro' Fenestrations on Exterior Wall (Cont'd)



A series of fenestrations:

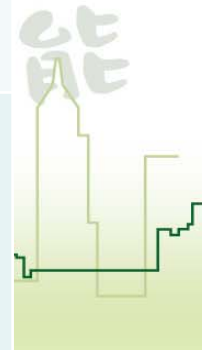
- same orientation; and
- separated by solid element of $\leq 2 m$ wide

A control device serves lighting zone on different floors permissible for those floors -

- of similar configuration;
- with similar lighting layout; and
- with lighting installations under same owner

Exception:

- Non-see-through fenestration;
- Fixed lightings $\leq 150W$ (wholly or partially within *a lighting zone*);
- Overlapped area assigned under the lighting zone of overhead skylight control



Lighting Installation

Clause 5.6.3

Daylight Responsive Control thro' Overhead Skylight

Skylight fenestration(s) $\geq 5m^2$;

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** based on available daylight



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Lighting Installation

Clause 5.6.3

Daylight Responsive Control thro' Overhead Skylight (Cont'd)

Lighting zone's area

- ≥ 5 x fenestration area (discrete);
- ≥ 5 x sum of fenestration areas (a series of fenestrations); or
- the entire space

A series of fenestrations:

- separated by solid element of $\leq 2m$ wide

Exception:

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



BEC 2015 - Air Conditioning Installation



- **Coefficient of Performance**
- **System Fan Power**
- Piping Frictional Loss
- Thermal Insulation
- **System Control**
- **Energy Metering**



Air-conditioning Installation



<u>Tightening Requirement</u>	<u>New Requirement</u>	<u>Unchanged</u>
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	Chiller isolation	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
	Isolation of zones	
	Demand control ventilation	
	Direct digital control	
		System load calculation

Air-conditioning Installation



Clause
6.7

Tightening requirement on Air
Distribution System Fan Power

< 5 kW

**< 2.5
kW**

BEC 2012 (Rev. 1)

BEC 2015

Clause
6.7.5

Exception on the system fan motor power
(CAV \leq 1.6W/L·s or VAV \leq 2.1 W/ L·s
the same as BEC 2012)

Air-conditioning Installation



Clause 6.7

New requirement on Air Distribution System Fan Power

Clause 6.7.6 (NEW)

Mechanical ventilation system fan motor power requirement

BEC 2015

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

BEC 2012 (Rev. 1)

- Not specified

Air-conditioning Installation



Clause 6.7.4

New & Revised requirement on CAV & VAV Air Distribution System

BEC 2012

Clause 6.7.4	SAF/RAF for VAV flow (≥ 5 kW): <ul style="list-style-type: none">consume $\leq 55\%$ power @ 50% flow
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BEC 2015

Clause 6.7.4	6.7.4.1	CAV Low-speed operation: <ul style="list-style-type: none">set at $\leq 66\%$ full speed; andconsumes $\leq 40\%$ full speed power
	6.7.4.2	VAV minimum fan speed: <ul style="list-style-type: none">set at $\leq 50\%$ full speed; andconsumes $\leq 30\%$ full speed power
	6.7.4.3	Conditioned space fresh air requirement take preference.

Exception: fan motor power < 1.0 kW (e.g. FCU)

Air-conditioning Installation



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 \geq 5kW
- pump motor consumes \leq 55% full power @ 50% design water volume flow

BEC 2015

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

Air-conditioning Installation

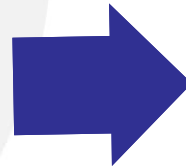


Clause 6.9

Update requirement on Water Pipe Sizing

BEC 2012 (Rev. 1)

- Pipe $\leq \phi 50\text{mm}$;
 $\leq 1.2 \text{ m/s}$
- Pipe $> \phi 50\text{mm}$;
 - $\leq 400 \text{ Pa/m}$ &
 - $\leq 3 \text{ m/s}$



BEC 2015

- Pipe $\leq \phi 50\text{mm}$;
 $\leq 1.2 \text{ m/s}$
- Pipe $> \phi 50\text{mm}$;
 - $\leq 400 \text{ Pa/m}$ &
 - $\leq 3.0 \text{ m/s}$ (variable flow) or
 - $\leq 2.5 \text{ m/s}$ (non-variable flow)

Variable flow (3.0 m/s):

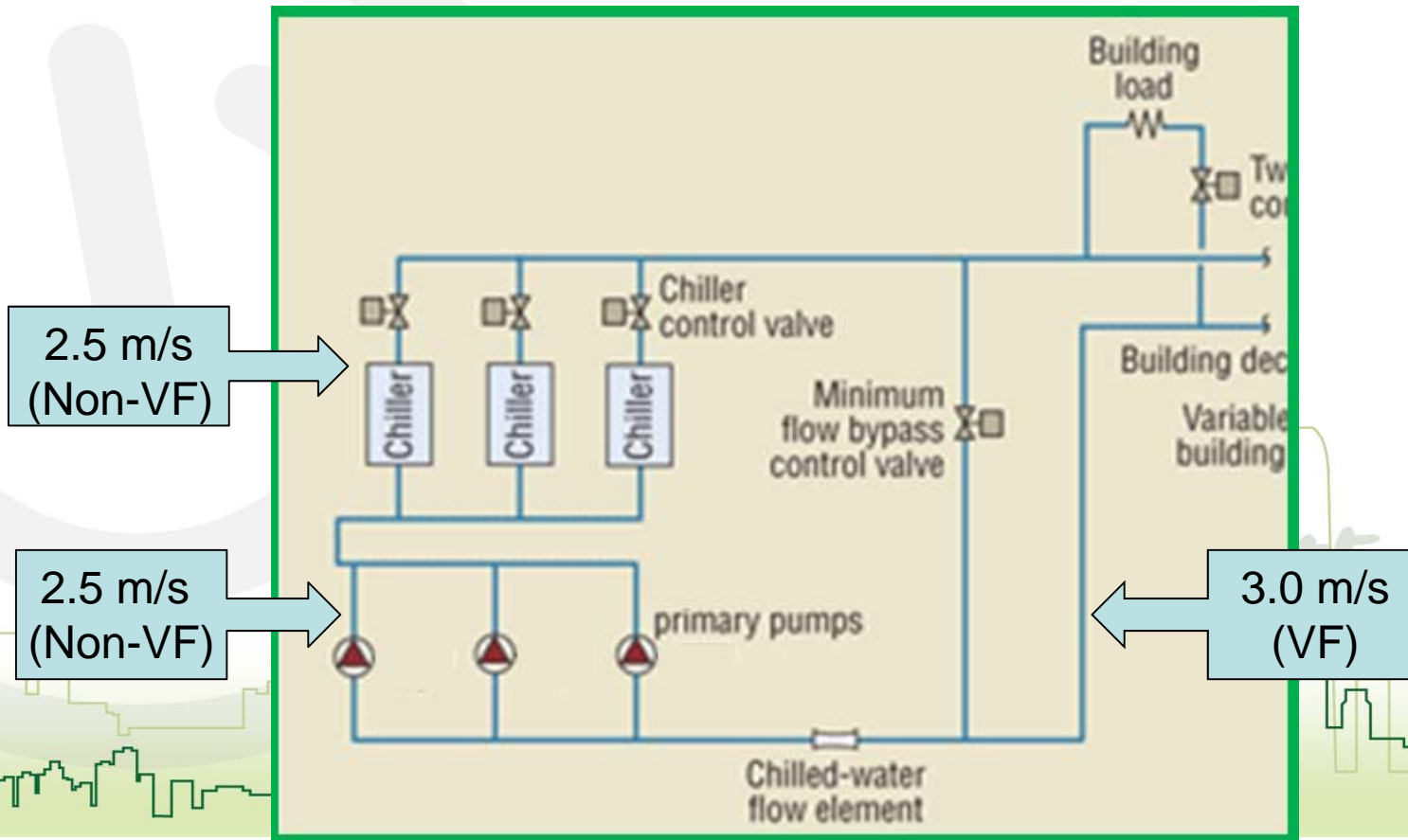
- VS pump motors or
- Multiple *duty* fixed-speed pump motors in stage operation (i.e. standby pump excluded)

Air-conditioning Installation



Clause 6.9

Update requirement on Water Pipe Sizing



Air-conditioning Installation



Clause 6.10.6 Control of VAV Air Distribution System

BEC 2015

Clause 6.10.6.1	Sensor so located with set pt. ≤ 300 Pa
	Sensor at each major branch when necessary (e.g. main split close to SAF)
Clause 6.10.6.2	Reset set point based on the actual demand load

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Air-conditioning Installation



**Clause
6.10.7**

**New requirement on Demand Control
Ventilation**

Carpark

provide staging or modulation of fan for ventilation system

Clause 6.10.7.1

down to $\leq 50\%$ design capacity based on the detected contaminant level
basement floor: the control response also to temperature is permissible

AC system

provision of demand control

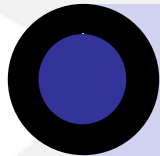
Clause 6.10.7.3

fresh air rate ≥ 1400 L/s

Clause 6.10.7.4

FA dampers shall be modulated based on the CO₂ level of the conditioned space

Air-conditioning Installation



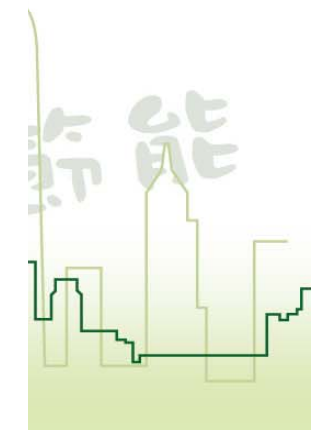
Clause 6.12 Update Minimum COP for different equipment type

Table 6.12a (Part 1):
Minimum Coefficient of Performance for Unitary Air-conditioner at Full Load

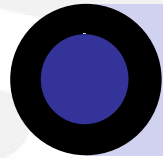
Type of Cooling	Air-cooled			Water-cooled	
Capacity range (kW)	7.5 kW & below, of types outside the scope of Room Air Conditioners in the labelling scheme specified in clause 6.12.2	Above 7.5 kW & below 40 kW	40 to 200 kW	Above 200 kW	All Ratings
Minimum COP at cooling mode (free air flow ^(*))	2.6 for split type 2.3 for non-split type	2.5 3 (@2)	2.6 3.1 (@2)	2.6	3.3
Minimum COP at heating mode (heat pump), (free air flow ^(*))	2.7	3.1	3.1	3.1	3.4

Table 6.12a (Part 2):
Minimum Coefficient of Performance for Variable Refrigerant Flow System at Full Load

Type of Cooling	Air-cooled (@2)			Water-cooled (@3)
Capacity range (kW)	7.5 kW & below 40 kW	40 to 200 kW	Above 200 kW	All Ratings
Minimum COP at cooling mode	3.3	3.3	3.3	4.3



Air-conditioning Installation



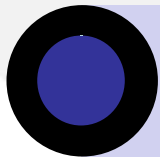
Clause 6.12

Update Minimum COP for different equipment type

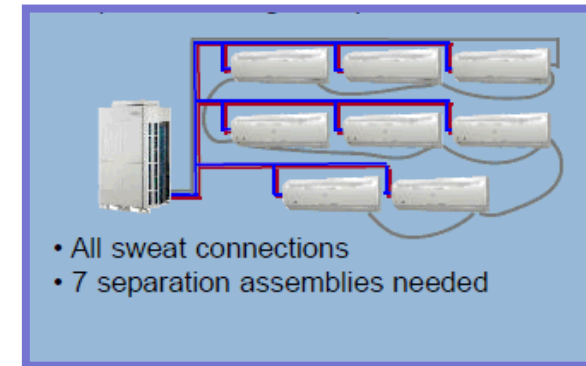
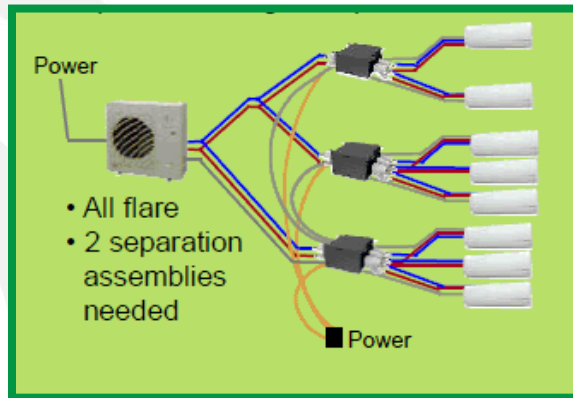
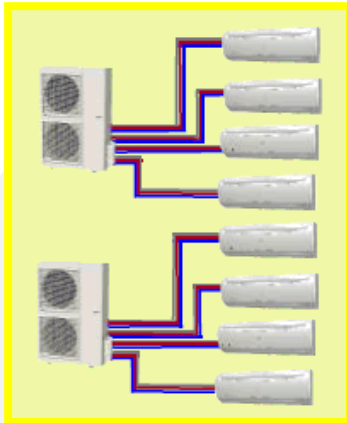
<u>Equipment Type</u>		<u>BEC 2012 (Rev. 1)</u>	<u>BEC 2015</u>
Unitary Air-conditioner (U-A/C) – (cooling mode)			
		<u>Table 6.12a</u>	<u>Table 6.12a – Part 1</u>
Air-cooled	≤ 7.5 kW	2.1 (non-split type)	2.3
	≤ 7.5 kW	2.4 (split type)	2.6
	>7.5 kW to 200 kW	2.4	2.5
Variable Refrigerant Flow (VRF) System (cooling mode)			
		<u>Table 6.12a</u>	<u>Table 6.12a – Part 2</u>
Air-cooled		2.9 – 3.0 (*)	3.3
Water-cooled		3.0 (*)	4.3

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

Air-conditioning Installation

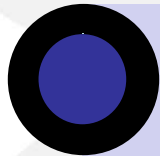


Clause 6.12 Update Min. COP for different equipment type Unitary Air-Conditioner Vs VRF system



Typical multi-split	Hybrid multi-split	Typical VRF System
CS or VS	VS typically	VS
4 to around 10 kW	8 to around 20 kW	From 25 kW to over 200 kW
≤ 4 indoor units	Up to 8 or 9 indoor units	Over 60 indoor units
All EVs at outdoor unit	Up to 3 EVs inside a distribution box each connecting 2 to 3 indoor units	EV located inside each indoor unit
May have only simple control	Typically with computerized zone control	Computerized zone control

Air-conditioning Installation

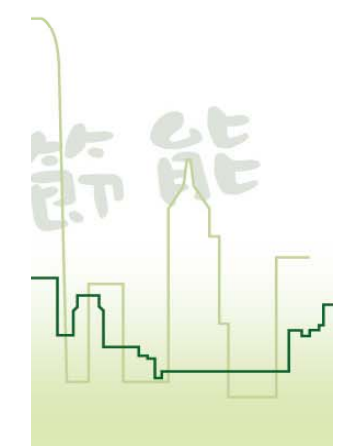


Clause 6.12

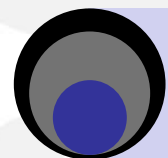
Update Minimum COP for different equipment type

Table 6.12b : Minimum Coefficient of Performance for Chiller⁰² at Full Load

Air-cooled															
Type of compressor	Reciprocating		Scroll		Screw		VSD Screw		Centrifugal	VSD Centrifugal					
Capacity Range (kW)	Below 400 kW	400 kW & above	Below 400 kW	400 kW & above	Below 500 kW	500 kW & above	Below 500 kW	500 kW & above	All Ratings	All Ratings					
Minimum COP at cooling (free air flow ⁰¹)	2.8	2.9	2.8	2.9	2.9	3.0	2.8 (3.6) ⁰⁵	2.9 (3.7) ⁰⁵	3.2	3.1 (4.0) ⁰⁵					
Water-cooled															
Type of compressor	Reciprocating / Scroll			Screw			VSD Screw			Centrifugal			VSD Centrifugal		
Capacity Range (kW)	Below 500 kW	500 to 1000 kW	Above 1000 kW	Below 500 kW	500 to 1000 kW	Above 1000 kW	Below 500 kW	500 to 1000 kW	Above 1000 kW	Below 1000 kW	1000 kW to 3000 kW	Above 3000 kW	Below 1000 kW	1000 kW to 3000 kW	Above 3000 kW
Minimum COP (Cooling)	4.2	4.7	5.3	4.8	5.0	5.5	4.7 (6.1) ⁰⁵	4.9 (6.3) ⁰⁵	5.2 (6.7) ⁰⁵	5.4 ⁰³	5.7	5.8	5.1 (6.6) ⁰⁵	5.5 (7.1) ⁰⁵	5.6 (7.2) ⁰⁵
										5.6 ⁰⁴					



Air-conditioning Installation



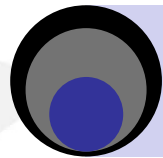
Clause 6.12

Update Minimum COP for different equipment type

<u>Equipment Type</u>		<u>BEC 2012 (Rev. 1)</u>	<u>BEC 2015</u>		
Chiller - Air Cooled		<u>Table 6.12b</u>	<u>Table 6.12b</u>		
Reciprocating or scroll	Below 400 kW	2.6 - 2.7	2.8		
	Above 400 kW	2.7 – 2.8	2.9		
Screw or VSD Screw (New)	Below 500 kW	2.9	2.9	2.8 (1)	3.6 (2)
	Above 500 kW		3.0	2.9 (1)	3.7 (2)
Centrifugal or VSD Centrifugal (New)		2.8	3.2	3.1 (1)	4.0 (2)

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

Air-conditioning Installation



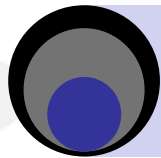
Clause 6.12

Update Minimum COP for different equipment type

<u>Equipment Type</u>		<u>BEC 2012 (Rev. 1)</u>	<u>BEC 2015</u>		
Chiller - Water Cooled		<u>Table 6.12b</u>	<u>Table 6.12b</u>		
Reciprocating / Scroll	Below 500 kW	4.1	4.2 / 4.8		
	500 to 1000kW	4.6	4.7 / 5.0		
	Above 1000 kW	5.2	5.3 / 5.5		
Screw or VSD screw	Below 500 kW	4.6	4.8	4.7 (1)	6.1 (2)
	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)

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

Air-conditioning Installation

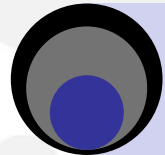


Clause 6.12

Update Minimum COP for different equipment type

<u>Equipment Type</u>		<u>BEC 2012 (Rev. 1)</u>	<u>BEC 2015</u>	
Chiller - Water Cooled		<u>Table 6.12b</u>	<u>Table 6.12b</u>	
Centrifugal	Below 1000 kW	5.1 (< 500 kW) 5.6 (\geq 500 kW)	5.4 (< 500 kW) 5.6 (\geq 500 kW)	
	1000 to 3000kW	5.6	5.7	
	Above 3000 kW	5.7	5.8	
VSD Centrifugal (New)	Below 1000 kW	Not Specified	5.1	6.6 (75%)
	1000 to 3000kW		5.5	7.1 (75%)
	Above 3000 kW		5.6	7.2 (75%)

Air-conditioning Installation

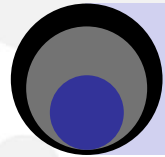


Misc. Requirements

Clause No.	Requirement
6.8.3	Automatic isolation device at chiller
6.10.4.4	Automatic air dampers at FA intake and EA discharge
6.12.4	Cooling Tower (open circuit) Fan: For each kW (motor nameplate power) to achieve – ≥ 1.7 L/s condensing water flow (centrifugal); ≥ 3.4 L/s condensing water flow (propeller or axial)



Air-conditioning Installation



Misc. Requirements

Clause No.	Requirement
6.13.5	Metering devices for: AHU ≥ 5.0 kW rated motor and inside plant room
6.14	Direct Digital Control: <ul style="list-style-type: none">• Chiller /heated water plant ≥ 350 kW (cooling or heating capacity)• CAV/VAV of fan motor power ≥ 7.45 kW

BEC 2015 - Electrical Installation



- **Motor Efficiency**
- Motor Sizing
- Power Distribution Loss
- Power Quality
- **Energy Metering**



Electrical Installation



Table 7.5.1
Update requirement on motor efficiency

	<u>BEC 2012</u>	<u>BEC 2015</u>	% of change
1.1 to 4.0 kW	81.4 – 86.6	No Change	0
5.5 kW	87.7	No Change	0
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)	(IE2/IE3 Motors)	

Only 4-pole motor shown as illustration

Electrical Installation



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.)

BEC 2015 - Lift and Escalator Installation



- **Electrical Power of motor drive**
- **Energy Metering**
- **Lift Decoration Load**
- **Lift idling**



BEC 2015 - Lift and Escalator Installation



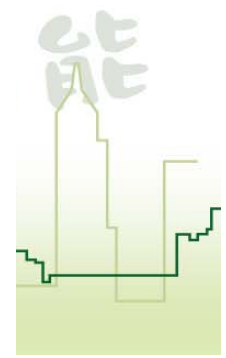
Max. allowable traction lift electrical power ↓ **3 ~ 5 %**

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 V_c (m/s)				
	$V_c < 1$	$1 \leq V_c < 1.5$	$1.5 \leq V_c < 2$	$2 \leq V_c < 2.5$	$2.5 \leq V_c < 3$
$L < 750$	6.5	9.2	11.1	14.7	16.6
$750 \leq L < 1000$	9.2	11.1	15.7	19.4	22.1
$1000 \leq L < 1350$	11.1	15.7	20.3	24.9	29.5



BEC 2015 - Lift and Escalator Installation



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 V_c (m/s)				
	$V_c < 1$	$1 \leq V_c < 1.5$	$1.5 \leq V_c < 2$	$2 \leq V_c < 2.5$	
$L < 750$	6.7	9.5	11.4	15.2	17.1
$750 \leq L < 1000$	9.5	11.4	16.2	20	22.8
$1000 \leq L < 1350$	11.4	16.2	20.9	25.7	30.4
$1350 \leq L < 1600$	14.3	19	25.7	30.4	36.1
$1600 \leq L < 2000$	16.2	23.8	30.4	37.1	43.7
$2000 \leq L < 3000$	23.8	35.2	44.7	56.1	66.5

Requirements the same as BEC 2012

BEC 2015 - Lift and Escalator Installation



Max. allowable hydraulic lift electrical power ↓ **5 %**

Max. allowable escalator electrical power ↓ **2 %**

Max. allowable passenger conveyer electrical power ↓ **2 %**

BEC 2015 - Lift and Escalator Installation



Max. lift decoration load ↓ **10 %**

Table 8.5.2 : Maximum Lift Decoration Load

Lift Rated Load L (kg)	Allowable Decoration Load D (kg)
$L < 1800$	$D = 0.5 \times L$, or 540 whichever is smaller
$L \geq 1800$	$D = 0.3422 \times L - 0.00002344 \times L^2$, or 1125 whichever is smaller

能

BEC 2015 - Lift and Escalator Installation



New Requirement

Lift car ventilation fan power consumption: ≤ 0.7 W per L/s

Regenerative braking system for lift of:

Speed ≥ 3 m/s; &

Capacity ≥ 1000 kg

Lift car automatic lighting control:

Automatic cut lighting power to 50% or less (15-min. or longer idling)

Escalator:

Provision of automatic speed reduction mode.

BEC 2015 - Lift and Escalator Installation



Revised Requirement

Each Lift, Escalator or Passenger Conveyor:

To provide **metering devices**.

(Requirement on provision of measurement removed)

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



BEC 2015

Trade-off items cover all the four BS installations

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

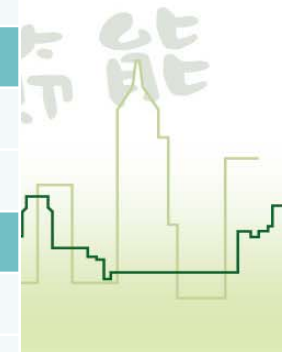
3 Items

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)

Performance-based Approach



**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)**

**Follow ASHRAE 90.1 Energy Simulation Approach
Follow recommendations of CIBSE TM54 to evaluate operational energy use**

Editions of the BEC

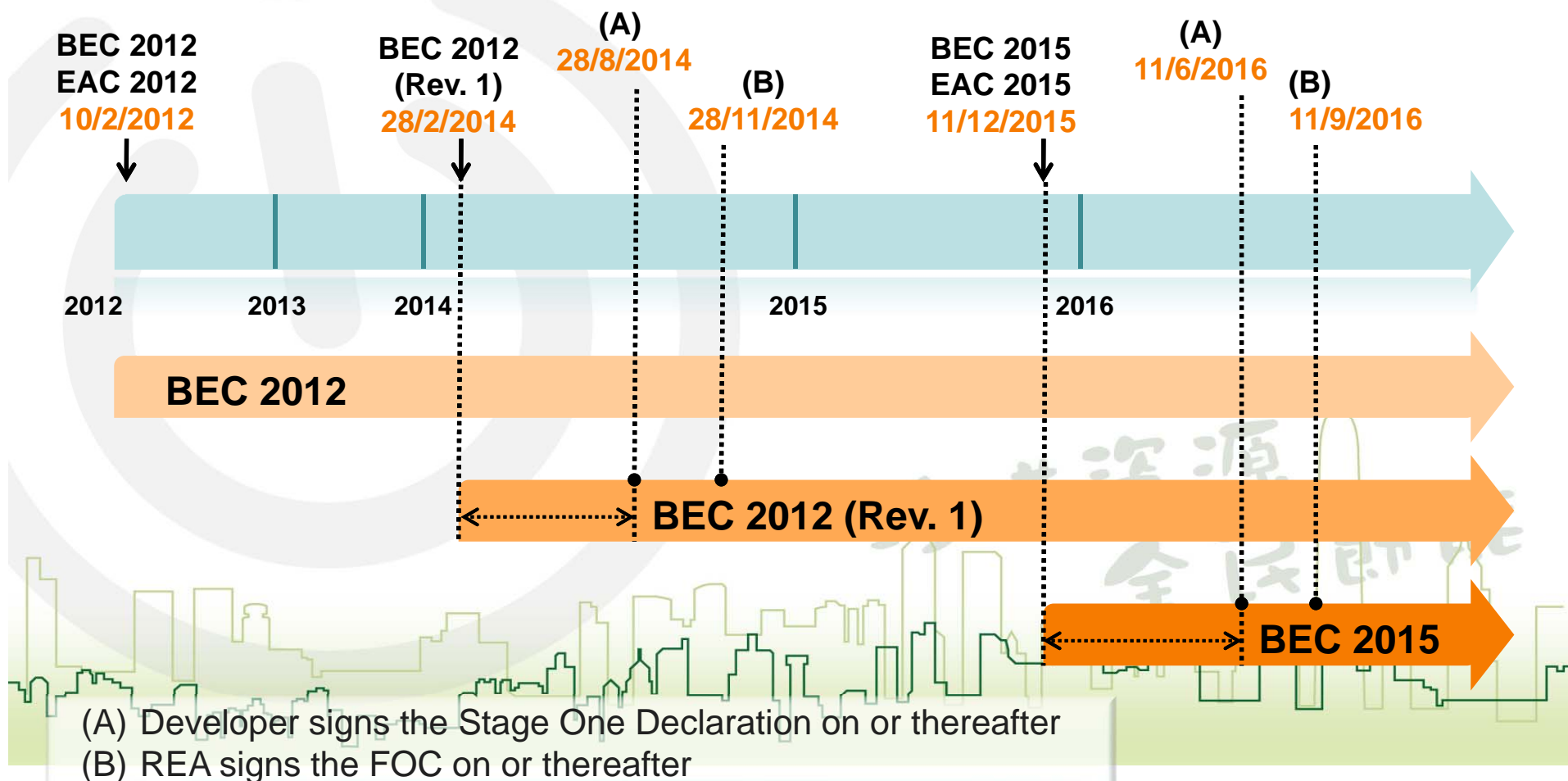


11 December 2015: BEC 2015 Gazette Date

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



Editions of the BEC



Editions of the BEC



BEC 2012 & BEC 2012 (Rev. 1) Are Still Applicable To: (Existing building and FOC Related)

- Forthcoming MRW being completed with the FOC signed and issued **before 11.09.2016** (i.e. comply with BEC 2012 (Rev. 1))
- CBSI/BSI issued with FOC under BEC 2012 or BEC 2012 (Rev. 1) previously:
 - **Owner** of the **CBSI** to maintain the installation(s) to the standard applied in the FOC [S18(2)];
 - **Responsible person** of a unit to maintain the **BSI** to the standard applied in the FOC [S18(2)]

Form E04 表格 E04
機電工程署 EMSD
The Government of the Hong Kong Special Administrative Region
香港特別行政區政府
Building Energy Efficiency Ordinance
建築物能源效率條例
Chapter 610, Section 18E
(第 610 章 第 18 條)
Form of Compliance
履行規定表格

NOTE (注意)
Please read the "Notes to Complete this Form" and "Personal Data Privacy Statement" attached and complete all the items in black ink.
請細閱隨表附上的「填寫表格的注意事項」及「個人資料私隱聲明」，並以黑色墨水填寫。

Section A (可選) Information of Building/Common Area 建築物資料/公用地方資料

Information of Building
建築物資料

Name of Building
建築物的名稱
English: ETC
Chinese: ETC

Address of Building
建築物的地址
Street no. / 街道號碼
English: ETC
Chinese: ETC

District / 地區
English: ETC
Chinese: ETC

Information of Relevant Unit / Common Area
有關單位/公用地方的資料

Name
名稱
English: ETC
Chinese: ETC

Location
位置
Room / 房間
Floor / 樓層
Unit / 單位
Other description / 其他說明
E04/01

Editions of the BEC



BEC 2012 & BEC 2012 (Rev. 1) Are Still Applicable To: (COCR related)

- Building with **stage one** declaration made **before 11.06.2016** & the subsequent stage two declaration when reported the same edition;

E.g. If making stage one declaration on *01.01.2016*;

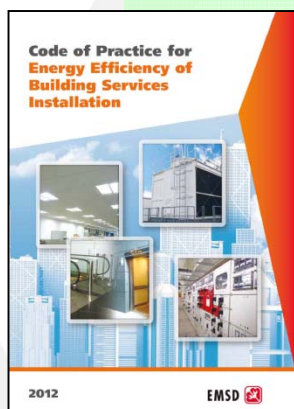
→ BEC 2012 (Rev. 1)

When making the subsequent stage two declaration on *01.01.2018*;

→ BEC 2012 (Rev. 1), at least.

Alternatively,

→ BEC 2015 (i.e. upgrade the BSI to follow BEC 2015 within the two-year construction period)

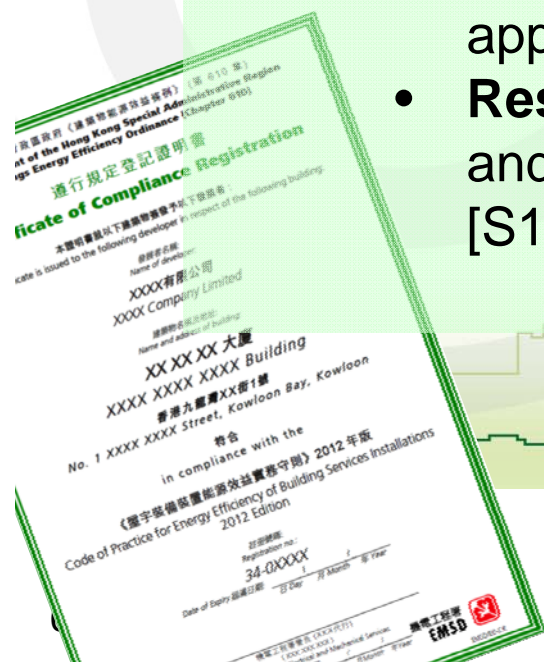


Editions of the BEC



BEC 2012 & BEC 2012 (Rev. 1) Are Still Applicable To: (COCR related)

- Building issued with COCR in compliance with BEC 2012 or BEC 2012 (Rev. 1):
 - **Building owner** to maintain the **CBSI** to the standard applied in the COCR [S12(3)];
 - **Responsible person** of a unit to have the **BSIs** to *meet*, and *are maintained* to the standard applied in the COCR [S12(4)]



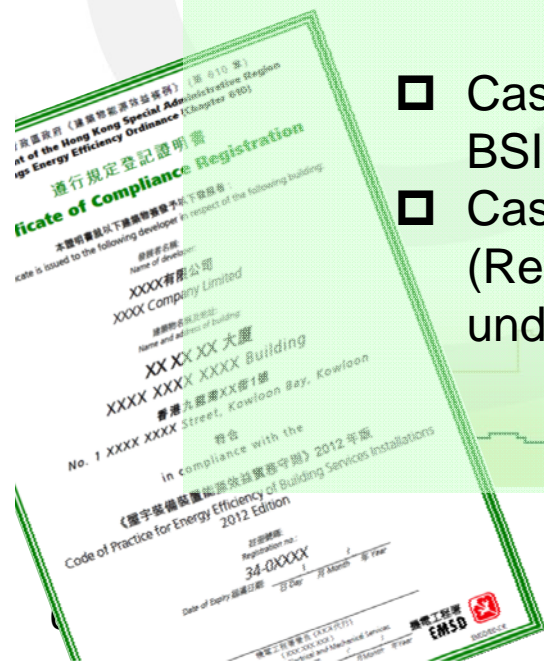
Editions of the BEC

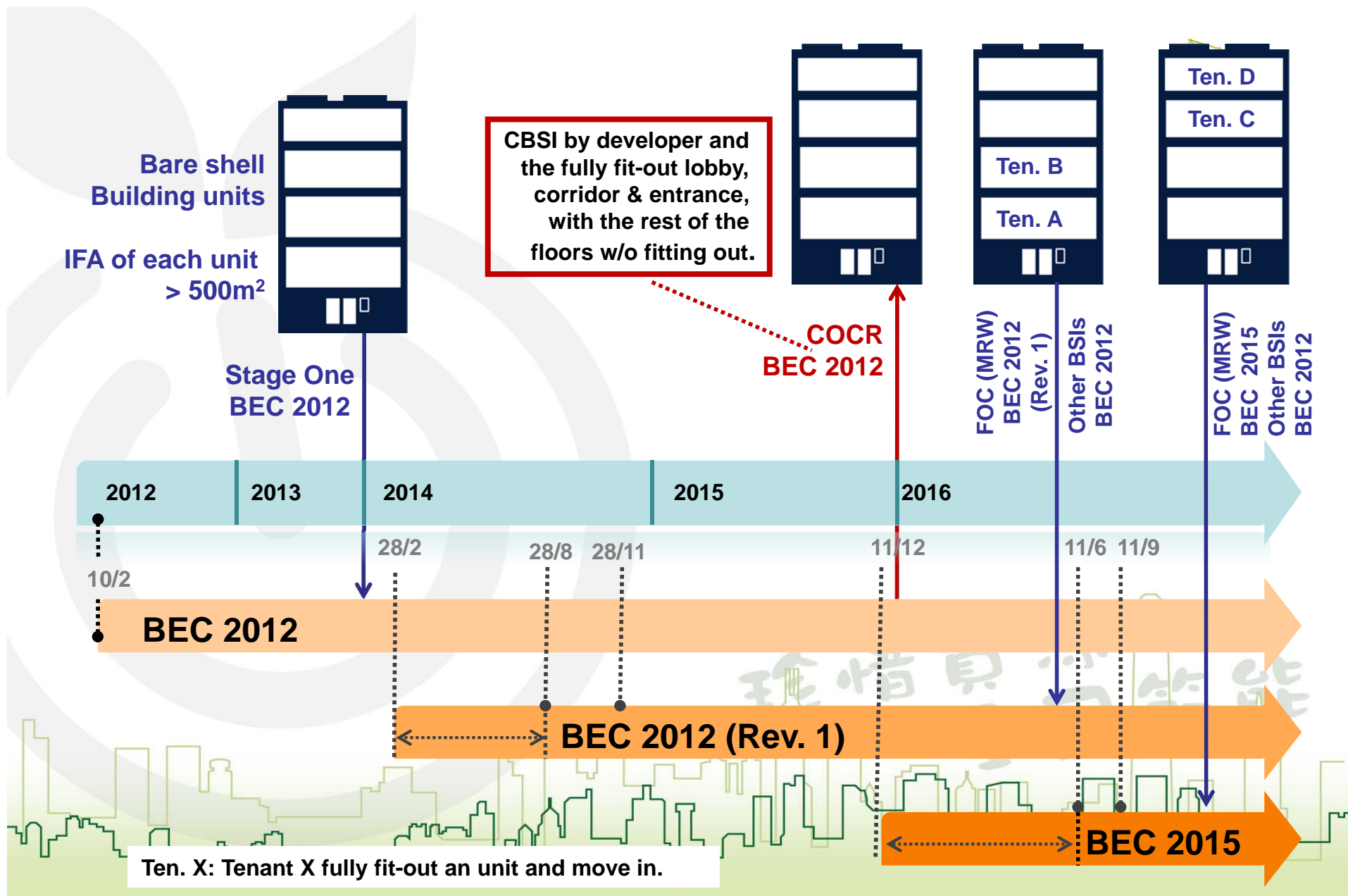


BEC 2012 & BEC 2012 (Rev. 1) Are Still Applicable To: (COCR and duties of responsible person related)

- (Building issued with COCR to *BEC 2012*) A bare shell office unit left ready be developer.
- When tenant moves in and fits out the unit, e.g. the **LPD** to follow *BEC 2012* or *BEC 2012 (Rev.1)* depends on:

- ❑ Case 1: Unit's IFA of 499 m², LPD to follow *BEC 2012* and other BSIs to follow also *BEC 2012*.
- ❑ Case 2 : Unit's IFA of 501 m² and of MRW and with *BEC 2012 (Rev. 1)* takes effect, LPD to follow *BEC 2012 (Rev. 1)* and cover under a FOC. Other BSIs, of non-MRW, to follow *BEC 2012*.





EAC 2015

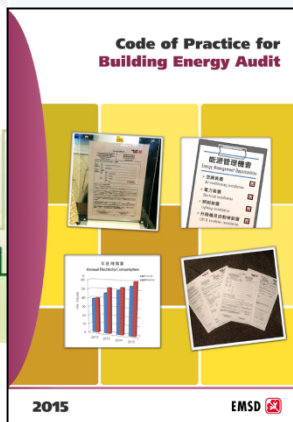


EAC 2015

Further guidance on power consumption measurement

Explicitly allows applying on-site measurement for:

- aged building lack of engineering information; or
- the available engineering information not reflecting the actual situation nor accurate enough



EAC 2015



EAC 2015 (Cont'd)

EA Report to include:

- Judgement/rationale on proceeding with on-site measurement;
- methodology; and
- engineering information available (as reference)

Form EE-EAes (Executive Summary of EA Report):

- Refined to suit:
 - Rated value of equipment capacity / power consumption
 - Measured / Calculated equipment capacity / power consumption
 - Chiller plant overall COP

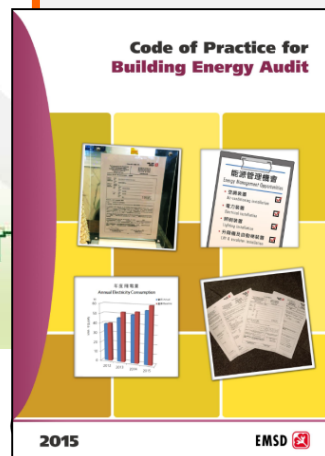
EA exemption criteria updated

Effective Date of the EAC 2015



11 December 2015: EAC 2015 Gazette Date

	Date
Completion Date of the Energy Audit	<i>11 June 2016</i>



Way Forward



- Technical Forms (EE-AC, EE-LG, EE-LE, EE-EAes etc.)
- TG-BEC 2015; TG-EAC 2015
- 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 respectively.

珍惜資源
全民節能



Thank you!

珍惜資源
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