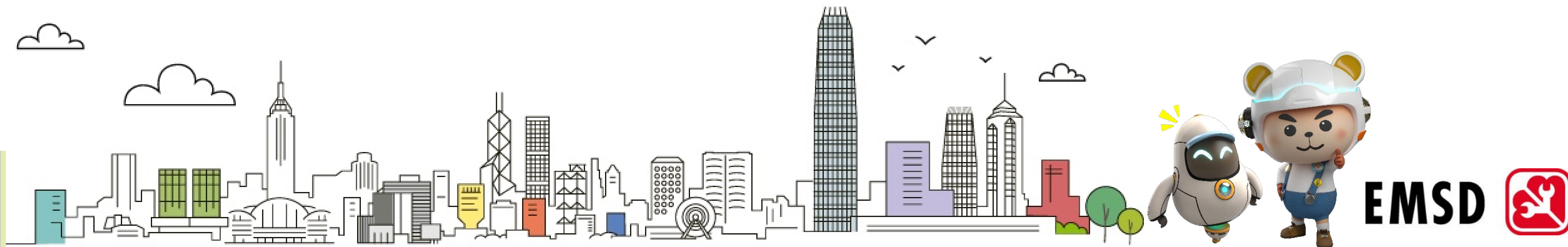


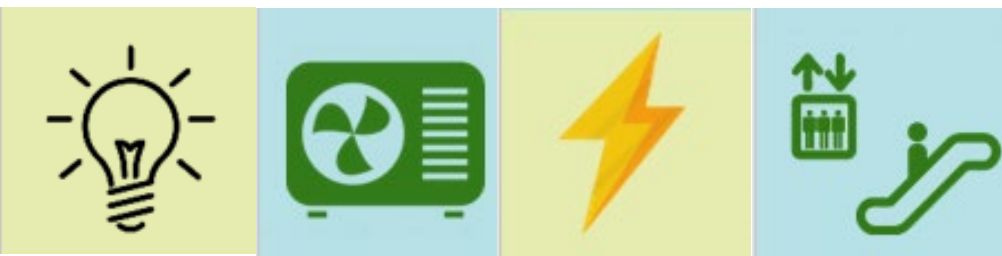
Enhancing Buildings Energy Performance Towards Carbon Neutrality by Regulation and Collaboration

Energy Efficiency Office
Electrical and Mechanical Services Department
Government of the HKSAR
21 December 2022





- 1. Hong Kong's Climate Action Plan 2050**
- 2. Buildings Energy Efficiency Ordinance (Cap 610)**
- 3. Building Energy Code and Energy Audit Code**
- 4. Decarbonisation Strategies and Actions**



Extreme Weather



七月最熱月

月平均氣溫 30.3度 破紀錄

1884年以來最長連續熱夜 單月最多熱夜

33.3度 月平均最高氣溫 破紀錄

28.4度 月平均最低氣溫 破紀錄

34.9度 全港最高氣溫 破紀錄

35.0度 十日破紀錄

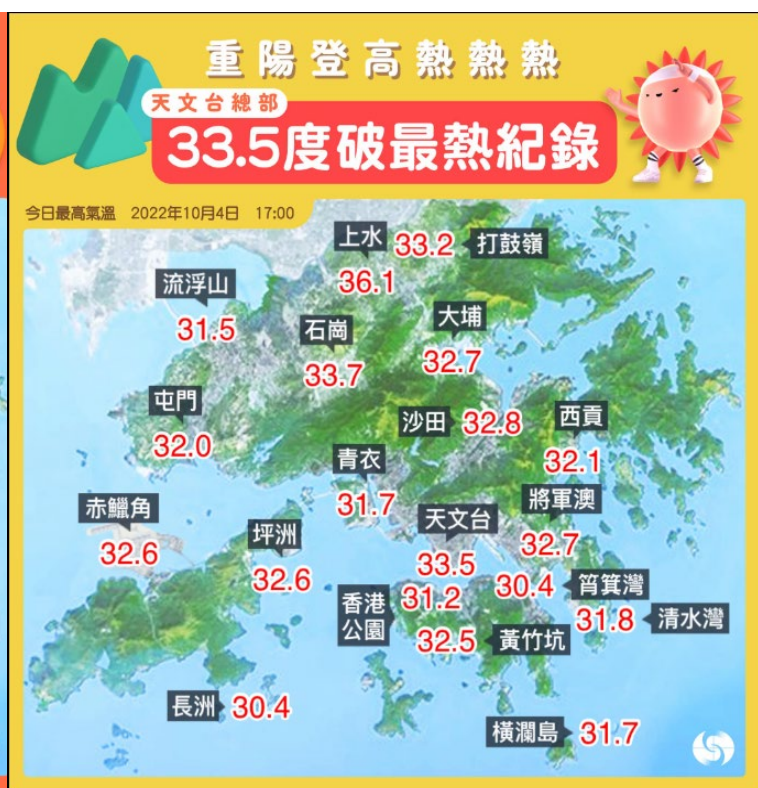
36.1度 單月最熱七月天

34.0度 飲多啲水

34.9度 大暑

29.9度 破紀錄

多補充水分慎防中暑



三種主要溫室氣體 二氧化碳 甲烷 氧化亞氮

濃度創新高

IPCC 第六次評估報告

若不加強減排 本世紀末或升溫

3.2°C

若全球升溫 4°C 某些地區或會出現持續 5 年以上

嚴重乾旱

英國熱浪! 40.3°C 破最熱紀錄

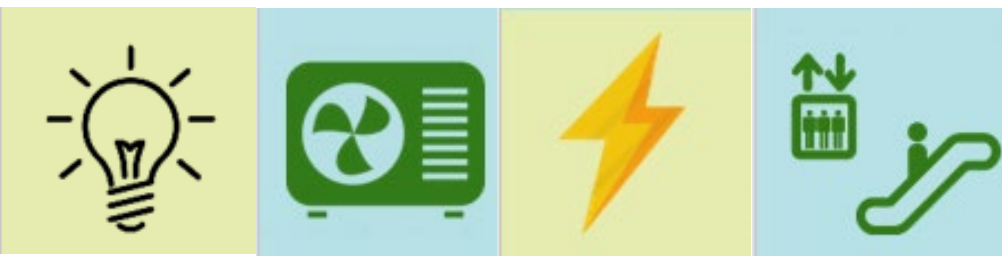
40.3c Coningsby

澳洲錄 50.7°C 高溫 平 1960 年紀錄

1910 年以來 **亞洲最熱四月** 較平均值高 2.62°C

格陵蘭錄得有紀錄以來 **最熱九月**

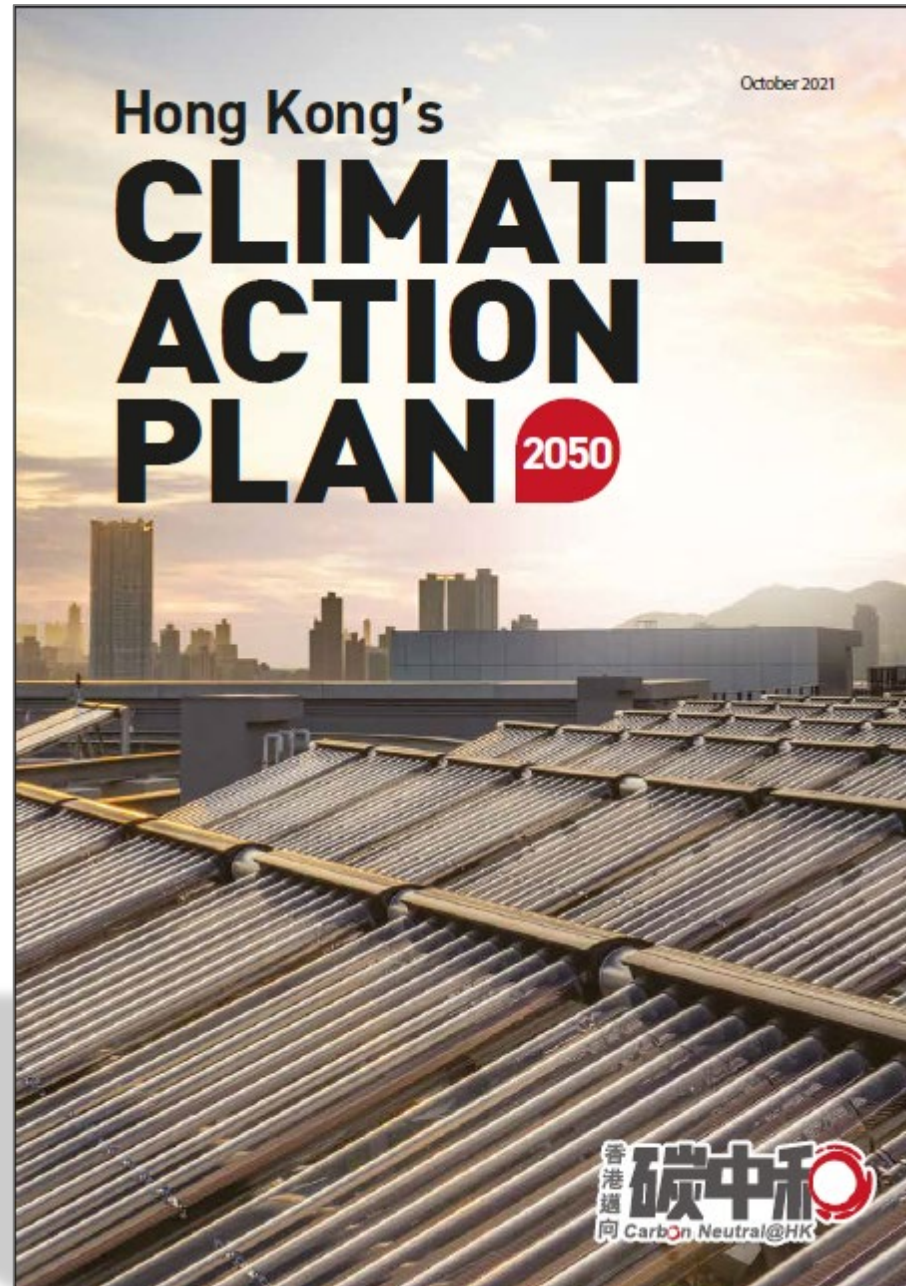
Source: 香港天文台 HKO | Facebook







Hong Kong's Climate Action Plan 2050



Source: The Chief Executive's Policy Address 2020 and 2021



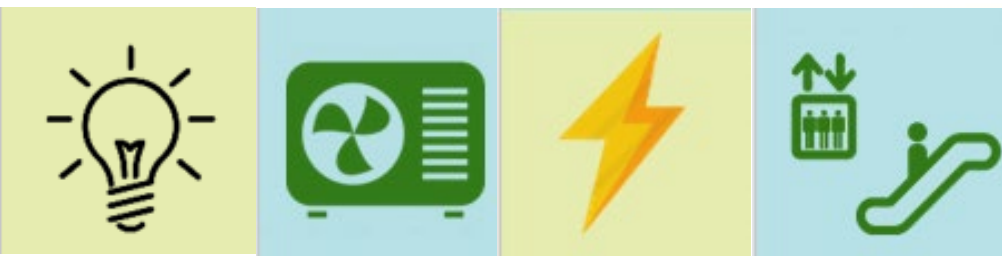
 **Before 2035**
 **Total carbon emissions**
Compared with 2005 level

 **Before 2050**


Four decarbonisation strategies

- Net-zero Electricity Generation** (Icons: power plant, wind turbine, solar panel)
- Energy Saving and Green Buildings** (Icon: modern building)
- Green Transport** (Icons: person walking, bicycle, electric car)
- Waste Reduction** (Icon: recycling bins)

Source: Hong Kong Climate Action Plan 2050



Hong Kong Situation



Around 50,000
Buildings in
Public and Private Sector



Around 300
New Buildings
per year

2035

Electricity
consumption
(Compared
with 2015)

**COMMERCIAL
BUILDINGS
15-20%**

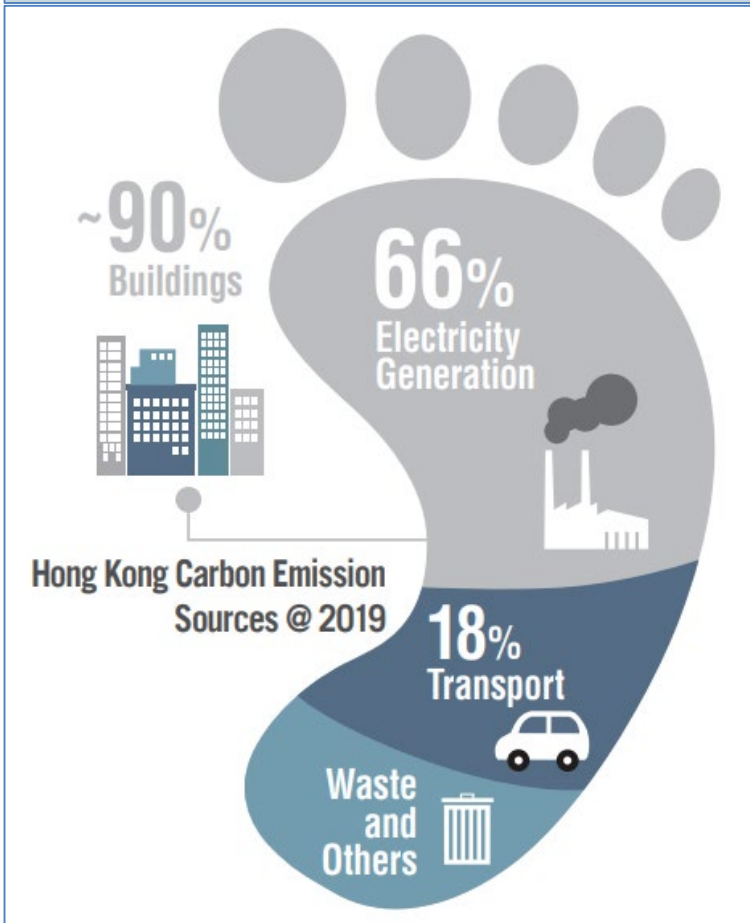
**(Reduce by 30-40%
subsequently)**

**RESIDENTIAL
BUILDINGS
10-15%**

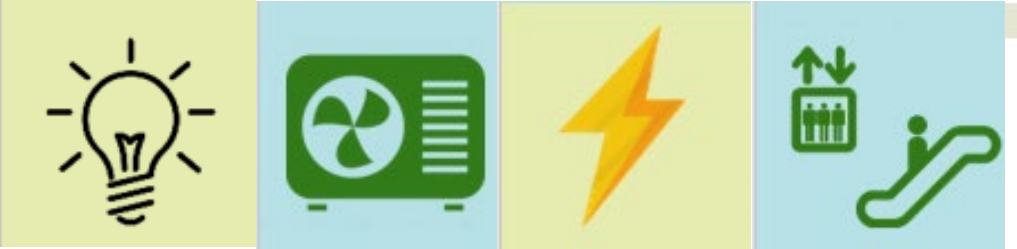
**(Reduce by 20-30%
subsequently)**



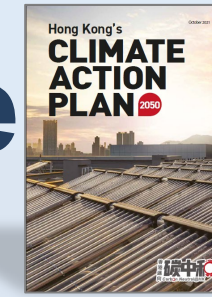
Net-zero Electricity Generation
Energy Saving and Green Buildings



Source:
1. Building Department
2. Census and Statistics Department
3. Hong Kong's Climate Action Plan 2050



Multi-pronged Approach in Enhancing Buildings Energy Performance - Hong Kong's Climate Action Plan 2050

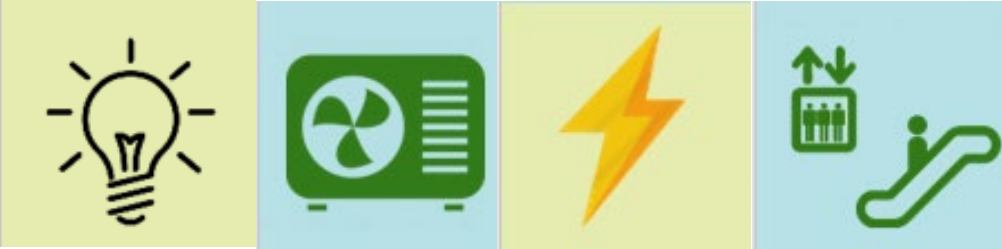
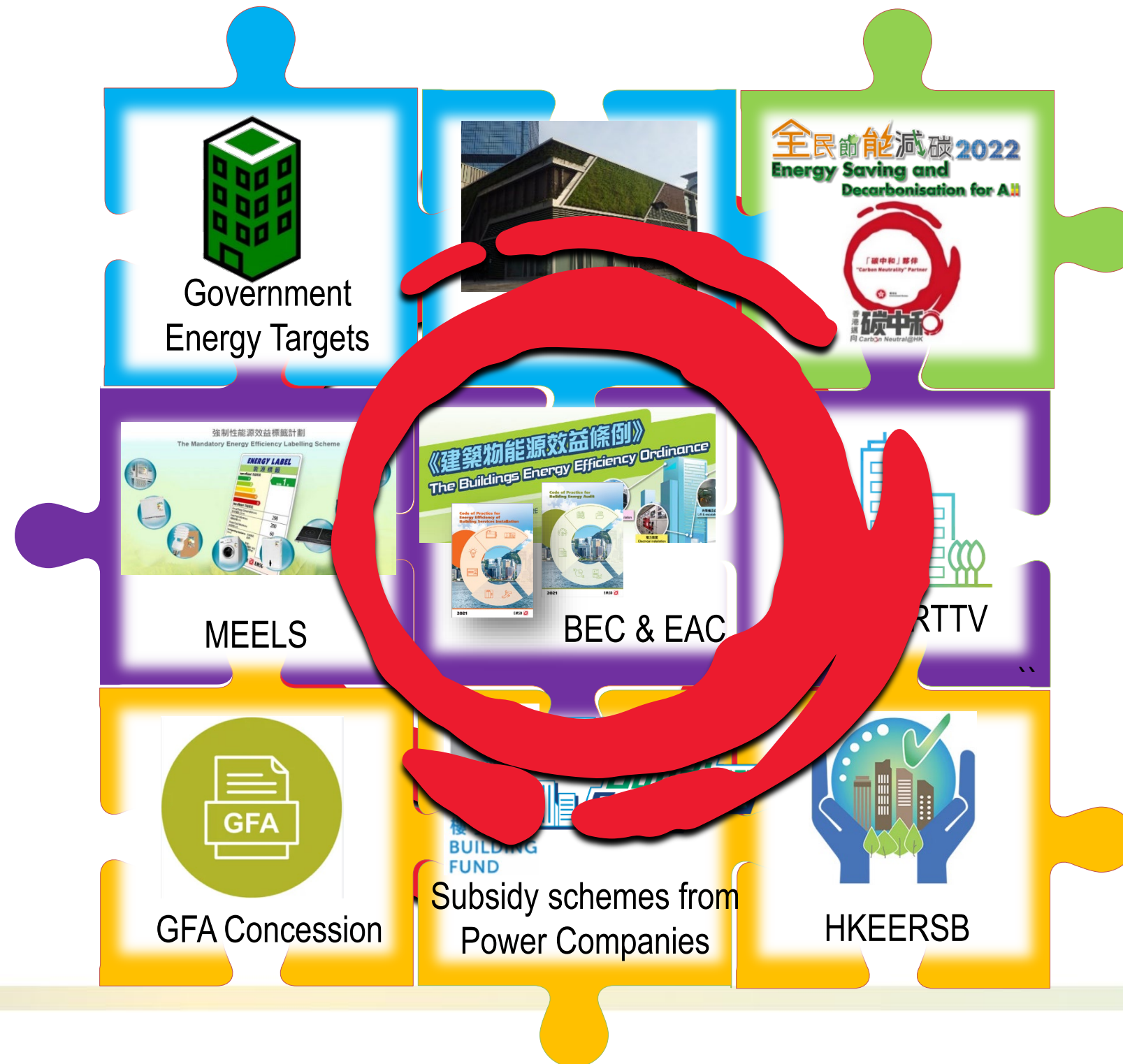


Government-Led

Regulatory Approach

Collaboration

Incentive & Subsidy



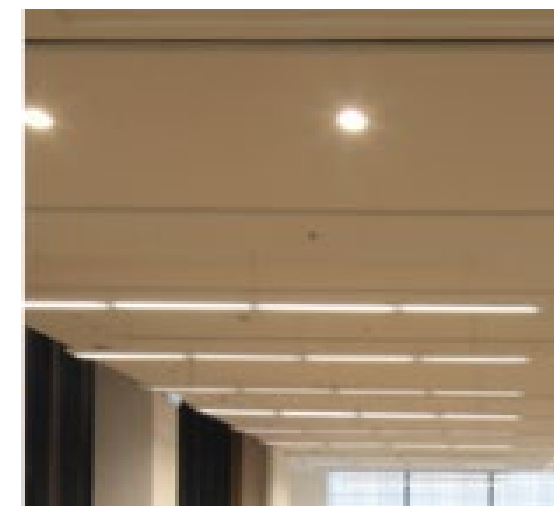
Buildings Energy Efficiency Ordinance Cap 610 (BEEO)



✓ Full Implementation on 21 September 2012

4 types of Prescribed Building Services Installation (BSI)

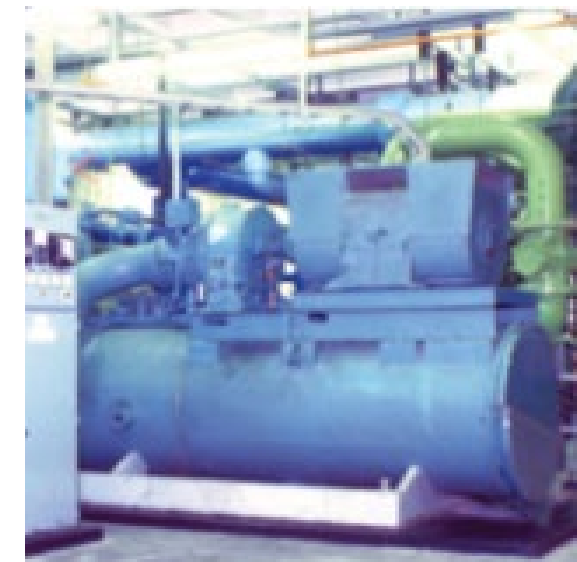
The banner features the EMSD logo and the text 'Buildings Energy Efficiency Ordinance (Cap. 610)'. The main title is 'BUILDINGS ENERGY EFFICIENCY ORDINANCE (CAP. 610)' with the Chinese subtitle '《建築物能源效益條例》第610章'. It highlights four categories of BSI: Air-conditioning Installation (空調裝置), Lighting Installation (照明裝置), Electrical Installation (電力裝置), and Lift and escalator Installation (升降機及自動梯裝置). The banner includes a QR code and language options for English, 繁體中文, and 簡體中文. The website URL <http://www.emsd.gov.hk/beeo> is displayed at the bottom.



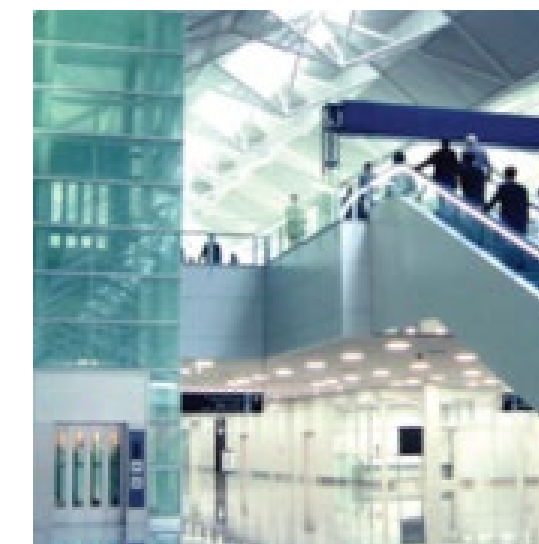
Lighting



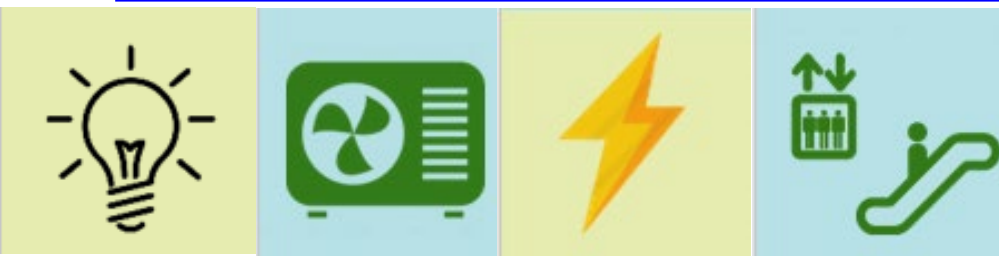
Electrical



Air-conditioning



Lift & Escalator



Ten-Year Implementation of the BEEO



Ten-Year Achievements in Energy Saving and Green Buildings

2,600

Energy Audit Reports

12,000

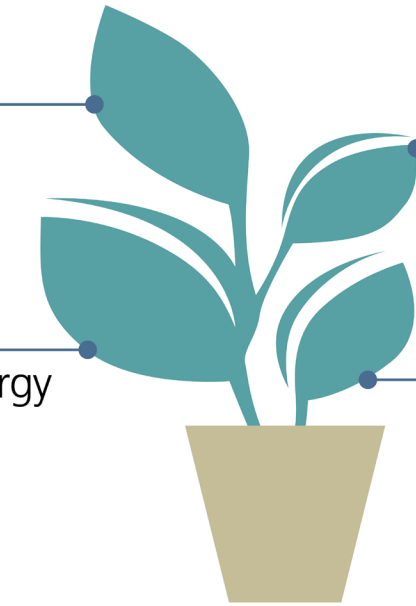
Major Retrofitting Works in Existing Buildings

1,100

Registered Energy Assessors

1,800

New Buildings



(as at October 2022)

Electricity Conserved

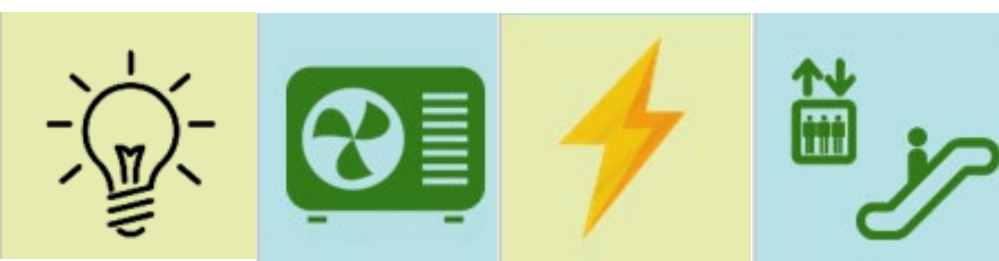
(compare with 2015)

- **1.5 billion kWh/year up to 2020**

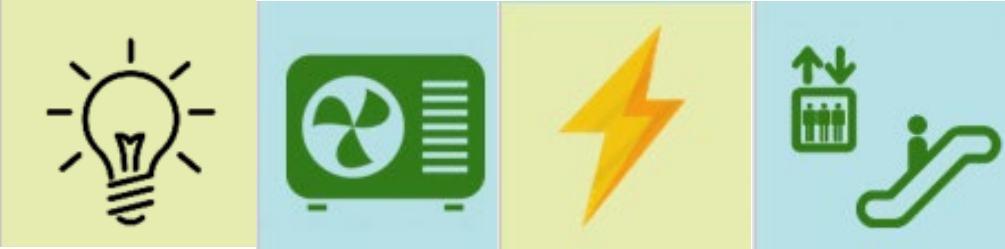
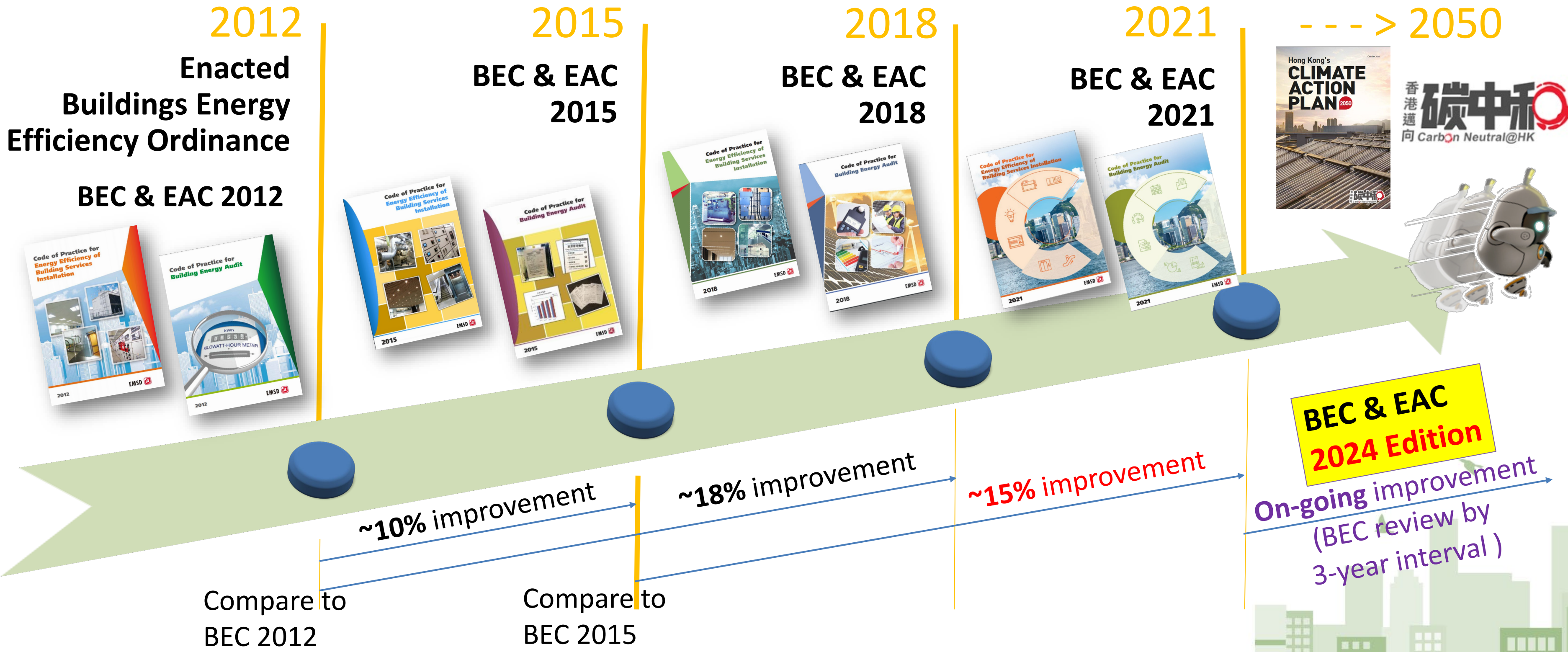


Expected Electricity Saving

- **4.7 – 5.3 billion kWh/year by 2035**



Milestone of the BEEO



Major Changes on the Building Energy Code (BEC 2021)



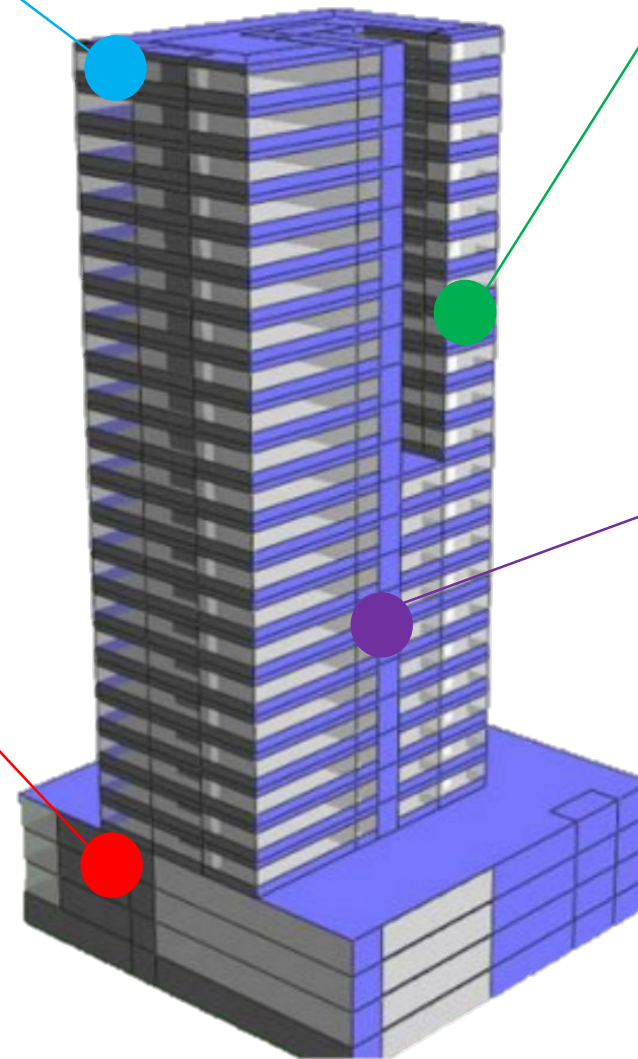
Air-conditioning

- AC equipment efficiency (COP)
- Variable flow pumping system
- Chilled water temperature reset control



Performance-base Approach

Allow flexibility to promote PB approach to predict building energy performance and on-going monitoring



Lighting

- LPD requirement & new space
- Automatic Lighting Control



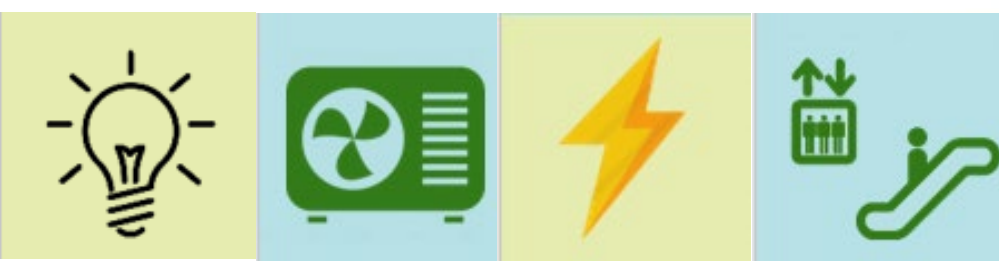
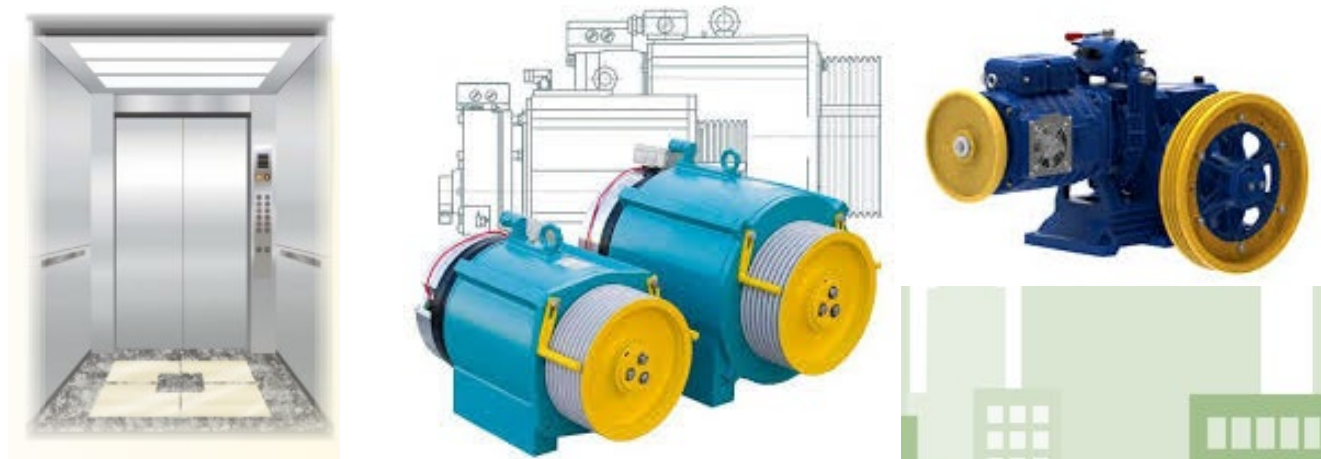
Electrical

- Metering for EV Charging Facilities



Lift & Escalator

- Lift max. allowable electrical power
- Lift decorative load
- Lift regenerative braking system



Major Changes on the Energy Audit Code (EAC 2021)

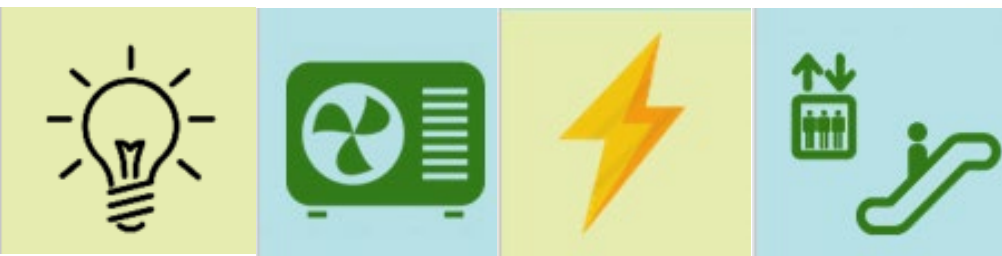


EAC 2021

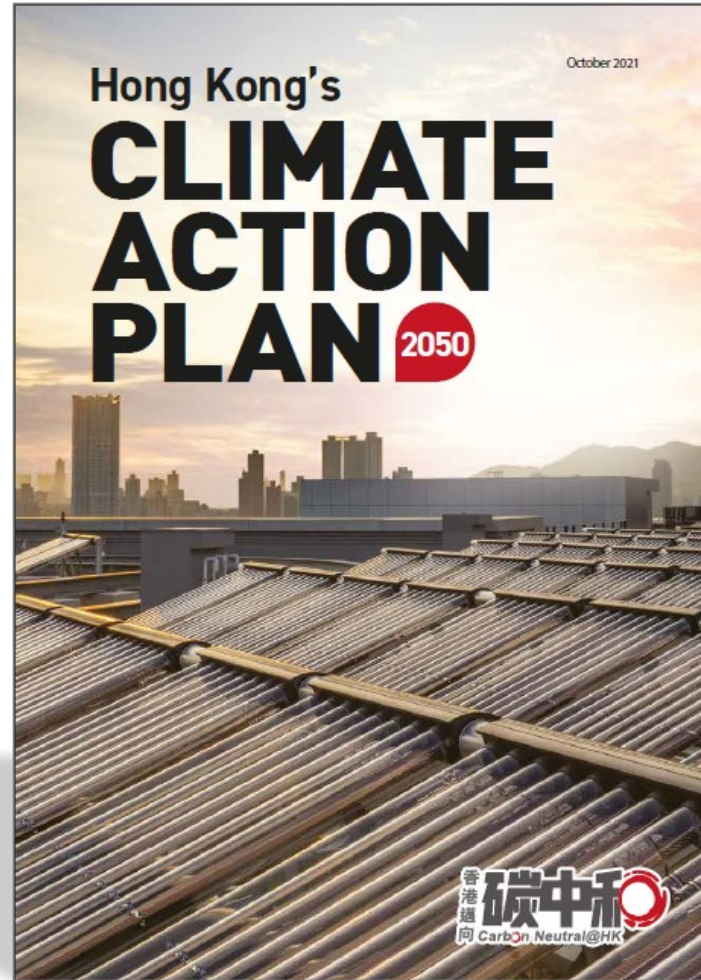
Separation of Electricity consumption under charging facilities of **electric vehicles**

Reporting on **chiller plant efficiency data** and possible EMO for chiller plant optimization

Review the **execution of EMO** and **comparison of EUI** with previous EA report



Decarbonisation Strategies and Actions



Four decarbonisation strategies

- Net-zero Electricity Generation
- Energy Saving and Green Buildings**
- Green Transport
- Waste Reduction

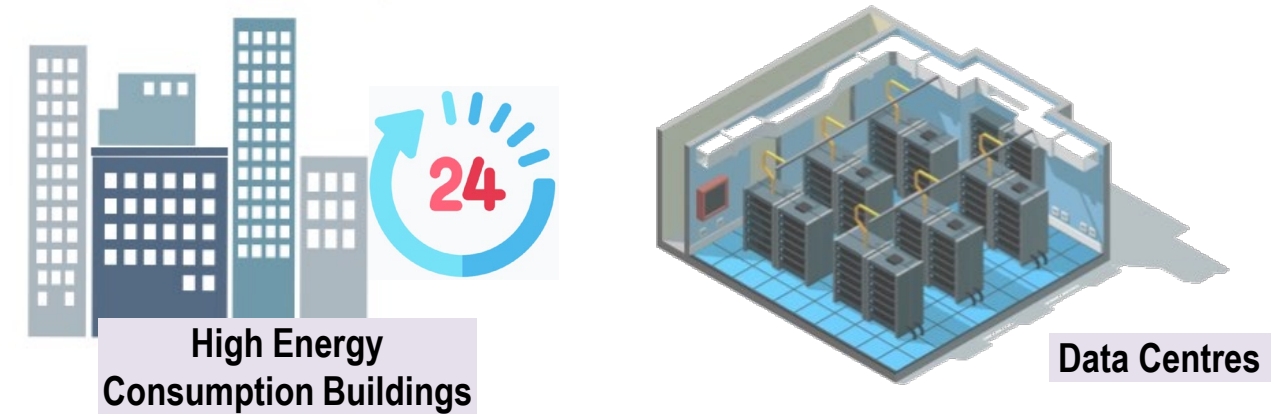
Energy Saving and Green Buildings

4.4.8 To continuously improve the energy efficiency standards of buildings, we will make reference to the international standards and harness innovative and intelligent technologies to ensure the energy efficiency standards of building services installations are up to date. We will actively explore the possibility of expanding the scope of regulation to cover all buildings with high energy consumption, such as data centres, so as to further enhance the overall energy efficiency performance of buildings in Hong Kong.

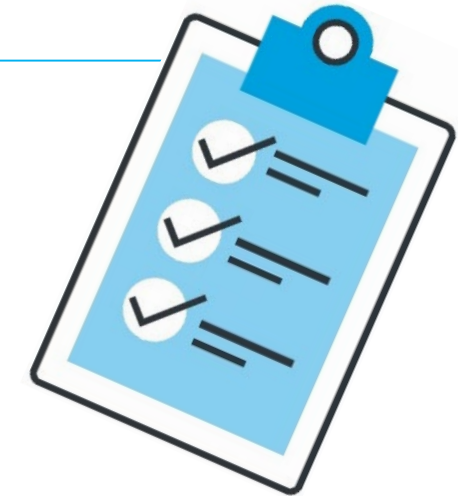
4.4.9 To explore and utilise decarbonisation opportunities in a systematic manner, we will consider conducting energy audits more frequently and mandating the implementation of identified energy management opportunities. At

Explore the possibility

Expanding the scope of regulation to cover the building with High Energy Consumption (such as Data Centres)



- Conducting Energy Audit more frequently
- Implementation of identified EMOs



Data Centre in Hong Kong



~700,000m²
Data Centre
Floor Space as of 2019

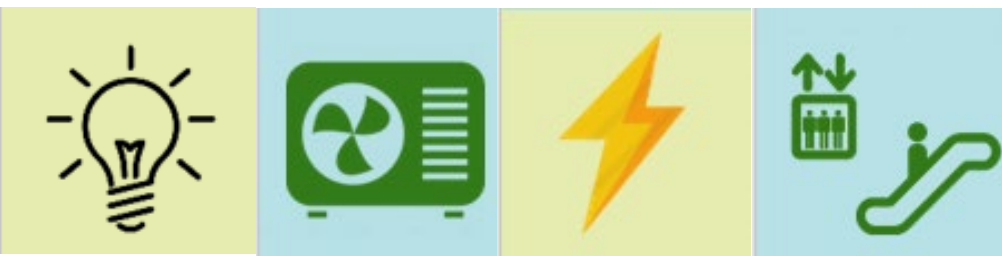
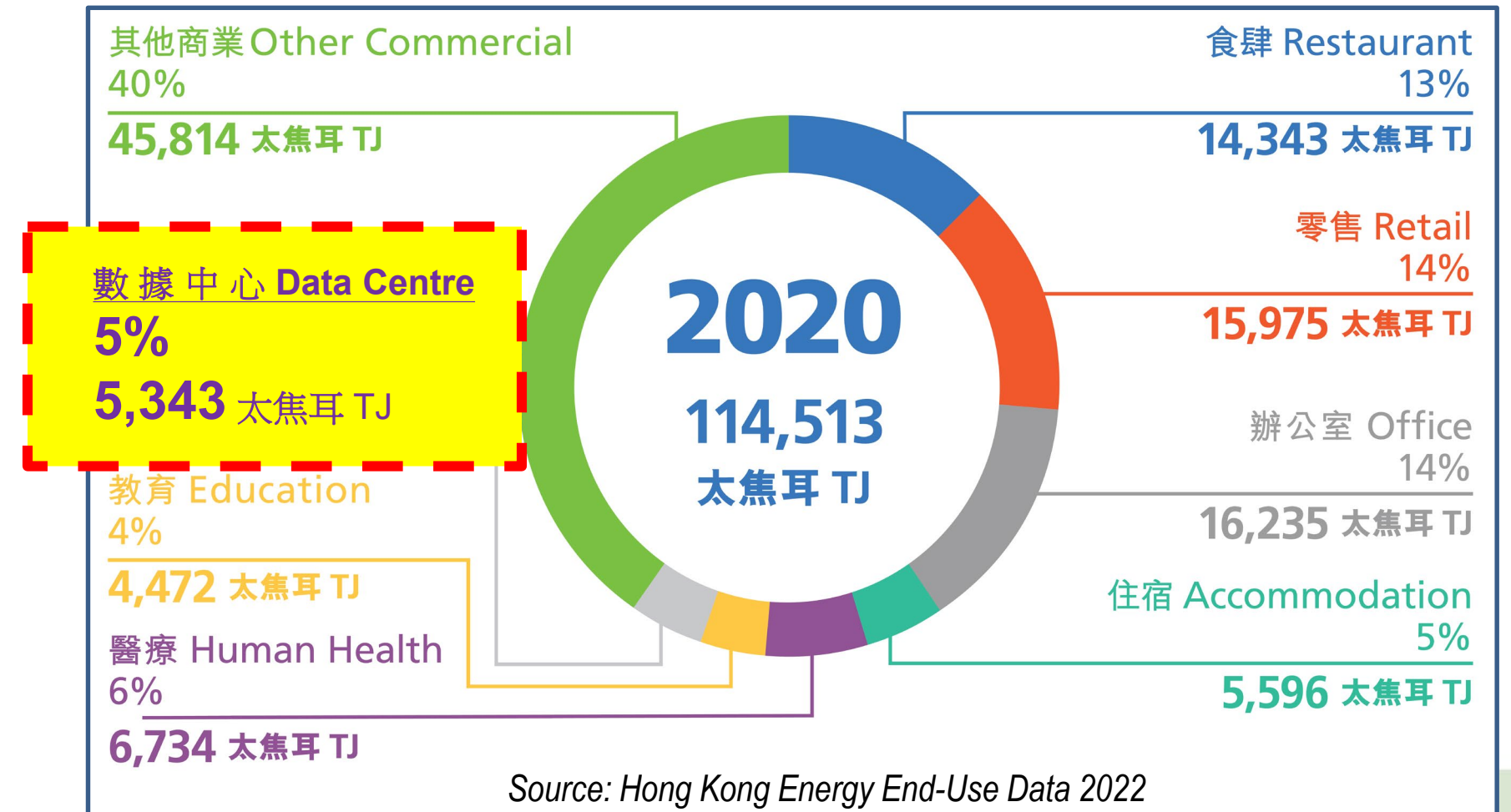


↑ ~1,100,000m²
Data Centre
Floor Space **by 2025** (forecast)

>50%
Increment on
floor space

Electricity Consumption

- 5% in Commercial Sector
- 3.2% in Hong Kong
- 10% increased in 2019 compare with 2018
- 19% increased in 2020 compare with 2019



Expanding the Scope of Regulation



BEEO Cap 610

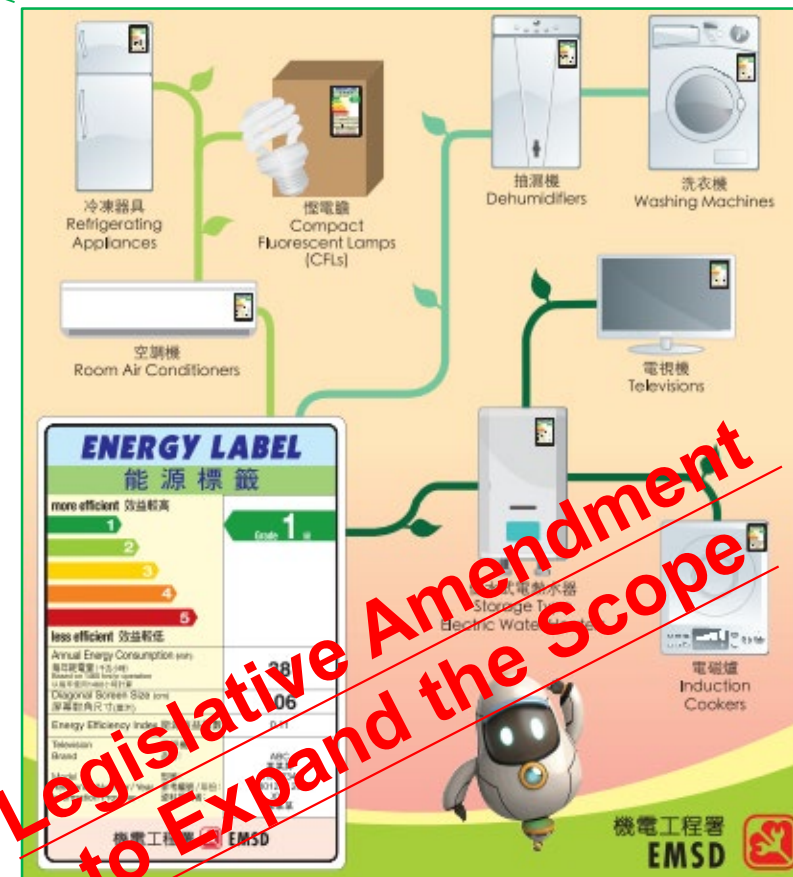
Schedule 1

New Building & Existing Building (COCR & FOC)

- Hotel & guesthouse
- Educational building
- Community building (Social Service, Elderly Centers)
- Municipal services (Library, Indoor Game Hall, Market etc.)
- Hospital & clinic
- Government building
- Commercial building
- Industrial building – **common area**
- Residential building – **common area**
- Composite building –
 - (schedule 1) prescribed portion
 - **common area** of residential portion or industrial portion
- Railway station
- Airport passenger building

High Energy Consumption Building (Data Centre)

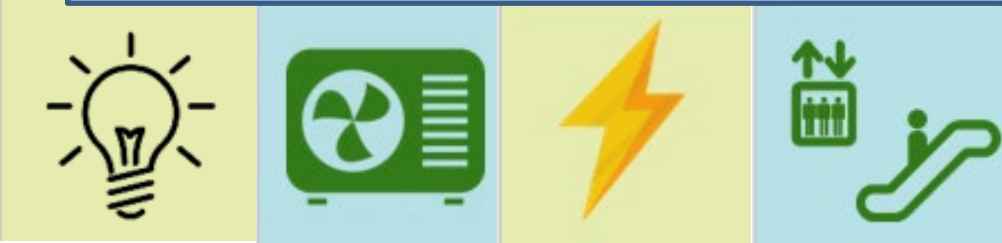
Residential Units



Data Centre Location in Hong Kong



<https://research.hktdc.com/en/article/MTIwODgzOTEzMQ>

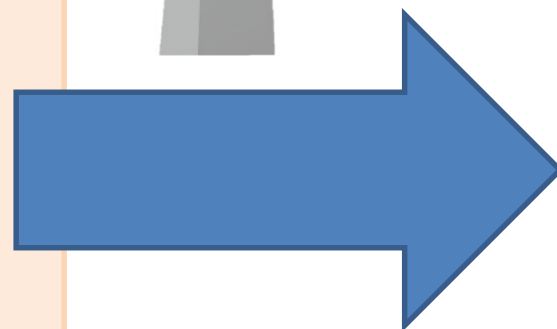


Expanding the Scope of Regulation

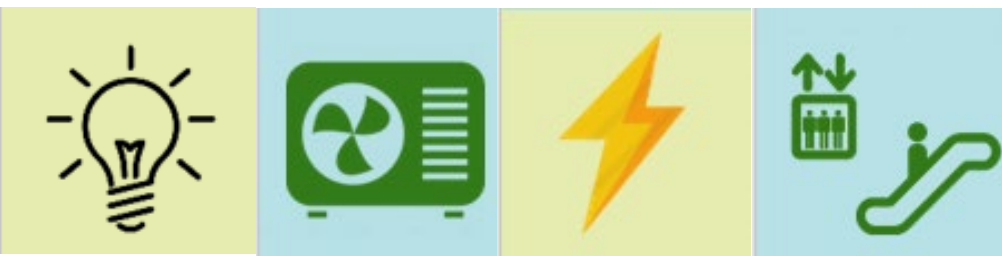


BEEO Cap 610
Schedule 4
Energy Audit

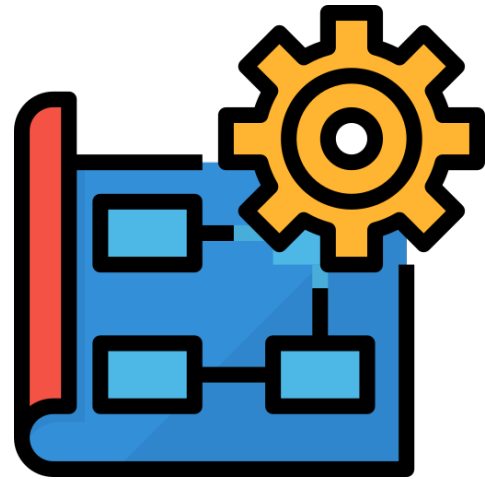
- Commercial building
- Composite building (commercial portion)



Other Buildings with High Energy Consumption



More Frequent Energy Audit & EMO Implementation

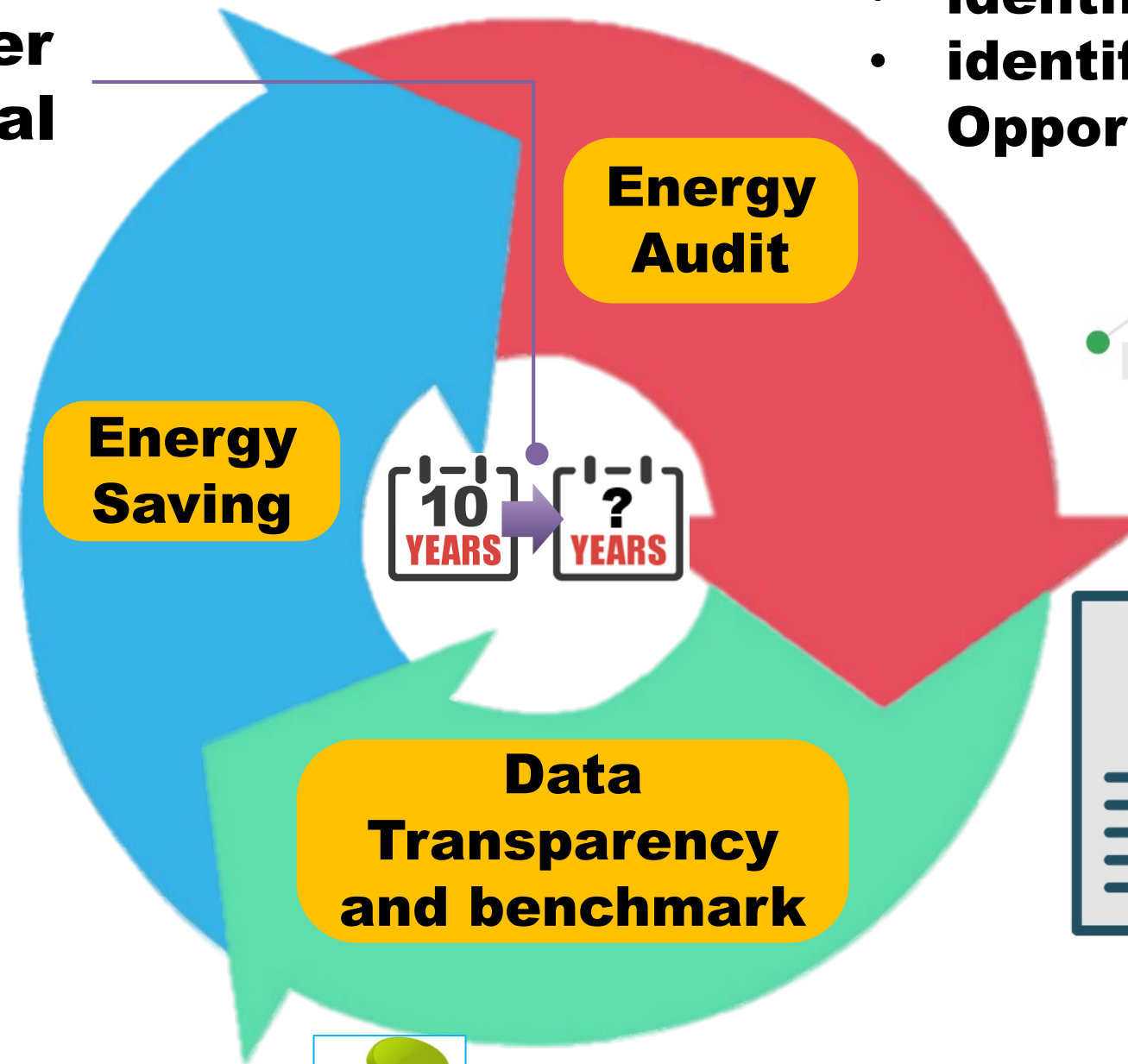


Shorter interval

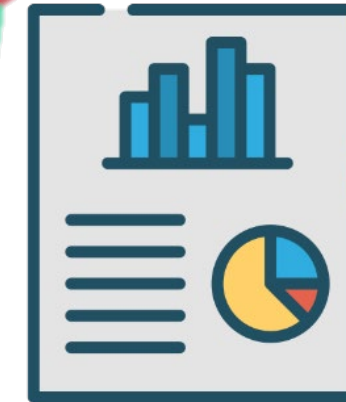
- **Implementation of EMO and Energy saving projects**

+

Incentive schemes

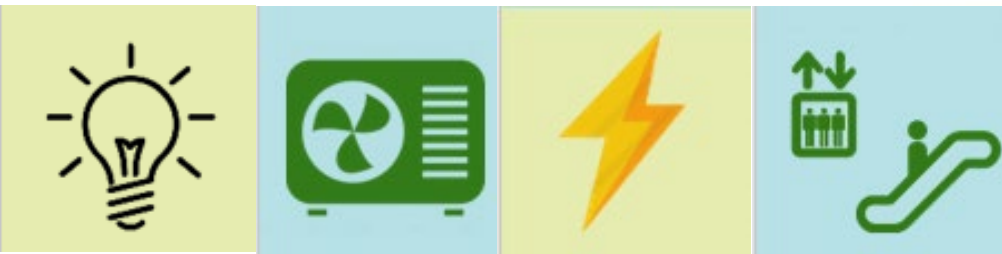


- **identify Energy Utilization Index (EUI)**
- **identify Energy Management Opportunities (EMO)**



- **display latest and previous EUI**
- **Disclose more information (e.g. identified & implemented EMOs)**

EAC 2021



Tripartite Collaboration

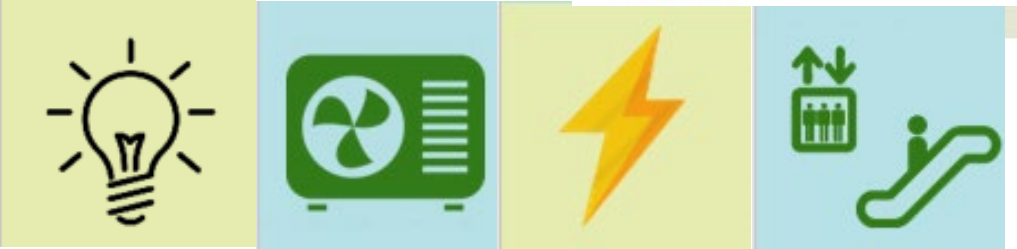


Government

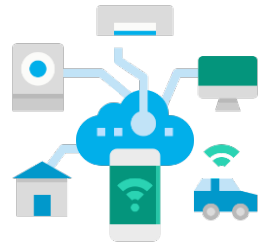


Business sector

Community



Green Innovation and Technology



Internet of things (IOT)

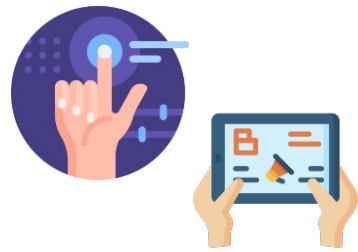


Innovation & Technology

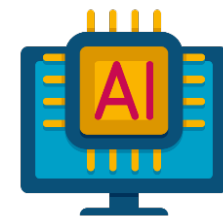


Research & Development

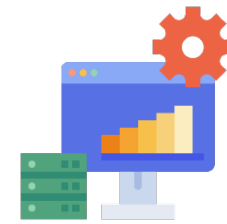
E&M InnoPortal



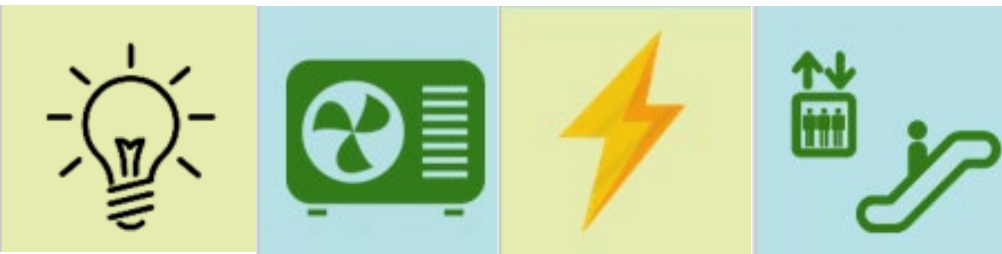
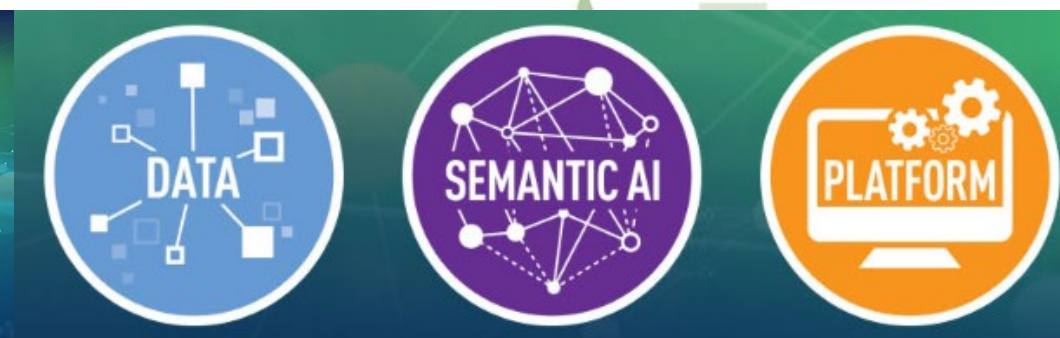
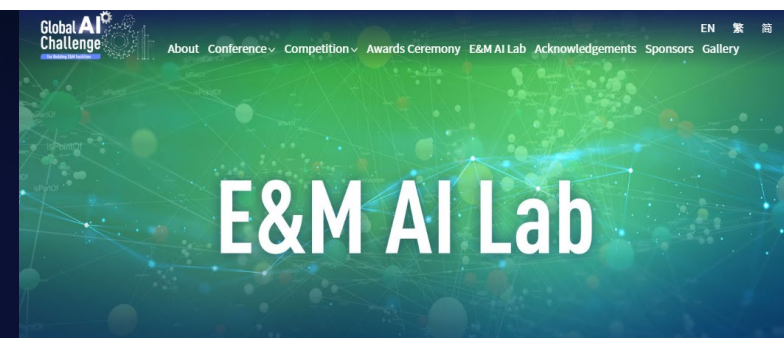
Digitization & Digitalization



Artificial Intelligence



Big Data





Thank You !!

Energy Efficiency Office
Electrical and Mechanical Services Department
Government of the HKSAR

 mbec@emsd.gov.hk

