

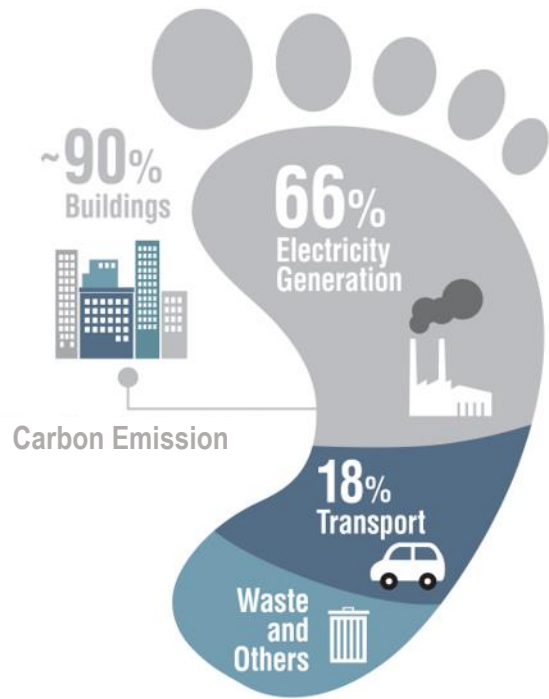
Improving Energy Efficiency in Buildings in Hong Kong, China

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23 January 2024

Buildings in Hong Kong, China

- Around 46 000 buildings
- Around 80% are residential buildings
- Account for 90% of total electricity consumption
- Account for around 60% carbon emission



Targets in
Climate
Action
Plan 2050

by 2035

by 2050

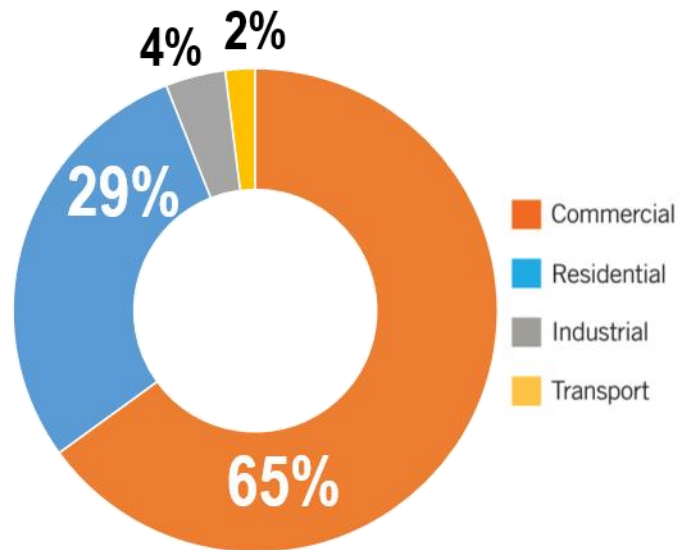
COMMERCIAL
BUILDINGS
15-20%

(Reduce by 30-40%
subsequently)

Electricity consumption
(compared with 2015)

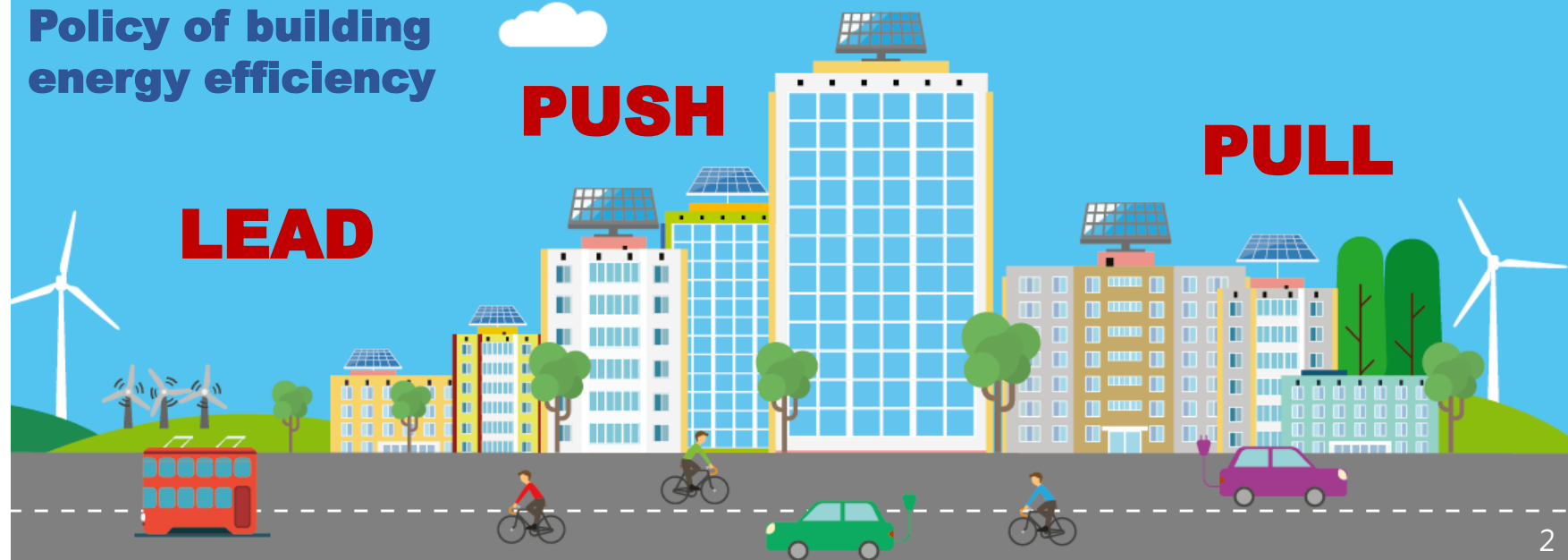
RESIDENTIAL
BUILDINGS
10-15%

(Reduce by 20-30%
subsequently)



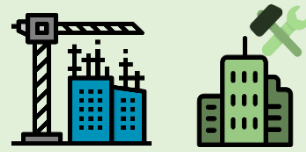
Electricity Consumption breakdown

Policy of building
energy efficiency



Regulatory Approach

Buildings Energy Efficiency Ordinance



The building services installations of **New Constructed Building** or **Existing Building undergoing major retrofitting works** shall comply with the Building Energy Code



Existing Building shall conduct regular **energy audit**

Planned amendments in 2024

- Require more types of buildings to conduct energy audit
- Shorten interval of energy audit
- Mandate disclosure of energy audit report information

Mandatory Energy Efficiency Labelling



11 products, ~80% energy consumption in residential buildings

Further development :

- (i) Upgrade of standard ; (ii) set minimum standard

Estimate saving :
1 billion kWh/year

(~half of Hong Kong Island annual household consumption)



ENERGY LABEL 能源標籤	
more efficient 效益較高	Grade 1 級
1	
2	
3	
4	
5	
less efficient 效益較低	
Annual Energy Consumption (kWh/Cooling) 每年耗電量(千瓦小時(製冷)) Based on 1200 hourly operation 以每年電機2000小時計算	620
Cooling Capacity (kW) 製冷量(千瓦)	6.03
Refrigerant 製冷劑	R410A
Room Air Conditioner Brand 品牌:	ABC 某某牌
Model Reference Number / Year Information Provider 資料提供者:	HK1234 U2-C123456 / 2020 XYZ 某某某
機電工程署 EMSD	

Building (Energy Efficiency) Regulation



Govern the energy efficiency of building envelope of commercial buildings and hotels

Tower : $\leq 21 \text{ W/m}^2$

Podium : $\leq 50 \text{ W/m}^2$



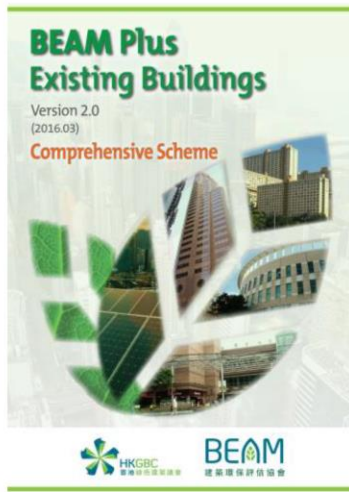
- The Building Energy Code is updated once every 3 years
- Energy efficiency standard of the latest Building Energy Code has uplifted by 15% compared with the 2015 edition
- Saving ~5 billion kWh by 2035

GREEN BUILDING CERTIFICATION

Building Environmental Assessment Method (BEAM) Plus is a leading initiative to offer independent assessments of building sustainability performance



New buildings



Existing buildings



New data centres



Existing data centres



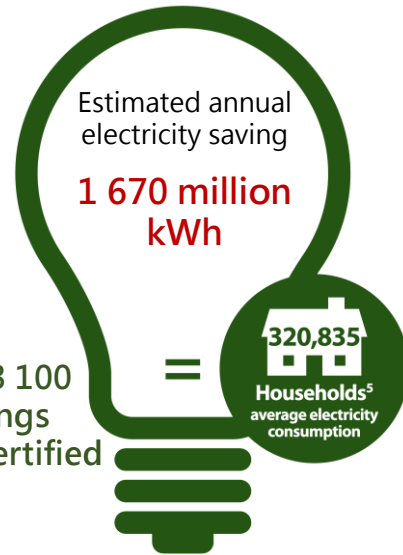
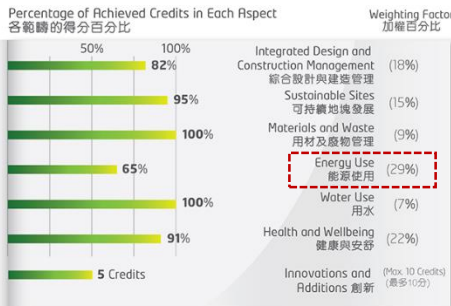
Interiors – Residential



Interiors – Non-residential



Existing Schools



Government take lead

New government buildings with floor area > 5 000m² with central air-conditioning need to achieve the Gold rating of BEAM Plus

Concessionary measure for private building

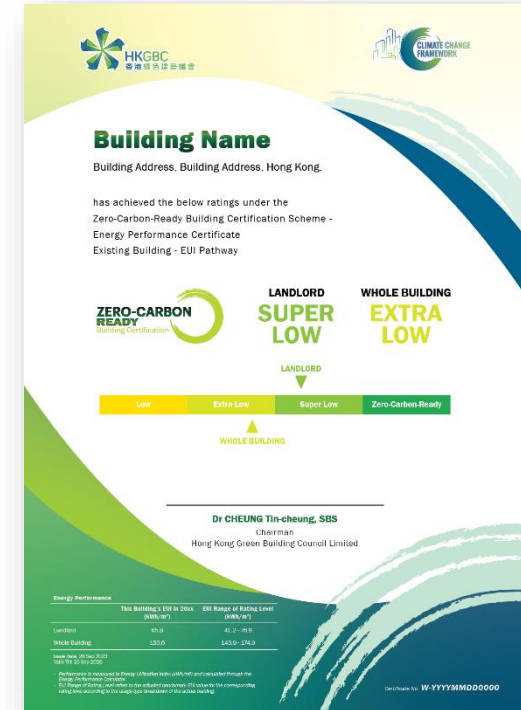
New private building development is eligible to grant gross floor area concessions by participating BEAM Plus. Around 60% of private buildings had granted the concession.



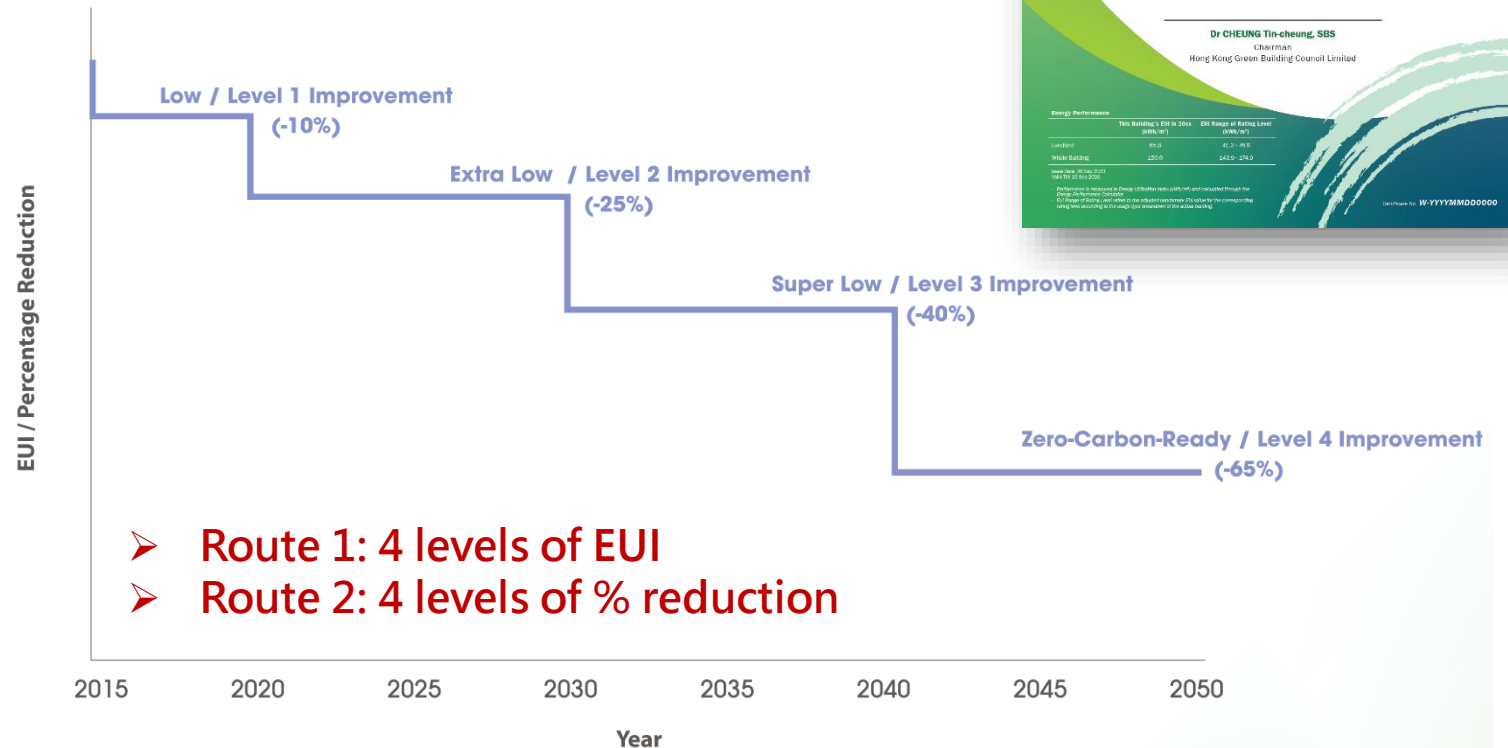
Starting from Jun 2024, buildings need to obtain Gold rating of BEAM Plus in order to grant for the concession

Zero-Carbon-Ready Building Certification Scheme

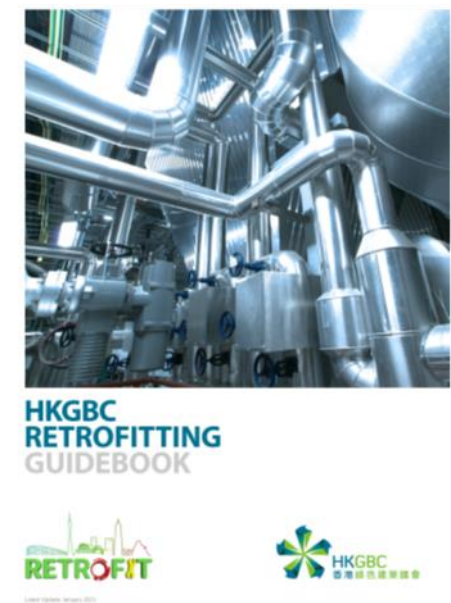
- Recognize buildings that have achieved high energy performance standards and/or set reduction targets towards zero-carbon-ready
- Align the performance indicators for building sector and set common standard to facilitate green finance



HKGBC
Climate Change Framework
For Built Environment



Promote Energy Saving Retrofit and Retro-commissioning



Energy saving retrofit

- ❑ Retrofit shall comply with the latest Building Energy Code
- ❑ Guidebook for promotion



Retro-commissioning

- ❑ Fine-tuning of buildings mechanical, electrical and plumbing (MEP) systems to optimise their operational efficiency without substantial capital investment
- ❑ Technical guidelines and online resource centre for promotion

Government buildings

- ❑ Take lead to carry out energy saving retrofit for various government buildings
- ❑ Implemented 3 rounds of 5-year cycle energy saving targets since 2003 (>5% saving for each cycle achieved) and target 6% for 4th round

Government buildings

- ❑ Take lead to carry out retro-commissioning for over 200 government buildings since 2019 and share the cases online
- ❑ 5% building energy saving in average achieved

Capacity building for the Trade

- ❑ Training and registration scheme: >1 900 participants

Examples of Energy Saving Initiatives

Existing Schools

Government to carry out energy saving retrofit works for non-governmental schools



Replace LED lighting and variable speed A/C



Install real time energy monitoring system

Existing NGO Venues

Government to carry out energy audit and energy saving retrofit works for welfare NGOs



Carry out energy audit



Replace LED lighting and variable speed A/C

Smart Power Meters



- ❑ The two power companies started installing smart meters for all customers for target completion in 2025
- ❑ Read data for past 14 months and hourly data for past 90 days
- ❑ Alerts for unusual consumption pattern

District Cooling Systems

Estimated saving ~ 40 million kWh
 Under construction
KTN New Development Area

Design
HSK New Development Area

Estimated saving ~ 30 million kWh
 Under construction
Tung Chung New Town

Planning
Central Water

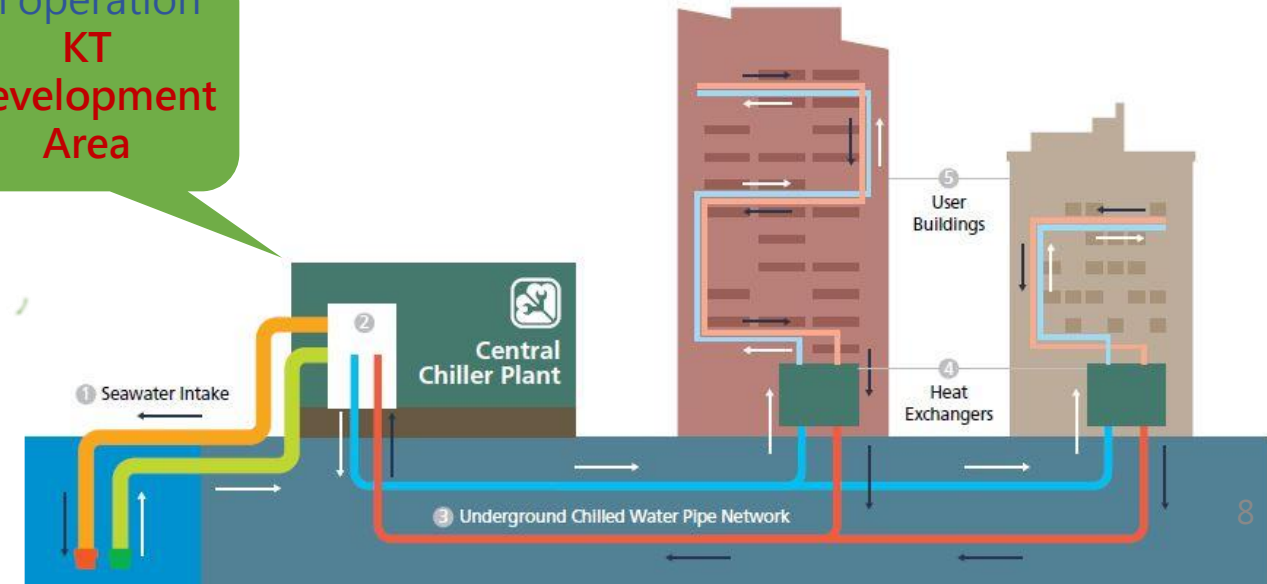
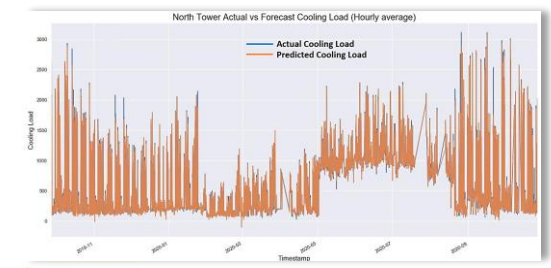
In operation
KT Development Area



- ❑ Total cooling capacity > 460 MW
- ❑ Chilled water distribution pipe > 60 km
- ❑ Estimated saving ~ 140 million kWh/year

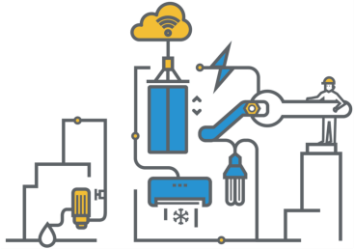


Energy optimization control by artificial intelligent



Finance Subsidy

Promoting energy efficiency and conservation through the Scheme of Control Agreements signed between the Government and the two power companies



- ❑ Subsidy energy-saving retrofitting works, retro-commissioning and smart technology projects to enhance energy efficiency in communal areas of private buildings
- ❑ Target to save 60 million kWh per year

Building Rehabilitation Assistance Scheme by Urban Renewal Authority

- ❑ Subsidy energy-saving equipment replacement during building repair works in communal areas of private buildings



Accelerated deduction under profit tax

- ❑ For new or existing buildings that have achieved BEAM Plus certification, capital expenditure incurred in the installation of energy efficient building installations registered under an Energy Efficiency Registration Scheme for Buildings is eligible for accelerated deduction under profits tax

Community Promotion and Education on Energy Saving



Outreaching programme for Kindergarten and Schools



Energy saving competition



Educational kits



Visiting tours on energy efficient infrastructure for the public



Promotion in social media



STEM Workshops

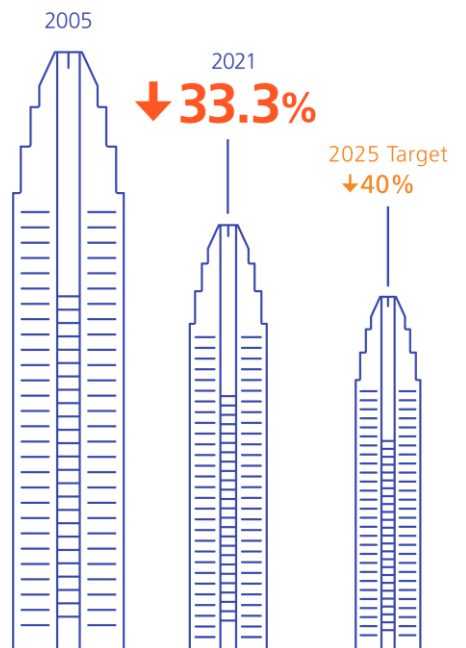
Energy Data Monitoring

Hong Kong, China's Energy Intensity Target

The Government has set target to reduce the energy intensity by **40% by 2025**, using 2005 as base year.

Hong Kong, China's energy intensity has **decreased by 33.3% from 2005 to 2021**

Data collected from annual energy end-use survey



Feed-in-Tariff for renewable energy systems

Application increased for 300 times (i.e. from 60 to 18 000) since the launch in 2018

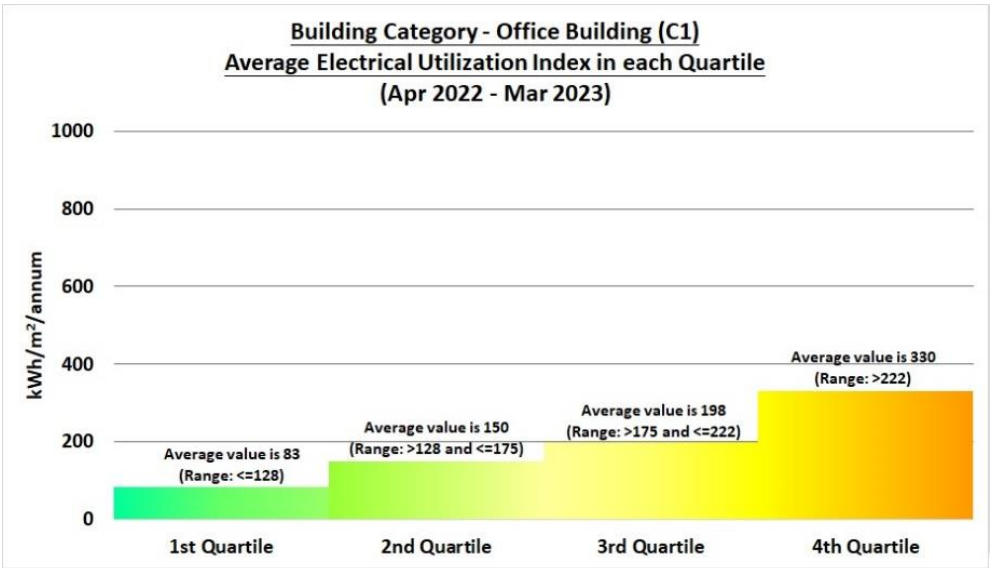


solar power system total

120
million kWh/year

Online Building EUI Benchmarking Tool

Based on real consumption data of 500 sample commercial buildings

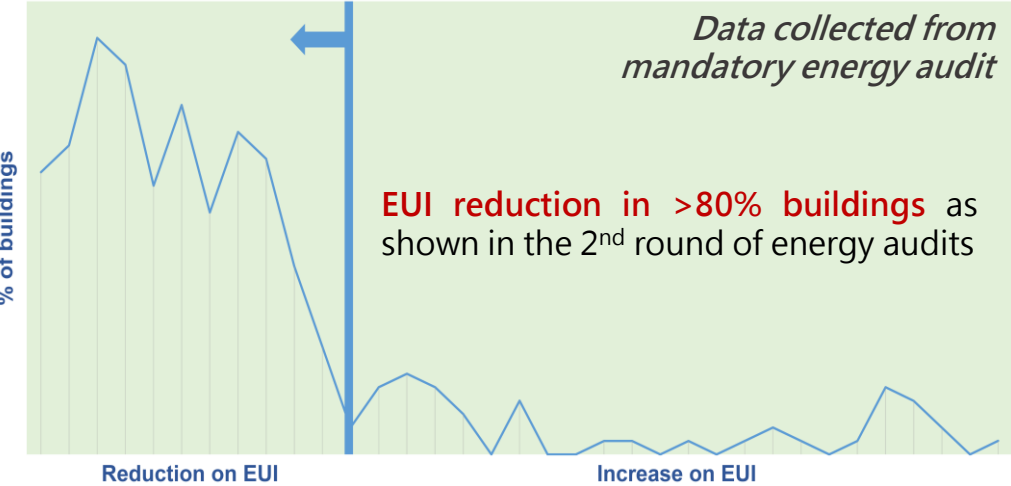


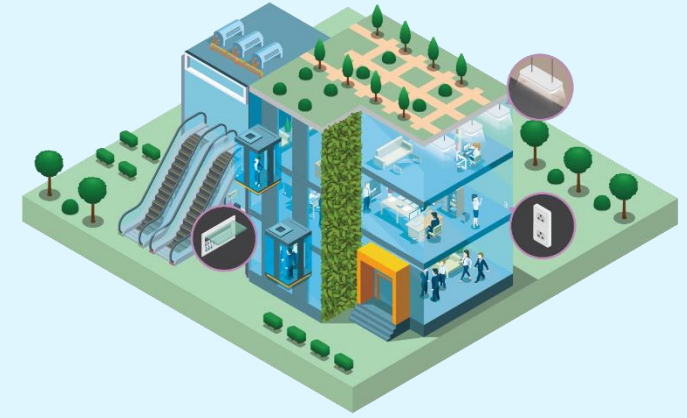
Benchmark data for commercial buildings

5 category

15%

EUI reduction
From 2015 to 2022





Thank You!

