

# 建築物 能源效益 調查

Buildings  
Energy Efficiency  
Investigation



2024



## **Buildings Energy Efficiency Investigation**

### **Introduction**

Last year's *Policy Address*<sup>1</sup> proposed amendments to the Buildings Energy Efficiency Ordinance (referred to as "the Ordinance") to further promote energy conservation and carbon reduction in buildings. The proposed measures include expanding the regulatory scope to cover more types of buildings, mandating the public disclosure of energy audit report data, and shortening the intervals between energy audits. Specifically, the energy audit requires the owners of commercial buildings to hire registered energy assessors to compile the Energy Utilisation Index (EUI) of their buildings and identify energy management opportunities (EMOs) that property management can implement with ease to reduce energy consumption.

However, The Green Earth (TGE) has found that the legislation allows a building's EUI to be higher than that of the previous audit. This means that buildings can consume more energy without any legal accountability. TGE believes this loophole permits excessive energy use in buildings. Even if every building services installation meets the minimum energy standards set by the Ordinance, the overall building energy consumption can still increase, such as through adding more installations. The government should seize this opportunity presented by the upcoming legislative amendment to close this loophole and champion energy reduction in buildings as a means to facilitate Hong Kong's target to achieve carbon neutrality before 2050.

### **Investigation**

During September 2024, TGE retrieved data from the "Online Benchmarking Tool" of the Electrical and Mechanical Services Department (EMSD) to review and analyse the EUI data of designated commercial buildings. The ten largest shopping malls in Hong Kong—three major retail malls each from Hong Kong Island, Kowloon, and the New Territories, as well as the largest mall in the Outlying Islands—were selected as subjects for this investigation. On-site measurements were taken to assess the temperature and lighting levels of these malls, aiming to identify EMOs that are considered suitable for the property management to implement. The results are as follows:

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<sup>1</sup> The Chief Executive's 2023 Policy Address <https://www.policyaddress.gov.hk/2023/en/p154.html>

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## Results and Analysis

### Loosely controlled EUI

In Hong Kong, buildings account for approximately 90% of total electricity consumption and generate 56% of the city's carbon emissions (2022<sup>2</sup>). To promote energy efficiency in buildings, the Hong Kong government implemented the Ordinance in 2012, which established energy efficiency standards for building services installations and mandated energy audits for commercial buildings every ten years to assess their energy performance.

Among the 2,656 commercial buildings, 880 had updated their audited EUI during the investigation. The new average EUI falls to 104 kWh/m<sup>2</sup>/annum, reflecting a reduction of about 21% from the previous average. While this indicates an improvement in overall energy performance, it was noted that 156 buildings reported higher EUI figures than their last audits, nearly one-fifth of the total. This suggests a lack of effective monitoring and comprehensive enforcement in building energy reduction. It appears that as long as the energy-reduction targets<sup>3</sup> are met, the government allows commercial properties to waste energy.

TGE warns that if the building sector continues to manage its energy consumption without stricter regulations, it could hinder progress in energy efficiency improvement. This could slow improvements even in better-performing buildings, undermining the intent of the Ordinance, which aims to drive reductions in energy consumption and emissions across the sector.

### Improvements to be made in the largest malls

The Ordinance requires shopping malls and office buildings to undergo energy audits every ten years. TGE reviewed the EUI figures of Hong Kong's ten largest shopping malls, which are managed by six major property management companies. These companies should be more resourceful to effectively conduct energy audits and implement the EMOs outlined in the audit reports. Among the ten malls, eight have shown improved energy performance compared to ten years ago. However, only half of them (four) have achieved better energy reductions than the average reduction

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<sup>2</sup> Hong Kong Energy End-use Data 2024  
[https://www.emsd.gov.hk/filemanager/en/content\\_762/HKKEUD2024.pdf](https://www.emsd.gov.hk/filemanager/en/content_762/HKKEUD2024.pdf)

<sup>3</sup> In 2021, the Hong Kong government announced the "Hong Kong Climate Action Plan 2050," which sets a mid-term target for commercial buildings to reduce electricity consumption by 15-20%, and a reduction of 30-40% by 2050.

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among buildings. The remaining two malls were underperforming, including a landmark mall in the financial district with rising energy consumption and the largest mall in Hong Kong, which has yet to submit its report three months after the expiration of the previous energy audit form.

District	Mall	Property Developer	Previous EUI (kWh/m <sup>2</sup> /annum)	Latest EUI (kWh/m <sup>2</sup> /annum)	Change (%)	Average change
Hong Kong	Times Square	Wharf	153.33	120.13	-21.65%	-21%
	CityPlaza Mall (South)*	Swire	184.66	114.97	-37.74%	
	IFC Mall	SHK & Henderson land	289.41	301.55	4.19%	
Outlying Islands	Citygate Outlets	Swire	109.51	76.11	-30.50%	
New Territories	MCP CENTRAL*	Henderson land	274.72	209.72	-23.66%	
	New Town Plaza Phase III*	SHK	140.93	132.19	-6.20%	
	YOHO Mall II*	SHK	134.97	118.03	-12.55%	
Kowloon	Ocean Terminal	Wharf	126.59	Data Missing**		
	MegaBox	Kerry	96.08	81.89	-14.77%	
	Elements	MTRC	155.28	130.42	-16.01%	

\* Selected mall of the development project in this investigation

\*\* Harbour City Malls failed to submit audit reports on time: Ocean Terminal audit form expired on 12 Jun 2024, Other parts expired on 29 May 2024

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IFC Mall was awarded "Platinum" certification by BEAM Plus green building assessment last year. While being a landmark in Hong Kong and the flagship mall of its parent group, it stands out as the only shopping mall, so far, among the ten malls that has an EUI figure higher than ten years ago. The existing Ordinance does not mandate that buildings implement the EMOs identified during audits, nor does it require them to reduce or maintain their EUI levels. This loophole in the Ordinance may lead property owners to focus solely on meeting the minimum legal requirements, neglecting the overarching goal of the entire system – energy conservation.

### **Widespread overdue energy audit reports**

During the investigation, Harbour City had not updated its information on the EMSD-designated website several months after the expiration of its audit validity. TGE reached out to the EMSD and Harbour City management for clarification. EMSD indicated that they had reminded the mall's management. However, as of the end of September 2024, they had still not received updated audit information. The mall responded, stating that they had hired a technical consultant for the energy audit at the end of last year (2023), but the consultant was dismissed for failing to deliver the report on time. The mall has since engaged another technical consultant to conduct the relevant audit.

According to the legislation, building owners who fail to conduct energy audits for four types of central building services installations every ten years can face fines of up to \$50,000. TGE previously emailed the EMSD to inquire about overdue energy audits and found that such delays are rather common (see table). In July 2024, EMSD reported that since the Ordinance was implemented on September 21, 2012, it has issued a total of 210 "Improvement Notice" to building owners for overdue audits and successfully prosecuted nine cases. Defendants received fines ranging from \$2,000 to \$21,000, and all relevant owners submitted their energy audit forms and reports after receiving the notice or being convicted. Energy audits are crucial for building managers to identify EMOs. Therefore, EMSD should enhance its monitoring and regularly update information to ensure data transparency for public inspection.

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Year	Number of buildings required to update its energy audit	Number of overdue audits (til May 2024)
2021	-	-
2022	61	-
2023	1084	114
2024	737 <sup>4</sup>	101

Source: EMSD

#### **Four below the government-recommended temperature**

According to the "Hong Kong Energy End-use Data 2024" published by the EMSD, air conditioning was the largest electricity usage in the commercial sector in 2022, accounting for 26% of total electricity consumption, followed by lighting at 12%<sup>5</sup>. Therefore, air conditioning (temperature) and lighting (illumination) were two environmental aspects considered in this investigation.

Since 2012, the Environment Bureau (now "Environment and Ecology Bureau"), along with the EMSD, has implemented a voluntary "Energy Saving Charter" to encourage the building sector to conserve energy. Signatories are required to maintain indoor temperatures between 24 and 26 degrees Celsius during the summer months from June to September to reduce air conditioning usage. Seven of the ten malls in the investigation have signed the said Charter. However, four of them recorded average temperatures below the recommended minimum, violating their commitments to the Charter. The lowest average temperature recorded among these malls was 23 degrees, which is one degree lower than the government's recommendation. According to CLP, a 3% of reduction in electricity use can be achieved by raising the air-conditioning temperature by one degree Celsius<sup>6</sup>. While most malls have shown improved energy performance compared to ten years ago, eight out of the ten malls have recorded minimum temperature points below the recommended summer

<sup>4</sup> For the entire year of 2024

<sup>5</sup> Greenhouse Gas Emissions in Hong Kong (by Sector)  
<https://cnsd.gov.hk/wp-content/uploads/2023/12/Greenhouse-Gas-Emissions-in-Hong-Kong-by-Sector.pdf>

<sup>6</sup>  
<https://www.clp.com.hk/en/residential/power-connect/energy-saving-tips/energy-saving-of-using-air-conditioner>

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indoor air-conditioning temperature range, indicating significant potential for further energy savings within the sector.

District	Mall	Property Management	Lowest Temp. (°C)	Highest Temp. (°C)	Average Temp. (°C)	Outdoor Temp. (°C)
Hong Kong	Times Square	Wharf	22.2	23.7	23	31.4
Kowloon	Elements	MTRC	21.7	23.8	23.2	32.1
Kowloon	Harbour City	Wharf	22.7	25.1	23.4	31
Hong Kong	IFC Mall	SHK & Henderson land	22.7	24.2	23.6	30.6
Outlying Islands	Citygate Outlets	Swire	23.4	25.1	24	32
New Territories	New Town Plaza	SHK	23.3	24.7	24.1	35
Hong Kong	CityPlaza	Swire	23.4	25.4	24.2	31.2
New Territories	YOHO	SHK	23.7	25.5	24.7	32
New Territories	Metro City Plaza	Henderson land	24.4	25.1	24.7	30.1
Kowloon	MegaBox	Kerry	24.5	26.2	25.2	33.1

\* Energy Saving Charter Signatory

### Brighter malls than green recommendation

The Hong Kong Green Building Council (HKGBC) has recommended that the indoor lighting levels for shopping malls and corridors be between 50 and 300 lux<sup>7</sup>. In measuring the light levels along the corridors without natural lighting of the ten largest malls, it was found that seven out of these locations exceeded the

<sup>7</sup> Hong Kong Green Shop Guide

<http://greenshopguide.hkgbc.org.hk/eBook/en/files/assets/basic-html/index.html#5>

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recommended lighting levels set by HKGBC. Despite conducting energy audits, most of the malls may not have identified those easily implementable EMOs, and such findings and recommended actions are often overlooked by mall operators.

District	Mall	Property Management	Lighting Level (lux)	Compared to highest recommended level* (lux)	Difference (%)
Outlying Islands	Citygate Outlets	Swire	46.4	-253.6	-84.53
New Territories	YOHO	SHK	245	-55	-18.33
Kowloon	Elements	MTRC	292	-8	-2.67
Hong Kong	IFC mall	SHK & Henderson land	342	42	14.00
Hong Kong	CityPlaza Mall	Swire	392	92	30.67
Kowloon	Harbour City	Wharf	492	192	64.00
New Territories	Metro City Plaza	Henderson Land	538	238	79.33
Kowloon	MegaBox	Kerry	545	245	81.67
New Territories	New Town Plaza	SHK	557	257	85.67
Hong Kong	Times Square	Wharf	566	266	88.67

\*HKGBC recommended highest lighting level is at 300 lux

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### **Malls Staff unfamiliar with EUI and ordinance requirement**

The Ordinance requires building owners to disclose the energy audit form (EUI form) and exhibit it in a conspicuous position at the main entrance of the building. The proposed amendments further mandate that these forms include more detailed energy consumption data to enhance public awareness and monitoring of building energy performance. While it is understood that mall staff may not be responsible for energy management tasks, their lack of knowledge about where the EUI form is posted hampers public monitoring efforts.

During the investigation, inquiries were made to staff at the mall inquiry counters to assess their familiarity with the EUI and the locations of the main entrances (where the energy audit form is required to be displayed). The findings revealed that inquiry staff at all of the malls were unfamiliar with the EUI, and only staff members at one mall could identify the location of the main entrance where the EUI form was exhibited.

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District	Mall	Familiar with EUI	EUI form found at the main entrance provided
Hong Kong	CityPlaza Mall	✗	✗
	Times Square	✗	✗
	IFC Mall	✗	✗
New Territories	New Town Plaza	✗	✗
	Metro City Plaza	✗	✗
	YOHO	✗	✗
Outlying Islands	Citygate Outlets	✗	✗
Kowloon	Harbour City	✗	✗
	Elements	✗	✗
	MegaBox	✗	✓

Public awareness of EUI remains insufficient, compounded by the numerous entrances at large malls, where most staff members cannot identify the main entrance. While the EUI forms are posted, members of the public can barely understand them without certain background knowledge, provided that they can find the EUI form.

Although the EMSD provides EUI data for all malls under requirement through an online benchmarking tool, this data is difficult to search. For instance, different phases of malls require standalone searches, complicating data access. Additionally, audit reports may still use previous mall names, further hindering public inspection.

The EUI forms only mention EUI figures and changes compared to previous audits. However, without any reference value or average change for similar buildings, it is challenging for the public to grasp a building's energy performance based solely on the report content.

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建築物詳情		
建築物名稱	新元朗中心	
地址	朗日路8號	
上次能源審核		
最近能源審核		
屆滿日期	11/09/2023	09/09/2033
能源使用指數** (兆焦耳/平方米/年)	485.88	424.9

Picture 1. No results were shown with searching YOHO in Chinese (形點). The EUI data was under the mall's previous name Sun Yuen Long Centre 新元朗中心.

Building Details		
Building Name	Gateway II (Podium), Ocean Galleries Phase I & IV (Podium), World Finance Centre (North), World Finance Centre (South), World Commerce Centre, Wharf T&T Centre, Sea Water Pump House	
Building Address	7-27 Canton Road , Tsim Sha Tsui, Kowloon	
Previous Energy Audit		
Latest Energy Audit		
Expiry Date of Energy Audit Form	-	29/05/2024
EUI** (MJ/m <sup>2</sup> /annum)	-	560.06

Picture 2: Harbour City includes Ocean Terminal, Gateway Arcade and Ocean Galleries. To access the EUI data for the mall, one must search for each individual building. The EUI for the Gateway Arcade expired at the end of May 2024 and is still pending an update.

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## Recommendations from The Green Earth

To effectively promote energy conservation in buildings, it is essential to enhance regulatory oversight of energy performance, raise public awareness, and increase data transparency. With the upcoming amendments, the government should:

- **Amend regulations to include more stringent oversight mechanisms**, requiring building owners of properties with energy consumption audits higher than in previous audits to provide reasonable explanations and timely improvement plans when deemed inappropriate.
- **Adopt best practices from abroad**, such as the Energy Savings Opportunity Scheme in the UK. It requires malls to submit energy-saving action plans and annual progress updates to the authorities after audits, thereby encouraging the adoption of EMOs and other appropriate energy-saving measures.
- **Improve the design of EUI documents** to enhance readability and facilitate comparison of EUI performance across locations. For example, reference the existing EMSD Mandatory Energy Efficiency Labelling Scheme to indicate energy usage through simple colours and graphics.
- **Ensure the EUI form is noticeable and posted in easily accessible locations**, such as enlarging the document size and placing it at inquiry counters, while informing mall staff that displaying the EUI form is a legal requirement to enhance information dissemination.

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