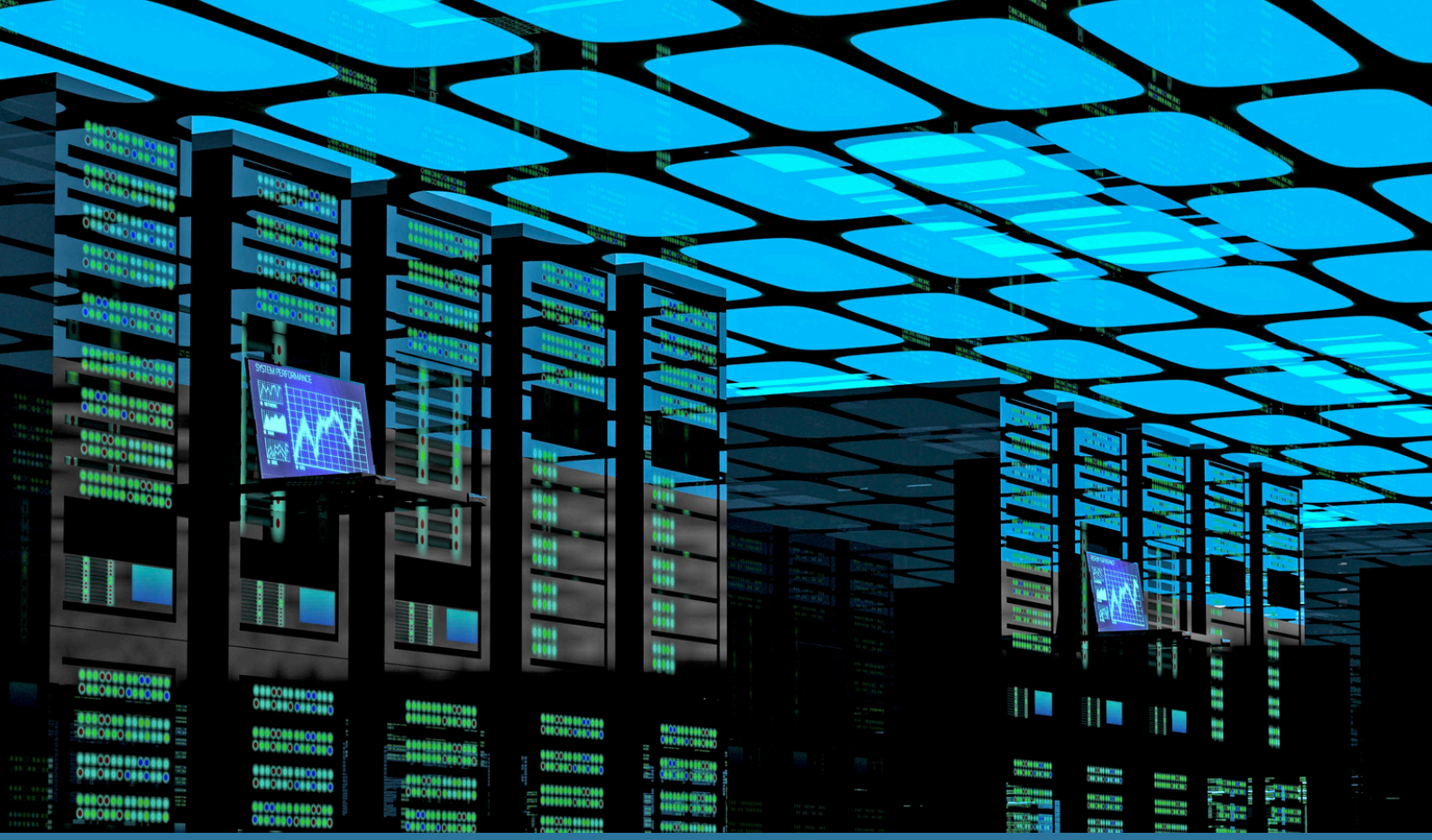

HONG KONG DATA CENTER ELECTRICITY CONSUMPTION AND CARBON EMISSIONS STUDY

2026

綠惜政策簡報
GREEN POLICY REPORT

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THE GREEN EARTH

Hong Kong Data Centers' Electricity Use and Carbon Emissions Rising Sharply

Government Urged to Update Energy-Saving Policies to Align with National and International Decarbonization Trends

[The Green Earth, March 2026] In recent years, Hong Kong has been vigorously pursuing innovation and technology development, driving rapid expansion of data centers. According to industry estimates, by the end of 2025 Hong Kong had 47 data center operators with a combined IT load capacity of 581 MW. An additional 671 MW of capacity is currently in the planning and construction pipeline. While technological advances can bring substantial economic benefits to Hong Kong, data centers' electricity consumption and greenhouse gas emissions continue to rise sharply. Yet comprehensive management policies remain absent. The Green Earth expresses concern and urges the government to proactively align with national and international emission reduction strategies, revise its energy-saving policies immediately, and leverage green finance tools to encourage the industry to improve energy efficiency and manage the expanding electricity demand and carbon footprint of data centers.

Data Center Carbon Emissions Increased by One-Third in Five Years
Sandy Ridge Data Park Projected to Consume 1.754 Billion kWh Annually
Likely to Surpass MTR as Hong Kong's Largest Single Electricity User

Data centers consume enormous amounts of energy for cooling. Since 2018, the Electrical and Mechanical Services Department (EMSD) has published total data center electricity consumption figures in its *Hong Kong Energy End-Use Data* reports. These show that Hong Kong's data center electricity use surged more than 75.5% over five years. Using this data together with the Environmental and Ecology Bureau's annual *Hong Kong Greenhouse Gas Emission Inventory*, The Green Earth has calculated that carbon emissions attributable to data center electricity consumption rose from approximately 680,164 tonnes CO_2-e in 2018 to 922,391 tonnes CO_2-e in 2023 — an increase of 35.6% (see table below).

Year	Electricity Generation and Other Energy Industries ($ktCO_2$-e)	Total Final Energy Consumption (TJ)	Data Centers (TJ)	Data Centers as % of Total Electricity Consumption	Data Center Electricity-Related Carbon Emissions (tCO_2-e)
2018	26700	159494	4063	2.55	680164
2019	26300	161670	4483	2.77	729281
2020	20400	159100	5343	3.36	685086
2021	21800	164929	5868	3.56	775621
2022	21000	161497	6349	3.93	825582
2023	21200	163897	7131	4.35	922392

The Innovation, Technology and Industry Bureau recently announced the tender results for the Sandy Ridge Data Park, disclosing that the facility will have a power demand of 220 MW. Assuming a Power Usage Effectiveness (PUE)[1] of 1.3 and 70% utilization throughout the year, The Green Earth estimates the park's annual electricity consumption at 1.754 billion kWh — equivalent to the yearly usage of more than 640,000 three-person households or 3.8% of Hong Kong's total 2024 electricity consumption. The MTR Corporation is currently Hong Kong's largest electricity user, consuming approximately 1.67 billion kWh in 2024[2]. Once operational, the Sandy Ridge Data Park is expected to surpass the MTR and become the city's single largest electricity consumer.

The operating Shek Kwu Chau Incinerator, dubbed as a "waste-to-energy" facility, generates 480 million kWh per year. Supporting the Sandy Ridge Data Park's electricity needs would require the output of four such incinerators. In carbon terms, citing CLP Power's 2024 grid emission factor[3], the Data Park would generate approximately 666,500 tonnes CO_2-e annually — equivalent to 2% of Hong Kong's total 2024 carbon emissions.

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[1] Power Usage Effectiveness (PUE) is a key metric for measuring data center or server room energy efficiency. It is calculated as total electricity consumption divided by IT equipment electricity consumption. The closer the PUE is to 1.0, the lower the non-computing losses (cooling, lighting, etc.) and the higher the energy efficiency.

[2] MTR Performance Metrics: https://www.mtr.com.hk/sustainability/assets/pdf/en/2024/Performance_Metrics.pdf

[3] 0.38 kgCO_2-e per kWh (based on CLP Power's 2024 emission factor).

Outdated Data Center Energy-Saving Guidelines and Policy Vacuum
Government Data Center Energy Consumption Data Not Disclosed

While data center energy use and carbon emissions continue to rise, Hong Kong's policies and measures remain in a vacuum. A review by The Green Earth of major policy documents on data centers, greenhouse gas emissions, and electricity use found that the *Energy Saving Plan 2015–2025+*, developed by the former Environment Bureau, expired last year and never addressed data center energy use or greenhouse gas management. The *Green Data Centre Practice Guidelines* commissioned by the Digital Policy Office and prepared by a non-governmental organization has not been updated since 2020. It still only references traditional water-cooling and air-cooling technologies and has not incorporated newer, more efficient liquid-cooling solutions now widely adopted globally and on the Chinese Mainland to reduce energy costs.

On data disclosure, the Environment and Ecology Bureau and EMSD amended the Buildings Energy Efficiency Ordinance (Cap. 610) last year, requiring all data centers to conduct an energy audit every five years starting September this year and to disclose energy efficiency data. However, when The Green Earth requested energy performance data for government-operated data centers from the Digital Policy Office, the request was refused on "security" grounds. Therefore the public cannot assess the energy efficiency performance of government data centers.

Global Governments Are Implementing Strict Emission Reduction Policies to Drive Data Center Energy Efficiency — Hong Kong Must Catch Up Urgently

Data center electricity costs are substantial, making energy efficiency a key competitive factor. Electricity consumption generates large carbon emissions that can hinder national carbon neutrality goals. Governments worldwide have responded with robust measures.On the Chinese Mainland, the national standard *Maximum allowable values of energy efficiency and energy efficiency grades for data centers* (《數據中心能效限定值及能源效率等級》; GB 40879-2021) was revised last year. From the end of last year, newly built data centers nationwide must achieve a PUE no higher than 1.25. Beijing additionally requires data centers to use a proportion of renewable energy scaled to their PUE value. Governments also publish annual lists of exemplary "National Green Data Centers," (國家綠色數據中心) including their PUE and energy performance data.

The European Union requires member states to enact laws mandating that data centers report electricity use, water consumption, and carbon emissions to national authorities. Some countries have gone further with statutory efficiency standards. Under Germany's *Energy Efficiency Act* (*Energieeffizienzgesetz, EnEfG*), new data centers from July 2026 must achieve a PUE ≤ 1.2; by July 2030 all data centers must achieve a PUE ≤ 1.3. Ireland, a transatlantic data hub, requires new data centers to source 80% of their energy from renewables starting this year.

Singapore introduced a carbon tax in 2019. Data centers, as high-energy, high-emission facilities, are subject to the tax, but revenue is ring-fenced for subsidizing green transformation of the industries. Centers undertaking energy-saving retrofits can apply for government subsidies.

Hong Kong has only amended the Buildings Energy Efficiency Ordinance to require energy consumption disclosure. It lacks a comprehensive policy package and must act urgently to close the gap.

Country / Region	**Policy Type**	**Details**
Chinese Mainland	Statutory efficiency target	New data centers: PUE ≤ 1.25
Chinese Mainland	Standard setting	Revised national standard Data Center Energy Efficiency Limits and Energy Efficiency Grades
Chinese Mainland	Data disclosure	Annual National Green Data Center List published with PUE and energy data for recognition
Beijing (China)	Renewable energy use	Data centers must use a proportion of renewables scaled to PUE (higher PUE requires higher renewable share)
European Union	Data disclosure	Data centers must report electricity, water, and carbon emissions to national authorities
Germany	Statutory efficiency target	New data centers (from July 2026): PUE ≤ 1.2; All data centers (from July 2030): PUE ≤ 1.3
Germany	Waste heat reuse	Data centers must reuse waste heat to avoid energy loss
Ireland	Renewable energy	New data centers: 80% energy from renewables
Singapore	Standard setting	SS 715:2025: Energy Efficiency of Data Centre IT Equipment
Singapore	Tax & subsidy	Carbon tax system; revenue used to subsidize industry green transformation
Japan	Statutory efficiency target	National average PUE ≤ 1.4 by 2030; New data centers: PUE ≤ 1.3 from 2029

Table: Selected Global and Regional Data Center Energy Efficiency and Decarbonization Policies

The Green Earth's Recommendations

The Green Earth firmly believes that innovation and technology will bring enormous benefits to Hong Kong and welcomes low-carbon operators. However, the high energy consumption of data centers inevitably produces substantial carbon emissions. Relevant government departments should therefore formulate control policies without delay.

Hong Kong's primary decarbonization strategy relies on greening the power grid (i.e., replacing coal with natural gas and importing nuclear and renewable energy). For this strategy to succeed, electricity demand must not grow dramatically. Yet Ireland's experience shows that even when grid carbon intensity fell by more than half over the past decade, a nearly five-fold surge in data center electricity use caused data center-related carbon emissions to nearly double (see table below).

Year	Data Center Electricity Consumption (GWh)	Grid Carbon Intensity (gCO_2/kWh)	Data Center Carbon Emissions ($MtCO_2$)
2015	1238	470	0.58
2016	1480	486	0.72
2017	1760	446	0.78
2018	2180	384	0.84
2019	2488	332	0.83
2020	3028	307	0.93
2021	4010	345	1.38
2022	5270	330	1.74
2023	6335	253–255	1.61
2024	6969	224	1.56

Source: Ireland Central Statistics Office (CSO) & Sustainable Energy Authority of Ireland (SEAI); compiled by The Green Earth

Looking ahead, in addition to Sandy Ridge, large data centers are also planned for the Loop (河套區) and San Tin. Electricity demand and carbon emissions may rise sharply. Grid decarbonization and electricity demand management must both be pursued in parallel.

Policy and Guideline Recommendations

The government should update the *Energy Saving Plan* and other policies and guidelines on energy conservation and GHG reduction, and establish legally binding energy-saving targets for data centers — for example, setting an upper limit on PUE.

Energy Use Data Disclosure

To demonstrate commitment to energy saving and emission reduction, the government should lead by example and proactively publish energy consumption data for its own data centers, encouraging the industry to follow. If genuine security concerns exist, the government must explain who monitors energy performance and how.

Green Finance

Energy-saving technologies require capital investment. The Green Earth recommends making full use of green finance tools to accelerate industry transformation. When government bodies, banks, and other institutions approve green loans or design green bonds, they must rely on credible standards to evaluate environmental performance. The development of such standards is therefore critical. The Green Earth believes relevant departments should draw on experience from the Chinese Mainland and other countries to formulate Hong Kong-specific data center energy-saving and emission-reduction standards. This would help Hong Kong align with national decarbonization strategies and international environmental trends.

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Media coverage

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數據中心耗電巨 港未列PUE規管 環團料沙嶺年耗相若64萬戶 促訂上限「與世界接軌」

政府銳意發展創科，數據中心正急速增加，用電需求顯著上升。現時全球多地已制定數據中心電力使用效率（PUE）標準及其他能源效益措施，例如內地去年底起規管新建大型數據中心PUE不得高於1.25（見另稿），惟本港仍未訂定PUE 上限等規管措施。有環保團體推算，單是沙嶺數據園區估計年耗電量已達約17.5 億度，相等於全港用電量約3.8%，足夠64 萬戶三人家庭全年用電，成爲本港一大耗電用戶，敦促政府與國家及世界接軌，及早更新政策，確保2050年前實現碳中和的目標不受影響。

明報記者 馬耀森

政府： 現例已間接規管

年內諮詢業界PUE值

環境及生態局與機電署綜合回覆本報稱，現時《建築物能源效益條例》「已間接規管數據中心的PUE 值」，機電署會持續檢視《條例》實施情況和建築物能源效益標準，並在今年內諮詢數據中心業界，探討如何加強規管數據中心的能源效益指標，包括PUE值；此外，機電署會持續「促進」業界應用相關實務指引，例如香港綠色建築議會制訂的《綠建環評數據中心》綠色建築評估工具，以及建築環保評估協會制訂的《綠色數據中心實務指引》。

根據政府早前公布，沙嶺數據園區耗電量達220兆瓦，創新科技及工業局長孫東前日（28日）出席沙嶺數據園區動工儀式後表示，沙嶺項目用電屬長期穩定的剛性需求，不存在突發用電，相關電力供應系統有成熟方案應對。

不過，數據中心是否具能源效益，足以影響電力需求甚至碳排放，國際間普遍已制定標準，並透過指標「電力使用效率」（Power Usage Effectiveness, PUE）衡量。PUE 是以設施總用電量（數據設備和屋宇裝備裝置）除以數據設備用電量計算所得，數值必大於1 ， PUE愈接近1，代表非數據用途（例如冷卻、照明）的能源效益愈高，超過2則代表效率低下。

綠惜地球助理環境事務經理陳永傑以政府公布的用電量220兆瓦推算，若PUE爲1.3，全年耗電約17.5億度；若以2018/19年度本地數據中心節能表現、即PUE平均1.6計算（根據《綠色數據中心實務指引》），沙嶺數據園區年耗電會增至約21.6 億度（增加約4.1 億度），當中增加的電量已等於全港用電約1%。

陳永傑指出，本港未來將會有更多數據中心建成，耗能和排放量與日俱增，惟至今未有訂定數據中心的PUE 標準，更未有披露最新的用電數據，若不加以規管其耗電效率，會影響碳中和步伐，敦促政府及早訂立管控政策，妥善管理數據中心用電及碳排放量，與國家和世界接軌，並追上節能科技，例如採用液冷技術爲數據中心降溫，以達到更具能源效益的表現。他又說，電力公司爲配合用電需求增加，有可能增加投資成本，帶來加電費壓力。

2030年料增20間

環境局及機電署回覆稱，經修訂的《建築物能源效益條例》今年9 月20 日起全面實施，要求新建數據中心和現有數據中心在進行主要裝修工程時，屋宇裝備裝置須符合《屋宇裝備裝置能源效益實務守則》內訂明的能源效益標準，換言之，屋宇裝備裝置的能源效益愈高，將有助減低用電量，令數據中心PUE 值降低，故《條例》已間接規管數據中心的PUE值。

數據中心用電 數字辦無數字

數字辦回覆稱，香港現時有61 間數據中心，預期2030 年將增至81 間，當中包括沙嶺數據園區；目前，數據中心毋須向政府交代用電量，所以政府並無全港數據中心的平均能源使用效率數據。數字辦又說，儘管如此，電費是數據中心主要營運支出，因此業界非常關注其能源效益，爲降低能源消耗，數據中心一般會安裝高效能的能源系統，以

降低營運成本。

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沙嶺數據園區預計2029年逐步啓用，其中九成用地規劃用作高端*數據中心*，香港潤江的母公司「潤澤智算科技集團」前日稱不用擔心能源問題，因國家正發展不同綠色能源。圖爲園區模擬圖。（香港潤江提供）

近年本港*數據中心*發展急速，據政府公布，前日（28日）舉行動工儀式的沙嶺數據園區耗電220兆瓦，有可能成爲全港最大電力用戶之一。環團綠惜地球推算，園區每年電力需求超過17億度電，佔全港用電量約3.8%。 （賴俊傑攝）

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數據中心耗電5年升75% 環團推算碳排升35%

本港近年陸續有數據中心建成，除了對電力造成額外需求，亦間接令碳排放增加。機電工程署於2018 年起在《香港能源最終用途數據》公布數據中心用電量，當中顯示全港數據中心總用電量由2018至2023年上升75% ，佔全港用電量比例約4.35%（見圖）。

翻查《香港能源最終用途數據》， 2023 年全港數據中心使用能源7131 太焦耳，當中「伺服器房資訊科技設施」涉3913太焦耳、佔整體耗電約55% ，其次的空調涉2653 太焦耳、佔整體耗電約37% ，兩者相加已佔整體耗電逾九成。

綠惜地球進一步推算，得出全港數據中心於2023 年的碳排放量約92萬公噸，較2018年的68 萬公噸上升約35% 。根據環境及生態局《香港溫室氣排放清單》， 2023 年全港碳排放約3450 萬公噸，若計及綠惜地球的推算結果，即2023 年數據中心的碳排放量佔全港約2.7%。

綠惜地球助理環境事務經理陳永傑指出，政府2015 年公布的《香港都市節能藍圖2015-2025+ 》，未有探討數據中心的能源使用和溫室氣體排放管理；數字辦委託建築環保評估協會等團體編製的《綠色數據中心實務指引》自2020年推出至今亦未有更新，該指引主要提及數據中心採用水冷和風冷等傳統冷卻技術，未有提及近年迅速發展並更具能源效益的液體冷卻技術。

綠色指引擬2026/27檢討

數字辦回覆查詢稱， 上述《指引》旨在爲業界提供最佳實務參考，數據中心持份者可按實際情況引入新科技設備，以提升能源效益及環保表現，該《指引》按計劃將於2026/27年度檢討，按需要作出更新。

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位於將軍澳創新園區的數據技術中心（DT Hub）於2021年開幕，是現時香港最大的數據中心集結地之一。資料顯示，中心數據機的冷氣設備之間搭建了水管，會24小時不斷注入凍水降溫。 （徐君浩攝）

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內地德日設PUE上限 愛爾蘭要求綠能佔八成

全球各地加快建設*數據中心*的同時，亦相繼制定減排政策以促進*數據中心*節能。以內地爲例，根據發改委頒布，去年底開始內地新建大型*數據中心*的電力使用效率（PUE）不得高於1.25 ，國家標準《*數據中心*能效限定值及能源效率等級》去年亦展開修訂。另外，北京的*數據中心*除要符合PUE標準，更要採用一定比例的可再生能源；各省市亦要公開*數據中心*（包括政府機關）在節能上的良好表現和做法，以示表揚。

歐盟區*數據中心*須申報碳排

至於歐洲，歐盟規定成員國須制訂法律，要求*數據中心*向所在國申報用電、用水及碳排放等數據，部分成員國亦制訂法定能效標準，*數據中心*必須遵從。德國規定，今年7月起新建*數據中心*PUE不得高於1.2，而所有*數據中心*PUE 到2030 年不得高於1.3 。亞洲方面，日本規定2029 年起新建*數據中心* PUE不得高於1.3，2030年起全國PUE均值不得高於1.4。

除了制定PUE 上限，多國亦有其他規管，愛爾蘭作爲跨大西洋數據樞紐，今年起要求新建*數據中心*80% 能源要來自可再生能源。當地具備濕冷天氣、低稅率及戰略位置等優勢，近年大力發展*數據中心*，於2015至2024年的10年間，*數據中心*用電量激增約4.6倍至69.7億度電，當地即使從境外輸入核電和可再生能源，同期*數據中心*的碳排放量仍上升約1.7 倍至156萬公噸。

綠惜地球助理環境事務經理陳永傑指出，愛爾蘭*數據中心*發展急速，即使輸入潔淨電力也追不上電力需求急升，因此碳排放上升。至於本港，他稱未來除了沙嶺，河套及新田亦會興建大型*數據中心*，若本港計劃從內地輸入潔淨電力，應配合用電需求增長趨勢，否則每度電的碳排放量會大幅上升。

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政府：嚴審兩電投資 避影響電費

本港未來陸續有大型*數據中心*建成，電力需求將會顯著增加。被問到電力增長牽涉電力公司投資基建設施、會否構成電費加價壓力，環境及生態局回覆稱，政府在《管制計劃協議》框架下審批兩電提交的五年發展計劃，嚴格審核兩電建議的資本項目投資（包括爲未來大型*數據中心*供電的項目），避免兩電作出過大、過早、不必要或不合理的投資，影響電費水平，而中電已根據五年發展計劃（ 2018 至2023 年）就香港未來發展供電需求作出建設，以配合創科產業（包括*數據中心*）發展，提供穩定電力。

沙嶺數據園區前日舉行動工儀式，投得該園區的香港潤江智算科技有公司披露園區模擬圖，日後園區將有兩個132千伏變電站，均由中電興建。中電早前表示將投資有關變電站的電力設備，並負責日後營運及維修，以確保供電安全穩定。

翻查中電向立法會提交2025年電費檢討的資料， 2018 至2023 年獲批准的資本開支中，多個變電站均屬北都範疇，包括河套西、洪水橋、古洞北及牛潭美變電站等。

文章編號:202603309502312

香港經濟日報 | 2026-03-30
報刊 | A18 | 港聞 | | By 方咏思

環團料沙嶺數據園 用電量將冠全港

沙嶺數據園區剛舉行動工儀式。有環團估算，保守估計園區啓動後，每年用電量最少達17.54億度，相當於63.78萬個家庭住戶用電量，料成全港「用電之冠」；惟政府現無對電力使用效率（PUE）進行規管。

數據中心的碳排放量驚人。環團「綠惜地球」指，按機電署《香港能源最終用途數據》所載數據，全港數據中心用電量在2018至23年間，急增逾75.5%；結合環境局《香港溫室氣體排放清單》推算，全港數據中心耗電產生的碳排量，在同期由68.5萬噸升至92.2萬噸，增幅達35%。

每年用電量 相若64萬住戶

綠惜地球指，現時國際間採用電力使用效率（PUE），即「數據設備」和「屋宇裝備裝置」的用電量，除以「數據設備用電量」，評估電力是否有效運用。當PUE愈貼近1，即電力愈多用於數據設備，相反數值愈高，即電力多用於散熱而非運算上。

而參照商界環保協會在2023年報告，全港數據中心PUE值達1.6。按政府公布，沙嶺園區涉及電力用量料達220兆瓦，即每小時用電22萬度，按全天候運作、全年70%運力運作，PUE值已達1.3，即一年用電量料高達17.54億度，佔全港總用電量3.8%，假設園區運力再升，當PUE值達1.6，用電量將升至21.58億度，料成全港最高。而沙嶺園區耗電產生的碳排放量，推算可達66.65萬噸，相當於本港2024年全年碳排放量約2%。

不過，政府現未有設定「PUE標準」，綠惜地球質疑形同「無王管」，擔心影響達到《香港氣候行動藍圖2050》碳中和目標進度。環團指，作爲歐洲數據中心樞紐的愛爾蘭，因數據中心用電量在10年間急增近5倍至69.69億度，曾致供電緊張，故已禁止新建數據中心接入國家電網，上月更頒令要求其80%用電需來自可再生能源，「日本、德國也有對數據中心PUE作規管，內地要求新建中心PUE值不得高於1.25，本港亦宜設PUE值上限」。

液體冷卻等節能技術 年內推廣

本報亦向機電署查詢本港未設「PUE標準」原因，署方指現行條例已透過規管屋宇裝備標準，間接影響PUE值；亦計劃在今年內諮詢業界，探討如何加強PUE值等能效指標，並承諾在今年內推廣液體冷卻等節能技術。

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香港經濟日報 I 2026-03-30
報刊 I A18 I 港聞 I I By 方咏思

港4年後增至81數據中心 促增監管

本港現有61間數據中心，數字辦預期至2030年將增至81間，當中包括沙嶺園區。有環團關注，目前港府監管數據中心政策多處「真空狀態」，資訊透明度亦不及內地。

縮短能源審核 更新技術指引

政府去年修訂《建築物能源效益條例》，數據中心在今年9月起，必須每5年作一次能源審核，並公開能效數據。但綠惜地球關注，數據中心用電按年升幅驚人，倡縮短至每1至2年一審，「且雖說數據公開，但向數字辦查詢時，對方卻以保安理由拒絕。」

數字辦回覆本報則指，目前數據中心毋須向政府提供用電量，故政府沒有全港中心的平均能源使用效率數據。

另環團關注，數字辦委託編製的《綠色數據中心實務指引》自2020年起未作更新，仍停留在「風冷」技術，恐難跟上現時主流的「液體冷卻」。

數字辦則指，預計在26/27年度檢討更新指引；機電署也計劃年內與業界合作推廣最新節能科技應用，如數據設備液體冷卻技術等。

同時，不少國家和地區均要求數據中心作「綠色轉型」，惟本港節能責任多屬「自願性計劃」。港燈回覆本報查詢指，收到十個涉「智惜用電數據中心」計劃查詢，但最後僅半數有申請；中電稱，爲逾8成數據中心提供免費能源審核，當中一間與大學合作優化氣流管理，成功減低3成冷氣耗能。

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信報財經新聞 I 2026-03-30
報刊 I A14 I 港聞 I 特稿

國家設能耗標準 港府年內諮詢

沙嶺數據園區動工，意味爲本港未來創科發展提供大量算力，惟數據中心高耗電與高排放引起社會關注。近年全球針對其用電碳排放激增，紛紛制定對策【表】，常見有限制PUE值（Power Usage Effectiveness，電能利用效率）不得高過某一水平，內地去年已規定新建數據中心PUE值不得逾1.25。有環保團體質疑本港至今無相關具體對策，目前本地各區數據中心平均PUE值1.6，以此計算沙嶺數據園區未來落成後用電量，每年達21.58億度。

環團：制定對策刻不容緩

PUE是衡量數據中心節能程度的指標，計法以「總用電量」除以「IT設備用電量」，若數值愈接近1，代表非計算用途如冷卻、照明等耗能愈少，能源效益愈高；相反耗能愈大。

綠惜地球助理環境事務經理陳永傑受訪，以「超級焚電爐」形容世界各地數據中心，直言全球正設法處理高用電與高碳排放問題，偏偏本港政策與措施呈真空，「我哋翻查文件，前環境局2015年訂嘅《節能藍圖2015-25+》舊年已屆滿，內容冇探討數據中心嘅能源使用同溫室氣體排放管理，數字辦《綠色數據中心實務指引》自2020年之後冇更新過。」他質疑本港在政策措施上未追上國際間冷卻科技發展。陳永傑稱，截至去年底本港有47間數據中心，整體PUE平均值1.6。「我哋推算佢哋（數據中心）耗電產生嘅碳排量，至2023年已增至92.2萬噸，較2018年升35.6%。」他認爲當局制定對策刻不容緩，「若以PUE值1.6去計沙嶺，一年用電21.58億度，就算以PUE1.3去計都17.54億度，都比港鐵2024年嘅16.7億度高，勢成未來本港用電之冠。」

環境及生態局回覆指經修訂的《建築物能源效益條例》將今年9月20日起實施，屆時數據中心需每隔不多於5年進行一次能源審核，完成後公開其屋宇裝備裝置即空調裝置、照明等相關能源效益的技術資料。發言人稱由於屋宇裝備裝置能源效益愈高，亦有助減低用電量，間接規管數據中心的PUE值。機電署指今年內諮詢數據中心業界探討如何有效加強規管能源效益指標，包括PUE值等。數字辦認爲在沙嶺用地發展數據園區無不能克服的技術問題。

採訪、撰文：司徒志雄

#政情 #特稿 - 國家設能耗標準 港府年內諮詢

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報刊 | A14 | 港聞 |

浸沒式液冷 碳排放降45%

根據資料，***數據中心***因高密度的伺服器運作會產生大量熱力，需用額外電力冷卻，故電力是***數據中心***主要營運開支。惟目前本港大部分***數據中心***仍用較傳統的水冷及風冷技術，綠惜地球助理環境事務經理陳永傑指出，近年更節能的液體冷卻技術愈趨成熟，但本港使用寥寥可數。「內地同國外已好多***數據中心***用液冷慳能源同開支，但香港唔流行。」

機電署稱年內推廣最新節能

據知沙嶺數據園區未來會採用綠色液冷技術，惟PUE值限制卻一直無公開，機電署稱計劃今年內會與***數據中心***業界推廣最新節能科技應用，包括液冷技術。

科大早在2024年已引進全港最大規模浸沒式液冷卻系統，透過將精密電腦硬件直接浸入特製類水冷卻液散熱，相較用風扇及冷氣的機櫃式系統，顯着減逾80%能源消耗，有效將機房PUE降至低於1.1，長遠助延長硬件壽命，減輕***數據中心***運營成本。

校方指因新的液冷技術能有效降低耗電量，令每年可減少900噸碳排放，較傳統機櫃式系統少45%，年省近300萬元電費，效能功耗比（performance per watt）亦升10%。

#政情 - 浸沒式液冷 碳排放降45%

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South China Morning Post

Source:
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Hong Kong / Health & Environment

Northern Metropolis data hub may surpass MTR Corp as Hong Kong's top power consumer

Environmental experts urge authorities to set energy efficiency standards for data centres to limit carbon emissions

Theodora Yu

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The Range (Hong Kong) Sandy Ridge data facility cluster in the Northern Metropolis. Photo: Edmond So

A planned supercomputing hub in Hong Kong's Northern Metropolis could overtake the MTR Corporation rail operator as the city's single largest electricity consumer, prompting a green group and experts to call for setting energy efficiency standards to limit the sector's carbon emissions.

According to The Green Earth's estimates, the new project – set to begin operating in 2029 – could increase the industry's annual carbon emissions by about 70 per cent compared with current levels. Experts have urged incorporating sustainable policies and design before work begins.

The hub's projected annual consumption is equivalent to the electricity used by roughly 530,000 households in a year.

"The most pressing issue is the current lack of government regulation regarding both energy consumption and carbon emissions," said Steven Chan Wing-kit, assistant environmental affairs manager at The Green Earth.

"Picture another large-scale electricity consumer springing out within a few years ... if the government continues its current approach to focus only on decarbonising the power grid rather than actively managing electricity consumption, we are concerned that carbon emissions will escalate rapidly."

According to available official statistics, existing data centres in the city took up about 4.35 per cent of Hong Kong's electricity consumption in 2023 at 7,131 terajoules, or 1.98 billion kilowatt-hours.

Consumption jumped by 75 per cent from 2018 to 2023, with the associated carbon emissions rising by about 35 per cent, according to the green group.

As of last year, about 47 providers were operating more than 100 data facilities in the city.

Based on the latest energy end-use data published by the Electrical and Mechanical Services Department in 2025, The Green Earth estimated that existing data centres generated 922,390 tonnes of carbon emissions in 2023 from electricity consumption.

The supercomputing hub, with a total area of over 110,000 square metres to be built in Sandy Ridge, aims to fuel the development of the artificial intelligence (AI) industry.

By 2032, the cluster is expected to provide 180,000 petaflops of computing power, equivalent to 36 times the city's current capacity.

It is expected to consume about 220 megawatts of electricity – representing an hourly consumption of 220,000 kWh – according to Secretary for Innovation, Technology and Industry Sun Dong earlier this month.

Based on this figure, the hub was projected to consume 1.754 billion kWh of electricity in a year, according to modest estimates of its power usage effectiveness (PUE) level and operating capacity, the green group said.

PUE measures the total electricity consumption of a data centre divided by the electricity consumed by the data equipment. The closer the PUE value is to 1, the more efficient its usage of energy.

The MTR Corp – Hong Kong's largest single electricity consumer – consumed 1.67 billion kWh of electricity in 2024.

Factoring in 2024 carbon emissions per electricity unit from CLP Power, the facility could generate 666,520 tonnes of carbon emissions in a year, which would increase the data centre industry's emissions by about 70 per cent.

The emissions figure is also 16 times more than the yearly amount of carbon absorbed by the 1.6 million trees managed by the city, which Chan called "a shocking number".

While the group believes new technologies will benefit Hong Kong, Chan urged the government to align with national and international emission reduction strategies and implement timely revisions to energy-saving policies.

He cited Germany's example of setting two caps on PUE for newly built and existing data centres, as well as the European Union's mandatory disclosure system for electricity usage and carbon emissions.

Mainland China also has a statutory PUE limit of 1.25 for new data centres, while Japan has set a target PUE cap of 1.4 for data centres by 2030.

"With a PUE cap, there is motivation [for data centres] to change their energy conservation measures," Chan said.

Staff on duty during the groundbreaking ceremony for the Range (Hong Kong) Sandy Ridge data facility cluster. Photo: Edmond So

Ian Varela Soares, a business consultant specialist and former public policy researcher in digitalisation and decarbonisation at the Hong Kong University of Science and Technology, echoed Chan's concerns.

He urged the government to set up PUE levels and energy efficiency thresholds for the equipment – a "double-layer" regulatory framework that was implemented in Singapore for its new large-scale data centre projects.

The framework could serve as a good blueprint for Hong Kong as both places were geographically more "constrained" and lacked energy and land resources, Soares said.

"Energy efficiency will always have a higher importance because of the limited resources Hong Kong has. So the first instinct should always be to consume less," Soares said.

Professor Wang Shengwei, director of Research Institute for Smart Energy at Polytechnic University, said the Sandy Ridge data centre should be designed to cater for the "progressive increase of the proportion of liquid-cooling IT equipment".

Liquid-cooling – cooling by means of circulation of a liquid to the chip – had higher energy efficiency and was increasingly becoming a "must" for AI equipment, Wang said.

One data centre provider that was fully equipped with liquid cooling solutions and supporting projects to adopt the technology was Sunevision, a company spokeswoman told the South China Morning Post.

The firm, the technology arm of Sun Hung Kai Properties, holds a 25 per cent share of the local market.

The company noted that while liquid cooling was an emerging trend, a full transition was not supported by market demand, and air-cooling remained the preferred approach.

A Digital Policy Office spokesman said the firm that won the tender for the Sandy Ridge construction was planning to conduct a sustainability evaluation, known as the BEAM Plus Data Centres assessment, upon completion of the Sandy Ridge site.

"The office is mindful of the estimated electricity consumption and carbon emissions of the Sandy Ridge site upon its completion," he said.

In a response to the SCMP, the Environment and Ecology Bureau said the Electrical and Mechanical Services Department would consult the data centre industry in 2026 to "explore how best regulation of energy efficiency standards of data centres could be enhanced, including PUE value", adding there were plans to import more zero-carbon energy to Hong Kong.

Under Hong Kong's Climate Action Plan 2050, the government aimed to reduce the electricity consumption of new and existing commercial buildings, including data centres, by 30 to 40 per cent, the bureau added.

Starting in September, the government would also require data centres to conduct regular energy audits every five years and to disclose certain energy efficiency-related technical data of the data centre's building services installation.

沙嶺數據園年耗電達17.5億度　相等於64萬戶三人家庭全年用電量

03月30日(一) 12:18

有團體推算，單是沙嶺數據園區估計年耗電量已達約17.5億度。

本港數據中心數目急速增加，用電需求顯著上升。全球多地目前已制定數據中心電力使用效率(PUE)標準，惟本港仍未訂定PUE上限等規管措施。有環保團體推算，單是沙嶺數據園區估計年耗電量已達約17.5億度，相等於全港用電量約3.8%，足夠64萬戶三人家庭全年用電，成為本港一大耗電用戶。團體敦促政府與國家及世界接軌，及早更新政策，確保2050年前實現碳中和的目標不受影響。

根據政府早前公布，沙嶺數據園區耗電量達220兆瓦。綠惜地球助理環境事務經理陳永傑推算，若PUE為1.3，全年耗電約17.5億度；若以2018/19年度本地數據中心節能表現、即PUE平均1.6計算，沙嶺數據園區年耗電會增至約21.6億度，當中增加的電量已等於全港用電約1%。他續指，本港未來將有更多數據中心建成，耗能和排放量與日俱增，惟至今未有訂定PUE標準，更未披露最新用電數據，若不加以規管其耗電效率，會影響碳中和步伐。

陳敦促政府及早訂立管控政策，妥善管理數據中心用電及碳排放量，與國家和世界接軌，並追上節能科技，例如採用液冷技術為數據中心降溫，以達到更具能源效益的表現。他又指，電力公司為配合用電需求增加，有可能增加投資成本，帶來加電費壓力。

環境及生態局與機電署綜合回覆傳媒稱，現時《建築物能源效益條例》「已間接規管數據中心的PUE值」，機電署會持續檢視《條例》實施情況和建築物能源效益標準，並在今年內諮詢數據中心業界，探討如何加強規管數據中心的能源效益指標，包括PUE值。此外，機電署會持續「促進」業界應用相關實務指引，例如香港綠色建築議會制訂的《綠建環評數據中心》綠色建築評估工具，以及建築環保評估協會制訂的《綠色數據中心實務指引》。

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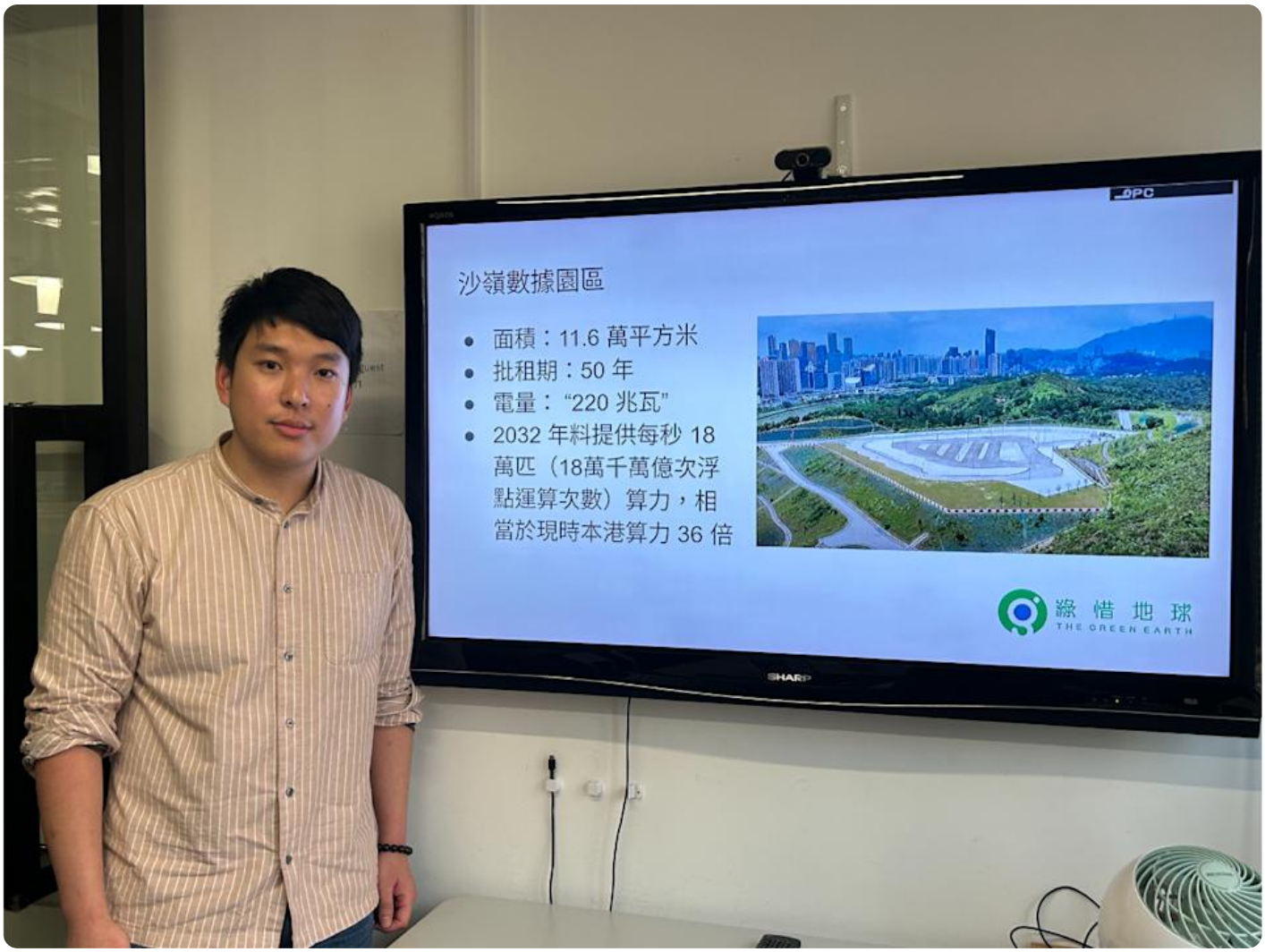
沙嶺數據園區用電量恐超港鐵 料成全港最大用電戶 數字辦：基於保安不披露資料｜Yahoo

Yahoo新聞
2026年3月30日週一 上午 7:00



綠惜地球助理環境事務經理陳永傑。

【Yahoo新聞報道】沙嶺將發展為數據中心和相關產業的數據園區，總面積超過11萬平方米。綠惜地球估算，沙嶺數據園區落成後，全年用電量可達 17.54 億度，相當於逾 53 萬戶家庭全年的用電，或超越港鐵成為全港用電量最多的單一用戶。綠惜地球助理環境事務經理陳永傑批評，港府現有的數據中心節能政策和措施呈真空狀態，呼籲儘快公布現有數據中心的效能數據。

數據中心耗能於冷卻

本港近年全力推動創科產業，數據中心規模迅速擴張，截止 2025 年年底全港共有 47 間數據中心。機電工程署自 2018 年起在《香港能源最終用途數據》公布數據中心總用電量，資料顯示，全港數據中心用電量在五年間急增超過七成半。

除必須電子設備用電以外，數據中心還需耗用大量能源作冷卻用途。電能利用效率（PUE）可作為評估數據中心用電量效能的指標，數值越低、越接近 1 ，代表中心用電效能越高，使用在冷卻、安保、升降機等其餘電量越少。有環保團體在 2023 年評估本港數據中心節能表現，推算 PUE 平均為 1.6，落後於全球平均值 1.54。

估算沙嶺數據園年耗電達 17.54 億度

創新科技及工業局本月初（2 號）公布，總面積超過11萬平方米的沙嶺數據園區用地已經批出，發展先進的數據中心和相關產業的數據園區，局長孫東透露數據園的用電功率為「220 兆瓦」。綠惜地球助理環境事務經理陳永傑指，即使樂觀估計沙嶺數據園區之電能 PUE 為 1.3、全年以 70 %運力運作，推算該新數據園區全年用電量可達 17.54 億度，相當於超過 53 萬戶家庭全年的用電量，佔 2024 年全港用電量之 3.8 %。

現時港鐵為全港用電最多的單一用戶，2024 年耗電量約為 16.7 億度，意味若沙嶺數據園投入運作後將超越港鐵成為全港用電之冠；目前作「轉廢為能」用途的石鼓洲焚化爐年產 4.8 億度電，若需要支持沙嶺數據園用電量，即須四支焚化爐

才可支撐；碳排放量方面，估計沙嶺數據園耗電所產生的碳排放量相當於 2024 年本港碳排放量的 2 %。

相關指引未見更新

綠惜地球關注當局對於電力需求的管理，批評現有政策和措施呈真空狀態，包括前環境局在 2015 年牽頭制訂的《節能藍圖 2015 - 25+》已於去年屆滿，未見更新，且內容亦未有探討數據中心的能源使用和溫室氣體排放管理；至於數字政策辦公室委託民間團體編制的《綠色數據中心實務指引》，自 2020 年沿用至今仍未更新，指引當中提及水冷和風冷等傳統冷卻技術，惟近年國外數據中心已經轉用節電效能高的液體冷卻技術，綠惜地球質疑指引未能跟上冷卻科技的發展，難以鼓勵業界一同減低 PUE。

綠惜地球同時指出，環境及生態局和機電工程署已於去年修訂《建築物能源效益條例》，規定所有數據中心必須於本年 9 月起，每 5 年進行一次能源審核，並且公開效能數據，惟數字辦現時以「保安」為由拒絕提供資料予綠惜地球，未能得知現有數據中心的整體用電效能發展。

提醒需注意供電穩定

陳永傑倡政府主動披露其數據中心的能源使用數據，鼓勵業界節能減排，又建議參考內地及其他地區制訂具法律約束力的節能目標，加強電能利用效率，以及盡快推進液態冷卻等節能技術。他舉例，內地新建的數據中心的 PUE 值不得高於 1.25，並公開數據中心的節能表現，而德國、日本等地同樣對新建數據中心設置 PUE 上限，呼籲港府儘快指定管控政策。

陳永傑以近年大力發展數據中心的愛爾蘭為例，當用電量持續擴大，城市和郊區的用電量和用電比例越趨下降，反映電網壓力大，不足以同時供給數據中心和城郊，而香港亦需要考慮當越來越多數據中心落成後，是否會出現電力負荷不足問題。

當局：現有條例間接規管PUE值

環境及生態局與機電工程署綜合回覆指，根據《建築物能源效益條例》，新建的數據中心和現有數據中心在進行主要裝修工程時，屋宇裝備裝置須符合《屋宇裝備裝置能源效益實務守則》內訂明的能源效益標準。數據中心 PUE 值是由數據中心的總用電量除以數據設備的用電量計算所得。換言之，屋宇裝備裝置的能源效益越高，將有助減低用電量，令數據中心的PUE值降低，因此《條例》已間接規管數據中心的PUE值。機電署亦會在年內諮詢數據中心業界，探討如可有效加強規管數據中心的能源效益指標，包括PUE值。

數字辦：披露內部資料或影響運作及保安

數字辦則回覆指，有關注沙嶺數據園區落成後的估計用電量及碳排放量，中標的香港潤江智算科技有限公司在標書承諾會採用創新系統，將來沙嶺數據園區落成後，會進行《綠建環評數據中心》評估；政府數據中心屬重要設施，基於保安考慮，披露其內部運作資料可能對政府數據中心的運作及保安構成影響，因此選擇不披露相關資料。《綠色數據中心實務指引》則會在 2026 - 2027 年度進行檢討，並按需要更新。