



WORLD GREEN
ORGANISATION

WORLD GREEN ORGANISATION

世界綠色組織

(Registered Charitable Institution)
(註冊慈善機構)

香港九龍荔枝角青山道 電話Tel:+852 2391 1693
483 D - E號 4樓 綠閣 傳真Fax:+852 2371 4100
Green House, 4th Floor, info@thewgo.org
483 D - E, Castle Peak Road, www.thewgo.org
Lai Chi Kok, Hong Kong

Local News, Environment, Features/Reporters

Press Release

For immediate release

「Synergy Energy Efficiency Index」 Press Conference – Energy Usage in Residential and Commercial Sector has Increased

For photos : <https://goo.gl/MPFzJg>

(Hong Kong • July 4th) The World Green Organisation (WGO) announced the ‘Synergy Energy Efficiency Index’ this year to measure and analyse energy use in Hong Kong. It found that despite improvements in energy efficiency, consumptions in energy has increased. Energy consumption per residential household was 4% higher in 2014 than in 2000 (after adjustments for population, weather, and economic growth). Consumption in the commercial sector was found to be 17% higher. For both of these sectors, there was a 7% greater increase than what was calculated in 2013. WGO believes that a major factor of this increase in the residential sector is a result of government electricity subsidies which drove up power usage amongst residents. Another factor is the expansion of private residential estates and their clubhouses which have to operate long hours. Increases in the commercial sector may be related to the growth in data centres. In this day and age, data centres have become one of the largest and fastest consumers of electricity in the modern world. If new energy conservation methods are not developed or strengthened, data centres will consume more electricity than what the power grids can supply.

The ‘Synergy Energy Efficiency Index’ is sponsored by the Synergy Groups Holdings International Ltd. (stock code: 1539) and is the result of a collaboration between WGO and Dr. William Chung Sui-wai, Director of Energy and Environmental Policy Research Unit at the City University of Hong Kong. The index was designed through the use of scientific methods such as the decomposition analysis which takes into account different factors which may affect changes in energy consumption such as type of building (office, retail, or restaurant) or floor area through the years. The index considers these factors in order to calculate difference in energy consumption in 2000 and 2014 for the same activity.

The index uses data from the Electrical and Mechanical Services Department’s Hong Kong Energy End-Use data for year 2000 and analyses factors such as population growth, number of public and private buildings and offices, energy use attitudes, and weather changes that will cause an increase or decrease in energy consumption. By excluding each factor, the index can deduce the Hong Kong people’s attitudes towards energy and estimate what actually causes the energy consumption increase.

Hong Kong’s residential sector energy consumption index was 104% in 2014

The index found that Hong Kong’s residential sector’s index was at 104%¹ in 2014. This is 4% higher than the 2000 energy consumption baseline. In other words, for the same activity, Hong Kong’s residential sector was using 4% more energy in 2014 than in 2000. It is important to

¹ The index is based on the year 2000 data. If energy consumed for the same activity in 2014 is higher than in 2000 despite all other factors, the index would be higher than 100%. Likewise, if energy consumed for the same activity is found to be lower, the index would be under 100%.

note that in 2013, the index found that the residential sectors' index was 97%. In just one year, the percentage increase 7%. The results were surprising.

According to the statistics, the total energy consumption of the residential sector in 2013 was 59,458 TJ (Terajoule) (approximately 16.5 billion Wh, see table 2) which was 1,429 TJ less than in 2012². In 2014, the total energy consumption of the residential sector was 62,958 TJ. When compared to the 2013 data, there is a difference of approximately 3,500 TJ. One of the reasons for the increase was probably due to the private housing sector which was accountable for 2,071 TJ of the increase, 60% of the total increase. The public housing sector and government-funded housing were responsible for 747 and 557 TJ of the increase. The former was an increase of over 20% whereas the later was an increase of 16%. If energy use attitudes were taken into consideration, the amount of energy consumed per 1,000 homes, compared to 2000, was -1,525.8 TJ in 2013 (see table 3) and 2,546.36 TJ in 2014(see table 4). The difference between 2013 and 2014 was 4,072.16 TJ in just one year (this is equivalent to 1.4 times the amount of electricity consumed by the MTR Corporation Limited in 2014).

The government's electricity subsidies are probably one of the reasons why electricity consumption has increased

Dr William Chung Sui-wai, Associate Professor of City University said "Increasing public awareness of energy conservation and popularity of energy efficient appliances in recent years created a decline of energy use in 2013 (97%). However, in 2014, there was a major reversal in public attitudes towards energy use. This, in addition to increased energy consumption of private estates, resulted in energy consumption to increase again. The worsening attitude may stem from government electricity subsidies³ which helps users pay for a portion of their electricity. Because users are no longer paying the full amount, they may feel as though they are not using as much electricity and therefore, will not try to limit energy use. In addition, many private residential estates provide clubhouses which have long operating hours. Some may even have swimming pools which require a lot of energy to maintain. These are just a few reasons as to why energy consumption in private residential sector have increased significantly."

The commercial sector's energy consumption index was 117% in 2014

The business sector also recorded an increase once again in energy consumption. The index measured the energy consumption at 117 % for 2014. This is a 17% increase compared to 2000. In other words, for the same activity, Hong Kong's commercial sector was using 17% more energy in 2014 than in 2000.

Breakdown of electricity consumption in the commercial sector

Despite global awareness of energy conservation, the index showed that the commercial sector's electricity usage has increased. For 2014, the total energy consumed by the commercial sector was 121,480 TJ. In 2000, the consumption was 94,043 TJ. There was a significant increase of 27,437 TJ. However, a breakdown of energy usage in the different industries of the commercial sector indicated that offices and restaurants actually reduced energy consumption 1,097 and 3,078 TJ respectively (see table 5). Although traditional industries have drastically improved their energy efficiency, 'retailers' and 'others'⁴ increased energy consumption by 1,778 and 29,833 TJ respectively. 'Retailers' and 'others' increased

² The total energy consumption in 2012 was 60,888 TJ.

³ In July 1st, 2013, the government launched electricity subsidies which lasted for 12 months. On the first day of every month, users of China Light and Power Co., Ltd (CLP) and Hongkong Electric Company (HEC) will have a subsidy of up to 150HKD. Each eligible residential user account can claim up to \$1,800.

⁴ Including hotels, educational institutes, healthcare facilities, warehouses, subway and railway stations, etc.

their usage to a total of 108%⁵ which completely offsets the reduction made by offices and restaurants.

In 2013, the index measured energy consumption at 110% compared to 2000. From 2000 to 2013, there was an increase of 10% in energy consumption (an average annual increase of approximately 0.77%). However, from 2013 to 2014, consumption increase 7% which is 9 times more than from 2000 to 2013. Data centres have been found to consume 3% of the global electricity supply. Its carbon emissions account for 2% of all global emissions.

Energy consumption of data centres and IoT

Technological advances has meant that data centres can now operate in room temperature. This means that many new data centres no longer have to use as much electricity in order to cool the server. However, there is still a lot of stored data and many old data centres that require cooling technologies to keep rooms around 10 degrees Celsius. The increasing need for data centres can be attributed to the popularity of online shopping and the development of the ‘Internet of Things’⁶. Both of which have large number of images and data processing.

The United States Department of Energy published a United States Data Centre Energy Usage report last June which found that in 2014, data centres consumed an estimated 70 billion W/h which represents about 1.8% of total U.S. electricity consumption. The report showed that electricity consumption of data centres increased to 4% from 2010-2014 alone.

Technological developments has allowed people to use their smartphones to go on the internet, check their social media, or shop online anywhere and everywhere they go. This has meant that although technological advances have made the internet much more energy efficient, the popularity and accessibility of the internet is causing usage to increase. This is an example of what is called the ‘Jevons Paradox’; technological progress has increased the efficiency and availability of the resource, however, the rate of consumption of that resource still continues to rise exponentially because of the increasing demand.

Data Centres are time bombs

Dr William Yu, Chief Executive Officer of WGO said, “Data centres are currently a time bomb. Online shopping, IoTs, Hong Kong’s Investment banks and domestic banks have all moved towards an online, cloud-based platform which is increasing the need for data centres. If new energy conservation methods are not developed or strengthened, data centres will use up the global electricity supply by 2030. Daily operations, businesses will all be greatly affected. Research and development must start now before it is too late. All data centres should transition into using renewable energy so that it can also reduce its carbon emissions.”

Synergy Groups Holdings International Ltd.’s Chief Operation Officer, Mr Ken Cheng said “At present, there is a general lack of energy efficiency measures. If you take data centres as an example, there are a lot of factors to consider just in terms of temperature. The servers need to be cool in order to operate so centres need to take into account power usage effectiveness (PUE)⁷ and set up energy saving measures in order to ensure optimal electricity efficiency.”

⁵ The difference between the total energy consumed in 2014 and 2000 was 27,436TJ while energy consumption for ‘others’ in 2014 was 29,833 TJ more than in 2000.

⁶ The interconnection between devices and the internet allows data such as consumer habits, preference, tendencies to be stored. All the small detailed data is then congregated into large data.

⁷ Electricity Efficiency is calculated using the electricity consumption of Information Technology (IT) facilities and the total equipment energy consumption.

$$\text{Electricity Efficiency} = \frac{\text{Total Energy Consumption}}{\text{IT equipment Energy Consumption}}$$

Mr Alan Lee, General Manager of Fotomax talked about the company's move towards becoming more environmentally friendly. They hope that the different energy saving measures will help them save money in the long run. As part of their energy conservation plan, Fotomax pledged in 2011 to install energy-saving LED lamps at all of their retail stores and offices. In 2012 they replaced their digital laser printing technology to energy-saving ones. This year they are replacing 50 and have plans to replace the remaining 10 machines. He admitted that this is a vast project that may take several months and affect operations. However, research has found that a single retail store that switches to LED lamps can help the company save 13,000 W/h. From 2011 to June this year, the company was able to save more than 800,000 W/h accumulated which proved that the energy saving measures were very successful.

Table (1) : Decomposition of Households in the Residential Sector in 2014 (per 1,000 unit)

Year Number of household (1,000)	2000	2010	2013	2014
Public	691.1	744.6	772.1	781.5
Housing Authority Subsidised Apartments (such as HOS flats)	324.7	392.9	391.6	393.9
Private	1014.8	1265.7	1315.8	1325.1
Others (such as village houses)	104.5	157.7	168.2	171.4
Total	2135.1	2560.9	2647.7	2671.9

Table (2) : Breakdown of Total Energy Consumed in the Residential Sector in 2014

Year Energy Use (TJ)	2000	2010	2013	2014
Public	15,343	16,152	16,836	17,583
Housing Authority Subsidised Apartments (such as HOS flats)	7,207	10,084	9,566	10,123
Private	22,967	28,730	28,976	31,047
Others (such as village houses)	3,549	3,430	4,080	4,205
Total	49,066	58,396	59,459	62,958

Table (3) : Year 2000 and 2014 Difference in Total Energy Effect with Breakdown in the Residential Sector

Effects Segments (2000, 2014)	Activity Effect ⁸	Structural Effect ⁹	Intensity Effect ¹⁰	Weather Effect ¹¹	Total Effect
Public	3,501.48	-1,515.52	429.77	-175.74	2,240
Housing Authority Subsidised Apartments (such as HOS flats)	2,097.62	-475.60	1,407.68	-113.71	2,916
Private	5,767.26	1,076.43	1,633.26	-396.95	8,080
Others (such as village homes)	742.7	912.85	-924.35	-75.2	656
Total	12109.1	-1.84	2546.4	-761.6	13,892

Table (4) : Year 2000 and 2013 Difference in Total Energy Effect with Breakdown in Residential Sector

Effects Segments (2000, 2013)	Activity Effect	Structural Effect	Intensity Effect	Weather Effect	Total Effect
Public	3,344.9	-1,567.2	-357.1	72.3	1,493
Housing Authority Subsidised Apartments (such as HOS flats)	2,008.1	-443.7	733.7	60.9	2,359
Private	5,494.3	1,138.1	-827.5	204.1	6,009
Others (such as village homes)	705.0	872.5	-1,074.9	28.4	531
Total	11,552.3	-0.3	-1,525.8	365.7	10,392

⁸The energy used for when tenant move buildings(between public, private, HOS flats, or others)

⁹Number of households

¹⁰Energy Consumption per household (TERAJOULE)

¹¹Number of 'Cooling days' (< 18C)

Table (5) : Decomposition of Commercial Sector in 2014 (per 1000m²)

Floor Area (1000m²) (Act) \ Year	2000	2010	2013	2014
Office	9,075.4	10,689	10,983	11,061
Restaurant	2,483	2,992	2,978	2,928
Retail	4,625	4,982	5,884	5,763
Others	54,110	56,410	57,609	56,789
Total	70,293.4	75,073	77,454	76,541

Table (6) : Breakdown of Total Energy Consumed in the Commercial Sector in 2014

Energy Use (TJ) \ Year	2000	2010	2013	2014
Office	13,888	12,195	12,544	12,791
Restaurant	23,907	24,185	20,863	20,829
Retail	15,994	15,711	17,237	17,772
Others	40,255	64,300	69,321	70,088
Total	94,043	116,391	119,965	121,480

Table (7) : Year 2000 and 2014 Difference in Total Energy Effect with Breakdown in the Commercial Sector

Segment (2000, 2014) \ Effect	Activity Effect¹²	Structural Effect¹³	Intensity Effect¹⁴	Weather Effect¹⁵	Total Effect
Office	1,086.23	1,487.84	-3,302.3	-368.8	-1,097
Restaurant	2,001.31	2,043.79	-6,855.3	-267.8	-3,078
Retail	1,369.70	2,150.59	-1,390.1	-352.2	1,778
Others	5,194.33	-2,312.18	27,321.7	-370.9	29,833
Total	9,651.57	3,370.05	15,774.1	-1,359.7	27,436

¹²Change in offices, restaurants, retails, or others





¹³Floor area (Square meters)

¹⁴Energy Consumption per household (TJ)

¹⁵Number of 'cooling' days (< 18C)

Table (8) : Year 2000 and 2013 Difference in Total Energy Effect with Breakdown in the Commercial Sector

Effect Segment (2000, 2013)	Activity Effect	Structural Effect	Intensity Effect	Weather Effect	Total Effect
Office	1,236.4	1,248.0	-4,013.4	185.0	-1,344.0
Restaurant	2,248.5	2,149.6	-7,616.8	174.7	-3,044.0
Retail	1,577.2	2,306.7	-2,807.8	166.8	1,243.0
Others	6,020.9	-2,139.4	25,036.6	147.9	29,066.0
Total	11,083.0	3,564.9	10,598.7	674.4	25,921.0

	<p>The World Green Organisation (WGO) announced the ‘Synergy Energy Efficiency Index’ today. The index found that both the residential and commercial sector has increased their energy usage due to government electricity subsidies and rise of data centres.</p>
	<p>Dr William Yu, CEO of WGO said ‘Data centres are currently a time bomb. Online shopping, IoTs, Hong Kong’s investment banks and domestic banks’ switch to the cloud have resulted in an increase of power consumption.’</p>
	<p>Dr William Chung Sui-wai, Associate Professor at City University analysed, “Government electricity subsidies, added with the increase of electricity consumption in private housing estates have caused energy consumption to increase again in 2014. Private residential estates provide clubhouses and facilities such as swimming pools that require a lot of energy to maintain. ”</p>
	<p>Synergy Groups Holding International Ltd.’s Chief Operation Officer, Mr Ken Cheng said “In order to improve and ensure optimal energy efficiency, data centres must monitor their power usage effectiveness (PUE) and set up energy saving measures.”</p>

About Us

The **World Green Organisation (WGO)** is an independent non-governmental organisation concerned with environmental conservation and environmentally related livelihood and economic affairs by proposing an integrated, three-pronged solution that combines social, environmental, and economic aspects, leading to an environmental revolution. Through science-based policy research and community projects, the WGO aims to enhance the quality of the environment, promote a greener economy, and improve people's livelihoods. In particular, it will focus on the social concerns of underprivileged groups and on the creation of a green economy to help realise its vision of sustainable development. For more information, please visit <http://www.thewgo.org/>

The **City University of Hong Kong's Energy and Environmental Policy Research Unit** was established in response to the increasing end-use energy consumption as well as the government's international commitment to reduce energy intensity (like reducing energy intensity by at least 25% by 2030 with 2005 as the base year in joint effort to tackle the climate change reduction in energy intensity in Hong Kong) and tackle issues of climate change. The research unit was developed to study and formulate formulating a comprehensive energy policy that address energy demand and supply, and related issues including transport, environment and technology innovation. A comprehensive energy policy should be able to ensure a safe, secure, reliable and cost effective energy supply under sustainable development environment. However, there is no research centre or unit for energy and environmental policy analysis in Hong Kong to provide a comprehensive research studies for the above mentioned issues. Hence, we establish the Unit to satisfy this need.

Synergy Group Holdings International Ltd. (stock code: 1539) is a leading integrated energy management solutions provider based in Hong Kong. In addition to specialising in different lighting solutions, Synergy Group also trades its lighting products to their customers and provides carbon audition to install the intended lighting products. It offers services to a number of industries and multinational companies to over 20 different countries including Japan, Australia, Malaysia, Indonesia, Singapore, Fiji, etc. Synergy Group has become one of the leading energy management contract providers in Asia and the first ESCO Company listed on the Hong Kong Stock Exchange.

For inquiries :

CEO Dr. William Yu

Communications Ms. Noel Wong
Manager

Telephone : 2391-1693/ 9041 3527

Telephone : 2991-9126/ 9229 4626

Email : williamyu@thewgo.org

Email : noelwong@thewgo.org