CLP 中電

中電資料冊

CLP INFORMATION KIT

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Last Update: November 2024 (Figures as at June 2024)

Electronic version of this Information Kit is available on CLP website: https://clp.to/infokit-en

To facilitate readers' navigation in the CLP Information Kit, useful links to further information available online are marked in blue text and provided with QR codes.

This Information Kit is printed on environmentally friendly paper

1 ABOUT CLP

Who We Are

- **CLP Power Hong Kong Limited** is a wholly-owned subsidiary of CLP Holdings Limited. CLP Holdings Limited is a company listed on the Hong Kong Stock Exchange and is one of the largest investor-owned power businesses in Asia.

- CLP Power operates a vertically integrated power supply business in Hong Kong, covering electricity generation, transmission and distribution, and marketing and customer services.

- CLP Power has been serving Hong Kong for over 120 years. It supplies highly reliable electricity to over 80% of Hong Kong's population.

- CLP Power entered Mainland China's energy market in 1979 to provide electricity to Guangdong Province. In 1985, CLP Power participated in the investment of the first large-scale commercial nuclear power station in China - Daya Bay Nuclear Power Station. It was one of the earliest and largest Sino-foreign joint venture projects, setting a successful example of reform and opening up of China.

- In 2014, CLP Power, in collaboration with China Southern Power Grid International (HK) Co., Limited (CSG HK), a wholly-owned subsidiary of China Southern Power Grid Co., Limited, completed the acquisition of 60% interest in Castle Peak Power Company Limited (CAPCO) held by ExxonMobil Energy Limited. Separately, CLP Power also acquired ExxonMobil's 51% stake in Hong Kong Pumped Storage Development Company, Limited (PSDC). Following the acquisition, CLP Power holds 70% of CAPCO and 100% of PSDC whilst CSG HK owns the remaining 30% of CAPCO.

- To offer better services tailored to customers' needs and in the ongoing digital transformation of our business, we will continue to focus on the development of new smart services for households and businesses, as well as the use of technologies such as robotics solution, digitalisation, and data analytics to enhance our operational performance, and contribute to a greener and smarter Hong Kong. Based on our understanding of various sectors and businesses, CLP Power will continue to act as a bridge and an energy partner to connect them with start-up companies, smart product and service providers, which aim to provide innovative smart technology and energy saving solutions to address their operational needs.

Facts and Figures (December 2023 figures)

CLP Power in Hong Kong

Year founded	▪ 1901
Supply area	▪ Kowloon, New Territories and most of the outlying islands
No. of customer accounts	▪ About 2.81 million (as of June 2024)
Population served	▪ Over 6.2 million
Installed capacity	▪ 9,399MW (as of June 2024)
Total electricity sales	▪ 35,392GWh
No. of employees	▪ 4,101
Financial performance	▪ SoC Revenue: HK$50,455 million
Regulated by	▪ HKSAR Government under the Scheme of Control Agreement

Generation Facilities

Generation Facilities	Since	Fuel Type	Generation / Purchase Capacity (MW)	Remarks
Castle Peak Power Station	1982	Coal	3,058[1]	Owned by Castle Peak Power Company Limited (CAPCO), in which CLP Power has 70% stake and China Southern Power Grid International (HK) Co., Limited has 30% stake
Black Point Power Station	1996	Natural Gas	3,850	
Penny's Bay Power Station	1992	Oil	300	
WE Station	2020	Landfill Gas	14	
Daya Bay Nuclear Power Station	1994	Nuclear	1,577[2]	Owned by Guangdong Nuclear Power Joint Venture Company, Limited, in which CLP has 25% stake
Guangzhou Pumped Storage Power Station	1993	Hydro	600	By holding 100% of the shares in the Hong Kong Pumped Storage Development Company Limited, CLP has the right of use of 600MW, which is 50% of the power generation capacity of Phase 1 of Guangzhou Pumped Storage Power Station

Castle Peak Power Station

Black Point Power Station

Penny's Bay Power Station

WE Station

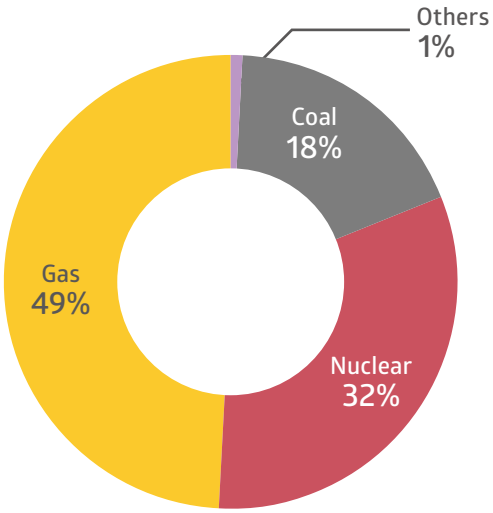
Daya Bay Nuclear Power Station

Guangzhou Pumped Storage Power Station

1 Three coal-fired units at Castle Peak A Power Station (total 1,050MW) were retired in the first half of 2024.

2 CLP Power purchases 70% of the output from Daya Bay Nuclear Power Station. Starting from late 2014, CLP Power has increased the purchase of approximately 10% of additional nuclear power from Daya Bay.

Electricity Output by Generation Fuel Type in 2023

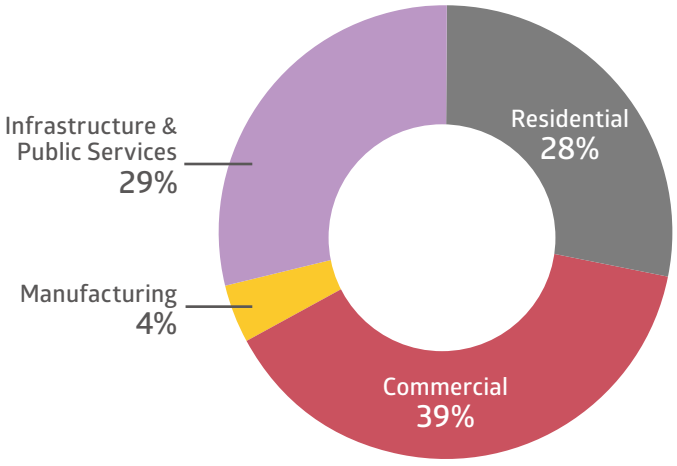


Transmission and Distribution (June 2024 figures)

No. of primary substations	244
No. of secondary substations	Over 15,600
Transmission and high voltage distribution lines	Over 16,900km
Average network loss (2019-2023)	3.44% of total energy consumption
Average unplanned Customers Minutes Lost per year (2021-2023)	6.0 minutes (1 minute if excluding cable bridge fire incident in Yuen Long and Super Typhoon Saola)
Electricity supply reliability (as of December 2023)	99.999%

Our Customers

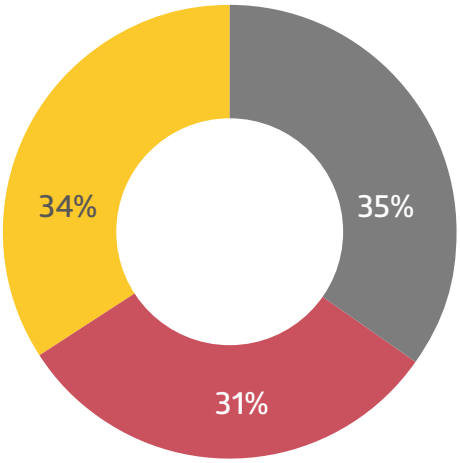
Customer Type as of Percentage in Total Local Sales in 2023



Our Shareholders

- CLP Holdings Limited had nearly 18,000 registered shareholders at the end of 2023. The actual number of investors in CLP shares will be much greater, taking into account those people and organisations who have an indirect interest in our shares through intermediaries such as nominees, investment funds and the Central Clearing and Settlement System of Hong Kong.

Shareholding by Category (2023)



As at 31 December 2023

- Interests associated with the Kadoorie Family our single largest shareholder group
- Institutional investors mainly based in North America, UK, Europe and Asia
- Retail investors mostly based in Hong Kong

- The Kadoorie Family became a shareholder in 1928 and participated in the Company's policy making. In guiding CLP forward, the Kadoorie Family follows the traditional values of previous generations, which include being forward-looking, financially prudent, showing integrity in business dealings, and having a sense of obligation to society. The Kadoorie Family is also engaged in a host of civic and philanthropic activities which benefit people across the city.

- Shareholder value is delivered through the maintenance of a stable dividend stream.

- CLP attaches great importance to effective communications with shareholders through various channels. Our Annual General Meeting (AGM) is well-attended by high number of shareholders each year. The 2024 AGM of CLP Holdings was held in a hybrid format, with almost 600 shareholders attending the meeting in person and more than 250 shareholders participated online. Shareholders who joined the AGM online were able to view a live webcast of the AGM, pose questions and cast votes in near real-time through the online platform.

- Our Shareholders' Visit Programme, unique amongst Hong Kong companies, welcomed over 42,800 shareholders and their guests to various CLP facilities since the programme was initiated in 2003. In light of the pandemic situation, the tours were suspended in February 2020. Despite this, we continue to receive strong interest from shareholders. We have resumed our programme in September 2023 in a gradual manner. The theme for 2023/24 is "A Sustainable Future" and it is a half day visit to CLP Pulse.

2 SCHEME OF CONTROL AGREEMENT

What is the Scheme of Control Agreement (SCA)?

- CLP's electricity business in Hong Kong is regulated by the Hong Kong SAR Government under the **Scheme of Control Agreement** (SCA).
- The SCA is an agreement signed between the Hong Kong SAR Government and CLP Power / Castle Peak Power Company Limited (CAPCO). It defines the companies' role as an electricity provider, and provides a regulatory framework for the Government to monitor its operating performance and financial affairs.
- Under the regulatory regime, power companies have obligations to provide sufficient and reliable electricity supply in their service areas. Customers obtain quality electricity supply at a reasonable price and in an environmentally responsible manner, while the power companies earn a return which is reasonable in relation to the risks involved and the capital invested.
- The SCA also provides an effective and stringent regulatory framework for the Government to monitor power companies' operating and financial performance. Operating performance covers supply reliability, operational efficiency, customer services and energy efficiency. Financial performance covers power companies' capital investment, operating expenditure, permitted rate of return and tariff adjustment.
- The first SCA was signed between CLP and the Government in 1964. A 15-year term has been adopted in all the agreements except the fourth one that came into effect in October 2008. The duration of the agreement was 10 years with an option for the Government to extend the SCA for another five years. In April 2017, CLP signed a new SCA with the Government for a 15-year term, effective from 1 October 2018 until 31 December 2033.

Key Terms in the Current SCA

Key Term	What is it?
Performance Targets	▪ Performance targets of power companies are set for supply reliability, operational efficiency, customer services, supply restoration, energy efficiency, demand response and renewable energy (RE) development to enhance the service level. ▪ A new penalty scheme for large-scale electricity supply interruption has been introduced.[1]
Basic Tariff	▪ Basic Tariff is set at a level to cover the required operating cost (including a standard cost of fuel) and return. (See also Chapter 3 on Electricity Tariff)
Fuel Cost Adjustment	▪ Fuel Cost Adjustment is either a surcharge or rebate to cover the difference between the actual cost of fuels spent and the standard cost of fuel collected through the Basic Tariff. ▪ An arrangement for Monthly Fuel Cost Adjustment has been introduced, with revisions made more frequently from once a year to once a month to take into account the actual prices of fuels used. The arrangement is more transparent and reacts to fuel price changes in a more timely manner. ▪ A new mechanism to provide special tariff relief in the event of energy crisis has been introduced to help targeted residential customers most in need of support.[1]
Fuel Clause Recovery Account	▪ The Account through which the difference between the standard cost of fuel and the actual cost of fuel is captured and passed onto the customers by way of rebates or charges.
Tariff Stabilisation Fund (TSF)	▪ If the gross tariff revenues collected exceed or are less than the total revenue required, the amount will be added to, or deducted from, the TSF. ▪ The TSF aims to ameliorate tariff increases or stabilise tariff levels.
Permitted Rate of Return	▪ Power companies are permitted to earn a fixed rate of return of the total value of their average net fixed assets. The permitted rate of return under the current SCA is 8%.

1 Results of 2023 Interim Review of SCA.

Regulatory Process

- Government monitoring of the power companies under the SCA covers the following: Development Plan Review, Annual Tariff Review, Annual Auditing Review and Interim Review.

Development Plan Review	▪ CLP submits to the Government a detailed five-year plan to meet electricity demand for the development of Hong Kong. The plan, approved by the Executive Council, covers the required capital expenditure, operating and fuel costs, projected electricity sales and basic tariff rate. ▪ It is required whenever the current Development Plan is about to expire or major capital expenditure is planned.
Annual Tariff Review	▪ CLP submits to the Government a tariff proposal for the coming year before the end of October each year. The proposal includes: sales forecasts, total capital expenditure, total operating expenditure, cost of fuels and projected basic tariff rate, etc. ▪ Any proposal to increase the Basic Tariff by more than 5% above the level approved in the Development Plan will require further approval by the Executive Council. ▪ The adjusted tariff will be effective from 1 January of the following year after the Government's review.
Annual Auditing Review	▪ CLP submits detailed information to the Government before the end of March every year for auditing and review purpose. ▪ The Government will compare the actual results for the previous year with the corresponding estimates made at the last Development Plan, and monitor the Company's financial, technical and environmental performance.
Interim Review	▪ A review is conducted every five years of the SCA on SCA-related matters. Changes can be made by mutual agreement by the Companies and the Government.

- Links to reference information:
  - 2024-2028 Development Plan and 2024 Tariff Review Presentation
  - 2024-2028 Development Plan and 2024 Tariff Review Information
  - Legislative Council brief on 2024-2028 Development Plan, 2024 Tariff Review and 2023 Interim Review of SCAs

Evolution of the SCA

- Over the years, the terms in the SCAs have been evolving to reflect continuous refinements made to the regulatory framework in the areas of enhancing operation efficiency and services quality, promoting energy saving and improving environmental performance, increasing information transparency and economic benefits to customers.

- The Government conducted a **public consultation** on the future development of the electricity market in 2015. The majority of the respondents considered that the power supply in Hong Kong was reliable and safe at reasonable prices. The views collected generally agreed that improvements need to be made to the SCA but the requisite conditions for introducing competition were not present at that stage.

- After detailed discussion and taking into account of Hong Kong's long-term carbon reduction target for 2030 and results of the public consultation on the future development of the electricity market, the Government and CLP signed the fifth SCA, a 15-year term, in April 2017. The new agreement took effect from 1 October 2018 and runs until 31 December 2033.

Current SCA (2018–2033)

- The current SCA is an agreement achieved through the joint efforts of both the Government and power companies. Taking into consideration of the Government's long-term carbon reduction target for 2030 which requires gradual transition to a generation fuel mix composed mainly of natural gas, the 15-year agreement provides a clear and certain regulatory framework for the future development of the electricity industry in Hong Kong. It also enables power companies to plan ahead and make appropriate investments to meet the Government's energy policy objectives.

- The incentive and penalty mechanism of the previous agreement continues to apply, but with more stringent performance targets on supply reliability and customer services. Performance targets on supply restoration are introduced to enhance service levels. Besides, a new penalty scheme for large-scale electricity supply interruption[1] is introduced to complement the existing mechanism and encourage power companies to further improve their reliability performance.

- In support of the Government's environmental policy to address climate change, a series of initiatives have been introduced from the fourth quarter of 2018. These include the Feed-in Tariff (FiT) scheme and Renewable Energy Certificates to encourage participation from various sectors of the community to support local renewable energy development. Other initiatives also include CLP Eco Building Fund, Community Energy Saving Fund and energy audits to help our customers achieve demand side management, energy saving, and enhance public education.

- The Fuel Cost Adjustment (FCA) in the total tariff is revised more frequently from once a year to once a month under the SCA to reflect changes in fuel prices in a more timely way and with enhanced transparency.

- A new mechanism is introduced to provide special tariff relief in the event of energy crisis[1] to help targeted customers mitigate the impact of the sharp rise in fuel costs.

- Link to reference information:

  Scheme of Control Agreement (2018–2033)

  CLP Press Release:

  CLP Power Signs Scheme of Control Agreement with Hong Kong SAR Government

1 Results of 2023 Interim Review of SCA.

- The table below shows a list of key refinements made to the current SCA (2018–2033) compared with the previous one (2008–2018).

Areas of Refinement	Current SCA (2018–2033)	Previous SCA (2008–2018)
Duration	▪ 15-year term	▪ 10-year term, with an option to extend for five years by the Government
Permitted Rate of Return	▪ 8% on Average Net Fixed Assets ▪ The same return rate applies to assets of both renewable and non-renewable energies	▪ 9.99% on Average Net Fixed Assets ▪ Investments on RE facilities can earn a rate of return of 11%
Tariff Adjustment	▪ The annual tariff adjustment mechanism is maintained. The Fuel Cost Adjustment (FCA) in the total tariff is revised more frequently from once a year to once a month	▪ FCA in the total tariff is revised once a year
Incentives / Penalties on a number of performance categories	**Operational Performances** ▪ More stringent performance targets for the incentive and penalty mechanism, including introducing performance targets on supply restoration and a new penalty scheme for large-scale electricity supply interruption[1] **Energy Saving and Demand Side Management** ▪ Performance targets for Energy Audit and energy saved from the initiatives under the current SCA are set at about four times the previous targets ▪ Peak Demand Management programmes are offered to commercial and industrial customers in order to lower the overall system demand, resulting in a lower requirement for investments in new generation units in the long-term. The target for this initiative is to achieve a reduction of up to 60MW from the demand peak ▪ A new five-year energy saving target has been set. CLP must achieve at least 4% of energy saving on the basis of the average annual sales within a five-year period in order to earn the incentive. More incentives will be given if the said energy saving reaches 5% **RE incentives will be given if:** ▪ the ratio of RE in the local generation fuel mix achieves the target set (RE generated from projects directly owned by the Government is excluded) ▪ the annual target of new RE connections to the grid is met ▪ CLP sells RE Certificates	▪ The rate of return is linked to various performance targets under the incentive and penalty mechanism: ◆ Emissions (2008–2013) ◆ Energy efficiency ◆ Supply reliability ◆ Operational efficiency ◆ Customer services ◆ Renewables

1 Results of 2023 Interim Review of SCA.

Areas of Refinement	Current SCA (2018–2033)	Previous SCA (2008–2018)
Environmental Initiatives	▪ An Eco Building Fund to promote energy saving for buildings has been set up. Incentive target set for this initiative is to provide subsidies to 400 residential blocks and commercial and industrial buildings per year to carry out improvement work to enhance the energy efficiency of the communal areas of the buildings. The energy saving target is set at 48GWh per year ▪ CLP is entitled to 35% of the incentives in relation to Energy Audit, energy saved from these audits and promoting energy saving for buildings, while the remaining 65% will be allocated to the CLP Community Energy Saving Fund to enhance energy efficiency ▪ The CLP Public Education Fund has been increased from HK$5 million to HK$10 million a year	▪ Set up Loan Fund for non-Government customers to implement energy saving initiatives ▪ Set up Education Fund for energy efficiency education and promotion activities ▪ Set up Eco Building Fund to subsidise building owners to carry out improvement works to enhance energy efficiency of non-commercial buildings
Support RE Development	▪ Introduce FiT Scheme to encourage the RE development in the community. By connecting the systems to CLP's power grid, CLP will pay for electricity generated by these systems at a rate offered through the scheme ▪ Introduce RE Certificates Scheme to allow customers who prefer clean energy and offer different platforms for the community to participate in RE development	▪ Investments on RE facilities can earn a rate of return of 11%
Others	▪ If there is excessive capacity when an additional generation unit is commissioned, 100% of the net asset value of the mechanical and electrical equipment of the said unit will be deducted from the fixed assets and the permitted return calculation ▪ Introduce a new Special Tariff Relief Mechanism in the event of energy crisis[2] ▪ More information such as information related to fuel costs and fuel procurement, operating expenses and borrowing arrangements will be published to improve information transparency	▪ If there is excessive capacity when an additional generation unit is commissioned, 50% of the net asset value of the mechanical and electrical equipment of the said unit will be deducted from the fixed assets and the permitted return calculation

- In 2023, the Government, CLP Power and CAPCO conducted the Interim Review of the SCA and reached agreement on the incentive and penalty mechanism, special tariff relief in the event of energy crisis and improvements to information transparency.

2 Results of 2023 Interim Review of SCA.

CLP's Current Five-year Development Plan (2024-2028)

- Approved by the Executive Council, the second five-year Development Plan under the current SCA covers the period from January 2024 to December 2028. The projected capital investment for the period is HK$52.9 billion, HK$3.2 billion less than the investment of $56.1 billion in the previous five years and three months of the 2018 Development Plan.

- In 2023, Hong Kong emerged from the pandemic and the business and social life of the city returned to normal. In the next few years, the Government will be focusing on developing new areas of economic growth in line with our nation's development and reinforcing Hong Kong's distinctive advantages as a global city. CLP's Development Plan aims to fully support Government policy priorities and covers a wide range of investments, with the majority on network development, to underpin Hong Kong's accelerating economic and infrastructural development, continued delivery of a world-class reliable electricity system, the transition to a smart and resilient city, and continuation of the decarbonisation journey.

- Whilst maintaining a world class electricity supply reliability, CLP's supply networks will also be expanded and reinforced to ensure adequate and reliable electricity supply to meet our customers' demand in a timely manner. Extreme weather, such as super typhoons and severe rainstorms, poses threats to supply reliability, so it is important to continue carrying out various reinforcement works to strengthen the resilience of our power supply facilities and minimise the impacts from these potential natural events.

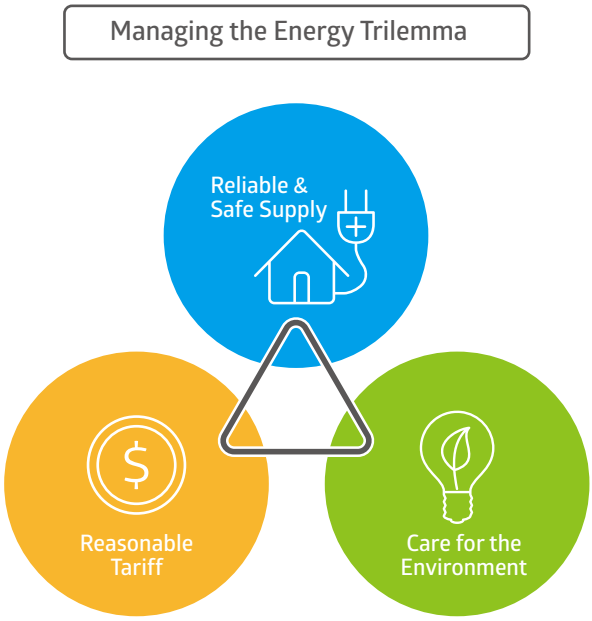
- Supporting Hong Kong to reach carbon neutrality is a long-term energy transition process. In the coming few years, the Development Plan will continue the objectives of phasing out of coal-fired generation units at Castle Peak 'A' Power Station, switching to more local gas-fired generation, increasing the supply of zero-carbon energy and the transformation of Hong Kong into a smart city.

- Along this long decarbonisation journey, CLP has completed the construction of an additional gas-fired generation unit at the Black Point Power Station. CLP will enhance the Clean Energy Transmission System (CETS), roll out smart meters and install the grid-scale battery. In addition, CLP will also enable hydrogen blending trial in gas-fired generation fleet and more charging facilities for an increasing number of electric vehicles.

- Link to reference information:
  CLP Press Release: **CLP Power's Five-Year Development Plan to Fuel Hong Kong's Revitalisation and Development; 2024 Tariffs to be Revised Downward**

CLP's Performance under the SCA

- A **stable and long-term regulatory regime** can provide an effective mechanism to address the electricity industry's requirements for long-term and capital-intensive infrastructural investments.
- The SCA is recognised as a balanced and effective regulatory regime that has served Hong Kong well. Such a regime has supported CLP in delivering an electricity service that meets all four energy policy objectives — supply is safe and very reliable, environmental performance is improving and tariffs are reasonable. The SCA enables CLP to contribute to Hong Kong's long-term development as a world-class city, and to play a role in enhancing Hong Kong's competitiveness and sustainable growth.
- The challenge for the electricity industry comes from the tensions that are apparent in the **Energy Trilemma** — how to deliver a safe and reliable supply to acceptable environmental standards whilst containing tariff adjustment at reasonable levels. With the SCA, the electricity industry of Hong Kong has been able to strike a balance in managing the energy trilemma.

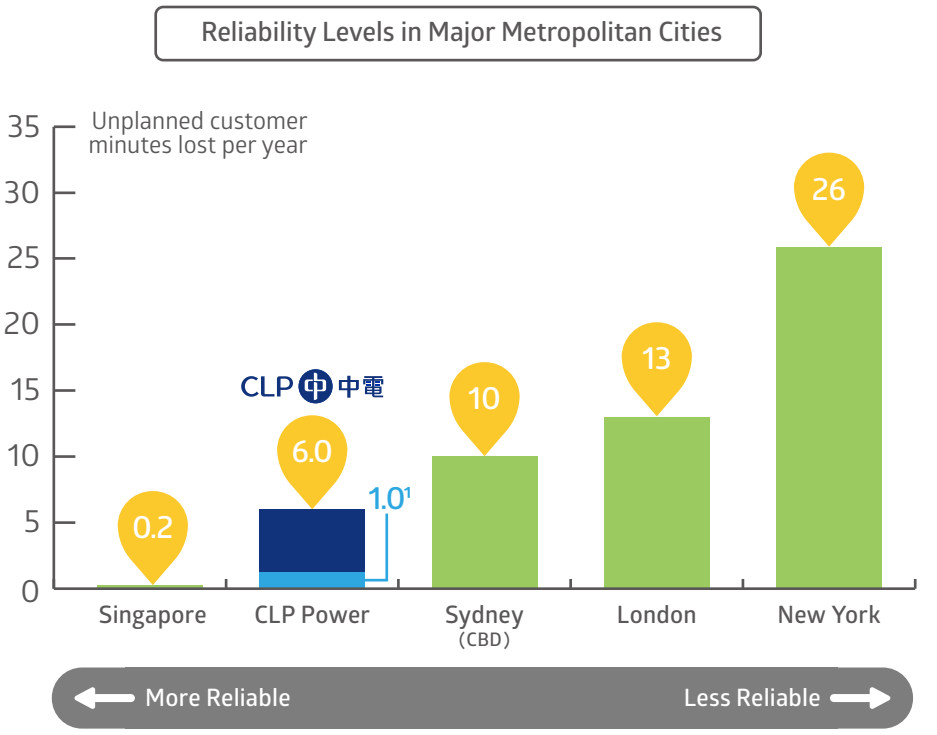


The **Energy Trilemma** is initiated by the World Energy Council, which advocates that different economies should strike a balance among the three objectives for energy development.

Reliable and Safe Supply

- A reliable and safe power supply is an important pre-requisite for Hong Kong to maintain its competitiveness and attractiveness for organisations to set up their businesses. Maintaining high reliability is critical for our customers in an economy which is built around service industries that depend on a reliable electricity supply.
- Under the SCA, **CLP provides a world-class supply reliability of 99.999%.**

- Between 2021 and 2023, on average a CLP customer experienced 6.0 minutes of unplanned power interruptions per year (1 minute if excluding cable bridge fire incident in Yuen Long and Super Typhoon Saola). This compares to the 2020 to 2022 average of 0.2 minutes for Singapore, 10 minutes for Sydney CBD, 13 minutes for London, and 26 minutes for New York.
- Highly reliable electricity supply has been instrumental in maintaining Hong Kong's status as a world-class city, and in powering the long-term social and economic development of Hong Kong.



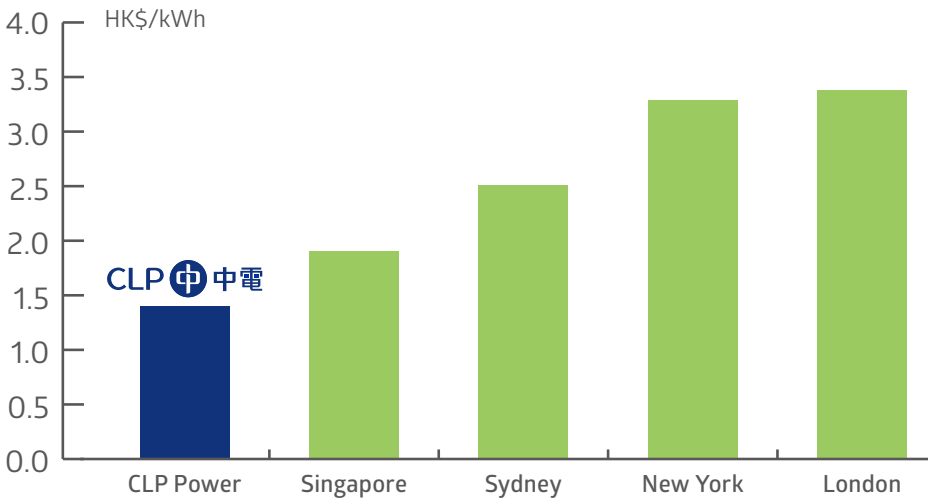
Notes:

1. 2021-2023 average for CLP Power is 6.0 minutes, and 1.0 minute if excluding cable bridge fire incident in Yuen Long in 2022 and Super Typhoon Saola in 2023.
2. 2020-2022 average for all other cities.
3. Singapore's power supply network is mostly underground, and is less exposed to the influence of weather and other external interferences than overhead lines.

- See also Chapter 4 on **Reliable Electricity Supply**.

Reasonable Tariff

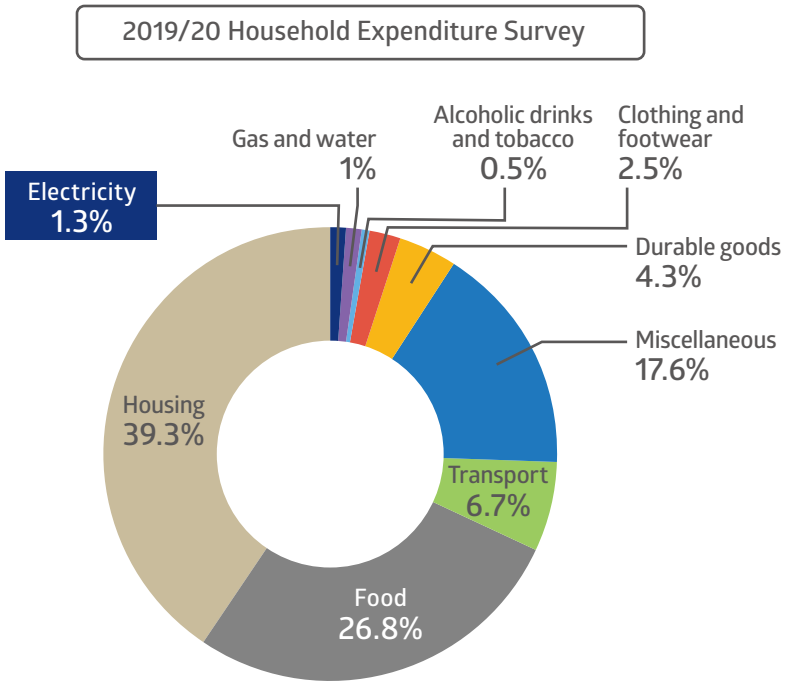
- **CLP's tariff level is reasonable and competitive** when compared to that of other key metropolitan cities in the world. In January 2024, our average tariff for residential customers in CLP's service areas is HK$1.4/kWh while tariffs for Singapore and Sydney are about 35% and 80% higher than that of Hong Kong respectively, and tariffs for New York and London are more than double of Hong Kong.



Notes:

1. Comparison based on monthly domestic consumption of 275kWh.
2. Tariff and exchange rate in January 2024.

- In Hong Kong, electricity expenses account for 1.3% of total household expenditure, lower than other metropolitan cities like Singapore (1.6%), Sydney (1.8%), New York and London (1.9%).



Source: "2019/20 Household Expenditure Survey and the Rebasing of the Consumer Price Indices", Census and Statistics Department

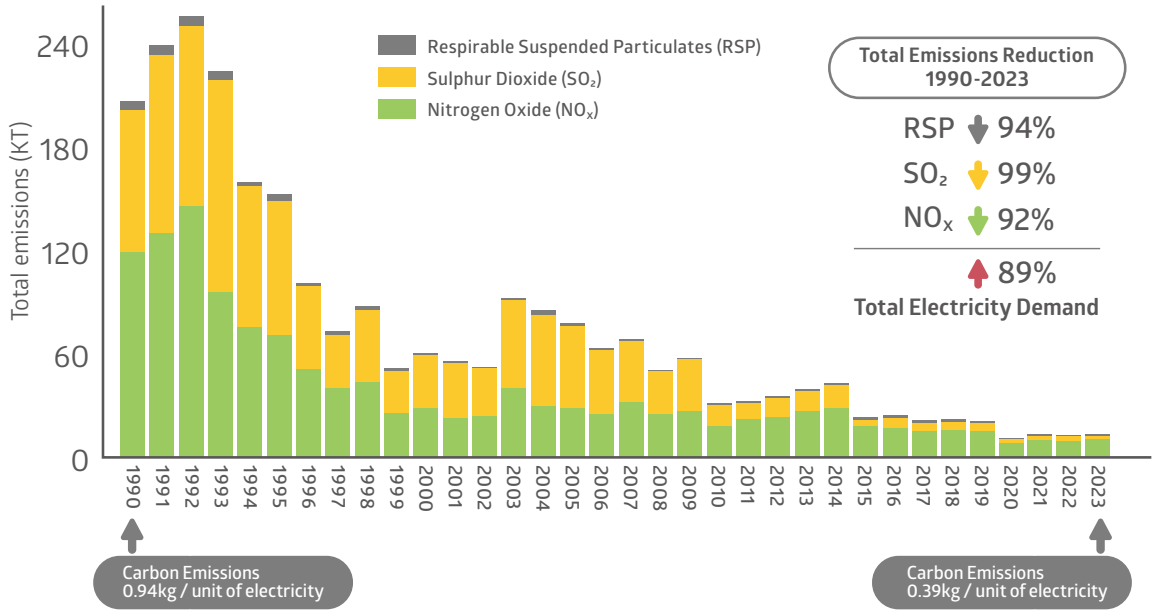
- **The adjustments of tariff in recent years have mainly been due to the impact of fuel price fluctuations**. In addition, in order to meet carbon reduction targets and the increasingly tightened air emissions caps set by the Government, we will need more natural gas and renewable energy. The costs of natural gas and renewable energy are generally higher than that of other fuels, leading to further challenges in tariff management.

- CLP has taken actions to minimise the cost impact as a result of significant fuel cost fluctuations and to maintain the tariff at a reasonable level. These actions include enhancing generation efficiency, making the most use of the existing gas reserves, exploring new sources of gas supplies and contracting with different fuel suppliers, to secure competitively-priced fuels from the market and control cost. CLP also imports nuclear energy which is relatively stable in price. Amid a surge in international fuel prices, nuclear has played an important role to help smoothen out price fluctuations in case of market volatility.

- See also Chapter 3 on Electricity Tariff.

Care for the Environment

- Over the years, CLP has been supporting the community's expectations for **better air quality and a reduction in greenhouse gas emissions** by deploying the best practical technologies and operational excellence, and through changes to our fuel mix.
- Our **emissions control measures** – including installation of emissions control facilities – helped improve Hong Kong's emissions performance substantially.
- **Managing our fuel mix** is also a key contributor to resolving the issues of climate change and air quality. CLP has made sustained efforts in improving the environment through the use of low sulphur coal, natural gas, nuclear and renewable energy. We started to import nuclear energy from Daya Bay Nuclear Power Station in 1994. In 1996, we pioneered the use of natural gas for power generation in the region. We launched the Feed-in Tariff Scheme in 2018 to encourage local renewable energy development. In 2020, the landfill gas generation project at the West New Territories (WENT) Landfill started operation to utilise landfill gas produced locally as fuel.
- CLP Power and The Hongkong Electric Co., Ltd. (HK Electric) jointly developed the Hong Kong offshore liquefied natural gas (LNG) terminal. After it went into operation in mid-2023, the LNG terminal further improves the stability of Hong Kong's natural gas supply by diversifying supply sources, allowing Hong Kong to procure natural gas at competitive prices from the global market.
- **CLP's emissions have reduced over 90% since 1990 while electricity demand has grown by nearly 90% during the same period.**
- CLP is also committed to **energy efficiency and conservation**. A wide range of tools and programmes have been developed to provide practical assistance to both residential and commercial and industrial customers to achieve energy saving and change their habits of electricity consumption.



- We also conduct **energy audits** for commercial and industrial customers. CLP's professional engineers are assigned to conduct detailed analysis of energy usage and energy efficiency at customers' premises. Professional reports and practical advice are provided after evaluation which greatly enhance customers' awareness of energy conservation.

- **Concerted efforts from all sectors in the community** and a change of the public's lifestyle and habits are required to effectively conduct energy efficiency and conservation work.

- See also Chapter 7 on **Energy Management**.

- Link to reference information:
  Scheme of Control Financial & Operating Statistics (10-year Summary)

3 ELECTRICITY TARIFF

CLP Tariff Components

- CLP's tariff is made up of two major components:

1. Basic Tariff	▪ Basic Tariff is set at a level to cover the total costs of electricity supply, including operating cost, standard cost of fuels and return
2. Fuel Cost Adjustment	▪ Fuel Cost Adjustment is either a surcharge or rebate to cover the difference between the actual cost of fuels spent and the standard cost of fuel collected through the Basic Tariff

- At-a-glance table of CLP's tariff in the past four years:

Tariff Component (cents/kWh)	2021	2022	2023	2024
Basic Tariff	93.7	93.7	93.7	96.6
Fuel Cost Adjustment[1]	28.1	38.6	62	46.3
Total Tariff	**121.8**	**132.3**	**155.7**	**142.9**
Special Rebate	-	-2.1	-	-
Rent and Rates Special Rebate	-	-1.3	-1.3[2]	-
Net Tariff	**121.8**	**128.9**	**154.4**	**142.9**

- In April 2017, CLP signed a new Scheme of Control Agreement (SCA) with the Hong Kong SAR Government. The permitted rate of return has been reduced from 9.99% to 8% under the current SCA which came into effect in October 2018.
- International fuel prices have fallen from their peak but geopolitical factors continue to present upside risks to the global fuel prices. We will closely monitor the trend of international fuel prices, continue to control fuel costs, and endeavour to minimise the impact of fuel cost increases on customers.

1 The figure is based on the rate announced in the annual tariff review. Under the current Scheme of Control Agreement, the Fuel Cost Adjustment is automatically adjusted on a monthly basis to reflect changes in actual price of fuel used. This arrangement is more transparent and reacts to fuel price changes in a more timely way.

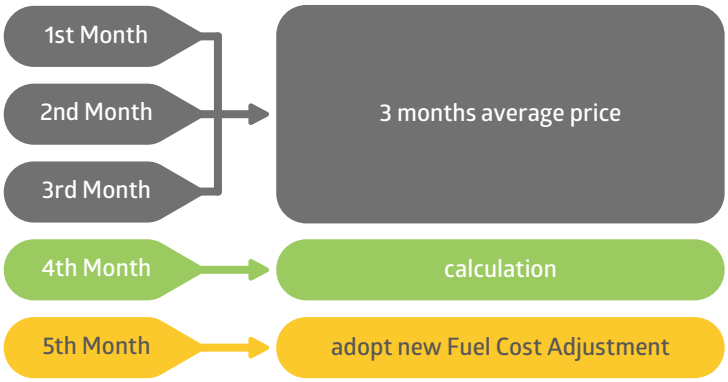
2 Since the Government refunds of overcharged rents and rates received by CLP were fully rebated to customers by 28 April 2023, the Rent and Rates Special Rebate was discontinued from 29 April 2023.

Annual Tariff Review

- CLP submits to the Government a tariff proposal before the end of October every year.
- The proposal includes: sales and maximum demand forecasts, total capital expenditure, total operating expenditure, cost of fuels and basic tariff rate, etc.
- The basic tariff rate agreed with the Government will be implemented on 1 January of the following year.

Monthly Fuel Cost Adjustment

- After the current SCA came into effect on 1 October 2018, the Fuel Cost Adjustment (FCA) in the tariff package is revised automatically during the year on a monthly basis to take into account the actual prices of fuels used. This arrangement is more transparent and reacts to upward or downward fuel price changes in a more timely way. It also helps smoothening out short term fluctuations in case of market volatility.
- The monthly FCA is calculated based on the average actual fuel prices over three preceding months as compared with the fuel prices projected at the most recent tariff review. The revised FCA will be applied the following month after a process of data collection and verification. The monthly FCA is published on CLP Power website and electricity bills.



- Links to reference information:
  - Fuel Cost Adjustment
  - 2024-2028 Development Plan and 2024 Tariff Review Presentation
  - Explanatory Note for Fuel Cost Adjustment

Tariff Structure

- CLP has four tariff categories, namely:

  1. **Residential Tariff** (Residential customers)

  2. **Non-Residential Tariff** (Small and medium enterprises customers)

  3. **Bulk Tariff** (Large businesses and public services with monthly consumption not less than 20,000 units)

  4. **Large Power Tariff** (Large businesses and public services with monthly demand not less than 3,000kVA)

- CLP's tariff structure is designed to be fair and cost reflective for each tariff group of customers, and it therefore avoids cross-subsidies between the customer groups.

- The cost of electricity supply to each tariff group takes into account the investment and resources needed to supply them and the efficiency with which these resources are used. In general, fixed operating costs like metering, billing and customer services are lower per unit for higher-consuming customers.

- For **Residential Tariff**, an inclining block structure is applied. Under this structure, there are seven blocks with different rates. Higher consumption is charged at a progressively higher unit rate. This encourages the efficient use of energy by residential customers. The lower blocks provide protection for residential customers with lower household incomes and encourage energy saving. Inclining tariff structures for residential customers are common in many cities world-wide.

- Unlike Residential Tariff customers, inclining tariff structures for businesses and public services are uncommon in other cities in the world.

- A fixed rate is applied for **Non-Residential Tariff**. Customers are charged according to their consumption. High consumption customers under **Bulk Tariff** and **Large Power Tariff** categories have a declining tariff structure of two blocks. They have two tariff features:

  - They have to pay a Demand Charge in addition to the cost of the energy units they consume. The Demand Charge reflects the capacity of the supply customers draw from CLP's network based on their maximum energy demand.

  - In addition, under a Time-of-Use tariff feature, they also pay a premium for energy used at peak times but are able to reduce costs if they can move this to off-peak periods. This facilitates demand side management and better utilisation of power generation facilities.

- At-a-glance table of CLP's tariff structure:

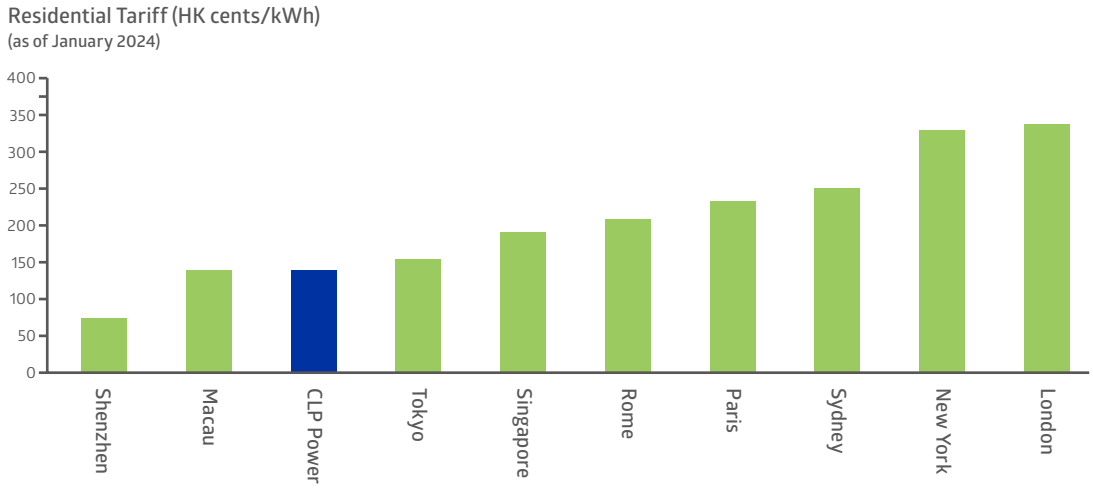
Tariff Categories	Customer Type	Basic Tariff	
		Energy Charge	Demand Charge
Residential Tariff	Residential customers	✓ With 7 inclining blocks	
Non-Residential Tariff	Small and medium enterprises customers	✓ Uniform rate	
Bulk Tariff	Large businesses and public services with monthly consumption not less than 20,000 units	✓ With Time-of-Use feature	✓ With Time-of-Use feature
Large Power Tariff	Large businesses and public services with monthly demand not less than 3,000kVA	✓ With Time-of-Use feature	✓ With Time-of-Use feature

- Link to reference information:
  CLP Tariff Table 2024

Tariff and Fuel Costs Challenge

- Compared to other key metropolitan cities in the world, **CLP's tariff level is very competitive**. Cities with lower tariffs than CLP are mostly characterised by having government subsidies, being state-owned power companies, or having relatively abundant natural resources to support power generation.

Residential Tariff Comparison with Other Cities



Notes:

1. Comparison based on monthly domestic consumption of 275kWh.
2. Tariff and exchange rate in January 2024.

Source: Web

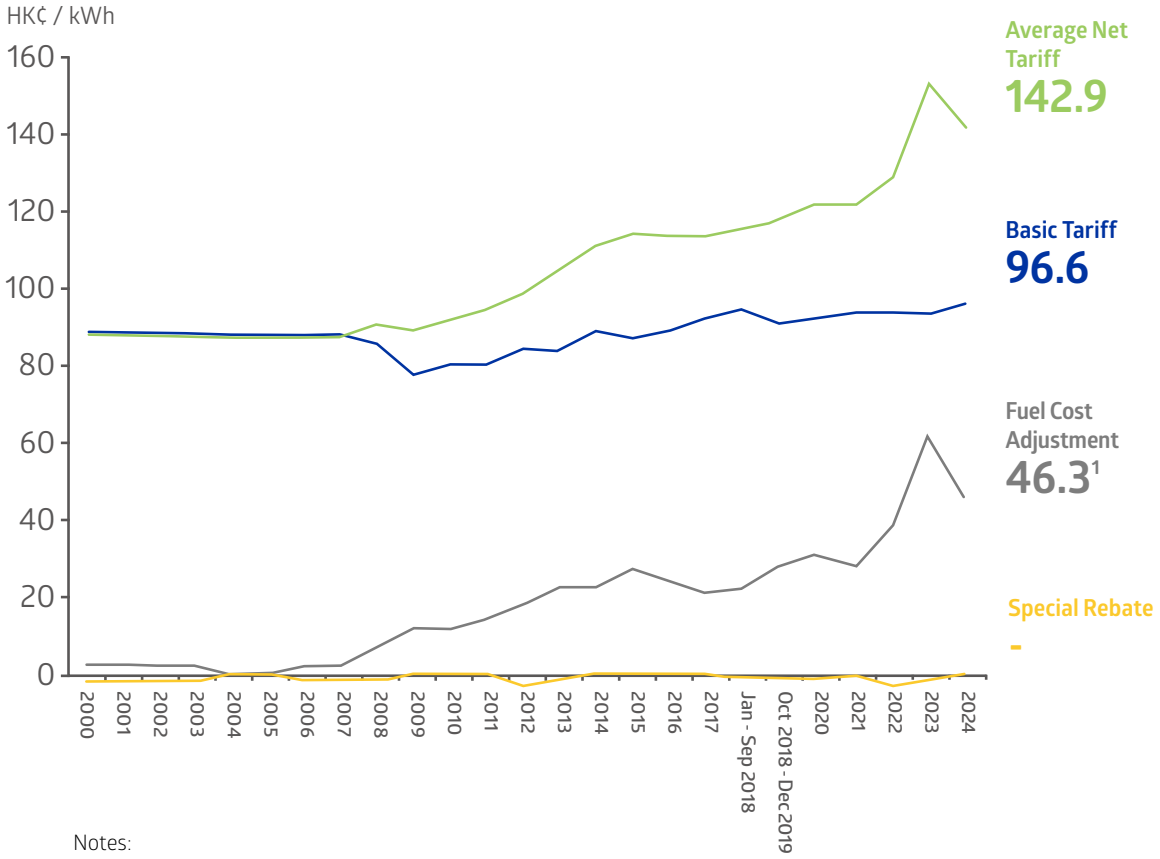
- CLP has for many years adopted a **diversified fuel mix** comprising more natural gas, less coal, importing zero-emission nuclear power, and renewable energy to ensure the reliability of electricity supply and to meet statutory environmental requirements at a reasonable cost.

- In support of the Government's environmental policy and the transition from coal-fired to gas-fired generation, CLP increased substantially the usage of natural gas to around 50% in 2020. As the coal-fired units gradually retire, and to meet the Government's long-term decarbonisation goal to achieve carbon neutrality before 2050, the use of natural gas in generation is expected to continue to increase to take up the largest portion of the fuel mix and local renewable energy development will also be promoted.

- The cost of gas-fired generation is typically higher than that of coal-fired generation. CLP is thus facing **significant challenges from rising fuel costs** due to its need to meet tightening emissions caps starting from 2015 and the need to increase the usage of natural gas.

- Nuclear energy from Daya Bay contributes around one third of CLP's electricity supply with a more stable price than that of coal or natural gas. Nuclear, which is non-carbon emitting, is therefore playing an important role in helping to smooth out fuel cost increases and stabilise tariff levels amid market volatility.

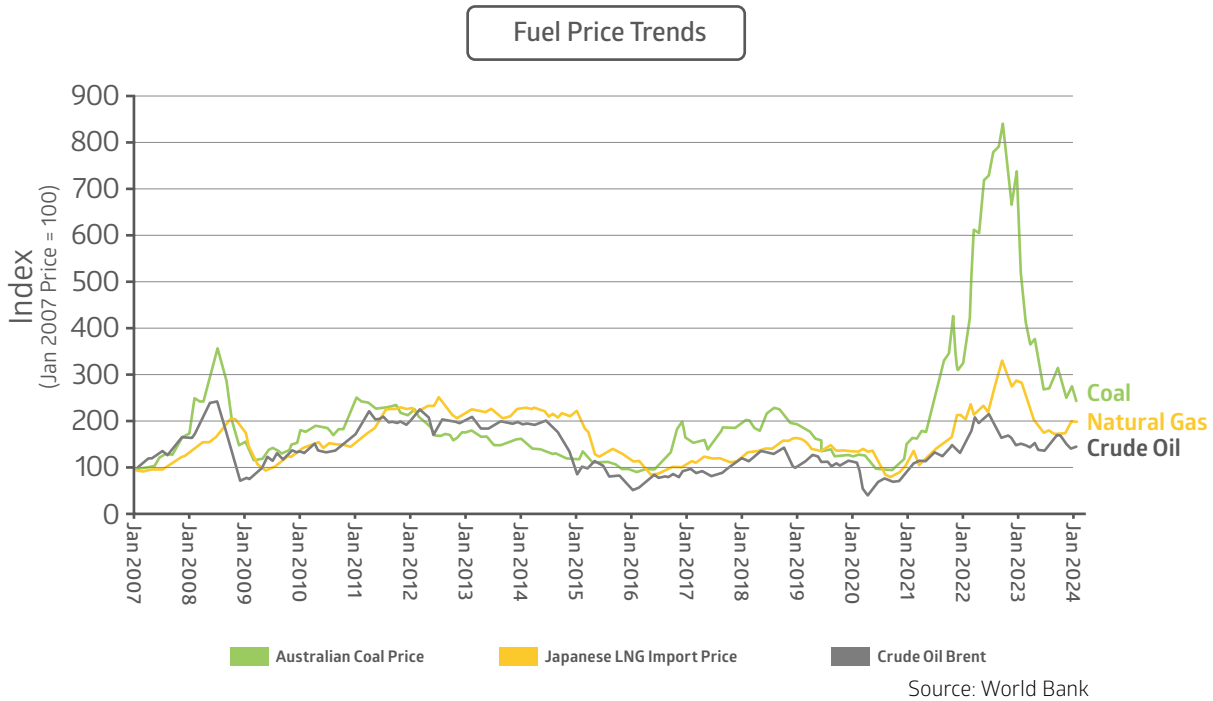
- International fuel prices have experienced rapid and volatile changes, have been a key driver for CLP's total tariff adjustment over the past few years.



Notes:

1. The figure is based on the rate announced in the annual tariff review. Under the current Scheme of Control Agreement, the Fuel Cost Adjustment is automatically adjusted on a monthly basis to reflect changes in actual price of fuel used. This arrangement is more transparent and reflects fuel price changes in a more timely manner.

- Globally, fuel prices have been highly volatile in recent years. The following chart shows the volatility of fuel prices since 2007.



Source: World Bank

- Since 1996, the Yacheng field in the South China Sea has been supplying natural gas to CLP. This reserve is depleting fast and the gas supply to CLP is being supplemented by the natural gas supplies from the Second West-East Gas Pipeline (WEPII) since 2013. The gas price of WEPII, which is partially affected by the market price, is more expensive than that of the Yacheng supply. The Yacheng supply was contracted some 20 years ago when fuel prices were significantly lower than current market price.

- In view of the need of substantially increasing the usage of natural gas which will put pressure on CLP's fuel costs in the coming years, CLP has been taking actions to minimise the impact of high fuel costs and to **contain tariff increases to a reasonable level**. Measures adopted include:

  - The launch of the offshore liquefied natural gas (LNG) terminal made available a critical new source of natural gas to ensure a reliable and stable supply of natural gas to Hong Kong in the long term, while allowing Hong Kong to purchase competitively-priced LNG directly from the global market;

  - Enhancing the operational performance of our generation fleet;

  - Continuing stringent cost control; and

  - Securing additional supply of nuclear power from Daya Bay starting from the fourth quarter of 2014.

- To enhance tariff information transparency, CLP has been providing information related to **fuel mix** on our website. The published information enables our customers to better understand CLP's fuel mix and the latest fuel cost adjustment.

Alleviating Tariff Pressures

- The SCA has **mechanisms to stabilise tariff**. It sets out a role for two balancing funds — the Tariff Stabilisation Fund and the Fuel Clause Recovery Account, which are designed to act to smooth out volatility in adjusting the Basic Tariff and the Fuel Cost Adjustment respectively.

- CLP tries its very best to alleviate the pressure of rising tariffs, especially due to the impact of fuel price fluctuations. It works hard in containing tariff increases to a minimum level through **prudent cost management and control**, as well as supporting customers with practical help and advice in both energy saving and reducing bills.

- CLP has provided an **Energy Saving Rebate Scheme** for low-consumption residential and small and medium enterprises customers since 2013 to help them reduce electricity expenses and encourage energy saving. Under the scheme, customers consuming 400 units or less per bill can enjoy savings in their electricity bills.

- CLP also offers a **Concessionary Tariff for the Elderly**. Customers aged 60 or above who live alone or with other similarly qualified elderly, and those who are relying on or entitled to Comprehensive Social Security Assistance are eligible for the concessionary tariff. The approved applicant will be offered a 50% reduction for the first 400 units of electricity consumed in each two-month billing period plus an exemption of the minimum charge on each bill.

- Under the current SCA, a **CLP Community Energy Saving Fund** has been set up and begun operations in 2019. Under this fund, one of the initiatives being launched is **CLP Power Connect programme**, which aims to encourage residential customers to save energy year-round. In 2024, CLP is allocating HK$50 million from the Fund to provide electricity subsidies to 20,000 subdivided unit tenants and 50,000 households in need a year, including the elderly, disabled and low income families.

- See also Chapter 7 on **Energy Management** and Chapter 10 on **Community Commitment**.

4 RELIABLE ELECTRICITY SUPPLY

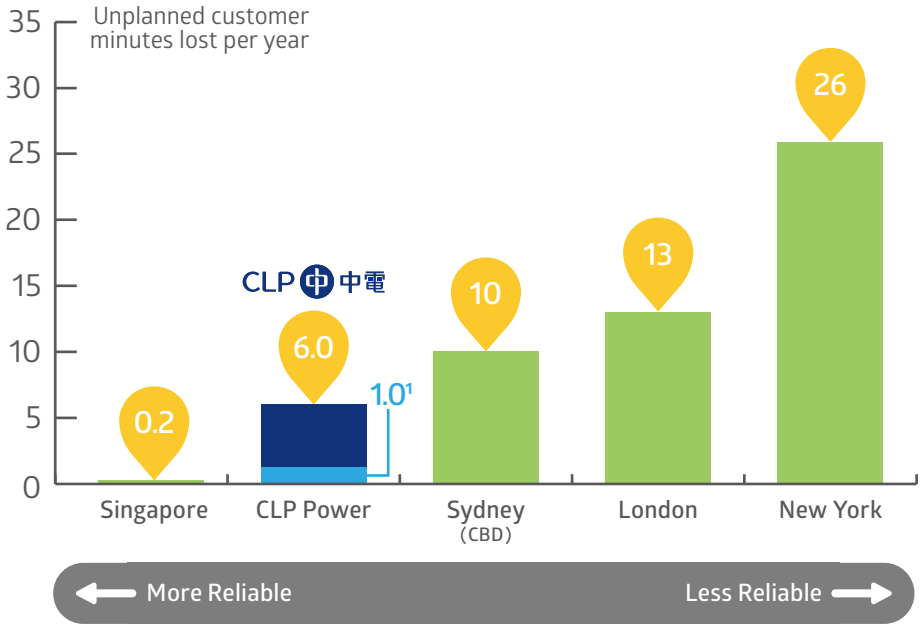
Why is Reliable Power Supply Critical to Our Customers?

- A **reliable and safe power supply** is an important pre-requisite for Hong Kong to maintain its competitiveness and attractiveness for organisations to set up their businesses. Maintaining high reliability is critical for our customers in an economy which is built around service industries that depend on a reliable electricity supply.
- Hong Kong is unique. It is a densely populated city with over 50% of people living or working above the 15th floor, and more than 73,000 elevators in operation daily. It is also a key international financial centre and the electrified mass transit networks carried an average of over 5.4 million passengers each weekday in 2023. These unique characteristics make exceptional power supply reliability essential for Hong Kong.

CLP's Supply Reliability

- CLP provides reliable and safe electricity supply in Hong Kong at a **world-class reliability of 99.999%.**
- Between 2021 and 2023, on average a CLP customer experienced 6.0 minutes of unplanned power interruption per year (1 minute if excluding cable bridge fire incident in Yuen Long and Super Typhoon Saola). This compares to the 2020 to 2022 average of 0.2 minutes for Singapore, 10 minutes for Sydney CBD, 13 minutes for London and 26 minutes for New York.

Reliability Levels in Major Metropolitan Cities



Notes:

1. 2021-2023 average for CLP Power is 6.0 minutes, and 1.0 minute if excluding cable bridge fire incident in Yuen Long in 2022 and Super Typhoon Saola in 2023.
2. 2020-2022 average for all other cities.
3. Singapore's power supply network is mostly underground, and is less exposed to the influence of weather and other external interferences than overhead lines.

Maintaining World-Class Supply Reliability

- CLP's high supply reliability cannot be taken for granted. It is the result of our power expertise, and long-term commitment to generation, network and operational excellence. The following areas demonstrate CLP's ongoing efforts to uphold its world-class supply reliability.

Sufficient Generation Capacity

- Reserve capacity is essential to cater for any loss of generation capacity due to planned maintenance and unforeseen outages even at peak load. Reserve margin is similar to keeping a spare tyre in a car, which is crucial for contingency management.
- Take CLP's Castle Peak Power Station as an example, the loss of one larger generation unit will reduce the Station's available generation capacity by about 15%, adding uncertainty to the highly reliable power supply provided by CLP. Reserve capacity is therefore important to meet emergency needs.
- CLP sets the level of reserve margin by making reference to the maximum electricity demand as one of the most important indicators for planning and operations. This is in line with the practices adopted in the electricity industry all over the world.
- To ensure top service quality and reliability, CLP's **reserve margin is maintained at an appropriate level** and is within the recommended range of 20% to 35% by the International Energy Agency.

Facilities and Network Upgrades to Address New Demand

- To maintain the highly reliable supply and support the Government's environmental policy, a key challenge is **meeting our customers' increasing demand for electricity in Hong Kong and embracing more distributed renewable energy systems**. A large number of territory-wide development and infrastructure projects are in progress simultaneously, these important projects support population growth, new housing, railway expansions, Airport three-runway system expansion, hospital development plan, West Kowloon Cultural District, Kai Tak Sports Park, Tung Chung New Town Extension (TCNTE), Advanced Manufacturing Centre (AMC) & Microelectronics Centre in Industrial Estate, desalination plant, the development of the Lok Ma Chau Loop, Northern Metropolis and Kau Yi Chau Artificial Islands, data centre infrastructure, electric vehicle development, large renewable energy & waste-to-energy development and so on, which call for increasing needs of power supply.
- These projects are closely linked with Hong Kong's ongoing social and economic growth, and a safe and reliable electricity supply is a key contributing factor to their successful developments.
- To cope with the demand growth while ensuring a stable power supply, CLP has been adopting different measures to **enhance our generation and network infrastructure** to address the challenge.
- In 2024, CLP announced a new Five-year Development Plan (2024-2028) which aims to fully support Government policy priorities and covers a number of important projects, with the majority on network development, to underpin Hong Kong's accelerating economic and infrastructural development, continued delivery of a world-class reliable electricity system, the transition to a smart and resilient city, and continuation of the decarbonisation journey.

- For our **generation facilities**, in response to the Government's plan to increase the proportion of local gas-fired generation to around 50% of the total fuel mix in 2020 and to ensure a reliable power supply, the two new gas-fired generation units (Units D1 and D2) at Black Point Power Station were commissioned in 2020 and 2024 respectively. The new units deploy the combined cycle gas turbine (CCGT) technology with more advanced design and are capable of achieving an efficiency rate of around 60%, making them two of the most efficient gas-fired power plants in the world. Units D1 and D2 also play a key role in facilitating the decarbonisation of Hong Kong's power supply and supporting the gradual retirement of coal-fired generation units at Castle Peak A Power Station.

- Upgrading the efficiency of existing and aging generation facilities is essential to ensure that we increase output, meet increased demand and maintain reliability. Efficiency upgrades in our plants are also important to improving our emissions performance. We have also been making replacements and carrying out refurbishments for aged facilities to ensure that generation capacity is able to meet increasing electricity demand. As an example, turbine upgrades on eight gas-fired generation units in Black Point Power Station were completed in 2022, increasing the capacity of each unit by 25MW (8%) and driving improvements in efficiency, as well as reducing the nitrogen oxides emissions.

- On **power systems**, reinforcement of our supply networks are crucial to ensure adequate and reliable electricity supply. These will include continuous improvements and extensions of our transmission and distribution facilities to meet new demand, connect more renewable energy systems, and ensure safe and reliable delivery of supply to customers and minimise the interference due to external factors.

- CLP has implemented the Clean Energy Transmission System project to enhance the reliability and transmission capacity of the existing 400kV cross-border transmission overhead line circuits currently connecting Hong Kong and Mainland China. This enhancement will increase the resilience of the system and provide the necessary infrastructure to enable greater flexibility to tap into cleaner energy and for possible increased use of non-fossil energy in future.

- Network enhancements also cover refurbishing current transmission facilities and equipment to increase the transmission capacity as well as ensuring continuous reliable operations. The project is expected to be completed by the end of 2025.

Advanced Technology

- A reliable and secure power grid is critical to ensuring supply reliability. CLP's strategy is to incorporate advanced and the most relevant technologies to improve the performance of our power system, thereby facilitating decarbonisation of the future, delivering customer-centric solutions and continuously enhancing our operational excellence.

Smart Grid

- Smart grid development is an emerging global trend of power grid modernisation. CLP is one of the few power companies worldwide which develops smart grid in a vertically integrated approach, covering all aspects including power generation, transmission and distribution, as well as customer services. By integrating clean and sustainable power generation, leveraging advanced control and monitoring technologies, enhancing information and communications system, the new power system is capable of delivering low-carbon, reliable and efficient power service to customers. It can open up new opportunities to engage customers in energy saving and demand side management. CLP also applies data analytics to enhance customer services, operational efficiency, supply reliability, safety and power quality.

  - **11kV overhead line automatic restoration system:** CLP applies smart technology to carry out real-time analysis to protect and control the power grid. When the 11kV overhead lines equipped with automatic restoration system are interfered by external factors such as lightning strikes or vegetation interference, the system will automatically isolate the faulty section, and shift to other sources for immediate supply restoration.

  - **Intelligent transmission substations:** CLP continuously introduces automated equipment in our transmission substations to enhance operational efficiency and supply reliability. Among all smart features, a self-healing system can significantly shortening the power restoration time from several minutes to less than one second. This self-healing system is widely deployed as standard requirement in all new CLP transmission substations.

  - **Online condition monitoring:** Aside from intelligent substations, CLP also introduces online condition monitoring systems at transmission transformers and switchgears for conducting round-the-clock health checks. Once irregularities are observed, the system will automatically issue alerts to relevant engineering staff, so that inspection or repair can be conducted at an early stage. The data collected can also serve to support the implementation of Condition Based Maintenance through the calculation of Asset Health Index to optimise the maintenance cost.

  - **Smart meters for all customers:** To support Hong Kong's transformation into a smart city, all CLP customers' conventional meters are now being replaced with smart meters in phases from November 2018, which is targeted for completion by 2025. As of the end of June 2024, CLP Power has connected over 2.44 million smart meters for customers.

  - Smart meters connected through a telecommunication system form the Advanced Metering Infrastructure (AMI) system. It can provide detailed electricity usage information and a range of digitalised services to customers, empowering them to efficiently manage their consumption, reduce energy use and demand at peak times, so as to move towards a low-carbon living. The AMI system can also further improve supply reliability and enhance customer experience.

Overhead line vegetation management

- There are a large number of fast-growing tree species in Hong Kong, and fallen trees or branches that make contact with overhead lines under strong wind or heavy rain can disrupt electricity supplies. CLP has adopted **vegetation management** techniques since 2001. The vegetation management team carries out pruning work on trees which might affect overhead lines. CLP has adopted airborne LiDAR scanning to accurately and efficiently measure the clearance between transmission overhead line conductors and nearby vegetation. By building 3D models and mapping the vegetation along the overhead lines, we can manage vegetation works more systematically and enhance the efficiency and effectiveness. Since 2022, CLP has implemented its self-developed **Predictive Vegetation Management System.** The system is a comprehensive tree management platform that combines Geographic Information System (GIS) technology. It recorded the data of more than 170,000 trees within range of CLP overhead lines, including tree species, age, and pruning records. It can predict the growth of vegetation at the route of overhead lines and identify trees that pose potential risks to the overhead lines. Engineering personnel can schedule and carry out pruning in a timely and effective manner based on tree risk level, so as to enhance supply reliability to the customers.

Drone inspections for power station facilities and overhead lines

- Engineers from CLP's Generation Business Group began studying drones in 2016 and set up the first team responsible for using drones to carry out safety inspections on various facilities and mechanical components at power stations as a means to assess their health and level of wear-and-tear. For better precaution, by installing infrared technology on outdoor drones, engineering team can also detect signs of faults from components such as overheating or leaks from pipes, allowing for earlier detection of issues that may require the need for worn-out components to be replaced.

- For indoor inspection within the power stations, the drone team introduced a cutting-edge innovation known as the cage drone, which is small and uses a Light Detection And Ranging (LiDAR) system and sensors to reach high and inaccessible spaces flexibly and quickly. This not only makes inspections more thorough and comprehensive but also saves the time and cost of erecting scaffolding.
- The use of drones not only enhances work safety by mitigating the potential risks associated with working at height and confined spaces, but also improves the accuracy of inspections, uplifting overall operational efficiency. In addition, the video recording by a cage drone helps engineering teams analyse the condition and defects of generation facilities in fine detail so that maintenance can be carried out immediately to avoid any equipment failures.
- Since September 2018, CLP extended the use of drones to outdoor power supply facilities, including transmission towers and overhead lines, making up for certain areas inaccessible for helicopters in the past. In 2021, CLP further adopted an Extended Visual Line of Sight operation to increase operation distance of drone, thus enhance the efficiency of drone operation during overhead line inspections.

Application of robotics

- CLP uses a variety of robots for inspections of generation and auxiliary facilities, including the crawler robot which inspects underground culverts in power stations. There are many underground culverts in the power stations to divert water from the sea to power generation units for cooling purposes. Regular inspection of the culverts is essential to ensure that their structure is intact and there are no blockages. As the culverts are confined space, the inspections used to be conducted by specially trained personnel. Because of the physical constraints, and capacity of the breathing apparatus and diving cylinder, it took several days to inspect a single culvert.

- CLP switched to crawler robot to inspect underground culverts in 2021. The crawler robot is small and has a retractable top. It is equipped with lights and a rotation lens, allowing it to capture detailed footage inside narrow and poorly-lit culverts. The crawler robot overcomes the physical and time constraints of manual inspections, making culvert inspections safer and more accurate and efficient. The inspection time required for each network of culverts has also been reduced by more than 50% to two days. In addition, engineers are able to gain a deeper understanding of culvert conditions through the data gathered by the robot, allowing them to develop more comprehensive inspection procedures and maintenance strategies.

- Apart from underground culvert inspection, CLP has also extended the robotic applications to other facilities in the power stations for the enhancement in work quality and safety.

Measures against Extreme Weather

- As reliable electricity supply is very important to our customers, CLP constantly reviews and explores new technologies to sharpen our emergency preparedness. In recent years, extreme weather conditions occur more frequently as a result of climate change, with stronger destructive power, posing threat to supply reliability. CLP's power supply is at particular risk from super typhoons, storm surges, lightning strikes and high temperature. Therefore, we implement a number of measures to enhance the resilience of our power equipment against extreme weather, aiming to maintain a reliable power supply and minimise the impact on critical services and infrastructure, as well as our customers.

- More than 30% of CLP's transmission network consists of overhead lines. There are more than 700 transmission towers that form the backbone of our 400kV supply system. Overhead lines are exposed and susceptible to the influence of weather and the external environment. If a tower is destroyed by super typhoon or collapses because of a landslip, it could take several months to be restored.

- Hong Kong is exposed to increasing challenges posed by high-impact extreme weather events including super typhoons. CLP constantly reviews and enhances its measures for emergency preparedness. These include: **strengthening thetower structures and foundations of 400kV overhead lines** that can withstand super typhoons with wind gusts up to 300km/h at 500m height; and **introducing an Emergency Restoration System** that enables rapid construction of temporary masts that the time to restore power supply can be shortened to just two weeks when an existing tower is damaged. In addition, CLP has also established a typhoon response protocol and coordinating systems. Drills are conducted on a regular basis.

- Hong Kong may also be vulnerable to storm surges caused by tropical cyclones. To counter the potential impact of storm surges on the power supply, CLP has since 2014 introduced a **flood calculator**, which evaluates the flooding risk at substations during typhoons based on real-time data and forecasts released by the Hong Kong Observatory, allowing for meticulous monitoring and timely coordination by our engineering staff. Upgraded mitigation measures have also been taken at flood-prone transmission substations and distribution substations such as **installing flood gates, sealing the cable inlets, equipping the substations with sump pumps and flooding alarm systems**. In addition, flood prevention measures have also been put in place at our power generation facilities. CLP collaborated with a local university in 2024 to conduct risk assessment on the impacts of severe rainstorms and landslides on the power system. Based on the assessment results, CLP plans to expedite the installation of about 200 flooding gates or devices at more critical substations this year and next year.

- Overhead lines are exposed and susceptible to lightning strikes. To minimise voltage dips caused by lightning, CLP has installed **line arresters** on transmission towers and poles. Line arresters can drain tremendous lightning current to the earth and hence help stabilise the system voltage, and improve the resilience of the power systems against lightning. As a result, supply reliability and power quality are enhanced. In consideration of the adverse weather triggered by climate change, CLP plans to install more line arresters to further enhance the supply reliability and power quality.

- To strengthen the monitoring of the power grid, CLP has developed an advanced system known as Grid-V. The system enables real time monitoring of critical assets, such as transmission overhead lines and substations. Its AI features can detect external disturbances, such as hill fire, smoke, or flying objects, and alert engineering staff to take prompt action. Supply reliability is enhanced by its proactive monitoring and AI-assisted analysis functions.

- In view of the more frequent **high temperature** days, a study was initially conducted in 2006 to assess the impact of a high ambient temperature up to 40°C on power systems equipment. All equipment were found to maintain operation. Since 2007, a new operating condition at substations against high temperature of 45°C for new equipment has been incorporated in CLP guidelines to ensure the operations in substation would be maintained. The guidelines on operating condition of power supply facilities are regularly reviewed against the trend of climate change and actual data released by Hong Kong Observatory and CLP closely monitors the performance of the power supply facilities to avoid heavily loaded situation.

- Given the severe damage caused by Super typhoon Mangkhut to the power supply facilities of remote villages in 2018, CLP prioritised the replacement of smart meters at remote villages in 2019, which are more prone to typhoon disruptions. With smart meters in place, supply failure detection improves and repair times are reduced. Customers can also report power outages to CLP via an online form at ease.

Linesmen are connecting conductors on a 70-feet high temporary mast. The construction of a temporary mast takes a little over 10 days, which is over 10 times faster than repairing a damaged tower.

Flood-prone transmission and distribution substations are equipped with flood gates.

- In early September 2023, Hong Kong was hit by Super Typhoon Saola, with typhoon signal of No. 8 or above (reaching a maximum of No. 10) hoisted for a total duration of 38 hours. Saola had a wide-reaching impact and caused some degree of disruptions in Hong Kong. CLP implemented multiple measures to mitigate the impacts of the super typhoon and strive to maintain a reliable power supply. These measures included enhanced inspections of power supply equipment before the typhoon, installing flood gates at substations vulnerable to flooding, and pruning trees that could pose potential risk to overhead lines.

- Additionally, CLP strengthened its 24-hour emergency hotline service. Extra staff were mobilised and some frontline personnel were assigned to handle customer inquiries remotely to ensure prompt response to customer enquiries. Due to the wide-reaching impact of Super Typhoon Saola, CLP also maintained close communication with relevant power supply parties in Guangdong Province to ensure mutual assistance when necessary.

- During the typhoon, CLP's power supply system remained normal, ensuring stable power supply for the majority of our customers. In the same month, Hong Kong experienced a severe rainstorm, which brought landslides and flooding across the city. CLP's electricity supply remained largely intact during the torrential Black Rainstorm.

- CLP implemented measures in advance to mitigate the impact of extreme weather on its operations and enhance the resilience of the power supply system to typhoons and heavy rain events, reducing the impact on power supply services. CLP also enhanced public communication and understanding of its preparation efforts through a video that showcased mitigation measures before, during, and after a typhoon.

- To enhance public awareness and preparedness towards natural hazards, CLP launched a short video providing precautionary tips for the public in bracing for the imminent typhoons, as well as information on matters to keep in mind in the event of power incidents during a typhoon.

CLP's Typhoon Preparedness Measures

Public education video on tips to follow before, during and after typhoons

Tips for dealing with power interruptions during typhoons

Power Quality

- Power quality has become a concern of our customers in recent years with the increased use of sophisticated computing, automation and control technologies especially in the financial, medical, communication and industrial sectors. One of the most common power quality issues is **voltage dip**.

- A voltage dip is not a power supply interruption. It is a voltage fluctuation in a very short period of time. Power companies all over the world have not been able to totally eliminate voltage dips. Voltage dip can be caused by various factors, for example, overhead lines are exposed and susceptible to the influence of adverse weather such as typhoons, lightning strikes, or third party interference including trees and wildlife, all of which may cause voltage dip in the power system. For these reasons, occasional voltage dips are unavoidable.

- Over 30% of CLP Power's transmission network consists of overhead lines, which are exposed and vulnerable to external factors such as weather and environment conditions. In the past few years, an average of more than 80% of voltage dips were caused by external factors.

- In general, voltage dips last for less than 0.1 seconds. Individual users may experience momentary dimming or flickering of lights. Some electrical installations sensitive to voltage fluctuation, such as lifts, may trip as a result of the activation of the equipment's protection mechanism. Property management office could arrange a qualified contractor to restart the tripped equipment.

- With the increase of distributed renewable energy systems connecting to CLP grid, voltage rise issue may occur if power flow from customer distribution network towards CLP grid. CLP's professional engineers have been carrying out assessment for all the grid connection application to ensure power quality with all the new renewable energy grid connections unaffected.

- To proactively deliver Power Quality services, CLP invites developers or consultants to attend our planning-ahead meeting upon new supply applications. By testing the equipment on site and identifying the sensitive components, CLP can recommend tailor-made and cost-effective solutions to improve the equipment performance when a voltage dip occurs.

- CLP's professional engineers have been carrying out an ongoing study to improve the quality of our power supply. CLP actively engages customers and industry practitioners, provides **technical advices** and recommends engineering solutions for mitigating the impact of voltage dip such as suitable ride-through devices. Over the past three years, we have reached out to over a hundred housing estates and organisations. Around half of them have accepted our recommendations to mitigate voltage dips.

- To enhance customer support, CLP organises seminars and workshops for corporate customers and property management industry personnel, sharing the knowledge and mitigation measures related to voltage dips, helping the industry strength the ability to respond to voltage dips.

- Stakeholder visits to the Power Quality Workshop are arranged, where exhibits and interactive games that illustrate the causes of voltage dips and harmonic distortions, the corresponding potential impacts on electrical equipment and mitigation measures are featured.

CLP Tutorial – Introduction to Voltage Dips

CLP organised seminar for property management professionals to help improve their capability to handle voltage dips.

5 ENVIRONMENTAL MANAGEMENT

Government's Environmental Policy

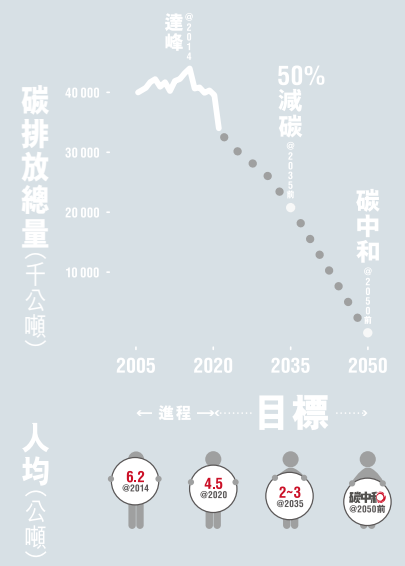
- Climate change is affecting every corner of the Earth. Like other coastal cities, Hong Kong faces multiple climate-related threats. With the community's increasing environmental awareness, the Government and the community are more concerned about monitoring and managing emissions. **Carbon emissions** are sometimes used as a shorthand for referring to the emissions of carbon dioxide (CO_2), or greenhouse gases (GHGs) in general.
- Strictly speaking, gases that absorb and trap heat on the planet are called GHGs. The main GHGs in the Earth's atmosphere are CO_2, methane (CH_4), nitrous oxide(N_2O) and ozone (O_3). **Air emissions** refers to the emission of air pollutants. At present, the Hong Kong Government monitors emission of the following pollutants: sulphur dioxide (SO_2), nitrogen oxides (NO_X), respirable suspended particulates (RSP/PM_{10}), fine suspended particulates (FSP/$PM_{2.5}$), ozone, carbon monoxide (CO) and lead.

Carbon Reduction

- In addressing the increasingly stringent challenges brought by climate change, global cooperation and concerted efforts by every member in the society are needed. The Central Government announced its target as early as 2009 to reduce **carbon intensity** (in terms of carbon dioxide emissions per unit GDP) by 40% to 45% by 2020, as compared with the 2005 level. Subsequently, in 2020, the Central Government set a "dual carbon" goal, aiming to achieve peak carbon emissions by 2030 (i.e. carbon peak) and carbon neutrality by 2060; and further announced a new commitment to lowering the nation's carbon intensity by over 65% from the 2005 level by 2030.
- On the other hand, the Paris Agreement, endorsed by many countries in 2015 with an aim of holding the increase in the global average temperature to well below 2°C above pre-industrial levels, brought a clear direction for low-carbon energy development at the international level.
- Hong Kong is among the earliest cities in Asia to take actions to combat climate change. The city's carbon emissions already peaked in 2014 through a series of carbon reduction measures, including halting the construction of new coal-fired power plants in 1997 and gradually replacing coal with natural gas and zero-carbon sources for power generation.
- To align with the nation's carbon reduction goals and respond to the Paris Agreement, the Hong Kong SAR Government announced the **Hong Kong's Climate Action Plan 2030+** in 2017, pledging to reduce carbon intensity by 65% to 70% compared to the 2005 level by 2030. In order to meet the target, Hong Kong will continue to phase down the remaining coal plants in the next decade and replace them with natural gas and non-fossil fuel sources.
- In 2019, the then Council for Sustainable Development (now Council for Carbon Neutrality and Sustainable Development) launched the **Public Engagement on the Long-term Decarbonisation Strategy** to gauge the views from the community for developing feasible strategies and measures for carbon reduction. The Government accepted the recommendations submitted by the Council and committed to striving to achieve carbon neutrality before 2050 in the 2020 Policy Address.

- In 2021, the Government unveiled the **Hong Kong's Climate Action Plan 2050**, setting out new measures for Hong Kong's long-term decarbonisation strategy, including achieving net-zero electricity generation before 2050 and setting an interim target to reduce total carbon emissions by half against the 2005 level before 2035. CLP will offer full support to the Government and work closely with the community to decarbonise. Addressing both demand and supply sides, CLP will encourage customers to save energy and achieve decarbonisation in electricity generation.

- See also Chapter 6 on **Cleaner Fuel Mix for Electricity Generation**



Hong Kong's Roadmap to Carbon Neutrality

Source: **Hong Kong's Climate Action Plan 2050**

Air Quality Improvement

- To regulate the emissions from power plants, the Government in 2008 issued its first Technical Memorandum (TM) under the Air Quality Control Ordinance to set emission caps of pollutants (including sulphur dioxide, nitrogen oxides, and respirable suspended particulates) for power plants based on the levels of 1997 actual emissions. Since the emission allowances stipulated in the first TM came into effect in 2010, the Government reviewed the emission allowances at least once every two years and has tightened the requirements for several times to continuously improve air quality in Hong Kong.

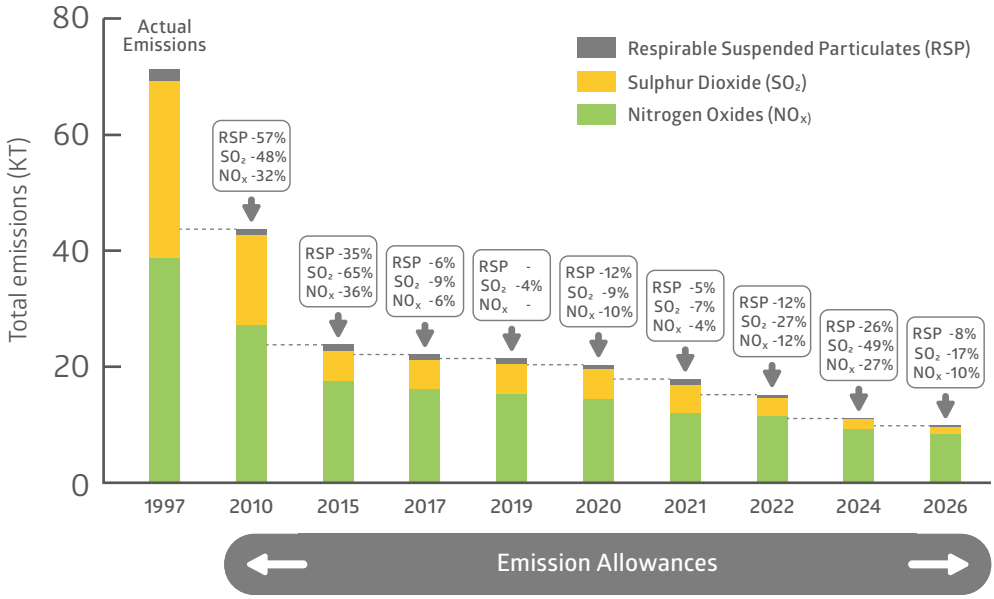
- The Government has issued nine TM to date, with the latest version issued in 2021 which stipulated the annual emissions cap for power plants in 2026 and beyond. The emission allowances have dropped significantly by about 70% to 90% as compared with those for 2010 set under the First TM. In 2023, the Government completed review of the emission allowances and confirmed that the emission caps set by the Ninth TM are still applicable for 2028 and beyond. At this stage, there is no need to issue a new TM.

- In June 2021, the Government announced the **Clean Air Plan for Hong Kong 2035**, setting out the challenges, goals and strategies to enhance the air quality of Hong Kong to 2035. The Plan covers six major areas of action on green transport, livable environment, comprehensive emissions reduction, clean energy, scientific management, and regional collaboration. Action areas related to the power industry such as promoting the use of new energy transportation, carrying on reducing emissions from electricity generation and exploring at the same time the use of new low-carbon energy such as hydrogen energy and liquefied natural gas.

- Moreover, the Government reviewed the **Air Quality Objectives** (AQOs) at least once in every five years, with the current AQOs took effect from January 2022. The Government conducted the public consultation in 2023 on the new round of the AQOs review to assess the improvement of Hong Kong's air quality in 2030. The working group comprising experts and stakeholders proposed to further tighten 5 prevailing AQOs which include sulphur dioxide, respirable suspended particulates and fine suspended particulates, and add 3 new parameters introduced in the **World Health Organisation's Global Air Quality Guidelines**, with a view to implementing the new AQOs in January 2025. The working group has also consolidated 21 air quality improvement measures with significant emission reduction impact by 2030 which cover aspects of power generation and transportation, such as tightening of emission limits of power plants under the new low-carbon electricity generation strategy, reduction of energy consumption of new and existing commercial and residential buildings and promoting the use of liquefied natural gas by marine vessels.

Climate Ready website

Emission Caps for Power Stations have been Increasingly Tightened



Note:

After reviewing the Ninth TM in 2023, the Government stated that the emission caps set by the Ninth TM for power plants are still applicable for 2028 and beyond.

Powering Responsibly and Reducing Emissions

- CLP manages the environmental impact of electricity generation responsibly. We adopt the world's best practices to improve our operational efficiency, safety and environmental performance. We have also established effective environmental management systems which conform to the globally recognised ISO 14001 Standard. Over the years, CLP has diligently put in effort to manage carbon and air emissions in our operations.

CLP's Emissions Management Measures

- **CLP has successfully met the increasingly stringent emissions caps for our power plants set by the Government**. We continually seek to adopt new technologies, fuel sources and processes to help make the air in Hong Kong cleaner. We have successfully achieved significant emissions reduction through a combination of emissions reduction technologies and changes to our fuel mix including the introduction of natural gas, nuclear power, low sulphur coal, renewable energy and the addition of sophisticated emissions control facilities.

- From 2010 to 2011, we retrofitted by phases the largest four units of the coal-fired Castle Peak Power Station with **large-scale desulphurisation and nitrogen oxides reduction facilities** which have significantly improved the emissions performance of the station. In addition, gypsum produced during the desulphurisation process is re-cycled as material for the construction industry such as plasterboard, bringing extra environmental benefits to the society.

- Turbine upgrades on eight gas-fired generation units at Black Point Power Station were completed in 2022, increasing the capacity of each unit by 25MW (8%) and driving improvements in efficiency, as well as reducing the nitrogen oxides emissions. Moreover, the two new gas-fired generation units (Units D1 and D2) at Black Point Power Station were commissioned in 2020 and 2024 respectively, increasing the proportion of gas-fired generation to around 50%. Along with other improvements in generation efficiency, the emissions will be further reduced.

- Meanwhile, jointly developed by CLP and HK Electric, the Hong Kong offshore liquefied natural gas (LNG) terminal went into operation in mid-2023 to increase the gas supply security by diversifying supply sources, and to enable procurement of LNG at competitive prices from the global market.

- CLP is also enhancing the Clean Energy Transmission System which would allow more flexibility to tap into cleaner energy and for possible increased use of non-fossil energy in future to support the Government's environmental policy.

- **CLP has always strived for reducing emissions. More than 90% emissions reduction in SO_2, NO_x and RSP have been achieved since 1990, while electricity demand has grown by over 85% during the same period**. Electricity generation emissions have fallen greatly as a result of various emissions reduction efforts. The chart below illustrates these efforts.

Ongoing Improvement in CLP's Environmental Performance

1990
Installed electrostatic precipitators at Castle Peak Power Station

1993
Installed low NO_x burners at Castle Peak Power Station

1994
Import nuclea r from Daya Bay Nuclear Power Station

1996
Natural gas-fired Black Point Power Station established

2005
Increased use of ultra low sulphur coal

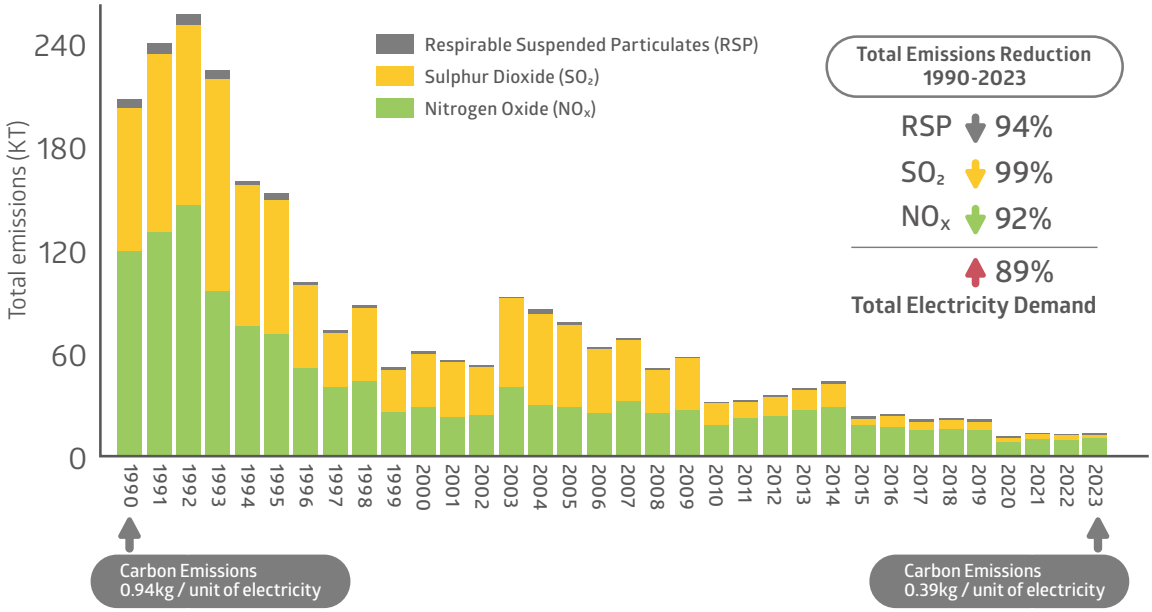
2010 / 2011
Castle Peak Power Station emissions control facilities commissioned

2013
Began using Second West-East Gas Pipeline for gas-fired generation

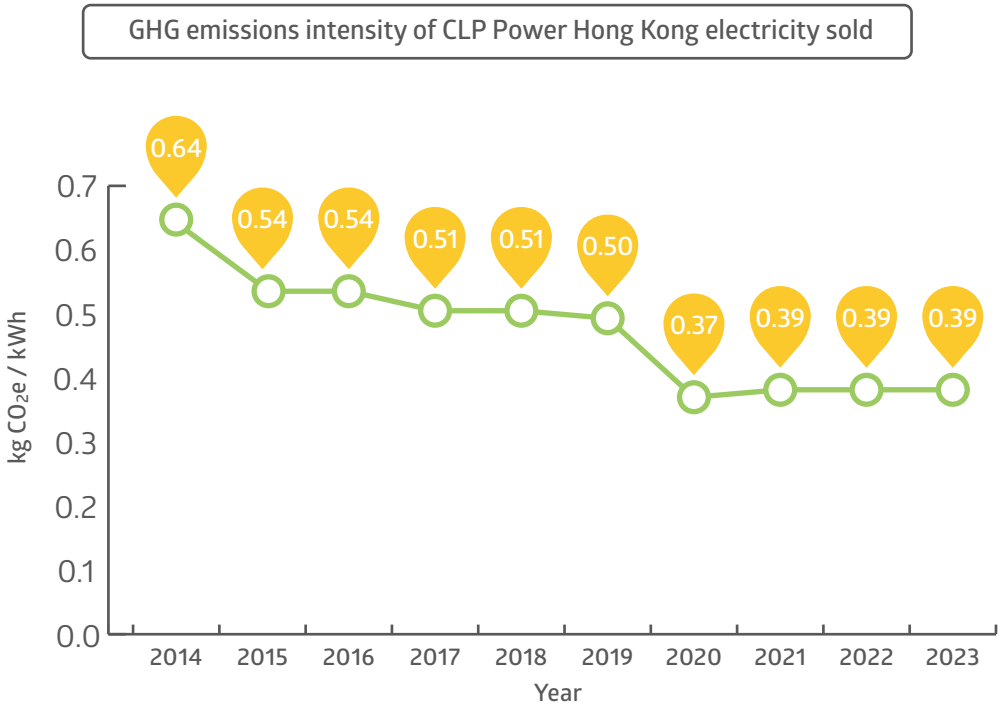
2020
The first new gas-fired generation unit at Black Point Power Station commissioned

2023
Hong Kong offshore liquefied natural gas (LNG) terminal went into operation

2024
The second new gas-fired generation unit at Black Point Power Station commissioned



- The GHG intensity of the electricity sold in Hong Kong in 2023 was maintained at 0.39kg CO_2e/kWh.



Source: CLP Sustainability Report 2023

Long-term Decarbonisation Target

- As a major power company in Hong Kong, CLP recognises its role in addressing climate change. In 2004, CLP Group published its first Group-wide renewable energy target of 5% by 2010. In 2007, the Group published CLP's **Climate Vision 2050** which set out the blueprint of moving towards a net-zero future. It has informed our business strategy since its launch and supports our long-term development. It is also integral to our broader climate strategy.

- To ensure we keep up to the pace of change in our operating environment, CLP Group reviews its climate targets and commitments from time to time. The Group updated the **Climate Vision 2050** in early 2024 which strengthened the greenhouse gas emissions intensity target for 2030 to bring it closer to the goal of limiting global warming to 1.5°C, while maintaining existing commitments including phasing out coal before 2040 and achieving net-zero greenhouse gas emissions across our value chain by 2050.

- CLP Group is committed to reviewing its climate transition plan and targets at least every three years, taking into consideration the latest climate science, policy drivers, technological advancement, industry trends and community expectations, guiding the Group in managing climate-related risks and opportunities to ensure an orderly transition.

- The 2050 carbon neutrality target is an important milestone for Hong Kong. CLP will promote the development of local renewable energy and explore ways to enhance regional cooperation on zero-carbon energy with the Government and identify sources of zero-carbon energy in neighbouring regions, including seeking joint investment and development opportunities for participating in and operating zero-carbon energy projects near Hong Kong. We will also keep abreast of developments in technologies that utilise renewable energy for electricity generation. At the same time, we are working on ways to convert our local gas generation infrastructure to support the use of green fuels such as zero-carbon hydrogen. In decarbonising our electricity generation, CLP Power continues to adopt careful planning to maintain high levels of safe and reliable supply for our customers.

- CLP will continue to help customers manage energy demand and promote energy saving as well as innovative technology applications. We also engage the wider community to adopt low-carbon living through energy efficiency and conservation public education programmes.

Other Environmental Initiatives

- Caring for the environment is one of CLP's core values. We strive to introduce various initiatives in the process of operations that contribute to improving the environment we live.

CLP Sky Woodland


Queen's Hill Substation

CLP Sky Woodland

- To promote city greening, CLP teamed up with The University of Hong Kong in 2006 to pioneer a study on Sky Woodland. In May 2013, the concept was turned into the largest Sky Woodland in Hong Kong. Located in Tseung Kwan O, the Sky Woodland is planted on the rooftops of two substation blocks, covering an area of 520m² with 500m² of vertical greening on the substation walls.

- The Sky Woodland is far more than just a rare stretch of urban greenery. It is a slice of genuine woodland in the city with its building structures tailor-made to replicate a natural woodland environment, hosting 80 trees made up of 32 native species. Since its launch in 2013, the Sky Woodland has attracted an abundance of birds and insects. In addition to its ecological benefits, the Sky Woodland also contributes to a better living environment by improving air quality, enhancing buildings' energy efficiency by reducing the indoor and outdoor temperature through solar heat absorption and transpiration.

- The Sky Woodland project was presented with the Gold Award for the Transmission and Distribution Project of the Year at the Asian Power Awards in 2013 for its distinctive feature and sustainable design.

Green Substation with Low Carbon Initiatives

- CLP is introducing a more systematic and innovative approach for the design of green substations.

- The designs of the new Hong Kong-Zhuhai-Macao Bridge Substation, Queen's Hill Substation and Shing Kai Road Substation feature not only with increased ratio of greenery, but also enhanced with installation of rainwater recycling system and automatic dripping irrigation system which help save more water for irrigation. Photovoltaic (PV) panels are installed to maximise the harvest of the solar energy.

- The Hong Kong-Zhuhai-Macao Bridge Substation and Queen's Hill Substation were awarded Final Platinum rating in 2021 while Shing Kai Road Substation was awarded Final Platinum rating in 2023 under BEAM Plus V1.2 for New Buildings. In 2022 and 2023, Ho To West Substation, Kwu Tung North Substation, Tuen Mun Eco Park Substation and Ma Sik Road Substation were also awarded BEAM Plus Provisional Platinum rating. The Hong Kong-Zhuhai-Macao Bridge Substation, Queen's Hill Substation and Ho To West Substation were also presented with the Gold Award for the Transmission and Distribution Project of the Year at the Asian Power Awards.

Waste Management

- Waste generated during power generation is also treated responsibly. For example, the coal ash from coal combustion is classified at the Ash Classification Plant in Castle Peak Power Station in accordance with the British Standard. Classified pulverised fuel ash (CPFA) that fully complies with the standard is sold to local concrete production companies as a direct replacement for cement in concrete production while the lower quality ash, such as furnace bottom ash (FBA), raw PFA and reject PFA are sold to local plants for cement production.

Green Driving

CLP's EV charging station

- In recent years, CLP has studied and introduced various electric vehicle (EV) charging technologies to enhance the **EV charging network**, aiming at promoting green driving in Hong Kong.

Promote Green Motoring

- Following the launch of **"Trial Network of Charging Stations"** in 2009, CLP has set up 47 semi-quick and quick charging stations in Kowloon, the New Territories and Lantau Island, providing a total of 146 chargers in CLP's supply area. Drivers can charge their EVs for free. They can also locate nearby EV charging stations through the CLP App.

- In response to the rapid development of the EV market in Hong Kong, CLP introduced the first **multi-standard EV quick charger** in Hong Kong in June 2015, which supports the majority of EV models available in Hong Kong. CLP's quick charging stations are now available at driving intervals averaging 10km throughout Kowloon and the New Territories. In support of the Government's EV-charging at Home Subsidy Scheme (EHSS), CLP has introduced an advanced service called **Eco Charge 2.0** which provides a one-stop technical support to the customers, who are interested for installation of EV charging-enabling infrastructure in the car parks of private residential blocks.

- In addition, CLP launched its first EV Managed Charging Programme in 2023, providing smart EV chargers for EV owners to reduce power consumption at times of peak demand. CLP will remotely control the charging rate of the smart EV chargers during peak demand hours to optimise grid management and encourage customers to charge in a smarter and more energy efficient way.

eMobility Network launch ceremony

Promote Wider Use of Electric Commercial Vehicles (ECVs)

- CLP and 14 businesses and organisations launched a cross-sector partnership called the **eMobility Network** in October 2023 to promote the wider use of ECVs in Hong Kong. The network, which includes ECV manufacturers and operators, charging service providers, and a bank offering green finance services, encourages technology exchange and accelerates the popularisation of ECVs. Network members will cooperate to promote green transport in a holistic manner and drive sustainable mobility in four key areas: (1) power supply infrastructure and equipment, (2) quick charging facilities, (3) EV manufacturing and operation, and (4) green finance.
- CLP is also working with the Government and stakeholders to support e-transport trials of buses, minibuses, taxis, and ferries. Strategy will be adjusted from time to time to keep abreast of the latest EV development.

Adoption of the Latest Technology

- To support the expansion of the EV charging network, CLP has developed the **eMobility Grid Management Platform (eGMP)**. The platform analyses EV charging data to assess the utilisation and patterns of charging stations in different locations of Hong Kong, enabling the power company to optimise grid planning and resource allocation.
- Link to reference information: **eMobility**

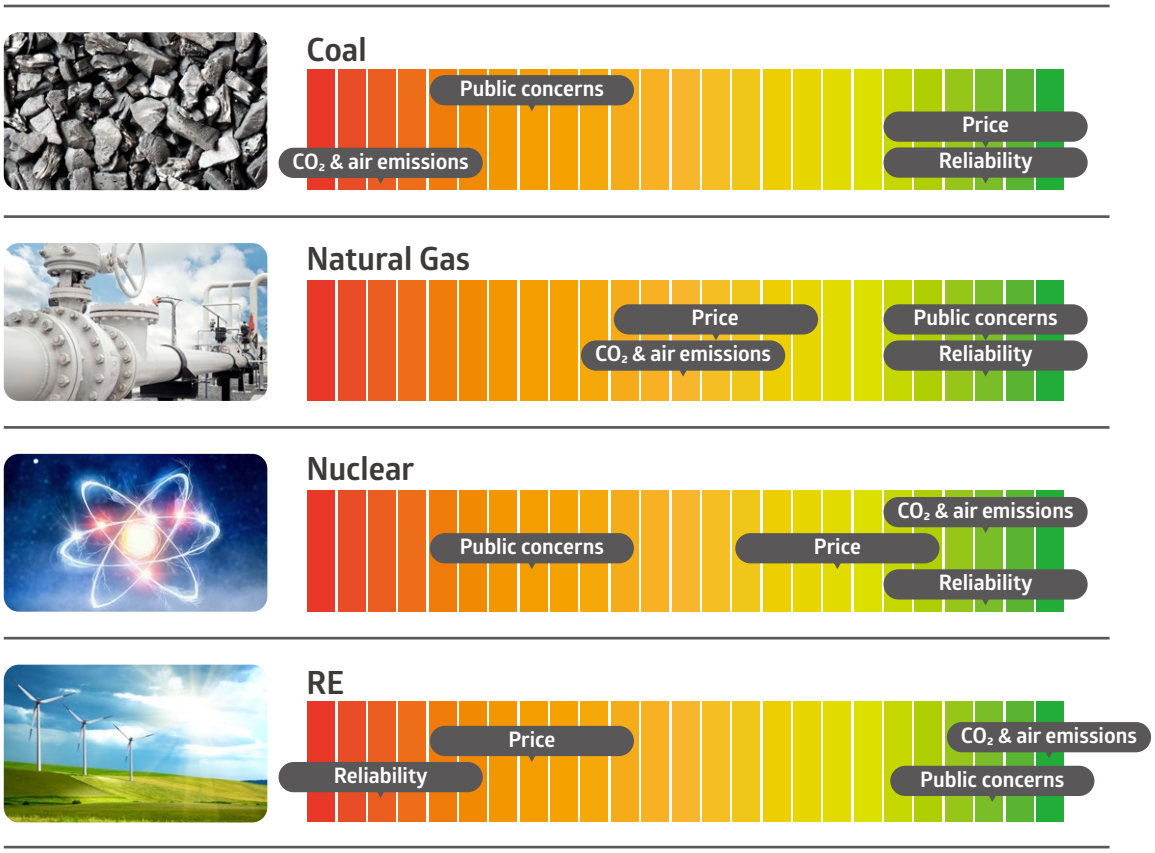
6 CLEANER FUEL MIX FOR ELECTRICITY GENERATION

Getting to Know the Fuels for Power Generation

- Different fuels used for electricity generation have their own unique properties and each plays different roles in the fuel mix.
- Hong Kong has no indigenous energy resources and most of the fuels needed for electricity generation are imported. CLP takes into careful consideration of the properties of different fuels to strive for an optimal fuel mix to achieve a balance among safety and reliability, environmental performance and cost. The following introduces them in terms of cost and efficiency etc.

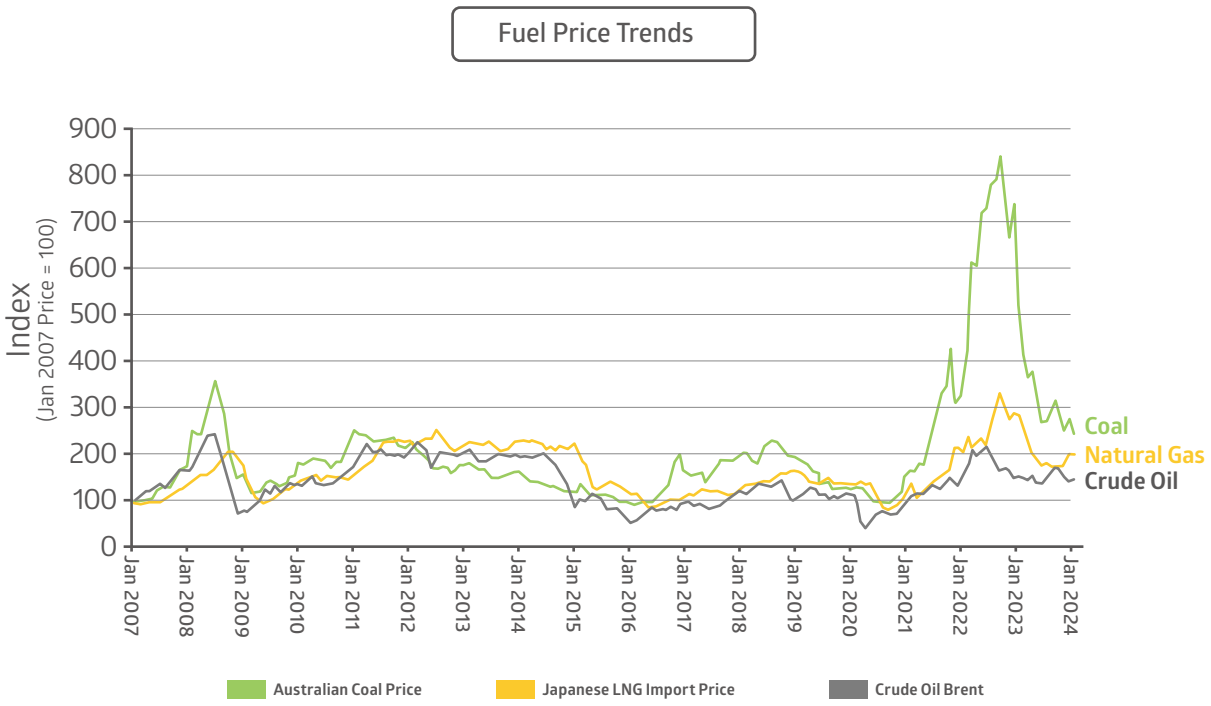
Coal	▪ Provides high reliability, can be stored on site and a quick response to meet changes in demand ▪ Fuel cost is typically low ▪ High carbon emissions and other air emissions even with the latest available abatement measures are the major drawbacks
Natural gas	▪ Provides high reliability and a very quick response to meet changes in demand. Outperforms coal in emissions performance ▪ A significantly higher generation cost in place ▪ World demand for gas is increasing given its environmental benefits
Nuclear	▪ High reliability, enables large-scale and steady base-load electricity ▪ Very competitive generation cost for stabilising tariff levels ▪ Non-carbon emitting and no other air emissions ▪ Requires sophisticated and careful operational safety and waste management ▪ Public concern over nuclear safety still remains after the Fukushima accident
Renewable Energy (RE)	▪ Natural resources availability is intermittent in nature, and support from conventional fossil fuel generation is required to ensure reliable electricity supply ▪ Large amount of land is often required for developing RE ▪ Due to continuous technological advancement in zero-carbon energy development, the generation cost has become more competitive ▪ It is practically emission-free and thus is gaining in popularity in countries where its relatively high cost can be supported ▪ RE is growing important in the world's fuel mix, and where there are abundant quantities of RE available (e.g. Hydro in British Columbia, Canada; wind in Australia; solar in Arizona, United States.) However, abundant natural RE resources and favourable criteria for developing RE are not available everywhere

- The chart below compares the fuel types in terms of emissions, price, reliability and public concerns.



Managing Fuel Costs

- Most of the fuels in Hong Kong required for power generation are imported and they are subject to price volatility in the international fuel markets.
- In support of the Government's environmental policy and the increasingly tightening emissions requirement, CLP continues to increase the use of natural gas for power generation even after meeting Hong Kong's fuel mix target in 2020, while the cost of gas-fired generation is typically higher than that of coal-fired generation.
- The following chart shows the volatility of fuel prices since 2007.



Source: World Bank

- CLP adopts a **diversified fuel mix**, including more natural gas, less coal and importing zero-emission and relatively stable-priced nuclear. When international fuel prices surge, nuclear plays an important role to help smoothen price fluctuations in case of market volatility.
- CLP takes a prudent approach in managing our fuel costs. Measures taken include enhancing the efficiency of power generation units, and contracting with different suppliers, to secure competitively-priced fuels from the market. CLP also uses the Fuel Clause Recovery Account under the Scheme of Control Agreement to stabilise tariff levels.

Fuel Choices

- The Government launched a public consultation in 2014 on the **Future Fuel Mix for Electricity Generation**. Most of the respondents supported local power generation by natural gas and expressed reservation about importing electricity from the Mainland. Following the consultation, the Government proposed to revamp fuel mix target for power generation with around 50% natural gas by 2020 in order to reduce the carbon intensity of Hong Kong by 50% to 60% by 2020 when compared to 2005.

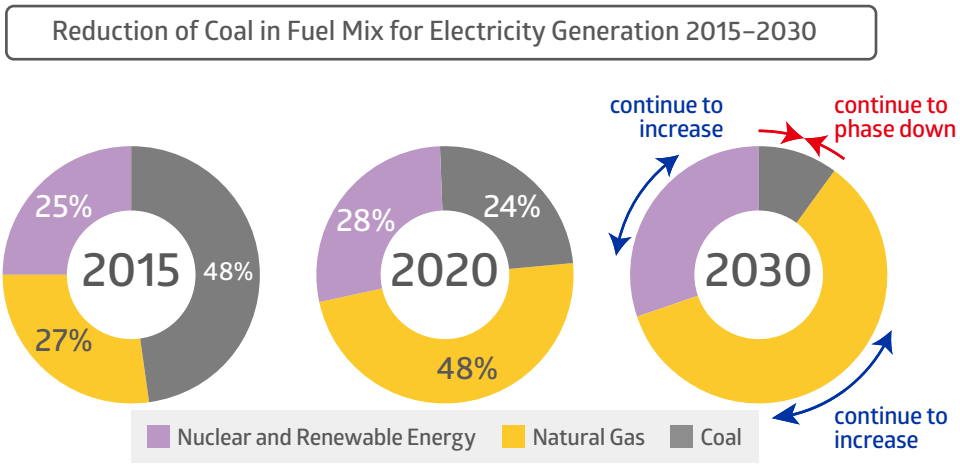
- In 2017, the Government announced **Hong Kong's Climate Action Plan 2030+**, which stated that in order to meet its new carbon intensity reduction target of 65% to 70% by 2030, Hong Kong needed to continue to phase down remaining coal plants in the next decade and replace them with natural gas and non-fossil fuel sources.

- To tackle the imminent challenge of climate change, and to fulfil the obligation of carbon reduction target in the Paris Agreement, the then Council for Sustainable Development (now Council for Carbon Neutrality and Sustainable Development) launched the **public engagement on Long-term Decarbonisation Strategy** in 2019 and suggested different fuel mix strategies for carbon reduction in the power sector. It pointed out that if the global average temperature rise is to be limited to 2°C or even 1.5°C, it is estimated that 80% or even 100% of the electricity has to come from zero-carbon fuel sources, including renewable energy and imported nuclear energy. CLP Power submitted a response paper to the Council in September 2019, supporting the need for deep decarbonisation of electricity generation and the Government's environmental policy by exploring increasing low-carbon electricity supply through more gas-fired generation and regional cooperation in the longer term.

- Subsequently, the Government announced **Hong Kong's Climate Action Plan 2050**, setting out net-zero electricity generation as one of the strategies to achieve carbon neutrality before 2050. This requires the city to strive by 2035 to cease coal-fired generation, to raise the proportion of zero-carbon energy in the fuel mix for electricity generation to about 60% to 70%, as well as to increase the proportion of renewable energy in the fuel mix for electricity generation from less than 1% at that time to 7.5% to 10% by 2035, and further increase to 15% before 2050.

- Links to reference information:

  - **CLP's Response to the Public Engagement on the Long-term Decarbonisation Strategy**
  - **Council for Sustainable Development's Report on Public Engagement on Long-term Decarbonisation Strategy**



Source: Hong Kong's Climate Action Plan 2050

CLP's Fuel Mix for Electricity Generation

- CLP has been adopting a **diversity of fuel types** supplied from **multiple sources** and optimising its fuel mix. The objectives of the diversified fuel mix are to **ensure energy security and price stability** while providing a reliable electricity supply and meeting environmental standards at reasonable costs.

- CLP endeavours to source fuels with high quality and at competitive prices. A well-established mechanism for fuel procurement is in place to source the fuels that can satisfy our requirements such as emission standards and costs. Our procurement team also keeps exploring new sources of cleaner fuels. For instance, we have started procuring low-emission coal from the US, another fuel source in addition to Indonesia. For gas supplies, we are also exploring new sources for diversity.

- The following table and chart illustrate CLP's ongoing efforts in managing a diversified fuel mix to achieve these objectives.

Evolution of CLP's Fuel Mix

1960s–1980s	▪ Single fuel supply from **oil**
1982	▪ Began fuel diversification with the introduction of **coal** with multiple sources of supply
1994	▪ Further diversification by importing **nuclear energy** from Daya Bay Nuclear Power Station ▪ Began to phase out oil
1996	▪ CLP pioneered the use of **natural gas** for power generation in the region in the early 1990s ▪ Secured natural gas supply from one of the four largest offshore gas fields in the Mainland near Hainan with a 20-year contract
2000	▪ Began to use **low-emission coal** to further improve emissions performance
2013	▪ Started using **natural gas** supplied via the **Second West-East Gas Pipeline** (WEPII) in the Mainland
2015	▪ HKSAR's Sludge Treatment waste-to-energy facility connected to the CLP grid
2018	▪ Feed-in Tariff was introduced to promote the development of **local renewable energy**
2020	▪ The **first new gas-fired generation unit (Unit D1)** at Black Point Power Station was commissioned to increase the share of gas-fired generation to around 50% ▪ The landfill gas generation units at the West New Territories (WENT) Landfill, **WE Station** started operation to utilise **landfill gas** produced locally as fuel
2023	▪ **Hong Kong offshore liquefied natural gas (LNG) terminal** went into operation to increase the gas supply security by diversifying supply sources, and to enable procurement of LNG at competitive prices from the global market
2024	▪ The commissioning of the **second new gas-fired generation unit (Unit D2)** at Black Point Power Station further increased CLP's gas ratio in the local fuel mix and supported the gradual retirement of coal-fired generation units at Castle Peak A Power Station ▪ The second phase of WE Station has been put into operation

- As early as the 1990s, CLP spearheaded the introduction of nuclear energy and natural gas for power generation, achieving **a diversified fuel mix** that enables an abundant and reliable electricity supply, an improving environmental performance and a stable tariff for Hong Kong.

- CLP fully supports the new measures set out for Hong Kong's long-term decarbonisation strategy in the Government's Hong Kong's Climate Action Plan 2050. CLP strives to advance energy transition, phase out coal-fired generation, promote the development of local renewable energy, explore the use of green hydrogen, promote electrification, as well as enhance regional cooperation to seek new zero-carbon energy sources. The section below illustrates our key initiatives of using cleaner fuels: natural gas, nuclear energy, renewable energy, and zero-carbon energy.

Natural Gas

- **CLP was the first electricity supplier to bring natural gas to Hong Kong** for power generation, for which natural gas emits much less sulphur dioxide, nitrogen oxides, particulates and carbon dioxide than most other fossil fuels. Over the years, the use of natural gas has helped CLP reduce emissions from its operations.

- CLP started importing gas from **Yacheng Gas Field** near Hainan Island in 1996 at a very attractive price, providing an abundant and reliable energy source to support Hong Kong's economic development. It enabled significant environmental improvement accompanied with a stable tariff regime.

- A Memorandum of Understanding (MOU) on energy cooperation was signed between the Central Government and the Hong Kong SAR Government in 2008, paving the way for the use of new gas sources from the Mainland. One of the primary sources is the **Second West-East Gas Pipeline (WEPII)**.

- WEPII, operated by China Oil & Gas Pipeline Network Corporation, is currently the **world's longest natural gas pipeline**. It consists of one trunk line and eight branches that starts in Horgos, Xinjiang, where it connects to the Central Asia-China Gas Pipeline and crosses 14 provinces, autonomous regions and municipalities, and terminating at Hong Kong's Black Point Power Station.

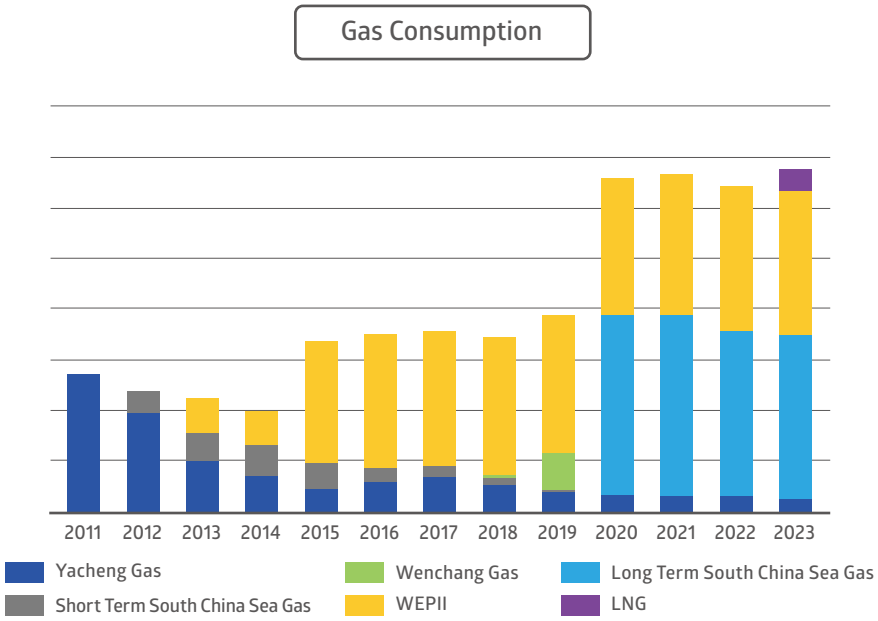
- In line with the MOU, a long-term gas supply agreement with PetroChina was signed for supplying WEPII gas to Hong Kong starting from 2013. Gas is delivered via a 20-km undersea pipeline connecting the gas launching station at Dachan Island in Shenzhen and Black Point Power Station.

- With the gradual depletion of the Yacheng gas field, CLP has since 2020 brought in additional gas from CNOOC's gas fields in the South China Sea using the existing Yacheng pipeline under a new long-term contract.

Ensuring Gas Supply

- To meet the Government's target of increasing local gas-fired generation by 2020, CLP is taking additional steps to ensure sufficient gas supply and to further increase the diversity and security of supply. In view of the depleting Yacheng gas fields and the two-month temporary suspension of gas supplies from the existing WEPII due to a landslide in Shenzhen in December 2015, CLP sees the importance to diversify the gas sources for CLP, and for Hong Kong as a whole.

- CLP has developed a plan to ensure future energy supply stability, security and diversity. This also helps enhance the city's bargaining power for natural gas purchases and provide our customers a more cost-effective electricity supply.



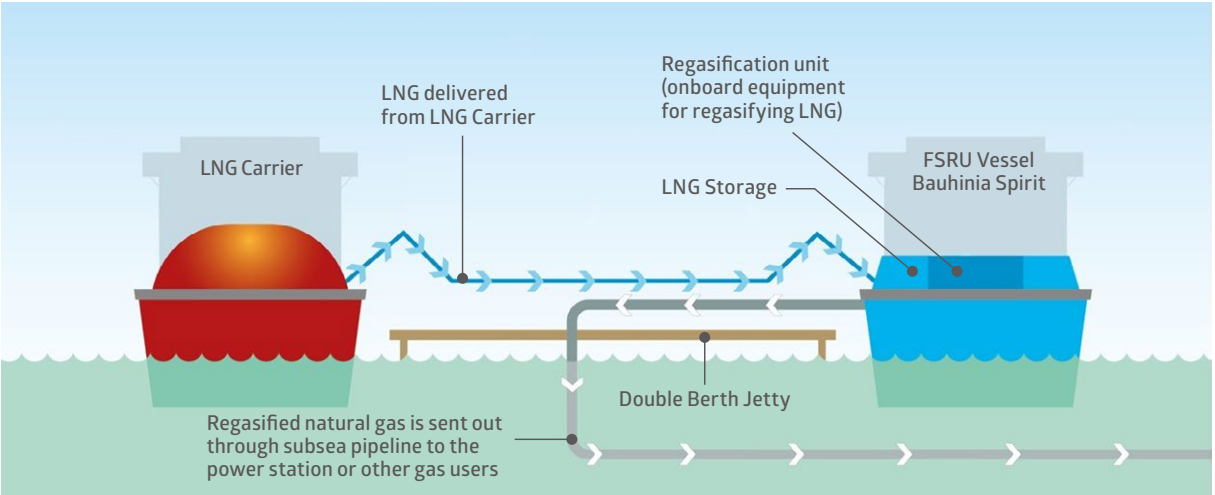
Hong Kong Offshore Liquefied Natural Gas (LNG) Terminal

- Jointly developed by CLP and HK Electric, the Hong Kong Offshore Liquefied Natural Gas (LNG) Terminal went into operation in mid-2023 to provide a long-term alternative source to meet Hong Kong's need for fuel supply, which is crucial for enhancing the security of the city's natural gas supply. It also gives the two power companies direct access to international LNG markets, strengthens their ability to source competitively-priced gas, and ultimately benefits customers and Hong Kong as a whole.

- The offshore LNG terminal in the south-western waters of Hong Kong is the first of its kind in the city. It applies the technology of **Floating Storage Regasification Unit (FSRU)** to regasify the LNG, and the natural gas is supplied to CLP Power's Black Point Power Station and HK Electric's Lamma Power Station through two separate subsea gas pipelines. This initiative by the two power companies helps raise the low-carbon generation capability and fuel supply security of the power companies in support of Hong Kong's energy transition.

- Bauhinia Spirit, the world's largest FSRU vessel with an LNG storage capacity of 263,000 cubic metres, has moored at the jetty of the terminal. It is used to receive, store, and regasify LNG.

- To support marine ecology conservation and the sustainable development of fishing industries, the two power companies have established a Marine Conservation Enhancement Fund and a Fisheries Enhancement Fund. A total of HK$100 million was injected into two funds to support community initiatives that contribute to the enhancement of the marine environment and fisheries.



- In parallel, CLP continues to consider opportunities for additional gas sources as stipulated in the MOU on energy cooperation and strives to achieve an optimal balance between different fuel types.

- Links to reference information:
  CLP Press Release:
  - CAPCO and HK Electric Sign Contract with Shell for Long-Term Liquefied Natural Gas Supply to Hong Kong
  - CAPCO and HK Electric Sign Contract with MOL for Hong Kong Offshore LNG Terminal Project
  - CLP Power and HK Electric Launch Funds to Support Marine Conservation and Sustainable Fisheries
  - Hong Kong's First FSRU Vessel Weighs Anchor as Offshore LNG Terminal Prepares to Go into Service
  - FSRU Vessel Berths as Final Countdown to Launch of Hong Kong's First Offshore LNG Terminal Project
  - First LNG Shipment under Long-Term Supply Agreement Arrives as Hong Kong's Offshore LNG Terminal Goes into Service
  - A New Chapter of Low-carbon Energy: Celebrating Hong Kong's First Offshore LNG Terminal

Introduction Video to the Hong Kong Offshore LNG Terminal

The Hong Kong Offshore LNG Terminal Project Website

Hong Kong LNG Terminal Limited Website

At-a-glance video of the Hong Kong Offshore LNG Terminal

Nuclear Energy

Nuclear Energy in Hong Kong

- In 1985, the Chinese Government and CLP joined hands to develop Daya Bay Nuclear Power Station in Guangdong Province, the nation's first large-scale commercial nuclear power station. It was CLP's first large-scale power project in the Mainland and our new milestone to low-emission power generation. In the same year, CLP established a joint venture company with Guangdong Nuclear Investment Co., Ltd. (a subsidiary of China General Nuclear Power Corporation) and signed a 20-year contract for nuclear power supply to Hong Kong starting from 1994.

- In September 2009, the supply contract for Hong Kong was extended for another 20 years to 2034.

- As of today, nuclear energy accounts for about a third of CLP's fuel mix in Hong Kong and has been safely and reliably meeting a quarter of Hong Kong's electricity needs for 30 years. Importing non carbon-emitting nuclear energy directly from a dedicated plant through a dedicated line has been proven effective.

- Daya Bay Nuclear Power Station produces around 15 billion kWh of electricity per year. To ensure that more non-carbon and cost-competitive energy is provided to Hong Kong, Daya Bay increases its electricity supply to Hong Kong from 70% to around 80% of its output starting from late 2014.

- As of June 2024, Daya Bay has supplied Hong Kong with a cumulative total of 314.5 billion kWh of electricity.

- Importing nuclear energy to Hong Kong has helped avoid carbon dioxide emissions in the city by over 7.5 million tonnes a year. Given that the cost of nuclear energy is less affected by volatile fuel prices, nuclear energy helps smoothen price fluctuations amid recent global energy crisis, ensuring a reliable power supply at a competitive price.

- In the longer term, CLP believes that nuclear power should continue to be a part of the fuel mix to support Hong Kong and Mainland China's decarbonisation plan. CLP will actively explore with the Government and industry players on the importation of more nuclear energy through regional cooperation to meet Hong Kong's decarbonisation targets.

- CLP has three distinct roles in the Daya Bay Nuclear Project. We:

  - act as an investor;
  - contribute our expertise; and
  - import nuclear electricity into Hong Kong.

Facts and Figures about Daya Bay Nuclear Power Station

CLP Ownership	25% (through Hong Kong Nuclear Investment Company Limited (HKNIC))
Joint Venture Partner	China General Nuclear Power Corporation
Reactor Technology	Pressurised Water Reactor
Generation Capacity	Gross capacity → 1,968MW (2 x 984MW) Capacity attributable to HK → 1,577MW*
Commencement Date of Construction	7 August 1987
Date of Commissioning	Unit 1 → 1 February 1994 Unit 2 → 6 May 1994
Plant Management & Operation	Daya Bay Nuclear Power Operations & Management Company, Limited (DNMC) (CLP has 12.5% stake)

- Link to reference information: **Nuclear Energy - A Sustainable Choice for Powering the Future**

Safety Excellence and Emergency Preparedness

- **Safe operation** is always the top priority for all nuclear power operators. At Daya Bay Nuclear Power Station, the **defence-in-depth** principles are applied to ensure a robust and safe operation, covering a full spectrum of activities from the initial plant design to the installation of all equipment and the implementation of all operational procedures. They include:
  - site selection;
  - plant design and operational safety;
  - staff training and qualification;
  - international benchmarking;
  - radiation protection and environmental monitoring; and
  - emergency preparedness.
- Daya Bay Nuclear Power Station is located in a seismically stable region. The site was selected meticulously according to international guidelines and stringent safety assessment by the National Nuclear Safety Administration, after a comprehensive analysis and survey.
- The nuclear power station is designed according to the local situation around the site of the power station and able to withstand natural hazards such as tsunami and earthquake.
- In the event of an emergency due to equipment failure or human error, standby equipment is ready to step in and maintain the safe operation of the plant, minimising the chances of any incidents and their adverse impacts on the environment.
- **Well established contingency plans** are in place at Daya Bay Nuclear Power Station. A communication mechanism is also set up to facilitate communication with the general public and between relevant government authorities in Guangdong and Hong Kong in the unlikely event of a nuclear accident.
- To enhance public's understanding of nuclear operation and promote higher transparency, Daya Bay Nuclear Power Station has adopted **a public notification mechanism** to release information of non-emergency Licensing Operational Events through the websites of DNMC and HKNIC. These events carry no nuclear safety consequences and have no impact on the environment or public safety. Events of an emergency significance will be announced quickly and as appropriate by the government authority.

* Daya Bay has increased its electricity supply to Hong Kong from 70% to around 80% of its output starting from late 2014.

- **Daya Bay Nuclear Power Station has maintained an excellent record of plant reliability, performance and safety since its commissioning in 1994.**

- To comply with the statutory requirement of National Nuclear Safety Administration, a planned outage was carried out at the two units of Daya Bay Nuclear Power Station from September 2023 to June 2024. The outage was successfully completed in mid-June 2024, enhancing the operational safety, supply reliability and digitalisation capability of the power station.

- Over the years, Daya Bay Nuclear Power Station has ranked high in the World Association of Nuclear Operators (WANO)'s performance indices across major aspects of generation capability, plant safety and efficiency, industrial safety and radiation protection. In 2023, Daya Bay Nuclear Power Base reached the world's level of excellence of WANO performance indicators.

- Daya Bay Nuclear Power Station has a **comprehensive environmental monitoring programme** to safeguard the health of its staff and the general public. Regular checks over the years have indicated that there has been no excessive or undue release of radioactivity and the effect of radioactive releases on the environment is very low if not negligible. No adverse public health impact from Daya Bay (and the nearby Ling Ao Nuclear Power Station) is confirmed in a 25-year survey by the Shenzhen Municipal Health Bureau.

Renewable Energy (RE)

- CLP supports the Government's energy policy and strives to explore practical local RE opportunities despite limited RE resources and land scarcity in Hong Kong. The following provides an overview about CLP's support to facilitate the community in developing distributed RE systems and RE projects constructed by CLP.

Grid Connected Renewable Energy Projects

- While large-scale distributed RE projects prove challenging, CLP provides technical support, a simple application procedure for grid connection to encourage local RE developments. In addition, we provide back-up electricity supply for these systems so that customers could enjoy clean electricity from renewable sources without sacrificing power supply reliability.

- Solar power is the most popular technology applied in distributed RE systems in Hong Kong. Project examples include the Siu Ho Wan Sewage Treatment Works of Drainage Services Department. This solar farm, built by CLP*e* and connected to CLP's electricity grid, comprises over 4,200 solar panels covering an area of 11,000m² and is anticipated to generate as much as 1.1 million kWh of electricity annually. It is one of the large-scale solar farms in Hong Kong.

- There are also larger scale RE facilities under construction, planning and operation, e.g. the Government's waste-to-energy facilities including the T-Park in Tuen Mun and the Integrated Waste Management Facilities Phase 1 (I.Park 1) under construction at Shek Kwu Chau as well as the Organic Resources Recovery Centers located in Lantau and other places would have larger capacity and may generate surplus electricity to CLP grid. We fully support the operation of these new facilities in order to provide help to meet the Government's environmental goals. In April 2015, the T-Park in Tuen Mun was connected and electricity generated from the incinerators is also sent to the grid.

Renewable Energy Feed-in Tariff (FiT) Scheme

- CLP introduced a Renewable Energy Feed-in Tariff (FiT) scheme and Renewable Energy Certificates in May 2018 and January 2019 respectively, with an aim to promote the development of local RE. The new initiatives also aim to encourage the community to embrace low-carbon lifestyles through their participation in the development of RE.

- The FiT scheme is applicable to electricity produced by solar and wind power systems with a total generation capacity of up to 1MW. CLP will purchase the electricity produced by an approved RE system once it is successfully connected to the company's power grid. A smart meter will be installed to record the amount of electricity generated by the RE system. The FiT rate will be the same for both solar and wind power systems.

- For instance, if a customer has installed solar panels at his rooftop and the system is approved and connected to CLP's power grid, CLP will offer him FiT rate, ranging from HK$2.5 to HK$4 depending on the generation capacity of the RE system. The FiT rates are higher than the prevailing tariffs to incentivise RE investment which is expected to enjoy a shortened payback period of around 10 years. The FiT rate applies to the electricity generated during the entire project technical lifetime or until the end of the current SCA on 31 December 2033, whichever is earlier.

- The FiT rates:

RE system generation capacity	FiT rate (per unit)
≤10kW	HK$4
>10kW to ≤200kW	HK$3
>200kW to ≤1MW	HK$2.5

- The FiT scheme is open to all CLP's customers other than government departments. FiT rates may change from time to time as agreed with the Government. The new rates will apply to new applications after the effective date of change.

- The scheme attracted customers from a variety of sectors including business and industrial sector, schools, and both urban households and village houses. Since the commencement of applications in May 2018, CLP received over 25,700 applications as of end-June 2024. Around 96% of the applications have been approved, majority of them are from village houses. So far about 22,500 applications have been completed and successfully connected to CLP power grid to enjoy FiT. Among the systems that have been connected to our grid, the largest systems are from four commercial and industrial customers with a capacity of 1,000kW each.

- RE promotions are launched through the CLP website, CLP App, and social media, etc. to help customers understand the FiT application procedures, information related to system design and installation. CLP will offer technical assistance to customers all the way till the RE system is connected to the power grid. Customers can also refer to the Technical Guidelines on Grid Connection of Renewable Energy Power Systems, and Guidance Notes for Solar Photovoltaic (PV) System Installation from **Electrical and Mechanical Services Department website** for more information.

Renewable Energy Certificates (RECs)

- For customers who want to support local development of RE but cannot afford an RE system on their own, they can purchase the Renewable Energy Certificates (RECs). Each unit of REC represents environmental attributes of electricity produced by local RE sources including solar power, wind power, and landfill gas projects, generated or purchased by CLP.

- Launched on 1 January 2019, the current price per unit of RE electricity is HK$0.5, and the minimum purchase is 100 units. Any residential or commercial and industrial customer with a CLP Power electricity account is eligible to purchase RECs.

- To encourage more commercial and industrial customers to participate, CLP Power has offered a variety of purchasing options since mid-2020.

- Revenue generated from the sale of RECs will contribute towards part of the cost of purchasing RE through the FiT scheme, helping minimise the costs of electricity as a whole.

- The units of electricity carried in the RECs available for sale will match the total amount of electricity from local RE sources generated or purchased by CLP over a specific period of time. Any CLP's residential or business customers can support local development of RE by purchasing RECs.

- CLP's RECs have been well-received by commercial and industrial customers since its launch. As of end-June 2024, around 320GWh were sold through RECs, equivalent to a reduction of 125,000 tonnes[1] of carbon emissions. Many corporate customers have committed to larger and longer RECs purchases, demonstrating their commitment to long-term sustainability and supporting local renewable energy development.

CLP Feed-in Tariff Scheme

CLP Renewable Energy Certificates

1 Calculation based on the carbon intensity of the electricity sold by CLP Power in Hong Kong from 2019 to 2022.

RE Projects Developed by CLP

Town Island Renewable Energy (RE) Supply Project

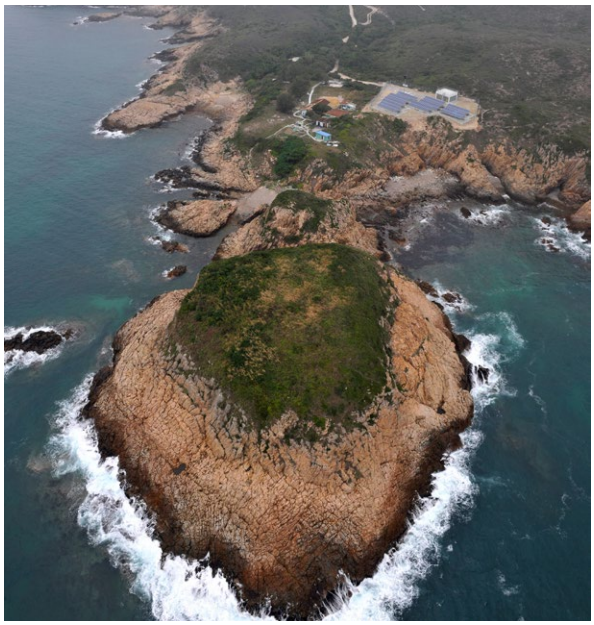
- CLP has developed Hong Kong's first commercial-scale standalone RE generation and storage system on Town Island, located off Sai Kung. The Town Island RE Supply Project powers a non-profit drug rehabilitation centre run by Operation Dawn.

- The entire project, comprises 672 solar panels, two wind turbines and 576 batteries, with a generation capacity of up to 192kW which is capable of lighting up 9,600 compact fluorescent lamps.

- As the system is not connected to the grid, it features batteries capable of storing over 1,000 kWh of electricity to provide power supply for the rehabilitation centre's use lasting for around 30 hours. By the first quarter in 2024, the system generated more than 859,500kWh of electricity, equivalent to the monthly consumption of over 2,500 households. It achieved a significant reduction of over 429,000kg carbon emissions.

- Staff and residents at the centre, located off Sai Kung, used to rely on the intermittent running of small diesel generators for a few hours every day for their power supply. Since the commissioning of the first phase of the system in 2010, more reliable electricity has been available to meet their basic energy needs.

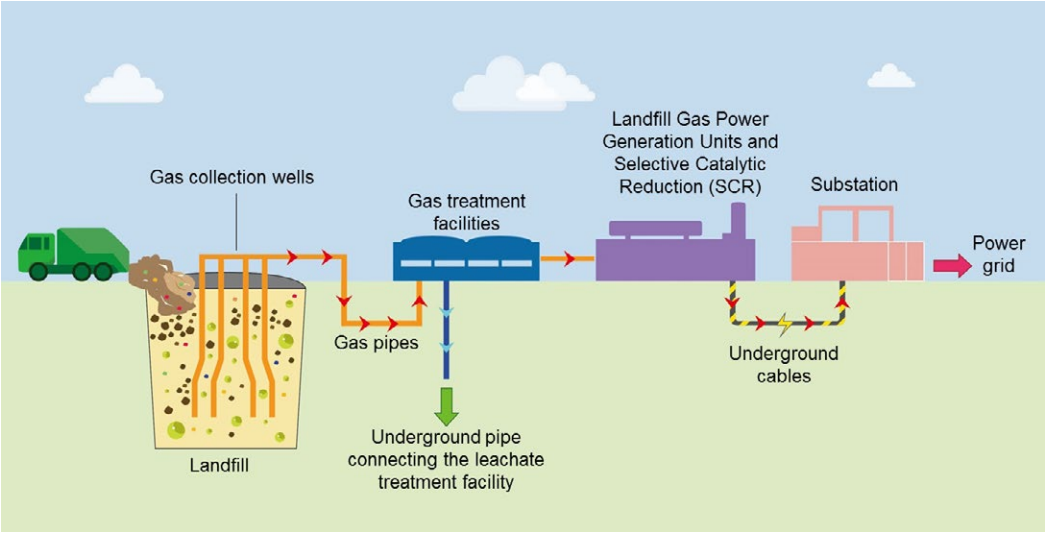
- In 2013, the Project was named one of the "Hong Kong People Engineering Wonders in the 21st Century" in a prestigious public vote organised by Hong Kong Institution of Engineers in recognition of CLP's commitment to promoting sustainability, the use of clean energy and caring for the community.



Landfill Gas Power Generation Project

- CLP's waste-to-energy initiative involves the installation of power generation units at the **West New Territories (WENT) Landfill**, namely **WE Station**. The units **make use of landfill gas produced locally at the landfill site for power generation** and the electricity produced will be transmitted to CLP's power grid.
- The first phase of WE Station comprises five generation units with a total generation capacity of 10MW, which began operation in the first quarter of 2020. The second phase of the project has added two more units, increasing the generation capacity by 4 MW to a total of 14 MW, which was completed in 2024.

Landfill Gas Generation Process



Zero-Carbon Energy

- CLP will explore ways to enhance regional cooperation on zero-carbon energy with the Government and identify sources of zero-carbon energy in neighbouring regions, including seeking joint investment and development opportunities for participating in and operating zero-carbon energy projects near Hong Kong.
- CLP signed a memorandum of understanding agreement with GE in 2021, exploring the use of the latest technologies to enhance local gas- fired power generation facilities for supporting the usage of low-carbon fuels such as hydrogen.

7 ENERGY MANAGEMENT

Helping Customers with Energy Efficiency and Conservation (EE&C)

- **CLP is firmly committed to energy efficiency and conservation.** We encourage our residential and business customers and the Hong Kong community to use energy more efficiently. We provide tools and organise activities for residential customers to raise their environmental awareness and change their energy consumption habits. On the other hand, we have introduced a series of measures for business customers to help them reduce energy use and save costs in their operations, hence accelerating their decarbonisation journey, and together creating a greener and smarter city.

Helping Residential Customers in Energy Saving and Carbon Reduction

Smart Meter

- CLP has been gradually replacing or installing smart meters for customers since late 2018. Customers who have connected smart meters can enjoy a variety of new and convenient services through the CLP App and website, including projected consumption, unusual consumption alert, daily or hourly consumption data. With these consumption data, customers are equipped to better manage their energy usage, and reduce energy use.

Save & Earn

- Apart from helping customers manage energy usage, **Domeo Points** will be offered to customers who are able to save energy, adopt eServices, and participate in Power Connect activities for redemption of smart gadgets and energy efficient appliances at the **Domeo eShop**, so as to encourage customers to reduce carbon emissions and save energy.

- Since April 2020, CLP invited some residential customers with smart meters to join the **Summer Saver Rebate Programme**. Customers who meet energy saving targets on specific days during the peak period can earn Domeo Points for redeeming gifts. Nearly 70% of the participating households successfully saved electricity during the event period in 2024.

Helping Business Customers in Enhancing Energy Efficiency

Energy Audit Services

- CLP has been conducting **Energy Audits** for business customers since the 1990s. It is a free service helping businesses to save energy and operating costs. Our engineering staff carry out energy system performance analysis at customers' premises to identify Energy Management Opportunities and propose energy saving solutions.

- Under the current SCA, CLP increases the number of energy audits it offers to business customers from 150 to 600 a year, with total electricity saved expecting to reach 48GWh each year.

Eco Building Fund

- **Eco Building Fund** was first set up in 2014 to help residential building owners to carry out energy efficiency improvement works in the communal areas. Under the current SCA, its scope has been extended to cover commercial and industrial buildings as well, and its funding has been increased five-fold to HK$100 million a year to subsidise about 400 buildings. On top of lighting and air-conditioning systems replacement, the upgraded fund will also support retro-commissioning projects and the use of smart technology.

Electrical Equipment Upgrade Scheme

- CLP **Electrical Equipment Upgrade Scheme** aims to subsidise business customers, in particular small and medium enterprises, to replace or upgrade the lighting and air-conditioners to more energy-efficient models.

Retro-commissioning (RCx) Charter Programme

- Launched in May 2021, the programme provides business customers with RCx training courses to equip participants with practical knowledge. It encourages business and organisations to set up energy saving targets and implement with RCx works at their properties to enhance building energy efficiency in a highly cost-effective way.

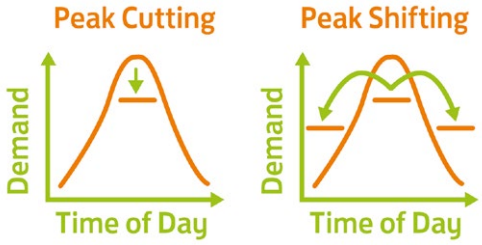
Smart Energy Online platform

- Equipped with smart meters and remote meter reading systems, large businesses are able to monitor and analyse their electricity consumption data of business premises or buildings through the one-stop energy management platform **Smart Energy Online**, which helps them manage energy usage and enhance operational efficiency.

Peak Demand Management programme

- CLP continuously promotes Demand Side Management measures to our customers, with an aim to reduce customers' and entire community's peak electricity demand to achieve energy efficiency through closer customer engagement. This will help defer the new investment in electricity infrastructure by the power companies.

- CLP has launched a **Peak Demand Management** programme since 2013 to encourage commercial and industrial customers to reduce electricity consumption during peak demand hours by offering incentives. This programme is especially suitable for Bulk or Large Power Tariff customers who have high energy demand. Participating customers can earn rewards if they successfully implement measures to reduce their electricity usage during peak demand hours when CLP gives them advance notice about anticipated specific hours of extremely high electricity demand.



Smart Energy Award

- CLP is committed to encouraging our customers to conduct their business in a greener way and participate in Hong Kong's low carbon transformation. In 2018, we launched the **Smart Energy Award** to recognise businesses and organisations for their outstanding performance in applying innovative solutions to reduce energy use and improve efficiency, with hundreds of organisations participating each year.

Deepen Cooperation with Various Industries to Promote Low-carbon Transformation

Sustainability-Linked Loans

- To accelerate the pace of energy conservation and emission reduction in the commercial and industrial sectors, and support the development of the green finance ecosystem, CLP has been providing energy audits services and formulating energy management solutions for businesses since 2022. Those suggestions were accepted as sustainability performance targets for their application for a sustainability-linked loan, supporting the businesses to secure loan to drive expansion in a sustainable way. CLP has so far helped customers from different industries to obtain more than HK$2.3 billion in sustainability-linked loans.

Electrification of Residential Buildings

- CLP has in recent years supported and encouraged property developers and property management industry to promote low carbon property developments as well as 'All-Electric Homes'. We introduce innovative energy-saving technologies and energy-efficient appliances such as induction cookers and water heaters to property developers for improving the premises' energy efficiency. We also provide support for installing solar panels and EV charging facilities at the buildings, with an aim to reduce carbon emissions and support the transformation of Hong Kong into a low-carbon smart city.

- In 2023, CLP collaborated with Hong Kong Housing Society (HKHS) to drive decarbonisation and sustainable lifestyle through raising residents' understanding on the benefits of 'All-Electric Homes', smart and safety tips on energy use. The elderly housing projects under HKHS's Senior Citizen Residences Scheme, including Blissful Place, adopt an 'All-Electric Homes' design to allow the residents to use energy in a smart, safe and environmental way.

- The advantages of 'All-Electric Homes':
  - Induction cooking's energy cost is lower than that of gas cooking
  - High energy performance appliances help enhance energy efficiency at homes
  - Smart meters and CLP App enable residents to better manage their electricity expenses
  - Enable residents to adopt a low-carbon lifestyle

Promoting Adoption of All-Electric Cooking by Catering industry

- CLP has always been providing professional advice to the catering industry to enhance its operational efficiency. In 2023, we commissioned the City University of Hong Kong to analyse the energy efficiency of commonly used electric appliances in Chinese restaurants, including electric steam cabinets, induction woks, and induction stoves. The results show that the energy efficiency of the three electric appliances is superior to traditional cooking appliances. In addition to improving operational efficiency, electric cooking has lower energy cost, contributing to reduction in operational costs in the long run.

- An all-electric kitchen also helps lower the kitchen's temperature and improve the working environment. In 2023, CLP organised the inaugural "Low Carbon Legacy ▪ All Electric Professional Cooking Competition" to promote low-carbon electric cooking to the industry, which received tremendous support from the industry.

Battery Energy Storage System

- Diesel generators were traditionally used to provide power supply for equipment at construction sites. CLP promotes electrification and encourages the industry to switch to battery energy storage system (BESS) to protect the environment and reduce carbon emissions. The BESS, which operates without fuel and is more environmentally friendly than existing backup generators. CLP further developed a 'General Guideline on BESS Adoption for Construction Sites' which provides practical guidance for the industry on the installation, application, and maintenance of BESS.

- To help enhance the Hong Kong International Airport's energy efficiency and reduce carbon emissions, CLP introduced the city's largest BESS to the Airport Authority Hong Kong for storing electricity produced by the existing generators during routine testing. Currently, it is the largest emergency backup power supply system in Hong Kong.

- CLP looks forward to cooperating with more customers to further expand the adoption of BESS.

Supporting Commercial and Industrial Customers to Achieve Decarbonisation Goals

- CLP is committed to assisting commercial and industrial customers in low-carbon transformation at all levels, and has signed Memorandums of Understanding (MoU) with different companies to further strengthen our partnership in energy-saving and carbon reduction. CLP and Chinachem Group (Chinachem) signed a MoU to launch a wide range of new sustainability initiatives to help Chinachem decarbonise its premises, including using a pilot Energy Management System powered by 5G technology and big data analytics solution to predict and deliver precise cooling load at Nina Mall. CLP Power will also conduct energy audits on new development projects covering a prime cold storage and logistics facility in Kwai Chung, and on the new Tung Chung business hub which will include a green data centre, to identify further opportunities for decarbonisation.

- Also, CLP and Link Asset Management Limited (Link) have established a framework to collaborate on a variety of energy-saving and electrification initiatives, including improving the energy efficiency of Link premises, encouraging sustainable business operations among its tenants, exploring the feasibility of adopting battery energy storage systems on Link's construction sites, providing technical support to Link for electric vehicle charging systems to reduce carbon emissions. Additionally, we are exploring opportunities to provide energy solutions in the Greater Bay Area.

8 SAFETY IS OUR VALUE

Safety is our Core Value

- **Safety** is our **core value**. CLP aims to build individual, team and organisational capabilities and capacities that enable the prevention of harm to our people, our assets and the communities in which we operate. Stringent safety guidelines, including **Life Saving Rules** which serve to prevent serious incidents, are well in place and strictly enforced on CLP staff and contractors to ensure safety in all work processes and at all facilities.

- To ensure a safe working environment for CLP staff and contractors, we proactively conduct safety inspections and risk assessments to upkeep our safety performance and seek continuous improvement.

Safety Commitment

- **Total Involvement** — At CLP, safety is everyone's responsibility. All staff members of CLP are assigned with respective safety roles and accountabilities. We also actively engage with our contractors to drive their continued improvement in safety so as to upkeep safety performance across the board.

- **Safety Performance** — CLP has made every effort to prevent incidents and is working diligently in achieving world-class safety standard. We have possessed the certificate of ISO 45001:2018 Occupational Health and Safety Management Systems. CLP endeavours to maintain recordable injury rates well below industry average.

Safety Advocacy

- **A well-established Safety Management Framework** is in place to uphold the safety performance across CLP. Leading by example, a steering committee championed by top management has been established to formulate the company's safety policies, management systems, practices and programmes, in order to continually monitor and drive our safety performance for higher standards as well as cultivating a safety culture among staff and contractors. Designated safety teams are set up in every operation and business unit to promote safety in every aspect of our operation.

- The **Serious Injuries and Fatalities (SIF) Prevention Principle** was also introduced at CLP, emphasising the mitigation of potential hazards that pose significant consequence to personal safety.

- The **"See-it, Own-it, Fix-it"** campaign is implemented to inspire everyone to collectively identify and manage risks, with the goal of prevention of harm in our workplaces.

- Our colleagues and contractors apply the concept of **Situational Awareness** and the principle of **Risk Assessment** to enhance their risk awareness during the execution of work activities. To further enhance situational awareness, capability, responsibility and accountability at various levels of our staff and contractors, including managers, supervisors and front-line workers, **A Day in Life** safety culture promotion program was launched in 2023.

- **"Own-it" Approach** is adopted for contractor management to uplift our contractors' capability and commitment on safety. Contractors are expected to own their Safe Systems of Work (SSoW) and be responsible for their own health and safety. With more control being handed over to the contractors, they are enabled to leverage their respective expertise under our ongoing monitoring.

- A **"Prevention of Harm"** journey plan covering the following five pillars of our Health, Safety and Environment (HSE) improvement strategy has been implemented in CLP:

  - Building Capabilities
  - Rethinking Risks
  - Involving Our Stakeholders
  - Maintaining a Healthy & Engaged Workforce
  - Ensuring Environmental Sustainability

- As CLP is transforming to become a Utility of the Future, we strive to strengthen our capabilities as a **Learning Organisation**. Building the capabilities and capacities required to manage our current and emergent HSE risks is our principal focus. This is accomplished through capturing 'good saves', enhancing investigation capabilities and using learning teams to drive operational improvements and strengthen leadership capabilities.

- For strengthening our safety foundation and uplifting safety competency, CLP was accredited as the international licensed Training Provider to conduct the Institution of **Occupational Safety and Health (IOSH) Foundational Training** to different levels of staff.

Safety Incentive Scheme Recognition Ceremony 2023

- CLP appoints dedicated employees as our safety role models through the **Safety Champion Programme**, with aims of inspiring peer colleagues to strive for continuous improvement in safety and health.

- **Safety Family** culture, which emphasises on treating our employees, contractors and the public as family members, has been promoted in CLP to foster mutual care to each other's health and safety. Roles and responsibilities on safety have been clearly defined for implementation by different family members. Besides, CLP Power SHE (Safety, Health and Environment) Day is organised annually to promote safety family culture and safety awareness to the participants.

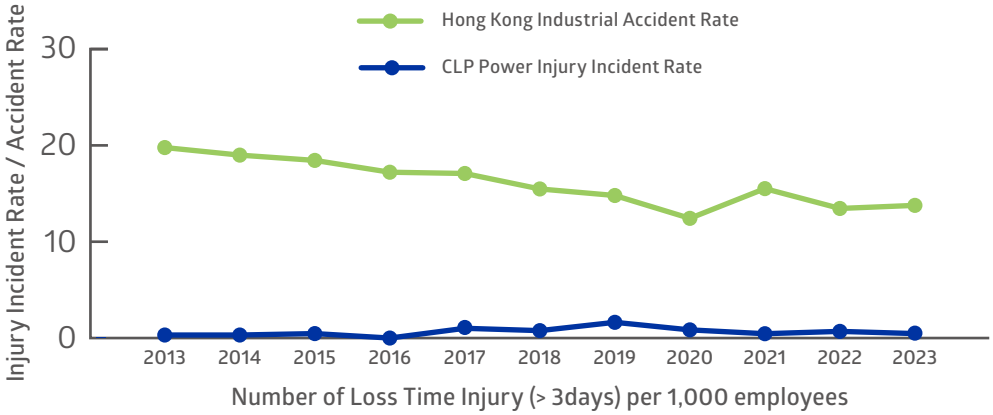
- **Safety Incentive Scheme** is one of the signature programmes to connect colleagues' safety effort with the community. The scheme encourages staff to implement safety processes. Their safety effort is eligible for accumulation of reward scores, which will then be converted into a sum of money for donations to local charities.

- CLP proactively participates and organises occupational health and safety seminars to keep the industry workforce abreast of the up-to-date health and safety knowledge, as well as providing a platform for sharing good safety practices with other utilities in the industry.

Safety Performance

- CLP achieves excellent safety performance, and our accident rates are far better than the average industrial accident rates of Hong Kong over the years.

Industrial Accident Rate of Hong Kong Industries and CLP (2013-2023)



Note: The Hong Kong Industry Accident Rate is sourced from Labour Department Occupational Safety and Health Statistics Bulletin, and information paper of Legislative Council Panel on Manpower on Hong Kong's Occupational Safety Performance in 2023.

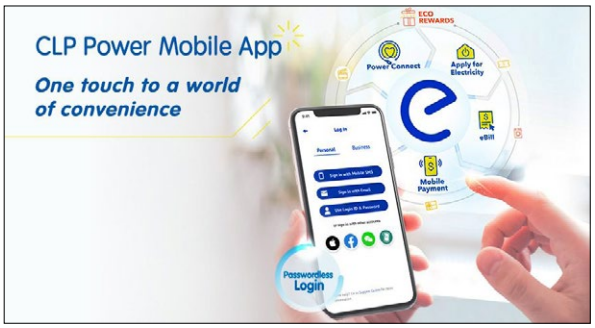
9 NEW GENERATION CUSTOMER EXPERIENCE

Improving Online-to-Offline Customer Experience

- We strive to be the trusted partner of our customers, creating bespoke experiences and empowering them with customer centric solutions. We offer greater convenience and benefits to our customers by integrating our online and offline service channels.

CLP App and CLP Website

- CLP launches a full array of refreshed and convenient e-services that customers can access at the **CLP App** and **CLP Website** anytime and anywhere.



Download the CLP App

App Store

Google Play

- Customers can login to their account easily using their mobile number, email address, Facebook account, Apple ID, WeChat or iAM Smart account, and start experiencing the CLP e-Journey to manage their electricity accounts. Customers can receive consumption and billing alerts, receive personalised energy saving recommendations and offers according to their electricity consumption and **Domeo** Points level, as well as connect and manage multiple accounts of their family members and companies at the same time.

- Customers can also participate in online and offline activities to earn points to redeem rewards, or purchase energy efficient home appliances at the **Domeo eShop** (See also Chapter 7 on **Energy Management**).

- Useful information including energy saving tips, locations of CLP Customer Service Centres, service hotlines, and information on nearby charging facilities for electric vehicles is also available at CLP App and CLP Website.

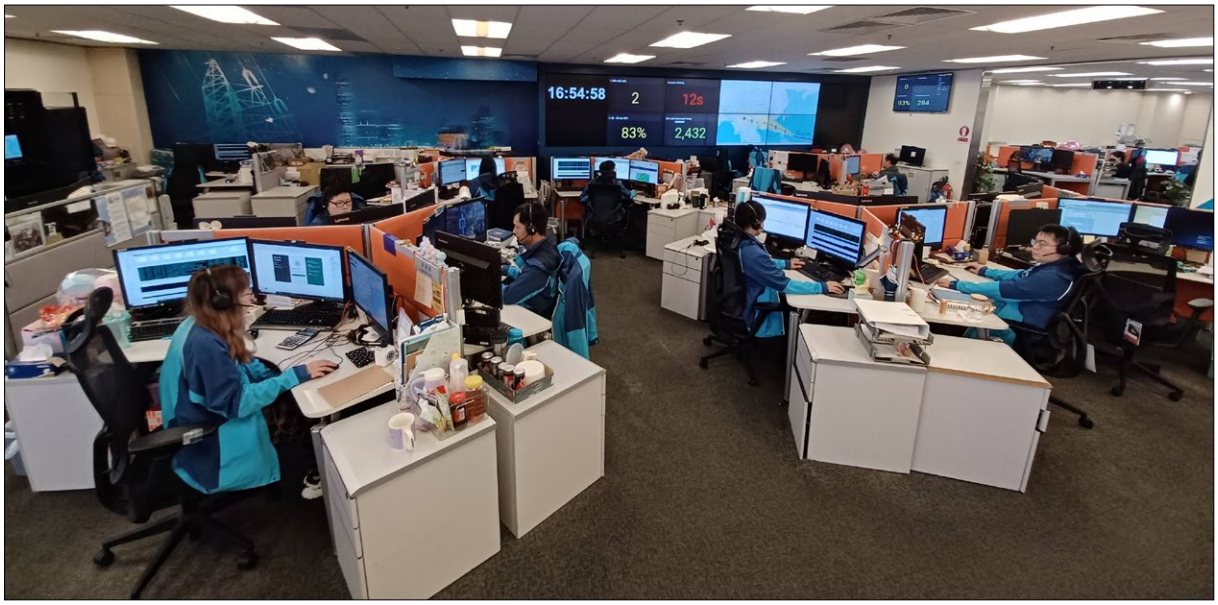
- Power Kid serves as our new digital ambassador on CLP App and CLP Website, handling general enquiries from residential and business customers in a chatbot format, including questions on application procedures of electricity accounts, billing and payments.

eBill Notifications and Mobile Payment Services

- **eBill notifications** will be sent to customers via CLP App and email, which not only reduces paper usage but also helps protect our environment. Customers can track their billing and payment history up to the past 14 months online, and sign up for receiving billing and payment alert via CLP App and website.

- Customers can settle their electricity bills instantly by AlipayHK, WeChat Pay HK, and mobile banking app with Faster Payment System QR code via CLP App.

- To enhance service flexibility, customers can use the eForm channel to deal with account matters, self-report meter reading, apply for renewable energy schemes, or enquire about energy saving products and services.



Enhancing Customer Experience with Cutting-edge Technology

- At the end of 2022, CLP's Customer Interaction Centre introduced a Data-driven Operation Model. Leveraging on machine learning algorithms and integrating big data analytics and artificial intelligence (AI) technology, the system analyses customer enquiry data in the past 5 years, and predicts the peak times, categories, and volume of customer enquiries. This helps the Centre flexibly allocate customer service manpower to enhance work efficiency and service quality.

Helping Senior Customers adopt Digital Technology

- CLP's Customer Service Centres regularly organise free 'Elderly Digital Classes', teaching elderly practical skills such as video calling with smartphones, as well as checking home electricity consumption, online bills and bus schedules.

Customer Service Hotlines

- A **Customer Service Hotline (2678 2678)** attends to customer enquiries related to their electricity accounts.

- A 24-hour **Emergency Hotline (2728 8333)** is dedicated to handling customer enquiries on supply interruptions, planned outages, voltage fluctuations, cable damages and dangerous wiring.

Customer Service Centres

- CLP's Customer Service Centres are conveniently located at Kowloon and the New Territories to meet different needs of residential and business customers.

Customer Service Centres	
Smart Energy@Mong Kok	▪ Smart Energy@Mong Kok is a five-storey building located in Mongkok. As CLP's flagship store, it showcases different technologies and smart products and promotes low carbon living and electric cooking.
Smart Energy@Kwun Tong	▪ Smart Energy@Kwun Tong provides an array of self-service technologies including the automated self-service machines which facilitate customers to apply for opening and closing electricity account, raise billing enquiries and update account information. The Grab & Go machines and Pay & Go lockers are also available to provide customers with a more flexible shopping experience.
Smart Energy@Yuen Long	▪ Smart Energy@Yuen Long aims to promote low-carbon, smart and green lifestyles. Customers can experience the CLP e-Journey by trying out various smart mobile services at the Centre, so as to get a taste of smart living. The Centre is also equipped with a kids zone, a pet-friendly zone and a pet cart parking area to provide customers with a more convenient and caring customer service experience.
Tai Po Eco Home	▪ Tai Po Eco Home brings smart yet green living ideas to the residents in the New Territories. The Centre is also equipped with a kids zone, a pet-friendly zone and a pet cart parking area to provide customers with a more convenient and caring customer service experience.
Sham Shui Po Customer Service Centre	▪ Sham Shui Po Customer Service Centre provides assistance to customers in managing their electricity accounts, as well as offers advice on energy efficient products, energy saving tips and product safety that improves their quality of life.

- Link to reference information: **CLP Customer Hotlines and Customer Service Centres**

Performance Pledges

- CLP is committed to providing our customers with the best quality service and value. We are continuously improving both our productivity and efficiency for the benefit of our customers.
- **We establish a performance pledge on a yearly basis, regularly assess and report our performance**. CLP's service excellence has been recognised by the community and a number of prestigious awards.
- CLP won 26 corporate and individual awards in the Hong Kong Customer Contact Association Award 2023, including the Greater China Contact Centre Alliance, 12 Gold awards, 8 Silver awards, 4 Bronze awards, and the Best Improvement Award.
- Also, the Customer Interaction Centre won 3 international awards at the Contact Center Association of Asia Pacific Regional Awards 2023 organised in Malaysia, including 2 Gold awards in the categories of Employee Engagement and Contact Centre Operations.
- In 2024, CLP team won 4 awards in the Customer Service Excellence Award 2023 organised by Hong Kong Association for Customer Service Excellence, including the Team Award – Counter Service, the Customer Care Award, the Young Star Award and the Individual Contact Centre Service Award.

- CLP strives to achieve the service targets pledged to our customers. The table below shows our 2024 targets and 2023 performance.

Performance Standards	2024 Targets	2023 Results
Reliability of electricity supply	>99.99%	✓
Notify customers 3 working days in advance of planned outage	>99%	✓
Average arrival time for loss of supply inspection	<28 minutes#	✓
Average supply restoration time after fault outage	<2 hours#	✓
Provide appointments for installation inspections within 3 working days	96.50%	✓
Carry out site investigations on consumption enquiries within 3 working days	98%	✓
Keep appointments to visit customers for supply applications within a 1.5-hour time slot	99.8%	✓
Connect and supply electricity within the same day after satisfactory installation inspection	99.98%	✓
Reconnect supply within the same day of payment of outstanding charges	95%	✓
Answer Emergency Service Hotline by Customer Service Officer within 20 seconds	90% of answering time	✓
Answer Enquiries Hotline by Customer Service Officer within 20 seconds	80% of answering time	✓
Average queuing time for customer service enquiries at Customer Service Centres	Within 3.5 minutes	✓

✓ Target met

Excluding incidents occurred during major events which are specified in the Scheme of Control Agreement.

Customer Engagement

- CLP understands the importance of listening to our customers, who can be from all walks of life, because their opinions can help us to continuously improve our services. In 1992, CLP formed a **CLP Customer Consultative Group (CCG)** with the support from the Consumer Council by inviting members from a wide spectrum of customers. CLP is the first-ever public utility company in Hong Kong to form a CCG. With the extension of the customer base and service variety, the number of CCG members has increased from 5 to 15.

- CCG's main purpose is to further enhance the relationship between CLP and its customers, improve services to customers, address the ever increasing demand of customers, and ensure that customer complaints are handled properly.

- Following the success of CCG, **CLP Local Customer Advisory Committees (LCACs)** were formed in 1994 to strengthen our connection with the community. Members of the LCACs consist of representatives from different customer segments, including management professionals, resident associations, business owners of Small and Medium Enterprises (SMEs), community leaders and members of rural committees. Currently, there are 14 LCACs in CLP's supply area.

- Each LCAC meets periodically to offer advice on CLP's customer service, and collaborate with CLP in many community services. Over the years, this well-established communication channel between CLP and local communities has timely reflected the expectations from customers.

10 COMMUNITY COMMITMENT

Care for Our Community

- The success of CLP as a business is closely linked to the well-being of the community we serve. At CLP, we deliver reliable and safe electricity at reasonable tariff with minimal environment impact. We also **contribute positively to the community of Hong Kong**.
- Our community commitment initiatives focus on four areas: **community well-being, environment, education and development**, as well as **arts and culture**. We work closely with local NGOs and community groups to **identify evolving social needs** and to devise programmes that will have long-lasting impact.
- Over the years, we contributed our **skills, expertise and resources** in our community activities which have improved people's quality of life.

Our Flagship Programmes

CLP Hotmeal Canteens

- We are continuing our efforts in enhancing community well-being. In 2011, CLP launched Hotmeal Canteen, serving hot meals to the underprivileged at a nominal cost.
- CLP has partnered with **Po Leung Kuk** to provide CLP Hotmeal Canteen service in Sham Shui Po, Kwun Tong and Kwai Tsing. The Canteens provide nutritious hot meals at discounted prices to low-income families, unemployed people, and elderly people. The service also includes meals for people with special dietary requirements and conditions such as diabetes.
- To celebrate the milestone of providing over 1 million hot meals to the community, around 3,000 free meals were provided for eligible beneficiaries of CLP Hotmeal Canteens in May 2023. A total of more than 1.1 million hot meals had been provided to the community as of June 2024.
- CLP volunteers regularly serve up meals to diners at the canteens and organise special themed activity day to encourage Canteen users to take part in physical exercises, handicraft workshops and social activities, delivering warmth and care to the community.

- During the pandemic, the Canteens continued to respond quickly and flexibly to provide dine-in and takeaway meals, as well as delivery services for people in need. More than 5,500 free meal coupons and emergency food packs were also given out which enabled beneficiaries to enjoy nutritious hot meals.

- Through CLP's own publicity channels, such as CLP website, bill insert and CLP eBill, the Hotmeal Canteen programme has been well received with strong public support, generating **more than HK$10million** in donations from customers and members of the public as of June 2024.

Caring for the Elderly

- CLP launched the **Sharing the Festive Joy programme** in 2014, inviting single elderly people/ elderly couples and people in need to spend the festivities such as the Tuen Ng Festival, Mid-Autumn Festival and Senior Citizen's Day with CLP volunteers to show our care and spread messages on energy efficiency and safety. During the pandemic, CLP hosted online events to celebrate festivals with the elderly through video conferencing and also prepared goody bags for beneficiaries. CLP volunteers also took the elderly on walks in Tsim Sha Tsui and showed them the beautified distribution boxes and substation to help them understand the relationship between electricity and the community.

- In 2023, an enriched version, **Sharing the Festive Joy – Fun4Infinity**, was launched which provided digital classes for the elderly to learn common mobile applications and opportunities for application in their daily life.

- In 2024, the programme celebrates its 10th Anniversary with the theme of "Upcycling". A series of workshops with talks were organised for elderly to learn how to turn used clothes into daily necessities, and the concept of waste reduction at source and upcycling, encouraging them a life-long learning. To date, CLP volunteers have celebrated festivals and shared energy-saving tips with more than **20,000 elderly people and the grassroots.**

Promoting Energy Conservation in the Community and Providing Assistance to the Disadvantaged

- CLP is committed to promoting energy efficiency and conservation to our residential and business customers through **public education, community programmes** and **subsidy programmes**; and at the same time, CLP is devoted to offering assistance to the disadvantaged and low-income families.

- Under the current Scheme of Control Agreement, a **CLP Community Energy Saving Fund** began operations in 2019. It is funded by 65% of the incentives earned by CLP from achieving energy saving targets.

CLP Community Energy Saving Fund

- CLP allocated more than HK$200 million from the **CLP Community Energy Saving Fund** (CESF) to roll out a series of community support programmes in 2024 to support underprivileged people, promote the development of renewable energy, encourage the community to save energy and reduce carbon emissions, and boost the economy. The key programmes include:

  - Launching the **CLP Electricity Subsidies for the Underprivileged Families Programme** to provide electricity subsidies of HK$600 to 50,000 eligible households, including single elderly people and elderly couples aged 65 years or above, low-income families, and people with disabilities, as well as electricity subsidies of HK$1,000 to 20,000 tenants of subdivided units (SDUs).

  - Continuing the assistance for tenants of SDUs and families in transitional housing, including conducting rewiring works for the installation of individual electricity meters to improve the safety and living conditions of the tenants referred by community partners. As at end of June 2024, a total of 334 households from 101 subdivided units benefited from the scheme. In addition, subsidies of HK$2,000 were provided to each of 2,000 families in transitional housing for purchasing energy-efficient electrical appliances.

  - Subsidies were provided to equip Community Living Rooms with energy-efficient electrical appliances and education resources relating to energy saving and conservation in support of the Government's Pilot Programme on Community Living Room to help tenants of SDUs.

  - Launching the **Home Electrical Safety Enhancement for the Underprivileged Programme** to arrange qualified electricians to inspect and repair fixed electrical installations in the homes of 2,000 elderly people, ethnic minorities households, low-income families, and people with disabilities.

  - Organising the **CLP Retail and Catering Coupons Programme** for the third time and providing coupons worth a total of HK$100 to each of around 580,000 households, including residential customers with low levels of electricity consumption and elderly customers receiving tariff concessions.

  - Continue encouraging customers to save energy year-round through the **CLP Power Connect Programme**.

- Continue running the **Students E-learning Assistance Programme** to support the e-learning needs of students. Since its launch, e-learning devices such as tablets, laptops and data SIM cards, were distributed to about 3,100 primary, secondary schools and tertiary students from underprivileged families.

- Continuing the **Electrical Equipment Upgrade Scheme** to provide subsidies for commercial and industrial customers, particularly small and medium-sized enterprises, to install or replace more energy-efficient electrical equipment such as lighting and air conditioning systems to improve their energy efficiency and reduce their operating costs.

- Launching the **CLP Solar Grant Programme** to subsidise schools and non-governmental organisations for the purchase and installation of solar energy systems, enhancing young people's understanding of renewable energy and the importance of combatting climate change.

Alleviating Tariff Pressure

- **Energy Saving Rebate Scheme**: An energy saving rebate CLP has been providing to low-consumption customers since 2013. Residential and SME customers consuming 400 units or less per bill are eligible to enjoy the rebate.

- **Concessionary Tariff for the Elderly**: A rebate CLP provides to eligible elderly customers aged 60 or above who live either alone or with other similarly qualified elderly, and who are relying on or entitled to Comprehensive Social Security Assistance. They can enjoy half-price for the first 400 units of electricity consumed in each two-month billing period plus an exemption of the minimum charge per bill.

Know more about CLP's other community programmes launched in the past years

CLP Volunteer Team

- Employee involvement is a very important part of the success of our community projects. The **CLP Volunteer Team** is one of the largest corporate volunteer teams in Hong Kong. It was **initiated in 1994** by a group of frontline staff who provided free rewiring services to underprivileged elderly people. Today, it comprises **more than 1,800 employees and retirees along with family members and friends**. Senior CLP executives have lent their enthusiastic support to the team and actively participated in the volunteer services. CLP also encourages staff to bring their family and friends for volunteering work, encouraging more compassion in the community.

- CLP volunteers provide support to the community initiatives led by CLP and other organisations. These initiatives include:

  - Conducting rewiring work for the elderly;
  - Regular visits to the elderly with early symptoms of dementia;
  - Knitting scarves for people in need;
  - Cleaning up beaches to protect marine ecology;
  - Participating actively in the CLP community programmes, including CLP Hotmeal Canteens, Sharing the Festive Joy Programme and Power Connect Programme ;
  - Organising homework tutorial classes and career experience activities for students with special educational needs;
  - Organising workshops on electrical safety and energy efficiency, caring visits, stargazing camps and a range of other activities for people in need;
  - Donating second-hand laptops and organising computer training and cyber security workshop to underprivileged students;
  - Participating in fund-raising activities for NGO partners, such as night walk, charity run, and city orienteering race.

CLP volunteers share basic computer knowledge and cyber security with students from underprivileged families in workshop.

CLP volunteers joined with elderly and youth to beautify the CLP Power substation in Shek Kip Mei.

- We also actively provide training to our volunteer teams' leaders. By inviting experienced social workers from NGOs to give talks, our leaders are able to learn more about the social trends and demands. It helps them devise volunteer programmes that meet the social needs.
- We encourage our employees to take part in volunteering work. Employees can apply for a one-day **Wellbeing Leave** for community service rendered during a normal working day to participate in projects run by the Company or recognised voluntary service organisations.

Year of Award	Key Social Performance Awards Received by CLP	Organiser(s)
2024	▪ Outstanding Corporate Award in the Hong Kong Volunteer Award 2023 ▪ Hong Kong Volunteer Award 2023 — Corporate (Volunteer Hours) Sliver Award	Home and Youth Affairs Bureau and the Agency for Volunteer Service
2022–2024	▪ 20 Years Plus Caring Company Logo	The Hong Kong Council of Social Service
2022	▪ Outstanding Corporate Award in the Hong Kong Volunteer Award 2022 ▪ Hong Kong Volunteer Award 2022 — Corporate (Volunteer Hours) Gold Award	Home and Youth Affairs Bureau and the Agency for Volunteer Service
2022	▪ Jockey Club Age-friendly City Partnership Scheme 2022 Logo	The Hong Kong Jockey Club Charities Trust
2022	▪ Excellence in Construction Industry Volunteering Collaboration — Gold Award ▪ Excellence in Construction Industry Volunteering Project — Merit Award ▪ Most Supportive Organisation	Construction Industry Council

Year of Award	Key Social Performance Awards Received by CLP	Organiser(s)
2021	▪ Excellence in Construction Industry Volunteering Project — Gold Award ▪ Excellence in Construction Industry Volunteering Collaboration — Bronze Award ▪ Most Supportive Organisation ▪ First-Time Participation Award	Construction Industry Council
2021	▪ Age-Friendly Appreciation Scheme 2020–2021 Gold Star Award	The Hong Kong Council of Social Service
2017–2021	▪ 15 Years Plus Caring Company Logo	The Hong Kong Council of Social Service
2019	▪ The 10th Hong Kong Outstanding Corporate Citizenship Awards (Volunteer Team Category) — Gold Award ▪ The 10th Hong Kong Outstanding Corporate Citizenship Awards (Enterprise Category) — Silver Award	Hong Kong Productivity Council Hong Kong Productivity Council
2018	▪ Age-Friendly Appreciation Scheme 2018–2019 — Gold Star Award ▪ The 9th Hong Kong Outstanding Corporate Citizenship Awards (Volunteer Team Category) — Bronze Award	The Hong Kong Council of Social Service Hong Kong Productivity Council
2017	▪ Friend of Social Enterprise Awards ▪ Metro Awards for Corporate Social Responsibility 2017	Home Affairs Bureau and Social Enterprise Advisory Committee Metro Daily and Metro Prosperity
2017 (Since 2007)	▪ Corporate Voluntary Team Award — Sing Tao Services Awards	Sing Tao Daily
2016–2020	▪ Gold Award for Volunteer Service (Organisation)	Social Welfare Department
2016	▪ Outstanding Contribution Award of the Partnership Fund for the Disadvantaged	Social Welfare Department
2015	▪ Grand Caring Award (Enterprise Group) — Corporate Social Responsibility (CSR) Recognition Scheme — Industry Cares ▪ The 6th Hong Kong Volunteer Award, Corporate Award	Federation of Hong Kong Industries Agency for Volunteer Service
2013–2016	▪ 10 Years Plus Caring Company Logo	The Hong Kong Council of Social Service
2013–2014	▪ Champion Award (General Corporate Group) of 2013–14 Best Corporate Volunteer Service Project Competition — Rewiring and Home Electricity Safety Service Programme ▪ Outstanding Award (General Corporate Group) of 2013–14 Best Corporate Volunteer Service Project Competition — CLP Green Volunteers for Seniors Programme	Social Welfare Department

Public Education and Youth Engagement

- We firmly believe in the importance of public education and knowledge sharing for the continuous development of our businesses as well as a sustainable future. Over the years, CLP has launched a host of educational initiatives, covering the entire education pathway, from kindergarten to primary, secondary and tertiary education. Our visitation facilities are open to public, guests including shareholders, government officials, Legislative Council members, professional groups, business counterparts, community leaders as well as students.

For Kindergarten Education

POWER YOU Kindergarten Education Kit and Related Outreach Activities

- In 2016, CLP launched a **POWER YOU Kindergarten Education Kit**. The electricity-themed education kit is an innovative public education initiative for kindergarten students that aims to spark interest among them in the work of electricity, to give them the basic knowledge about energy and teach them good habits in energy efficiency. CLP is the first commercial company in Hong Kong providing a comprehensive tool kit for 180,000 pupils of 1,000 kindergartens for free.

- In 2018, CLP introduced a new team of energy saving cartoon characters called **POWER FOUR**. Teamed up with Power Kid, the new characters are brainy Professor K, mischievous Lululu, and cheeky yy Boy. A series of **3D cartoon videos on the Power Kid Channel**, featuring their daily lives, was also launched to help young children explore the world of electricity and acquire energy saving knowledge in a fun and engaging way. A new episode of cartoon videos launched in 2024 to feature the waste reduction.

- In 2019, an updated Education Kit with enriched content was sent to around 1,000 kindergartens for free again. The updated education kit comprises storybook series with game sheets, hand and finger puppets to facilitate storytelling, a board game, stamp chops, a Cartoon MV and a theme song titled "Please Come and Save the Earth" as well as 3D cartoon videos on Power Kid Channel. The accumulated viewership of over 50 million has been recorded so far for the whole series of seven episodes.

- In 2024, CLP developed a new board game, **"Low-Carbon City Planner"**, and distributed it for free to around 1,000 kindergartens and over 500 primary schools in the new academic year. The newly-developed board game aims to teach young children the knowledge of energy conservation, low-carbon living, and waste reduction, so as to encourage them to apply the knowledge in their daily lives and build a sustainable low-carbon city. With the coding element, young children can develop logical thinking and problem-solving skills through playing the board game.

- **A Power Kid Mobile App**, an e-version of the Education Kit, was also launched to bring the education kit from school to home and to teach young kids on green knowledge anytime and anywhere. The App was awarded My Favourite Green Phone App at the U Green Awards 2020-21 organised by U Magazine. In 2022, the App was revamped and enriched with low-carbon elements.

Download the Power Kid Mobile App

- In 2020, CLP distributed around 200,000 pieces of POWER FOUR face shields with energy saving and anti-epidemic tips to kindergarten students in Hong Kong, protecting them from COVID-19 when classes resume and adopting green living under the pandemic.

- As an extended activity, CLP young engineers and graduate trainees started to visit the kindergartens from 2017 to introduce power generation journey, safe use of electricity, work life of engineers and energy saving tips. Over 50,000 children in over 650 kindergartens were reached out so far. In 2020 while the city was suffering from COVID-19 pandemic, CLP produced a visitation video with different versions to suit the needs of K1-K3 children, introducing the work of engineers, their personal protective equipment, power journey and energy conservation.

- In addition, CLP participated in Hong Kong Book Fair in 2018, 2019, 2022-2024, where the public learnt about energy saving and low-carbon lifestyle through fun and interactive games at CLP booth.

- In 2017, **Please Come and Save the Earth Music Contest** was organised to promote energy saving to the public. 170 teams and some 1,700 contestants from different nationalities, social backgrounds and ages were attracted to perform the theme song in very creative genres.

Know more about POWER YOU Kindergarten Education Kit and related outreach activities

For Primary School Education

Green Studio

- CLP **Green Studio** (GS) has toured round primary schools and local communities since 2009. The two Multi-purpose Vehicles (MPVs), draw public attention to climate change and spread green messages using different multi-media technologies including 4D movie, immersive cinematic experience and educational games.
- Equipped with a unique seagull-wing design and an open stage platform, the MPV2 can be transformed into a mobile service station, allowing visitors to experience CLP's latest products and services, and encouraging them to adopt a low-carbon living.

Know more about
Green Studio

Green Elites Campus Accreditation Programme

- With the aim of nurturing primary students to develop green living behaviour at an early age, CLP launched the Green Elites Campus Accreditation Pilot Programme and Green Elites Portal cum Award Scheme in the 2014/15 academic year. In the past decade, the programme was carried out in about 120 primary schools under Tung Wah Group of Hospitals, Po Leung Kuk, Sheng Kung Hui and Catholic Education Office in which all participated primary schools were accredited as Green Elites Campuses.
- The programme encouraged over 83,000 primary school teachers and students to apply green and low-carbon tips in their daily lives through checklists, student handbooks, teaching materials, visitations, talks and energy audits.
- To complement the programme, the green education portal continues to be the online platform for all students to learn about green and low-carbon habits through games and interactive content. The portal has been open to the public since September 2017.
- Under COVID-19 pandemic, CLP compiled online education materials on environmental protection for school teachers to facilitate their online teaching. In 2021, CLP launched animation cartoons under a new **Power Kid Channel Advanced Series** designed to teach primary school pupils about Hong Kong's fuel mix, electricity generation and the smart grid in a fun and interactive way. Each episode comes with complementary worksheet to deepen their understanding.

Know more about
Green Elites Campus
Accreditation Programme

Public Education

'Save Energy Today for a Low-Carbon Tomorrow' Webpage

- In support of the Government's goal of achieving carbon neutrality for Hong Kong before 2050, CLP launched a webpage titled **'Save Energy Today for a Low-Carbon Tomorrow'** in 2022 to raise public awareness of decarbonisation, highlight CLP's strategies and commitments, and encourage people to save energy for a carbon neutral future.

- The webpage contains four sections: 'Learn More About Decarbonisation', 'CLP's Decarbonisation Plan', 'Working Together for a Green Tomorrow', and 'How to Live More Sustainably'. It also offers a range of energy-saving tips to help people embrace a low-carbon lifestyle.

Know more about 'Save Energy Today for a Low-Carbon Tomorrow' webpage

CLP TomorroVerse

- CLP has launched a metaverse game platform, **CLP TomorroVerse**, to promote energy efficiency and electricity conservation messages to the digital-savvy new digital generation, while bringing an interesting game learning experience to the public. The world of CLP TomorroVerse leads people to explore a low-carbon lifestyle, and uses different tasks to encourage participants to contribute to environmental protection.

Know more about CLP TomorroVerse

'Understanding Nuclear Energy' Animated Video Series

- CLP develops a series of **'Understanding Nuclear Energy' animated videos** in partnership with the Nuclear Division of the Hong Kong Institution of Engineers. The videos aim to enhance understanding of nuclear energy in a simple and engaging way, helping the public and students to understand its importance in enabling Hong Kong to achieve its carbon neutrality goal.

- The four animated videos introduce the science of nuclear energy, covering nuclear power generation, radiation in daily life, how nuclear power helps address climate change and nuclear safety.

View 'Understanding Nuclear Energy' animated videos

Youth Engagement

- At CLP, we see engaging young people, from early teens who are in junior secondary education to undergraduates in tertiary institutions, as a key focus area of our community initiatives. Initiatives targeting this group, as they move along the education pathway, are launched with the objectives to stimulate early interest in power engineering, offer alternative career paths and opportunities for academic, vocational and professional education and training (VPET), so as to facilitate their career development and upward mobility.

Engineer in School

- CLP's Engineer in School programme was launched in 2016 to enhance junior secondary school students' understanding of the power engineering profession and inspire them to join the industry in future. Through visitations to CLP E-Playground and Daya Bay Nuclear Power Science and Technology Museum, school talks and STEM workshops, the programme wishes to increase students' knowledge in decarbonisation, environmental protection and energy conservation, and also to inspire their interests in engineering profession. Since its launch, the programme has benefitted over 71,000 students from around 190 schools.

Community Beautification Project

- CLP's Beautification Project is set out to connect art and technology with people and the community to aim for a greener and sustainable community together. By bringing a touch of contemporary art depicting local landmarks, culture and green elements by local design students and artists, the project aims to power up the community with bright colours, social connectivity and common goal for a greener future. Art tech is also applied in the distribution box design to enhance the interaction and engagement with audiences through Instagram filters. The project covers 14 districts of CLP's supply area in Kowloon, the New Territories and outlying islands.

- CLP has also teamed up with the local artists and NGOs to create the murals featuring local landmarks and green energy to beautify four substations on Haiphong Road, Hung To Road, Shanghai Street and Shek Kip Mei.

- The Community Power Journey for general public is also introduced in this Project. Through the appreciation of beautified distribution box and local landmarks, tour participants will be able to gain knowledge in electricity, energy conservation and local history and culture.

CLP supports CSD's Rehabilitation Programme

- CLP Power has supported the Correctional Services Department (CSD) 's rehabilitation programme in a holistic approach. Courses and career talks, job hunting workshop and experience sharing sessions are organised for more than 130 young people in custody to equip them with knowledge in power industry.

- Visitations, special internship programme and employment opportunities were also offered for the teens to assist them in planning for their career and reintegrating into the society.

- CLP Power was presented with an Outstanding Rehabilitation Partners Award by CSD which recognised CLP Power for providing rehabilitation opportunities to young people in custody and helping to build a more inclusive and harmonious society.

The Strive and Rise Programme

- CLP supports the Government's Strive and Rise Programme for a consecutive two-year by nominating CLP colleagues, including graduate trainees, young engineers and other representatives from various business units, to join the mentorship programme as mentors. The mentors are paired with junior form underprivileged students and provide them with advice on life and study via a wide range of activities including visits to CLP facilities.

Initiatives to Stimulate Interest in Power Engineering

- CLP set up a cable jointing workshop at **St. James' Settlement Career Sparkle Centre** in 2018. The workshop aims at giving senior secondary students the first-hand experience on the craftsmanship of power industry and inspiring their interest in the power industry to help promote the engineering careers. Our workshop received around 20,200 visitors since its opening in September 2018.

- In collaboration with the Hong Kong Federation of Youth Groups, CLP has been the Energising Partner of the **CLP Energy for Brighter Tomorrows Award** for six consecutive years since 2018. CLP each year awarded scholarships to 20 secondary students who have overcome adversity in life, remained positive and dedicated to driving a better future. The awardees also joined a year-long mentorship programme in which guidance by CLP mentors was provided for the awardees' further growth and development.

Initiatives to Introduce Power Engineering as a Career of Choice

- CLP actively collaborated with industry, community partners and NGOs in various programmes and reached out to more than 80,000 students, introducing power engineering as a career of choice and training opportunities in the industry. These programmes include:

  - **Hong Kong Trade Development Council Education and Careers Expo** – CLP joined hands with the other 18 members of the Hong Kong Electrical and Mechanical Trade Promotion Working Group (the Working Group) to showcase the electrical and mechanical (E&M) industry, highlight CLP's training programmes and recruit technical trainees for CLP.

  - **E&M Go!** – CLP initiated and co-organised the E&M Go! function with the Working Group from 2017 onwards, to welcome new recruits of young entrants to the E&M industry, and at the same time reinforcing the opportunities as a professional and skilled workforce.

Opportunities for Vocational and Professional Education and Training

- **CLP Power Academy** has become an important building block for CLP's youth engagement framework since it was established in 2017. It expanded CLP' s well recognised and structured internal training programme to the E&M industry. It aims to become the leading vocational- based academy for power engineering, bridging the gap between career training and higher education, providing industry practitioners with the necessary professional and accredited qualifications, paving way for their career advancements. It also provides an alternative runway for youths with the necessary vocational and professional education and training (VPET) path. In collaboration with various tertiary institutions, CLP Power Academy offers a complete articulation pathway from Diploma to Professional Diploma, Bachelor's Degree and Dual Master's Degree in the electrical and mechanical engineering aspects in part-time mode.

- The Academy will continue to explore opportunities to launch more professional training programmes, as well as training programmes specially for power engineering talents to work in the Greater Bay Area.

CLP Internship Programme and Scholarships for Tertiary Students

- To identify and nurture new talents for the company, CLP Internship Programme offers full-time training for tertiary students studying different disciplines during the summer vacation or for a 12-month period. Moreover, CLP offers a number of scholarships every year to outstanding engineering students from local tertiary institutions, and provides opportunities for some of the scholarship awardees to join the CLP Internship Programme and experience the work life of engineers.

- See also Chapter 11 on **People Development**.

Our Key Visitation Facilities

- CLP offers a wide range of exhibition and education facilities to share knowledge with the public and provide value-added services to customers. Members of the public are welcome to visit these facilities and interactive platforms, to learn about CLP's energy business, fuels, and energy efficiency.

- For more information on visitation facilities: **Visit to CLP**

CLP Power Low Carbon Energy Education Centre	▪ CLP has sponsored the City University of Hong Kong to set up a **CLP Power Low Carbon Energy Education Centre** on campus, where visitors can learn about the importance of low-carbon energy in addressing the challenge of climate change. Various exhibition zones are connected by an innovative array of multimedia and interactive elements, illustrating the complex scientific concepts and generation principles of different kinds of energy in an interesting and vivid manner. The Centre provides free onsite or online guided tours and a variety of educational activities to offer visitors an inspiring and enlightening learning experience.
Power Quality Workshop (Workshop closed for renovation until further notice)	▪ It provides a better understanding of the vital issue of power quality to the industry and corporate customers. Exhibits and interactive games that illustrate the causes of voltage dips and harmonic distortions, the corresponding potential impacts on electrical equipment and mitigation measures are featured.
CLP Pulse	▪ The CLP clock tower was built in 1940 and served as the CLP headquarters for more than seven decades. This landmark architecture was named as a Grade One historic building in 2018. The building has been revitalised to become **CLP Pulse**, showcasing the intertwined history of Hong Kong's electricity development and the Kadoorie Family. The iconic building has been turned into a cultural hub with three themed exhibitions. "ElectriCity" details the development of Hong Kong's electricity supply, Our Home · Our History tells the story of the Kadoorie family, and Traces of Human Touch curated by the Intangible Cultural Heritage Office showcases a number of local intangible cultural heritage items. CLP Pulse also features a host of multimedia features and experiential activities for the public to enjoy and learn our history and culture, sustaining its decades-long bond with the Hong Kong community.
Green Studio	▪ Green Studio tour welcomes primary schools and community organisations to experience the green adventure and learn more about environmental protection, climate change and energy conservation. Booking available and free of charge.

Know more about
CLP Pulse

11 PEOPLE DEVELOPMENT

People-first

- CLP Power Hong Kong Limited employs 4,101 staff members in Hong Kong (as of December 2023). As the energy market pivots to a low-carbon and digitalised future, CLP is committed to developing a diverse and inclusive workforce that is skilled for the future.

- CLP has a clearly-defined company policy towards people development and invests constantly in **training and development** to equip staff members with skills and knowledge in areas covering power engineering, digital technologies, safety, business ethics, and leadership, allowing them to perform well in their current roles and nurturing talents for the power industry.

- CLP's commitment to people development is well recognised in the Randstad Employer Brand Awards. CLP has ranked among the top three since 2015 and was voted as the Most Attractive Employer in Hong Kong in 2016, 2018 and 2019. CLP was recognised as one of the world's 12 most attractive employers in 2019 and was inducted in the Global Hall of Fame for 2020/2021, becoming the first company in Hong Kong to receive this honour. Moreover, CLP has been continuously recognised by the Employees Retraining Board (ERB) as a "Manpower Developer" since 2010 for 10 consecutive years and was acknowledged as "Super MD" in 2020 (2020 to 2025).

- CLP makes dedicated efforts and continuous investment to promote knowledge management and an innovation culture. We are devoted to sustaining the specialised professional expertise of the power industry and encourage staff members to share their knowledge and experience. Our outstanding performance in this area is well recognised by the Global Most Innovative Knowledge Enterprise (MIKE) Award from 2018 to 2023. Competed with other outstanding international companies and institutions from Asia, Australia, New Zealand, and the Middle East, CLP was one of the award winners.

- CLP continuously promotes and practises a positive corporate culture that prioritises the well-being of staff. CLP cares for people and organises various activities to cultivate a happy workplace. CLP was recognised with relevant awards by different organisations in 2023 including the Elite Award in the "Grand Award of Employee Wellness - Organisational Category" at the HKiHRM HR Excellence Awards, "Grand Award of Employer of the Year" and "Gold Award of Best Corporate Wellbeing Programme Award" by CTgoodjobs Best HR Award, "Recognised Company" by InspiringHK Sports Foundation's SportsHour Company Scheme and its "Best Practice Showcase" award, "Happy Company 10 Years+ Award" by "Happy@Work" co-organised by The Chinese Manufacturers' Association of Hong Kong and Promoting Happiness Index Foundation, as well as "Company Award" and "CHO Back to Normal Workplace Award" by The Chief Happiness Officer Association.

- CLP Group Provident Fund Scheme has been awarded by Asia Asset Management for "Hong Kong Best ORSO Scheme" and "Hong Kong Best Member Communications" awards since 2019 and 2020 respectively to acknowledge CLP's commitment to employees' retirement benefits.

- CLP has won the following engineering awards for its outstanding performance in power expertise:

Year of Award	Project / Expertise Area	Award / Recognition	Organiser
2023	Shing Kai Road Substation	▪ Final Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2023	Ma Sik Road Substation	▪ Provisional Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2023	Kwu Tung North Substation	▪ Asian Power Awards 2023 Silver Award in Transmission and Distribution Project of the Year	Asian Power Awards
2023	Distributed Energy Resource Management System Project	▪ Asian Power Awards 2023 Smart Grid Project of the Year – Hong Kong	Asian Power Awards
2022	Ho To West Substation Kwu Tung North Substation Tuen Mun Eco Park Substation	▪ Provisional Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2022	Ho To West Substation	▪ Asian Power Awards 2022 Gold Award in Transmission and Distribution Project of the Year	Asian Power Awards
2022	New gas-fired generation unit D1	▪ Final Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2021	Hong Kong-Zhuhai-Macao Bridge Substation	▪ Final Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2021	Ma Sik Road Substation	▪ Asian Power Awards 2021 Silver Award in Transmission and Distribution Project of the Year	Asian Power Awards
2021	New gas-fired generation unit D1	▪ Asian Power Awards 2021 ◆ Gold Award in Gas Power Project of the Year ◆ Gold Award in Flexible Gas Power Project of the Year ◆ Gold Award in Dual Fuel Power Plant of the Year ◆ Gas Power Project of the Year for Hong Kong	Asian Power Awards

Year of Award	Project / Expertise Area	Award / Recognition	Organiser
2021	Queen's Hill Substation	▪ Final Platinum Rating under BEAM Plus New Buildings V1.2	Hong Kong Green Building Council
2020	Shing Kai Road Substation	▪ Asian Power Awards 2020 Silver Award in Transmission & Distribution Project of the Year	Asian Power Awards
2020	Technician Trainee Career Development Programme	▪ Silver Award for Excellence in Training and Development ▪ Best in Career Development Award	Hong Kong Management Association
2019-2023	Knowledge Management	▪ Global Most Innovative Knowledge Enterprise (MIKE) Award 2018-2023 ▪ Top Winner of Hong Kong Most Innovative Knowledge Enterprise Award 2022	Knowledge Management and Innovation Research Center of The Hong Kong Polytechnic University
2019	Pioneering First Retro-Commissioning Energy Saving Project for Hong Kong Public Hospitals in Asia	▪ Regional Energy Project of the Year Award for Asia-Pacific	Association of Energy Engineers (AEE)
2019	Queen's Hill Substation	▪ Asian Power Awards 2019 Gold Award in Transmission & Distribution Project of the Year	Asian Power Awards
2017	Hong Kong-Zhuhai-Macao Bridge Substation	▪ Asian Power Awards 2017 Gold Award in Transmission & Distribution Project of the Year	Asian Power Awards
2016	West Kowloon Cultural District Substation	▪ Asian Power Awards 2016 Silver Award in Transmission & Distribution Project of the Year	Asian Power Awards
2015	Kai Tak Cable Tunnel Project	▪ Asian Power Awards 2015 Gold Award in Transmission & Distribution Project of the Year	Asian Power Awards
2014	Chun Yat Street Substation	▪ Asian Power Awards 2014 Gold Award in Transmission & Distribution Project of the Year	Asian Power Awards

Internal People Development

CLP Power Learning Institute

- To meet the unique requirements of the power industry, CLP puts a particular emphasis on people development and skills transfer from one generation to the next. CLP established training school (now known as **CLP Power Learning Institute**) in 1966. Through systematic and practical training, it has since nurtured tens of thousands of engineering talents, who have gone on to play important roles and contribute to the power industry and Hong Kong's economic and social development.

- **CLP Power Learning Institute** has a wide range of world-class training facilities, providing training on power generation, transmission and distribution for engineering staff. It also provides non-technical training such as commercial, project management and leadership. Moreover, it provides training in big data, robotics, and coding to keep staff members abreast of the cutting edge of new technology, so as to further improve our service quality and operational performance.

- The Institute has a dedicated team to promote knowledge management and learning culture. In addition, the Institute coordinates the development of training strategy and delivery of training programme with an ultimate goal to uplift the standard of customer services and capabilities of our staff in the energy retail industry.

- Well-structured trainee programmes are provided to transform talented young people into seasoned technical experts. These programmes include:
  - Graduate Trainee Programme
  - Technical Officer Trainee Programme
  - Operations Engineer Trainee Programme
  - Technician Trainee Programme

- CLP also organises the annual Graduation Ceremony to strengthen the bonding with the trainees upon their completion of trainee programmes at CLP. The occasion aims at building a sense of belonging among the new joiners in working at CLP.

CLP trainees received their graduation certificates at the Graduation Ceremony upon completion of the trainee programmes.

Training Facilities

- The world-class training facilities at the CLP Power Learning Institute give our employees the opportunity for hands-on experience of the design, operation and maintenance of the power generation, transmission and distribution facilities.

On Power Transmission and Distribution

- The Institute is well equipped with training facilities on power transmission and distribution including the Electrical Fitting Workshop, Cable Jointing Workshop, Electrical Installation Workshop, High-voltage Equipment Operations Training Centre, Fault Simulator, Simulated Primary Substation, Distribution Overhead Lines Training Poles, Transmission Training Towers, etc.

- With a total area of 27,200 square metres, the Overhead Line Training School is the largest outdoor training venue of its kind in Hong Kong. The School has various transmission and distribution overhead line training facilities, allowing trainees to work and practice in a safe environment.

On Power Generation

- Located in our power station, the Mechanical and Electrical Training Workshop houses comprehensive facilities to enable trainees to be well equipped with not only electrical and mechanical skills but also electronic instrumentation techniques that are essential for the operation, monitoring and maintenance of huge and complex generators.

Application of New Technologies

- Keeping pace with the latest technology, the Institute introduces Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), Immersive Cave Automatic Virtual Environment (CAVE), as well as gamification tools, providing zero-risk and interesting training in a virtual environment simulating the real one.

- To improve learning experience, micro learning and digital learning are being used to enable anytime, anywhere learning and interaction with trainers through mobile devices.

Digital Graduate Trainee Programme

- CLP continuously drives its digital transformation and recognises the importance of introducing and cultivating relevant talents. The Digital Graduate Trainee Programme aims to attract young talents with potential to develop their digital technology career, in order to strengthen CLP's digital capabilities to implement new business solutions.

Caring for Our Employees

- CLP cares for our employees and provides them with a safe, healthy, and secure work environment that is free of discrimination or harassment on the basis of gender, physical or mental state, race, nationality, religion, age, family status or sexual orientation, ensuring everyone who works at CLP is treated fairly with respect.

Embrace Diversity and Inclusion

- CLP believes that a diverse workforce and an inclusive culture is important to our sustainable growth and innovation capability. Considering the nature of our business which is traditionally male dominated, CLP has set gender diversity as a priority to ensure a diverse workforce.

- The Diversity and Inclusion (D&I) Council reviews CLP team's progress in gender and racial diversity, and inclusion goals regularly. A gender affinity group has been set up to advocate for gender equality in the workplace, and provide insights to the D&I Council on issues related to gender diversity and inclusion.

- The company supports the career development of high potential female employees with diversified training programme to develop long-term career and take up leadership positions. CLP also sponsors young female engineers to attend the mentoring programme organised by The Women's Foundation where they can meet with female leaders from other industries and gain workplace experience and industry knowledge, allowing them to better plan for their career path.

Family-friendly Measures

- CLP has been implementing various family-friendly measures that help our staff achieve a healthy balance between work and life, including:

  - Implements flexi-hours, part-time working policy and working from home policy.

  - Provides various leave entitlements beyond the statutory requirements:

    - Wellbeing leave: one day (not statutory)
    - Maternity leave: 16 weeks (statutory 14 weeks)
    - Paternity leave: 10 days (statutory five days)
    - Marriage leave: five days (not statutory)
    - Adoption leave: 10 days (not statutory)
    - Auxiliary service training leave: five days (not statutory)

- Provides lactation room to support female employees continuing breastfeeding after returning to work.

- CLP Centenary Scholarship Programme has been established since 2001. After evaluation, children of employees with outstanding academic performance and whole-person achievements can receive scholarships. Starting from 2019, we have increased the quota for the children of our employees who are studying engineering at university or physics in high school, in order to encourage them to develop their interests and potential in related fields, while cultivating the next generation of talent for the power industry.

Care for Employee Well-being

- CLP launched a well-being programme named Boost that leverages various tools, activities and events to promote the physical health, mental wellness, social health and financial well-being of our employees.

  - Introduces health and well-being digital platform and app Virgin Pulse to encourage employees to create records and keep track of their own healthy habits;
  - Organises financial talks to provide personal finance and provident fund information;
  - Organises mental health first aid training programme to equip employees with the knowledge to identify early signs of mental health sickness and make appropriate interventions. CLP's efforts to prioritise employee mental health and provide support are recognised by Bupa and the Mental Health Association of Hong Kong, which named CLP a "MindCare Company" in 2022;
  - Organises various social, recreational and sports activities; and
  - Provides various facilities including staff canteen and fitness room.

Nurturing Power Talents

CLP Power Academy

- To support the sustainable development of Hong Kong and to meet the growing demand for power expertise, CLP Power Academy (the Academy) was established in 2017. Being a vocational-based academy for power engineering, the Academy bridges the gap between career training and higher education. It also serves as an important building block for CLP to engage the younger generation by providing them alternative pathways to join the power engineering industry. Various part-time accredited programmes are offered to facilitate industry practitioners in their career development and professional techniques. This also helps ensure an adequate supply of competent engineering employees for the local power industry.

- CLP Power Academy has been working in partnership with tertiary institutions, such as the Vocational Training Council (VTC), the Royal Melbourne Institute of Technology University, The Hong Kong Polytechnic University's School of Professional Education and Executive Development, The Hong Kong University of Science and Technology, the University of Strathclyde, and Guangzhou Industry and Trade Technician College to offer part-time accredited programmes, ranging from Diploma to Professional Diploma, Bachelor's Degree and Dual Master's Degree in electrical and mechanical engineering aspects. These programmes provide young people and industry practitioners multiple entry points to gain practical skills and to advance their career with a clear articulation path through continuous learning.

- At CLP Power Academy, classroom lectures are supplemented by practical sessions. Equipped with world-class training facilities and through applying the latest technologies such as Virtual Reality and Augmented Reality, the Academy gives students the opportunity for hands-on and practical experience of the design, operation and maintenance of different types of power facilities. Visits to power facilities and Work Experience programme are arranged to provide students with valuable experience of working in the power industry. The Academy also organises short courses periodically on Continuing Professional Development on generation and power systems.

- In view of the integration and development of the Guangdong-Hong Kong-Macao Greater Bay Area, the Academy signed a Memorandum of Understanding with the VTC and Guangzhou Industry and Trade Technician College in October 2021, which aims to provide professional electrical engineering courses, and Training Courses for High Voltage / Low Voltage Electrical Workers, to help local engineering talent in grasping career opportunities in the Greater Bay Area. After completing the course, students could take exam to obtain the Special Operations License (High-Voltage) or (Low- Voltage) from Mainland China for work. The first high-voltage and low-voltage training courses were commenced in July 2022 and April 2023 respectively.

CLP Power Academy 中電學院

Programme Overview

Programme	Partner
Diploma in Power Engineering / Certificate for Junior Electricians	▪ Vocational Training Council
Diploma in Infrastructure Engineering (Electrical & Mechanical) /Certificate for Junior Mechanics	▪ Vocational Training Council
Diploma in Power Installation	▪ Vocational Training Council
Professional Diploma in Power Engineering (Power Systems Stream / Power Plants Stream)	▪ Vocational Training Council
Professional Diploma in Engineering Studies (Mechanical)	▪ Vocational Training Council ▪ Royal Melbourne Institute of Technology University (RMIT)
Training Course for Low Voltage Electrical Workers	▪ Vocational Training Council ▪ Guangzhou Industry and Trade Technician College
Training Course for High Voltage Electrical Workers	▪ Vocational Training Council ▪ Guangzhou Industry and Trade Technician College
Bachelor of Engineering (Honours) in Electrical Engineering	▪ School of Professional Education and Executive Development at the Hong Kong Polytechnic University
Bachelor of Engineering (Honours) in Mechanical Engineering	▪ School of Professional Education and Executive Development at the Hong Kong Polytechnic University
Bachelor of Engineering (Mechanical Engineering) (Honours)	▪ Vocational Training Council ▪ RMIT University
Dual Master's Degree (MPhil & MSc)	▪ The Hong Kong University of Science and Technology ▪ University of Strathclyde, Glasgow

CLP Power Academy Brochure

Stimulate Interest in Power Industry

- CLP has launched various programmes to deepen young people's understanding and interest in the power industry, providing a talent pool for our sustainable growth.
- To enhance junior secondary school students' understanding of power engineering profession and strengthen their career and life planning, CLP launched the **Engineer in School** programme in 2016 through a series of activities including visitations to CLP E-Playground and Daya Bay Nuclear Power Science and Technology Museum, school talks, and STEM workshops.
- CLP also works with various community partners to stimulate young people's interest in the power industry. In 2018, a cable jointing workshop was set up at **St. James' Settlement Career Sparkle Centre**. Located at the centre's Engineering & Science Industries Experiential Area, the workshop enables senior secondary students to gain first-hand experience on the craftsmanship of the power industry.
- See also Chapter 10 on **Community Commitment** for other related programmes.
- CLP has taken steps to attract more females to join the power industry, including our Engineer in School programme and the Girls Go Tech Programme organised by The Women's Foundation. We send young engineers to secondary schools to deliver talks and organise activities, including power journey tour and job shadowing programme, with an aim to give students a chance to learn about the energy sector and the life as an engineer.
- Helps female university engineering students establish connections with industry professionals through the Female Engineering Students Mentoring Programme, hoping that the students can get ready and pursue their careers in engineering.

Academic Collaboration and Scholarships

- To nurture the development of human capital in the power industry, CLP has actively collaborated with local and overseas tertiary institutions.

- Locally, CLP has built long-term partnerships with tertiary institutions, and offers the **CLP Internship Programme** to identify and nurture new talents, and to attract potential students to join CLP when they graduate. The internship programme offers full-time training for students studying different disciplines either during the summer vacation or for a 12-month period.

- **CLP Engineering Studies Award** provides sponsorship and mentorship to outstanding engineering students for their final year studies and to identify them early to join CLP as Graduate Trainees upon their graduation.

- A number of **scholarships** are offered every year to outstanding engineering students at The University of Hong Kong (HKU), The Hong Kong Polytechnic University (PolyU), The Chinese University of Hong Kong (CUHK), The Hong Kong University of Science and Technology (HKUST), and City University of Hong Kong (CityU), as well as students who are studying electrical and mechanical engineering at the Vocational Training Council (VTC). Some of the scholarship awardees will join the CLP Internship Programme to experience the work life of engineers.

- To strengthen CLP's youth engagement work, CLP introduced the **CLP Award for VPET Students** from 2020 to 2023 to provide financial assistance to students who have financial needs and enrolled into designated vocational and professional education and training (VPET) programmes, with an aim to enhance their upward mobility and at the same time nurture young professional talents for the energy sector in Hong Kong.

- CLP also supported VTC to establish the **CLP Power Engineering Laboratory** at Haking Wong Campus of the Hong Kong Institute of Vocational Education in 2021. The laboratory is equipped with advanced smart grid and high voltage training facilities, including Real Time Digital Simulator and Power Hardware in-the-loop testing platform, where power engineering students would benefit in learning the latest industry technologies. It also offers EMSD-accredited programmes to the public for obtaining Grade H Registered Electrical Worker qualification.

- Since 2015, CLP has supported the VTC to develop and deliver an Applied Learning Course for Electrical and Energy Engineering, enabling senior secondary students to understand fundamental theories and practical application of relevant subjects through diversified learning activities. We have also offered a scholarship scheme and internship opportunities for the students.

- To motivate engineering students to become tomorrow's innovative global leaders and play a key role in the sustainable future of the community, CLP and HKU's Faculty of Engineering formed a 10-year alliance **"Powering a Sustainable Generation Scholarship"** in 2013. The scholarship scheme supports promising engineering undergraduates and helps them develop an international perspective through one semester of study in a prestigious overseas university. Selected students also have the opportunities to join CLP's internship programme and experience the work of the power industry.

- To widen the exposure of engineering students through the real working environment, CLP has started the **University Co-op Programme** with the Department of Mechanical and Aerospace Engineering of HKUST since 2016. Starting from 2019, the programme has been also extended to Chemical and Biological Engineering students. Selected engineering students can be offered a chance to work at CLP's power stations. After acquiring practical knowledge, many of the programme participants turned out to be successfully recruited as Graduate Trainees at CLP.

- CLP supported City University of Hong Kong in establishing a **CLP Power Chair Professorship in Nuclear Engineering**, which is the first of its kind among Hong Kong's higher education institutions with the aim to promote research excellence in the nuclear energy discipline, and to nurture more young engineering talents.

- Link to reference information: **CLP Training and Internship Programme**

12 CLP IN MAINLAND CHINA

Background

Huaiji Hydro Power Station, Guangdong

- CLP entered Mainland China's energy market in 1979 when it started providing electricity to Guangdong.
- CLP is one of the largest external investors in the energy sector in Mainland China, focusing on clean energy generation. CLP also takes the role of a developer, investor, project manager and operator. Our business includes renewable energy such as wind, solar and hydro, as well as nuclear, coal and energy storage.
- Currently CLP has over 50 projects in Mainland China, covering 15 provinces, autonomous regions and municipalities in eastern China (Jiangsu and Shanghai), southern China (Guangdong and Guangxi), south-western China (Guizhou, Yunnan and Sichuan), northern China (Beijing, Shandong, Hebei, Tianjin and Inner Mongolia), north-eastern China (Jilin and Liaoning) and north-western China (Gansu).
- Link to reference information:
  CLP in Mainland China

Our Operations

Renewable Energy

- CLP has undertaken to support the country's dual carbon goals through continued development of renewable energy projects, including wind, solar and hydro.
- CLP Xicun Solar Power Station and CLP Huai'an Solar Power Station adopt agrivoltaic model. By combining agricultural activities (plantation of honeysuckle flowers, fruits and vegetables in the solar farms respectively) with solar generation, the projects bring about multiple benefits including maximising land use, creating jobs for local residents and fueling the community with clean energy.

- CLP Sihong Solar Power Station and Yangzhou Gongdao Solar Power Station in Jiangsu adopts aquavoltaic model and uses its surrounding abundant local water supply to develop a fish farm underneath the photovoltaic panels, breeding crabs, crayfish and mandarin fish etc. The results have been positive and have provided job opportunities and income for residents.

- Qian'an Wind Farm in Jilin province, at 199MW, is the largest wind farm in CLP Group's wind portfolio and the first CLP project of its kind equipped with a battery energy storage system.

- As of June 2024, we had stakes in over 40 non-carbon energy projects in various parts of the country, with equity capacity of 5,085MW. The installed capacity of non-carbon energy accounts for around 70% of its total generation capacity on the Mainland.

- CLP is committed to providing green energy solutions by supplying the Power Purchase Agreement (PPA) and Green Electricity Certificate (GEC) to businesses and providing comprehensive support to customers in the pursuit of sustainability and environmental, social and governance (ESG) objectives.

Qian'an III Wind Farm, Jilin

Xicun Solar Power Station, Yunnan

Pumped Storage Power Station

- Guangzhou Pumped Storage Power Station was constructed in two phases and has a total installed capacity of 2,400MW.

- CLP wholly owns the Hong Kong Pumped Storage Development Company Limited (PSDC), which provides it with the contractual rights to use 600MW, equivalent to 50% of the power generation capacity of Guangzhou Pumped Storage Power Station Phase 1 until the year 2034.

- CLP uses this contractual pumped storage capacity to support the operation of the power systems in Hong Kong and maintain a reliable electricity supply.

Guangzhou Pumped Storage Power Station

Nuclear Power Stations

- CLP's first major expansion beyond Hong Kong was our joint venture with China General Nuclear Power Corporation to develop, build and operate the Daya Bay Nuclear Power Station (Daya Bay).
- Daya Bay is one of the earliest and largest projects launched under China's Open Door Policy and remains one of the most successful.
- Operation began in 1994 and the two pressurised water reactor (PWR) generating units now produce around 15 billion kWh of electricity per year, of which 70% is exported to Hong Kong as a start.
- To ensure more clean and cost-competitive energy is provided to Hong Kong, Daya Bay has increased its electricity supply to Hong Kong from 70% to around 80% of its output starting from late 2014.
- The acquisition of a 17% equity interest in Yangjiang Nuclear Power Co., Ltd. from CGN Power was completed in December 2017. Yangjiang Nuclear Power Station has added over 1,100MW (on a 17% equity basis) of non-carbon emitting generation capacity to CLP's portfolio. Yangjiang Nuclear Power Station is connected to the Guangdong power grid and supplies its full capacity to the electricity market in Guangdong.
- Yangjiang Nuclear Power Station comprises six pressurised water reactors with 1,086MW each adopting advanced CPR1000 technology. All of them are in commercial operation.

Daya Bay Nuclear Power Station

- Link to reference information: **Nuclear Energy — A Sustainable Choice for Powering the Future**
- See also Chapter 6 on **Cleaner Fuel Mix for Electricity Generation**.

Yangjiang Nuclear Power Station

Coal-fired Power Plants

- CLP first invested in coal-fired power plants in Mainland China in 1996. As of 30 June 2024, we had operations in 10 projects in Beijing, Hebei, Inner Mongolia, Liaoning, Shandong and Tianjin, with an equity capacity of over 1,700MW.

CLP Power Hong Kong Limited
中華電力有限公司

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