

中電資料冊

CLP INFORMATION KIT

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9. 2017

電子版的資料冊已上載於中電網頁：<https://www.clp.com.hk/infokit>
為方便讀者閱覽，我們在中電資料冊內，以附底線的藍色文字標示有用連結，提供進一步的網上資料。

Electronic version of this Information Kit is available on CLP website:

<https://www.clp.com.hk/infokit-EN>

To facilitate readers' navigation in the Information Kit, useful links to further information available online are marked in blue text with underline.

本資料冊以環保紙印製 This Information Kit is printed on environmentally friendly paper

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 116 years. It supplies highly reliable electricity to over 80% of Hong Kong's population.
- 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.



Facts and Figures *(2016 figures)*

CLP Power in Hong Kong

Year Founded	1901
Supply area	Kowloon, New Territories and most of the outlying islands
No. of customer accounts	2.52 million (as of 31 December 2016)
Population served	About 6.0 million
Total generation capacity	8,913MW
Total electricity sales	34,442GWh
No. of employees	3,808
Financial performance	SoC Revenue: HK\$37,223millions
Regulated by	HKSAR Government under the Scheme of Control Agreement

Generation Facilities

Castle Peak Power Station



Black Point Power Station



Penny's Bay Power Station



Guangzhou Pumped Storage Power Station

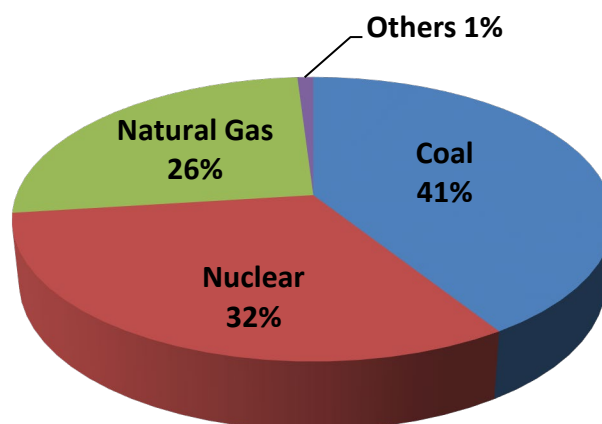


Daya Bay Nuclear Power Station



Power Stations	Since	Fuel Type	Generation/ Purchase Capacity (MW)	Remarks
Castle Peak Power Station	1982	Coal	4,108	Owned by Castle Peak Power Company Limited (CAPCO), in which CLP has 70% stake and China Southern Power Grid International (HK) Co., Limited has 30% stake
Black Point Power Station	1996	Natural Gas	2,525	
Penny's Bay Power Station	1992	Oil	300	
Daya Bay Nuclear Power Station	1994	Nuclear	1,380	Owned by Guangdong Nuclear Power Joint Venture Company Limited, in which CLP has 25% stake
Guangzhou Pumped Storage Power Station	1993	Hydro	600	CLP has the right of use of 600MW of Phase 1 through Hong Kong Pumped Storage Development Company Limited in which CLP has 100% stake

Electricity Output by Generation Fuel Type in 2016

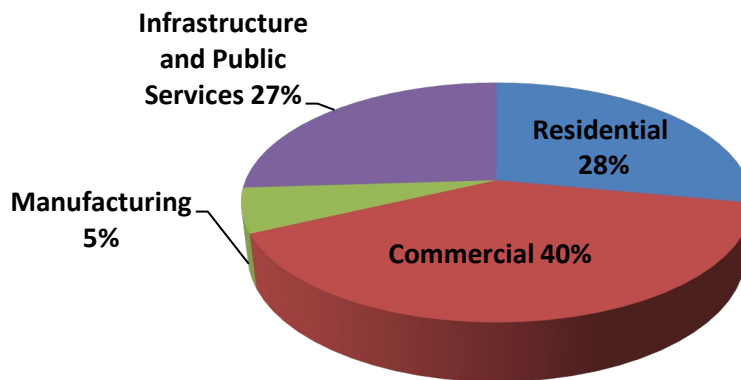


Transmission and Distribution

No. of primary substations	230
No. of secondary substations	14,254
Transmission and high voltage distribution lines	Over 15,200 km
Average network loss (five-year average)	4.1% of total energy consumption
Average unplanned Customers Minutes Lost per year (2014-2016)	1.48 minutes
Electricity supply reliability	Above 99.999%

Our Customers

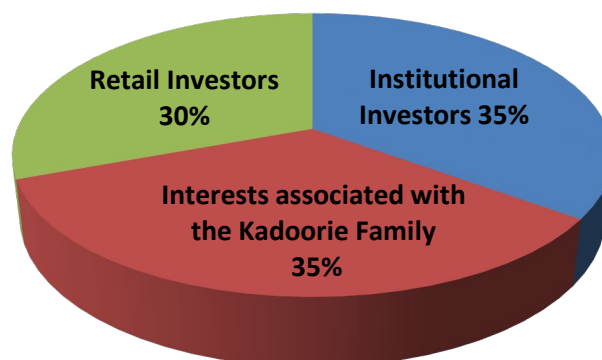
Customer Type as of Percentage in Total Local Sales in 2016



Our Shareholders

- CLP Holdings Limited had over 20,000 registered shareholders at the end of 2016. 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 (2016)



- 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 a relatively stable price appreciation over the past ten years and maintenance of a stable dividend stream.
- CLP attaches great importance to effective communications with shareholders through various channels. Our Annual General Meeting is well-attended by an average of about 1,352 shareholders each year in the past five years — an exceptionally high number for a Hong Kong company. Our Shareholders' Visit Programme, unique amongst Hong Kong Companies, welcomed about 36,100 shareholders and their guests (as of June 2017) to various CLP facilities since the programme was initiated in 2003.

SCHEME OF CONTROL AGREEMENT

What is the Scheme of Control Agreement (SCA)?

- CLP's 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/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 Government to monitor power companies' operating and financial performance. Operating performance covers supply reliability, operational efficiency, customer service and energy efficiency. Financial performance covers power companies' capital investment, operating expenditure, rate of permitted return and tariff adjustment.
- The first SCA was signed between CLP and the Government in 1964 for a 15-year term. The 15-year term continued to be adopted in the following agreements until the current SCA, which is the fourth one, came into effect in October 2008. The duration of the agreement is 10 years with an option for the Government to extend the SCA for another 5 years until 2023* or to introduce changes to the electricity regulatory framework at the end of that period.

* The Government did not exercise the option to extend the existing SCA for five years and signed a new SCA (from 1 October 2018 to 31 December 2033) with CLP Power in April 2017.

Key Terms in the Current SCA

Key Term	What it is?
Performance Targets	<ul style="list-style-type: none"> Performance targets of power companies are set for supply reliability, operational efficiency, customer services, energy efficiency and renewable energy development.
Basic Tariff	<ul style="list-style-type: none"> Basic Tariff is set at a level to cover the required operating cost (including a standard cost of fuel) and return. <i>(See also separate Fact Sheet on Electricity Tariff)</i>
Fuel Cost Adjustment	<ul style="list-style-type: none"> Fuel Cost Adjustment is either a surcharge or rebate to cover the difference between the actual cost of fuel and the standard cost of fuel collected through the Basic Tariff.
Fuel Clause Recovery Account	<ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> 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 alleviate tariff pressure.
Permitted Rate of Return	<ul style="list-style-type: none"> 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 existing SCA is 9.99%.

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	<ul style="list-style-type: none"> CLP has to submit a detailed 5-year plan to meet electricity demand for the development of Hong Kong. The plan, to be 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. Links to reference information: 2014-2018 Development Plan & 2014 Tariff Review Presentation 2014-2018 Development Plan & 2014 Tariff Review Information
Annual Tariff Review	<ul style="list-style-type: none"> CLP is required to submit to the Government a tariff proposal for the coming year before 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 currently approved level requires further approval by the Executive Council. The adjusted tariff will be effective from 1 January of the following year after Government's review. Links to reference information: 2017 Tariff Review Presentation 2017 Tariff Review Information
Annual Auditing Review	<ul style="list-style-type: none"> CLP is required to submit 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 technical and environmental performance.
Interim Review	<ul style="list-style-type: none"> A review is conducted every five years through the term of the SCA. Changes can be made by mutual agreement.

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 Hong Kong SAR Government conducted a [public consultation](#) on the future development of the electricity market in 2015 and received a total of 15,762 submissions. The majority of the respondents considered that the current 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 current SCA but the requisite conditions for introducing competition were not present at this stage.
- The Government decided not to exercise the option to extend the existing SCA (2008-2018). After detailed discussion and taking into account 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 Power signed the fifth SCA, in 15-year term, in April 2017. The new agreement will come into effect on 1 October 2018 and run until 31 December 2033.



New SCA (2018-2033)

- The new SCA is a fair and reasonable agreement achieved through the joint efforts of both the Government and CLP Power. Taking into consideration of the Government's long-term carbon reduction target for 2030 which requires gradual migration 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 electricity industry is capital intensive by nature and requires long-term investments which are often exposed to risks. In view of the rising interest rate trend as well as unpredictable global political developments, CLP Power's huge investment will be exposed to certain risks. Accepting a new rate of Permitted Return has signified CLP Power's commitment to continue working for the long-term benefits of Hong Kong.
- The permitted rate of return under the new SCA will be 8%. Customers will see benefits in tariffs when it comes into effect. The Fuel Cost Adjustment (FCA) in the total tariff will be revised more frequently under the new SCA to reflect changes in fuel prices in a more timely way and with enhanced transparency. As a result of more frequent adjustments, the balance of the Fuel Clause Recovery Account can be maintained at a lower level.
- The existing incentive and penalty scheme will continue to apply, but with more stringent performance targets on supply reliability and customer services. New performance targets on grid supply restoration will be introduced to enhance service levels.
- In support of the Government's environmental policy to address climate change, as well as meeting the public aspirations expressed during the public consultation on the future development of the electricity market, a series of new initiatives will be introduced under the new SCA to promote the development of renewable energy (RE), demand side management, enhance energy saving, and increase public education. A Feed-in-Tariff (FiT) programme will be introduced and Renewable Energy Certificates will be issued to encourage participation from various sectors of the community to support local RE development.
- Details of the new initiatives will be finalised starting from the fourth quarter of 2018. We will discuss with the Government and continue to engage and communicate with stakeholders to ensure that the new initiatives meet the expectations of our customers.
- Links to reference information:
[Scheme of Control Agreement \(2018 - 2033\)](#)
CLP Press Release: [CLP Power Signs Scheme of Control Agreement with Hong Kong SAR Government](#)

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

Areas of Refinement	New SCA (2018-2033)	Existing SCA (2008-2018)
Duration	<ul style="list-style-type: none"> ▪ 15-year term 	<ul style="list-style-type: none"> ▪ 10-year term, with a Government option to extend for 5 years
Permitted Rate of Return	<ul style="list-style-type: none"> ▪ 8% on Average Net Fixed Assets ▪ The same return rate applies to assets of both renewable and non-renewable energies 	<ul style="list-style-type: none"> ▪ 9.99% on Average Net Fixed Assets ▪ Investments on renewable energy facilities can earn a rate of return of 11%
Tariff Approval	<ul style="list-style-type: none"> ▪ The annual tariff adjustment mechanism will be maintained. The Fuel Cost Adjustment (FCA) in the total tariff will be revised more frequently 	<ul style="list-style-type: none"> ▪ FCA in the total tariff is revised once a year
Incentives / Penalties on a number of performance categories	<p>Operational Performances</p> <ul style="list-style-type: none"> ▪ The existing incentive and penalty scheme continues to apply, but with more stringent performance targets. New performance targets on grid supply restoration will be introduced <p>Energy Saving and Demand Side Management</p> <ul style="list-style-type: none"> ▪ Performance targets for Energy Audit and energy saved from the initiatives under the new SCA are set at about four times the existing targets ▪ Demand Response programmes will be offered to businesses 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 	<ul style="list-style-type: none"> ▪ The rate of return is linked to various performance targets under the incentive and penalty scheme: <ul style="list-style-type: none"> – Emissions (2008-2013)¹ – Energy efficiency – Supply reliability – Operational efficiency – Customer services – Renewables

¹ CLP agreed to remove the "Emission Performance Linkage Mechanism" in the SCA subsequent to the 2013 Interim Review of SCA

Areas of Refinement	New SCA (2018-2033)	Existing SCA (2008-2018)
	<ul style="list-style-type: none"> ▪ A new five-year energy saving target will be set. CLP Power 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 incentive. More incentives will be given if the said energy saving reaches 5% <p>Renewable Energy Award will be given if:</p> <ul style="list-style-type: none"> ▪ the ratio of RE in the local generation fuel mix achieves the target set (RE generated from projects directly owned by the Government will be excluded) ▪ the annual target of new RE connections to the grid is met ▪ CLP Power will be incentivised to sell RE certificates 	
<p>New Environmental Initiatives</p>	<ul style="list-style-type: none"> ▪ A New Eco-Building Fund to promote energy saving for buildings will be set up. Incentive target set for this initiative is to provide subsidies to 400 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 Power will be 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 a new CLP Community Energy Saving Fund to enhance energy efficiency ▪ The CLP Public Education Fund will be increased from HK\$5 million to HK\$10 million a year 	<ul style="list-style-type: none"> ▪ Set up Loan Fund for non-Government customers to implement energy savings initiatives ▪ Set up Education Fund for energy efficiency education and promotion activities ▪ Set up Eco Building Fund² to subsidise building owners to carry out improvement works to enhance energy efficiency in the common areas of non-commercial buildings

² Eco Building Fund was set up as a result of 2013 Interim Review of SCA

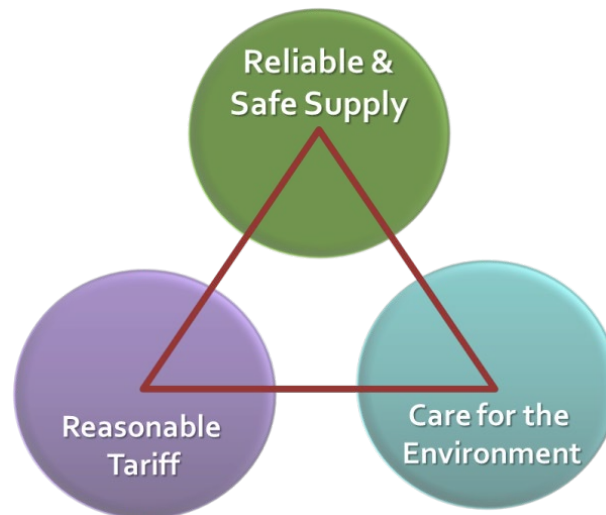
Areas of Refinement	New SCA (2018-2033)	Existing SCA (2008-2018)
Support RE Development	<ul style="list-style-type: none"> ▪ Introduce Feed-in Tariff (FiT) Scheme to encourage the development of RE systems in the community. By connecting the systems to CLP Power's electricity grid, CLP will pay for electricity generated by these systems at a rate offered through the scheme ▪ Introduce RE Certificates Scheme to allow customers who prefer clean energy to purchase the certificate to support the FiT Scheme, and offers different platforms for the community to participate in RE development 	<ul style="list-style-type: none"> ▪ Investments on renewable energy facilities can earn a rate of return of 11%
Others	<ul style="list-style-type: none"> ▪ If there is excessive capacity when an additional generating 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 ▪ More information such as cost data will be disclosed to customers and the public to improve information transparency 	<ul style="list-style-type: none"> ▪ If there is excessive capacity when an additional generating 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

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.

Managing the Energy Trilemma

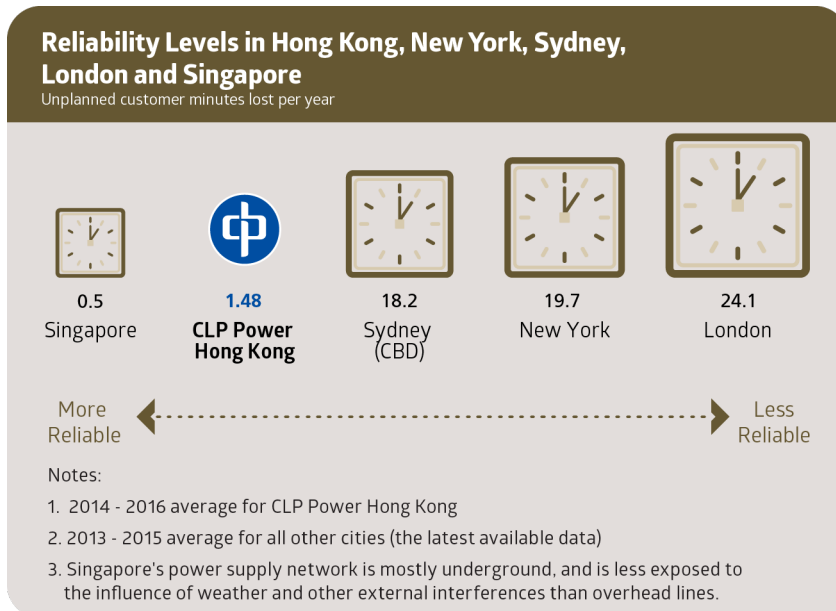


* The **Energy Trilemma** is initiated by the World Energy Council, which advocates that different economies should strike a balance among the three objectives for energy development.

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.
- Hong Kong has no indigenous energy resources. It is densely populated and over 50% of people live or work above the 15th floor using more than 60,000 elevators in daily operation. Hong Kong is a key international financial centre and around 5 million trips are taken every day on electrically powered transportation networks. These unique characteristics make exceptional power supply reliability essential for Hong Kong.
- Under the SCA, **CLP provides world-class supply reliability over 99.999%.**

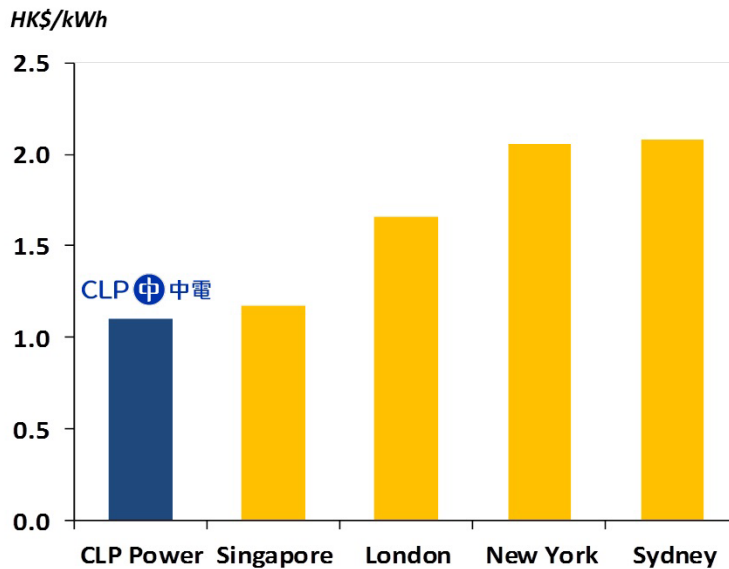
- Power interruption in Hong Kong is at an extremely low level. Between 2014 and 2016, on average a customer might experience less than 1.5 minutes unplanned power interruptions in a year. This compares to 18 minutes for Sydney CBD, 20 minutes for New York, as well as London's 24 minutes.
- High electricity supply reliability has been instrumental in enabling Hong Kong's status as a world-class city, and in powering the long-term social and economic development of Hong Kong.



- Hong Kong has been ranked 3 out of 190 economies in the ease of getting electricity in the Doing Business 2017 rankings published by the World Bank, supporting the fact that our customer service levels meet those of any developed economy.
- 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.
- See also separate Fact Sheet on **Reliable Electricity Supply**.

Reasonable Tariff

- CLP's tariff level is reasonable and competitive compared to other key metropolitan cities in the world. In 2017, our average tariff for typical residential customers in CLP's service areas is \$1.1/kWh while tariff for New York is almost double of Hong Kong.



Notes:

- Comparison based on average monthly residential consumption of 275kWh
- Tariff and exchange rate as of January 2017

- Cities with lower tariff than CLP are mostly characterised by: having government subsidies, being state-owned power companies, or having relatively abundant natural resources to support power generation.

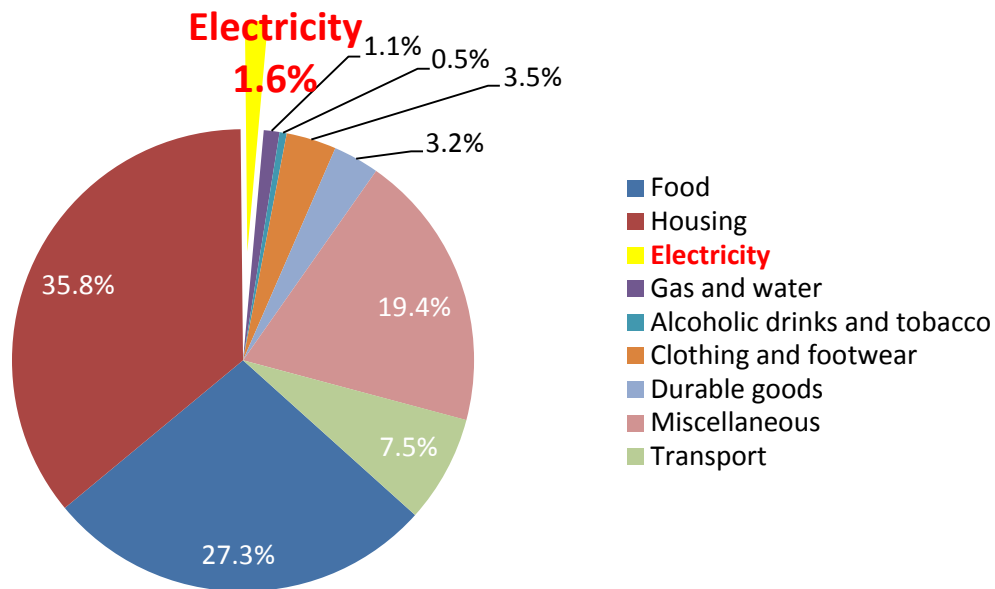


Notes:
 1. Comparison based on average monthly domestic consumption of 275kWh.
 2. Tariff and exchange rate at January 2017.

Source: Web search

- In Hong Kong, electricity expenses account for 1.6% of total household expenditure, lower than other metropolitan cities like Sydney (2%), London (1.8%), Singapore (2.2%).

2014/15 Household Expenditure Survey

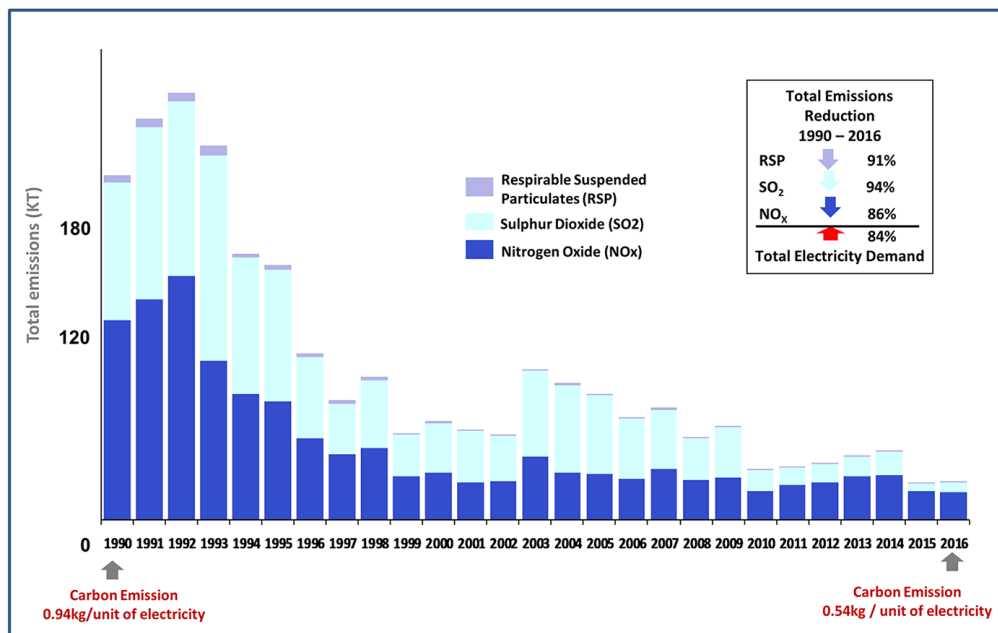


Source: "2014/15 Household Expenditure Survey and the Rebasing of the Consumer Price Indices", HKSAR Government

- **Adjustments in total tariff in recent years have mainly been due to fluctuation of fuel costs.** Globally, fuel prices have been highly volatile. In addition, in order to meet the increasingly tighter emissions caps set by the Government, we will need more natural gas. This cost more than other fuels, leading to further challenges in tariff management.
- CLP has taken actions to minimise the cost impact of significant fuel cost fluctuations and to maintain tariff at a reasonable level. These actions include enhancing generation efficiency, making the most of existing gas reserves and cost control.
- The significant drop in fuel prices in 2015 and CLP's constant cost control efforts have enabled the customers to enjoy a special fuel rebate in August 2015 and eventually a reduction of the 2016 tariff. In 2017, CLP froze the tariff at the level of 2016 as promised. A rebate of nearly HK\$800 million have been returned to all CLP customers. Together with the special rebate the company offered in 2015, a total of HK\$2 billion will have been returned to customers over the course of two years.
- See also separate Fact Sheet 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 and nuclear. 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.
- CLP's emissions have reduced over 86% since 1990 while electricity demand has grown by over 84% 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 customers to achieve energy saving and change their habits of electricity consumption.
- CLP **helps customers reduce energy consumption** through: public education (e.g. exhibitions, workshops and energy saving campaigns), the provision of tools and technical support (e.g. customised energy solutions and mobile apps), the provision of related information and energy-saving tips (e.g. [online energy saving ideas](#)) and offering useful enablers (e.g. [Meter Online](#)).

- We also conduct **energy audits** for business 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 separate Fact Sheet on **Energy Saving**.*
- Links to reference information:
[Scheme of Control Financial & Operating Statistics 10-year Summary](#)

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 fuel and return
2. Fuel Cost Adjustment	Fuel Cost Adjustment is either a surcharge or rebate to cover the difference between the actual cost of fuel and the standard cost of fuel collected through the Basic Tariff

- Other components include :
 - Rent and Rates Special Rebate (if applicable) — amount refunded to customers upon CLP's receipt of all interim refunds from the Government in 2013 for overcharged rent and rates.
- At-a-glance table of CLP's tariff in the past five years:

Tariff Component (cents/kWh)	2013	2014	2015	2016	2017 ¹
Basic Tariff	84.0	88.6	87.1	88.9	92.2
Fuel Cost Adjustment	22.4	22.4	27.0	24.3	21.0
TOTAL TARIFF	106.4	111.0	114.1	113.2	113.2
Rent and Rates Special Rebate	(1.7) ²	-	-	-	-
NET TARIFF	104.7	111.0	114.1	113.2	113.2

¹ The tariff for 2017 is the average tariff rate effective from 1 January 2017

² CLP Power Hong Kong provided customers with a Rent and Rates Special Rebate of 2.1 cents per unit from January to mid-October 2013.

- CLP Power provided a one-off special fuel rebate to all customers in August 2015 subsequent to reduced fuel price earlier in the year. The rebate was calculated at 8 cents per unit based on customers' electricity consumption between January and June in 2015. CLP announced another fuel rebate of 2.3 cents per unit to all customers based on their electricity consumption between January and December in 2016. Together with the special rebate CLP Power offered in 2015, a total of HK\$2 billion will have been returned to customers over the course of two years.
- Links to reference information:
 - [Tariff Component](#)
 - [Energy Costs](#)

Annual Tariff Review

- CLP is required to submit 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, basic tariff rate, etc.
- Any proposal to increase the Basic Tariff by more than 5% above the currently approved level in the Development Plan requires further approval by the Executive Council.
- The basic tariff rate agreed with the Government will be implemented on 1 January of the following year.
- In April 2017, CLP Power has signed a new Scheme of Control Agreement (SCA) with the Hong Kong SAR Government. The new SCA will come into effect on 1 October 2018 and run until 31 December 2033. The annual tariff review mechanism will be maintained under the new SCA. The Fuel Cost Adjustment (FCA) in the tariff package will be revised more frequently to reflect changes in fuel prices in a more timely way and with enhanced transparency. As a result of more frequent adjustments, the balance of the Fuel Clause Recovery Account can be maintained at a lower level. Details of this new arrangement will be confirmed in the months ahead.
- Links to reference information:
 - [2017 Tariff Review Presentation](#)
 - [2017 Tariff Review Information](#)

Tariff Structure

- CLP has four tariff categories, namely:
 1. **Residential Tariff** (Residential customers)
 2. **Non-Residential Tariff** (Small-to-medium businesses)
 3. **Bulk Tariff** (Large businesses and public services)
 4. **Large Power Tariff** (Largest businesses and public services)
- 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, and the lower blocks provide some protection for the smaller residential customers with lower household incomes. Inclining tariff structures for residential customers are common in many cities world-wide.
- Unlike Residential Tariff customers, inclining tariff structures for large business customers are uncommon in other cities in the world.
- CLP’s **Non-Residential Tariff** has a declining structure of two blocks with a slight difference per unit. High consumption customers under **Bulk Tariff** and **Large Power Tariff** categories have two extra 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 tariff structure:

Tariff Categories	Customer Type	Basic Tariff	
		Energy Charge	Demand Charge
Residential Tariff	Residential customers	√ With 7 inclining blocks	-
Non-Residential Tariff	Small-to-medium businesses	√ With 2 slightly declining blocks	-
Bulk Tariff	Large businesses and public services	√ With Time-of-Use feature	√ With Time-of-Use feature
Large Power Tariff	Largest businesses and public services	√ With Time-of-Use feature	√ With Time-of-Use feature

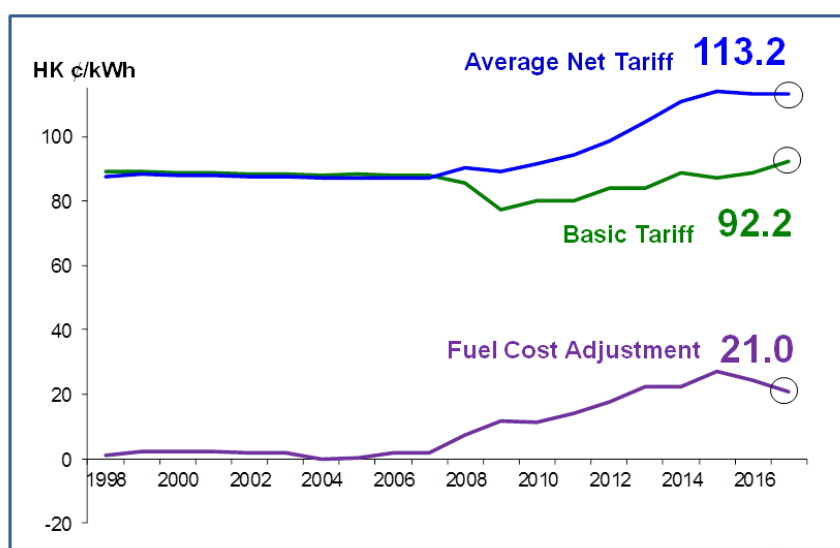
- Link to reference information: [CLP Tariff Table 2017](#)

Tariff and Fuel Costs Challenge

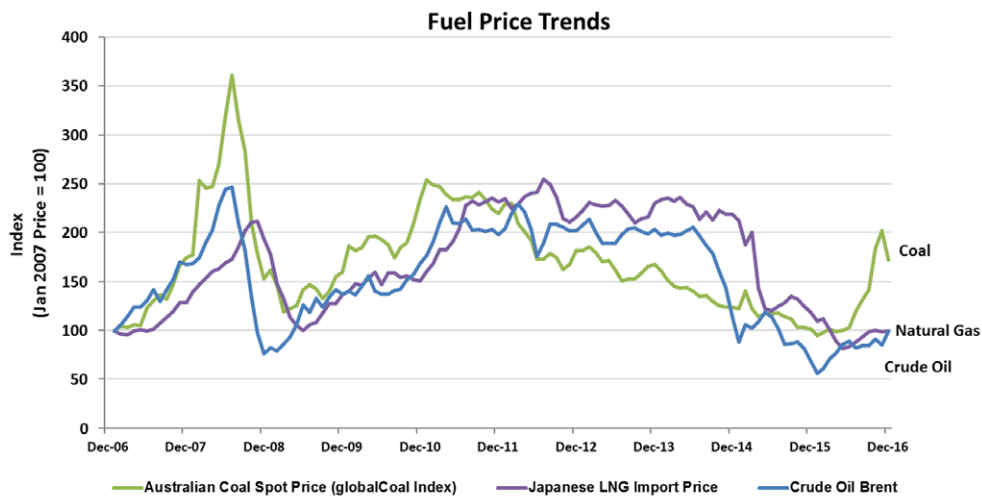
- Compared to other key metropolitan cities in the world, **CLP's tariff level is very competitive**. Cities with a lower tariff than CLP are mostly characterised by having government subsidies, being state-owned power companies, or having relatively abundant natural resources to support power generation.



- CLP has for many years adopted a **diversified fuel mix** to ensure the reliability of electricity supply and to meet statutory environmental requirements at a reasonable cost. Its fuel mix comprises natural gas, coal and imported nuclear electricity and oil.
- CLP is facing **significant challenges from rising fuel costs** due to its need to meet tightened emissions caps starting from 2015 and the need to use new supplies of natural gas.
- Adjustment in total tariff in recent years have mainly been due to fluctuation of fuel costs.



- Globally, fuel prices have been highly volatile. The following chart shows the volatility of fuel prices in the past decade.



- Since 1996, the Yacheng field in the South China Sea has been supplying natural gas to CLP. This reserve is depleting fast and 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 20 years ago when fuel prices were significantly lower than current market price. The need to use extra and higher-priced gas will put pressure on CLP's fuel costs in the coming years.
- Nevertheless, CLP is taking actions to minimise the impact of high fuel costs and to **contain tariff increases to a reasonable level**. These mitigation measures adopted include:
 - Optimising gas supply from Yacheng gas field so as to defer or reduce the usage of the more expensive gas supplies from the Second West-East Gas Pipeline;
 - Using more low emissions coal;
 - Enhancing the operational performance of our generation fleet;
 - Continuing stringent cost control;
 - Securing a temporary additional supply of a small amount of nuclear power from Daya Bay starting from the fourth quarter of 2014.
- To **enhance tariff information transparency**, CLP has been providing data and information related to [energy costs](#) for electricity generation and [electricity sales](#) on our website on a monthly basis since November 2013. The published data enables our customers to better understand the latest fuel mix, fuel cost and tariff components.

Alleviating Tariff Pressures

- The Scheme of Control Agreement 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. 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 business customers since 2013 to help them reduce tariffs and encourage energy saving. Under the Scheme, customers using 400 units or less per bill can enjoy savings in their electricity bills. In 2017, the scheme will result in 35% of residential customers and 44% of small business customers enjoying lower electricity bills than five years ago, before the scheme's launch.
- CLP also has a **Concessionary Tariff for the Elderly**. Customers aged 60 or above who live alone or with other similarly qualified elderly, and 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 months billing period plus an exemption of the minimum charge on each bill.
- CLP introduced the [Power Your Love Programme](#) in 2015 which encourages CLP's residential customers to save energy and contribute to the well-being of the society by transferring units of electricity saved to offset the electricity bills of households in need, helping to ease their electricity expenses. In 2017, about 400,000 residential customers participated the campaign, an increase of 25% from 2016. In 2015 and 2016, a total of 12.5 million kWh saved from the programmes in two years. Each year, around 20,000 households in need received the subsidy amounting to HK\$6 million donated by CLP's shareholders. Each family received HK\$300 that helps alleviating their pressure in electricity expenditure.

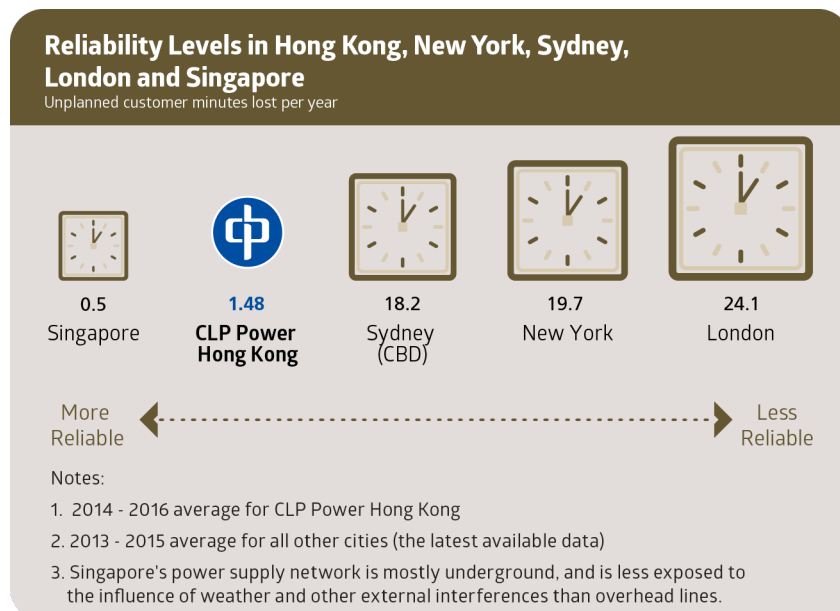
RELIABLE ELECTRICITY SUPPLY

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 60,000 elevators in operation daily. It is also a key international financial centre and around 5 million trips are made every day on electrified mass transit network. 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 over 99.999%**.
- Power interruption in Hong Kong is at an extremely low level. Between 2014 and 2016, on average a customer might experience less than 1.5 minutes unplanned power interruption in a year. This compares to 18 minutes for Sydney CBD, 20 minutes for New York, as well as London's 24 minutes.



- High electricity supply reliability has been instrumental in enabling Hong Kong's status as a world-class city, and in powering the long-term social and economic development of Hong Kong.
- Hong Kong has been ranked 3 out of 190 economies in the ease of getting electricity in the Doing Business 2017 rankings published by the World Bank, supporting the fact that our customer service levels meet those of any developed economy.

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 operations excellence. The following areas demonstrate CLP's ongoing efforts to uphold its world-class supply reliability.

Sufficient Generating Capacity

- Reserve capacity is essential to cater for any loss of generating 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 generating 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, a key challenge is **meeting our customers' demand** for electricity in Hong Kong. A large number of territory-wide development and infrastructure projects are in progress simultaneously, and they call for increasing power supply. These important projects for Hong Kong are needed to support population growth, new housing, railway expansions, the new West Kowloon Cultural District, the Hong Kong-Zhuhai-Macau Bridge, the development of the Lok Ma Chau Loop, data centre infrastructure, and so on.
- 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, and in the absence of building new electricity generation facilities for a number of years, CLP has been adopting different measures to **enhance our generation and network infrastructure** to address the challenge.
- For our **generation facilities**, upgrading the efficiency of existing and aging generation facilities is essential to ensure we increase output, meet increased demand and maintain reliability. Efficiency upgrades in our plants are also important to improving our emissions performance. We also have in place programmes to replace and refurbish aging facilities to ensure supply reliability. For example, in 2016, one of the eight gas turbine systems at Black Point Power Station was successfully upgraded, increasing its capacity by 25MW, or 8%, enhancing its nitrogen oxides emissions performance and making an improvement in efficiency and fuel cost. The success of this trial paves the way for additional units to progressively be upgraded in coming years to realise the full potential for environmental performance improvement and capacity increase.
- In response to the government’s plan to increase the percentage of local gas generation to around 50% of the total fuel mix in 2020 and to ensure a reliable power supply service, CLP is constructing an additional gas-fired generation unit with an advanced design at Black Point Power Station. The new unit would feature a Combined Cycle Gas Turbine (CCGT) configuration which would give it an efficiency of around 60%, higher than that of the existing gas-fired units.
- **On power systems**, expansion and reinforcement of our supply networks are crucial to ensure adequate and reliable electricity supply. These will include continuous improvements to, and extensions of, our transmission and distribution facilities to meet new demand and ensure reliable delivery of supply to customers.
- Network enhancements also cover refurbishing current facilities such as switchgears and transformers, and replacing components to ensure continuous smooth operations.

Advanced Technology

- A reliable and secure power grid is critical to ensuring supply reliability. CLP’s strategy is to incorporate the latest and most relevant technologies to improve the performance of our power system.
- 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 information and communications system and advanced monitoring technology into the traditional power grid, it can open up new opportunities to engage customers in energy saving and demand side management. It also enhances the reliability, efficiency, safety, and quality of power supply to customers.
 - **Real-time monitoring system:** CLP has equipped the generation units of Black Point Power Station with the real-time monitoring system. Developed by CLP, the system comprises intelligent sensors which can be installed at key generation facilities, allowing engineering staff to continuously monitor and analyse different parameters such as temperature and pressure and vibration of the power plants, so as to timely identify potential faults for maintenance.

Since its commissioning in the second quarter of 2015, the real-time monitoring system has enhanced CLP's reliability of power generation and reduced the maintenance cost of the generation units. To further increase the reliability of power generation, CLP plans to extend the application of the system by installing intelligent sensors at more facilities at Black Point Power Station and introducing similar system at Castle Peak Power Station.

- **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 falling trees, the system will automatically isolate the faulty section, and shift to other sources for immediate supply restoration. A trial run has proven the system's effectiveness and a plan to extend its application to other high-risk overhead lines is being worked out.
- **Intelligent transmission substations:** As a pilot scheme, CLP has recently built two intelligent transmission substations, namely Eastern Road Substation and Chui Ling Road Substation, featuring with the most advanced and fully automated equipment. Among all the smart features, the self-healing system can significantly shorten the power restoration time from several minutes to less than one second. CLP is currently reviewing the effectiveness of the operation of these intelligent transmission substations.
- **Smart distribution substations:** CLP is also evaluating the performance of three smart distribution substations, namely Fong Ma Po Substation, 180 Nathan Road Substation and Po Leung Kuk Ngan Po Ling College Substation, where intelligent electronic devices were installed at the power distribution equipment. By comparing the operational data with pre-set parameters such as the amount of electric current, voltage, temperature, relative humidity, dust level and water level, it enables CLP to conduct online condition monitoring of electrical plants and auxiliary equipment at the substations. Alarm of the system will be activated when equipments are found abnormal. CLP is currently reviewing the effectiveness of the operation of these substations.
- **Online condition monitoring:** Aside from intelligent substations, CLP also introduces online condition monitoring systems at some 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.

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 suspension. It is a voltage fluctuation in a very short period of time. 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. Power companies all over the world have not been able to totally eliminate the occurrence of momentary voltage dips.

- In general, voltage dips last for less than 0.1 second. 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.
- CLP's professional engineers have been carrying out an ongoing study to improve the quality of our power supply. CLP is always willing to engage and share with customers and industry practitioners engineering solutions for mitigating the impact of voltage dip such as ride-through devices.

Measures against Adverse Weather

- As reliable electricity supply is regarded as very important by our customers, CLP constantly reviews and explores new technologies to sharpen our emergency preparedness. We adopt a number of measures to mitigate the impact of adverse weather on our power systems.
- More than 30% of CLP's transmission network consists of overhead lines. There are more than 700 400kV transmission towers that form the backbone of our supply system. Overhead lines are exposed and susceptible to the influence of weather and the external environment. If a tower is destroyed by strong winds or collapses because of a landslide, it could take several months to be restored.



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

- Hong Kong is exposed to increasing challenges posted by adverse weather including super typhoons. For instance, Hong Kong was hit by two typhoons in four days in Aug 2017. CLP constantly reviews and enhances its measures for emergency preparedness. These include: **strengthening the tower structures and foundations of 400kV overhead lines** that can withstand super typhoons with wind gusts up to 300km/h; 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 system. Drills are conducted in a regular basis.

- Hong Kong may also be vulnerable to storm surges caused by tropical cyclones. To counter the potential impact of storm surge 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** and **equipping the substations with sump pumps and flood alarm systems**. In addition, flood prevention measures have also been put in place at our power generation facilities. These measures ensure all CLP's transmission and distribution substations could withstand a super typhoon with a return period of one in 200 years.



Flood gates are installed at flood-prone transmission substations and distribution.

- Overhead lines and towers are exposed and susceptible to lightning strikes. To minimise voltage dips caused by lightning, CLP has installed **line arresters** on towers. Line arresters can drain tremendous lightning current to the earth and hence help stabilise the voltage. As a result, supply reliability and power quality are enhanced.
- 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 and heavy rain can disrupt electricity supplies. To mitigate this threat, CLP has adopted **vegetation management** techniques since 2001 to enhance the stability and reliability of the power supply while ensuring the safety of the public and contributing to the conservation of the environment. CLP's vegetation management team carries out pruning work on trees which might affect overhead lines, and steps up inspections in the run-up to the typhoon season. The pruning of trees can be carried out when the lines are carrying live electricity.

ENVIRONMENTAL MANAGEMENT

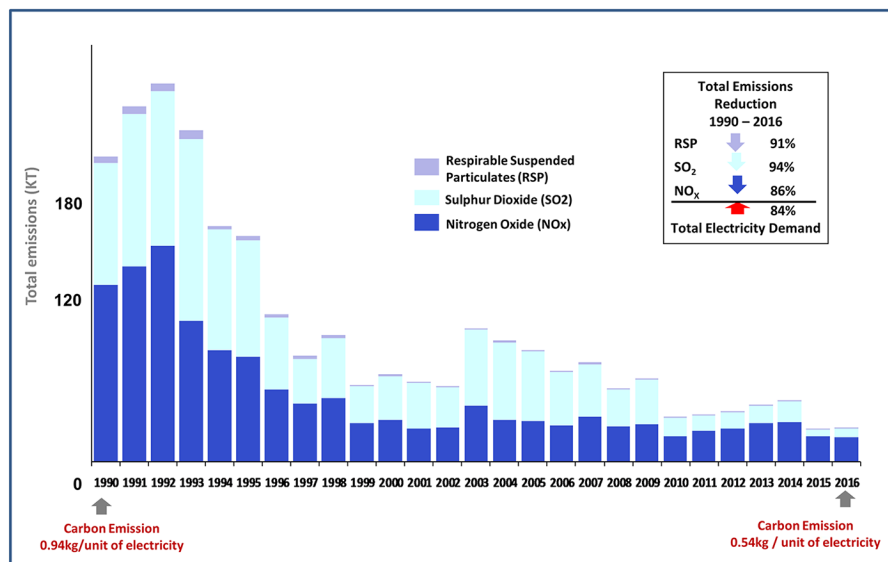
Powering Responsibly and Reducing Emissions

- 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. **Carbon emissions** refer to carbon dioxide emissions. Carbon dioxide is a kind of greenhouse gas that contributes to climate change. **Air emissions** refer to the emission of air pollutants. At present, the Government monitors emission of the following pollutants: sulphur dioxide (SO₂), nitrogen oxide (NO_x), respirable suspended particulates (RSP/PM₁₀), fine suspended particulates (FSP/PM_{2.5}), volatile organic compounds (VOC) and carbon monoxide (CO).

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-emission coal 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 oxide reduction facilities** which have significantly improved the emissions performance of the station. In addition, gypsum produced during the desulphurisation process are re-cycled as material for the construction industry such as plasterboard, bringing extra environmental benefits to the society.
- More than 86% emissions reduction in SO₂, NO_x and RSP have been achieved since 1990, while electricity demand has grown by over 84% 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



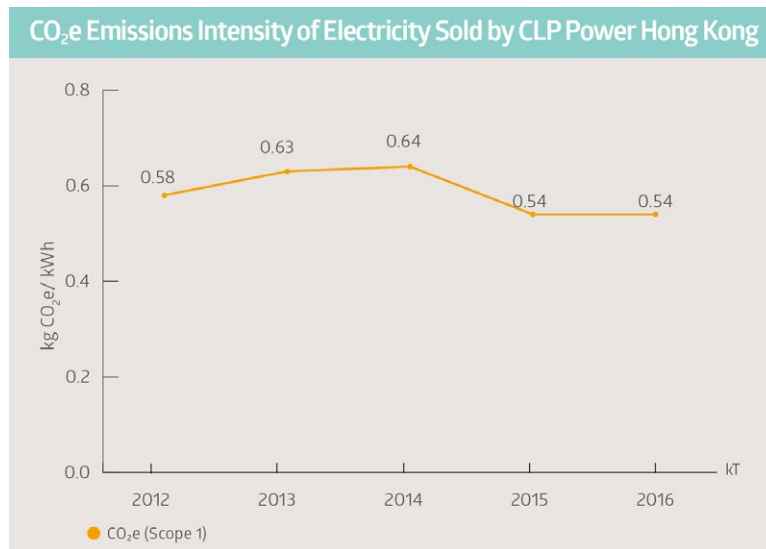
Emissions performance of CLP's power stations in Hong Kong in 2016

Power Station	Carbon Emissions (kT)		Air Emissions (kT)		
	CO ₂	SO ₂	NOx	Particulates (Total)	Particulates (Respirable)
Black Point	3,745	0.05	1.6	0.06	0.06
Castle Peak	14,737	5.2	15.4	0.5	0.3
Penny's Bay	1.2	0.000005	0.0018	0.00003	0.00003

Source: CLP Sustainability Report 2016

- CLP was committed to further improving its emissions performance to meet the emissions reduction targets set by the HKSAR Government for 2015, which represent a further reduction of 33%-64% from the already low emissions caps of 2010. The targets will be further tightened in 2017, 2019 and 2020 respectively. This is an ongoing exercise with the caps subject to review at least once every two years. In 2016, the Environmental Protection Department legislated a new set of emissions caps for 2021 and afterwards, in which air emissions levels will be reduced by 4% to 7% as compared to the already stringent 2020 caps. One of the means to achieve this is to increase gas-fired power generation significantly.
- In the meantime, it is critical for CLP to **manage the fuel mix prudently** to ensure fuel security, maintain a reliable electricity supply and meet the emissions caps. CLP will continue to work closely with the Government, its business partners and the community to support the Government's environmental policy for achieving better air quality.

- The carbon intensity of CLP’s operations in Hong Kong remains stable primarily due to the Daya Bay Nuclear Power Station which provides a significant amount of nuclear power to Hong Kong that has virtually been zero carbon emissions. In 2016, the carbon intensity for Hong Kong was 0.54 kg CO₂/kWh.



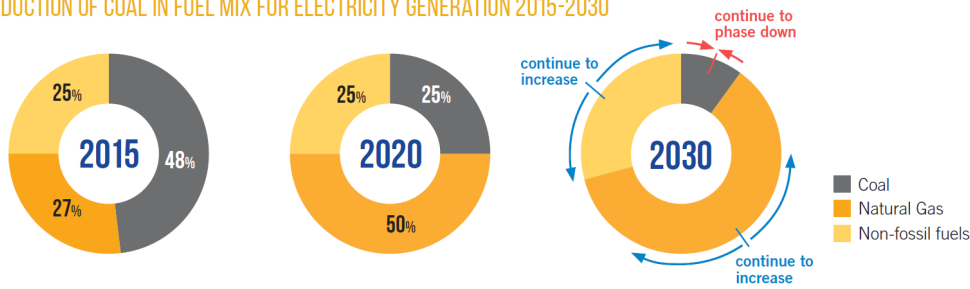
Source: CLP Sustainability Report 2016

- Link to reference information: [CLP Sustainability Reports](#)

Supporting Government’s Environmental Policy

- In addressing the global issue on climate change, the Central Government announced its target in 2009 to reduce **carbon intensity** (in terms of carbon dioxide emissions per unit GDP) by 40%-45% by 2020, as compared with the 2005 level. On 30 June 2015 Central Government further announced a new commitment to lowering the nation’s overall carbon intensity by 60-65% from the 2005 level by 2030.
- The Hong Kong SAR Government also set a voluntary carbon intensity reduction target. The Government proposed Hong Kong to reduce its carbon intensity by 50%-60% by 2020 when compared to 2005. Following China’s announcement of the new commitment, Hong Kong Government stated in its [Climate Change Report 2015](#) that it will use this target as reference to continue sharpening our mitigation plans.
- In March 2014, the Environment Bureau conducted a three-month **public consultation on the Future Fuel Mix for Electricity Generation**. The [consultation document](#) stated that the carbon emissions reduction target set in 2010 will be maintained, while effort will also be strengthened to achieve the air quality objectives effective since 1 January 2014.
- Having regard to the views and comments received during the public consultation, the Government plans to implement the following fuel mix in order to meet the pledged environmental targets for 2020. In addition, the Government has stated in Hong Kong’s Climate Action Plan 2030+ that in order to meet its new carbon intensity reduction target of 65% to 70% by 2030, 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.

REDUCTION OF COAL IN FUEL MIX FOR ELECTRICITY GENERATION 2015-2030



Sources: Hong Kong's Climate Action Plan 2030+

- In supporting the Government’s environmental policy of increasing natural gas to **around 50%** in the fuel mix target for 2020 and the rising demand of the community, CLP plans to construct an additional gas-fired generation unit to meet the increasing use of natural gas.
- In November 2015, the Paris Agreement made at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) has brought clear direction for low-carbon energy development at the international level. In Hong Kong, the Government announced a new carbon intensity target for 2030 in its Policy Address made in January 2017, which is to reduce carbon intensity by 65%-70% by 2030 using 2005 as the base . In addition, the Environment Bureau published the [Hong Kong's Climate Change Action Plan 2030+](#), setting out Hong Kong's long-term actions in combating climate change.

CLP’s Initiatives to Support Climate Strategy

- As a leading power company in Hong Kong, CLP recognises its role in addressing climate change. At CLP, we voluntarily set a group-wide [Climate Vision 2050](#), which aims to cut the carbon intensity of our generation portfolio by 75% by 2050, as compared to 2007 levels. In Hong Kong, CLP is supportive to HKSAR’s overall approach to build community awareness of the issue and be ready to play a part in a range of initiatives to help Hong Kong with **Mitigation, Adaptation and Resilience** strategies.
- We are working along the environmental policy through **delivering smarter and greener electricity** and to **enhance customer experience through improving service for our customers**. Key areas of initiatives we are working to support the climate strategy include:
 - **Stepping up public education campaigns** on the challenges from climate change and the need for preparedness;
 - **Decarbonising the fuel mix for electricity generation** with more zero carbon energy such as nuclear and extra natural gas as well as more support for local small-scale RE generation in Hong Kong (where this is practicable). CLP is exploring multiple sources of gas supplies for energy security and building an Offshore LNG Terminal in Hong Kong to enable the city to purchase LNG directly from the international fuel market and ensure adequate supply of natural gas;
 - **Supporting energy efficiency in buildings** through adoption of new technology such as LED Lighting and Heat Pumps;

- Enabling customers to monitor their own energy consumption more closely with **smart meters** so as to raise energy efficiency;
- **Enabling lower carbon transportation** by promoting electric vehicles in both the private and public transport sector, with a widespread charging network;
- **Enhancing Hong Kong’s preparedness for extreme weather events by supporting the necessary investments in infrastructure.** For instance,
 - o Installing flood gate at flood-prone transmission and distribution substations, sealing the cable inlets and equipping the substations with sump pumps and flood alarm systems to upgrade mitigation measures against potential impact of super-typhoons or storm surges;
 - o Strengthening the tower structures and foundations of 400kV overhead lines to withstand super typhoons with wind gusts up to 300km/h.
- **Putting in place robust contingency planning programmes** to help our city deal with or quickly recover from such disaster events, with better coordination across government and with key infrastructure owners like the power companies, airport, transport operators etc. and enhanced public communications.

- See also separate Fact Sheets

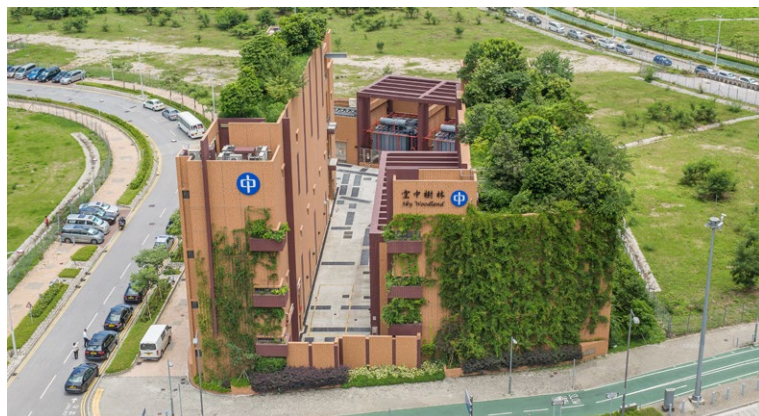
- 4. Reliable Electricity Supply
- 6. Energy Efficiency & Conservation
- 7. Cleaner Fuel Mix for Electricity Generation

Other Environmental Initiatives

Caring for 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

- 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 covering area of 520m² on the rooftops of two substation blocks, together 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.

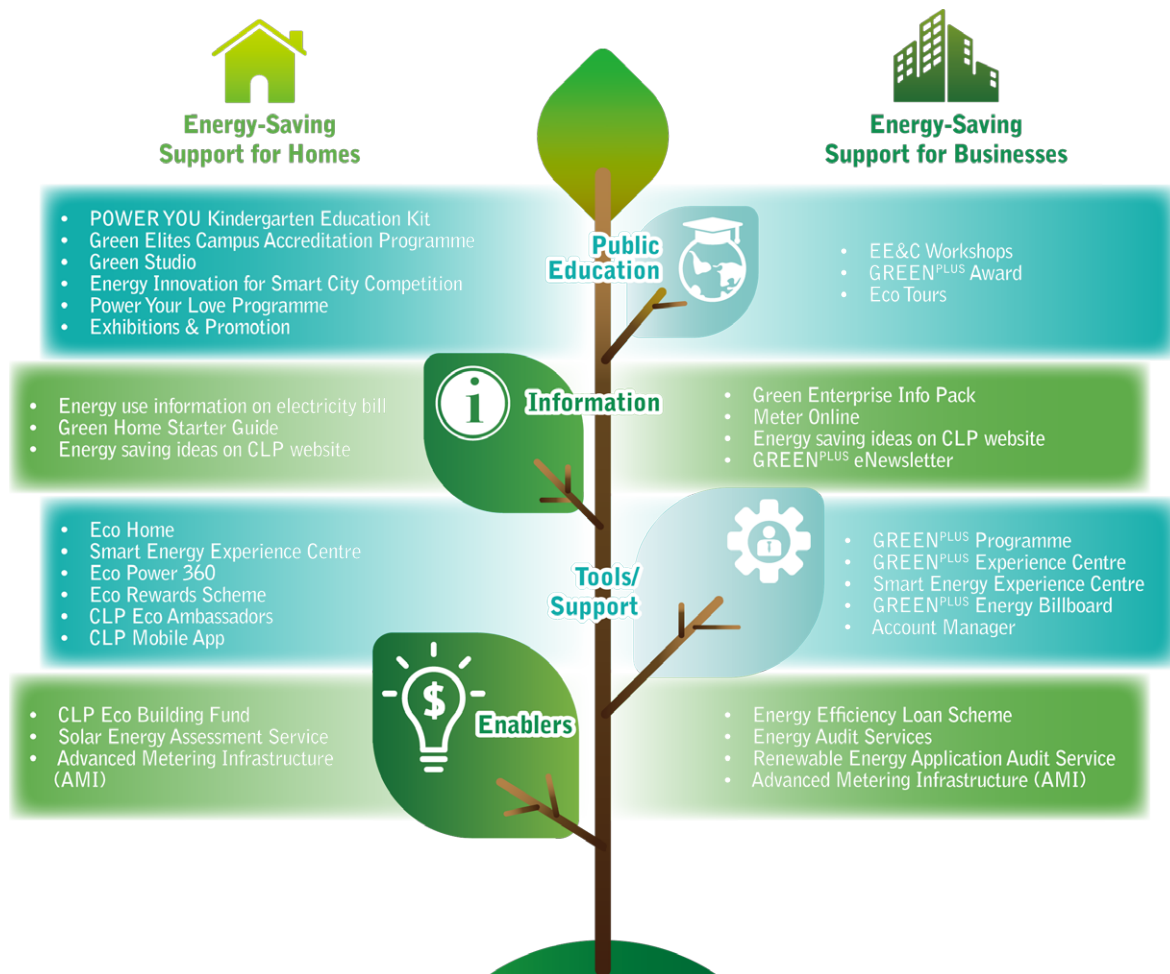
Waste Management

- 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.

ENERGY EFFICIENCY & CONSERVATION

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 at large to use energy more efficiently and change their behaviour so that they save energy and help to create a better environment.
- We adopt a four-pronged approach in changing people’s habits and helping them to reduce their energy consumption. These steps are:
 - Educating the public;
 - Providing customers with information and energy-saving tips;
 - Equipping customers with tools and technical support;
 - Helping with enablers to make greater energy efficiency possible.
- We are committed to doing all we can to help our customers and our city move towards a low-carbon lifestyle that will improve our environment for future generations. The following diagram summarises the scale and variety of CLP’s commitments to help our **residential** and **business customers** and our city move towards an energy-efficient lifestyle.



- The figures below illustrate the scale of some of these efforts:

EE&C Approach	Residential Customers	Business Customers
Education	<ul style="list-style-type: none"> • To further extend environmental education to our kindergartens, a POWER YOU Kindergarten Education Kit was developed in 2016. So far, 85% of the schools are using the Kit in 2016/17 academic year, reaching around 153,000 children. • Since 2009, the Green Studio has spread green messages to over 130,000 school children and visitors. • The Energy Innovation for Smart City Competition for secondary schools has sponsored over 260 projects. 	<ul style="list-style-type: none"> • Over 45,000 business and community leaders have visited the Energy Efficiency Exhibition Centre. • GREEN^{PLUS} Award received more than 6,000 submissions in 2016.
Tools / Support	<ul style="list-style-type: none"> • More than 35,000 visitors have visited CLP Eco Home. • Eco Power 360 is an online assessment tool, which compares electricity consumption against similar neighbourhood households. It provides consumption projection and recommendations to help customers save energy. All 2.2 million customers are able to access through this internet platform and receive energy saving recommendations by email on a bi-monthly basis. In addition, by joining the Eco Rewards Scheme, customers can earn Eco Points for gift redemption. 	<ul style="list-style-type: none"> • Over 9,000 customers have joined the GREEN^{PLUS} programme and many of them have received energy saving solutions from CLP. Customers can typically achieve 10-20% savings annually if they implement the recommended energy saving measures.
Enablers	<ul style="list-style-type: none"> • The CLP Eco Building Fund provides subsidies on a matching basis to residential building owners to carry out improvement works to enhance the energy efficiency of the communal areas of their buildings. Over HK\$42 million has been approved to 94 applications as of February 2017. 	<ul style="list-style-type: none"> • Since the 1990s, CLP has conducted over 2,100 energy audits for business customers. • From 2009 to 2016, CLP has helped business customers to save 120 million kWh of electricity.

- The existing Scheme of Control Agreement (SCA) sets an EE&C target of achieving no less than 150 energy audits for business customers and saving at least 12 million kWh of electricity consumption per year. CLP has successfully achieved these targets each year. In conducting **energy audits**, CLP's professional engineers are assigned to conduct a detailed analysis of energy usage and study the energy efficiency of customers' premises. Professional reports and practical advice are provided after evaluation which greatly enhance customers' awareness of energy conservation.
- Meeting these targets, however, represents only a small proportion of CLP's overall EE&C efforts. Adding to the overall energy saving impact is a wide variety of educational and promotional programmes, including those supported by an **Education Fund** provided by CLP.
- The [CLP Eco Building Fund](#) was set up as a result of the 2013 Interim Review of the SCA. It provides subsidies on a matching basis to residential building owners to carry out improvement works to enhance the energy efficiency of the communal areas of their buildings. It is estimated that CLP will contribute shareholders' earning of some \$70 million from the energy efficiency incentive mechanism of the SCA from 2014 until the expiry of the current term of the SCA in 2018, to support energy improvement projects in these buildings. Over HK\$42 million has been approved to 94 applications as of February 2017.
- To encourage energy saving, CLP launched the [Eco Power 360](#) in 2016, an enhanced online home energy assessment tool. It applies behavioural science methods by using simple charts to show electricity consumption comparison against similar homes in the neighbourhood, and provides consumption projection and recommendations on energy saving. All 2.2 million residential customers are able to access the information about their energy use through the internet platform and receive energy saving tips by email on a bi-monthly basis. In addition, customers can also join the **Eco Rewards Scheme** and participate in designated activities to earn Eco Points for gift redemption.
- As a further step in our continuous EE&C efforts, we launched community-wide energy saving competition titled "Let's Save Now for a Better Future" in 2013 and 2014, with the support of the Government and all 14 district councils in the CLP Power supply areas to encourage people to reduce their power consumption.
- In 2015, CLP introduced a world-first community programme that combines energy saving with a mission to help the less fortunate in society. The [Power Your Love Programme](#) encourages CLP residential customers to save energy and contribute to the well-being of the society by transferring units of electricity saved to offset the electricity bills of households in need, helping to ease their electricity expenses. In 2017, about 400,000 residential customers participated the campaign, an increase of 25% from 2016. In 2015 and 2016, a total of 12.5 million kWh saved from the programmes. Each year, around 20,000 beneficiary households, each receiving a HK\$300 special grant from a HK\$6 million CLP shareholders' fund that helps alleviate these families' pressure in electricity expenditure.
- Since 2013, CLP has provided an **Energy Saving Rebate Scheme** for low-consumption residential and small business customers to help reduce tariffs and encourage energy saving. Under the Scheme, customers using 400 units or less each bill can enjoy savings in their electricity bills. In 2017, about 35% of residential customers and about 44% of small business customers enjoy lower electricity bills than five years ago, before the scheme's launch.



- For CLP’s public education programmes to promote EE&C, *see also separate Fact Sheet on Community Commitment.*
- **The success of EE&C efforts is primarily dependent on concerted efforts from all sectors in the community** to change their energy consumption behaviour and habits.
- CLP is willing to participate in an informed discussion on any new initiatives to promote energy efficiency by providing our professional expertise and sharing our experience to encourage the public to consume energy in a more efficient and sustainable manner.

Green Driving

- In recent years, CLP has developed and introduced various vehicle charging technologies to enhance the **electric vehicle (EV) charging network**, aiming at promoting green driving in Hong Kong.
- Following the launch of “**Trial Network of Charging Stations**” in 2009, CLP has set up 47 standard, semi-quick and quick charging stations in Kowloon, the New Territories and Lantau Island by the second quarter of 2017, providing more than 140 charging points in CLP’s supply area. Drivers can charge their EVs for free until the end of 2017. They can also locate nearby EV charging stations through the “CLP Hong Kong 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, and added more chargers of the same type in districts across the city to support the majority of EV models available in Hong Kong. CLP’s quick charging stations are now available at driving intervals averaging 10 km throughout Kowloon and the New Territories. We also offered an Eco Charge one-stop charging service which makes it easier for EV drivers to arrange installation of EV charging facilities in the car parks of residential and commercial buildings.
- CLP plans to **add more than 10 multi-standard quick chargers in 2017 and 2018** for public use. The company also plans to gradually upgrade all of the existing standard chargers to semi-quick chargers.
- Link to reference information: [Electric Vehicles](#)



Multi-standard EV quick charger

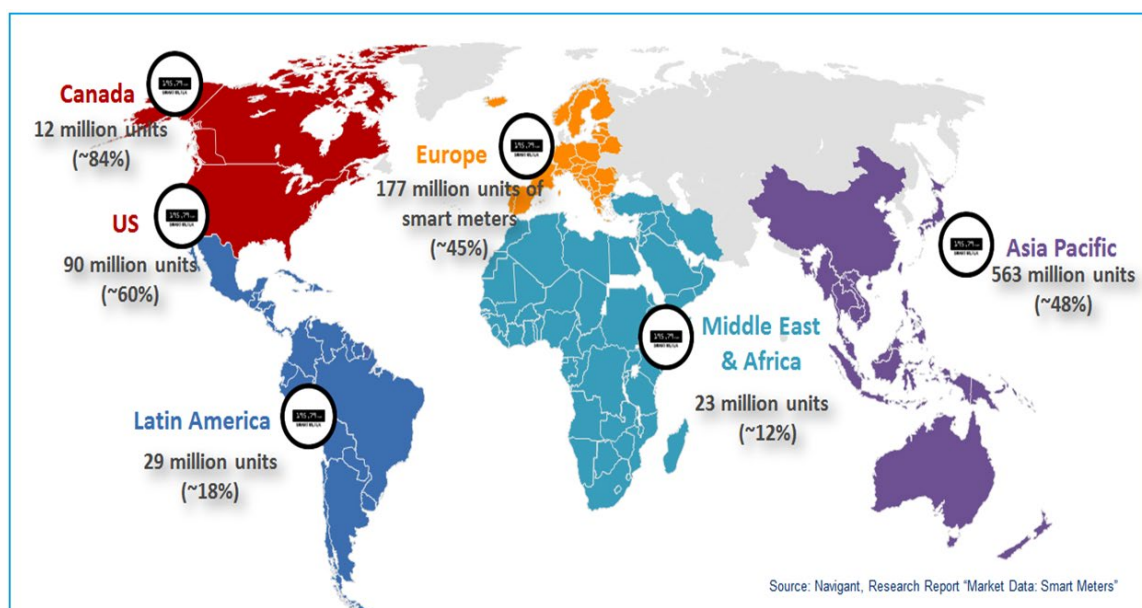
Demand Side Management

- As part of our continuous efforts to drive towards a greener future, CLP is stepping up our Demand Side Management measures. Demand side management aims to reduce customers' peak electricity demand to achieve energy efficiency through closer customer engagement. The more the electricity demand can be lowered, through applying more efficient devices and increasing customers' the awareness of energy consumption, the more the bills can be reduced and the longer the new investment in electricity infrastructure can be deferred by the power companies. New technology also plays a significant role in this area.
- Smart Grid** development is an emerging global trend of power grid modernisation. By integrating information and communications technology into the traditional power grid, it can open up new opportunities to engage customers in energy saving and demand side management. It also enhances the reliability, efficiency, safety, and quality of power supply to customers.

Advanced Metering Infrastructure (AMI)

- AMI** is a core component of Smart Grid. It is an integrated system that comprises smart meters and communication technologies, which facilitates a two-way communication between customers and the power company. It is also the key enabler in promoting energy saving and demand side management.
- Globally, over 150 AMI programmes involving smart meters are now underway. A number of countries such as the United States, members of the European Union and cities in Mainland China have millions of smart meters being installed.
- According to Navigant Research, the global penetration of smart meters can reach up to 84% in developed countries, such as Canada, by end 2020.

AMI is an Emerging Global Trend



- With AMI, customers will have easy access to keep track of their electricity consumption via the Internet, smartphones or tablets, and receive energy saving tips. Alert signals can also be sent to customers if their energy usage approaches pre-selected consumption levels, which will help them make informed decisions on electricity usage, and at the same time **take a greater control over their energy use** and generate cost savings.
- CLP was the first utility in Southeast Asia to implement an **end to end AMI solution**.
- In 2013, we introduced myEnergy Pilot Programme, which involved a sample of around 3,000 residential customers and around 1,400 small to medium-sized enterprise customers. Customers who participated in the trial welcomed the opportunity to understand more about their electricity consumption and many took active steps to reduce electricity use.

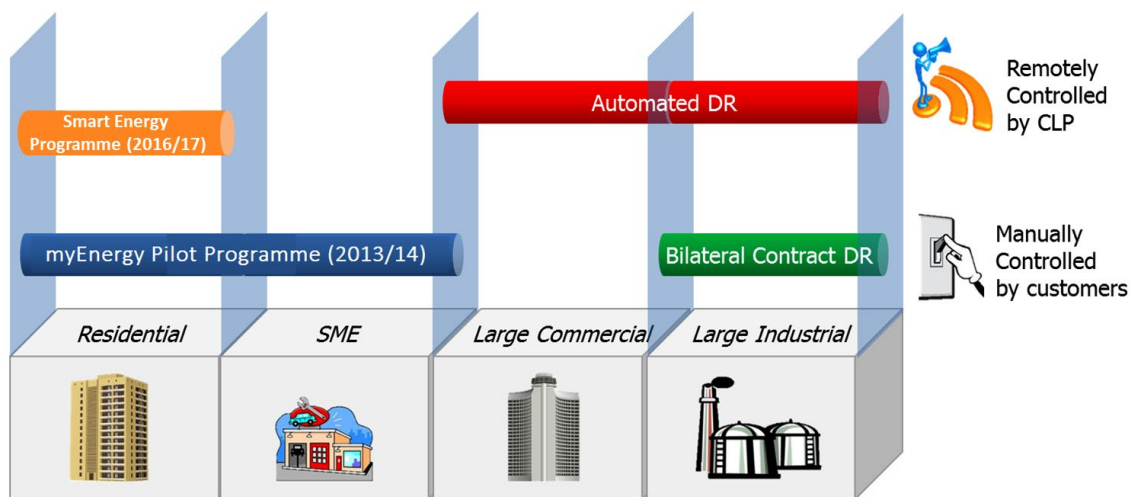
Smart Energy Programme

- To combat climate change and support the government's vision to develop Hong Kong into a smart city, CLP launched a Smart Energy Programme in June 2017. It is a one-year pilot scheme for which smart meters have been installed for 26,000 selected residential customers. With the Advanced Metering Infrastructure (AMI) system, customers are given timely access to data of their electricity consumption. Through promotions and reward scheme, they are encouraged to adjust their consumption behavior to lower their electricity consumption at peak times and to save on electricity bills.
- The programme covers residential customers who live in private and public housing, Home Ownership Scheme flats, and village houses in 14 districts of Kowloon and the New Territories, which cover customers of varying characteristics and ensure a representative result. Participating customers are assigned to different service trials, including Time-of-Use (ToU) Tariff and Summer Saver Rebate. Under the pilot scheme, customers enjoy bill protection that they would not (be paying their electricity bill at a tariff higher than the prevailing tariff level) if they participate in the ToU Tariff service trial. Customers can also opt out from the programme at their own discretion.
- By undergoing the pilot scheme, CLP Power expects to better evaluate the effectiveness of a demand response programme on a larger scale, and will be able to explore how to effectively implement AMI in Hong Kong in the future.
- The AMI system also features other advanced functions which not only help customers manage their electricity consumption but also further enhance supply reliability, safety, and operational efficiency.

Demand Response (DR) Programmes

- With CLP's move towards Smart Grid technology and the AMI applications becoming increasingly prevalent, we are able to engage customers for smarter use of energy. Peak demand can be reduced through **Demand Response (DR) Programmes** which help achieve greater environmental and economic benefits.
- In general, **DR Programmes** enable the overall reduction of consumption when electricity demand is extremely high. Customers can optimise their energy usage, with potential savings in energy bills.
- DR Programmes have been adopted in many overseas countries and many are able to demonstrate a cut in demand at peak load.

Demand Response Programme



Automated DR Programme & Bilateral Contract DR Programme

- CLP has been offering DR programmes for business and industrial customers since 2013. Customers can obtain rebates by reducing the amount of electricity consumed during demand peaks. Customers can switch off or reschedule the operation of certain equipment themselves, or be remotely controlled by CLP during an agreed period of critically high demand.
- Automated DR Programme** enables customers to easily participate in demand response. By installing free ADR equipment at a business customer's premises, CLP can automatically and remotely reduce the electricity consumption of customer's equipment during an agreed period when CLP gives advance notice to the customer about the potential occurrence of periods of very high electricity demand.

- **Bilateral Contract DR Programme** is best suited industrial customers that use high demand, involving heavy manufacturing process and need manual control to reduce energy consumption. Customers under the Bilateral Contract DR Programme agree to reduce their electricity usage themselves by switching off equipment, adjusting settings or re-scheduling their operations during an agreed period when CLP informs customers about the potentially very high electricity demand.
- Participating customers show strong commitment in energy management, effectively **reducing energy consumption of large commercial and industrial equipment** and greatly improve energy efficiency.

More Energy Saving and Conservation Initiatives under new SCA

- In April 2017, CLP Power Hong Kong signed a new Scheme of Control Agreement (SCA) with the Hong Kong SAR Government. The new SCA will come into effect on 1 October 2018 and run until 31 December 2033. A series of new initiatives will be introduced during the new SCA period to encourage residential and business customers as well as the community to practise energy efficiency and adopt an energy-efficient lifestyle for a greener Hong Kong.
- Enhanced efforts will be made in conducting energy audits and energy saving to meet the new performance targets stipulated in the new Scheme of Control Agreement. On energy audit, the new target will be increased to 600 audits per year as compared to the existing 150. The target set for energy saved from the energy audits will also be increased from the existing 12GWh to 48GWh per year.
- The company will introduce demand response programmes for business customers to cut down the overall electricity generation during peak periods, and a new Eco Building fund to promote buildings' energy efficiency.
- In addition, a new CLP Community Energy Saving Fund, with 65% of incentives earned in energy audit, energy saved from the audits and promoting energy saving for building, will be set up to promote energy efficient electrical appliances, renewable energy, as well as targeted support for disadvantaged groups, etc.
- The CLP public Education Fund that provides support for energy efficiency education and promotion activities will be increased from HK\$5 million to HK\$10 million a year.
- Details of these new initiatives will be confirmed in the months ahead, and are expected to be implemented from the fourth quarter of 2018. CLP will continue to discuss with the Government, as well as to **engage and communicate with stakeholders** to ensure that the new initiatives **meet the expectations of the customers**.
- See also separate Fact Sheet on **Scheme of Control Agreement**.

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
- Generation cost is relatively 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 environment benefits











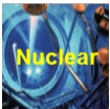









Nuclear

- High reliability, enable large scale steady base-load electricity
- Very competitive generation cost
- Virtually zero CO₂ and other air emissions
- Requires sophisticated and careful operational safety and waste management
- Public concern over nuclear safety still remains after the Fukushima incident

Renewable Energy (RE)

- Natural resources availability is intermittent 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
- Higher generation cost
- It is practically emission-free and thus is gaining in popularity in countries where its relatively high cost can be supported
- RE has a role to play in the world's fuel mix, and where there are abundant quantities of renewable energy 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 (e.g. in Hong Kong)

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

	CO ₂ & air emissions	Price Today	Reliability	Public concerns
				
				
				
				

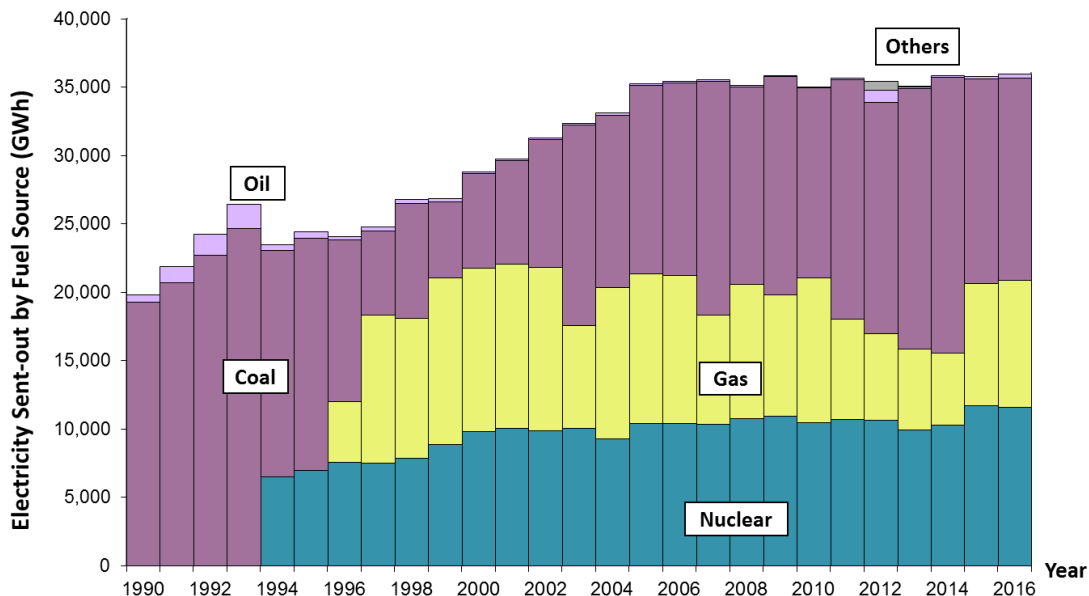
CLP's Fuel Mix for Electricity Generation

- 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** to provide a reliable electricity supply and meet environmental standards at reasonable costs.
- CLP endeavours to source fuels with high quality and at competitivethe best 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 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 Pipeline (WEPII) gas pipeline in the Mainland
2015	▪ HKSAR's Sludge Treatment waste-to-energy facility connected to the CLP grid
2017	▪ CLP was granted an environmental permit to install power generation units at the West New Territories (WENT) Landfill to utilise landfill gas produced there as fuel. Commercial operation of the project is expected by the end of 2018

- 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.

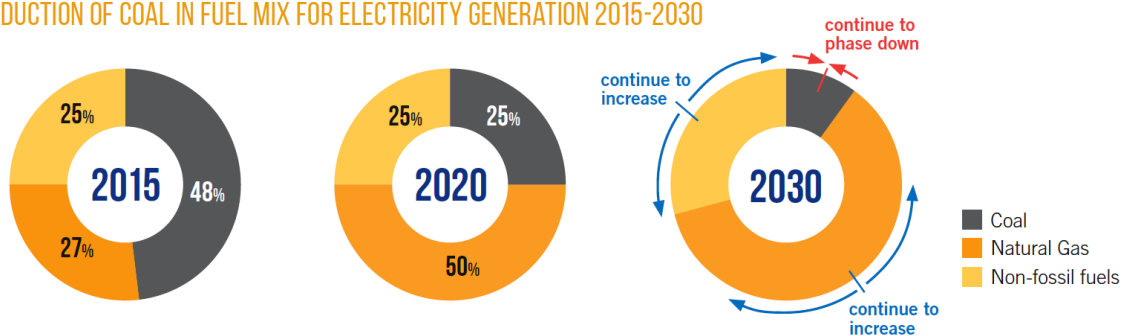


Note: Financial year basis (i.e. Oct to Sept) for 1990 to 1999 and calendar year basis for 2000 and thereafter

Fuel Choices

- The Government in Hong Kong launched a **public consultation in March to June 2014 on the [Future Fuel Mix for Electricity Generation](#)**, proposing two fuel mix options: importing more electricity through purchase from the Mainland power grid, or using more natural gas for local generation. According to Government’s report on the consultation published in 2015, more than 86,000 submissions were received during the consultation period. Most of the respondents supported local generation by natural gas and expressed reservation about importing electricity from the Mainland.
- Following the consultation, the Government announced a new fuel mix target with around 50% natural gas for 2020 in order to meet the proposed environmental targets. These targets are to reduce the carbon intensity of Hong Kong by 50-60% by 2020 when compared to 2005; and to reduce emissions of sulphur dioxide (SO₂) by 35%-75%, nitrogen oxide (NO_x) by 20%-30% and respiratory suspended particulates (RSP) by 15%-40% by 2020 when compared to 2010.
- In January 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 will continue to phase down remaining coal plants in the next decade and replace them with natural gas and non-fossil fuel sources.

REDUCTION OF COAL IN FUEL MIX FOR ELECTRICITY GENERATION 2015-2030



Sources: Hong Kong's Climate Action Plan 2030+

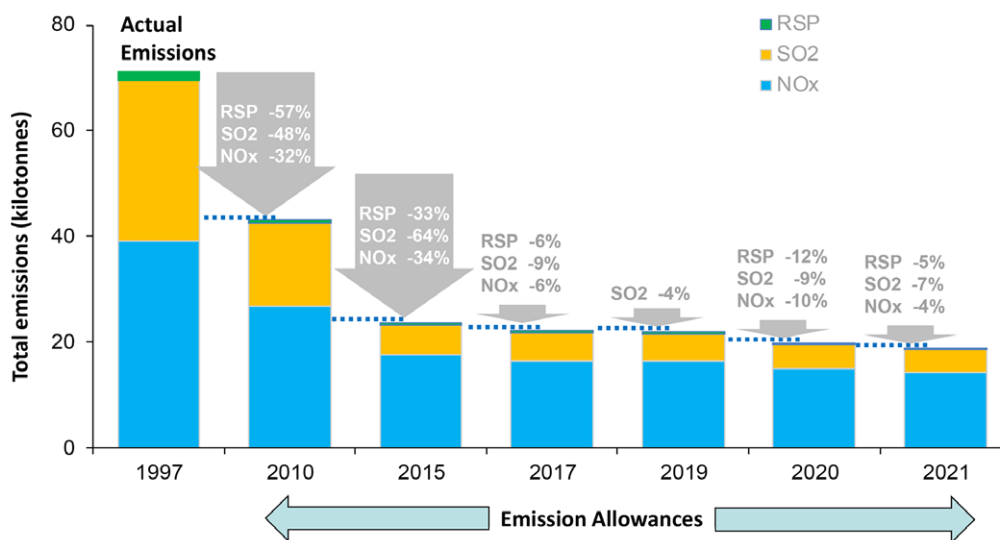
- CLP fully supports the Government’s plan to improve Hong Kong’s air quality and to promote low-carbon living. We are committed to continuing to increase the proportion of cleaner fuels in our generation portfolio. The section below illustrates our key initiatives of using cleaner fuels: natural gas, nuclear energy and renewable energy.

Natural Gas

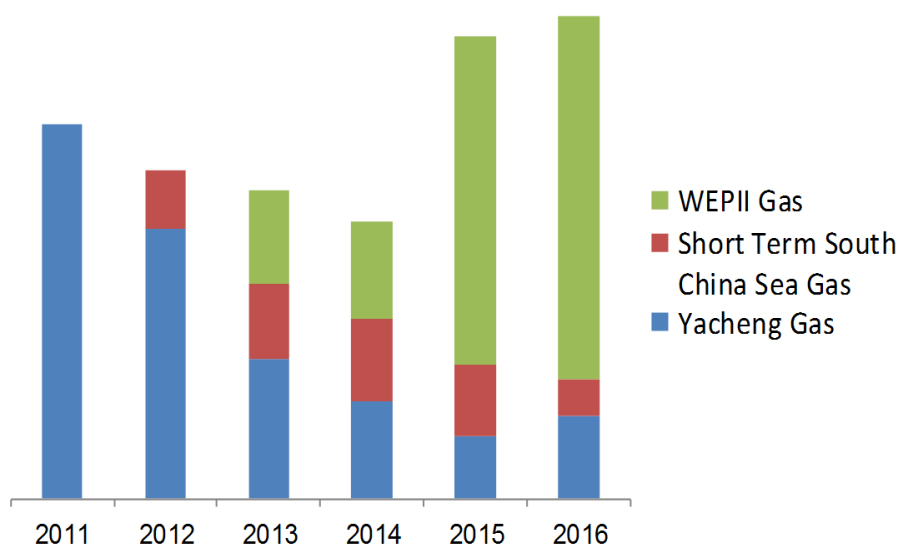
- **In 1996, CLP became the first electricity supplier to bring natural gas to Hong Kong** for power generation, for which natural gas emits much less sulphur dioxide, nitrogen oxide, particulates and carbon dioxide than most other fossil fuels. Over the years, the use of natural gas has helped CLP reduce 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.
- Today, the Yacheng gas supply is nearly exhausted. There is a need to replace this gas source as well as to develop new sources to meet the tightened emissions caps and the fuel mix policy set by the Hong Kong Government. Accordingly, we expect the **proportion of gas-fired local generation to increase significantly over the next few years.**

Emission caps for power stations have been increasingly tightened

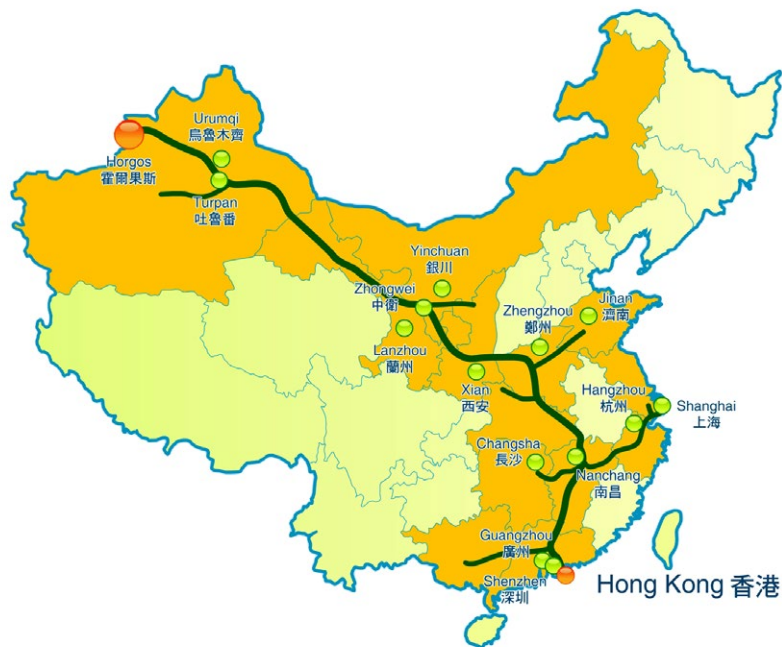


Gas Consumption



Gas Supplies to Hong Kong

- A Memorandum of Understanding (MOU) on energy cooperation was signed between the Hong Kong SAR Government and the Central Government in 2008, paving the way for the use of new fuel sources from the Mainland. Primarily one of the sources is the **WEPII**.
- WEPII, operated by China National Petroleum Corporation (PetroChina) and its subsidiaries, 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 Gas Supply Agreement (GSA) with PetroChina was signed for supplying WEPII gas to Hong Kong for 20 years starting from 2013. Gas is delivered via a 20-km undersea pipeline connecting the gas launching station at Dachan Island in Shengzhen and Black Point Power Station.



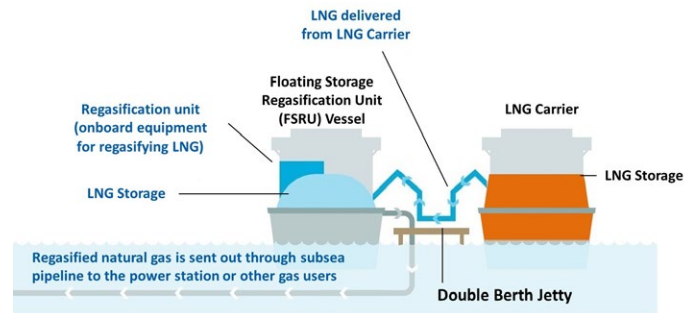
Ensuring Gas Supply

- To support the Hong Kong Government's policy of increasing the percentage of local gas generation to around 50% by 2020, CLP is seeking new gas sources to ensure long-term gas supply stability. 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 Hong Kong as a whole.
- CLP has developed a short, medium and long-term plan to ensure future energy supply stability, security and diversity. This also helps enhance the city's bargaining power for natural gas purchases to provide our customers a more cost-effective electricity supply.



- **Short-term** – gas from Wenchang Gas Field in the South China Sea will start supplying CLP from 2018 onwards via the existing Yacheng pipeline to supplement our supply needs in the medium term.
- **Medium-term** – CLP is building an additional Combined Cycle Gas Turbine (CCGT) with an advanced design at the Black Point Power Station. The new capacity ensures that reliable and cleaner electricity from gas-fired generation will be supplied to the customers. The new CCGT unit will adopt a technology that produces a comparatively higher efficiency and better emissions performance than the existing generating units at Black Point. Environmental Permit has been obtained from the Government and the unit is expected to start operations before 2020.
- **Long-term** – CLP has also been exploring the feasibility of building an offshore Liquefied Natural Gas (LNG) terminal by applying the new natural gas related technology of Floating Storage Regasification Units to enable direct purchase of liquefied natural gas from the international gas market.

A comprehensive Environmental Impact Assessment (EIA) is now underway to examine potential impacts of the offshore LNG terminal in regard to the marine ecology and other related aspects during construction and operation. Appropriate mitigation measures will be adopted when needed to minimise possible impacts on the environment.



- In parallel, CLP continues to **pursue the gas sources stipulated in the MOU** on energy cooperation and strives to achieve an **optimal balance between different fuel types**.

Nuclear Energy

Nuclear Energy in Hong Kong

- In 1985, the Chinese Government and CLP joined hands to develop the nation's first large-scale commercial **nuclear power station at Daya Bay** in Guangdong Province in the Mainland. It was CLP's first large scale power project in the Mainland and our first step 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 twenty-year contract for nuclear power supply to Hong Kong starting from 1994.



- As of today, nuclear energy accounts for about a third of CLP's fuel mix in Hong Kong and has been safely meeting 25% of Hong Kong's electricity needs for more than 20 years.
- Daya Bay produces around 14 billion kWh of electricity per year, of which 70% is exported to CLP's Hong Kong system. In September 2009, the supply contract for Hong Kong was extended for another twenty years to 2034.
- To ensure that more clean and cost-competitive energy is provided to Hong Kong, an agreement was reached to provide an additional 10% of the electricity output of Daya Bay to Hong Kong from late 2014 to 2018.
- Importing nuclear energy to Hong Kong has helped to avoid carbon dioxide emissions in the city by over 7.5 million tonnes a year while 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 our fuel mix and we will continue to explore ways of importing it in a manner that is acceptable to the community. It will offer an important element of diversity as we seek to minimise generation costs and emissions.
- CLP has 3 distinct roles in the Daya Bay Nuclear Project. We:
 - act as an investor;
 - contribute our expertise;
 - import nuclear electricity into Hong Kong.

Facts and figures about Guangdong 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	⇒ 1,380MW
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 Viable 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, the [defence-in-depth](#) principle is used 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;
 - Emergency Preparedness.

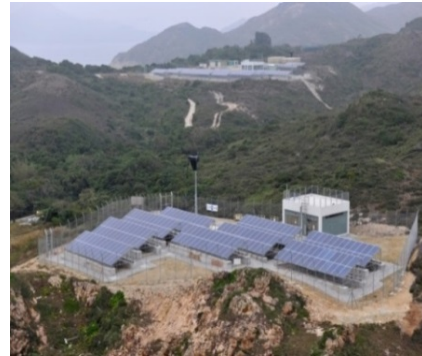
- Daya Bay is located in a seismically stable region. The site was selected with great care according to international guidelines and stringent safety assessment by the National Nuclear Safety Administration, after a comprehensive analysis and survey.
- The design of the nuclear power station allows for natural hazards such as tsunami or earthquake and is tailor made for the local situation around the site of the power station.
- In the event of an emergency due to equipment failure or human error, auxiliary equipment is ready to step in and maintain the safe operation of the plant, minimising the chances of any adverse impacts of Daya Bay on the environment.
- **Well established contingency plans** are in place at Daya Bay. A communication mechanism is also in place 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.
- For public understanding of nuclear operation and higher transparency, Daya Bay has adopted a **public notification mechanism** to release information of non-emergency Licensing Operational Events through the websites of DNMC and HKNIC, within two working days after such an event is identified. These events carry no nuclear safety consequences and have no impact on the external environment or public safety. Events of an emergency significance will be announced far more quickly and as appropriate by the government authority.
- **Daya Bay has maintained an excellent record of plant reliability, performance and safety since its commissioning in 1994.**
- Over the years, Daya Bay has ranked high in the World Association of Nuclear Operators (WANO) performance indices across various major aspects of generation capability, plant safety and efficiency, industrial safety and radiation protection. DNMC was also named champion in Capability Factor at the EDF Safety Challenge Competition for nine consecutive years by 2016.
- Daya Bay 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) is confirmed in a 25 year survey by the Shenzhen Municipal Health Bureau.

Renewable Energy (RE)

- **CLP is supportive to the development of community RE projects** and we strive to explore development of practical local RE opportunities.
- In Hong Kong, there is a lack of good renewable resources and there are constraints on land use availability. Moreover, RE requires higher generation cost and very often large land footprint. Given its intermittent nature, RE also requires backup, which usually comes from conventional generation. Despite these limitations, CLP's RE Projects include the following:

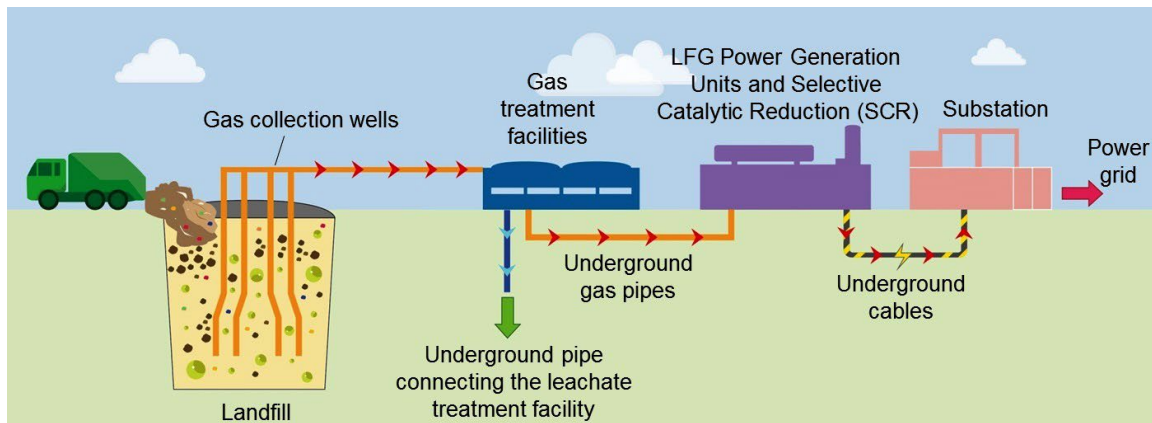
Town Island Renewable Energy (RE) Supply Project

- CLP has developed Hong Kong's first commercial-scale standalone renewable energy 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 generating capacity of up to 192 kW 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 second quarter in 2017, the system had generated more than 408,000 kWh of electricity, equivalent to the monthly consumption of 1,166 households. It had achieved of over a significant reduction of over 165,000 kg in carbon dioxide (CO₂) 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 Project

- CLP plans to install power generation units at the **West New Territories (WENT) Landfill**. The units will make **use of landfill gas produced locally at the landfill site for power generation** and the electricity produced will be transmitted to the CLP Power's existing power grid.
- Upon the completion of the first phase of the WENT landfill project with five generation units, power generated would be sufficient to supply 17,000 four-person households. The project is expected to commission by end of 2018.



Landfill gas generation process

Feasibility test for developing offshore wind farm

- Given Hong Kong's densely populated urban environment and the nature of our terrain, there is limited potential for Hong Kong to develop significant land-based RE projects. However, developing wind resources offshore is a possible alternative. CLP is keen to explore this new technology for Hong Kong on a wider scale, although such a move would involve economic and environmental trade-offs.
- CLP is studying the feasibility of developing an **offshore wind farm** in the south-eastern waters of Hong Kong.
- We are in the process of collecting wind, wave and other environmental data for completing the feasibility study and will engage with the community on the appropriate way forward.

Grid Connection Renewable Energy Projects

- While large-scale land-based projects prove challenging, there is still the possibility of installing small scale distributed RE generations in schools, on rooftops, in homes and other community facilities. We are supporting these smaller systems with easy **connection to our grid** and providing technical advice.

- There are so far about 270 distributed RE facilities connected to CLP's grid, with a total generating capacity of around 40 MW, which is less than 0.5% of CLP's generating capacity in Hong Kong. Project examples include the largest solar farm in Hong Kong located at the Siu Ho Wan Sewage Treatment Works of Drainage Services Department. The solar farm, built by CLP Engineering and connected to CLP's electricity grid, comprises over 4,200 solar panels covering an area of 11,000 square meter and is anticipated to generate as much as 1.1 million kilowatt hours of electricity annually.



- Other community RE projects also include the Construction Industry Council's Zero Carbon Building which generates RE on site from photovoltaic (PV) panels and bio-diesel and Science Park's building integrated photovoltaic (BIPV) and wind turbine systems on the facades.
- At present, the energy generated by these installed small grid connected RE systems is mostly consumed locally. There are however larger scale RE facilities under construction, planning and operation, e.g. Government's waste-to-energy facilities including the Sludge Treatment Facility at Tuen Mun and the Integrated Waste Management Facilities planned to construct at Shek Kwu Chau as well as the Organic Waste Treatment Facilities 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 Government's environmental goals. In April 2015, the Government Sludge Treatment Facility at Tuen Mun was connected and electricity generated from the incinerators is also sent to the grid.
- We will continue to support community renewable projects through such [enhanced services](#) as Solar Energy Assessment Service, setting up a dedicated hotline and simplifying the procedures for grid connection.

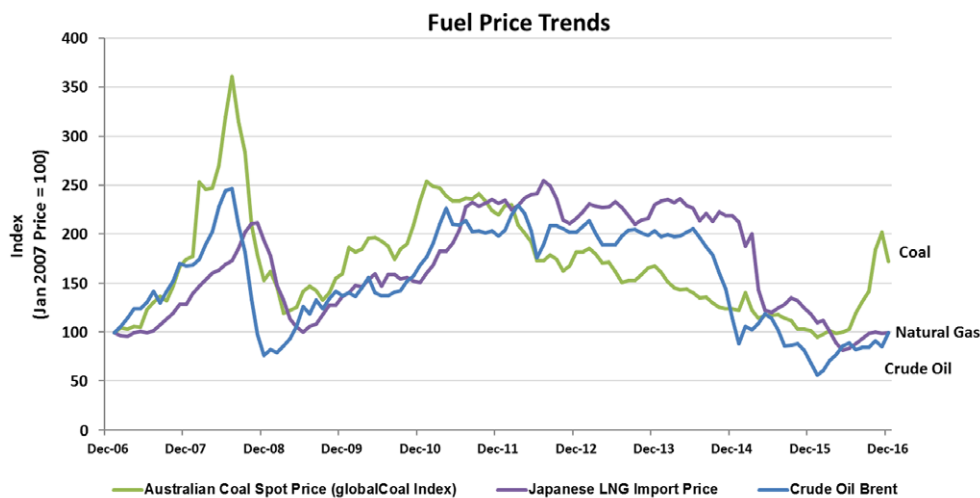
Enhanced Support and More Choices for Adopting RE

- CLP Power signed a new Scheme of Control Agreement (SCA) with the Hong Kong SAR Government. The new SCA will come into effect on 1 October 2018 and run until 31 December 2033.
- CLP will **introduce a Feed-in-Tariff programme** to encourage development of RE systems in the community. After connecting the RE systems to CLP Power's electricity grid, CLP will pay for electricity generated by these systems at a rate offered through the scheme. FIT will **provide financial incentives** for RE projects customers by **shortening the payback period**.
- We will also **issue Renewable Energy Certificates** to allow customers who prefer clean energy to support electricity generated from local RE systems. Revenue generated from the RE Certificate Scheme will help lower the electricity charge for all customers, and offers different platforms for the community to participate in RE development.

- Details of the new initiatives will be finalised in the months ahead. CLP Power will discuss with the Government and **continue to engage and communicate with stakeholders** to ensure that the new schemes will help promote RE development.
- See also separate Fact Sheet on **Scheme of Control Agreement**.

Managing Fuel Costs

- All the fuels Hong Kong required for power generation are imported and they are subject to price volatility in the international fuel markets.
- CLP is facing **challenge of volatile fuel costs** due to the need to use more expensive natural gas to meet the Government’s tightening emissions requirement and the increasing cost volatility in world energy markets.
- Fluctuating fuel cost has been the driver of CLP’s tariff adjustment over the past few years and will inevitably continue to **put pressure on future tariffs**.
- The following chart shows the **volatility of fuel prices in the past decade** while the price of nuclear power is relatively stable.



- CLP’s **diversified fuel mix strategy** helps maintain the competitiveness of fuel costs in addition to fuel supply security.
- CLP takes a prudent approach in managing our fuel cost. Measures taken include contracting with different suppliers, as well as using a range of commercial terms to help us capture value from changing market conditions over time, thus ensuring our supply costs are in line with the market.

SAFETY FIRST

Safety Always Comes First

- Safety is always the **Number One priority** in CLP. Stringent safety guidelines, including **Life Saving Rules** which serve to prevent serious incidents, are well in place and strictly enforced by 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. In 2016, CLP carried out over 112,000 safety observations and inspections at CLP offices and construction sites.



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 apply the same safety standard to our contractors so as to upkeep safety performance across the board.
- **Safety Performance** – CLP has made every effort to achieve the goal of zero incidents and is working diligently towards the world’s best or world class safety standard. CLP was awarded the certificate on OHSAS 18001 Occupational Safety and Health Management System across all of its business units. CLP endeavoured in maintaining recordable incident rates well below average in the industry and the efforts were well recognised. Its achievement in no lost-time injury incidents in 2016 was recorded.

Safety Advocacy

- **A well-established Safety Management System** is in place to uphold the safety performance across CLP. Leading by example, a steering committee championed by top management is formed to formulate the company’s safety policies, practices and programmes, in order to cultivate 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.
- **Alignment Programmes for Contractors** are in place to ensure the same safety standard and practices are applied to CLP staff and contractors. Safety initiatives and enhancement programs such as safety observations (focusing on behaviour), review of personal risk, safe systems of work and control of heavy lifting operations are communicated to all contractors for effective implementation at all CLP’s work sites.

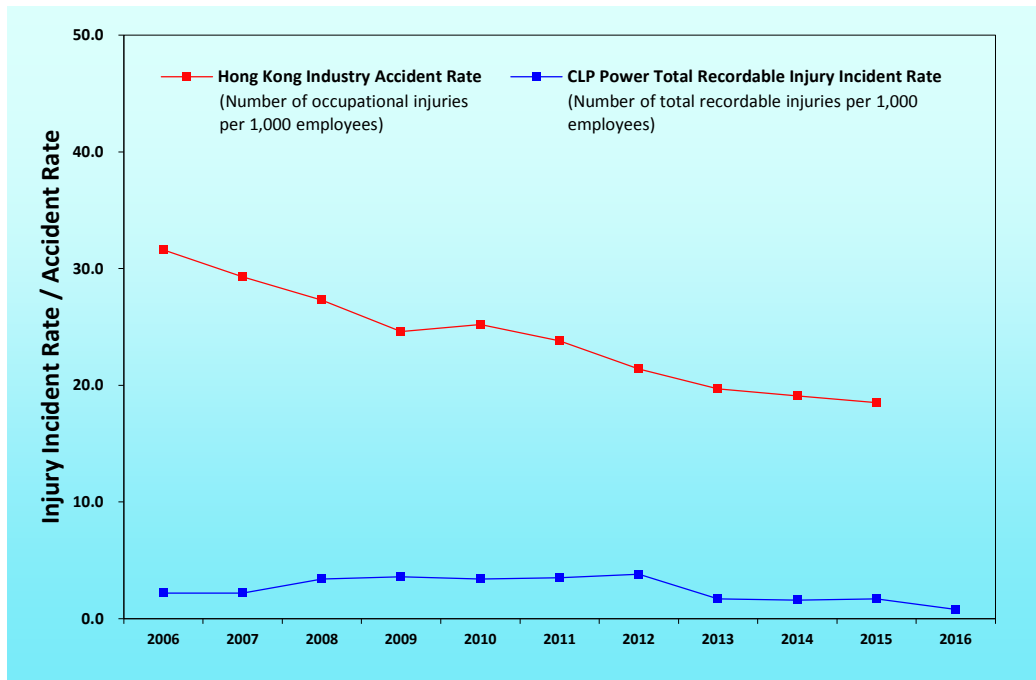
- CLP has conducted **Safety Climate Survey** every three year since 2004. The most recent survey was completed in late 2016. The analysed survey results will be communicated to all staff. An action plan will then be developed to address comments and areas of improvement in the next three-year cycle.
- 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 safety and health. Roles and responsibilities on safety have been clearly defined for implementation by different family members.
- Safety Incentive Scheme** is one of the signature programmes to connect colleagues' safety effort with the community. The scheme encourages staff to share initiatives on safety practice which will turn into donations to local charities as the company will reward outstanding initiatives that help enhance our safety performance.
- CLP proactively participates and organises **occupational safety and health seminars** to keep the industry workforce abreast of the up-to-date safety and health knowledge, as well as providing a platform for sharing good safety practices.
- As early as in 2004, CLP has launched the **Safety Leader** programme to provide comprehensive trainings to all staff, ranging from frontline colleagues to the executives, with an aim to raise their safety awareness. Up to now, over 1,500 staff members have been appointed as Safety Leaders to be the role models and cultivate safety messages to all staff.
- CLP has been widely recognised for our continuous efforts on occupational safety and health promotion. We have received various awards from the industry in recognition of our outstanding safety performance.



Safety Performance

- CLP achieves excellent safety performance, and our accident rates have been far below the average industrial accident rates of Hong Kong over the years.

Industrial Accident Rate of Hong Kong industries and CLP (2006 - 2016)



(1) The Hong Kong Industry Accident Rate is sourced from [Labour Department Occupational Safety and Health Statistics Bulletin \(August 2016\)](#)

(2) Occupational injuries (including industrial accidents) are injury cases arising from work accidents, resulting in death or incapacity for work of over three days, and reported under the Employees' Compensation Ordinance.

(3) Total Recordable Injury is the sum of all injuries other than first aid case, which includes all Fatalities, Lost Time Injury Incidents, Restricted Work Injury Cases and Medical Treatment Cases.

Major awards which CLP received in 2016

Organiser	Scheme	Award
Occupational Safety & Health Council	The 15th Hong Kong Occupational Safety and Health Award	<ul style="list-style-type: none"> • Gold Award for Safety Enhancement Programme • Silver Award for Safety Promotion Award • Silver Award for Safety Culture Award
Construction Industry Council and Occupational Safety & Health Council	Good Housekeeping Competition 2016-17	<ul style="list-style-type: none"> • Good Housekeeping Gold Award (Other Industries)
Labour Department and Occupational Safety & Health Council	The 8th Award Scheme for the Outstanding Employees in Occupational Safety & Health	<ul style="list-style-type: none"> • Merit Award for Outstanding Employees in Occupational Safety & Health – Management Employee • Merit Award for Outstanding Employees in Occupational Safety & Health – Supervisory Category • Merit Award for Outstanding Employees in Occupational Safety & Health – Frontline Employee
Labour Department, Hong Kong International Airport and Occupational Safety & Health Council	Forklift Truck Safe Operation Competition 2015-16	<ul style="list-style-type: none"> • The Best Forklift Truck Safe Operation (Merit Award) • The Best New Forklift Truck Operator (Champion)
Occupational Safety & Health Council	Safety Quiz 2016	<ul style="list-style-type: none"> • 2nd Runner Up in Occupational Safety and Health Council Cup

Awards for CLP's Engineering Projects in 2016

Organiser and Scheme	CLP Winning Project	Award
Labour Department and Occupational Safety & Health Council Construction Industry Safety Award Scheme 2015/2016	<ul style="list-style-type: none"> Minor Building / Civil Works Contract at CLP Power Premises 	<ul style="list-style-type: none"> Silver Award in Minor Renovation and Maintenance Work Merit Award in Safety Team
	<ul style="list-style-type: none"> Kai Tak Cable Tunnel 	<ul style="list-style-type: none"> Merit Award in Safety Team
Development Bureau and the Construction Industry Council The 22nd Considerate Contractors Site Award Scheme	<ul style="list-style-type: none"> West Kowloon Cultural District Substation 	<ul style="list-style-type: none"> Bronze Award in Considerate Contractors Site Award Gold Award in Outstanding Environmental Management and Performance Award
	<ul style="list-style-type: none"> Kai Tak Cable Tunnel 	<ul style="list-style-type: none"> Silver Award in Considerate Contractors Site Award Silver Award in Outstanding Environmental Management and Performance Award
	<ul style="list-style-type: none"> Tseung Kwan O 400kV Substation and Lee On Substation (under Minor Civil Works) 	<ul style="list-style-type: none"> Gold Award in Considerate Contractors Site Award Merit Award in Outstanding Environmental Management & Performance Award
	<ul style="list-style-type: none"> Strafford House and San Po Kong Staff Quarter (under Minor Civil Works) 	<ul style="list-style-type: none"> Silver Award in Considerate Contractors Site Award
	<ul style="list-style-type: none"> CLP Outline Agreement No. 4610000802 for No Dig Works 	<ul style="list-style-type: none"> Merit Award in Considerate Contractors Site Award
	<ul style="list-style-type: none"> Design and Construction of Minor Building & Civil Engineering Works for CLP 	<ul style="list-style-type: none"> Merit Award in Model Subcontractor Award

CUSTOMER EXCELLENCE

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 assess our performance regularly and report our achievements to establish a performance pledge on a yearly basis.** Our efforts in meeting our performance pledge are recognised in the community — CLP has won a number of prestigious awards for excellence in customer service. For instance, we have won the Gold Award of the Mystery Caller Assessment Award by Hong Kong Call Centre Association for the seventh consecutive year. In 2016, CLP also won the Silver Award in HKACE Grand Award from the Hong Kong Association for Customer Service Excellence.
- CLP strives to achieve the service targets pledged to our customers. The table below shows our 2017 targets and 2016 performance.

Performance Standards	2017 Targets	2016 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	96.5%	✓
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	98.8%	✓
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 in less than 9 seconds	90% of answering time	✓
Answer Enquiries Hotline in less than 9 seconds	80% of answering time	✓
Average queuing time for customer service enquiries at Customer Service Centres	Within 3.5 minutes	✓
[#] Excluding incidents occurred during severe weather conditions or in remote locations (e.g. outlying islands without regular transportation).		✓ Target met

Delivering Customer Benefits

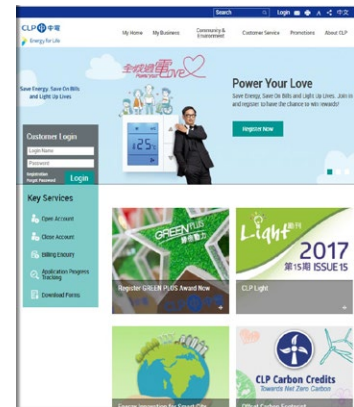
Offering Convenience to Customers

- We strive to continuously enhance our service quality by offering greater convenience and benefits to our customers.
- For **residential customers**, we offer value added services designed to provide inspiring ideas that improve their quality of life. For some of our larger **business customers**, our dedicated account management team serves as a single point of contact to deliver professional services and offer high quality advice on electricity usage and energy management.
- Below shows a wide variety of channels through which our customers can enjoy our quality service:

Online Platforms

CLP Website

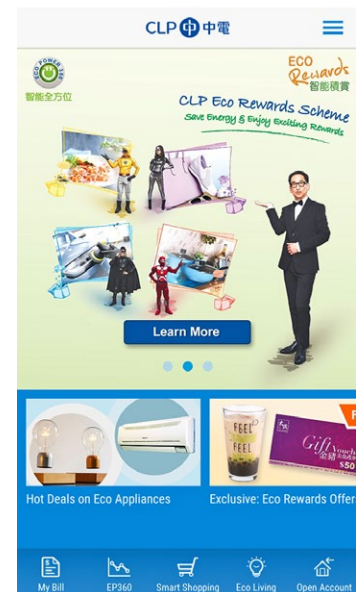
- CLP offers a one-stop [online platform](#) for customers to manage their electricity accounts, payment and billing anytime anywhere. Energy saving tips and promotional offers are also available for the public.



For Residential Customers

CLP Mobile App

- A brand new mobile platform that provides customers with green living ideas wherever they go. Customers can also manage their electricity accounts, payment and billing while they are on-the-go, enjoy shopping for energy efficient appliances on the online and mobile shopping platform **Smart Shopping**, and gift redemption by earning Eco Points through **Eco Rewards Scheme**. Quick access to useful information including Customer Service Centre locations, hotlines, and a quick guide to Electric Vehicle Charging Stations are all available at the fingertips.



Eco Power 360

- An enhanced version of online assessment tool, [Eco Power 360](#) helps customers understand more about their electricity consumption pattern and benchmark with similar families. Customers can redeem gifts with the Eco Points rewarded by saving energy and joining designated activities under the Eco Rewards Scheme.

For Business Customers

GREEN^{PLUS} Energy Billboard

- An online benchmarking tool, [GREEN^{PLUS} Energy Billboard](#), offers business customers the convenience to compare average monthly energy performance among individual outlets of chain stores or group-wide companies as well as against the industry norm. The tool helps them manage their electricity consumption and save operational cost.

Enhanced Communication Channels

- To facilitate instant communication with customers, CLP launched the following enhanced communication channels for designated customers:
 - **SMS Notification Service** provides proactive SMS notification to Estate Management Office (EMO) and Incorporated Owners in the events of voltage dip or power incidents relating to their facilities.
 - **“CLP – EMO Direct” WeChat Channel** for EMO, in case of any power outages or voltage dip incidents, enables power company and EMO to communicate instantly via this WeChat channel.
 - **WeChat Communication Platform** for hearing-impaired customers to enquire their electricity account and communicate with us about supply issues and during emergencies.
 - Customers can call 2728 8333 for more details.

Personalised Services

Smart Energy Experience Centre

- The Yuen Long customer service centre has undergone a major facelift, transforming into a Smart Energy Experience Centre. By partnering with the Hong Kong Science and Technology Parks Corporation (HKSTP) and using innovative technology developed by local start-up companies, the centre introduces smart home devices and smart business solutions, aiming to promote smarter, low-carbon lifestyles to customers.



Customer Service Centres

- Three [customer service centres](#), two [Eco Homes](#) and one Smart Energy Experience Centre conveniently located in CLP's supply area provide basic assistance in account management and enquiries as well as advice on energy efficient products, energy saving tips and product safety for better quality living.
- Two business centres in Sham Shui Po and Yuen Long provide a comprehensive range of professional and dedicated services for small to medium-sized business customers, from power supply and technical support to energy efficiency solutions.



24-hour Hotlines operated by Customer Interaction Centre

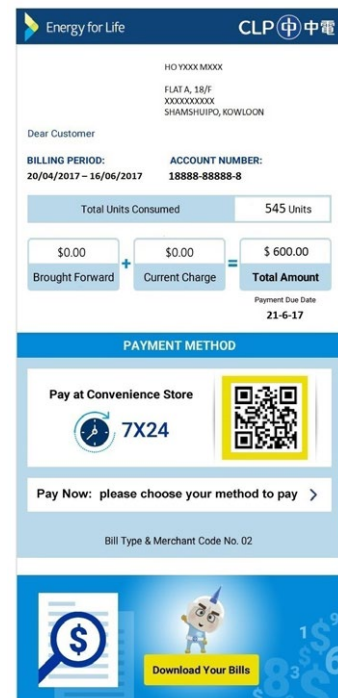
- A 24-hour **Customer Service Hotline (2678 2678)** attends to customers' enquiries via phone calls in person. Around 4,100 calls a day and 1.17 million calls a year are taken by our hotline service.
- A separate **Emergency Hotline (2728 8333)** is dedicated to handle customer enquiries on supply interruptions, planned outages, voltage fluctuations, cable damages and dangerous wiring.
- Link to reference information: [CLP Customer Hotlines](#)

Billing Made Easy

- Electricity Bill** is designed to highlight important billing and tariff information and incorporate useful features to customers such as statistics on average consumption per day over the past 14 billing periods.

Green Bills

- CLP also offers **green bills** to customers via e-mail and CLP App which not only reduces paper wastage but also helps protect our environment. Customers are able to manage their bills and make payment via different online platforms. They can also track their billing and payment history up to past 14 billing periods.



Payment Channels

- A wide range selection of **payment channels** is offered to customers for settling their bills:
 - Cash settlement at convenience stores
 - Cheques by mail or via deposit machines
 - E-Cheques via e-Drop Box
 - Cash and cheque payment at Hong Kong Post Offices
 - Autopay via bank accounts or credit cards
 - e-payment options such as Payment by Phone (PPS) and automated teller machine (ATM)
 - Mobile payment via Payment by Phone (PPS) is available from mid-2017 onwards

Professional Services

- For large business customers, professional services are offered through our **Account Managers** on energy solutions, energy audits and improving power quality.

Helping Customers to Save Energy

- CLP is committed to energy efficiency and conservation. We adopt a four-pronged approach to changing people's habits and helping them to reduce their energy consumption. These steps are:
 - Educating the public;
 - Providing customers with electricity consumption information and energy-saving tips;
 - Equipping customers with energy saving tools and technical support;
 - Helping with enablers to make greater energy efficiency possible.
- See also separate Fact Sheets on **Energy Saving** and **Community Commitment**.

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 13.
- CCG's main purpose is to further enhance the relationship between CLP and its customers, improve services to customers, and to ensure that the ever increasing demand of customers is addressed.
- Following the success of CCG, [CLP Local Customer Advisory Committees \(LCACs\)](#) were formed in 1994 to strengthen customer communication. Members consist of representatives from different customer segments, such as management professionals, resident associations, business owners of small and medium-sized enterprises (SMEs), community leaders and members of rural committees. Currently, there are 14 LCACs in CLP's supply area.
- Each LCAC meets quarterly to offer advice on quality and efficient customer service. They also collaborate with CLP in many community services. Over the years, this well established communication channel between CLP and local communities has constructively helped reflect timely feedback from customers.

COMMUNITY COMMITMENT

Care for Our Community

- The success of CLP as a business is closely aligned with the well-being of the community we serve. At CLP, we deliver reliable and safe electricity at reasonable tariff, operate in a responsible way, and **give back energetically to the community of Hong Kong.**
- Our community commitment initiatives focus on three areas: the **environment, youth and education**, as well as **community well-being**. We work closely with local NGOs and community groups to **identify evolving social needs** and to devise programmes that will have the best long-lasting impact. In 2016, we initiated and supported 447 community projects in Hong Kong.
- Over the years, our community activities have improved people's quality of life with the help from **our skills, expertise and resources.**

Our Flagship Programmes

CLP Hotmeal Canteens

- We are continuing our efforts in enhancing community well-being. Since 2011, CLP has been partnering with **The Hong Kong Council of Social Service** and **Baptist Oi Kwan Social Service** to provide hot meals for just **HK\$10** as nutritious supplement to low-income families, the unemployed and elderly people in need in Sham Shui Po.
- In 2014, CLP, partnering with **Po Leung Kuk**, launched the second and third hotmeal canteens in Kwai Tsing and Kwun Tong.
- These three canteens are located in Hong Kong's top five poorest districts according to Census and Statistics Department's information. The canteens provide dietician-approved nutritious breakfasts, lunches and dinners to elderly and needy families at a **concessionary price of HK\$2/HK\$10** respectively.
- These three canteens **serve about 10,000 hot meals every month.**



- **A total of more than 390,000 hot meals** had been provided for the needy in Sham Shui Po, Kwai Tsing and Kwun Tong districts **as of August 2017**.
- The Hotmeal Canteen in Sham Shui Po also offers **job counseling, health advice sessions and counselling service** to help participants lead a healthier lifestyle and regain confidence by establishing a new social network.
- In April 2013, the **Hotmeal Delivery** service was launched to make the programme more far-reaching. Volunteers, including some of our Hotmeal Canteen beneficiaries, delivered meals to the homes of disabled people and the chronically ill in Sham Shui Po.
- Since May 2013, dietician-supervised menus have been offered. One of the dishes on the **daily menu** has been specially created by a dietician for people with blood pressure, cholesterol and glucose issues.
- CLP Volunteers participate actively in the hotmeal canteens, serving the beneficiaries on a weekly basis.
- Through CLP's own publicity channels, such as CLPOnline, CLP Green Living Express e-newsletter and print media, the programme has attracted broad support, generating more than **HK\$3.2 million in donations** from customers and members of the public as of August 2017.

Sharing the Festive Joy

- CLP launched the Sharing the Festive Joy programme in 2014, inviting single elderly people / elderly couples to spend the festivities such as the Chinese New Year, Tuen Ng Festival, Mid-Autumn Festival and Senior Citizen's Day with CLP volunteers to showcase our care for the elderly and spread message on energy efficiency and safety. Some **2,900 elders enjoyed** the festive meals as of September 2017.



Elderly Yum Cha

- CLP organised the **Elderly Yum Cha** programme in 2015 and 2016 running in partnership with more than 360 members of 14 District Councils in Kowloon, the New Territories, the outlying Islands, four major catering associations and 20 NGOs and local community groups. 200,000 coupons have been distributed to 70,000 elderly people as to treat them free dim sum breakfasts in over 170 restaurants across the territory. This programme also enabled elders in need to expand their social network.
- A total of HK\$5 million fund from CLP shareholders was set aside for the programmes in 2015 and 2016.



Promoting Energy Efficiency and Conservation (EE&C) in the Community

- CLP is committed to promoting energy efficiency and conservation, through **public education, community programmes** and a **series of tools**, to assist the public, our residential and business customers on energy saving.
- Since 2015, CLP has organised the **Power Your Love** programme for three consecutive years. It is the first programme of its kind in the world, combining energy saving with a mission to help the less fortunate in society. It is also a unique campaign to encourage people to save energy and contribute to the well-being of society by transferring units of electricity saved by customers to help people in need. In 2017, about 400,000 residential customers participated the campaign, an increase of 25% from 2016. In 2015 and 2016, a total of 12.5 million kWh saved from the programme in two years. Each year, about 20,000 households in need, such as the single elderly people, the elderly couples, the severely disabled, families living in sub-divided flats and the families of boarders in special schools, received the subsidy from a HK\$6-million fund from CLP's shareholders. Each family received HK\$300 that helps alleviating the pressure in electricity expenditure.
- In 2014, CLP allocated HK\$10 million from our shareholders' fund to launch the **CLP Subsidy Programme for Energy Efficient Electrical Appliances**. In joint effort with members of 14 District Councils in our supply areas, NGOs and green groups, the programme gave out sets of four energy saving electrical appliances to 4,000 households, including low-income families, residents of sub-divided flats, single elderly and the multiple have-nots" people, to improve their basic necessities and help them save energy expenditure. In 2016 and 2017, we continued to cooperate with the community leaders to provide energy saving electrical appliances to families with imminent needs, such as those who face financial burden after accidents or the chronic patients. This initiative followed the good deeds of our late Lord Lawrence Kadoorie, who gave out electrical appliances to residents of Tap Mun in 1978, when CLP started electricity supply to the area.
- In 2013 and 2014, CLP organised the **CLP Green Volunteers for Seniors** programme and joined hands with 14 community partners to give out 6,000 LED light bulbs (which can save over 80% electricity) to the elderly in need who were living in Kowloon, the New Territories and Lantau Island. Energy-saving and electricity safety information was also shared to raise their awareness of greener living.



Assistance to the Energy Poverty

- Energy poverty has been a growing concern in the community and hence the low-income families are one of key targets we offer assistance.
- In the past few years, CLP initiated different community projects to alleviate the economic burden of needy households including tenants living in sub-divided flats:
 - In 2013, we provided the Community Care Subsidy of HK\$300 to each eligible low-income person or household;
 - In 2014, sets of four energy saving electrical appliances to 4,000 underprivileged households including low-income families, residents of subdivided flats, single elderly people and people classified as multiple have-nots, were given out through the “CLP Subsidy Programme for Energy Efficient Electrical Appliances” to help improve their living condition and cut down on their electricity expenditure;
 - Since 2015, Power Your Love programme has been organised that electricity saved by participating households is transferred to help the people in need through CLP’s shareholders’ HK\$6-million fund. Each year, about 20,000 households in need receive HK\$300 each that helps alleviating their pressure in electricity expenditure;
 - We also provide energy saving rebate to low-consumption customers. The Energy Saving Rebate Scheme has been launched since 2013, residential customers using 400 units or less on a bi-monthly basis, can enjoy the rebates;
 - We also provide Concessionary Tariff for elderly customers aged 60 or above who live either alone or with other eligible 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 two months plus an exemption of the minimum charge per bill.
- CLP noted some concerns in the society about the electricity charge that tenants living in sub-divided flats are facing. CLP is willing to consider and work towards a resolution that fits in every aspect to help these people install individual meters. However, prior approvals from landlords and Owners’ Corporations for such installations are necessary.
- Since 2014, CLP has worked with Caritas Hong Kong, Yan Oi Tong, Society for Community Organization (SoCO), World Green Organisation and Hong Kong & Kowloon Electrical Engineering & Appliances Trade Workers Union in an attempt to identify sub-divided flat tenants and help those who have obtained their landlord’s permission and fulfilled safety requirements to install individual meters for free. So far, a total of three flats, have been installed with twelve individual meters.
- The Hong Kong Council of Social Service launched the Community Housing Movement in 2017, aims to provide transitional social housing to deprived households. As one of the supporting parties of the Movement, CLP will donate energy efficient home appliances to the tenants, such as induction cookers, rice cookers, electric fan and LED light bulbs etc., to help alleviate their household expenditure, encourage energy saving and improve home safety.
- We will continue to engage with the concern groups and tenants to understand their needs. As long as the landlords agree and it is under safe conditions, they are welcome to apply for individual meter installation.



Employee Volunteering

- Employee involvement is a very important part of the success of our community projects. **CLP's 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 re-wiring services to underprivileged elderly people. Today, it comprises **more than 1,400 employees, their family members and friends**. Senior CLP executives have lent their enthusiastic support to volunteers and actively participate in the volunteer effort. The CLPV Junior Team was also established to encourage staff to bring their children for volunteering work, encouraging more compassion in the community.
- CLP volunteers joined the community initiatives led by CLP and other organisations. These initiatives included:

 - Re-wiring work for the elderly;
 - Delivering of refurbished electrical appliances to the disadvantaged families;
 - Volunteer services for CLP Hotmeal Canteen beneficiaries;
 - English lessons and homework tutorial classes for new migrants and underprivileged children;
 - Beach cleaning activities;
 - Fund-raising activities, such as night walk, charity run, and city orienteering race;
 - Eco-tours, workshops on electrical safety and energy efficiency, caring visits, and a range of other activities for people in need;
 - Training of young volunteer leaders;
 - Actively participate in the CLP community programmes, including Sharing the Festive Joy Programme, Elderly Yum Cha Programme, Power Your Love Programme, giving out LED light bulbs to the elderly, and paying caring visits to the needy under the CLP Subsidy Programme for Energy Efficient Electrical Appliances.
- Apart from programmes initiated by CLP, we also encourage our employees to take part in other volunteering work. Employees are entitled to enjoy one day of **Community Service Leave** at full pay each year to participate in projects run by recognised voluntary service organisations.



Director of Social Welfare Ms Carol Yip presents a trophy to the CLP Volunteer sub-team with the highest number of service hours in 2016.



CLP presents certificates to representatives of more than 30 non-governmental organisations, which have given invaluable support to CLP Power's community projects, at the 2016 CLPV Appreciation Ceremony.

Various awards received by CLP	Organiser
2017 <ul style="list-style-type: none"> ▪ Community Engagement Crystal Award ▪ Metro Awards for Corporate Social Responsibility 2017 ▪ The 21st Outstanding Volunteer Awards - Corporate Caring Award ▪ 15 Years Plus Caring Company Logo 	Senior Citizen Home Safety Association Metro Daily and Metro Prosperity Hong Kong Sheng Kung Hui Welfare Council The Hong Kong Council of Social Service
2016 <ul style="list-style-type: none"> ▪ Outstanding Contribution Award of the Partnership Fund for the Disadvantaged 	Social Welfare Department
2015 <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ▪ 10 Years Plus Caring Company Logo 	The Hong Kong Council of Social Service
2013 - 2014 <ul style="list-style-type: none"> ▪ 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
2014 (Since 2007) <ul style="list-style-type: none"> ▪ Community Services Award - Sing Tao Services Awards 	Sing Tao Daily
2010 - 2011 <ul style="list-style-type: none"> ▪ Outstanding Partnership - "Care for the Elderly – Active Mind" 	The Hong Kong Council of Social Service
2006 - 2007 <ul style="list-style-type: none"> ▪ Total Caring Award 	The Hong Kong Council of Social Service
2005 - 2006 <ul style="list-style-type: none"> ▪ Outstanding Partnership - The Rewiring and Home Electricity Safety Service for the Elderly Programme 	The Hong Kong Council of Social Service
2002 - 2012 <ul style="list-style-type: none"> ▪ 10 Consecutive Years Caring Company Logo 	The Hong Kong Council of Social Service

Public Education Initiatives

- 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 introduced a host of environmental education activities for primary and secondary schools as well as university and college students. In 2016, our visitation facilities (listed in later section) received over 33,000 guests including shareholders, government officials, Legislative Council members, professional groups, business counterparts, community leaders as well as students.
- In August 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 introduce STEM education and inspire them to develop an interest in engineering as a profession. CLP is the first commercial company in Hong Kong providing a comprehensive tool kit for 180,000 pupils of 1,000 kindergartens for free.
- The education kit comprises storybook series, finger puppets to facilitate story telling, a board game, stickers, work sheets, an iconic cartoon character Power Kid to promote EE&C messages, Cartoon MV and a theme song titled “Please Come and Save the Earth” on energy saving. So far, 85% of the schools are using the Kit in 2016/17 academic year, reaching around 153,000 children.
- To inspire students to develop an interest in engineering, visitations by Graduate Trainees to kindergartens are arranged from January 2017. More than 1,800 kids from 25 schools were reached out as of August 2017.
- To further promote EE&C to the public, youths, local community groups and NGOs, **Please Come and Save the Earth** Music Contest was organised on 12 March 2017. It attracted 170 teams and some 1,700 contestants coming from different nationalities, social backgrounds and ages, to perform the theme song of the education kit in very creative genres such as using a wind orchestra, guitars, vocals, percussion, Chinese musical instruments and even sign language.



- 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 school year. The Programme was carried out in 34 primary schools under Tung Wah Group of Hospitals and Po Leung Kuk. It will continue to run in the 2017/18 school year, in collaboration with Hong Kong Sheng Kung Hui Welfare Council (SKH), Green Power and Friends of the Earth (HK), to encourage 13,000 students and teachers from 17 SKH primary schools to apply green tips in their daily lives through checklist, assessment criteria, education materials, visits, talks and workshops. The green education portal continues to be the online platform for all students to learn green habits in a fun way through games and interactive content. The portal has also been opened to the public starting September 2017.



- Engineer in School programme provides secondary school students with a better understanding of Hong Kong’s energy industry and the power supply system in particular. It also educates them on the importance of environmental protection and energy conservation through job shadowing, day camps and school talks. In the 2016/2017 academic year, Engineer in School has toured 32 secondary schools reaching out to over 6,000 Form 2 to Form 3 students.



- Launched in 2011, the [LS-energy HK e-learning Portal](#) is Hong Kong’s first and most comprehensive one-stop Liberal Studies e-learning kit for the “Energy Technology and the Environment” module in the senior secondary Liberal Studies programme. CLP invited experts from the education sector, academia and government to form the CLP Liberal Studies Advisory Committee to develop this free platform to better facilitate students’ learning process.



- Green Studio** is the first mobile classroom equipped with an interactive movie which delivers messages on environmental protection to primary schools students and local communities in Hong Kong. Through the latest interactive 4D movie and Augmented Reality (AR) interactive educational games, students will learn about the impact of climate change, the importance of energy efficiency and how they can contribute to environmental conservation. Since 2009, Green Studio has reached out to over 130,000 school children and visitors.
- Launched in September 2017, CLP's first multi-purpose truck will join the Green Studio mobile classroom to deliver green messages to schools and local communities. Apart from delivering an upgraded 4D movie experience and educational AR games, the new truck can also be transformed to an open stage platform. Equipped with various digital technologies and interactive games, customers can get to know CLP's latest products and services in a more engaging and fun way.
- The **Junior Green Engineer Programme** was one of CLP's key initiatives to promote energy efficiency and conservation to the younger generation. The programme, ran from 2013 to 2016, was specially designed for local primary 4 to 6 students. Under the mentorship of CLP engineers, the programme uniquely integrated engineering, science and environmental protection learning through interactive activities, field trips and workshops. Students could also better understand the role of engineers and their contribution to Hong Kong's prosperity.
- The **Here WEEE Go** was Hong Kong's **first large-scale corporate recycling partnership programme** jointly organised by CLP and **St James' Settlement** between 2010 and 2013. CLP volunteers collected unused home appliances and delivered refurbished appliances to families in need. In four years, over 2,500 waste electrical appliances were collected for recycling and over 430 refurbished electrical appliances have been delivered to 200 disadvantaged families. Besides, 10,000 disused transformers have been collected to be matched up with other electronic appliances so that they can be re-used or recycled for their copper and plastic components. In 2013, CLP invited students from the Hong Kong Design Institute to turn discarded electrical appliances into niched, creative household furniture and accessories. (*WEEE: Waste Electrical and Electronic Equipment*)



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. The general public are welcome to visit these facilities and interactive platforms, which cover three key areas: energy business, fuels, and energy efficiency and conservation.

About Our Energy Business

ElectriCity

- It aims to educate the public about the production of electricity and promote environmental protection and energy efficiency. The centre features interesting and informative displays that explain the fundamental principles of electricity, power generation, transmission and distribution. Visitors can also learn more about the fuel mix in Hong Kong.

Black Point Gallery

- CLP's first exhibition on the theme of natural gas-fired power generation. It introduces the operation of gas-fired power generation and its environmental benefits which contribute to air quality improvement and carbon reduction for Hong Kong.

CLP Power Low Carbon Energy Education Centre

- CLP has sponsored the City University of Hong Kong to set up a [Low Carbon Energy Education Centre](#) on campus. Visitors can learn about the importance of low carbon energy in addressing the challenge of climate change. Connecting various exhibition zones is an innovative array of multimedia and interactive elements to illustrate the complex scientific concepts and generation principles of different kinds of energy. In an interesting and vivid manner, the Centre offers visitors an inspiring and enlightening learning experience. So far, 90 guided tours arranged for about 1,950 visitors of which 1,322 were students.

Power Quality Workshop

- 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, and the corresponding potential impacts on electrical equipment are featured.

Smart Grid Experience Centre

- As the first Smart Grid exhibition and education facility of its kind in Hong Kong, it showcases the features and benefits of smart grid with the latest smart grid-specific technologies such as Smart Meters. It also displays demonstration on CLP projects such as renewable energy, intelligent substations and self-healing system. Through interactive demonstrations, the benefits to customers and society are shared.

About Our Energy Efficiency and Conservation Efforts

Smart Energy Experience Centre

- The Yuen Long customer service centre has undergone a major facelift, transforming into a Smart Energy Experience Centre. Partnering with the Hong Kong Science and Technology Parks Corporation (HKSTP), using innovative technology developed by local start-up companies, the centre introduces smart home devices and smart business solutions, aiming to promote smarter, low-carbon lifestyles to customers.

Eco Home

- [CLP Eco Home](#) located in Mongkok is the first ever one-stop green living concept store in Hong Kong. The five-storey complex is home to a wide range of energy efficient products and help our customers experience up-to-date green technology and to keep abreast of energy saving knowledge. Experiential programmes are regularly held to bring to the public a 360-degree, eco-experience for their home. In 2015, CLP extended the Eco Home concept to Tai Po, bringing smart, green ideas to residents of the New Territories. This new green lifestyle centre showcasing innovative energy saving products such as solar-powered heat pump and garden lights for village homes and low-density housing. There are also demonstrations of electric vehicle charging. Free cookery demonstrations, induction cooking classes, product mega sales and other innovative activities will also be organised from time to time for customers to experience green living concepts.

GREEN^{PLUS} Experience Centre

- It is a platform for SMEs to experience energy efficiency and conservation in an interactive and innovative way by using the latest technology and motion-sensing interactive exhibits. It showcases mock ups of different SME trades such as fashion, lighting shops, convenience stores, catering outlets and offices, allowing visitors to experience applicable and affordable energy saving solutions in their own business operations.

Green Studio

- [Green Studio](#) is the first mobile classroom equipped with an interactive 4D movie which delivers messages on environmental protection to primary schools students and local communities in Hong Kong. (see section above on Public Education Initiatives)

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- Link to reference information: [Visit to CLP](#)

PEOPLE DEVELOPMENT

Nurturing Power Talents

- CLP employs over 4,400 staff in Hong Kong (CLP Holdings Limited and CLP Power Hong Kong Limited) and invests constantly in **Training and Development** to help our staff perform well in their current roles and prepare them for future challenges.
- Established in 1966, our world-class **Power Academy** (formerly known as Training School) trains operational experts and engineers for power transmission and distribution.
- For our power stations, besides training teams under individual departments, our **Generation Academy** has been established for the training and development of our power generation staff and contractors.
- Our well-structured **Trainees and Apprentices Programmes** transforms talented young people into seasoned technical experts. These programmes include:
 - Graduate Trainee programme
 - Technician Trainee Programme
 - Apprentice Training Programme
 - Engineering Crew Programme
 - CLP Internship Programme
- To enhance our customer service, CLP established a **Customer Service Steering Committee** in 2014 comprising CLP senior executives across different Business Groups. The Committee provides overall guidance on customer service improvement initiatives. Also in 2014, an **Energy Retailer Academy** was launched to provide professional and in-depth training for our customer service team with an aim to enhancing their professional skills, knowledge and customer service level.



Training Facilities

Power Academy

- Our well-equipped **Power Academy** is located in Shatin, which provides the all-round training of technical, operational, safety, health and environmental quality management skills to our existing engineering staff and new joiners including trainees, apprentices and contractors for electricity transmission and distribution functions. The Academy has a dedicated team to promote Knowledge Management and learning culture.
- Training facilities include Web-based Learning Centre, 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.

Overhead Line Training School

- The **Overhead Line Training School** is the largest outdoor training venue of its kind in Hong Kong. With over 27,200 square meters, the School provides world-class training facilities and courses to train and develop staff for working and practising on overhead electricity lines.

Generation Academy

- Our **Generation Academy**, located in our power station, provides an array of training in technical, operational, safety, commercial and project management, as well as management skills with focus on power generation. The Mechanical & 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.

- CLP has a clearly-defined company policy towards people development and has introduced a variety of training and development programmes to enhance employees' professional proficiency and leadership potential. CLP's commitment to people development are well recognised and has been voted as one of the top five most attractive employers in Hong Kong in the Randstad Awards for five consecutive years. CLP is continuously recognised by the Employees Retraining Board (ERB) as a "Manpower Developer" since 2010 and received the "Manpower Developer 1st (2010-2018)" and "Voting of My Favorite MDs" award voted by the Hong Kong public in the 6th "ERB Manpower Developer Award Scheme".
- CLP has won the **Asian Most Admired Knowledge Enterprise (MAKE) Award 2015** for its outstanding performance in Knowledge Management and creating a knowledge-driven culture. CLP was one of the 25 organisations from South Korea, Japan, Singapore and other Asian countries and territories to win the regional award. The company was also named the best performer among the winners in the field of people development.

CLP Power Academy

- To support sustainable development of Hong Kong and to meet the growing need for power expertise, CLP is establishing CLP Power Academy. The new institution will collaborate with different academic organisations to provide training courses for those who aspire to develop their career in power industry, and existing practitioners who look for further studies in the field. Students from CLP Power Academy will receive industry-recognised professional qualifications upon graduation. Talents nurtured are expected to contribute to the sustainable development of the local power industry.
- In April 2017, CLP and the Vocational Training Council signed a Memorandum of Understanding to launch a Professional Diploma course in Power Engineering which will nurture and fast-track professionals for the engineering industry. The part-time course will be the first training course to be offered by CLP Power Academy. The course can be completed within a minimum period of one year that will give electrical and mechanical tradespeople the opportunity to advance their careers by studying for a professional diploma and qualifying as technicians. The diploma course is recognised as being equivalent to Level 4 of the Qualification Framework, Higher Diploma level. Graduates from the course can further their studies with Bachelor Degree in Engineering.
- Upon inception, CLP Academy plans to continue collaborating with other tertiary institutions to offer more courses at diploma and bachelor degree levels to nurture talents for the local power industry.



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 by offering the **CLP Internship Programme** to identify and nurture new talent, and to attract them 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, the Hong Kong Polytechnic University, the Chinese University of Hong Kong, the Hong Kong University of Science and Technology, and the City University of Hong Kong, as well as students who are studying electrical and mechanical engineering at the Vocational Training Council (VTC). Scholarship awarders will join the CLP Internship Programme to experience the work life of engineers.

- Since 2015, CLP has supported the VTC to develop 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 the University of Hong Kong's Faculty of Engineering** formed a ten-year alliance "**Powering a Sustainable Generation Scholarship**" in 2013. The scholarship scheme supports promising undergraduate engineering students and helps them develop an international perspective through one semester of study in a prestigious overseas university. Selected scholars also get to join CLP's internship programme.
 
- To widen the exposure of Mechanical Engineering students through the real engineering working environment, CLP started up a Co-op Program with Department of Mechanical and Aerospace Engineering of The Hong Kong University of Science and Technology since 2016. From February to June 2016 and 2017, selected engineering students were offered a chance to work at CLP's power stations. This also provides a way to identify potential Graduate Trainee talents.
- CLP is collaborating with universities in the Mainland to arrange seminars, talks and company visits for engineering students. CLP also promotes Hong Kong's power industry to young people studying overseas via participating in a career fair organised by the UK Joint University Hong Kong Career Society and other online recruitment platforms.
- CLP signed an **MOU with the University of Strathclyde, Scotland** in February 2014. It marked an important milestone in a closer working relationship in respect of providing continuing professional development for our engineering talent, uplifting technical knowledge and exploring innovative technological applications.
- In order to support employees developing the full potential of their children through full-time continuing education, a **CLP Centenary Scholarship** programme has been established since 2001 for children of employees who have demonstrated outstanding academic and personal achievements.
- Link to reference information: [CLP Training and Internship Programme](#)

CLP IN MAINLAND CHINA

Background

- CLP entered Mainland China’s energy market in 1979 when it started providing electricity to Guangdong.
- As of 30 June 2017, CLP is one of the largest external independent power producers in Mainland China, focusing on clean energy generation. CLP also takes the role of a developer, investor, project manager and operator. Our generation portfolio includes coal, nuclear, and renewable energy such as hydro, wind and solar.
- Currently CLP has over 50 projects in Mainland China, covering 15 provinces, cities and autonomous regions in eastern China (Shandong, Jiangsu and Shanghai), southern China (Guangdong and Guangxi), southwestern China (Guizhou, Yunnan and Sichuan), northern China (Hebei, Tianjin and Inner Mongolia), northeastern China (Jilin and Liaoning) and northwestern China (Gansu and Shaanxi).
- Link to reference information:
<https://www.clpgroup.com/en/our-business/regional-presence/mainland-china>



Huajji Hydro Power Station, Guangdong

Our Operations

Coal-fired Power Plants

- CLP first invested in coal-fired power plants in Mainland China in 1998. As of 30 June 2017, we had operations in 14 projects in Guangxi, Shaanxi, Hebei, Inner Mongolia, Liaoning, Shandong and Tianjin, with equity capacity of 4,056 MW.
- CLP has invested in a range of measures to improve the environmental performance at these plants. For example, Guangxi Fangchenggang II Power Station, is fitted with highly efficient ultra-supercritical coal units and other emission control facilities such as flue gas desulphurisation system. The station has commenced operation since December 2016.



Fangchenggang I & II Coal-fired Power Station, Guangxi

Nuclear Power Station

- CLP's first major expansion beyond Hong Kong was our joint venture with China General Nuclear Power Corporation (then China Guangdong Nuclear Power Holding Co., Ltd.) to develop, build and operate the Guangdong Daya Bay Nuclear Power Station.
- 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 generating units now produce over 14 billion kWh of electricity per year, of which 70% is exported to Hong Kong.
- To ensure that more clean and cost-competitive energy is provided to Hong Kong, Daya Bay has increased its electricity supply to Hong Kong from 70% to approximately 80% of its total capacity from late 2014 to 2018.
- Link to reference information: <https://www.clpgroup.com/nuclearenergy/eng/main/index.aspx>
- See also separate Fact Sheet on **Energy Vision and Fuel Mix** about Nuclear Energy.



Guangdong Daya Bay Nuclear Power Station

Renewable Energy

- CLP has undertaken to support the Central Government's goal of reducing the country's carbon intensity through environmental improvements at power stations and continued development of renewable energy projects, including wind, hydro and solar.
- CLP Xicun Solar Power Station is the first large-scale demonstration project of agriculture-and-solar integration in Yunnan. By combining agricultural activities (plantation of honeysuckle in the solar farm) with solar generation, the project brings about multiple benefits including maximising land use, creating jobs for local farmers and fueling the community with clean energy.
- As of 30 June 2017, we had stakes in over 30 projects in various parts of the country, with equity capacity of 2,050MW.



Dali Xicun Solar Power Station, Yunnan

Pumped Storage Power Station

- Guangzhou Pumped Storage Power Station has a total capacity of 2,400MW and was developed in two stages.
- CLP wholly owns the Hong Kong Pumped Storage Development Company Limited (PSDC), through which CLP has contractual rights to use the equivalent of half of the first stage of the project (600MW) until 2034.
- CLP uses this pumped storage capacity to support the operation and security of the Hong Kong electricity supply system.



Guangzhou Pumped Storage Power Station, Guangdong

24 October 2018

To: Olivia May Ogilvie Lancaster

Authorisation of Use of CLP Info Kit

Dear Olivia,

Thank you for your recent request for permission to make a copy of the “CLP Information Kit, CLP Holdings Limited, 2017” (link copied below) on the publicly-available Stanford University PH240 course website. This letter serves to confirm that permission is granted for such use.

<https://www.clp.com.hk/en/about-clp-site/media-site/resources-site/publications-site/Documents/CLP-Information-Kit-English.pdf>

Should you have any enquiries, please do not hesitate to contact me at (852) 2678-8189 or vivian.au@clp.com.hk.

Best regards,



Vivian Au
Deputy Director – Public Affairs (Group)