<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ABOUT CLP</td>
<td></td>
</tr>
</tbody>
</table>
Who We Are | 1  
Facts and Figures (December 2020 figures) | 2  |
| 2 | SCHEME OF CONTROL AGREEMENT |  
What is the Scheme of Control Agreement (SCA)? | 5  
Key Terms in the Current SCA | 6  
Regulatory Process | 7  
Evolution of the SCA | 8  
Current SCA (2018–2033) | 9  
CLP’s New Five-year Development Plan (2018–2023) | 12  
CLP’s Performance under the SCA | 14  |
| 3 | ELECTRICITY TARIFF |  
CLP Tariff Components | 19  
Annual Tariff Review | 20  
Monthly Fuel Cost Adjustment | 20  
Tariff Structure | 21  
Tariff and Fuel Costs Challenge | 22  
Alleviating Tariff Pressures | 25  |
| 4 | RELIABLE ELECTRICITY SUPPLY |  
Why is Reliable Power Supply Critical to Our Customers? | 26  
CLP’s Supply Reliability | 26  
Maintaining World-Class Supply Reliability | 27  |
| 5 | ENVIRONMENTAL MANAGEMENT |  
Government’s Environmental Policy | 34  
Powering Responsibly and Reducing Emissions | 37  
Other Environmental Initiatives | 42  
Green Driving | 43  |
| 6 | CLEANER FUEL MIX FOR ELECTRICITY GENERATION |  
Getting to Know the Fuels for Power Generation | 44  
Managing Fuel Costs | 45  
Fuel Choices | 47  
CLP’s Fuel Mix for Electricity Generation | 48  |
## ENERGY MANAGEMENT

- Helping Customers with Energy Efficiency and Conservation (EE&C) ........................................ 61
- Energy Saving and Conservation Initiatives under SCA (2018–2033) ........................................ 63
- Helping Residential Customers in Energy Saving ........................................................................ 64
- Helping Business Customers in Enhancing Energy Efficiency ............................................... 64
- Apply Innovative Technology to Save Energy and Reduce Carbon Emissions .................. 65
- Peak Demand Management ........................................................................................................ 66

## SAFETY FIRST

- Safety Always Comes First ............................................................................................................. 67
- Safety Commitment ....................................................................................................................... 67
- Safety Advocacy ............................................................................................................................ 68
- Safety Performance ....................................................................................................................... 70

## CUSTOMER JOURNEY

- Performance Pledges ................................................................................................................... 71
- Improving Online-to-Offline Customer Experience ................................................................. 72
- Customer Engagement ............................................................................................................... 75

## COMMUNITY COMMITMENT

- Care for Our Community ............................................................................................................. 76
- Our Flagship Programmes ........................................................................................................... 76
- CLP Volunteer Team .................................................................................................................. 80
- Public Education and Youth Engagement ................................................................................. 83
- Our Key Visitation Facilities ....................................................................................................... 90

## PEOPLE DEVELOPMENT

- Internal People Development and Caring for Employees .......................................................... 91
- Nurturing Power Talents ............................................................................................................. 95

## CLP IN MAINLAND CHINA

- Background ................................................................................................................................. 98
- Our Operations .......................................................................................................................... 99

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

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

This Information Kit is printed on environmentally friendly paper.
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 120 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.

- To offer better services tailored to customers’ needs and in the ongoing digital transformation of our business, we will continue to focus on the development of new smart services for households and businesses, as well as the use of technologies such as robotics solution, digitalisation, and data analytics to enhance our operational performance, and contribute to a greener and smarter Hong Kong. Based on our understanding of various sectors and businesses, CLP Power will continue to act as a bridge and an energy partner to connect them with start-up companies, smart product and service providers, which aim to provide innovative smart technology and energy saving solutions to address their operational needs.
Facts and Figures (December 2020 figures)

CLP Power in Hong Kong

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year founded</td>
<td>1901</td>
</tr>
<tr>
<td>Supply area</td>
<td>Kowloon, New Territories and most of the outlying islands</td>
</tr>
<tr>
<td>No. of customer accounts</td>
<td>2.69 million (as of June 2021)</td>
</tr>
<tr>
<td>Population served</td>
<td>Over 6.2 million</td>
</tr>
<tr>
<td>Installed capacity</td>
<td>9,573MW</td>
</tr>
<tr>
<td>Total electricity sales</td>
<td>33,963GWh</td>
</tr>
<tr>
<td>No. of employees</td>
<td>3,861</td>
</tr>
<tr>
<td>Financial performance</td>
<td>SoC Revenue: HK$41,905 million</td>
</tr>
<tr>
<td>Regulated by</td>
<td>HKSAR Government under the Scheme of Control Agreement</td>
</tr>
</tbody>
</table>

Generation Facilities

<table>
<thead>
<tr>
<th>Generation Facilities</th>
<th>Since</th>
<th>Fuel Type</th>
<th>Generation / Purchase Capacity (MW)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Castle Peak Power Station</td>
<td>1982</td>
<td>Coal</td>
<td>4,108</td>
<td>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</td>
</tr>
<tr>
<td>Black Point Power Station</td>
<td>1996</td>
<td>Natural Gas</td>
<td>3,225 (operational)(^1) 600 (under construction)</td>
<td></td>
</tr>
<tr>
<td>Penny’s Bay Power Station</td>
<td>1992</td>
<td>Oil</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>West New Territories (WENT) Landfill Gas Power Generation Project</td>
<td>2020</td>
<td>Landfill Gas</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Daya Bay Nuclear Power Station</td>
<td>1994</td>
<td>Nuclear</td>
<td>1,577(^2)</td>
<td>Owned by Guangdong Nuclear Power Joint Venture Company, Limited, in which CLP has 25% stake</td>
</tr>
<tr>
<td>Guangzhou Pumped Storage Power Station</td>
<td>1993</td>
<td>Hydro</td>
<td>600</td>
<td>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</td>
</tr>
</tbody>
</table>

\(^1\) Data as of June 2021.

\(^2\) CLP Power purchases 70% of the output from Daya Bay Nuclear Power Station. For the period between late 2014 to 2023, CLP Power has increased the purchase of approximately 10% of additional nuclear power from Daya Bay.
Transmission and Distribution (June 2021 figures)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of primary substations</td>
<td>236</td>
</tr>
<tr>
<td>No. of secondary substations</td>
<td>Over 15,100</td>
</tr>
<tr>
<td>Transmission and high voltage distribution lines</td>
<td>Over 16,300km</td>
</tr>
<tr>
<td>Average network loss (2016-2020)</td>
<td>3.69% of total energy consumption</td>
</tr>
<tr>
<td>Average unplanned Customers Minutes Lost per year (2018-2020)</td>
<td>0.92 minutes (The figure will be 9.77 minutes if including the impact due to Super Typhoon Mangkhut in 2018)</td>
</tr>
<tr>
<td>Electricity supply reliability</td>
<td>Above 99.999% (as of December 2020)</td>
</tr>
</tbody>
</table>

Our Customers

<table>
<thead>
<tr>
<th>Customer Type</th>
<th>Percentage in Total Local Sales in 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>38%</td>
</tr>
<tr>
<td>Residential</td>
<td>30%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5%</td>
</tr>
<tr>
<td>Infrastructure &amp; Public Services</td>
<td>27%</td>
</tr>
</tbody>
</table>
Our Shareholders

- CLP Holdings Limited had over 19,000 registered shareholders at the end of 2020. 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.

- 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 10 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 exceptionally high number of shareholders each year. In light of the COVID-19 situation, in accordance with the Government’s social distancing laws and regulations that remained in place at that time, the 2021 Annual General Meeting of CLP Holdings was held in a hybrid format, allowing shareholders to attend the meeting in person at the Annual General Meeting venue through prior registration or to join through an online platform. Our Shareholders’ Visit Programme, unique amongst Hong Kong companies, welcomed over 42,000 shareholders and their guests to various CLP facilities since the programme was initiated in 2003. In light of the ongoing pandemic situation, the tours have been suspended since February 2020. Despite this, we continue to receive strong interest from shareholders.
What is the Scheme of Control Agreement (SCA)?

- CLP’s electricity business in Hong Kong is regulated by the Hong Kong SAR Government under the Scheme of Control Agreement (SCA).

- The SCA is an agreement signed between the Hong Kong SAR Government and CLP Power / Castle Peak Power Company Limited (CAPCO). It defines the companies’ role as an electricity provider, and provides a regulatory framework for the Government to monitor its operating performance and financial affairs.

- Under the regulatory regime, power companies have obligations to provide sufficient and reliable electricity supply in their service areas. Customers obtain quality electricity supply at a reasonable price and in an environmentally responsible manner, while the power companies earn a return which is reasonable in relation to the risks involved and the capital invested.

- The SCA also provides an effective and stringent regulatory framework for the Government to monitor power companies’ operating and financial performance. Operating performance covers supply reliability, operational efficiency, customer 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. A 15-year term has been adopted in all the agreements except the fourth one that came into effect in October 2008. The duration of the agreement was 10 years with an option for the Government to extend the SCA for another five years. In April 2017, CLP signed a new SCA with the Government for a 15-year term, effective from 1 October 2018 until 31 December 2033.
# Key Terms in the Current SCA

<table>
<thead>
<tr>
<th>Key Term</th>
<th>What is it?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Targets</strong></td>
<td>- Performance targets of power companies are set for supply reliability, operational efficiency, customer services, supply restoration, energy efficiency, demand response and renewable energy (RE) development. New performance targets on supply restoration are being introduced to enhance the service level.</td>
</tr>
<tr>
<td><strong>Basic Tariff</strong></td>
<td>- Basic Tariff is set at a level to cover the required operating cost (including a standard cost of fuel) and return. (See also Chapter 3 on Electricity Tariff)</td>
</tr>
<tr>
<td><strong>Fuel Cost Adjustment</strong></td>
<td>- Fuel Cost Adjustment is either a surcharge or rebate to cover the difference between the actual cost of fuels spent and the standard cost of fuel collected through the Basic Tariff.</td>
</tr>
<tr>
<td></td>
<td>- A new arrangement for Monthly Fuel Cost Adjustment has been introduced, with revisions made more frequently from once a year to once a month to take into account the actual prices of fuels used. Such an arrangement is more transparent and reacts to fuel price changes in a more timely manner.</td>
</tr>
<tr>
<td><strong>Fuel Clause Recovery Account</strong></td>
<td>- 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.</td>
</tr>
<tr>
<td><strong>Tariff Stabilisation Fund (TSF)</strong></td>
<td>- 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.</td>
</tr>
<tr>
<td></td>
<td>- The TSF aims to ameliorate tariff increases or stabilise tariff levels.</td>
</tr>
<tr>
<td><strong>Permitted Rate of Return</strong></td>
<td>- Power companies are permitted to earn a fixed rate of return of the total value of their average net fixed assets. The permitted rate of return under the current SCA is 8%.</td>
</tr>
</tbody>
</table>
Regulatory Process

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

| Development Plan Review | CLP submits to the Government a detailed five-year plan to meet electricity demand for the development of Hong Kong. The plan, approved by the Executive Council, covers the required capital expenditure, operating and fuel costs, projected electricity sales and basic tariff rate.
| | It is required whenever the current Development Plan is about to expire or major capital expenditure is planned. |

| Annual Tariff Review | CLP submits to the Government a tariff proposal for the coming year before the end of October each year. The proposal includes: sales forecasts, total capital expenditure, total operating expenditure, cost of fuels and projected basic tariff rate, etc.
| | Any proposal to increase the Basic Tariff by more than 5% above the level approved in the Development Plan will require further approval by the Executive Council.
| | The adjusted tariff will be effective from 1 January of the following year after the Government’s review. |

| Annual Auditing Review | CLP submits detailed information to the Government before the end of March every year for auditing and review purpose.
| | The Government will compare the actual results for the previous year with the corresponding estimates made at the last Development Plan, and monitor the Company’s financial, technical and environmental performance. |

| Interim Review | A review is conducted every five years of the SCA on SCA-related matters. Changes can be made by mutual agreement by the Companies and the Government. |

- Links to reference information:
  - 2021 Tariff Review Presentation
  - 2021 Tariff Review Information

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* Period covering October — December 2018
Over the years, the terms in the SCAs have been evolving to reflect continuous refinements made to the regulatory framework in the areas of enhancing operation efficiency and services quality, promoting energy saving and improving environmental performance, increasing information transparency and economic benefits to customers.

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

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

- The current SCA is an agreement achieved through the joint efforts of both the Government and 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 incentive and penalty scheme of the previous agreement continues to apply, but with more stringent performance targets on supply reliability and customer services. Performance targets on grid supply restoration are introduced to enhance service levels.

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

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

- Link to reference information:
  
  Scheme of Control Agreement (2018–2033)

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

  [QR Code to Feed-in Tariff Scheme website]

  [QR Code to Renewable Energy Certificates website]

  [QR Code to Power Connect Programme website]

  [QR Code to CLP Eco Building Fund website]
The table below shows a list of key refinements made to the current SCA (2018–2033) compared with the previous one (2008–2018).

<table>
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</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>15-year term</td>
<td>10-year term, with a Government option to extend for five years</td>
</tr>
<tr>
<td><strong>Permitted Rate of Return</strong></td>
<td>8% on Average Net Fixed Assets, The same return rate applies to assets of both renewable and non-renewable energies</td>
<td>9.99% on Average Net Fixed Assets, Investments on RE facilities can earn a rate of return of 11%</td>
</tr>
<tr>
<td><strong>Tariff Adjustment</strong></td>
<td>The annual tariff adjustment mechanism is maintained. The Fuel Cost Adjustment (FCA) in the total tariff is revised more frequently from once a year to once a month</td>
<td>FCA in the total tariff is revised once a year</td>
</tr>
<tr>
<td><strong>Incentives / Penalties on a number of performance categories</strong></td>
<td>The existing incentive and penalty scheme continues to apply, but with more stringent performance targets. New performance targets on grid supply restoration are being introduced</td>
<td>The rate of return is linked to various performance targets under the incentive and penalty scheme: Emissions (2008–2013), Energy efficiency, Supply reliability, Operational efficiency, Customer services, Renewables</td>
</tr>
</tbody>
</table>

**Operational Performances**
- The existing incentive and penalty scheme continues to apply, but with more stringent performance targets. New performance targets on grid supply restoration are being introduced.

**Energy Saving and Demand Side Management**
- Performance targets for Energy Audit and energy saved from the initiatives under the current SCA are set at about four times the previous targets.
- Demand Response programmes are offered to commercial and industrial customers in order to lower the overall system demand, resulting in a lower requirement for investments in new generation units in the long-term. The target for this initiative is to achieve a reduction of up to 60MW from the demand peak.
- A new five-year energy saving target has been set. CLP must achieve at least 4% of energy saving on the basis of the average annual sales within a five-year period in order to earn incentives. More incentives will be given if the said energy saving reaches 5%.

**RE Award will be given if:**
- The ratio of RE in the local generation fuel mix achieves the target set (RE generated from projects directly owned by the Government is excluded).
- The annual target of new RE connections to the grid is met.
- CLP is incentivised to sell RE Certificates.

---

1 CLP agreed to remove the “Emission Performance Linkage Mechanism” in the SCA subsequent to the 2013 Interim Review of SCA.
<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Environmental Initiatives</td>
<td>A New Eco Building Fund to promote energy saving for buildings has been set up. Incentive target set for this initiative is to provide subsidies to 400 residential blocks and commercial and industrial buildings per year to carry out improvement work to enhance the energy efficiency of the communal areas of the buildings. The energy saving target is set at 486GWh per year.</td>
<td>Set up Loan Fund for non-Government customers to implement energy saving initiatives.</td>
</tr>
<tr>
<td></td>
<td>CLP is entitled to 35% of the incentives in relation to Energy Audit, energy saved from these audits and promoting energy saving for buildings, while the remaining 65% will be allocated to a new CLP Community Energy Saving Fund to enhance energy efficiency.</td>
<td>5. Set up Education Fund for energy efficiency education and promotion activities.</td>
</tr>
<tr>
<td></td>
<td>The CLP Public Education Fund has been increased from HK$5 million to HK$10 million a year.</td>
<td>6. Set up Eco Building Fund to subsidise building owners to carry out improvement works to enhance energy efficiency in the common areas of non-commercial buildings.</td>
</tr>
<tr>
<td>Support RE Development</td>
<td>Introduce FiT Scheme to encourage the RE development in the community. By connecting the systems to CLP’s electricity grid, CLP will pay for electricity generated by these systems at a rate offered through the scheme.</td>
<td>Investments on RE facilities can earn a rate of return of 11%.</td>
</tr>
<tr>
<td></td>
<td>Introduce RE Certificates Scheme to allow customers who prefer clean energy and offer different platforms for the community to participate in RE development.</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>If there is excessive capacity when an additional generation unit is commissioned, 100% of the net asset value of the mechanical and electrical equipment of the said unit will be deducted from the fixed assets and the permitted return calculation. More information such as cost data will be disclosed to customers and the public to improve information transparency.</td>
<td>If there is excessive capacity when an additional generation unit is commissioned, 50% of the net asset value of the mechanical and electrical equipment of the said unit will be deducted from the fixed assets and the permitted return calculation.</td>
</tr>
</tbody>
</table>

2 Eco Building Fund was set up as a result of 2013 Interim Review of SCA.
CLP’s New Five-year Development Plan (2018–2023)

- Approved by the Executive Council, the first Five-year Development Plan under the current SCA covers the period from October 2018 to December 2023. The projected capital investment for the period is HK$52.9 billion. The Development Plan aims to support the Government’s carbon reduction targets in 2030 by planning and constructing the electricity infrastructure needed to secure a reliable and stable electricity supply to meet Hong Kong’s continuous development, as well as to ensure the city’s transition from coal-fired to gas-fired generation for a low-carbon footprint in future. This will also create a greener and smarter energy system, paving the way for Hong Kong’s smart city development.

- Of the total approved investment, around 38% are dedicated to maintaining supply reliability, 30% to lowering carbon and air emissions, 24% to meeting new electricity demand and the remaining 8% to building a smart city and digitalisation.

- The Development Plan features a number of important capital projects to support the Government’s environmental policy, to make possible the phasing out of coal-fired generation units at Castle Peak A Power Station, the move to local gas-fired generation and the transformation of Hong Kong into a smart city. They include: construction of an additional gas-fired generation unit at the Black Point Power Station; construction of an offshore liquefied natural gas (LNG) terminal; enhancement of Clean Energy Transmission System to increase reliability and transmission capacity of the existing cross-border transmission overhead line circuits connecting Hong Kong and Mainland China which will provide greater flexibility for the increased use of zero-carbon energy in future; and the digitalised development with smart meters upgrade for all residential and small and medium business customers and strengthening the smart grid.
A Greener and Smarter Energy System

- Life Extension of Generation Fleets
- Retire Coal CPA
- New CCGT D2
- HK Offshore LNG Terminal
- Enhanced EE&C
- Demand Response
- Digitalised Service
- Smart Meter for Customers
- Intelligent Substation & Grid Automation
- CO2 emission reduced by 30% compared with 2005
- Supply Reliability at 99.999%
- Waste-to-Energy
- RE from Feed-in Tariff
- Integrated Waste Management Facility
- Organic Waste Treatment Facility
- Sludge Treatment Facility (T-Park)
- Energy Efficiency and Conservation
- Intelligent Substation & Grid Automation

Remarks:
- **CPA**: Castle Peak A Power Station
- **CCGT**: Combined Cycle Gas Turbine
- **BPPS**: Black Point Power Station
- **RE**: Renewable Energy
- **LNG**: Liquefied Natural Gas
- **WENT LFG RE**: West New Territories Landfill Gas Renewable Energy
- **STF**: Sludge Treatment Facility (T-Park)
- **OWTF**: Organic Waste Treatment Facility
- **IWMF**: Integrated Waste Management Facility
- **EE&C**: Energy Efficiency and Conservation

Link to reference information:
CLP’s Performance under the SCA

- **A stable and long-term regulatory regime** can provide an effective mechanism to address the electricity industry’s requirements for long-term and capital-intensive infrastructural investments.

- The SCA is recognised as a balanced and effective regulatory regime that has served Hong Kong well. Such a regime has supported CLP in delivering an electricity service that meets all four energy policy objectives — supply is safe and very reliable, environmental performance is improving and tariffs are reasonable. The SCA enables CLP to contribute to Hong Kong’s long-term development as a world-class city, and to play a role in enhancing Hong Kong’s competitiveness and sustainable growth.

- The challenge for the electricity industry comes from the tensions that are apparent in the **Energy Trilemma** — how to deliver a safe and reliable supply to acceptable environmental standards whilst containing tariff adjustment at reasonable levels. With the SCA, the electricity industry of Hong Kong has been able to strike a balance in managing the energy trilemma.

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

**Reliable and Safe Supply**

- A reliable and safe power supply is an important pre-requisite for Hong Kong to maintain its competitiveness and attractiveness for organisations to set up their businesses. Maintaining high reliability is critical for our customers in an economy which is built around service industries that depend on a reliable electricity supply.

- 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 70,000 elevators in daily operation. Hong Kong is a key international financial centre and over 6 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 2018 and 2020, on average a customer might experience 0.92 minutes unplanned power interruptions in a year (excluding the impact due to Super Typhoon Mangkhut in 2018). This compares to the 2017 to 2019 average of 1.7 minutes for Singapore, 15 minutes for London and 18 minutes for Sydney CBD, while the 2016 to 2018 average for New York is 19 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 third out of 190 economies in the ease of getting electricity in the Doing Business 2020 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 Chapter 4 on Reliable Electricity Supply.

Notes:
1. 2018–2020 average for CLP Power is 9.77 minutes. Taking out the impact due to Super Typhoon Mangkhut, the unplanned customer minutes lost per year was 0.92 minutes.
3. Singapore’s power supply network is mostly underground, and is less exposed to the influence of weather and other external interferences than overhead lines.
Reasonable Tariff

- **CLP’s tariff level is reasonable and competitive** when compared to other key metropolitan cities in the world. In January 2021, our average tariff for typical residential customers in CLP’s service areas is HK$1.19/kWh while tariff for New York is almost double of Hong Kong.

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

Residential Tariff Comparison with Other Cities

Notes:
1. Comparison based on average monthly domestic consumption of 275kWh.

Source: Web

Notes:
1. Comparison based on average monthly domestic consumption of 275kWh.
• In Hong Kong, electricity expenses account for 1.3% of total household expenditure, lower than other metropolitan cities like Sydney (1.8%), London (1.7%) and Singapore (1.6%).

![2019/20 Household Expenditure Survey](image)


• The upward adjustments of tariff in recent years have mainly been due to fuel cost increases. Globally, fuel prices have been highly volatile. In addition, in order to meet carbon reduction targets and the increasingly tightened air emissions caps set by the Government, we will need more natural gas. The cost of natural gas is generally higher than that of other fuels, leading to further challenges in tariff management.

• CLP has taken actions to minimise the cost impact as a result of significant fuel cost fluctuation and to maintain tariff at a reasonable level. These actions include enhancing generation efficiency, making the most use of the existing gas reserves, exploring new sources of gas supplies and cost control.

• For instance, the significant drop in fuel prices as well as CLP’s constant cost control efforts have enabled customers to enjoy a special fuel rebate amounting to a total of HK$2 billion offered in 2015 and 2017.

• See also Chapter 3 on Electricity Tariff.
Care for the Environment

- Over the years, CLP has been supporting the community’s expectations for **better air quality and a reduction in greenhouse gas emissions** by deploying the best practical technologies and operational excellence, and through changes to our fuel mix.

- **Our emissions control measures** — including installation of emissions control facilities — helped improve Hong Kong’s emissions performance substantially.

- Managing our fuel mix is also a key contributor to resolving the issues of climate change and air quality. CLP has made sustained efforts in improving the environment through the use of low sulphur coal, natural gas 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. We launched the Feed-In Tariff Scheme in 2018 to encourage local renewable energy development. In 2020, the landfill gas generation project at the West New Territories (WENT) Landfill started operation to utilise landfill gas produced locally as fuel.

- CLP’s emissions have reduced over 90% since 1990 while electricity demand has grown by over 80% during the same period.

- CLP is also committed to **energy efficiency and conservation**. A wide range of tools and programmes have been developed to provide practical assistance to both residential and commercial and industrial customers to achieve energy saving and change their habits of electricity consumption.

- **CLP helps customers reduce energy consumption** through: public education, the provision of tools and technical support, the provision of related information and energy saving tips and offering useful enablers.

- 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 Chapter 7 on **Energy Management**.

- Link to reference information: Scheme of Control Financial & Operating Statistics 10-year Summary
3 ELECTRICITY TARIFF

CLP Tariff Components

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

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Tariff</td>
<td>94.5</td>
<td>91.0</td>
<td>91.0</td>
<td>92.2</td>
<td>93.7</td>
</tr>
<tr>
<td>Fuel Cost Adjustment³</td>
<td>22.0</td>
<td>27.8</td>
<td>27.8</td>
<td>30.8</td>
<td>28.1</td>
</tr>
<tr>
<td>TOTAL TARIFF</td>
<td>116.5</td>
<td>118.8</td>
<td>118.8</td>
<td>123.0</td>
<td>121.8</td>
</tr>
<tr>
<td>Rent and Rates Special Rebate</td>
<td>-1.1²</td>
<td>-1.1²</td>
<td>–</td>
<td>-1.2</td>
<td>-</td>
</tr>
<tr>
<td>NET TARIFF</td>
<td>115.4</td>
<td>117.7</td>
<td>118.8</td>
<td>121.8</td>
<td>121.8</td>
</tr>
</tbody>
</table>

- In April 2017, CLP signed a new Scheme of Control Agreement (SCA) with the Hong Kong Government. The permitted rate of return has been reduced from 9.99% to 8% under the current SCA which came into effect in October 2018.

- Links to reference information:
  - Fuel Cost Adjustment
  - Fuel Mix

¹ The tariff for October 2018 to December 2019 is the average tariff rate effective from 1 October 2018.
² From 18 February 2019, the Rent and Rates refund available from the Government as a “Rent and Rates Special Rebate” was discontinued.
³ The figure is based on the rate announced in the annual tariff review. Under the current Scheme of Control Agreement, the Fuel Cost Adjustment is automatically adjusted on a monthly basis to reflect changes in actual price of fuel used. This arrangement is more transparent and reacts to fuel price changes in a more timely way.

Links to reference information:

- Fuel Cost Adjustment
- Fuel Mix
Annual Tariff Review

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

Monthly Fuel Cost Adjustment

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

![Fuel Cost Adjustment Diagram](image_url)

- Links to reference information:
  - 2021 Tariff Review Presentation
  - 2021 Tariff Review Information
  - New Arrangement for Fuel Cost Adjustment

[QR Code: Fuel Cost Adjustment website]
### Tariff Structure

- CLP has four tariff categories, namely:
  1. **Residential Tariff** (**Residential customers**)
  2. **Non-Residential Tariff** (**Small and medium enterprises customers**)  
  3. **Bulk Tariff** (**Large businesses and public services with monthly consumption demand not less than 20,000 units**)  
  4. **Large Power Tariff** (**Large businesses and public services with monthly consumption demand not less than 3,000KVA**)  

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

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

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

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

- A fixed rate is applied for **Non-Residential Tariff**. Customers are charged according to their consumption. High consumption customers under **Bulk Tariff** and **Large Power Tariff** categories have a declining tariff structure of two blocks. They have two tariff features:
  - They have to pay a Demand Charge in addition to the cost of the energy units they consume. The Demand Charge reflects the capacity of the supply customers draw from CLP’s network based on their maximum energy demand.
  - In addition, under a Time-of-Use tariff feature, they also pay a premium for energy used at peak times but are able to reduce costs if they can move this to off-peak periods. This facilitates demand side management and better utilisation of power generation facilities.
- At-a-glance table of CLP tariff structure:

<table>
<thead>
<tr>
<th>Tariff Categories</th>
<th>Customer Type</th>
<th>Basic Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Energy Charge</td>
</tr>
<tr>
<td>Residential Tariff</td>
<td>Residential customers</td>
<td>✓ With 7 inclining blocks</td>
</tr>
<tr>
<td>Non-Residential Tariff</td>
<td>Small and medium enterprises customers</td>
<td>✓ Uniform rate</td>
</tr>
<tr>
<td>Bulk Tariff</td>
<td>Large businesses and public services with monthly consumption demand not less than 20,000 units</td>
<td>✓ With Time-of-Use feature</td>
</tr>
<tr>
<td>Large Power Tariff</td>
<td>Large businesses and public services with monthly consumption demand not less than 3,000KVA</td>
<td>✓ With Time-of-Use feature</td>
</tr>
</tbody>
</table>

- Link to reference information:
  CLP Tariff Table 2021

**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.

### Residential Tariff Comparison with Other Cities

<table>
<thead>
<tr>
<th>Residential Tariff (HK cents/kWh) (as of January 2021)</th>
<th>Source: Web</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuala Lumpur</td>
<td>70</td>
</tr>
<tr>
<td>Taipei</td>
<td>100</td>
</tr>
<tr>
<td>Shanghai</td>
<td>150</td>
</tr>
<tr>
<td>Stockholm</td>
<td>170</td>
</tr>
<tr>
<td>Jakarta</td>
<td>180</td>
</tr>
<tr>
<td>Seoul</td>
<td>200</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>220</td>
</tr>
<tr>
<td>Vancouver</td>
<td>230</td>
</tr>
<tr>
<td>Macau</td>
<td>240</td>
</tr>
<tr>
<td>Shanghai</td>
<td>250</td>
</tr>
<tr>
<td>Singapore</td>
<td>260</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>270</td>
</tr>
<tr>
<td>Manila</td>
<td>280</td>
</tr>
<tr>
<td>Seoul</td>
<td>290</td>
</tr>
<tr>
<td>Helsinki</td>
<td>300</td>
</tr>
<tr>
<td>Lisbon</td>
<td>310</td>
</tr>
<tr>
<td>Tokyo</td>
<td>320</td>
</tr>
<tr>
<td>Paris</td>
<td>330</td>
</tr>
<tr>
<td>Wellington</td>
<td>340</td>
</tr>
<tr>
<td>London</td>
<td>350</td>
</tr>
<tr>
<td>Rome</td>
<td>360</td>
</tr>
<tr>
<td>Brussels</td>
<td>370</td>
</tr>
<tr>
<td>Sydney</td>
<td>380</td>
</tr>
<tr>
<td>New York</td>
<td>390</td>
</tr>
<tr>
<td>Madrid</td>
<td>400</td>
</tr>
<tr>
<td>Berlin</td>
<td>410</td>
</tr>
</tbody>
</table>

**Notes:**
1. Comparison based on average monthly domestic consumption of 275kWh.
• 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, imported nuclear electricity, oil, and renewable energy.

• CLP is facing significant challenges from rising fuel costs due to its need to meet tightening emissions caps starting from 2015 and the need to increase the usage of natural gas.

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

• As the cost of power generation by natural gas is more than double of that by coal, fuel costs will increase considerably and will add pressure on tariff.

• The upward adjustments in total tariff in recent years have mainly been due to the increases in fuel costs.

Notes:
1. The figure is based on the rate announced in the annual tariff review. Under the current Scheme of Control Agreement, the Fuel Cost Adjustment is automatically adjusted on a monthly basis to reflect changes in actual price of fuel used. This arrangement is more transparent and reflects fuel price changes in a more timely way.
Globally, fuel prices have been highly volatile. The following chart shows the volatility of fuel prices since 2006.

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

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

- Diversifying gas sources and constructing an offshore liquefied natural gas (LNG) terminal to ensure a reliable and stable supply of natural gas to Hong Kong in the long term, while allowing Hong Kong to purchase competitively-priced LNG directly from the global market.
- Enhancing the operational performance of our generation fleet;
- Continuing stringent cost control; and
- Securing additional supply of 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 information related to fuel mix on our website. The published information enables our customers to better understand the latest fuel mix and fuel cost adjustment.

Commencing 1 October 2018, the Fuel Cost Adjustment is revised more frequently from once a year to once a month. This arrangement is more transparent and reacts to fuel prices changes in a more timely manner. The Fuel Cost Adjustment will be published monthly on CLP’s website.
Alleviating Tariff Pressures

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

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

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

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

- Under the current SCA, a CLP Community Energy Saving Fund has been set up and begun operations in 2019. Under this fund, one of the initiatives being launched is CLP Power Connect programme, which aims to encourage residential customers to save energy year-round and in return CLP offers financial assistance to 10,000 subdivided unit tenants and more than 40,000 households in need a year, including single elderly or elderly couple, low income families to offset against their electricity expenses.

- See also Chapter 7 on Energy Management and Chapter 10 on Community Commitment.
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 70,000 elevators in operation daily. It is also a key international financial centre and over 6 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 2018 and 2020, on average a customer experienced 0.92 minutes unplanned power interruption per year (excluding Super Typhoon Mangkhut’s impact in 2018). This compares to the 2017 to 2019 average of 1.7 minutes for Singapore, 15 minutes for London and 18 minutes for Sydney CBD, while the 2016 to 2018 average for New York is 19 minutes.

Reliability Levels in Major Metropolitan Cities

<table>
<thead>
<tr>
<th>City</th>
<th>Unplanned Customer Minutes Lost per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLP Power</td>
<td>0.92</td>
</tr>
<tr>
<td>Singapore</td>
<td>1.7</td>
</tr>
<tr>
<td>London</td>
<td>15</td>
</tr>
<tr>
<td>Sydney (CBD)</td>
<td>18</td>
</tr>
<tr>
<td>New York</td>
<td>19</td>
</tr>
</tbody>
</table>

Notes:
1. 2018–2020 average for CLP Power is 9.77 minutes. Taking out the impact due to Super Typhoon Mangkhut, the unplanned customer minutes lost per year was 0.92 minutes.
3. Singapore’s power supply network is mostly underground, and is less exposed to the influence of weather and other external interferences than overhead lines.
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 third out of 190 economies in the ease of getting electricity in the Doing Business 2020 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 Generation Capacity

Reserve capacity is essential to cater for any loss of generation capacity due to planned maintenance and unforeseen outages even at peak load. Reserve margin is similar to keeping a spare tyre in a car, which is crucial for contingency management.

Take CLP’s Castle Peak Power Station as an example, the loss of one larger generation unit will reduce the Station’s available generation capacity by about 15%, adding uncertainty to the highly reliable power supply provided by CLP. Reserve capacity is therefore important to meet emergency needs.

CLP sets the level of reserve margin by making reference to the maximum electricity demand as one of the most important indicators for planning and operations. This is in line with the practices adopted in the electricity industry all over the world.

To ensure top service quality and reliability, CLP’s reserve margin is maintained at an appropriate level and is within the recommended range of 20% to 35% by the International Energy Agency.

Facilities and Network Upgrades to Address New Demand

To maintain the highly reliable supply and support the Government’s environmental policy, a key challenge is meeting our customers’ increasing demand for electricity in Hong Kong and embracing more distributed renewable energy system. A large number of territory-wide development and infrastructure projects are in progress simultaneously. These important projects support population growth, new housing, railway expansions, Airport three-runway system expansion, hospital development plan, West Kowloon Cultural District, Kai Tak Sports Park, the development of the Lok Ma Chau Loop, Data Centre infrastructure, and so on, which call for increasing needs of power supply.

To cope with the demand growth while ensuring a stable power supply, CLP has been adopting different measures to enhance our generation and network infrastructure to address the challenge.
In 2018, CLP announced a new Five-year Development Plan (2018–2023) which features a number of important projects to support the Government’s environmental policy of moving towards more local gas-fired generation and transforming Hong Kong into a smart city. The Development Plan also enables the planning and construction of infrastructures needed to secure a reliable and stable fuel mix as well as environmentally friendly electricity supply at competitive prices to meet future customer demand and more stringent carbon reduction requirements.

For our generation facilities, in response to the Government’s plan to increase the percentage of local gas-fired generation to around 50% of the total fuel mix in 2020 and to ensure a reliable power supply service, the new gas-fired generation unit with an advanced design at Black Point Power Station in Tuen Mun has been put into operation in mid-2020. The new unit features 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. To allow for the gradual phasing out of the coal-fired generation units at Castle Peak Power Station’s ‘A’ Station, the construction of another gas-fired generation unit in Black Point Power Station has been carried out and is targeted for completion in 2023.

Upgrading the efficiency of existing and aging generation facilities is essential to ensure that we increase output, meet increased demand and maintain reliability. Efficiency upgrades in our plants are also important to improving our emissions performance. We have also been making replacements and carrying out refurbishments for aged facilities to ensure that generation capacity is able to meet increasing electricity demand. As an example, since 2015, turbine upgrades have been carried out in stages on gas-fired generation units at Black Point Power Station. As of end-2020, five generation units have been upgraded, increasing the capacity of each unit by 25MW (8%) and driving improvements in efficiency, as well as reducing the nitrogen oxides emissions.

On power systems, expansion and reinforcement of our supply networks are crucial to ensure adequate and reliable electricity supply. These will include continuous improvements and extensions of our transmission and distribution facilities to meet new demand, connect more renewable energy systems, and ensure reliable delivery of supply to customers.

In CLP’s Five-year Development Plan (2018–2023), CLP will implement the Clean Energy Transmission System project to enhance the reliability and transmission capacity of the existing 400kV cross-border transmission overhead line circuits currently connecting Hong Kong and Mainland China. This enhancement will increase the resilience of the system and provide the necessary infrastructure to enable greater flexibility to tap into cleaner energy and for possible increased use of non-fossil energy in future.

Network enhancements also cover refurbishing current facilities such as switchgears and transformers, and replacing components to ensure continuous reliable operations.

Advanced Technology

- A reliable and secure power grid is critical to ensuring supply reliability. CLP’s strategy is to incorporate advanced and the most relevant technologies to improve the performance of our power system.
Smart Grid Development

- 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. CLP also applies data analytics to enhance customer services, operational efficiency, supply reliability, safety and power quality.

- **Real-time monitoring system**: CLP has equipped the generation units of Black Point Power Station with the real-time monitoring system. The system comprises intelligent sensors which are installed at key generation facilities, allowing engineering staff to continuously monitor and analyse different parameters such as temperature, 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 power generation and power supply reliability while also reducing the maintenance cost of its generation units.

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

- **Intelligent transmission substations**: CLP introduced two intelligent transmission substations, namely Eastern Road Substation and Chui Ling Road Substation, featuring the most advanced and 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. This self-healing system has been implemented as standard requirement in all the new CLP transmission substations.

- **Smart distribution substations**: CLP is also evaluating the application of smart technologies at distribution substations. Installation of intelligent electronic devices (IEDs) on the substation equipment allows on-line condition monitoring of primary electrical plants. The operational data collected, such as the amount of load current, voltage, or environmental readings such as temperature, relative humidity, and dust level can be monitored and responsible engineers will be notified when signs of abnormality are detected. This project will build up CLP’s experience on smart technology applications and to enable real-time monitoring of the substations.

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

- **Smart meters for all customers**: To support Hong Kong’s transformation into a smart city, all CLP customers’ conventional meters are now being upgraded to smart meters in phases from November 2018 to 2025. Smart meters connected through a telecommunication system form the Advanced Metering Infrastructure (AMI) system. It can provide detailed electricity usage information and a range of digitalised services and solutions to customers, empowering them to efficiently manage their consumption, reduce energy use and demand at peak times, so as to move towards a low-carbon living. The AMI system can also further improve supply reliability and enhance customer experience.

Starting from April 2020, CLP provides new and more convenient services to customers who have installed smart meters through the enhanced CLP App and website, including projected consumption, unusual consumption alert, daily or hourly consumption data, helping customers to save energy and manage the usage.
Airborne LiDAR scanning

- There are a large number of fast-growing tree species in Hong Kong, and fallen trees or branches that make contact with overhead lines under strong wind or heavy rain can disrupt electricity supplies. CLP has adopted vegetation management techniques since 2001. The vegetation management team carries out pruning work on trees which might affect overhead lines. In addition, CLP has adopted airborne LiDAR scanning to accurately and efficiently measure the clearance between transmission overhead line conductors and nearby vegetation. By building 3D models and mapping the vegetation along the overhead lines, we can manage vegetation works more systematically and enhance the efficiency and effectiveness.

Application of robotics

- CLP has also made use of robots to examine the conditions of boilers in generation units. The robot is able to attach to the boiler tubes and climb up along the vertical boiler walls while carrying out ultrasonic detection. The robotic inspection reduces the need for erecting scaffolds, eliminates work at height, greatly improves work safety, and shortens the inspection duration as well as the down time of the boiler plant. Furthermore, the robot allows the inspection in a wider area where it may not be accessible by traditional manual inspections. Potential robotic applications in other areas, such as welding of boiler tubes and inspection of underwater culverts, are also being explored for the enhancement in work quality and safety.

Drone inspections for power station facilities and overhead lines

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

- The use of drones not only enhances work safety by mitigating the potential risks associated with working at height and confined spaces, but also improves the accuracy of inspections, uplifting overall operational efficiency. Since September 2018, CLP extended the use of drones to outdoor power supply facilities, including transmission towers and overhead lines, making up for certain areas inaccessible for helicopters in the past. Starting from December 2019, CLP also began to use drones to inspect indoor areas of our power plants, such as confined spaces and risky locations.

- CLP is continuously exploring ways to enhance efficiency in maintenance by making use of advanced innovative technology and studying successful cases across the industry. Examples of these include the application of 3D printing to produce replacement parts, as well as the use of virtual reality (VR) for welding and safety training.
Measures against Extreme Weather

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

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

- Hong Kong is exposed to increasing challenges posed by high-impact extreme weather events including super typhoons. CLP constantly reviews and enhances its measures for emergency preparedness. These include: strengthening the tower structures and foundations of 400kV overhead lines that can withstand super typhoons with wind gusts up to 300km/h at 500m height; and introducing an Emergency Restoration System that enables rapid construction of temporary masts that the time to restore power supply can be shortened to just two weeks when an existing tower is damaged. In addition, CLP has also established a typhoon response protocol and coordinating system. Drills are conducted on a regular basis.
Hong Kong may also be vulnerable to storm surges caused by tropical cyclones. To counter the potential impact of storm surges on the power supply, CLP has since 2014 introduced a flood calculator, which evaluates the flooding risk at substations during typhoons based on real-time data and forecasts released by the Hong Kong Observatory, allowing for meticulous monitoring and timely coordination by our engineering staff. Upgraded mitigation measures have also been taken at flood-prone transmission substations and distribution substations such as installing flood gates, sealing the cable inlets 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 an extreme sea water level due to super typhoon with a return period of once in 200 years.

Overhead lines are exposed and susceptible to lightning strikes. To minimise voltage dips caused by lightning, CLP has installed line arresters on transmission towers and poles. Line arresters can drain tremendous lightning current to the earth and hence help stabilise the system voltage. As a result, supply reliability and power quality are enhanced.

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

Given the severe damage caused by Super typhoon Mangkhut to the power supply facilities of remote villages in 2018, CLP has prioritised the installation of smart meters at remote villages in 2019, which are more prone to typhoon disruptions. With smart meters in place, supply failure detection improves and repair times are reduced. Customers are timely kept informed of power outages by pushed notification through CLP app, SMS or email. Customers can also report power outages to CLP via an online form at ease.

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

In 2019, CLP Volunteer Team recruited volunteers to support caring visits to customers who are affected by a super typhoon. Relevant trainings have been provided for enrolled volunteers. The Team also cooperated with Social Welfare Department and NGOs to conduct caring visits to residents of the squatter area in Kwan Tong before a super typhoon, with an aim to enhancing their awareness and preparedness towards natural hazards.
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 seconds. Individual users may experience momentary dimming or flickering of lights. Some electrical installations sensitive to voltage fluctuation, such as lifts, may trip as a result of the activation of the equipment’s protection mechanism.

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

- 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.
Government’s Environmental Policy

- Climate change is now affecting every corner of the Earth. Like other coastal cities, Hong Kong faces multiple climate-related threats. With the community’s increasing environmental awareness, the Government and the community are more concerned about monitoring and managing emissions. Carbon emissions are sometimes used as a shorthand for referring to the emissions of carbon dioxide (CO₂), or greenhouse gases (GHGs) in general. Strictly speaking, gases that absorb and trap heat on the planet are called GHGs. The main GHGs in the Earth’s atmosphere are CO₂, methane (CH₄), nitrous oxide (N₂O) and ozone (O₃). Air emissions refers to the emission of air pollutants. At present, the Hong Kong Government monitors emission of the following pollutants: sulphur dioxide (SO₂), nitrogen oxides (NOₓ), respirable suspended particulates (RSP/PM₁₀), fine suspended particulates (FSP/PM₂.₅), ozone, carbon monoxide (CO) and lead.

Carbon Reduction

- In addressing the increasingly stringent challenges brought by climate change, global cooperation and concerted efforts by every member in the society are needed. The Central Government announced its target 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. In 2015, the Central Government further announced a new commitment to lowering the nation’s overall carbon intensity by 60%-65% from the 2005 level by 2030.

- In 2014, the Environment Bureau conducted a public consultation on the Future Fuel Mix for Electricity Generation. Having regard to the results of the public consultation, the Hong Kong Government planned to implement the following fuel mix to meet the pledged environmental targets for 2020. Natural gas for power generation will be increased to around 50% in the fuel mix. The 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 Mainland China’s announcement of the new commitment, the 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 2015, the Paris Agreement brought clear direction for low-carbon energy development at the international level. The Agreement aims at holding the increase in the global average temperature to well below 2°C above pre-industrial levels. In 2017, the Hong Kong Government announced a new carbon intensity target in the *Hong Kong’s Climate Action Plan 2030+* published by Environment Bureau. Carbon intensity will be reduced by 65%-70% by 2030, using the level in 2005 as the base. In order to meet the new target, Hong Kong will continue to phase down the remaining coal plants in the next decade and replace them with natural gas and non-fossil fuel sources.
As the Paris Agreement is applicable to Hong Kong, the Government is therefore obligated to formulate the long-term decarbonisation strategy up to 2050 by 2020. In June 2019, the Council for Sustainable Development launched the public engagement on the Long-term Decarbonisation Strategy with the aim to deepen public understanding of the negative impact of human induced carbon emissions, and to gauge the views of the community in formulating Hong Kong’s long-term decarbonisation strategy. It is expected that feasible actions to achieve the target could be developed so as to facilitate Hong Kong’s position towards a lower carbon economy.

In 2020, the Council for Sustainable Development submitted to the Government its report on Hong Kong’s long-term decarbonisation strategy and recommended that Hong Kong should progressively advance to net-zero carbon emissions by 2050. Subsequently, the Government committed to strive to achieve carbon neutrality before 2050 in the 2020 Policy Address. The Central Government also announced its goal to become carbon neutral by 2060. CLP is endeavoured to work with the Hong Kong Government to achieve the carbon neutrality goals through increasing low-carbon electricity supply, and supporting our customers in lowering their carbon footprint.
Air Quality Improvement

- Locally, the Government in 2008 issued its first Technical Memorandum (TM) under the Air Quality Control Ordinance to cap the emission allowances for power companies using the levels of 1997 actual emissions as a base. Power companies must fulfill the requirements starting from 2010 as specified in the TM. The emission allowances have been continuously tightened in subsequent years of 2015, 2017, 2019, 2020, 2021, 2022, 2024 and 2026. The emission allowances will be reviewed at least every two years to ensure continuous improvement of air quality in Hong Kong. Having regard to the results of the public consultation carried out in 2014 on future fuel mix, the Government announced the target to reduce carbon intensity by 50% to 60% by 2020 when compared to 2005; and to reduce the emission of SO₂, NO and RSP by 35% to 75%, 20% to 30% and 15% to 40% respectively by 2020 when compared to 2010.

- Moreover, the Government also launched the public consultation on Air Quality Objectives (AQO) Review in July 2019 so as to assess air quality improvements in 2025 and the scope of tightening the AQOs. The AQOs for SO₂ and PM₂.₅ are recommended to be tightened. On energy and power generation, the working group comprising experts and stakeholders have come up with some possible new measures. They include encouraging the development of more waste-to-energy facilities, progressively tightening the statutory emission caps of three key air pollutants and increasing local gas-fired generation to around 50% of the total fuel mix for electricity by 2020. The new AQOs will be effective from January 2022.

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

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

CLP's Emissions Management Measures

- **CLP has successfully met the increasingly stringent emissions caps** for our power plants set by the Government. We continually seek to adopt new technologies, fuel sources and processes to help make the air in Hong Kong cleaner. We have successfully achieved significant emissions reduction through a combination of emissions reduction technologies and changes to our fuel mix including the introduction of natural gas, nuclear power, low-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 oxides reduction facilities which have significantly improved the emissions performance of the station. In addition, gypsum produced during the desulphurisation process is re-cycled as material for the construction industry such as plasterboard, bringing extra environmental benefits to the society.

- From 2015 onwards, turbine upgrades have been carried out in stages on gas-fired generation units at Black Point Power Station. As of end-2020, five generation units have been upgraded, increasing the capacity of each unit by 25MW (8%) and driving improvements in efficiency, as well as reducing the nitrogen oxides emissions. Moreover, the first new 550MW gas-fired generation unit was commissioned in 2020 while another unit is under construction and targeted to start operation by end-2023. Along with other improvements in generation efficiency, the emissions will be further reduced.

- **CLP has always strived for reducing emissions.** More than 90% emissions reduction in SO₂, NOₓ, and RSP have been achieved since 1990, while electricity demand has grown by over 80% during the same period. Electricity generation emissions have fallen greatly as a result of various emissions reduction efforts. The chart below illustrates these efforts.
Ongoing Improvement in CLP’s Environmental Performance

1990
Installed electrostatic precipitators at Castle Peak Power Station

1993
Installed low NOx burners at Castle Peak Power Station

1994
Import nuclear from Daya Bay

1996
Natural gas-fired Black Point Power Station established

2005
Increased use of ultra low sulphur coal

2010 / 2011
Castle Peak Power Station emissions control facilities commissioned

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

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

Total Emissions Reduction 1990-2020
- RSP 94%
- SO2 98%
- NOx 93%
- Total Electricity Demand 81%

Carbon Emissions 0.94kg / unit of electricity
Carbon Emissions 0.37kg / unit of electricity
The Government has introduced the emission allowances for CLP since the First Technical Memorandum (TM) under the Air Quality Control Ordinance effective in 2010. In 2019, the Government issued the Eighth TM. When effective from 2024, the emissions allowances for the three pollutants, namely sulphur dioxide, nitrogen oxides and respiratory suspended particulates, will see a material reduction ranging from about 69% to 87% compared with those in 2010. Meeting the tightened control on emission allowances is challenging.

The Government issued the Ninth TM in May 2021, which aims to further tighten the annual emissions caps of the pollutants. The Ninth TM was approved by the Legislative Council in June 2021 and the new set of emission allowances will come into effect on 1 January 2026.

On carbon reduction, as a major power company in Hong Kong, CLP recognises its role in addressing climate change. In 2004, CLP published its first Group-wide renewable energy target of 5% by 2010. In line with changing policy drivers and the implementation of new technologies, CLP reviewed and updated its decarbonisation targets and clean energy targets in 2010 and 2017 (publicly announced in 2018).

In the most recent review, CLP adopted the equity plus long-term capacity and energy purchase as the basis of our targets. Hence, we have re-calibrated our decarbonisation target reductions to reflect this revised basis, meaning a target of an 80% reduction in the Group’s carbon intensity by 2050. CLP is on track to reach the decarbonisation targets. We are also committed to reviewing our targets at least every five years.

CLP is supportive to the Hong Kong Government’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.
The carbon intensity of CLP’s operations in Hong Kong significantly improved in 2020 in comparison with the performance in 2019. The GHG intensity of the electricity sold in Hong Kong in 2020 was 0.37kg CO₂e/kWh.

After the first new gas-fired generation unit has been put into operation, CLP achieved the Government’s target of increasing the share of gas to around 50% of the total fuel mix in 2020.

Meanwhile, CLP is constructing an offshore liquefied natural gas terminal in Hong Kong waters to increase the gas supply security by diversifying supply sources, and to enable procurement of natural gas at competitive prices from the global market. It is exploring the feasibility of developing an offshore wind farm in the south-eastern waters of Hong Kong to contribute the share of renewable energy for Hong Kong. It will also enhance the Clean Energy Transmission System which would allow more flexibility for the company in planning power generation and for possible increased use of non-fossil energy to support the Government’s environmental policy.

Link to reference information:
CLP Sustainability Reports
Long-term Decarbonisation Target

- In response to the Council for Sustainable Development’s three-month public engagement on Long-term Decarbonisation Strategy launched in June 2019, CLP submitted its response paper. The paper pointed out that although 2050 seems a long way away, Hong Kong needs to start planning now for a lower carbon future. CLP sees two broad directions to increase low-carbon electricity supply in the longer term. Both have their opportunities as well as challenges and elements of both could in future be combined. Technology in the energy sector is changing fast and we will need time for further study to maximise the opportunities that these could bring. CLP is determined to maintain high levels of safe and reliable electricity supply, whichever future approach we may adopt in decarbonising electricity generation.

- The two broad directions are:

1. **Increase gas-fired generation**: More gas-fired units could be built in Hong Kong and the use of natural gas would be increased along with maximising local renewable energy and zero-carbon energy continuing to be imported through CLP’s clean energy transmission system infrastructure. This amounts to a more gradual approach to decarbonisation initially. In the longer term, however, this could bring about further carbon reduction if new technologies, such as zero-carbon hydrogen or carbon capture and storage, develop and become viable.

2. **Increase zero-carbon energy through regional cooperation**: More zero-carbon energy, such as renewable energy and nuclear power, could be accessed from the Mainland through new interconnection infrastructure. This could mean potentially earlier reductions in emissions.

- In 2020, the Council for Sustainable Development submitted to the Government its report on Hong Kong’s long-term decarbonisation strategy and recommended that Hong Kong should progressively advance to net-zero carbon emissions by 2050. Subsequently, the Government committed to strive to achieve carbon neutrality before 2050 in the 2020 Policy Address. The Central Government also announced its goal to become carbon neutral by 2060. CLP is endeavoured to work with the Hong Kong Government to achieve the carbon neutrality goals through increasing low-carbon electricity supply, and supporting our customers in lowering their carbon footprint.
Other Environmental Initiatives

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

CLP Sky Woodland

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

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

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

Green Substation with Low Carbon Initiatives

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

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

- The Hong Kong-Zhuhai-Macao Bridge Substation and Queen’s Hill Substation were awarded Provisional and Final Platinum rating in 2016 and 2021 under BEAM Plus V1.2 for New Buildings respectively. Queen’s Hill Substation was also presented with the Gold Award for the Transmission and Distribution Project of the Year at the Asian Power Awards in 2019.
Waste Management

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

Green Driving

- 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 54 semi-quick and quick charging stations in Kowloon, the New Territories and Lantau Island by the second quarter of 2021, providing a total of 161 chargers in CLP’s supply area. Drivers can charge their EVs for free until the end of 2022. They can also locate nearby EV charging stations through the CLP App.

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

- Link to reference information: Electric Vehicles
## 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.

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coal</strong></td>
<td>Provides high reliability, can be stored on site and a quick response to meet changes in demand</td>
</tr>
<tr>
<td></td>
<td>Generation cost is relatively low</td>
</tr>
<tr>
<td></td>
<td>High carbon emissions and other air emissions even with the latest available abatement measures are the major drawbacks</td>
</tr>
<tr>
<td><strong>Natural gas</strong></td>
<td>Provides high reliability and a very quick response to meet changes in demand. Outperforms coal in emissions performance</td>
</tr>
<tr>
<td></td>
<td>A significantly higher generation cost in place</td>
</tr>
<tr>
<td></td>
<td>World demand for gas is increasing given its environmental benefits</td>
</tr>
<tr>
<td><strong>Nuclear</strong></td>
<td>High reliability, enables large-scale and steady base-load electricity</td>
</tr>
<tr>
<td></td>
<td>Very competitive generation cost</td>
</tr>
<tr>
<td></td>
<td>Virtually zero CO$_2$ and other air emissions</td>
</tr>
<tr>
<td></td>
<td>Requires sophisticated and careful operational safety and waste management</td>
</tr>
<tr>
<td></td>
<td>Public concern over nuclear safety still remains after the Fukushima accident</td>
</tr>
<tr>
<td><strong>Renewable Energy (RE)</strong></td>
<td>Natural resources availability is intermittent in nature, and support from conventional fossil fuel generation is required to ensure reliable electricity supply</td>
</tr>
<tr>
<td></td>
<td>Large amount of land is often required for developing RE</td>
</tr>
<tr>
<td></td>
<td>Due to continuous technological advancement in zero-carbon energy development, the generation cost has become more competitive</td>
</tr>
<tr>
<td></td>
<td>It is practically emission-free and thus is gaining in popularity in countries where its relatively high cost can be supported</td>
</tr>
<tr>
<td></td>
<td>RE is growing important in the world’s fuel mix, and where there are abundant quantities of RE available (e.g. Hydro in British Columbia, Canada; wind in Australia; solar in Arizona, United States.) However, abundant natural RE resources and favourable criteria for developing RE are not available everywhere</td>
</tr>
</tbody>
</table>
The chart below compares the fuel types in terms of emissions, price, reliability and public concerns.

Managing Fuel Costs

- Most of the fuels Hong Kong required for power generation are imported and they are subject to price volatility in the international fuel markets.

- In support of the Government’s environmental policy and the increasingly tightening emissions requirement, CLP continues to increase the use of natural gas for power generation after meeting Hong Kong’s fuel mix target in 2020. As the cost of gas-fired generation is more than double than that of coal-fired generation, CLP expects this will inevitably continue to put pressure on future tariffs. In fact, fuel cost increases have been the driver of CLP’s total tariff adjustment over the past few years.

- Globally, fuel prices have been highly volatile. The following chart shows the volatility of fuel prices since 2006.
- **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 costs.** 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.
Fuel Choices

- The Government launched a public consultation in 2014 on the Future Fuel Mix for Electricity Generation. Most of the respondents supported local power generation by natural gas and expressed reservation about importing electricity from the Mainland. Following the consultation, the Government announced a new fuel mix target for power generation with around 50% natural gas by 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 oxides (NOₓ) by 20%-30% and respiratory suspended particulates (RSP) by 15%-40% by 2020 when compared to 2010.

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

- To tackle the imminent challenge of climate change, and to fulfil the obligation of carbon reduction target agreed upon in the Paris Agreement signed in 2015, the Council for Sustainable Development launched the public engagement on Long-term Decarbonisation Strategy in June 2019. Views from the community were gauged for developing feasible strategies and measures for carbon reduction. The public engagement document suggested scenarios of three reduction levels, pointing out that if the global average temperature rise is to be limited to 2°C, between 1.5-2°C and to 1.5°C respectively, 80% or more than 80% or even 100% of the electricity has to come from zero-carbon sources. CLP Power’s response to the public engagement was submitted in September 2019.

- In 2020, the Council for Sustainable Development submitted to the Government its report on Hong Kong’s long-term decarbonisation strategy and recommended that Hong Kong should progressively advance to net-zero carbon emissions by 2050. Subsequently, the Government committed to strive to achieve carbon neutrality before 2050 in the 2020 Policy Address. The Central Government also announced its goal to become carbon neutral by 2060. CLP is endeavoured to work with the Hong Kong Government to achieve the carbon neutrality goals through increasing low-carbon electricity supply, and supporting our customers in lowering their carbon footprint.

- Link to reference information:
  - CLP’s Response to the Public Engagement on the Long-term Decarbonisation Strategy

### Reduction of Coal in Fuel Mix for Electricity Generation 2015–2030

![Graph showing reduction of coal in fuel mix for electricity generation from 2015 to 2030](image-url)
CLP’s Fuel Mix for Electricity Generation

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

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

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

## Evolution of CLP’s Fuel Mix

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s–1980s</td>
<td>Single fuel supply from oil</td>
</tr>
<tr>
<td>1982</td>
<td>Began fuel diversification with the introduction of coal with multiple sources of supply</td>
</tr>
<tr>
<td>1994</td>
<td>Further diversification by importing nuclear energy from Daya Bay Nuclear Power Station</td>
</tr>
<tr>
<td></td>
<td>Began to phase out oil</td>
</tr>
<tr>
<td>1996</td>
<td>CLP pioneered the use of natural gas for power generation in the region in the early 1990s</td>
</tr>
<tr>
<td></td>
<td>Secured natural gas supply from one of the four largest offshore gas fields in the Mainland near Hainan with a 20-year contract</td>
</tr>
<tr>
<td>2000</td>
<td>Began to use low-emission coal to further improve emissions performance</td>
</tr>
<tr>
<td>2013</td>
<td>Started using natural gas supplied via the Second West-East Gas Pipeline (WEPII) in the Mainland</td>
</tr>
<tr>
<td>2015</td>
<td>HKSAR’s Sludge Treatment waste-to-energy facility connected to the CLP grid</td>
</tr>
<tr>
<td>2018</td>
<td>Feed-in Tariff was introduced to promote the development of local renewable energy</td>
</tr>
<tr>
<td>2020</td>
<td>The first new gas-fired generation unit at Black Point Power Station was commissioned to increase the share of gas-fired generation to around 50%</td>
</tr>
<tr>
<td></td>
<td>The landfill gas generation units at the West New Territories (WENT) Landfill, WE Station started operation to utilise landfill gas produced locally as fuel</td>
</tr>
</tbody>
</table>

- As early as the 1990s, CLP spearheaded the introduction of nuclear energy and natural gas for power generation, achieving a diversified fuel mix that enables an abundant and reliable electricity supply, an improving environmental performance and a stable tariff for Hong Kong.
CLP fully supports the 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 oxides, particulates and carbon dioxide than most other fossil fuels. Over the years, the use of natural gas has helped CLP reduce emissions from its operations.

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

- **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 tightening emissions caps and the fuel mix policy set by the Hong Kong Government.
Gas Supplies to Hong Kong

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

- WEPII, operated by China Oil & Gas Pipeline Network Corporation established in October 2020, is currently the world's longest natural gas pipeline. It consists of one trunk line and eight branches that starts in Horgos, Xinjiang, where it connects to the Central Asia-China Gas Pipeline and crosses 14 provinces, autonomous regions and municipalities, and terminating at Hong Kong's Black Point Power Station.

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

- Since 2018, gas from Wenchang Gas Field in the South China Sea has started supplying CLP via the existing Yacheng pipeline, supplementing our supply needs in the medium term.

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

- Since 2020, CLP has begun receiving gas from CNOOC’s gas fields in the South China Sea via the existing Yacheng pipeline under a new long-term contract with CNOOC along with existing Yacheng gas supply.
Hong Kong Offshore Liquefied Natural Gas (LNG) Terminal

- For longer term, CLP is constructing an offshore liquefied natural gas (LNG) terminal to further improve Hong Kong’s long-term natural gas supply stability by diversifying supply sources, and enabling procurement of natural gas at competitive prices from the global market. The terminal, jointly developed by CLP and HK Electric, applies the technology of Floating Storage Regasification Unit (FSRU) to regasify the LNG, and the natural gas will be transmitted to power stations through subsea pipelines for electricity generation. The initiative is a critical step in supporting the Hong Kong Government’s plan to increase the proportion of natural gas for power generation and to reduce carbon intensity of the city.

- The project obtained an environmental permit in 2018. Construction of the project started after Engineering, Procurement, and Construction contracts were awarded for the offshore jetty facility, subsea pipelines, and gas receiving station at the Black Point Power Station.

- To facilitate communication over environmental issues with stakeholders regarding the construction of the offshore LNG terminal, a stakeholder liaison group was set up by CLP and HK Electric in September 2020 comprising academics, marine conservation and fisheries experts, as well as representatives of fishermen’s associations and the community. Meanwhile, a Marine Conservation Enhancement Fund and a Fisheries Enhancement Fund were established with HK$100 million available to support community initiatives that contribute to the enhancement of the marine environment and fisheries resources.
In parallel, CLP continues to consider opportunities for additional gas sources as stipulated in the MOU on energy cooperation and strives to achieve an optimal balance between different fuel types.

Links to reference information:
CLP Press Release:
- CAPCO and HK Electric Sign Contract with Shell for Long-Term Liquefied Natural Gas Supply to Hong Kong
- CAPCO and HK Electric Sign Contract with MOL for Hong Kong Offshore LNG Terminal Project
- CLP Power and HK Electric Launch Funds to Support Marine Conservation and Sustainable Fisheries

Introduction Video to the Hong Kong Offshore Liquefied Natural Gas Terminal

The Hong Kong Offshore Liquefied Natural Gas Terminal Project Website
Nuclear Energy

Nuclear Energy in Hong Kong

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

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

- As of today, nuclear energy accounts for about a third of CLP’s fuel mix in Hong Kong and has been safely meeting 25% of Hong Kong’s electricity needs for more than 20 years.

- Daya Bay produces around 15 billion kWh of electricity per year. To ensure that more clean and cost-competitive energy is provided to Hong Kong, Daya Bay increases its electricity supply to Hong Kong from 70% to around 80% of its output from late 2014 to 2023.

- Importing nuclear energy to Hong Kong has helped 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 three distinct roles in the Daya Bay Nuclear Project. We:
  - act as an investor;
  - contribute our expertise; and
  - import nuclear electricity into Hong Kong.
Safety Excellence and Emergency Preparedness

- **Safe operation** is always the top priority for all nuclear power operators. At Daya Bay, the **defence-in-depth** principles are applied to ensure a robust and safe operation, covering a full spectrum of activities from the initial plant design to the installation of all equipment and the implementation of all operational procedures. They include:
  - site selection;
  - plant design and operational safety;
  - staff training and qualification;
  - international benchmarking;
  - radiation protection and environmental monitoring; and
  - emergency preparedness.

- Daya Bay is located in a seismically stable region. The site was selected meticulously according to international guidelines and stringent safety assessment by the National Nuclear Safety Administration, after a comprehensive analysis and survey.

- The nuclear power station is designed according to the local situation around the site of the power station and able to withstand natural hazards such as tsunami and earthquake.

- In the event of an emergency due to equipment failure or human error, standby equipment is ready to step in and maintain the safe operation of the plant, minimising the chances of any incidents and their adverse impacts on the environment.

- **Well established contingency plans** are in place at Daya Bay. A communication mechanism is also set up to facilitate communication with the general public and between relevant government authorities in Guangdong and Hong Kong in the unlikely event of a nuclear accident.

- To enhance public’s understanding of nuclear operation and promote higher transparency, Daya Bay has adopted a **public notification mechanism** to release information of non-emergency Licensing Operational Events through the websites of DNMC and HKNIC. These events carry no nuclear safety consequences and have no impact on the environment or public safety. Events of an emergency significance will be announced far more quickly and as appropriate by the government authority.

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*Daya Bay has increased its electricity supply to Hong Kong from 70% to around 80% of its output from late 2014 to 2023.*
Renewable Energy (RE)

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

Grid Connected Renewable Energy Projects

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

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

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

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 11 consecutive years in 2018.

- 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.

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Renewable Energy Feed-in Tariff (FiT) Scheme

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

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

- For instance, if a customer has installed solar panels at his rooftop and the system is approved and connected to CLP’s power grid, CLP will offer him FiT rate, ranging from HK$3 to HK$5 depending on the generation capacity of the RE system. The FiT rates are higher than the prevailing tariffs to incentivise RE investment which is expected to enjoy a shortened payback period of around 10 years. The FiT rate applies to the electricity generated during the entire project technical lifetime or until the end of the current SCA on 31 December 2033, whichever is earlier.

- The current FiT rates are as follows:

<table>
<thead>
<tr>
<th>RE system generation capacity</th>
<th>FiT rate (per unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤10kW</td>
<td>HK$5</td>
</tr>
<tr>
<td>&gt;10kW to ≤200kW</td>
<td>HK$4</td>
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<tr>
<td>&gt;200kW to ≤1MW</td>
<td>HK$3</td>
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</table>
Renewable Energy Certificates (RECs)

- For customers who want to support local development of RE but cannot afford an RE system on their own, they can purchase the Renewable Energy Certificates (RECs) which represent the power from RE sources in Hong Kong generated or purchased by CLP Power, including solar power, wind power, and landfill gas projects.

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

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

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

- The units of electricity carried in the RECs available for sale will match the total amount of electricity from local RE sources generated or purchased by CLP over a specific period of time. As of end-June 2021, around 14.6GWh were sold through RECs. The biggest purchase so far is Rosewood Hong Kong which bought 13GWh of renewable energy through the purchase of RECs for six years from 2020.
RE Projects Developed by CLP

Town Island Renewable Energy (RE) Supply Project

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

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

- As the system is not connected to the grid, it features batteries capable of storing over 1,000 kWh of electricity to provide power supply for the rehabilitation centre’s use lasting for around 30 hours. By the second quarter in 2021, the system generated more than 685,000kWh of electricity, equivalent to the monthly consumption of around 1,870 households. It achieved a significant reduction of over 342,000kg 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 Power Generation Project

- CLP’s waste-to-energy initiative involves the installation of power generation units at the West New Territories (WENT) Landfill, namely WE Station. The units make use of landfill gas produced locally at the landfill site for power generation and the electricity produced will be transmitted to CLP’s power grid.

- The first phase of WE Station comprises five generation units. The annual power generated is sufficient to meet the electricity demand of over 17,000 four-person households. WE Station started operation from the first quarter of 2020.

Feasibility Study for Developing Hong Kong 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 Power has been exploring the potential and feasibility of developing an offshore wind farm in the south-eastern waters of Hong Kong since 2009. With the technology and equipment of wind generation getting more mature and more cost-effective over the past decade, these allow the project to apply larger but fewer turbines using technology at lower windspeeds, while generation is expected to be higher. CLP believes it is economically feasible to consider offshore wind as part of Hong Kong’s energy mix and contribute to achieving the Government’s carbon neutrality target by 2050.

- The Hong Kong Offshore Wind Farm project underwent a full Environmental Impact Assessment and an Environmental Permit was granted in 2009. CLP proposed deploying larger wind turbines with higher generation capacity to maximise the development potential of the project. The Variation of Environmental Permit for the project was granted by Environmental Protection Department in April 2021.

- Meanwhile, CLP is recalibrating the data we have collected on wind performance, wave and others, and will continue the feasibility study and work with the Government in an aligned way. We have also activated the project’s stakeholder liaison group to listen to the views of the community.
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 can 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 on electricity use and energy saving tips;
  - Equipping customers with energy saving tools and technical support; and
  - 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 table summarises the scale and variety of CLP’s commitments to help our residential and business customers and our city move towards a greener and smarter future.
<table>
<thead>
<tr>
<th>Energy-Saving Support for Home</th>
<th>Energy-Saving Support for Business</th>
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<tbody>
<tr>
<td><strong>Public Education</strong></td>
<td><strong>CLP Smart Energy Award</strong></td>
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<tr>
<td>• POWER YOU Kindergarten</td>
<td>• CLP Smart Energy Symposium</td>
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<tr>
<td>Education Kit</td>
<td>• EE&amp;C Workshops</td>
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<td>• Green Elites Campus</td>
<td>• Eco Tours</td>
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<td>Accreditation Programme</td>
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<td>• Green Studio</td>
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<td>• CLP Power Connect</td>
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<td><strong>Energy Saving Information</strong></td>
<td><strong>Smart Energy Online</strong></td>
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<td>• Energy saving ideas on</td>
<td>• Energy saving applications on</td>
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<tr>
<td>CLP Website and CLP App</td>
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<td><strong>Energy Saving Tools</strong></td>
<td><strong>Smart Energy eNewsletter</strong></td>
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<td>/ Technical Support</td>
<td>• SME energy saving tips</td>
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<td>• Smart Energy@Mong Kok</td>
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<td>• Smart Energy@Yuen Long</td>
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<tr>
<td>• Tai Po Eco Home</td>
<td>• Business Centres (Pei Ho Street,</td>
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<td>• Eco Rewards Scheme</td>
<td>Yuen Long)</td>
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<tr>
<td>• CLP Website</td>
<td>• Smart Energy@Yuen Long</td>
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<td>• CLP App</td>
<td>• SmartHub@CLP</td>
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<tr>
<td>• CLP Facebook and Instagram</td>
<td>• Account Managers</td>
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<td>pages</td>
<td>• SME Energy Saving Rewards</td>
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<td>• CLP LinkedIn page</td>
<td>• CLP LinkedIn page</td>
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<tr>
<td><strong>Enablers</strong></td>
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<tr>
<td>• CLP Electrical Equipment</td>
<td>• CLP Eco Building Fund</td>
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<tr>
<td>Upgrade Scheme</td>
<td>• Energy Audit Services</td>
</tr>
<tr>
<td>• CLP Eco Building Fund</td>
<td>• Energy Saving Loan Scheme</td>
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</table>
Energy Saving and Conservation Initiatives under SCA (2018–2033)

- The current SCA commenced in October 2018 marks another milestone for CLP in its movement towards a greener, smarter and low-carbon environment. To support the Government’s long-term environmental policy and climate strategy, CLP introduces and enhances its energy saving and conservation initiatives under the new SCA.

Community Energy Saving Fund

- In 2019, CLP has allocated 65% of the incentives earned from achieving energy-saving targets to set up the **CLP Community Energy Saving Fund (CESF)**, mainly to implement two programmes. Of which, **CLP Power Connect** is a city-wide energy efficient and conservation campaign which aims to encourage residential customers to earn rewards by saving energy throughout the year. Participants can choose the disadvantaged group they want to support to alleviate their electricity expenses. In 2021, the programme offers electricity subsidy to more than 50,000 households in need, with a subsidy of HK$500 each for more than 40,000 underprivileged households, including single elderly or elderly couple, low income families, and the disabled, whereas 10,000 subdivided unit households which do not benefit from the Government’s electricity subsidy scheme are expected to receive a subsidy of HK$600 each.

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

Eco Building Fund

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

Energy Audit Services

- CLP has been conducting **energy audits** for business customers since the 1990s. It is a free service helping businesses to save energy and operating costs. CLP’s engineers carry out energy system performance analysis at customers’ premises to identify Energy Management Opportunities and propose energy saving solutions.
Under the current SCA, CLP increases the number of energy audits it offers to business customers from 150 to 600 a year, with total electricity saved expecting to reach 48GWh each year.

From the beginning of the current SCA in October 2018 to end-2020, CLP conducted more than 1,400 energy audits for business customers, saving a total of around 120GWh of electricity for customers who carried out the recommended improvement works. During the same period, the Electrical Equipment Upgrade Scheme subsidised around 4,300 projects, saving around 40GWh of electricity, while the CLP Eco Building Fund provided subsidies for improvement works in around 1,500 residential blocks and commercial and industrial buildings, saving a further 110GWh of electricity.

### Helping Residential Customers in Energy Saving

**Smart Meter**

- Starting from April 2020, CLP provides new and more convenient services to customers who have installed smart meters through the enhanced CLP App and website, including projected consumption, unusual consumption alert, daily or hourly consumption data. With these consumption data, customers are equipped to better manage their energy usage, and reduce energy use.

**Eco Rewards Scheme**

- We empower our customers with consumption data that underpins their energy management approaches. To further motivate them to live a greener lifestyle, the **Eco Rewards Scheme** comes into place which engages customers in an interactive and creative way. Customers who participate in the scheme can earn Eco Points to redeem fabulous gifts while saving energy.

### Helping Business Customers in Enhancing Energy Efficiency

- To raise awareness of environmental protection among business customers, CLP organises various events and offers services regularly with an aim to introduce affordable energy-efficient solutions and renewable energy applications, which include **Smart Energy Symposium**, **EE&C Workshops**, **Energy Audit Services**, **Smart Energy Online Service**, **Smart Energy Award**, and **Retro-commissioning Charter Programme**. We hope to not only helping customers to save energy costs, but also to protect the environment.
CLP and the Airport Authority Hong Kong have jointly designed and developed the city’s largest battery energy storage system (BESS) and a predictive control system for air conditioning first adopted at the airport. Leveraging advanced smart technology, the two new innovative energy-saving systems help enhance the Hong Kong International Airport’s energy efficiency and reduce carbon emissions. The BESS is the largest emergency backup power supply system in Hong Kong with capacity equivalent to more than 55,000 pieces of 10,000mAh portable power banks. The predictive control system, together with the upgraded chiller plants, will save an estimated 5.1GWh of electricity a year for Terminal 1, equivalent to the annual energy consumption of nearly 1,200 CLP Power residential customers - and reduce carbon emissions by around 1,900 tonnes. The reduction is equal to the planting of some 80,000 trees. The two systems went into operation in 2021.

Apply Innovative Technology to Save Energy and Reduce Carbon Emissions

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All-in-One Smart Management System for Elderly Homes

- To support elderly homes tackling the manpower shortage problem and improving their energy efficiency, CLP partnered with a management system software developer to design an All-in-One smart management system for elderly homes. The system enables all smart devices to be controlled via one mobile app, and monitors the electricity consumption, which help elderly homes to identify energy-saving opportunities and reduce electricity costs. With the system installed, staff's workload is relieved so that they may focus on taking care of the elderly residents.

Peak Demand 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 greater the electricity demand can be lowered, through applying more efficient devices and increasing the customers’ awareness of energy consumption, the more the bill amount can be reduced and the longer the new investment in electricity infrastructure can be deferred by the power companies.

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

- Since 2020, CLP invited some residential customers with smart meters installed to join a summer energy saving programme. Customers who meet energy saving targets on specific days during the peak period can earn CLP Eco Points for redeeming gifts.
Safety Always Comes First

- **Safety** is one of the core values of CLP and is always the **Number One priority** in the organisation. Stringent safety guidelines, including **Life Saving Rules** which serve to prevent serious incidents, are well in place and strictly enforced on CLP staff and contractors to ensure safety in all work processes and at all facilities.

- To ensure a safe working environment for CLP staff and contractors, we proactively conduct safety inspections and risk assessments to upkeep our safety performance and seek continuous improvement. In 2020, CLP carried out more than 152,230 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 in achieving world class safety standard. CLP has possessed the certificate of OHSAS 18001 Occupational Safety and Health Management System since 2002, and migrated to the new international standard, ISO 45001, in 2019. CLP endeavoured in maintaining recordable incident rates well below industry average.
Safety Advocacy

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

- **Alignment Programmes for Contractors** are in place to ensure the same safety standard and practices are applied to both CLP staff and contractors. Safety initiatives and enhancement programmes such as safety observations (workers' behaviour and work practices), personal risk review, serious injury prevention, safe systems of work and control of heavy lifting operations are communicated to all contractors for effective implementation at all CLP's work sites.

- Starting in 2017, new concept of **Serious Injuries and Fatalities (SIF) Prevention Principle** was introduced in CLP by putting focus on potential hazards that are imposing significant consequence in personal safety.

- **“Zero Exposure” and “See-it, Own-it, Fix-it”** campaigns were launched in early 2018 which aims for promoting everyone's effort in identifying and working together to control risks towards a goal of zero exposure in the workplace.

- A “**Zero Harm**” journey plan covering the following five pillars of our Health, Safety and Environment (HSE) improvement strategy has been established for implementation in CLP and has commenced since early 2019:
  - Uplift Safety Culture
  - Rethinking Risk
  - Stakeholders Involvement
  - Healthy and Engaged Workforce
  - Environmentally Sustainable

- **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.

- CLP has conducted **Safety Culture Survey** once every three years since 2004 and survey results are communicated to all staff. Improvement actions are defined and incorporated into our Safety Plan for implementation. In the same year, CLP 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 June 2021, over 2,300 staff members have been appointed as Safety Leaders to be the role models and cultivate safety messages to all staff. A new **Safety Champion Programme** was launched in 2020 to train up dedicated employees to become ambassadors to inspire peer colleagues to strive for continuous improvement in safety and health.
Safety Incentive Scheme is one of the signature programmes to connect colleagues’ safety effort with the community. The scheme encourages staff to implement safety processes. Their safety effort is eligible for accumulation of reward scores, which will then be converted into a sum of money for donations to local charities.

CLP proactively participates and organises occupational 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 with other utilities in the industry.
Safety Performance

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

Industrial Accident Rate of Hong Kong Industries and CLP (2007–2020)

Notes: The Hong Kong Industry Accident Rate is sourced from Labour Department Occupational Safety and Health Statistics Bulletin, and information paper of Legislative Council Panel on Manpower on Hong Kong’s Occupational Safety Performance in 2020.
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. CLP’s efforts in meeting its performance pledge are recognised in the community. We have won a number of prestigious awards for excellence in customer service over the past years.

  In the 2020 Mystery Caller Assessment Award organised by the Hong Kong Customer Contact Association, CLP won the Customer Service Hotline Gold Award for 11 consecutive years and the Emergency Service Hotline Gold Award for four consecutive years. We also received one Gold Award in the Customer Service Centres category, and one Silver Award in the Best Contact Centre in Omni-Channel Deployment category.

  For the individual awards, we clinched two Silver Awards in the Digital Contact Centre Representative of the Year category and the Inbound Contact Centre Leader of the Year category, and another Bronze Award in the Inbound Contact Centre Representative of the Year.

- CLP strives to achieve the service targets pledged to our customers. The table below shows our 2021 targets and 2020 performance.

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2021 Targets</th>
<th>2020 Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability of electricity supply</td>
<td>&gt;99.99%</td>
<td>✔</td>
</tr>
<tr>
<td>Notify customers 3 working days in advance of planned outage</td>
<td>&gt;99%</td>
<td>✔</td>
</tr>
<tr>
<td>Average arrival time for loss of supply inspection</td>
<td>&lt;28 minutes*</td>
<td>✔</td>
</tr>
<tr>
<td>Average supply restoration time after fault outage</td>
<td>&lt;2 hours*</td>
<td>✔</td>
</tr>
<tr>
<td>Provide appointments for installation inspections within 3 working days</td>
<td>96.50%</td>
<td>✔</td>
</tr>
<tr>
<td>Carry out site investigations on consumption enquiries within 3 working days</td>
<td>98%</td>
<td>✔</td>
</tr>
<tr>
<td>Keep appointments to visit customers for supply applications within a 1.5-hour time slot</td>
<td>99.40%</td>
<td>✔</td>
</tr>
<tr>
<td>Connect and supply electricity within the same day after satisfactory installation inspection</td>
<td>99.98%</td>
<td>✔</td>
</tr>
<tr>
<td>Reconnect supply within the same day of payment of outstanding charges</td>
<td>95%</td>
<td>✔</td>
</tr>
<tr>
<td>Answer Emergency Service Hotline in less than 9 seconds</td>
<td>90% of answering time</td>
<td>✔</td>
</tr>
<tr>
<td>Answer Enquiries Hotline in less than 9 seconds</td>
<td>80% of answering time</td>
<td>✔</td>
</tr>
<tr>
<td>Average queuing time for customer service enquiries at Customer Service Centres</td>
<td>Within 3.5 minutes</td>
<td>✔</td>
</tr>
</tbody>
</table>

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

✔ Target met
Improving Online-to-Offline Customer Experience

- We strive to continuously enhance our online and offline service quality by offering greater convenience and benefits to our customers.

Digitalised Platforms

CLP App and CLP Website

- In meeting customers’ extensive demands on mobile services in this ever-changing digital era, CLP launches a full array of e-services that its 2.69 million customers can access at the refreshed CLP App and CLP Website anytime and anywhere.

- Apart from energy saving information, other useful information such as locations of CLP Customer Service Centres, hotlines, and information on nearby charging facilities for electric vehicles are also available at CLP App and CLP Website.

- CLP rolled out a brand new residential service ambassador, Karen the Chatbot, to handle residential customers’ general enquiries. Karen will tackle questions related to move-in, billing and payment in an interactive manner.

eBill Notifications and Mobile Payment Services

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

- Customers can settle their electricity bills instantly via AlipayHK, WeChat Pay HK, and Faster Payment System with mobile banking app or stored value facilities.

- Customers can also make cash payment at convenience stores by presenting the barcode on eBill from the CLP App.

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

- Customers can also shop for smart gadgets and energy efficient appliances on the one-stop online Smart Shopping platform, and participate in online and offline activities to earn Eco Points under the Eco Rewards Scheme, which can be used to redeem rewards, or purchase energy efficient home appliances (See also Chapter 7 on Energy Management).
Offline Platforms

- Customer service centres are conveniently located at Kowloon and the New Territories to meet different types of customers' needs. Customer service hotlines operate around the clock to attend to customers' enquiries.

SmartHub@CLP

- **SmartHub@CLP**, a 5,000 square-feet interactive multimedia experience centre located in CLP Shamshuipo Centre, showcases different applications for improving energy efficiency. It comprises the InnoLab, the Experience Lab and a start-up corner. The InnoLab features a 270-degree video projection that gives a futuristic impression of how a smart city looks. The Experience Lab has six themed zones explaining smart grid, smart environment, smart living, smart business, smart mobility and smart education. The start-up corner displays new products and solutions from start-up companies.

Customer Service Centres

**Smart Energy@Mong Kok**

- Smart Energy@Mong Kok is a five-storey building located in Mongkok. As CLP’s flagship store, it promotes low carbon living and electric cooking and showcases state-of-the-art technologies and smart products.

**Smart Energy@Kwun Tong**

- Smart Energy@Kwun Tong introduces a new array of self-service technologies such as automated self-service machines to facilitate customers to apply for electricity service and move-out, raise billing enquiries and update account information. Grab & Go machines, and Pay & Go lockers are also available to provide customers with a more flexible shopping experience.

**Smart Energy@Yuen Long**

- Smart Energy@Yuen Long promotes smarter and greener lifestyles to customers. Customers can learn the benefits of induction cooking and how it can improve home energy efficiency. They can also experience the CLP e-Journey by trialing various smart mobile services at the Centre, so as to get a taste of smart living.
Tai Po Eco Home

- Tai Po Eco Home brings smart yet green living ideas to the residents in the New Territories.

Sham Shui Po Customer Service Centres

- Sham Shui Po Customer Service Centre provides assistance to customers in managing their electricity accounts, as well as offers advice on energy efficient products, energy saving tips and product safety for a better quality living.

Business Centres

- The two business centres located at Pei Ho Street in Shamshuipo and Fung Nin Road in Yuen Long aim to offer an all-round service to small and medium enterprises (SMEs). Services include providing technical support for power supply, introducing energy saving solutions and added-value services, so as to help customers enhance energy efficiency in business operations.

24-hour Hotlines

- A 24-hour Customer Service Hotline (2678 2678) attends to customer enquiries on their electricity accounts and related issues.

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

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

Notifications of Power Outages

- CLP started providing ‘Notifications of Power Outages’ service to customers who have already been upgraded with smart meters from 2019 onwards. When there are power outages caused by supply network abnormalities (excluding incidents induced by the failure of customers’ equipment and planned outages), customers will receive alerts by push notification through CLP App, SMS, or email.
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 five to 14.

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

- 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 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.
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, education and development, 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.

- 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. In 2011, CLP launched Hotmeal Canteen, serving hot meals to the underprivileged at a nominal cost.

- CLP has partnered with Po Leung Kuk to provide CLP Hotmeal Canteen service in Sham Shui Po, Kwun Tong and Kwai Tsing. The four Canteens provide nutritious hot meals at discounted prices to low-income families, unemployed people, and elderly people. The service also includes meals for people with special dietary requirements and conditions such as diabetes.

- CLP volunteers regularly serve up meals to diners at the canteens and organise special themed activity day every month to encourage Canteen users to take part in physical exercises and social activities, delivering warmth and care to the community.

- The COVID-19 pandemic raged last year and daily life of the underprivileged was especially affected. The Canteens responded quickly and flexibly to arrange dine-in and takeaway service for people in need which enabled beneficiaries to enjoy nutritious hot meals in times of the difficult moment. Meal delivery was also specially arranged for the elderly in need.
Sharing the Festive Joy

- CLP launched the **Sharing the Festive Joy programme** in 2014, inviting single elderly people/elderly couples and people in need to spend the festivities such as the Chinese New Year, Tuen Ng Festival, Mid-Autumn Festival and Senior Citizen’s Day with CLP volunteers to show our care and spread messages on energy efficiency and safety. Due to the COVID-19 pandemic, CLP hosted online events to celebrate festivals with the elderly through video conferencing in 2020 and 2021. CLP volunteers have celebrated festivals and shared energy-saving tips with more than 12,700 elderly people and people in need.

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

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

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

- COVID-19 has had a big impact on people and businesses across Hong Kong. Funded by a total sum of more than HK$160 million from the CLP Community Energy Saving Fund, CLP launched a series of community support programmes to benefit people in different parts of society in 2021. It was hoped that the support programmes could also stimulate the economy and help it regain its momentum. The programmes include:

- A total worth of HK$100 retail and catering coupons was given to each of the nearly 800,000 households, including residential customers with low electricity consumption, elderly customers who are qualified for concessionary tariffs, and 10,000 tenants of subdivided units. The coupons were used in more than 2,800 participating outlets for 6 months till June 2021.

- The CLP Power Connect programme continued to encourage residential customers to conserve energy. It also provided electricity subsidies of HK$500 each to more than 40,000 underprivileged households referred by non-governmental organisations (NGOs), including elderly people, disabled people, and low-income families.

- Offered a HK$600 electricity subsidy to each of 10,000 subdivided unit tenants. Eligible landlords of subdivided units were also given subsidies to carry out rewiring works needed for the installation of individual electricity meters to improve the safety and living environment of tenants. From the launch of the programme in 2019 until end-June 2021, a total of 99 households from 28 subdivided units have been benefited from rewiring and installation of individual meters.

- CLP provided HK$2,000 worth of energy-efficient electrical appliances to each of 5,000 households living in transitional housing to improve energy efficiency at homes.

- Subsidised over 100 NGOs and community partners to organise activities with energy efficiency and conservation components in the CLP Power supply area. The NGOs and community partners which have collaborations with CLP’s community initiatives, could apply for a maximum subsidy of HK$20,000.

- Students with financial difficulties and were enrolled in vocational and professional education and training (VPET) programmes with the Vocational Training Council received a subsidy of HK$20,000 each on the recommendation of the Council under the CLP Award for VPET Students. There were 75 awardees.

- Electrical Equipment Upgrade Scheme provides subsidies to commercial and industrial customers to replace or upgrade their electrical equipment to more energy efficient models. Subsidies for each eligible SME customer have been increased to HK$10,000.
Alleviating Tariff Pressure

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

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

Previous Assistance to Help the Underprivileged

Over the years, CLP has been organising various community programmes to provide assistance to the underprivileged:

- In 2014, CLP started working 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 subdivided unit tenants and help those who obtained their landlord’s permission and fulfilled safety requirements to **install individual meters for free**. Up till 2018, a total of four flats had been installed with 18 individual meters.

- In 2017, the Hong Kong Council of Social Service launched the three-year Community Housing Movement, aiming to provide transitional social housing to deprived households. As one of the supporting parties of the Movement, CLP **donated energy efficient home appliances** to the tenants, such as induction cookers, rice cookers, electric fans and LED light bulbs etc., to help alleviate their household expenditure, encourage energy saving and improve home safety.

- From 2015 to 2018, **CLP Power Your Love programme** attracted participation of more than 650,000 residential customers, saving around 32GWh of electricity in total. Each year, it helped 20,000 households in need, including single elderly and elderly couple, the disabled, families living in subdivided units and the families of boarders in special schools, with each family receiving HK$300 of subsidy that helps reduce their electricity expenses.

Know more about CLP’s other community programmes launched in the past years
CLP Volunteer Team

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

- CLP volunteers provide support to the community initiatives led by CLP and other organisations. These initiatives include:
  - Conducting re-wiring work for the elderly;
  - Regular visits to the elderly with early symptoms of dementia;
  - Conducting caring visits in rural areas for the elderly and residents before and after typhoon season;
  - Knitting scarves for people in need;
  - Cleaning up beaches to protect marine ecology;
  - Participating actively in and serving at the CLP community programmes, including CLP Hotmeal Canteens, Sharing the Festive Joy Programme, Power Connect Programme and paying caring visits to the needy under the CLP Subsidy Programme for Energy Efficient Electrical Appliances;
  - Organising homework tutorial classes and career experience activities for new migrants and underprivileged children;
  - Organising eco-tours, workshops on electrical safety and energy efficiency, caring visits, and a range of other activities for people in need;
  - Donating second-hand laptops to underprivileged families and organising basic computer knowledge workshop for parents in need;
  - Participating in fund-raising activities for NGO partners, such as night walk, charity run, and city orienteering race.

Over 100 CLP volunteers and their friends and families collect 80kg of marine waste and plastic bottles in Lung Kwu Tan in 2019.

CLP volunteers share basic computer knowledge with parents from underprivileged families in workshop.
CLPV Team initiated a donation of necessity items with the support of our business customers to frontline medical staff in public hospitals in early 2020 when the city suffered from the COVID-19 outbreak. In addition, our volunteers prepared 10,000 goody bags to people in need.

We also actively provide training to our volunteer teams’ leaders. By inviting experienced social workers from NGOs to give talks, our leaders are able to learn more about the social trends and demands. It helps them devise volunteer programmes that meet the social needs.

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.

<table>
<thead>
<tr>
<th>Year of Award</th>
<th>Key Social Performance Awards received by CLP</th>
<th>Organiser(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>‘Excellence in Construction Industry Volunteering Project’ category — Gold Award</td>
<td>Construction Industry Council</td>
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<tr>
<td></td>
<td>‘Excellence in Construction Industry Volunteering Collaboration’ category — Bronze Award</td>
<td>Construction Industry Council</td>
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<tr>
<td></td>
<td>‘Most Supportive Organisation’ Award</td>
<td>Construction Industry Council</td>
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<td></td>
<td>‘First-Time Participation’ Award</td>
<td>Construction Industry Council</td>
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<tr>
<td>2021</td>
<td>Age-Friendly Appreciation Scheme 2020–2021 Gold Star Award</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2017–2021</td>
<td>15 Years Plus Caring Company Logo</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2019</td>
<td>The 10th Hong Kong Outstanding Corporate Citizenship Awards (Volunteer Team Category) — Gold Award</td>
<td>Hong Kong Productivity Council</td>
</tr>
<tr>
<td></td>
<td>The 10th Hong Kong Outstanding Corporate Citizenship Awards (Enterprise Category) — Silver Award</td>
<td>Hong Kong Productivity Council</td>
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<tr>
<td>Year of Award</td>
<td>Key Social Performance Awards received by CLP</td>
<td>Organiser(s)</td>
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<tr>
<td>---------------</td>
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</tr>
<tr>
<td>2018</td>
<td>▪ Age-Friendly Appreciation Scheme 2018–2019 — Gold Star Award</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td></td>
<td>▪ The 9th Hong Kong Outstanding Corporate Citizenship Awards (Volunteer Team Category) — Bronze Award</td>
<td>Hong Kong Productivity Council</td>
</tr>
<tr>
<td>2017</td>
<td>▪ Friend of Social Enterprise Awards</td>
<td>Home Affairs Bureau and Social Enterprise Advisory Committee</td>
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<tr>
<td></td>
<td>▪ Metro Awards for Corporate Social Responsibility 2017</td>
<td>Metro Daily and Metro Prosperity</td>
</tr>
<tr>
<td>2017 (Since 2007)</td>
<td>▪ Corporate Voluntary Team Award — Sing Tao Services Awards</td>
<td>Sing Tao Daily</td>
</tr>
<tr>
<td>2016–2020</td>
<td>▪ Gold Award for Volunteer Service (Organisation)</td>
<td>Social Welfare Department</td>
</tr>
<tr>
<td>2016</td>
<td>▪ Outstanding Contribution Award of the Partnership Fund for the Disadvantaged</td>
<td>Social Welfare Department</td>
</tr>
<tr>
<td>2015</td>
<td>▪ Grand Caring Award (Enterprise Group) — Corporate Social Responsibility (CSR) Recognition Scheme — Industry Cares</td>
<td>Federation of Hong Kong Industries</td>
</tr>
<tr>
<td></td>
<td>▪ The 6th Hong Kong Volunteer Award, Corporate Award</td>
<td>Agency for Volunteer Service</td>
</tr>
<tr>
<td>2013–2016</td>
<td>▪ 10 Years Plus Caring Company Logo</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2013–2014</td>
<td>▪ Champion Award (General Corporate Group) of 2013–14 Best Corporate Volunteer Service Project Competition — Rewiring and Home Electricity Safety Service Programme</td>
<td>Social Welfare Department</td>
</tr>
<tr>
<td></td>
<td>▪ Outstanding Award (General Corporate Group) of 2013–14 Best Corporate Volunteer Service Project Competition — CLP Green Volunteers for Seniors Programme</td>
<td></td>
</tr>
<tr>
<td>2010–2011</td>
<td>▪ Outstanding Partnership — “Care for the Elderly — Active Mind”</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2006–2007</td>
<td>▪ Total Caring Award</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2005–2006</td>
<td>▪ Outstanding Partnership — The Rewiring and Home Electricity Safety Service for the Elderly Programme</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
<tr>
<td>2002–2012</td>
<td>▪ 10 Consecutive Years Caring Company Logo</td>
<td>The Hong Kong Council of Social Service</td>
</tr>
</tbody>
</table>
Public Education and Youth Engagement

- We firmly believe in the importance of public education and knowledge sharing for the continuous development of our businesses as well as a sustainable future. Over the years, CLP has launched a host of educational initiatives, covering the entire education pathway, from kindergarten to primary, secondary and tertiary education. In 2020, our visitation facilities received over 11,000 guests including shareholders, government officials, Legislative Council members, professional groups, business counterparts, community leaders as well as students.

For Kindergarten Education

POWER YOU Kindergarten Education Kit and Related Outreach Activities

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

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

- In 2019, an updated Education Kit with enriched content was sent to around 1,000 kindergartens for free again. The updated education kit comprises storybook series with game sheets, hand and finger puppets to facilitate storytelling, a board game, stamp chops, a Cartoon MV and a theme song titled ‘Please Come and Save the Earth” as well as 3D cartoon videos on Power Kid Channel. The accumulated viewership of over 24 million has been recorded so far for the whole series of five episodes.

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

![Download the Power Kid Mobile App](image-url)
In 2020, CLP distributed around 200,000 pieces of POWER FOUR face shields with energy saving and anti-epidemic tips to kindergarten students in Hong Kong, protecting them from COVID-19 when classes resume and adopting green living under the pandemic.

As an extended activity, CLP young engineers and graduate trainees started to visit the kindergartens from 2017 to introduce power generation journey, safe use of electricity, work life of engineers and energy saving tips. More than 41,700 kids from over 500 schools were reached out so far. In 2020 while the city was suffering from COVID-19 pandemic, CLP produced a visitation video with different versions to suit the needs of K1-K3 children, introducing the work of engineers, their personal protective equipment, power journey and energy conservation.

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

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

Green Studio

- CLP launched Hong Kong's first mobile classroom Green Studio in 2009, touring around schools and local communities to arouse public attention on climate change. To date, the mobile classroom has reached out to over 200,000 visitors.

- The two Multi-purpose Vehicles (MPV) have different features, one is equipped with 4D movie and Augmented Reality interactive educational games, while the other offers visitors a multi-sensory movie and touch screen game experience, promoting an eco-friendly and sustainable lifestyle, and encouraging the communities to work towards the goal of carbon neutrality by 2050.

- MPV’s open stage platform can also be transformed to a mobile service station, allowing visitors to experience CLP’s latest products and services.

Green Elites Campus Accreditation Programme

- With the aim of nurturing primary students to develop green living behaviour at an early age, CLP launched the Green Elites Campus Accreditation Pilot Programme and Green Elites Portal cum Award Scheme in the 2014/15 academic year. The programme was carried out in 85 primary schools under Tung Wah Group of Hospitals, Po Leung Kuk, Sheng Kung Hui and Catholic Education Office.

- The programme will run, in collaboration with Catholic Education Office, Green Power, The Green Earth, Environmental Association and The Hong Kong Observatory in the 2021/2022 academic year, to encourage some 11,000 students and teachers from 16 Catholic primary schools to apply green and low-carbon tips in their daily lives through checklist, student handbook, teaching materials, visitations, talks and energy audits.

- Going along with the programme, the green education portal continues to be the online platform for all students to learn about green and low-carbon habits through games and interactive content. The portal has been open to the public since September 2017.

- In view of the face-to-face class suspension under COVID-19 pandemic, CLP compiled online education materials on environmental protection for school teachers to facilitate their online teaching. In 2021, CLP launched animation cartoons under a new Power Kid Channel Advanced Series designed to teach primary school pupils about Hong Kong’s fuel mix, electricity generation and the smart grid in a fun and interactive way. Each episode comes with complementary worksheet to deepen their understanding.
Youth Engagement

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

Engineer in School

- To enhance junior secondary school students’ understanding of power engineering profession and strengthen their career and life planning, CLP launched the Engineer in School programme in 2016. Through a series of activities including school talks, STEM workshops and job shadowing, we encourage students to learn the importance of environmental protection and energy conservation. Well-performed students selected by CLP would also have the opportunity to join the engineer experience tour guided by CLP mentors. In the 2020/21 academic year, the programme has engaged 49 secondary schools with nearly 10,000 students. Since the launch of programme, we have reached out to around 140 schools, with more than 43,000 students participated in various STEM-related activities under the Engineer in School programme.

LS-energy HK e-learning Portal

- Launched in 2011, the Portal is Hong Kong’s first one-stop e-learning portal uniquely designed to support the ‘Energy Technology and the Environment’ module of the Liberal Studies Independent Enquiry Studies curriculum for senior secondary students. It offers comprehensive information with activities and thought-provoking discussions regarding knowledge on energy technology and the environment, aiming to inspire students to explore relevant issues in greater depth. The English version of the Portal was launched in 2018.

CLP E-Playground

- The CLP E-Playground was officially opened in 2021. The venue is Hong Kong’s first power engineering, energy and environment-themed outdoor playground of its kind, offering a unique education resource for students and members of the public to learn and experience the power journey through a variety of engaging and interactive games. Over 1,400 students and members of the public have visited the E-Playground since its opening.
Initiatives to Stimulate Interest in Power Engineering

- To inspire young people’s interest in engineering and promote Science, Technology, Engineering and Mathematics (STEM) education, CLP organised workshops at the Maker Faire Hong Kong x Make Big in 2017 and 2018, enabling participants to learn about cable jointing and use virtual reality (VR) to climb a transmission tower. Energy saving and renewable energy knowledge were also shared with the young people, families and children. A total of around 5,800 people visited and took part in the workshops.

- CLP set up a cable jointing workshop at St. James’ Settlement Career Sparkle Centre in 2018. The workshop aims at giving senior secondary students the first-hand experience on the craftsmanship of power industry and inspiring their interest in the power industry to help promote the engineering careers. Our workshop received around 2,860 visitors since its opening in September 2018.
As the Energising Partner of the **CLP Energy for Brighter Tomorrows Award** organised by the Hong Kong Federation of Youth Groups for the third year in 2021, CLP each year awarded scholarships to 20 secondary students who have overcome adversity in life, remained positive and dedicated to driving a better future. The awardees also joined a year-long Brighter Future Buddy mentorship programme in which guidance by CLP mentors was provided for the awardees’ further growth and development.

**Initiatives to Introduce Power Engineering as a Career of Choice**

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

  - **2021 Hong Kong Trade Development Council Education and Careers Expo** — CLP joined hands with the other 18 members of the Hong Kong Electrical and Mechanical Trade Promotion Working Group (the Working Group) to showcase the electrical and mechanical (E&M) industry, highlight CLP’s training programmes and recruit technical trainees for CLP.

  - **2017–2020 E&M Go!** — CLP initiated and co-organised the E&M Go! function with the Working Group from 2017 onwards, to welcome new recruits of young entrants to the E&M industry, and at the same time reinforcing the opportunities as a professional and skilled workforce. The 2017–2020 E&M Go! were attended by more than 3,000 new entrants and guests.

  - **2019 E&M Expo** — Organised by CLP and the Working Group, the Expo provided information about entry requirements to the E&M industry, training, career opportunities and progression to more than 2,000 students and teachers from 27 secondary schools and some parents. On-site recruitment was also provided to interested participants.
Opportunities for Vocational and Professional Education and Training

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

CLP Internship Programme and Scholarships for Tertiary Students

- To identify and nurture new talents for the company, CLP Internship Programme offers full-time training for tertiary students studying different disciplines during the summer vacation or for a 12-month period. The CLP Graduate Internship Programme launched in 2020 and 2021 provides 12-month learning opportunities with CLP to fresh university graduates. Moreover, CLP offers a number of scholarships every year to outstanding engineering students from local tertiary institutions, and provides opportunities for scholarship awardees to join the CLP Internship Programme and experience the work life of engineers.

- See also Chapter 11 on People Development.
Our Key Visitation Facilities

- CLP offers a wide range of exhibition and education facilities to share knowledge with the public and provide value-added services to customers. Members of the public are welcome to visit these facilities and interactive platforms, which cover three key areas: energy business, fuels, and energy efficiency and conservation.

- For more information on visitation facilities: Visit to CLP

### About Our Energy Business

#### ElectriCity
- It aims to educate the public about power generation and fuel mix in Hong Kong, as well as to 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.

#### 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 CLP Power Low Carbon Energy Education Centre on campus, where visitors can learn about the importance of low-carbon energy in addressing the challenge of climate change. Various exhibition zones are connected by an innovative array of multimedia and interactive elements, illustrating the complex scientific concepts and generation principles of different kinds of energy in an interesting and vivid manner. The centre aims to offer visitors an inspiring and enlightening learning experience.

#### 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.

### About Our Energy Efficiency and Conservation Efforts

#### SmartHub@CLP
- SmartHub@CLP, a 5,000 square-feet interactive multimedia experience centre located in CLP Shamshuipo Centre, showcases applications for improving energy efficiency. It comprises the InnoLab, the Experience Lab and a start-up corner. The centre is open to CLP business partners and tertiary institutions to visit by appointment.

#### Green Studio
- Green Studio mobile classroom welcomes primary schools and community organisations to experience the green adventure and learn more about environmental protection, climate change and energy conservation.

#### CLP E-Playground
- Located at The Hong Kong Award for Young People Jockey Club Duke of Edinburgh Training Camp in Lam Tsuen, Tai Po, the CLP E-Playground is the first recreational playground about power engineering, energy and environment in Hong Kong. The playground includes a range of attractions for visitors to learn about power generation, transmission and distribution, and supply, as well as the importance of using clean energy.
Internal People Development and Caring for Employees

- CLP employs around 4,500 staff members in Hong Kong (CLP Holdings Limited, CLP Solutions 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.

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

- Moreover, CLP values innovation and knowledge, and makes dedicated efforts and continuous investment to promote a learning and innovation culture. We are devoted to sustaining the specialised professional expertise of the power industry, and encourage staff members to share their knowledge and experience. Our outstanding performance in this area is well recognised by the Global Most Innovative Knowledge Enterprise (MIKE) Award accomplished in 2018, 2019 and 2020. Competed with other outstanding international companies and institutions from Asia, Australia, New Zealand, and the Middle East, CLP was one of the award winners.

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

<table>
<thead>
<tr>
<th>Year of Award</th>
<th>Project / Expertise Area</th>
<th>Award</th>
<th>Organiser</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>Queen’s Hill Substation</td>
<td>BEAM Plus Final Platinum Certification</td>
<td>Hong Kong Green Building Council</td>
</tr>
<tr>
<td>2020</td>
<td>Shing Kai Road Substation</td>
<td>Asian Power Awards 2020 Silver Award in Transmission &amp; Distribution Project of the Year</td>
<td>Asian Power Awards</td>
</tr>
<tr>
<td>2020</td>
<td>Technician Trainee Career Development Programme</td>
<td>Silver Award for Excellence in Training and Development, Best in Career Development Award</td>
<td>Hong Kong Management Association</td>
</tr>
</tbody>
</table>
To meet the unique requirements of the power industry, CLP puts a particular emphasis on people development and skills transfer from one generation to the next. CLP established training school (now known as CLP Power Learning Institute) in 1966. Through systematic and practical training, it has since nurtured tens of thousands of talented engineering employees, who have gone on to play important roles and contribute to Hong Kong's economic and social development.

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

The Institute has a dedicated team to promote knowledge management and learning culture. In addition, the Institute coordinates the development of training strategy and delivery of training programme with an ultimate goal to uplift the standard of customer services and capabilities of our staff in the energy retail industry.
Well-structured trainee programmes are provided to transform talented young people into seasoned technical experts. These programmes include:

- Graduate Trainee Programme
- Technical Officer Trainee Programme
- Technician Trainee Programme

CLP also organises the annual Graduation Ceremony to strengthen the bonding with Graduate Trainees, Technical Officer Trainees and Technician Trainees upon their completion of trainee programmes at CLP. The occasion aims at building a sense of belonging among the new joiners in working at CLP.

Training Facilities

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

On power transmission and distribution

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

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

- CLP cares for our employees and has been implementing various family-friendly policies that help our staff achieve a healthy balance between work and life.
- CLP provides a five-day work week and flexi-hours; starting from 2019, we have introduced Part-Time Working Policy.
- We have various leave entitlements for our employees, including:
  - Maternity leave: 16 weeks (statutory 14 weeks)
  - Paternity leave: 10 days (statutory five days)
  - Marriage leave: five days (not statutory)
  - Adoption leave: 10 days (not statutory)
  - Auxiliary service training leave: five days (not statutory)
- Launched a new well-being programme named Boost that leverages various tools, activities and events listed below, to help promote the physical health, mental wellness, social health and financial well-being of our employees, and in turn help achieve a healthy and fulfilling life.
  - Introduced a new health and well-being digital platform and App, Virgin Pulse in January 2021, helping employees create records and keep track of their own healthy habits, so as to stay fit;
  - Organises various social, recreational and sports activities;
  - Provides various facilities including staff canteen to allow employees to bring their own lunches, recreational amenities such as fitness room, and lactation room equipped with partitions to encourage breastfeeding.

On power generation

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

Application of new technologies

- Keeping pace with the latest technology, the Institute introduces Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR), providing zero-risk training in a virtual environment simulating the real one.
- To improve learning experience, micro learning and digital learning are being used to enable anytime, anywhere learning and interaction with trainers through mobile devices.
Nurturing Power Talents

CLP Power Academy

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

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

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

- To enhance junior secondary school students’ understanding of power engineering profession and strengthen their career and life planning, CLP launched the Engineer in School programme in 2016 through a series of activities including school talks, STEM workshops and job shadowing.

- CLP also works with various community partners to stimulate young people’s interest in power engineering. In 2018, a cable jointing workshop was set up at St. James’ Settlement Career Sparkle Centre. Located at the centre’s Engineering & Science Industries Experiential Area, the workshop enables senior secondary students to gain first-hand experience on the craftsmanship of power industry.

- See also Chapter 10 on Community Commitment for other related programmes.

Embrace Diversity in Workplace

- CLP respects and embraces diversity in our workplace, we have taken steps to attract more females to join our industry, including our Engineer in School programme and the Girls Go Tech programme organised by The Woman’s Foundation. We send young engineers to secondary schools to deliver talks and organise other activities, with an aim to give these students a chance to learn more about the energy sector and the life as an engineer. This helps provide talent pool for our sustainable growth, while helping us remain flexible and innovative.

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. For fresh university graduates, CLP introduced the CLP Graduate Internship Programme in 2020 and 2021, providing the graduate with a 12-month learning opportunities with CLP to demonstrate our commitment in nurturing the younger generation in Hong Kong. CLP Engineering Studies Award provides sponsorship and mentorship to outstanding engineering students for their final year studies and to identify them early to join CLP as graduate trainees upon their graduation.

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

- To strengthen CLP’s youth engagement work, CLP introduced the CLP Award for VPET Students in 2020 and 2021 to assist students who have financial needs and enrolled into designated vocational and professional education and training (VPET) programmes, particularly those related to CLP businesses, with an aim to support the students to pursue their studies, enhance upward mobility, and at the same time nurture a group of young professional talents for the energy sector in Hong Kong.
• CLP also supported VTC to establish CLP Power Engineering Laboratory at Haking Wong Campus of the Hong Kong Institute of Vocational Education in 2021. The laboratory is equipped with advanced smart grid and high voltage training facilities, including Real Time Digital Simulator and Power Hardware-in-the-loop testing platform, where power engineering students would benefit in learning the latest industry technologies. It also offers EMSD-accredited programmes to the public for obtaining Grade H Registered Electrical Worker qualification.

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

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

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

• CLP also collaborates with a number of overseas universities including the University of New South Wales, the University College London, the University of Manchester, and Aston University, to provide industrial placements for engineering students in Hong Kong.

• CLP signed a Memorandum of Understanding with the University of Strathclyde 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. To encourage our employees promoting engineering studies to their children, starting from 2019, awards for engineering-related subjects in the Scholarship have been introduced.

• Link to reference information: CLP Training and Internship Programme
Background

- CLP entered Mainland China's energy market in 1979 when it started providing electricity to Guangdong.

- As of 30 June 2021, CLP is the largest external independent power producer 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 renewable energy such as hydro, wind and solar, as well as nuclear and coal.

- Currently CLP has over 50 projects in Mainland China, covering 15 provinces, autonomous regions and municipalities in eastern China (Jiangsu and Shanghai), southern China (Guangdong and Guangxi), south-western China (Guizhou, Yunnan and Sichuan), northern China (Beijing, Shandong, Hebei, Tianjin and Inner Mongolia), north-eastern China (Jilin and Liaoning) and north-western China (Gansu).

- Link to reference information: CLP in Mainland China
Our Operations

Renewable Energy

- CLP has undertaken to support the 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 and CLP Huai’an Solar Power Station adopt solar-agriculture integration. By combining agricultural activities (plantation of honeysuckle flowers, fruits and vegetables in the solar farms respectively) with solar generation, the projects bring about multiple benefits including maximising land use, creating jobs for local residents and fueling the community with clean energy.

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

- As of 30 June 2021, we had stakes in 40 renewable energy projects in various parts of the country, with equity capacity of 2,352MW.

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 reliability of the Hong Kong power system.
Nuclear Power Stations

- CLP’s first major expansion beyond Hong Kong was our joint venture with China General Nuclear Power Corporation to develop, build and operate the Guangdong Daya Bay Nuclear Power Station (Daya Bay).

- Daya Bay is one of the earliest and largest projects launched under China’s Open Door Policy and remains one of the most successful.

- Operation began in 1994 and the two pressurised water reactor generating units now produce around 15 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 around 80% of its output from late 2014 until 2023.

- The acquisition of a 17% equity interest in Yangjiang Nuclear Power Co., Ltd. from CGN Power was completed in December 2017. Yangjiang Nuclear Power Station has added over 1,100MW (on a 17% equity basis) of non-carbon emitting generation capacity to CLP’s portfolio. Yangjiang Nuclear Power Station is connected to the Guangdong power grid and supplies its full capacity to the electricity market in Guangdong.

- Yangjiang Nuclear Power Station comprises six pressurised water reactors (PWR) with 1,086MW each adopting advanced CPR1000 technology. All of them are in commercial operation.

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

- See also Chapter 6 on Cleaner Fuel Mix for Electricity Generation.
Coal-fired Power Plants

- CLP first invested in coal-fired power plants in Mainland China in 1998. As of 30 June 2021, we had operations in 14 projects in Beijing, Guangxi, Hebei, Inner Mongolia, Liaoning, Shandong and Tianjin, with an equity capacity of 3,953MW.

- 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.