



Supplement of CLP in 2016



Our Business Model and Value Creation Journey

CLP's core business is providing reliable and safe electricity to our customers at a reasonable price and with minimal environmental impact. As the world moves into a smarter and greener era, we recognise that helping our customers to realise their energy needs more efficiently is of increasing importance. To achieve this, we draw on all of our resources, experience, and supply the highest standard of governance to provide our customers with choice and quality service and create value for all of our stakeholders along the way. The following diagram demonstrates how CLP created value and benefits for our stakeholders in 2016.



Capitals

To build a sustainable business, we take a connected view in the management of our Capitals, comprising our most critical resources and relationships, to create value for our stakeholders and maximise synergies.

Financial Capital

2019 was a turbulent year, as negative market sentiments caused by the Sino-US trade conflict, Brexit and social unrest in Hong Kong left most people in a sombre mood while combating the consequential headwinds of financial market turmoil. Even though most of these geopolitical events showed signs of moderating at the outset of 2020, their intermittent influences and the subsequent course of development would leave profound impacts on the economy.

The year started auspiciously as optimism on monetary easing by central banks drove equity market rallies through April, and 10-year US treasury yield declined after peaking at 2.8% in January 2019. However, the extension of rivalry between the US and China from trade to other frontiers soon undermined market confidence with the Dow Jones Industrial Index plunging 7% from April to June and again from July to August, and China A-shares indices falling about 16% from April to August, along with about 5% depreciation of the Renminbi (RMB) from 6.8 to 7.2 against the US dollar.

The domestic situation in Hong Kong from June onwards further fuelled market instability with Hong Kong dollar staying on the weak-side of the Convertibility Undertaking of HK\$7.85 most of the time since mid-2019. One-month interbank rate spiked from 0.9% in February to 3% in July, and posed a serious challenge to certain Hong Kong-based corporations in presenting their business and credit profiles to overseas investors when they attempted to raise funds in the bond and equity markets.

These disruptions in the financial market have not affected CLP in any material way, as CLP continued to benefit from its prudent financial philosophy; cost-effective, diversified funding, and effective risk management.

Preserving financial strength and flexibility

The power sector is capital-intensive with long payback periods, and needs sizable liquidity to run the business. A resilient capital structure and stable supply of diversified, cost-effective debt funding is therefore crucial to support daily operations and business expansion.

CLP is committed to maintaining its strong financial profile and good investment grade credit ratings. Over the decades, the Group has consistently ploughed back a portion of its operating earnings to fund capital investments. In 2014, CLP Power Hong Kong issued an aggregate of US\$750 million, non-call 5.5 years perpetual capital securities to partially fund the acquisition of an additional 30% equity stake in Castle Peak Power Company Limited (CAPCO) and the remaining 51% of interest in Hong Kong Pumped Storage Development Company, Limited. These perpetual capital securities were classified as equity in the Group financial statements and qualified for 50% equity credit under the Standard & Poor's and Moody's rating methodologies, strengthening CLP's capital structure and allowing the issuing entity to pay a reasonable premium compared with conventional bonds.

The first call day of the US\$750 million perpetual capital securities, on which an issuer should observe market practice to redeem or replace such securities, fell on 7 November 2019, amid a very eventful period in Hong Kong. CLP fully recognised that a number of Hong Kong-based entities were pressured to withdraw from fund raising in the capital markets due to the unique market circumstances. However, we were determined to achieve a good outcome from the refinancing, after reviewing the situation with utmost precaution and diligence, taking into account CLP Power Hong Kong's commitment to contribute US\$250 million of internal resources to reduce the replacement of perpetual securities to US\$500 million, supported by higher-than-expected earnings since acquisition.

With meticulous planning, thoughtful strategies, and astute execution, the new perpetual capital securities were 6.4 times over-subscribed with an overwhelming US\$3.2 billion orders from 151 global investors. The 3.55% coupon was 0.7% tighter than the original perpetual capital securities and represented a new lowest-ever coupon rate for a US dollar denominated Asian rating agency equity-targeted corporate hybrid transaction. This issuance helped to lay down a strong financial structure for CLP Power Hong Kong to meet the future funding requirements of the HK\$52.9 billion five-year Development Plan.

In view of the fast reducing financial market certainty in both overseas and domestic contexts, CLP Management also applied a pragmatic strategy to promptly complete the 2019 funding exercise in early third quarter 2019 by issuing a total of HK\$370 million 15-year and 25-year fixed rate private placement bonds for the Scheme of Control business at very appealing coupons of 2.74% and 2.8% to fund capital investment, and round up the rest of borrowing requirements for Hong Kong-based entities at very competitive terms from the bank market to mitigate financing risk. Also, CLP Power Hong Kong arranged HK\$1.8 billion one- to two-year bank loan facilities at attractive interest rates.

Meanwhile, CLP's businesses outside Hong Kong maintained adequate liquidity, and arranged additional bank facilities to meet business requirements. CLP India, for example, procured Rs6.5 billion (HK\$710 million) in bank facilities mainly to support new renewable and transmission projects. CLP Holdings received total consideration proceeds equivalent to HK\$2.9 billion in December 2018 and June 2019 from Caisse de dépôt et placement du Québec (CDPQ) for the transfer of a 40% shareholding in CLP India Private Limited. CLP China arranged RMB736 million (HK\$820 million) onshore and offshore bank loan facilities of between two- to 15-year tenors to expand its portfolio, and EnergyAustralia paid back A\$406 million (HK\$2.2 billion) to CLP Holdings in the form of dividend, shareholder's loan repayment, and interest payments.

Risk Management Plays a Discerning Role

CLP invests and operates in different geographical regions and regulatory regimes, facing multiple risk elements that need to be well-managed to guard against undue volatility in terms of business and financial performance.

CLP has a reputation for a high standard of financial discipline and well-established, regularly-reviewed policies. Our objective is straightforward and easy to understand. We identify, diligently manage and mitigate risk exposure to ensure a high degree of financial stability and certainty, which will help deliver a robust capital structure and good

investment grade credit ratings. We apply natural hedge or use approved financial derivative instruments that can qualify for effective accounting hedge (i.e. no adverse profit-and-loss impact) to offset the underlying obligations and risks.

Such truthful, conscientious application of risk management is vital. Our businesses in Mainland China and India stay financially strong even though RMB and Indian Rupee have depreciated about 11% and 12% respectively since 2018, and our debt funding costs in various geographical locations remain lower than market benchmarks as we always maintain a high level of interest rate and foreign currency hedging to withstand financial market volatilities, cover economic obligations, and transact only with credible financial institutions and financially sound business counterparts.

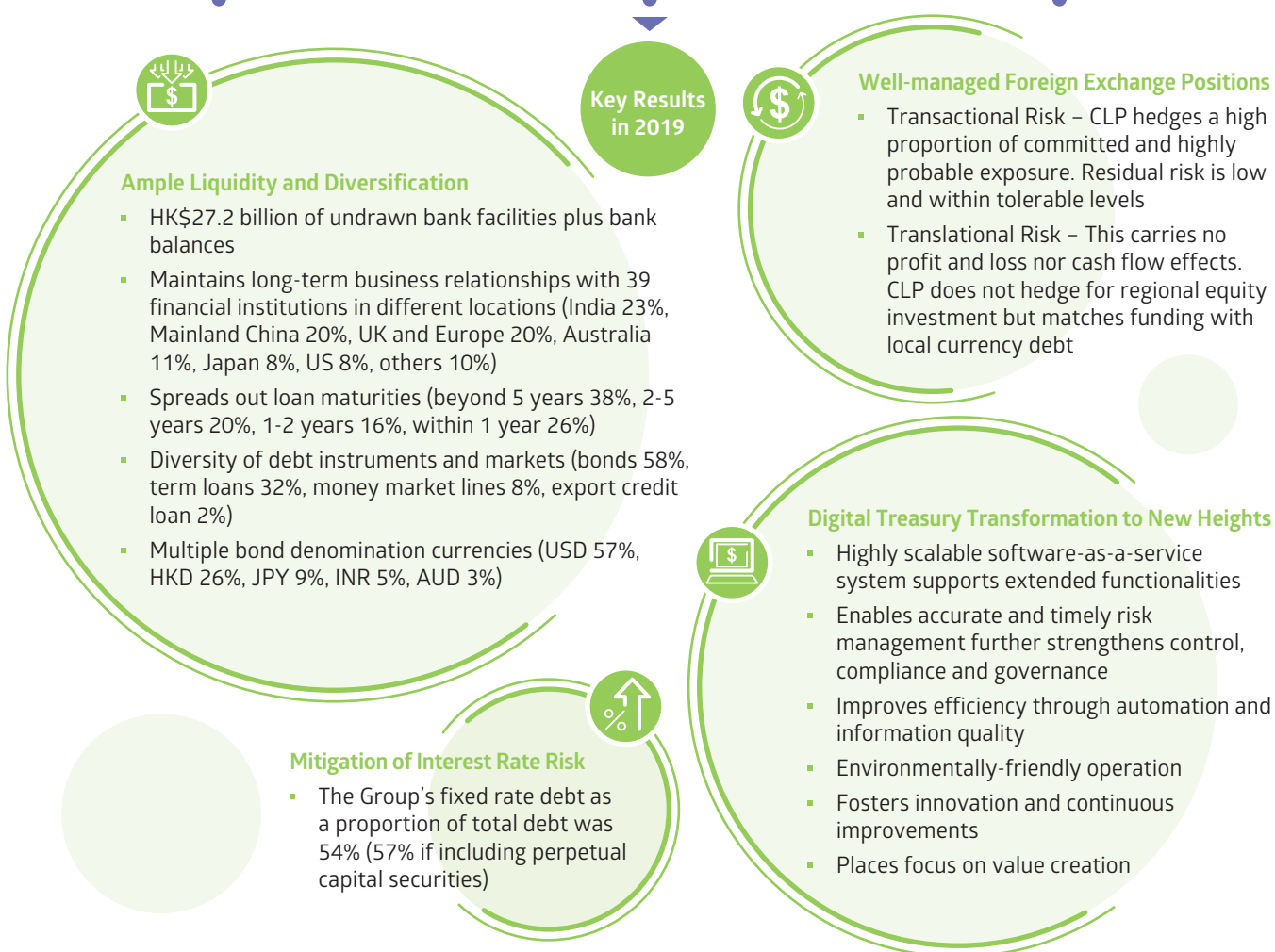
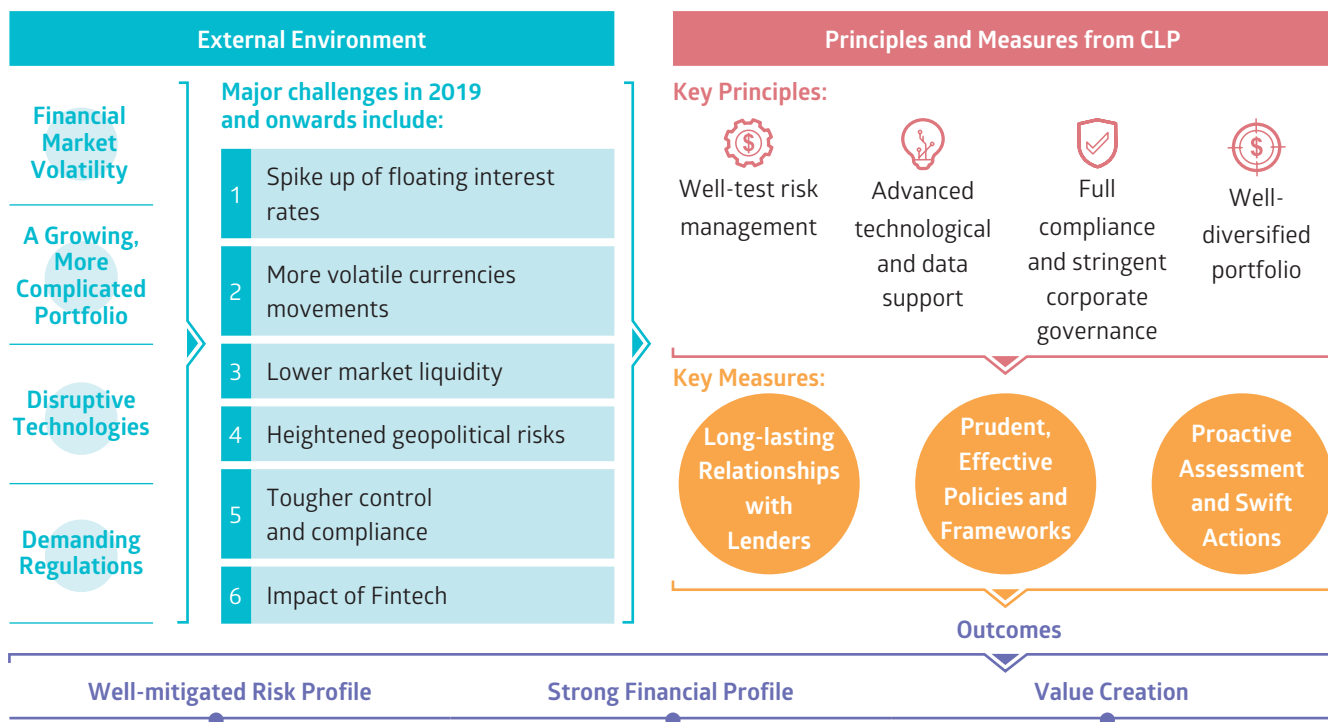
Continuous Enhancement in Governance and Technology

In addition to CLP's own professional finance and treasury team, the ongoing enhancement of the Group Treasury Management System (GTMS) have also supported the Group's financial governance efforts.

The cloud-based Software-as-a-Service GTMS has since 2016 proven to be an innovative and reliable electronic platform to integrate treasury positions, and enable enhanced risk management and compliance. With a multilateral treasury portfolio and volatile, fast-changing financial markets, the treasury team is engaged in an enhancement project for the GTMS which will deliver a cohesive digital platform with stronger functionality, scalability, connectivity, and dynamism to further support timely analyses and sound business decisions. The target is to realise greater automation, analytical capability, regulatory compliance in the context of proficient, straight-through processes and achieve paperless work cycle. For instance, the GTMS enhancement project can perform automatic matching and consolidate end-to-end work flows, as well as use robotic process automation with analytical tools to generate patterns and trends in a highly efficient manner to support decision making.

Embracing Challenges and Seizing Opportunities

The diagram below gives an overview of CLP's actions to embrace challenges, manage uncertainties, create value, and seize opportunities in a timely manner.



Debt Profile as at 31 December 2019

	CLP Holdings HK\$M	CLP Power Hong Kong HK\$M	CAPCO HK\$M	Other Subsidiaries HK\$M	CLP Group HK\$M
Availability Facility ¹	5,700	36,784	12,613	16,106	71,203
Bank Loans and Other Borrowings	–	31,122	10,049	11,178	52,349
Undrawn Facility	5,700	5,662	2,564	4,928	18,854

Note:

- 1 For the Medium Term Note Programmes, only the amounts of the bonds issued as at 31 December 2019 were included in the total amount of Available Facility. The Availability Facility in EnergyAustralia excluded a facility set aside for guarantees.

Credit Ratings

CLP always strives to maintain strong investment grade credit ratings. This not only enables CLP to source financings with the best terms (amount, pricing, tenor, diversity) but also maintains high credibility when negotiating commercial contracts. With its robust financial structure and healthy cash flow, CLP can maintain broad access to global capital and bank markets to fund operations, growth opportunities and contingencies. Standard & Poor's (S&P) and Moody's affirmed their credit ratings with stable outlooks for CLP Holdings, CLP Power Hong Kong, and CAPCO between May and October 2019. S&P affirmed its credit rating with a stable outlook for EnergyAustralia in November 2019.

	S&P	Moody's
CLP Holdings CLP Power Hong Kong CAPCO EnergyAustralia	A / Stable A+ / Stable AA- / Stable BBB+ / Stable	A2 / Stable A1 / Stable A1 / Stable Not applicable
Positives	<ul style="list-style-type: none"> Highly visible and stable operating cash flows of Scheme of Control (SoC) business More timely fuel-cost adjustment in Hong Kong Significant balance sheet capacity for EnergyAustralia to undertake growth-related investments 	<ul style="list-style-type: none"> CLP Holdings' strong financial profile, well-managed debt maturities and sound liquidity profile Stable regulatory environment in Hong Kong Predictable cash flow, low-risk business profile and good operating track record of SoC business
Negatives	<ul style="list-style-type: none"> Profitability from Hong Kong business will be affected over the next two years due to lower permitted rate of return EnergyAustralia's operating challenges including coal quality issues at Mount Piper Power Station and the impact of default retail price regulations 	<ul style="list-style-type: none"> Overseas and unregulated business investments increase the overall business risk profile Reduction in the permitted regulatory return in Hong Kong



More information of our credit ratings can be found on our website.



More information about major financing activities in 2019 and our debt profile can be found on pages 35 and 36 of CLP Holdings 2019 Annual Results Analyst Briefing Presentation.



Analyses of loan balance by types and bond funding by currencies can be found on page 47 of Investor Presentation Introductory Pack.



CLP's Sustainable Financing Trajectory

Although individual CLP entities started issuing green bonds from 2015, the Group took a step further in 2017 and extended its journey of sustainable financing for all business units with the launch of the CLP Climate Action Finance Framework (CAFF), after two years of refinement and communication with stakeholders.

The raising of debt through green or ESG financings is in line with good corporate governance, balancing the needs of various stakeholders. Processes and policies need to be implemented with high standard of accountability, addressing ESG requirements.

The CAFF sets out a holistic approach for CLP entities to undertake greater ESG responsibilities in the course of financing and makes available new funding options for the transition towards a low carbon energy future by tapping into a fast-expanding community of green and ESG investors. Under this framework, CLP can arrange financing through two types of Climate Action Bonds: New Energy Bonds, which are Green Bonds for renewable energy and energy-savings projects; and Energy Transition Bonds, similar to ESG Bonds, to fund projects that deliver valid, significant emission reductions. The CAFF aligns with most global requirements and standards, such as the Green Bond Principles issued by the International Capital Market Association, and has been independently verified.

As the first major sustainable financing initiative to support CLP in achieving its Climate Vision 2050, CAPCO successfully issued its first Energy Transition Bond under the CAFF in 2017. The US\$500 million proceeds from the bond were used to finance the construction of a new combined cycle gas turbine (CCGT) unit at Black Point Power Station which has a lower carbon emission intensity than the generation units it replaces. The bond was more than 2.5 times over-subscribed with orders from over 100 global investors, many of them ESG-targeted asset managers and financial institutions. The bond also obtained a recognition of being the first benchmark US dollar Energy Transition Bond issued globally.

In 2019, CAPCO issued a HK\$170 million, 25-year New Energy Bond to fund the construction of the West New Territories Landfill energy-from-waste project, which was an inaugural green bond for Scheme of Control-regulated business. This waste-to-energy project allows CAPCO to use landfill gas as energy source, offsetting emissions from some of its coal-fired power generation units and achieving significant environmental benefits.




CLP is continuously enhancing the CAFF so it can accommodate more forms and instruments of financing. The aim is to enrich the decarbonisation financing actions under the framework in support of the Climate Vision 2050 and its associated business strategy of expanding non-thermal or low-emission investment opportunities. Going forward, it is expected that the offshore LNG terminal and the second CCGT unit projects in Hong Kong will be able to meet ESG financing requirements, in addition to the sustainability-linked loans that CLP has included in its funding plan.

Manufactured Capital

CLP operates a diversified portfolio of power generation, transmission, and distribution assets that serves the energy needs of millions of households and businesses in Asia Pacific. As decarbonisation and digitalisation of the energy market gather pace, the Group is well-positioned to benefit from synergies created by its broad base of assets and technologies, encompassing specific expertise in each segment of the electricity supply chain. CLP is leveraging the wealth of capabilities in the Group's end-to-end operations to meet evolving customer demand for reliable, affordable and environmentally-responsible electricity amid the ongoing energy transition.

In 2019, the Group continued to invest in the latest technologies to improve the performance of its growing renewable energy operations in Asia Pacific, while upgrading existing thermal assets to optimise their operations in a lower-carbon and more digitalised electricity market.

Material Topics

-  **Harnessing the Power of Technology**
-  **Responding to Climate Change**
-  **Reinforcing Cyber Resilience**

New technologies are enabling power companies to increase operational efficiencies and capture new business opportunities emerging from the ongoing low-carbon transition of the energy market. This section discusses the strategies being deployed in our operations to manage the decarbonisation and digitalisation of the energy market, and our efforts to strengthen cyber security protection.

Leveraging Synergies to Seize Opportunity

The breadth of CLP's expertise gained in different Asia-Pacific markets and segments across the electricity supply chain gives it a competitive advantage to capture new growth opportunities and enhance operations. CLP India, capitalising on the Group's capabilities in managing power transmission assets in Hong Kong, including the cross-border overhead line circuits connected to southern China, agreed to acquire three transmission assets in 2019. It successfully took over operations of one of the assets – a 240-kilometre, 400kV intra-state transmission project in the central state of Madhya Pradesh – in November 2019. Engineers from Hong Kong provided support on the acquisition by reviewing the asset management, technical services, operation, and maintenance requirements of the project. Assets on the transmission line in Madhya Pradesh include 651 towers, approximately 3,000km of aluminium conductor steel-reinforced cable (ACSR) and 8,300 insulators. This project allowed CLP India to enter a new segment of the power sector and will support the integration of renewable energy capacity into the grid. CLP India is expected to complete the acquisitions of the other two transmission assets by the end of 2020.

Drawing on its experience from the use of aerial drones for plant inspection in Hong Kong, CLP rolled out the technology in renewable energy plants in Mainland China and India to improve operational performance and efficiency, as well as strengthening workplace safety.



Aerial drones with high resolution cameras have been trialled for wind turbine blade inspections in India.

Manufactured Capital

In Mainland China, drones with thermal cameras were deployed for the inspection of photovoltaic panels at Sihong Solar Power Station in Jiangsu and Meizhou Solar Power Station in Guangdong. The technology enables faster and more accurate identification of damaged and underperforming solar panels. Further trials have been conducted to automate the drones' flight paths, further reducing the time required to carry out plant inspections.

Aerial drones with high resolution cameras have also been trialled for wind turbine blade inspections in India to achieve savings in time and labour requirements.

Transitioning to Lower-Carbon Energy

CLP continued to invest in low-carbon generation with the construction of Laiwu III Wind Farm in Shandong in Mainland China beginning in the second quarter of 2019. The 50MW project, with 20 wind turbines, will be connected to the existing Laiwu I and Laiwu II plants through a new 35kV transmission system comprising 65 towers, requiring the construction of 18km of roads. Laiwu III is due to be commissioned in 2020.

Construction of the first high-efficiency H Class CCGT generating unit at Black Point Power Station in Hong Kong is on schedule to be completed in 2020, supporting the shift to the increased use of more efficient gas-fired generation in the city's fuel mix to help reduce carbon emissions. A second new CCGT unit is expected to go into service by the end of 2023.

In South Australia, Hallett Power Station completed the installation of an additional new fast-start gas turbine to meet increased electricity demand in the Australian summer. The 30MW generator, based on Aeroderivative Open Cycle Gas Turbine technology, is a variation of a jet plane engine design and has the capacity to reach full load within minutes, improving the plant's response to supply volatility. The turbine is also more fuel-efficient, helping to reduce the carbon intensity of EnergyAustralia's operations.

In New South Wales, meanwhile, work began to upgrade the two 700MW turbines at Mount Piper Power Station. The upgrade will allow each unit to provide 30MW of additional power without having to burn more coal when it is completed over the next two years.

Digital technologies including data analytics and artificial intelligence are being used to optimise the performance of the Group's renewable energy generation portfolio. CLP began the rollout of a cloud-based analytics platform for

renewable energy assets in Mainland China and India in 2019. Real-time operation data from solar and wind plants, including information monitored by aerial drones, will be collected and analysed through the platform, enabling improved performance tracking and automated reporting.

CLP's assets in Mainland China ranked well above the industry average in third-party performance benchmarking of more than 26,000 wind energy plants around the world conducted in 2019.

Strengthening Cyber Security

CLP continued to strengthen protection of its information systems against cyber-attacks in 2019, increasing its capacity to manage potential threats and mitigate risks. One of the company's internet portals was infected with malicious code in March 2019. Although the impact was negligible, the incident showed the importance of bolstering cyber security protection as new technologies such as the Internet of Things are deployed.

A Senior Director for Group Information Security was appointed in 2019 to oversee cyber security strategy and strengthen internal governance to protect systems and data across the region. The Group is implementing a centralised approach to the management of cyber security across its operations in Asia Pacific and will continue to increase the recruitment of information security experts to add to its capabilities.

CLP's cyber security strategy is underpinned by a high degree of technical assurance to maintain robust defences of its systems against prevalent cyber threats and scenarios, and to ensure the compliance of new standards and practices as they are implemented. Looking forward, the Group needs to integrate stringent cyber risk assessment on the potential information security impact of systems and technologies before they are deployed. It also needs to continue to identify and address system vulnerabilities to minimise risks.

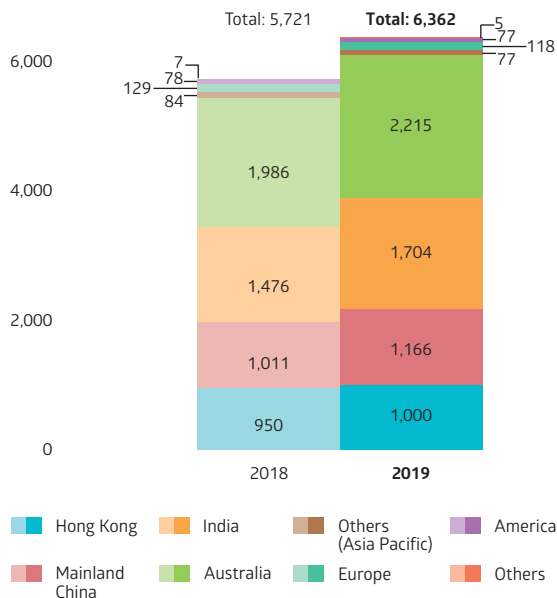
Effective cyber security is the result of a holistic approach that addresses people, processes, and technology. CLP conducts internal training programmes to improve cyber security awareness for employees, and devises clear processes to facilitate adoption across the Group. It is also investing in new digital technologies to strengthen monitoring of cyber threats, giving it improved visibility of potential threats.

Group Coordination on Procurement

CLP further enhanced its management of procurement in 2019, reinforcing coordination between businesses across the Group to increase commercial synergies. The Group formulates appropriate procurement strategies by evaluating the long-term needs of business units, as well as supply market opportunities and risks. This coordinated approach has increased CLP's ability to negotiate improved terms from suppliers and manage risks, resulting in tangible commercial benefits for the Group.

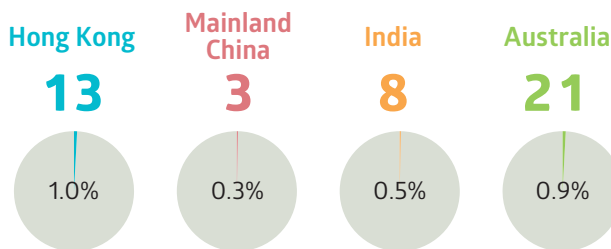
By following the Group Procurement Standard, businesses across the Group are implementing industry-leading practices in sourcing and supplier management, committing to responsible procurement to build a more sustainable supply chain.

Supplier Distribution by Geographical Region

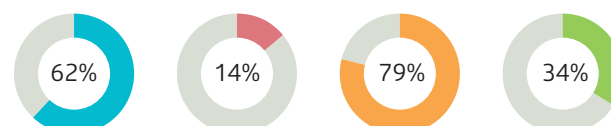


Overview of Strategic Suppliers by CLP Regional Subsidiary

Number of Strategic Suppliers and Percentage among Total Suppliers for Business



Percentage of Total Spend for Business



Enhancing Supplier Management

CLP conducts regular meetings with suppliers to review the Group's evolving procurement needs, and consider new technologies and innovations of suppliers. While supplier performance is assessed objectively, suppliers are also invited to give feedback to CLP, enhancing two-way communication and enabling continuous improvements. Businesses across the Group also implement processes to identify and mitigate potential risks with strategic suppliers, supported by quarterly management reviews consistent with the company's risk management practices.

A Commitment to Sustainable Procurement

CLP is committed to responsible procurement and proactively engages with suppliers to promote practices that are key to a sustainable supply chain including regulatory compliance, safe working conditions, ethical business conduct, and environmental protection.

Suppliers under consideration for critical project awards are assessed on their sustainability practices through various tools including self-declared questionnaires, proposal evaluations, site visits and audits. Subcontractors' capability to meet projects' requirements are assessed for services if subcontracting is involved.

The Group is committed to protecting intellectual property rights and safeguarding data privacy. This is reflected in our procurement practices where suppliers providing relevant services are required to comply with all applicable laws and regulations in relation to intellectual property rights and data protection.

The Company's overall assessment and monitoring mechanisms confirmed there were no significant risk findings in 2019 related to its Responsible Procurement Policy Statement. A roadmap of measures to enhance the sustainability risk assessment of suppliers for critical projects and purchasing categories has been developed, and CLP is exploring ways to work with suppliers to further improve their sustainability capability.



Extreme weather events, man-made hazards and other emergency situations can threaten the normal operation of CLP's power supply system. How does the Company ensure its power plants, substations, and transmission and distribution networks can withstand these potential risks?

Mr Mak Ka Nung
Shareholder



It is our utmost responsibility to ensure a reliable electricity supply to customers, and we take proactive steps to monitor and minimise potential risks to our power supply system. Recent events such as the bushfires in Australia, Super Typhoon Mangkhut in 2018 and cyber security incidents on electricity supply systems around the world are reminders that we need to be ever more vigilant against potential threats.

CLP employs multiple layers of protection on our infrastructure. For example, in Hong Kong, we have put structural reinforcements in place at the Black Point and Castle Peak power stations, while our transmission towers have been reinforced to withstand maximum wind gusts of 300km per hour. Floodgates and redundancy equipment such as transformers and switchgear are installed at substations situated in areas at high flood risks. To minimise the possible impacts of fallen trees on some of the critical overhead lines supplying remote villages more prone to typhoon disruption, we are carrying out a pilot to replace tall vegetation with shorter species.

To protect our systems against cyber security threats, we monitor potential risks to our information technology and operational systems. We also provide continuous training for staff to equip them with the skills required to identify and detect anomalies.

We maintain robust and regularly tested emergency response and crisis management procedures for our operations across the Group. To ensure efficiency and maximise readiness, emergency response drills are conducted at least annually at all our sites. Our goal is to make sure that we are prepared and equipped to respond to and recover from any emergency situations in a timely and effective manner, minimising disruption to our customers who rely upon us for electricity as a critical service.



David Smales
Chief Operating Officer

Intellectual Capital

CLP continued to invest in capabilities and expertise that drive the development of technology-enabled and customer-centric solutions in order to meet the needs of an evolving energy market. Our commitment to ongoing innovation in products and services, as well as business models, supports our transformation into a Utility of the Future, and contributes to a more sustainable and digitalised economy.

Material Topics

Harnessing the Power of Technology Responding to Climate Change

In the global effort to combat climate change, consumers and businesses need access to innovative technologies to improve energy efficiency and reduce emissions. This section discusses how new capabilities and partnerships are creating growth opportunities in a lower-carbon energy market.

Launching Innovative Business Models

CLP launched Smart Energy Connect (SEC) in 2019, a one-stop online shop that offers businesses and organisations access to a diverse selection of energy management applications powered by technologies including artificial intelligence, data analytics, and the Internet of Things. SEC represents a new business model for energy users, application developers, and utility companies to deploy innovative technologies that will optimise energy use in offices and buildings.

With a cloud-based platform, SEC provides a gateway for customers to find the latest solutions developed by CLP and its partners, including energy analytics and forecasting, performance monitoring of distributed energy systems, equipment fault diagnostics, and lighting and ambience control for offices and buildings.

Sales and engineering support for SEC customers in Hong Kong are provided by CLPe Solutions, the Group's wholly-owned subsidiary which was formerly named CLP Engineering. CLPe Solutions also offers a comprehensive range of power engineering and energy infrastructure services, drawing on its well-established technical and consultancy capabilities to meet growing demand for digitalised energy management services.

SEC has earned positive recognition since its launch, winning a prize in the Best Smart Energy Innovation category in the Future Digital Awards, an annual programme organised by consultancy Juniper Research to identify outstanding technologies globally. SEC also won the Hanson I&T Outstanding Award in the Energy Saving Championship Scheme organised by the Hong Kong Government's Electrical and Mechanical Services Department, as well as a silver award at the Firestarters 2019 awards, run by Invotech, an organisation promoting technology entrepreneurship.



Smart Energy Connect allows energy users, application developers, and utility companies to deploy technologies to optimise energy use.

Delivering User-Centric Innovations

Digital technologies are continuing to open new avenues for the Group to deliver data-enabled, user-centric services to customers. EnergyAustralia started a customer trial in New South Wales for new, simpler subscription-based electricity plans modelled on mobile phone services. In the trial, customers with smart meters are able to subscribe to annual plans based on different levels of electricity usage. The flat-rate pricing structure of the new plans offers customers better control over their energy expenses and peace of mind at a time of rising electricity costs in Australia, avoiding potential bill shocks and reducing the time needed to manage complex charges. Customers receive regular usage alerts on their mobile devices and can buy top-up quotas to meet additional energy needs. The subscription electricity services are part of a new platform allowing customers to try out innovative energy services.

EnergyAustralia also drew on demand response technologies to reward customers for reducing energy consumption during certain periods to ease strain on the electricity market. The Power Response programme was activated at a time of high temperatures in December 2019, alerting participating customers in Victoria to use less electricity to support grid reliability. Customers taking part in the programme are rewarded for achieving their personalised energy reduction targets, based on their previous usage patterns. Customers can track their usage on an online platform, which also offers advice on energy saving.

Technologies for Low-Carbon Economy

Technological innovation is increasing the capability of electricity utility companies to contribute to global efforts to limit greenhouse gas emissions and combat climate change. In addition to investments in renewable energy, CLP is examining non-generation opportunities emerging in the ongoing transition to a low-carbon economy in Asia Pacific, including microgrids, corporate power purchase agreements (CPPA), data centres, and electric transportation.

Microgrid systems are poised for strong growth in the Asia-Pacific region, supporting the rapid development of decentralised renewable energy and distributed energy resources such as batteries and electric vehicles, and providing new ways to serve the evolving energy needs of businesses. CLP's joint venture TUS-CLP Smart Energy

Technology Co. Ltd. is part of a group of companies developing a new incremental distribution network (IDN) in Fangchenggang Hi-Tech Park in the Guangxi Zhuang Autonomous Region in southwest China to provide integrated energy and distribution services to businesses. CLP is continuing to explore other microgrid project opportunities in Mainland China and other markets.

China's State Council issued a blueprint for the Guangdong-Hong Kong-Macau Greater Bay Area in February 2019, including key strategic initiatives to create a cluster of world-class cities which has a combined population of about 70 million people. As policymakers focus on the development of a closely-connected network of smart cities, powered increasingly by cleaner energy sources and technologies, CLP will intensify efforts to develop innovative energy services including IDNs and electric transportation. CLP signed a memorandum of understanding with China Southern Power Grid Industrial Investment Group Co. Ltd. in September 2019 on electric vehicle charging infrastructure and platforms.

Meanwhile, Smart Charge (HK) Limited, CLP's joint venture with telecommunications company HKT Limited, is continuing to expand its network of electric vehicle charging sites in public and private car parks in Hong Kong. CLP is also upgrading its free charging facilities in response to growing demand.

CLP is strengthening its efforts to capture opportunities emerging from the rising needs of multinational companies to purchase low-carbon electricity in Asia Pacific, leveraging its rich experience in developing renewable energy throughout the region. The growth of RE100, a global initiative to increase renewable energy consumption supported by some of the world's biggest companies, underscores the potential opportunities in the CPPA market as corporations look to source more renewable energy to make their operations more sustainable.

Reliable, clean energy is critical to data centres, and CLP aims to become the partner of choice for developers of these centres which play a key role in the region's ongoing digital transformation. CLP is exploring opportunities in the data centre market in Asia Pacific, as the Group is well-positioned to serve infrastructure operators that need access to low-carbon energy across multiple markets in the region, as data demand from businesses and consumers continues to increase.

Seeking Out Creative Partnerships

CLP continued to pursue partnerships with start-up energy technology companies from around the world in 2019 as a member of the Free Electrons accelerator programme to fast-track the development of innovative products and services. Comprising a series of week-long modules in the US, Europe and Asia, Free Electrons is a platform for leading utility companies to develop new energy services with potential for commercialisation. CLP hosted one of the Free Electrons modules in Hong Kong in 2019, bringing the accelerator programme to the city for the first time. CLP also supported the growth of technology development in Hong Kong by participating in events including JUMPSTARTER organised by the Alibaba Entrepreneurs Fund, and the STARS programme organised by the Federation of Hong Kong Industries. In Mainland China, CLP is increasing cooperation with energy technology innovators such as CYZone, a leading platform promoting business and investment opportunities in new technologies.

EnergyAustralia organised its second accelerator programme for energy start-up companies from around the world in partnership with Startupbootcamp. The annual programme supports the development of energy technology companies focused in key strategic areas including grid transformation, electric mobility, and customer empowerment. The 12-week event in Melbourne saw selected start-ups companies develop and refine their product and service offerings with expert counsel from energy companies and investors. The programme has helped start-up companies raise over A\$61 million of capital since its launch in 2018.

Strengthening Digital Technology Capabilities

CLP has deployed a variety of smart technologies to enhance the reliability of its supply and enable online condition monitoring. For example, Advanced Pattern Recognition technology is now being used in its power stations in Hong Kong to detect equipment failure based on measurements from different sensors. Online condition monitoring systems have been installed to allow real-time monitoring and detection of abnormal conditions for transmission switchgear and transformers. With the help of robotic process automation technology, CLP is now able to improve its customer service and free up employees from routine and lower-value tasks.

CLP also focused on enhancing its capabilities in artificial intelligence and machine learning to optimise operations and the performance of its assets. The company's growing data science team developed new software tools to predict potential faults in wind turbines, improving maintenance of our wind energy plants. The team also piloted new artificial intelligence software for load forecasting to enable improved grid management.

CLP continued to scan for, develop, and deploy new capabilities and emerging business models by investing in energy technology companies. A joint venture was set up with Other Sources Energy Group in March 2019 to explore investment opportunities in next-generation energy technologies including distributed energy, microgrids and energy storage in Israel. CLP made an additional investment of approximately HK\$100 million in California-based energy management software developer AutoGrid Systems, Inc. in May 2019 following an initial US\$5 million investment in 2018. It also made a US\$2 million investment in R&B Technology Holding Co. Ltd., a company with operations in Mainland China and Hong Kong. R&B is focused on artificial intelligence and data analytics technologies for managing energy systems in buildings.

EnergyAustralia acquired a 49% stake in Melbourne solar and lighting company Echo Group in July 2019. The investment broadens EnergyAustralia's offerings for commercial and industrial customers as demand for distributed energy systems continues to grow in Australia.

Human Capital

Our over 18,000 employees and contractors contribute their energy, talent and shared values to our customers, investors and stakeholders every day. They power CLP's success.

CLP's leading priority is safety: providing a safe, healthy and productive work environment for its people, complemented with necessary training, equipment and support. With safety as the foundation, our people agenda is to build an agile, inclusive and sustainable workforce, addressing the significant opportunities and challenges presented by digitalisation and decarbonisation of the energy sector, as well as intensifying demographic and labour supply issues.

CLP is investing in attracting and retaining a diverse, multi-generational workforce, building digital, commercial and leadership capabilities for the future and creating an environment in which people feel empowered to work together to find safer, more innovative and efficient ways of serving customers. The Group is committed to supporting all of its people to thrive in change through a long-term focus on inclusion, wellbeing and resilience, and re-skilling. Core to the people agenda, and to delivering CLP's strategy, is being a responsible employer that demonstrates respect for all of CLP's workforce, together with values-based management in addressing broader social issues.

Material Topic

Building an Agile, Inclusive and Sustainable Workforce

Our people are key to CLP's transformation into a Utility of the Future. This section discusses our strategies to empower our workforce in an increasingly dynamic energy market reshaped by decarbonisation and digitalisation.

Keeping People Safe and Well

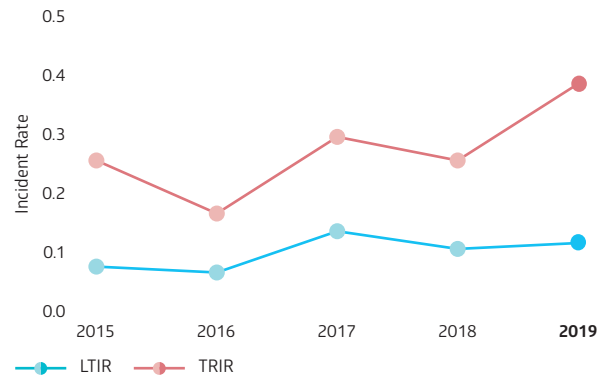
Worker safety has always been the leading priority of CLP, and the Group remains committed to ensuring the highest safety standards and to making continuing improvements in those standards across its entire operations.

Tragically, a fatal accident resulted in the death of a subcontractor's worker in Hong Kong in early 2019. An internal panel conducted an investigation into the incident to determine the causes and allow for improvements in safety standards and procedures. Investigations were also carried out into other isolated incidents with the potential to cause serious injury.

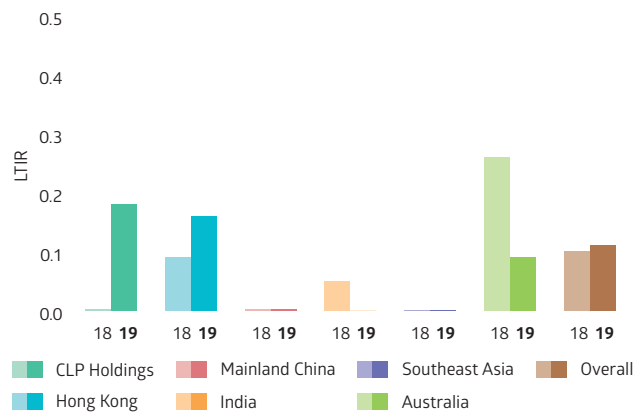
The increase in the Group's injury rates in 2019 was driven primarily by the construction of an additional gas-fired generation unit in Hong Kong. The start of other planned capital projects will also affect the Group's safety risk profile over time. At the same time, there has been an increase in the quality, frequency, and consistency of incident reporting

across the Group as a result of the Health, Safety and Environment (HSE) Improvement Strategy established in 2018.

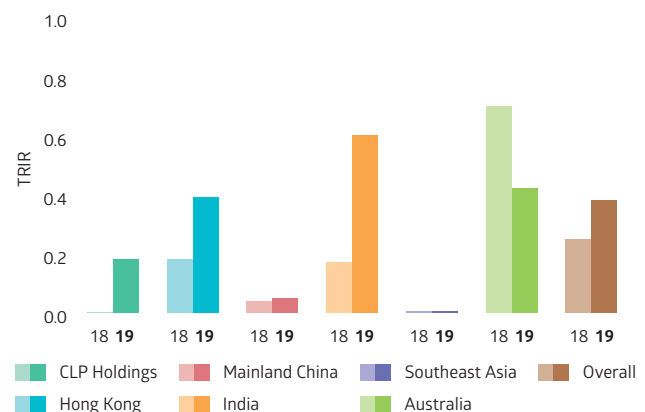
Group Lost Time Injury Rate and Total Recordable Injury Rate



Lost Time Injury Rate at Group and Regional Level



Total Recordable Injury Rate at Group and Regional Level



- Notes:
- 1 The LTIR and the TRIR are the number of lost time injuries and recordable injuries respectively measured over 200,000 working hours, which is equivalent to around 100 persons working for one year.
 - 2 To reflect the organisational restructuring of CLPe Solutions in 2019, its LTIR and TRIR are reported under CLP Holdings while the category of Overall represents the total LTI and total TRI divided by the total man-hour.

The HSE improvement strategy aims to raise the Group's safety culture across operating regions, promote more proactive risk management, and engage employees, contractors, and other key stakeholders to collectively implement changes to improve CLP's safety performance. CLP is committed to ongoing efforts to find better ways of

working by learning from investigations into incidents and by adopting best practice. CLP has established Group-wide principles for safety behaviour which set expectations at all levels of the organisation and encourage behavioural safety observation programmes at key assets. CLP also continues to implement consistent standards for risk management.

Key Performance Summary

At the end of 2019, CLP had 7,960 full-time and part-time employees, compared with 7,843¹ in 2018. A total of 4,305 employees were engaged in the Hong Kong electricity and related businesses and 3,294 by its businesses in Mainland China, India, Southeast Asia, Taiwan and Australia, with the remaining 361 employed by CLP Holdings. Total remuneration for the year ended 31 December 2019 was HK\$6,054 million compared with HK\$5,935 million in 2018, including retirement benefit costs of HK\$593 million compared with HK\$584 million in 2018.

	2019	2018
Total Workforce ²	18,979	18,313
Total Employees ¹	7,960	7,843
Workforce fatalities	1	2
Lost Time Injury Rate ³ (Workforce)	0.11	0.10
Gender Diversity		
– Group Executive Committee ^{4,5}	64% / 36%	71% / 29%
– Employees ^{1,4}	74% / 26%	74% / 26%
– Female percentage in leadership positions ⁶	24.2%	22.9%
– Female percentage in engineering ⁷	11.4%	10.9%
Voluntary Turnover ⁸	5.9%	6.0%
New Hires	857	965
Percentage of employees on permanent contract ¹	88%	87%
Percentage of labour supply ⁹ and service contractors ¹⁰ in workforce	59%	57%
Percentage of employees who received training ¹	94%	95%
Average training hours per employee ¹	40.1	45.4

Notes:

- 1 Full-time and part-time employees. Previously-reported data for 2018 covered full-time employees only.
- 2 Includes full-time and part-time employees, labour supply and estimated service contractors on full-time equivalent (FTE) basis. FTE calculations were based on the number of man-hours incurred and country-specific average weekly working hours. Previously-reported data for 2018 includes full-time employees only and FTE calculations on weekly hours of 48.
- 3 See note 1 under Total Recordable Injury Rate at Group and Regional Level.
- 4 Male/female ratio.
- 5 Includes Executive Directors (Chief Executive Officer and Chief Financial Officer).
- 6 Leadership positions are defined as positions at Hay Reference Level 19 & above.
- 7 Employees with a bachelor degree or above qualification in Engineering.
- 8 Includes permanent employees only, except for Mainland China, which includes both permanent and fixed-term contract employees due to local employment legislation. Data for 2019 covers full-time and part-time employees, while data for 2018 data includes full-time employees only.
- 9 Labour supply refers to manpower supplied by contractor companies under labour supply agreements. Reporting based on quarterly averages.
- 10 Estimated service contractors FTE are calculated based on the number of man-hours incurred and country-specific average weekly working hours.

Human Capital

CLP continued to focus on increasing transparency over the broader workforce to ensure a responsible approach is taken to manage the associated costs and risks. CLP employed over 18,000 employees and contractors on a full-time equivalent basis as at end of 2019. The reporting methodology evolved after the first reporting year in 2018 to include part-time

workers and to estimate the service contractor workforce in each region based on local weekly working norms.

Utilisation of contractors marginally increased in 2019, reflecting the ongoing work in the major construction projects in Hong Kong, and a refined calculation methodology commensurate with generally lower average local working hours in Australia.

Employees and Contractors by Region									
	Employees ¹			Contractors			Total		
	Average FTE (a)	Permanent	Fixed Term Contract	Labour Supply ² (b)	Service Contractor and Sub-contractor ³ (c)	Contractors Sub-total	Total Workforce (a)+(b)+(c)	Contractors in Total Workforce	
Hong Kong	4,539.5	85%	15%	1,309.0	5,063.6	6,372.6	10,912.1	58%	
Mainland China	603.7	72%	28%	13.0	350.2	363.2	966.9	38%	
India	463.3	99%	1%	78.5	2,453.4	2,531.9	2,995.2	85%	
Australia	2,248.9	95%	5%	172.5	1,683.7	1,856.2	4,105.1	45%	
Group Total	7,855.4	88%	12%	1,573.0	9,550.9	11,123.9	18,979.3	59%	

Notes:

- 1 Includes full-time and part-time employees on FTE basis.
- 2 See note 9 under Key Performance Summary Table.
- 3 See note 10 under Key Performance Summary Table.

Addressing Strategic Workforce Challenges

In coming years, industry, regional social and demographic drivers will bring unprecedented change to CLP and are redefining the Group's people agenda. There is no single solution to meeting these challenges – it requires a coordinated and integrated range of strategic initiatives to build an agile, inclusive and sustainable workforce.

While conventional energy needs will reduce in significance, the resourcing needs of renewable energy and new digital-based business and operating models will increase. CLP must find ways to attract and retain a more gender- and culturally-diverse, multi-generational workforce and share talent effectively across the portfolio of businesses in order to pursue regional growth and address the demographic and labour market challenges of an ageing workforce and increased competition for science, technology, engineering and mathematics (STEM)-qualified people.

The complexities of energy transition, digital evolution and increasing social and political uncertainties and expectations in CLP's markets drive the need for greater organisational agility: the ability to adapt and succeed in a rapidly changing environment. CLP's Value Framework provides the backbone, guiding how people are treated in change. With this as a constant, CLP is focusing on leveraging technology to speed up decision-making, strengthening the culture and practice of innovation, and empowering its people.

As the energy industry evolves, CLP is committed to supporting its people to thrive in change. This means helping them to embrace change, strengthening their wellbeing and resilience and developing more inclusive workplaces. CLP is investing in equipping its leaders to lead transformation under increasingly complex social and political influences, while providing opportunities for employees to gain exposure to new technologies and business models across the regional footprint.

CLP is mindful that it operates in a social context where there is increasing concern over inclusive growth, and the preservation of basic rights and freedoms in the workplace along with equality of income and opportunity. Consequently, employees and other stakeholders expect CLP to demonstrate values-based management in dealing with potentially divisive social issues. The Group is focused on providing competitive, fair and sustainable benefits and support to employees in need, and on implementing labour standards across the broader workforce.

Attracting and Retaining Tomorrow's Workforce

At the end of 2019, CLP employees collectively had a total of close to 100,000 years of service – a hugely valuable body of knowledge, experience, and skills of how value is delivered to customers and other stakeholders. Retaining this knowledge, together with transferring skills to a new generation of managers and team members is essential to CLP's long-term success, as is developing skills for a low-carbon, digitally-enabled future.

CLP employees received 40 hours of internal and external training and development on average in 2019, compared with 45 hours in 2018. The difference reflected lower training hours in the Paguthan plant in India, as well as in the Mainland China operations due to a lower turnover rate, and hence fewer hours in total of new hire training. A review of validity periods in Hong Kong resulted in longer validity periods being applied for some regular refresher training.

Employee Training		
	Average Training Hours per Employee	% of Employees Trained
By Gender		
Male	44.8	95.5%
Female	26.8	91.4%
By Professional Category		
Managerial	26.0	87.5%
Professional	35.0	95.3%
General & Technical	47.1	94.6%
By Region		
Hong Kong	47.6	92.3%
Mainland China	66.1	100.0%
India	23.2	81.4%
Australia	22.1	100.0%
Group Total	40.1	94.5%

CLP continued the development of future executives and high-potential Group engineering leaders in 2019, in partnership with the International Institute for Management Development (IMD) and the École Polytechnique Fédérale de Lausanne (EPFL). More than 50 employees participated in leadership and pipeline development programmes, in line with 2018.

Investing in building pipelines of skilled engineers and technicians in preparation for the energy transition and to address future skills shortages is a key priority. CLP introduced new technician grade structures and technician trainee roles in Hong Kong in 2019 to enhance progression and retention. A group of 22 high-potential engineering leaders participated in a cross-business engineering development programme. Several Hong Kong-based Graduate Trainee programmes were integrated and redeveloped into a single programme focused on future leadership and technical capabilities which will be launched in 2020.

In Mainland China, CLP conducted assessments for young local engineers, providing individual development plans and feedback. High potential early- to mid-career engineers continued to be recruited to supplement internal development efforts and facilitate international development assignments. CLP also continued to strengthen the resourcing of innovation and energy transition-related activities and projects, recruiting 29 senior hires into critical roles.

To support the development of skills for a digitally-enabled future, CLP partnered with Decoded, a technology educator, to launch a one-year data analytics programme in Hong Kong in 2019. Over 30 employees across the Hong Kong business gained a rich understanding of data and mastered cutting-edge data analysis tools and techniques to leverage CLP's data in new and insightful ways. At the end of the programme, participants can complete industry qualifications and become accredited Data Science Associates.

A diverse workforce and an inclusive culture support high performance and CLP's ability to operate effectively in the many communities in which it operates. CLP has set several Group-wide gender diversity targets and continue to undertake initiatives to encourage more women into the workforce. These included mentoring programmes for more than 40 female engineering students to provide exposure to CLP's operations and help them become more work-ready, together with holding the annual Female Engineer Networking event for the first time in India, with over 20 female engineers participating from across the Group. In China, CLP continued to hire staff with ethnic-minority backgrounds.

Human Capital

CLP continued to enhance leave and flexible working policies across the Group, providing continuation of full medical and other benefits for employees working part-time or on unpaid leave. Recognising the diverse backgrounds and needs of employees, EnergyAustralia is piloting flexibility for employees to choose public holiday dates in 2020 to meet cultural and social obligations.

Following certification of our Hong Kong operations as a Fair Wage Employer in 2018, a follow-up assessment was conducted in 2019 and confirmed our extended recognition for another year. In Australia, gender pay differentials were addressed in 2018. Analysis conducted on a job grade basis in 2019 showed that the gender pay gap issue has been addressed, with no further direct action required.

Building Organisational Agility

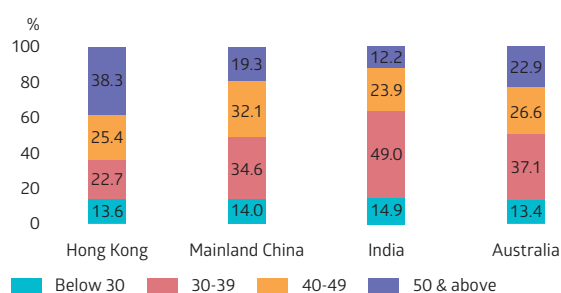
Energy transition, digital evolution, and changing social dynamics in CLP's markets will result in significant change for its people in coming years. The digital transformation of work and growth of automation will bring great benefits, together with disruption. The composition of CLP's workforce is changing too. In 2020, Millennials will make up around 43% of CLP's employees; this figure is expected to increase to 65% by 2025. This digital-native generation of employees bring different expectations of work and how the Group should engage and support them.

In response to these developments and trends, CLP is developing and implementing action plans across its business to simplify processes and ways of working to free people from non-value adding tasks so they can focus on key priorities. It is also accelerating the implementation of new agile ways of working. Across the Group, more agile team structures and working environments are being piloted to encourage collaboration and speed up decision-making. More than 900 Hong Kong employees have participated in Design Thinking training since its launch in early 2019. The programme is intended to nurture a people-centric innovation culture in our business, and to provide a practical problem-solving framework for product and service development with users' needs in mind. To date, employees have applied Design Thinking in projects spanning across digital transformation, productivity, safety and customer services.

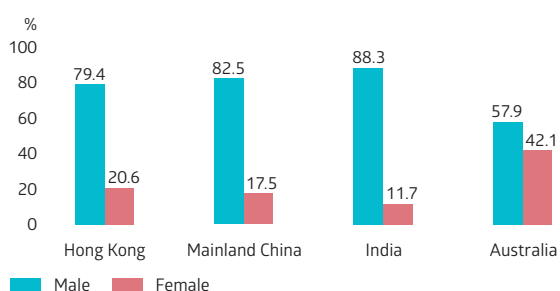
Supporting All Our People to Thrive in Change

As the energy industry evolves, CLP is committed to supporting all its people to thrive in change. This underpins our core value of Care for People as well as being good business practice in constrained labour markets. It means engaging and helping people to embrace change, strengthening their wellbeing and resilience, and developing more inclusive workplaces, supporting increased gender, age and cultural diversity.

Age Distribution by Region



Gender Distribution by Region



Voluntary Turnover Rate (%)

By gender	
Male	4.8%
Female	8.9%
By age group	
Below 30	10.3%
30 – 39	8.9%
40 – 49	4.7%
50 & above	2.5%
By region	
Hong Kong	2.4%
Mainland China	2.0%
India	6.6%
Australia	12.9%
Group total	5.9%

CLP was again voted Hong Kong's Most Attractive Employer in the Randstad Employer Awards in 2019, the first company to win the award three times since the programme's launch.

Two key programmes – the CLP Home Loan Scheme and the Boost Health and Wellbeing programme – were introduced in 2019 in Hong Kong. The CLP Home Loan Scheme provides financial support for employees seeking to buy a first home (See Case Study on page 92). The Boost Health and Wellbeing programme aims to support Hong Kong-based employees to look after their physical health, mental wellness, social health and financial wellbeing. An online survey was launched to learn more about employees' lifestyles and to seek their ideas for the programme, achieving a very encouraging response rate of over 80%. The survey results will drive major initiatives to improve the health and wellbeing of employees in 2020 and beyond.

Demonstrating Fair Work Practices

CLP's commitment to care for its people, as a leading responsible employer, has guided its operations for nearly 120 years. The Group's human resources policies and procedures are intended to ensure compliance with all local laws and regulations in relation to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, non-discrimination,

and those covering benefits and welfare in the markets in which it operates. CLP takes immediate action to investigate and address any suspected breaches or issues that are brought to its attention and carries out independent audits to proactively identify any risks of legal non-compliance and to take remedial action if any risks are identified.

In addition to local legal compliance, CLP respects internationally-proclaimed human rights across its value chain and recognise how that responsibility to respect human rights extends to its network of suppliers and contractors. CLP continued to focus on working practices across its extended workforce in 2019, including continuing to strengthen reporting of labour supply and service contractors and exercising more control and oversight over labour supply in Hong Kong.

CLP prohibits the employment of child labour or forced labour in any of its operations. The steps it takes to prevent such practices included stringent checking and control procedures in selection and on-boarding processes, and training for key contractors who provide manpower or services to operations. CLP did not identify any operation or supplier as having a significant risk of child labour, young workers exposed to hazardous work, or forced or compulsory labour in 2019. There was no breach of laws and regulations in relation to child and forced labour across CLP in 2019.



CLP employees have applied Design Thinking in projects spanning across digital transformation, productivity, safety and customer services.

Human Capital

CLP monitors pay carefully to ensure it is competitive and rewards employees for individual and company performance. It complies fully with any local legal requirements with respect to minimum wage, and in practice its remuneration and benefits often significantly exceed local legal requirements. Core benefits are also reviewed regularly to ensure they are fit for purpose and sustainable. In recognition

of the high value placed on sustainable retirement benefits, CLP received a Good Mandatory Provident Fund (MPF) Employer award and e-Contribution awards from the MPF Schemes Authority in Hong Kong, as well as an award for the Best ORSO (Occupational Retirement) Scheme from the publication Asia Asset Management.



How would CLP retain young talents who are increasingly interested in autonomous working environment (i.e. in start-ups) versus a traditional corporate environment?

Julia Ju

Senior Associate – Group Internal Audit
CLP Holdings



Start-up cultures typically involve taking responsibility and handling pressure early, working through uncertainty, wearing different “hats” and embracing change. Experimentation and different or out-of-the-box thinking are encouraged. Corporate environments may be different in some parts of their businesses – for example, in safety- and security-critical operations – but there are many opportunities within large companies that offer the qualities of start-ups.

CLP’s Innovation team offers the opportunity to be at the cutting edge of smart energy solutions in Asia. CLPe Solutions in Hong Kong, and our regional businesses in Mainland China, India and Australia, run projects that develop and commercialise smart energy and renewables solutions. In Hong Kong, CLP has introduced a training programme for employees on Design Thinking, allowing them to collaborate with colleagues and external partners to deploy agile methodologies to develop solutions to customer and operational problems. The entrepreneurial skills of successful start-up leaders – being able to identify business opportunities, develop strategies, and explore the risks and rewards of new ventures – are being incorporated into CLP’s development programmes and approaches to talent management and succession.

Arguably, CLP can offer entrepreneurial young talents the best of both worlds: the opportunity to develop and deploy their start-up skills and also to have large-scale impact on issues critical to society like decarbonisation.



Eileen Burnett-Kant

Chief Human Resources Officer

Social and Relationship Capital

The sustainability of CLP's business goes hand in hand with the development of the communities it serves. To contribute to the positive development of these communities, we create long-term relationships with partners and cultivates opportunities to work with stakeholders to address evolving societal needs.

At a time when the world focuses on decarbonisation and digitalisation, we cannot thrive in isolation as we move towards becoming a Utility of the Future. We need to work closely with partners to devise creative and responsive strategies that align our business objectives with the aims of our diverse social programmes that serve different markets.

Material Topic

Reinforcing Data Protection

This section discusses how our efforts to build long-term stakeholder relationships help tackle key societal challenges and contribute to the long-term sustainability of our business. The section also discusses our efforts to protect the data of our customers.

Inspiring Hope

Hong Kong is going through immensely challenging times, leaving many young people doubtful about the city's future and uncertain about their role in society. CLP believes strongly in instilling hope and empowering young people through education and engagement, and recognises the importance of supporting their positive development and promoting their interests.

To develop more effective youth engagement strategies, CLP stepped up efforts to deepen its knowledge and understanding through focus groups, regular school outreach, and cooperation with partners. Millennials and members of Generation Z are more independent-minded than previous generations, and have a more developed sense of social responsibility. Our work with youths therefore needs to be empathetic and supportive of their needs and aspirations.

Since its inception in 2017, CLP Power Academy has been offering a range of accredited programmes designed for young people in Hong Kong with varying academic achievements and work experience, providing high-quality vocational and professional education to help them develop careers in power engineering.

From entry-level courses for secondary school leavers without relevant qualifications to advanced post-graduate degrees for more experienced industry practitioners, programmes at the Academy widen the career options of young people and promote access to opportunities for youngsters from different backgrounds including those from underprivileged homes and ethnic minorities. Students include individuals referred by CLP partners such as the Society for Community Organization and Youth Outreach, both of which support grassroots and disadvantaged young people.

The Academy continued to broaden its range of curriculums in 2019, offering new courses in mechanical engineering as well as programmes focused on electrical engineering.

In January 2019, the Academy celebrated the graduation of its first intake of students after they successfully completed the Professional Diploma in Power Engineering and the Certificate for Junior Electricians programmes. The Academy now has 500 students studying in programmes it runs in collaboration with four renowned education institutions in Hong Kong and abroad.

CLP Power Academy is a founding member of the Corporate Tech Academy Network (CTAN), an alliance formed by Hong Kong companies in May 2019 to promote vocational and professional education and training (VPET) for young people. Other members of CTAN are MTR Academy, Hong Kong Institute of Construction, Hong Kong International Aviation Academy, Towngas Engineering Academy, and the academy of the Hong Kong Productivity Council.

To encourage more young people to consider a career in engineering, CLP's Engineer in School programme organises presentations, workshops, and experience tours for schools. Since the programme began in 2016, it has reached more than 26,000 students from over 130 schools. CLP is also working with organisations including the Hong Kong Association of Career Masters and Guidance Masters to promote power engineering as a profession.



Helping Employees onto the Housing Ladder

Housing costs in Hong Kong are among the most expensive in the world. A typical Hong Kong person may not be able to afford a property even with years of saved income and young people are particularly hard hit by this social issue.

To help employees get on the housing ladder, CLP launched a Home Loan Scheme in 2019 to provide those eligible with financial support for the purchase of their first home. The scheme is open to all employees below senior management level and successful applicants have as long as 25 years to repay interest-free loans.

The scheme provides a significant support to employees, particularly younger people for whom buying a home is the biggest investment of their lives as well as a major step towards independence. The programme also strengthens CLP's ability to attract and retain staff in an increasingly competitive talent market.

Feedback from staff has been extremely positive and 40 employees, including many junior members of staff, have received loans under the programme so far.

Promoting Positive Development of Young People

Supporting the healthy development of young people is a priority of CLP India's community work. In July 2019, it opened a centralised kitchen near Veltoor Solar Farm in partnership with The Akshaya Patra Foundation to provide daily lunches to nearby schools in an area of high poverty.

The initiative is part of the Indian Government's flagship Midday Meal Scheme which aims to serve 1.75 million children every day through 38 centralised kitchens in 12 states. By providing the meals, the programme seeks to improve enrolment, raise nutrition levels, and encourage children to stay in Government schools. The scheme dovetails with CLP India's approach to community initiatives, which focuses on education and development of children in rural communities near its operations. CLP India now supports two centralised kitchens in the country, including one near the Saundatti Wind Farm. Together, the kitchens meet the daily nutritional needs of more than 30,000 young people.

Sports and recreational pursuits are key components of CLP India's holistic strategy to encourage youth development. The company's new 1,500-seat mini sports stadium in Khanpur Kalan village near the Jhajjar Power Station provides sports facilities for local youngsters and helps set them up for success in life by instilling a commitment to individual and team sporting excellence as well as a greater sense of purpose.

The transformative power of sport is recognised by the Government which launched the Fit India Movement in 2019 to promote sports in a country which has one of the world's youngest populations. CLP India sponsored the purchase of sports equipment for hundreds of students and young people in 2019. Training courses in sports including wrestling, basketball, football, cricket, and hockey were also organised with the support of CLP India.

In Hong Kong, meanwhile, the CLP Energy for Brighter Tomorrows Award programme, organised in partnership with the Hong Kong Federation of Youth Groups, continued to recognise the achievements of young people who have overcome challenging circumstances, encouraging youngsters to embrace a positive outlook on life. Award winners were provided with scholarships and mentoring from CLP employees.

CLP also announced HK\$10 million of funding for scholarships for disadvantaged Hong Kong students in vocational, professional education, and training institutions in December 2019 as part of a wide-ranging relief programme for residents amid the city's current social and economic challenges.

Thousands of students in Mainland China and India meanwhile benefitted from scholarships and financial assistance provided by CLP in 2019, providing them with critical support to continue their studies and broaden their career possibilities.

Attending to Community Wellbeing

CLP is committed to promoting social inclusion in the communities in which we operate, and to supporting people in need. In Hong Kong, the CLP Power Connect programme provided HK\$20 million to relieve the electricity costs of underprivileged households. The programme, launched in 2019, also provides subsidies to landlords of subdivided units for rewiring work needed to install individual electricity meters for tenants. Customers are encouraged to join the programme through the offer of rewards in return for energy saving.

EnergyAustralia set up a cross-referral programme in partnership with water utility company Yarra Valley Water in 2019 to coordinate action to support customers with financial difficulties. The programme enables customer cases at one company to be referred to the other, avoiding the need for people to have to report financial difficulties for a second time.

EnergyAustralia provided A\$500,000 of energy-efficient heating and cooling systems to the Ozanam House homeless

hub and resource centre in North Melbourne to reduce their energy costs. It also continued its partnership with groups including ICAN Learn and the Thriving Communities Partnership to support people with financial difficulties.

CLP China started a three-year programme in 2019 to support impoverished students and villagers in two cities in Guangxi Zhuang Autonomous Region with large ethnic minority populations. In addition to financial aid, the programme also provides funding for projects to improve learning and living conditions in local schools and communities, in support of poverty alleviation efforts of the Government of Guangxi, home to Fangchenggang Power Station.

Across the markets where we operate, CLP employees devoted thousands of hours of their time and expertise in voluntary projects in their communities in 2019, when the CLP Volunteer Team celebrated its 25th anniversary. The selfless efforts of CLP employees had a positive impact on lives across the region and were recognised when CLP Power Hong Kong received the gold award in the volunteer team category of the 10th Hong Kong Outstanding Corporate Citizenship Awards in December 2019.



The CLP Power Connect programme in Hong Kong provides subsidies to landlords of subdivided units for rewiring work that enables installation of individual electricity meters.

Social and Relationship Capital

Protecting customer data

Respect for people and their privacy is one of our key business principles, committing the Company to protect the data entrusted to us by customers. In our Hong Kong retail business in 2019, no customer privacy and data loss cases were reported or noted.

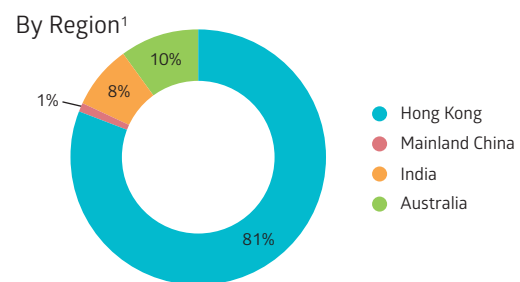
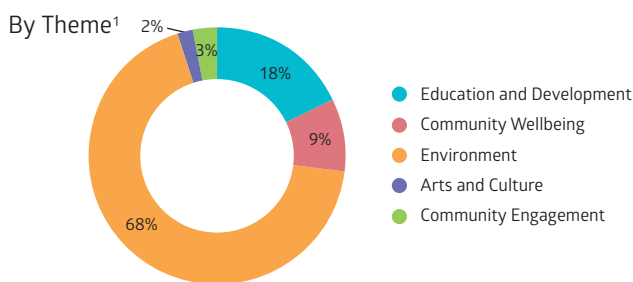
EnergyAustralia received notification from the Office of the Australian Information Commissioner (OAIC) in relation to four separate privacy complaints received during 2019. We

have provided the required updates to the OAIC and to date three of the four have been formally closed by the OAIC with no further action required to be taken by EnergyAustralia.

In addition, EnergyAustralia voluntarily reported eight separate instances of customer privacy breaches to the OAIC during 2019. One of these reported breaches has been formally closed by the OAIC and we await further instructions from the OAIC in relation to any actions required to be taken for the other seven breaches reported.

Community Initiatives and Volunteering

Our Community Spending



Our Beneficiaries



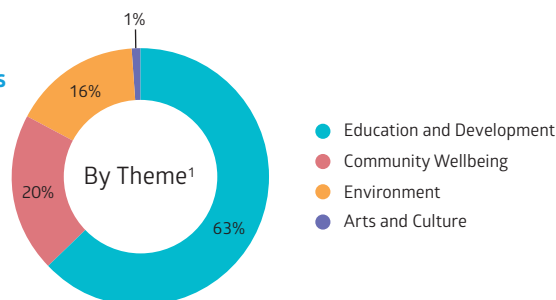
663 programmes
were initiated or supported



401 organisations
benefitted



615,803
direct beneficiaries



Contributing Our Time



20,015
volunteer hours
by CLP staff and
family members

Note:

¹ Figures include rounding adjustments.

Natural Capital

CLP is doubling its efforts to build a sustainable, low-carbon business at a time when the frequency and intensity of extreme weather events increase globally, highlighting the imminent dangers of climate change. These troubling events vividly demonstrate the urgent need to reduce emissions and manage natural resources in a sustainable way in the long-term interests of communities worldwide.

Material Topic

Responding to Climate Change

This section discusses CLP's strategies for decarbonising its business and minimising environmental impact as it joins global efforts to address the challenges of climate change.

Making Decarbonisation a Reality

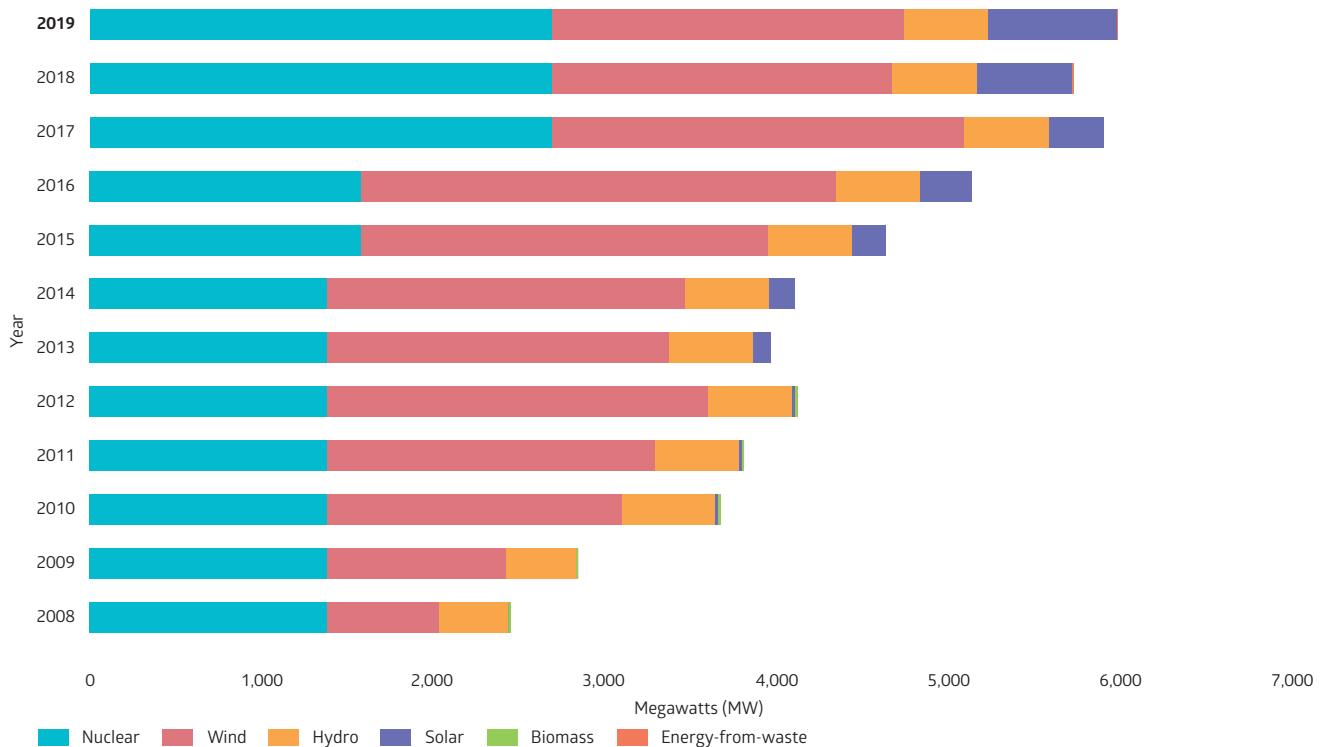
CLP is committed to making decarbonisation a reality, and is a long-term supporter of positive climate action. Under its updated Climate Vision 2050, the Group took the strategic decision not to invest in any additional coal-fired generation facilities and to progressively phase out all remaining coal-based assets by the middle of the century.

The Company started building its renewable energy portfolio in 2004, and in 2007 it became the first power company in the Asia-Pacific region to set voluntary carbon intensity reduction targets as part of the initial launch of Climate Vision 2050.

The Group undertook a comprehensive review of the strategy and its targets in 2017, committing to an 80% reduction in carbon intensity by 2050, compared with 2007 levels. In 2019, the Group's carbon intensity fell to 0.62 kg CO₂/kWh, based on equity and long-term energy and capacity purchase, moving closer to the 0.60 kg CO₂/kWh interim target set for 2020.

The United Nations Intergovernmental Panel on Climate Change published two special reports in 2019, both of which warned that the risks of severe climate change impacts will grow as global temperatures warm beyond the 2°C targets set in the 2015 Paris Agreement. Climate Vision 2050 will continue to be regularly assessed to take into account the emergence of new climate science and technologies as well as evolving business needs.

CLP Group's Non-carbon Emitting Generation Capacity




Note: The capacity is on an equity plus long-term capacity and energy purchase basis as of the end of each year.

Natural Capital

As part of the updated Climate Vision 2050, CLP committed to strengthening targets at least every five years. The Group will track its targets and progress towards them against the Science Based Targets initiative, a globally-recognised framework backed by the United Nations Global Compact and other international organisations. This transparent comparison will help CLP stay on course to accelerate its transition to a science-based target that is informed by independent climate science in line with the scale of reductions required to keep the global temperature increase at less than 2°C above pre-industrial temperatures.

Decarbonisation is ingrained into CLP's operations and strategies, including acquisitions and divestments, and Climate Vision 2050 guides the Group in managing climate-related opportunities and risks. As it gradually phases out coal-based generation, which currently contributes around 20% of operating earnings, the Group is focused on expanding business segments such as low- or non-carbon-based electricity generation, transmission, distribution, and new energy services enabled by digital technologies.

CLP is increasing the transparency of reporting in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) to allow stakeholders to track the ongoing impact of climate change on its business. It participated in the TCFD Electric Utilities Preparer Forum in 2019, an initiative of the World Business Council for Sustainable Development to bring together electricity companies from around the world to explore ways to enhance climate-related reporting. More information related to TCFD is available in CLP's [2019 Sustainability Report](#). 

CLP became the first Hong Kong company to join EV100, a global initiative run by The Climate Group to expand the electrification of transport. As part of the initiative, CLP aims to convert more than 1,000 cars in its fleet to electric vehicles by 2030.

Expanding Low-Carbon Assets

CLP further expanded its low-carbon portfolio in 2019 through new investments in renewable energy and transmission infrastructure. At the end of 2019, the Group's renewable energy portfolio increased to 3,294MW in equity generation and long-term energy and capacity purchases, or 13.7% of the generation portfolio.

CLP India accelerated efforts to expand its low-carbon business in 2019 after introducing CDPQ as a strategic investor. It secured a long-term power purchase agreement for a 250MW wind farm in Sidhpur, Gujarat, following its successful tender to develop the project at an auction held by the Solar Energy Corporation of India in August. The greenfield project is a significant addition to the capabilities of CLP India which previously focused on acquiring operating wind energy assets from other developers. Construction of the wind farm is due to be completed in 2021.

To sustain the development of renewable energy and its integration into the grid in India, investments in transmission infrastructure are critical. CLP India announced agreements in July 2019 to acquire three transmission projects, diversifying its business beyond electricity generation for the first time. Two of these projects are interstate transmission lines spanning the states of Bihar, West Bengal, Manipur, Nagaland, and Assam in northeast India, expanding the geographical reach of CLP India's business. The other is an intrastate transmission line in the central state of Madhya Pradesh.

CLP India's renewable energy portfolio was also expanded in 2019 as the Veltoor and Gale solar farms became wholly-owned assets after the acquisitions of the equity interests previously held by Suzlon Energy Limited.

In Mainland China, construction of the 50MW Laiwu III Wind Farm in Shandong Province near two of CLP's existing wind assets began in 2019 while operations commenced at the 49.5MW CLP Laizhou II wind farm in the same province. CLP also acquired an operational 36MW solar plant in Meizhou, Guangdong Province.

Yangjiang Nuclear Power Station completed the commissioning of its sixth and final 1,086MW unit in July 2019, allowing for the increased dispatch of zero-carbon energy to customers.

In Hong Kong, a growing number of residential customers and businesses benefitted from CLP's Feed-in Tariff scheme in 2019 by installing renewable generation capacity in their premises. CLP also started commissioning the new West New Territories Landfill project, comprising five 2MW units fired by landfill gas. EnergyAustralia meanwhile explored the use of non-recyclable plastics, linen, and other waste materials to power turbines and produce an additional 30MW of electricity at Mount Piper Power Station.

Raising Environmental Standards

CLP is committed to ongoing improvements in its environmental performance in line with technological advances and the evolving expectations of our stakeholders. Under its Group Environmental Policy, it continued to strengthen reporting on environmental data. CLP's performance in key environmental categories is summarised in the table below.

Environmental Category	Aspect	Parameters	2019	2018
Emissions	Greenhouse gases	Total CO ₂ emissions ¹	50,412kt	52,052kt ²
		Carbon intensity	0.70kg CO₂ per kWh / 0.62kg CO₂ per kWh³	0.74kg CO ₂ per kWh / 0.66kg CO ₂ per kWh ³
	Air pollutants	Total SO ₂ emissions	44.7kt	76.1kt
		Total NO _x emissions	47.0kt	60.9kt
Total particulate matter emissions		7.7kt	8.5kt	
Water discharged	Total water discharged	5,337.1Mm³	5,103Mm ³	
Waste	Total solid waste produced	14,206t	12,906t	
	Total liquid waste produced	1,637kl	1,737kl	
Resource Use	Fuel	Total coal consumed ⁴	485,453TJ	521,568TJ
		Total gas consumed ⁴	107,183TJ	83,364TJ ²
		Total oil consumed ⁴	2,620TJ	3,807TJ ²
		Non-carbon emitting generation capacity %	21.1% / 24.9%³	20.9% / 24.1% ³
		Total renewable energy generation capacity %	12.8% / 13.7%³	12.5% / 12.8% ³
	Water	Total water withdrawal	5,377.4Mm³	5,154Mm ³

Notes:

- 1 Scope 1 and Scope 2 CO₂ emissions on an operational control basis (from power generation).
- 2 Total CO₂ emissions data in 2018 has been restated due to update in gas and oil consumption data for Hallett.
- 3 Equity basis / Equity basis and capacity purchase arrangements.
- 4 Consumption for power generation.

Power generation facilities under CLP's operational control are required to achieve third-party certified ISO14001 environmental management certification within two years of acquisition or the beginning of operations. All assets in this category have successfully certified their environmental management system to the ISO14001:2015 standard in 2019.

Air Emissions

CLP continued to implement new technologies and practices in 2019 to meet and exceed increasingly stringent regulatory requirements on air emissions in the markets in which it operates. The Group's total air emissions decreased to 99.4kt.

In India, Jhajjar Power Station achieved further improvements in its sulphur dioxide (SO₂) emission performance, as CLP India upgraded the continuous emission monitoring

system (CEMS) to improve the accuracy of measurements. The power plant also made preparations to meet new nitrogen oxide (NO_x) emission limits.

In Mainland China, Fangchenggang Power Station continued to perform well after the upgrade of emission control equipment for SO₂ and NO_x. A pilot project was prepared to explore the use of microalgae to reduce carbon dioxide in flue gas.

All measurements taken at Castle Peak Power Station in Hong Kong were well below the mercury emissions limits introduced in April 2019. CLP was vigilant to prevent the leak of sulphur hexafluoride (SF₆), a greenhouse gas, throughout the life cycle of the electrical equipment in transmission line assets.

Natural Capital

In Australia, Tallawarra Power Station completed an CEMS upgrade in 2019 to ensure the plant had the most accurate data for keeping emissions as low as possible. Mount Piper Power Station also installed a CEMS unit as part of a programme to improve emissions monitoring and performance.

Waste

Waste management programmes and initiatives were implemented across the Group in 2019. Jhajjar Power Station enhanced ash handling systems and actively pursued ash reuse and recycling opportunities, such as for highway construction, cement plants, and brick-making plants. Jhajjar in 2019 became one of the first power plants in India to achieve a 100% utilisation rate of ash generated and complete clearance of ash for recycling. Total solid and liquid waste generated rose, as non-hazardous solid waste increased at Castle Peak Power Station and Fangchenggang Power Station.

Fangchenggang Power Station in Mainland China carried out a pilot project in using white mud, a waste by-product from paper mill factories, to partially replace the use of limestone in the flue gas desulphurisation process. Around 5,300 tonnes of white mud was used in 2019 to reduce solid waste and material consumption. At solar power plants in Mainland China, the company continued to ask solar panel manufacturers to collect damaged panels to ensure proper waste handling. In Hong Kong, CLP replaced single-use polyfoam meal boxes with corn-based biodegradable products in its canteens, saving about 26,000 pieces of single-use plastic meal boxes a year.

Water

CLP is committed to using water resources responsibly and sustainably in all of its operations and to ensure its assets withdraw water according to their licence entitlements.

Thermal plants use very large quantities of sea water for cooling and when the water is returned to the sea, it results in a slight temperature increase. As in previous years, the total water withdrawal and discharge from freshwater and municipal sources by CLP was determined by the electricity generation of its operating assets.

To conserve water, three of the five coal-fired power stations across the Group adopted a zero-liquid discharge approach while other generation assets continued to implement further water-saving initiatives. In Hong Kong, for instance, work began on a new station water pipework at Castle Park Power Station to replace the old one and reduce water leakage.

CLP continued to participate in the international CDP Water Survey in 2019, working with industry peers to benchmark and share best practices related to water resource management.

Environmental Regulatory Compliance

There were no environmental regulatory non-compliance incidents in 2019 resulting in fines or prosecutions at any of CLP's operating sites.

There were five incidents of licence limits for SO₂ emissions being exceeded at Jhajjar in India, and two incidents of licence limits being exceeded for NO_x emissions at Tallawarra in Australia. These incidents were all considered minor and did not result in any penalties.

There were also two oil spillage non-compliance incidents and one minor hydrocarbon exceedance to the Trade Waste Licence at Newport Power Station in Australia. The Environment Protection Authority Victoria was notified and no fines or penalties were imposed. Investigations have been conducted and corrective action taken to prevent a repeat of these incidents.

In India, the National Green Tribunal (NGT) in November 2018 passed an order directing all thermal power plants, including Jhajjar, that did not meet requirements to dispose of all fly ash up to 31 December 2017, to deposit damages based on the capacity of the plant. A stay on the enforcement of the order was passed by the Supreme Court. A joint committee set up by the NGT to determine the penalty mechanism for non-compliance in relation to the order submitted its report in December 2019. While Jhajjar successfully disposed of all the ash it had generated since commissioning to 31 July 2019, the implications of the report are currently being reviewed.

Environmental Regulatory Non-Compliances and Licence Limit Incidents

	2019	2018	2017	2016	2015
Environmental regulatory non-compliances resulting in fines or prosecutions	0	0	0	0	1
Environmental licence limit incidents and other non-compliances	10	2	13	2	13

Rising to the Challenge of New Regulations

CLP concluded discussions with the Hong Kong Government in 2019 over a new set of emissions caps for the power stations starting from 2024. Under the Technical

Memorandum, the allowances for air emissions of SO₂, NO_x, and respirable suspended particulates (RSP) in 2024 and beyond will be reduced by 90%, 66%, and 65% respectively compared with 2010 levels. Upgrades of all existing CCGT units by 2023 and the planned addition of two new CCGT units along with other improvements in generation efficiency will further reduce emissions.

The Council for Sustainable Development launched a public engagement exercise on a long-term decarbonisation strategy in 2019. CLP submitted a response and is committed to working with the Hong Kong Government and the community on decarbonisation once the policy direction is set. Meanwhile, the Government conducted a public consultation exercise during the year on plans to tighten Air

Quality Objectives. A revision of the objectives will potentially affect the air quality impact assessment of new projects.

In Australia, the Yallourn, Newport and Jeeralang plants are implementing measures to ensure compliance with new state environmental legislation in Victoria due to take effect from 1 July 2020. Detailed site investigations of per- and polyfluoroalkyl substances (PFAS) in soil and groundwater at Jeeralang and Newport are under way and will be completed in early 2020. The findings will help identify appropriate management action required under the new environmental legislation. EnergyAustralia is also monitoring the State Government's plans to bring in new legislation on greenhouse gas emissions reduction targets.



Q

With over 10,000 experts on flooding, coastal change, drought and managing the natural environment around the world, the Chartered Institution of Water and Environmental Management (CIWEM) plays a key role in water supply, sanitation and treatment, public health and environmental challenges. What are CLP's strategies to manage water resources in its operations in Asia Pacific, as water scarcity emerges as a growing challenge for water-intensive businesses in parts of the region?

Ir C.F. Leung

Chairman
Chartered Institution of Water and Environmental Management Hong Kong

A

CLP is committed to using water resources responsibly and sustainably in all our operations. We recognise that some of our plants are in water-stressed areas and we are actively seeking opportunities to enhance future water efficiency and resilience.

Three of our coal-fired power stations, Fangchenggang in Mainland China, Jhajjar in India and Mount Piper in Australia, operate on a zero-liquid discharge basis. The water is treated internally and reused for other parts of the power generation process from dust control to horticulture. To lower water usage, Jhajjar has installed drift eliminators in cooling towers to improve water efficiency, and is exploring the possibility of building an additional reservoir to improve its future water resilience. At Mount Piper, water had been sourced from the nearby Springvale Mine to augment cooling water supplies to the plant since commissioning. In 2019, we completed the construction of a new 14km water transfer pipeline and water facility. Consequently, operation of the station will no longer require water from local catchments for its cooling system and at the same time there will be no discharge from the mine into the local river systems.

Our solar farms require water, although in relatively small quantity, for cleaning purpose. We are currently exploring innovative technologies to reduce water consumption during dust removal on solar panels. In 2019, we completed a pilot project to use robotic cleaning on our solar panels in our Sihong and Veltoor solar farms in China and India, respectively. These projects not only achieve zero use of water for cleaning, but also potentially increase our electricity production efficiency.



Vanessa Forbes

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