

# Capitals

We have selected a number of critical resources and relationships – collectively known as Capitals – and explain how we manage them to contribute to the sustainability of our business







Connectivity

TECHNOLOGY



2016 was an extraordinary year in which a number of surprises in the political and financial arena caused serious upheavals in the debt, equity and foreign exchange markets. This was illustrated by “Brexit”, the result of the United States presidential election, the weakness of the Renminbi (RMB), spikes in RMB offshore interbank interest rates and the sharp rebound in the oil price after OPEC’s decision to cut production for the first time since 2008.

This uncertainty has translated into a number of exceptional events in the financial markets, including:

- the decline of the US 10-year treasury bond price by about 7% over two months;
- the nosedive of the British pound by 11% over five days in June; and
- the increase in the RMB offshore interbank overnight interest rate to over 60% on 12 January 2016 and 6 January 2017.

These were “black swan” events that have tested the robustness of CLP’s “prudent and diversified” financial strategy.

## Turning Strategy into Action in a Volatile Environment

Identifying potential financial market risks is only the first step of our financial strategy. Equally important is the swift and rigorous implementation of policies and procedures put in place to mitigate the potential risks to the business which could be exposed to a variety of external financial risks in areas such as funding, foreign currency, interest rates, credit rating and counterparty.

This year, strong operating performance of various business units and improved financial performance across the CLP Group further consolidated the Company’s financial strength. This was evidenced by the:

- reduction in net debt balance of HK\$4.7 billion;
- lower debt gearing ratio:  
net debt to total capital as at 31 December 2016: 29.5% versus 31 December 2015: 32.4%; and
- rise of debt serving capability:  
FFO (funds from operations) interest cover in 2016: 14 times versus 2015: 9 times.

CLP’s business and financial performance persuaded Standard & Poor’s (S&P) to revise the rating outlooks of CLP Holdings and CLP Power Hong Kong from stable to positive, and affirm their credit ratings at A- and A respectively in May 2016.

The further consolidation of CLP’s financial strength and flexibility has empowered the Group with additional firepower to capture investment opportunities consistent with our business strategy, when opportunities arise. As our investments are highly capital intensive and involve long payback periods, it is important to acquire sustainable, diversified, cost-effective and long-tenured funding on a timely basis to support business growth.

Among this year’s achievements were debt financing for the CCGT generation project at Black Point Power Station in Hong Kong, non-recourse project financing for the Vinh Tan III coal-fired project in Vietnam, and funding for the acquisition of a 17% equity stake in the Yangjiang nuclear project in Mainland China.



Further details of two major financing activities are as follows:

- CCGT project at Black Point Power Station

On 13 December 2016, the Hong Kong Government approved CLP Power Hong Kong's proposed investment in the 550MW CCGT generation unit at the Black Point Power Station, which is important for meeting the city's 2020 fuel mix target. Total investment is about HK\$5.5 billion. Ahead of the Government's final approval, CLP had already lined up a number of relationship banks and engaged Euler Hermes, a German export credit agency, to provide support for the project, ensuring that there would be no delay to the start of construction and that funding could be arranged at attractive terms.

- Vinh Tan III coal-fired project

At the Great Hall of the People in Beijing in September 2016 and under the witness of the Premier of the People's

Republic of China, Mr Li Keqiang, and the Prime Minister of Vietnam, Mr Nguyễn Xuân Phúc, the Vinh Tan 3 Energy Joint Stock Company (VTEC) (24.5% owned by CLP) and the China Development Bank Corporation (CDB) executed a non-recourse project financing term sheet. In parallel, VTEC appointed CDB as the underwriter, the Sinosure coordinating bank and a lead arranger for the Vinh Tan III project financing. A potential syndicate of banks including Chinese, regional and international banks have since been reviewing the project with keen interest to lend to Vinh Tan III. The success of this CLP-led fund-raising signified a vote of confidence to the Vinh Tan III project. With CLP as a co-developer and main sponsor, the project is a major Belt and Road initiative developed in partnership with Vietnam Electricity Group (EVN) and has the potential to deliver reliable and cost-effective energy to EVN's customers.



Executive Director & CFO Geert Peeters (front right) signs the Mandate Letter with Xie Zhijun, General Manager of China Development Bank Guangxi Branch, for Vinh Tan III in Vietnam

## Financial Capital

- Other financing arrangements

During 2016, CLP Power Hong Kong arranged HK\$6.1 billion three and five-year bank facilities and issued a HK\$500 million 15-year private placement bond all at very competitive rates. In India, Jhajar issued Rs.2.2 billion (HK\$251 million) standalone seven and eight-year bonds which carry credit rating of A+ and are listed on the Bombay Stock Exchange. It has materialised in significant savings to the cost of the historic financing in place.


## Diligent and Disciplined Risk Management

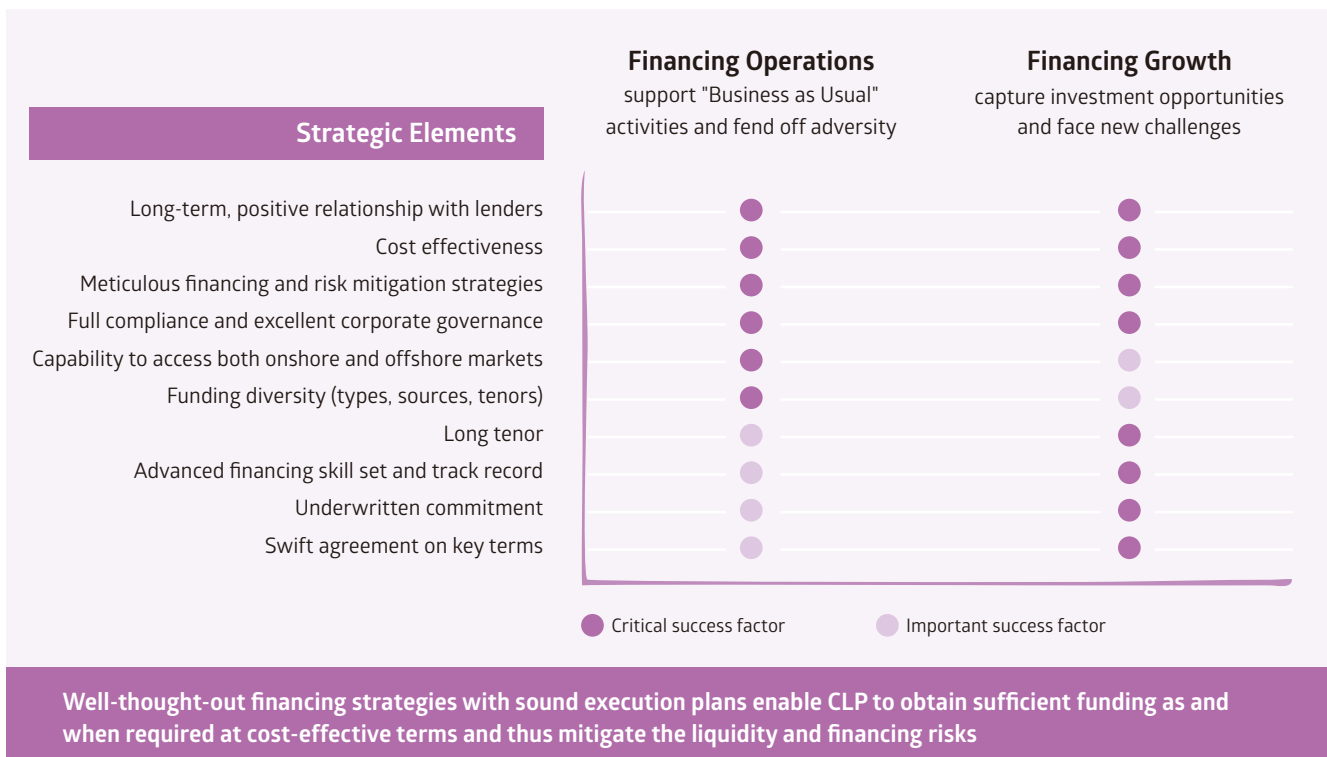
The power industry is well-known for its high investment costs, capital intensity and long payback periods with compounding risk factors. The ability to arrange timely, cost-effective, diversified, multiple-tenured and sustainable funding is critical in managing and growing our business. Our shareholders and business partners place high value on our consistent commitment to prudent and vigilant financial management. We are highly committed to preserving our robust capital structure, maintaining strong investment grade credit ratings, keeping and cultivating good, long-term business relationships with lenders and investors, and reserving financial strength and flexibility to meet business objectives and contingencies.

With our growing, cross-border businesses portfolio, we are exposed to multiple risks of liquidity, financing and refinancing, foreign exchange, interest rates, counterparties and compliance. CLP Group requires all business units to clearly identify, earnestly monitor and effectively manage their financial-related exposure, both in policy formulation and implementation.

Our financing strategies, success factors, and risk mitigation approaches as well as funding sources and usages are highlighted in the diagrams below and on the next page. They show:

- how our financing goals are achieved through the implementation of our strategic objectives;
- how we mitigate our liquidity and financing risks, and manage the financial market volatility risk as well as the credit and operational risks; and
- how effective management of these risks contribute to maintaining a healthy capital structure for our Company and enhance our shareholder value.

CLP's financial framework, major financing activities in 2016, and other related information are available in the [online supplementary information](#). 



<b>Financial Market Volatility Risk</b> Effectively mitigate undue adverse impact on profit or loss, cash flow or balance sheet	<b>Liquidity and Financing Risks</b> Effectively reduce risk of inadequate funding to support operations, fend off adversity and capture investment opportunities	<b>Credit and Operational Risks</b> Effectively curtail risk of adverse impact due to default by business parties, execution, or failure to meet regulatory requirements
<b>Our Measures and Performances</b>		
<b>Foreign Exchange</b> <ul style="list-style-type: none"> <li>Transactional Risk – CLP hedges a high portion of committed and highly probable exposure. Residual risk is low and within tolerable level</li> <li>Translational Risk – This risk carries no profit or loss nor cash flow effect. CLP does not hedge for regional equity investment but match funding with local currency debt</li> </ul> <b>Interest Rate</b> As at the end of 2016, the Group's fixed rate debt as proportion of total debt was approximately 57% (excluding perpetual capital securities) and 61% (if including)	<b>Strong Financial Flexibility</b> <ul style="list-style-type: none"> <li>Having HK\$28.7 billion of undrawn bank facilities and internal resources</li> <li>Maintaining long-term business relationships with 71 financial institutions (2015: 74)</li> <li>Distributing loan maturities evenly (beyond 5 years 40%, 2-5 years 30%, 1-2 years 9%, within 1 year 21%)</li> <li>Spreading out debt types (bonds 52%, term loans 40%, money market lines 8%) and sources</li> <li>Diversifying bond denomination currencies (USD 50%, HKD 33%, JPY 9%, INR 5%, AUD 3%)</li> </ul> <i>(All figures are as at end of 2016)</i>	<b>Credit Risk</b> We only conduct transactions with trustworthy and capable parties
		<b>Compliance and Governance</b> <ul style="list-style-type: none"> <li>Professional integrity and commitment</li> <li>Full compliance</li> </ul> <b>Advanced Technological Support</b> <ul style="list-style-type: none"> <li>Launched a new Group Treasury Management System which is a scalable, integrated and cloud-based platform</li> <li>Won the CFO Innovation Award 2016 for Excellence in Treasury Management Transformation</li> </ul>

**Holistic risk management framework with effective implementation can help CLP protect profit, improve reliability of cash flows and thus contribute to the financial strength of CLP and value creation to its shareholders**

### Funding Sources

#### Operational Performance

Quality operations deliver revenues to pay for expenditures, debt services and dividends

- Free cash flow: HK\$22,485 million

#### Capital Recycling to Realise Economic Benefit and Support Future Growth

Divestment of non-core, limited growth assets will generate profit and cash flows for new investments

#### Debt and Equity

Provide new funding for natural growth, merger and acquisitions

#### Healthy Capital Structure

Strong operational performance will generate strong cash flows, dependable dividends and retained earnings ensuring a sustainable capital structure. In 2016 we:

- Reduced net debt balance by HK\$4,705 million
- Decreased net debt to total capital ratio by 2.9%
- Increased Shareholders' Funds (including retained earnings) by HK\$4,892 million

### Funding Usages

#### Shareholder Value Creation

On-going capital investments will lead to higher earnings in subsequent years. These investments include:

- Scheme of Control: HK\$7,123 million
- Growth: HK\$635 million
- Maintenance: HK\$723 million
- Investment properties, joint ventures, associates and others: HK\$2,385 million

#### Dividends

We have delivered dependable growth in dividends

- 2016: HK\$7,074 million
- 2015: HK\$6,822 million

## Credit Rating

CLP always strives to maintain strong investment grade credit ratings. In 2016, our commitment and initiatives to support a strong financial position were recognised by positive rating actions from S&P for both CLP Holdings and CLP Power Hong Kong (rating outlooks revised to positive from stable) as well as to EnergyAustralia (credit rating to BBB from BBB- and outlook to positive).

	S&P	Moody's
	CLP Holdings (A- / Positive) CLP Power Hong Kong (A / Positive) EnergyAustralia (BBB / Positive)	CLP Holdings (A2 / Stable) CLP Power Hong Kong (A1 / Stable)
<b>Positives</b>	<ul style="list-style-type: none"> <li>• Sound and stable regulated business in Hong Kong</li> <li>• Higher earnings from overseas businesses</li> <li>• Ample liquidity, enhanced operational stability and working capital management in EnergyAustralia</li> </ul>	<ul style="list-style-type: none"> <li>• Predictable cash flow contributions from Hong Kong business</li> <li>• Sound liquidity profile of CLP Holdings</li> <li>• Good access to banks and capital markets, and the availability of sizeable committed bank facilities</li> </ul>
<b>Negatives</b>	<ul style="list-style-type: none"> <li>• Limited visibility on the regulatory framework in Hong Kong after 2018</li> <li>• EnergyAustralia operates in a highly competitive energy market that is facing some structural changes</li> </ul>	<ul style="list-style-type: none"> <li>• Overseas and non-regulatory business investments increase risk profile</li> <li>• CLP Holdings' credit rating is constrained by improving but modest performance of its Australian operations</li> </ul>



### Does CLP plan to explore new investment opportunities in countries along the Belt and Road Initiative as Chinese enterprises and financial institutions capitalise on the policy momentum and expand in these markets?

CLP's target investment regions include Mainland China, Southeast Asia and India, which are under the Belt and Road Initiative. In the past decades, we have made a number of investments in the region, including the Fangchenggang power plant in Guangxi, the Jhajjar project in India and a 20 km undersea section of the West-East Gas Pipeline connecting Central Asia with Hong Kong. CLP has detailed knowledge of the "Asian part" of Belt and Road countries and strong credentials in business development, financing, engineering, and fuel procurement and operation management. In particular, we have established long-term relationships with business partners, financial institutions and equipment suppliers in Mainland China. They are keen to join hands with us to do business in Belt and Road countries. Vinh Tan III, a 3 x 660MW coal-fired project with emission reduction facilities in Vietnam, is the latest demonstration of how CLP can forge successful partnerships with key stakeholders and introduce Chinese financing and equipment to help power the economic development in Vietnam.



**Dr Xie Zhijun**  
General Manager  
China Development Bank Corporation Guangxi Branch



**Geert Peeters**  
Executive Director &  
Chief Financial Officer





Manufactured capital is the man-made physical objects used in the production of utilities like electricity or the provision of services. Distinct from natural resources, they include equipment, infrastructure and buildings.

CLP excels in the fields of power generation, transmission and distribution technology, project management and operations. We have the technical know-how to construct and manage generation, transmission and distribution projects. We monitor and deploy the latest technology which has a proven track record in the power industry in our operations.

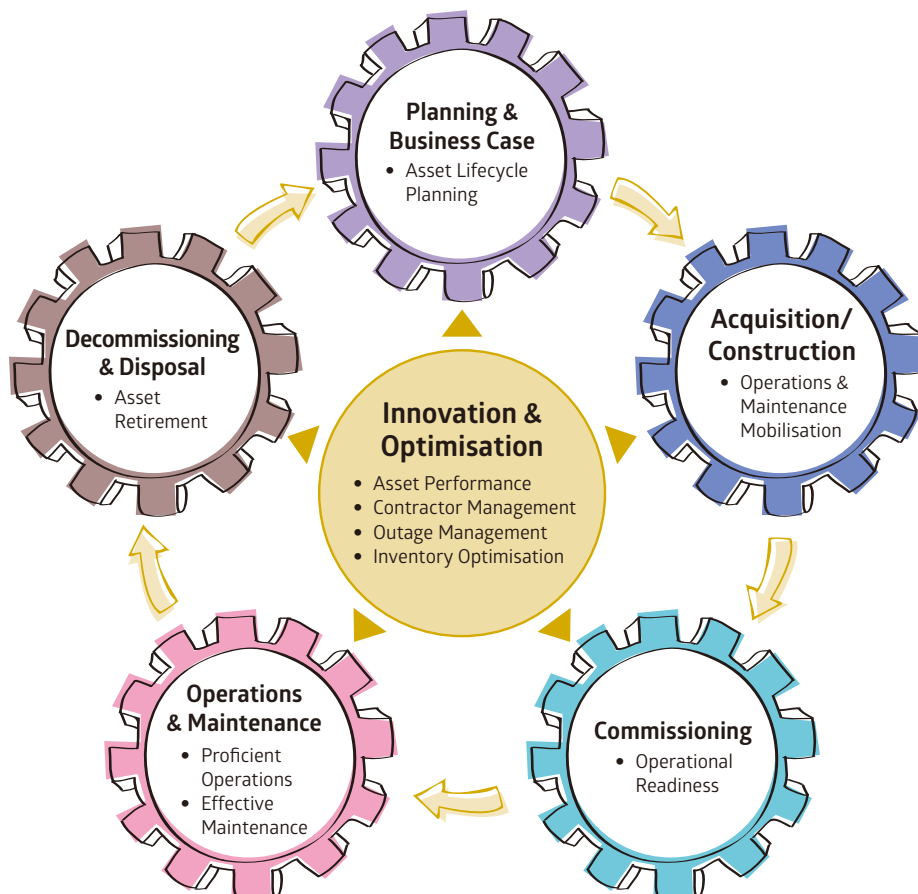
In 2016, the Group's total electricity sent out, which is based on 100% of sent out from the plants where CLP has investment and includes our capacity purchase, was 133,275GWh. On CLP's equity basis, our electricity sent out was approximately 79,600GWh with capacity purchase included. They remained at similar levels to 2015.

## Strengthening Asset Management

Assets are critical to the success of business operations. At CLP, a key initiative in 2016 was the development of a Group-wide Asset Management System (AMS) Standard that aims at standardising key practices in asset management across different markets. The AMS Standard, which is illustrated below, sets out a framework to ensure that we follow the industry's best practices based on the ISO 55000 series of standards for asset management as well as the ISO 31000 standards for risk management.

The AMS Standard is integrated with CLP's Health, Safety, Security and Environment (HSSE) Management System and the new Project Management Governance System (PMGS) Standards to manage the complete lifecycle of an asset from the planning stage to decommissioning.

## Overview of CLP's Asset Management System





## Maintaining Asset Quality

Although we have a diverse range of generation assets using different fuel sources, we endeavour to identify opportunities wherever possible for improving their operational efficiency at various stages of the asset lifecycle. For projects that involve a major overhaul of the assets, stringent technical and financial scrutiny is conducted before implementation. Our ultimate goal is to operate all of our plants efficiently with minimal environmental impact.

Some of the operational efficiency improvement initiatives conducted on our plants in 2016 are as follows:

- At Hong Kong's Black Point Power Station, one of the eight gas turbine systems was successfully upgraded, increasing its capacity by 25MW, or 8%, enhancing its nitrogen oxides emissions performance and making a minor improvement in efficiency and fuel cost. The success of this trial paves the way for additional units to progressively be upgraded in coming years to realise the full potential for environmental performance improvement and capacity increase.
- In our Fangchenggang power station in Mainland China, we completed Phase II extension of two ultra-supercritical units with higher efficiency, increasing the project's capacity from 1,260MW to 2,580MW. We also modified the existing supercritical units of Phase I, saving around 26,000 tonnes of standard coal per year. In addition, we optimised coal yard management by maintaining a reasonable coal stock level and reduced the cost of coal inventory by RMB5 million in 2016. Further improvements are planned in 2017. We have begun tendering for a retrofitting project for Phase I to ensure compliance with Mainland China's emissions requirements by the end of this decade.
- In Mainland China, we completed refurbishments of three hydro stations at our Huaiji asset, increasing the overall Huaiji generating capacity by around 3%.
- At our Mount Piper Power Station in Australia, performance has deteriorated over a number of years due to deposition on the steam turbine blades. In 2016 we successfully removed the deposition at one unit and recovered approximately 8% in capacity and 2% in efficiency. The second unit will be similarly treated in 2017 to improve output and efficiency.

The energy intensity of our power plants that use fossil fuel, are under CLP's operational control (defined as full authority to implement CLP's operating policies) and have

been operating for a full calendar year is listed below. Energy intensity is not calculated for renewable energy.

Region	Facility	Energy Intensity kJ/kWh
Hong Kong	Black Point	7,982
	Castle Peak	10,893
	Penny's Bay	17,062
Mainland China	Fangchenggang	10,093
India	Jhajjar	10,390
	Paguthan	9,036
Australia	Hallett	20,339
	Mount Piper	10,169
	Tallawarra	7,648
	Yallourn	13,926

## Enhancing Group Procurement Practices

To provide high-quality and cost-effective services to our customers in a responsible manner, we continue to enhance our procurement and supply chain management.

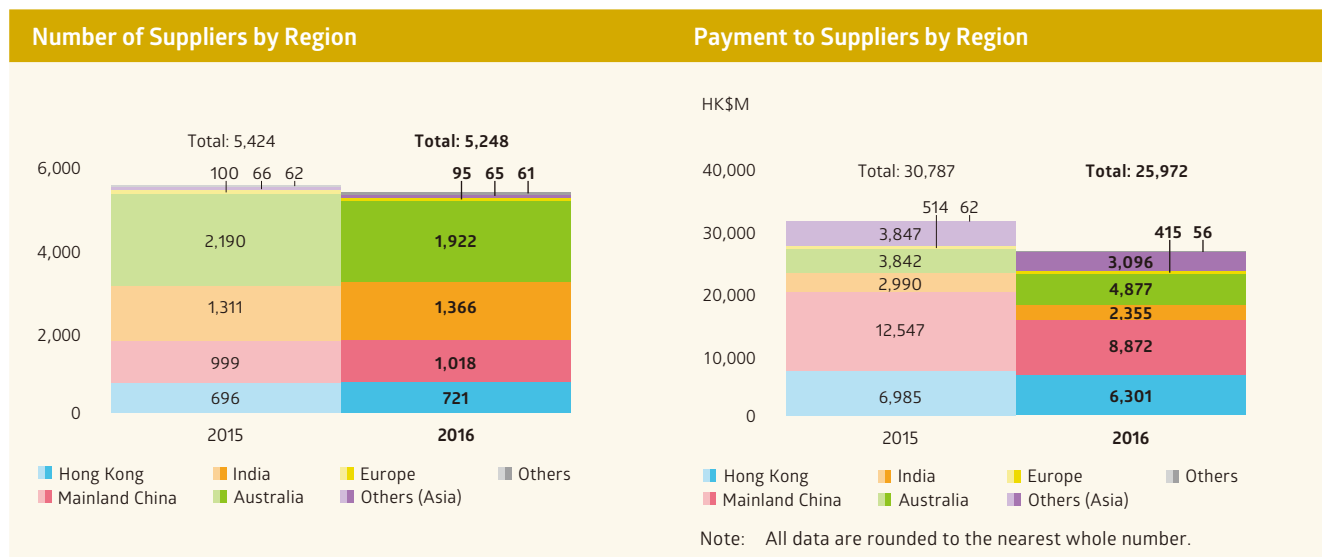
In December 2016, we launched the CLP Group Procurement Standard (GPS) to set the key principles for general and fuel procurement for all regions across the Group. The key objectives of the GPS are to help us acquire the most suitable products and services at the best price while maintaining integrity and ethical standards.

Our preferred suppliers are those who are ethical and committed to sustainable development, and have a track record on HSSE competence. Their products and services should be of high quality and they should be capable of meeting the expectations of our Responsible Procurement Policy Statement (RePPS). They should be compliant with legal and business performance requirements and maintain internationally competitive pricing. All purchases performed should be in line with CLP's Code of Conduct as well as Procurement Values and Principles.

Furthermore, we collaborate with suppliers in managing environmental impact during operations because of the nature of our business. Suppliers for critical projects are assessed on their relevant sustainability status and practices through self-declaration, tender evaluation, site visits or checks, or two-way performance review as appropriate. Our supplier assessment and monitoring mechanism confirmed there was no significant RePPS risk in 2016. No supplier relationship was terminated due to the assessment and monitoring results.

Across all major assets in Hong Kong, Mainland China, Australia and India, we procured from 5,248 suppliers for a total of HK\$26 billion in 2016. Some 86% of this amount was

from local suppliers in these four regions, supporting the local communities while meeting CLP's business needs. Details of the number of suppliers and payment to them are included in the charts below.



In addition, we are committed to protecting the company's intellectual property rights, as well as complying with all applicable laws and regulations, including observing the intellectual property rights of our suppliers and vendors.

## Focusing on Customer Needs

As an operator of retail energy businesses in Hong Kong and Australia, we strive to improve our customer-related infrastructure. For instance, in 2016 EnergyAustralia opened a new contact centre in the Philippines while our Hong Kong branch continued to enhance its digital retail platforms.

Furthermore, we are committed to complying with all applicable laws and regulations in relation to health and safety, marketing, labelling and privacy matters. There was no reported incidence of non-compliance with regulations or voluntary codes with regard to health and safety impacts of our products and services in 2016.

We also monitor and annually document any complaints related to breaches of customer privacy and loss of customer data. In our Hong Kong retail business, no customer privacy or data loss cases were reported. A small number of queries were received from the Australian Privacy Commissioner regarding potential breaches of customer privacy in EnergyAustralia's business; however following investigation, the Commissioner closed all files on the basis that EnergyAustralia had not interfered with the customer's privacy. [CLP Privacy Principles](#) are available on our Group website.

On product and service information and labelling, there was no breach of regulatory obligations and no fine for non-compliance relating to the provision and use of electricity in our Hong Kong business. EnergyAustralia reported some instances of non-compliance with information, contractual and billing requirements under the National Energy Retail Rules and the Victorian Energy Retail Code. These were reported as required under the self-reporting regime that operates in Australia. We are taking action to prevent these breaches reoccurring and to ensure customer satisfaction. Since 1 January 2016, the payment that energy retailers operating in Victoria must make to wrongfully disconnected customers has been doubled to A\$500 a day for each day that customers' supply is cut off. EnergyAustralia paid compensation of approximately A\$110,000 for wrongful disconnections.

In wholesale markets EnergyAustralia received two infringement notices of A\$20,000 under the National Electricity Rules in relation to failure to follow dispatch instructions on 13 January 2016. The regulator noted that EnergyAustralia cooperated fully with the investigation and that no further action will be taken.

Other than the instances reported above, there was no breach of laws and regulations concerning advertising of our products and services in Hong Kong and Australia.



The electricity industry is confronted with major changes that are reshaping the traditional utility model. Climate change, as one, has prompted the decarbonisation of generation facilities around the world. Technological advancements are driving down the costs of wind turbines, solar panels, energy storage devices and distributed energy, making renewables increasingly a part of people's daily life. Meanwhile, the ubiquitous communication networks coupled with the Internet-of-Things (IoT) are bringing about a digital revolution that means many everyday devices are becoming more intelligent and automated.

To thrive amid these challenges and maintain our leadership role, CLP needs to continuously innovate and adapt to the changing environment. Fresh ideas are developed; new experiences are sought; and technological expertise is constantly refined to meet the evolving needs of our customers.

Our customers today are empowered by the abundant information available to them on almost any topic in any geographic location at no cost. Increasingly they are demanding more individualised solutions and more choice. The focus of business has turned from a one-way promotion of products and services to putting customers at the heart of our transition and satisfying their needs before they even realise them. Our role as a utility is to leverage technology and innovation to do just that for our customers.

## Big Data

The digitisation phenomenon across many facets of our day-to-day activities, from banking to shopping, is transforming the way societies and individuals behave. The development of many smart systems and devices has resulted in the generation of data from a variety of sources in huge quantities and at high speed. Big data has become a new source of value creation and addition in almost all industries. Consequently, big data management is becoming an essential part of business and the following examples illustrate how CLP leverages big data to create new value for customers.

## Eco Power 360

We have introduced the online home energy assessment platform Eco Power 360 in Hong Kong to assist our residential customers in managing their energy usage more efficiently. It makes use of our extensive consumer usage records to help customers understand how much power they are using for different appliances and how their consumption patterns compare to historical data and their peer households.

## Meter Online

Since 2015, an advanced feature of the Meter Online service has combined data from the Hong Kong Observatory's weather projection, smart meter data from CLP's customer consumption archives, and our data analytic models to produce a nine-day consumption forecast for our customers. By enabling them to manage their energy consumption and demand for days ahead, better energy efficiency and money saving can be achieved. In 2016, over 2,100 CLP commercial and industrial customers subscribed to Meter Online, with more than 40% having access to the advanced nine-day consumption forecasting model. While continuing our efforts to promote the service to customers, we shared our experience with overseas power companies in various conferences.

## Integrating Renewables

CLP continues to support the community in developing renewable projects where practicable, especially in schools, on rooftops and at local community facilities. In Hong Kong, we provide expertise to help our customers understand and resolve technical issues so that they can connect their renewable energy systems, normally less than 200kW per site, to the electricity grid. By the end of 2016, over 250 renewable projects totalling more than 38MW have been connected to our grid.

We have also participated in building Hong Kong's largest solar facility (1.1MW) at a government sewage treatment plant on Lantau Island. The experience we gained in developing and operating renewable facilities in Hong Kong, along with our solar power and wind generation projects in Mainland China, India and Australia, has made us a reliable and innovative developer of renewables in Asia.



## Distributed Energy Resources

In the past, distributed generation has been limited by the lack of affordable local resources (e.g. natural gas or waste heat) and special conditions (e.g. backup generators). However, distributed renewables such as rooftop solar panels and small wind turbines have now become more accessible and affordable. In addition, the arrival of different energy storage means, including chemical batteries, flywheels, thermal storage systems and even electric vehicles, now enables both customers and utilities to store limited electricity easily.

It is important for utilities to understand these developments and their impact on the grid. In 2012, CLP commissioned Hong Kong's first self-contained microgrid on Town Island. Powered entirely by solar, wind and battery storage, it is completely isolated from the main grid. This exercise has enabled us to develop our knowledge and experience in developing microgrids, especially with renewables and storage devices. In recent years, we have continued the exploration through projects like a new partnership on a smart hybrid solar inverter system in Australia.

In 2016, EnergyAustralia teamed up with Redback Technologies to promote a smart hybrid solar inverter system to its customers. The system combines a smart solar inverter, battery enclosure and "intelligent" energy management software in a complete package which allows customers to

choose how they use, save and even sell energy captured from their rooftop solar panels. The aim of the partnership is to invest in the development of reliable, affordable and cleaner technology which puts the customer more in control of their energy consumption.

## Electric Vehicles

Globally, electric vehicles have gained significant traction and investment in recent years. While manufacturers from Japan, the US and Mainland China are delivering new models, governments are also providing incentives for consumers to buy these vehicles. Although most electric vehicles do have some limitations on their range and charging time, utilisation and adoption in urbanised areas is increasing. What has become critical in determining the rate of electric car adoption in a city is the planning and deployment of charging stations, especially their locations, accessibility and availability.

## Smart Charge

CLP and HKT formed Smart Charge in 2016 to offer electric vehicle charging solutions in Hong Kong. Smart Charge aims to develop a comprehensive EV charging network that provides safe, reliable and convenient EV charging services in residential and public areas. The joint venture shows that we can provide not just electricity but also adjacent energy services – a one-stop service to electric vehicle users.



The Eco Power 360 home energy assessment platform allows residential customers to manage energy use at their fingertips

## Towards a Customer-Centric Utility of the Future

The electricity industry is undergoing a period of transition. Enabled by technologies, regulatory advancement and customer empowerment, the new interaction between utilities and customers, and among customers themselves, will have to be developed and integrated as we evolve to become a utility of the future. In this new era, utilities can no longer succeed by simply fulfilling their traditional roles in

managing the power system in a safe, economic and reliable manner. Increasingly, power companies such as ours must learn to put innovation and technology to work in order to meet the evolving demands of customers. CLP will continue to pursue ventures that turn new ideas into reality and rely on that knowledge and experience to achieve a sustainable future for the communities in which we operate. We also have an important role to play in helping governments and the general public adopt technological advancements in a way that balances regulation, economics, environment and social concerns.

## New Horizons – A Platform to Share Our Intellectual Capital

One way to understand and keep track of the emerging issues affecting the industry is to encourage new ideas and experience sharing. Launched in 2015, [CLP's New Horizons website](#) provides a platform for industry experts to share their latest insights into market trends and innovations in the energy sector; and discuss how we can work together to achieve a more sustainable energy future. [🔗](#)



CLP's New Horizons website



We operate in a complex and rapidly changing business environment. To build and maintain a sustainable and innovative workforce, we pay special attention to issues such as safety, diversity and equality, competitive benefits, building new capabilities, and respect for human rights.

As at 31 December 2016, the Group employed 7,428 staff (2015: 7,360), of whom 4,233 were employed in the Hong Kong electricity and related business, 2,925 by our businesses in Mainland China, India, Southeast Asia and Taiwan, and Australia, as well as 270 by CLP Holdings. Total remuneration for the year ended 31 December 2016 was HK\$5,151 million (2015: HK\$4,855 million), including retirement benefits costs of HK\$440 million (2015: HK\$384 million).

## Care for Safety

Safety is always our number one priority. Each year, we assess the safety levels of our assets to help improve our safety performance and strive towards our goal of zero injuries.

Our Health, Safety, Security and Environment (HSSE) standards apply to assets where we have operational control. The CLP HSSE Management System Standard and Critical Risk Standards apply to everyone who works with us and allow us to apply HSSE considerations across our operations in a structured way. Our Crisis Management Plan helps us respond to emergency situations promptly and with due care.

Sadly three people lost their lives while working at sites under our operational control, namely Sihong Solar in Mainland China, and Jhajjar and Tejuva Wind in India in 2016. All involved contractors with two of the incidents relating to falls from height and the other an assault on a security guard at a remote location. We have the deepest sympathies for the families of the deceased and have thoroughly investigated these incidents to avoid similar events in the future.

Following the incidents, we reminded all employees and contractors to pay special attention to safety precautions. We also reviewed the safety conditions of similar facilities to ensure that they are up to our required safety standards. In 2016, we did not register any breach of laws or regulations regarding the provision of a safe working environment and the protection of employees from occupational hazards.

The approach we have adopted to reduce the exposure to serious injuries and fatalities is to identify the high-risk situations in which management controls are either absent, ineffective, or not complied with and to address the risks by bringing in corresponding protection. We also established a set of life saving rules to avoid exposure to serious injuries and fatalities. These rules will be implemented across assets under CLP's operational control in the first quarter of 2017. We hope that our existing and new measures will help reduce exposure to serious injuries and fatalities for employees and contractors.

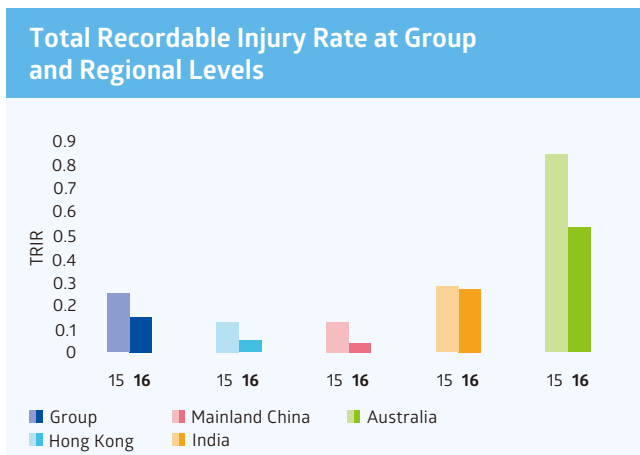
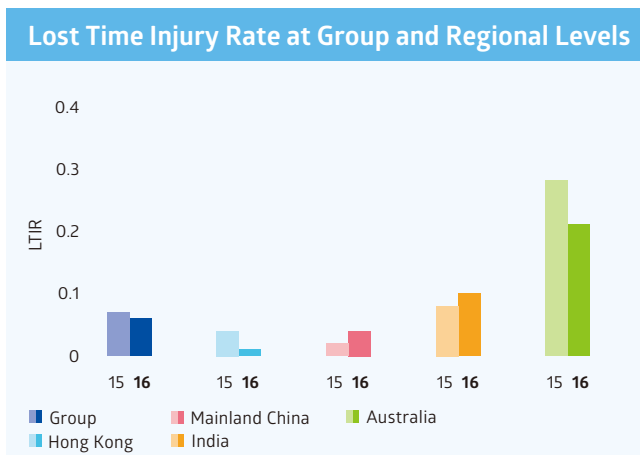
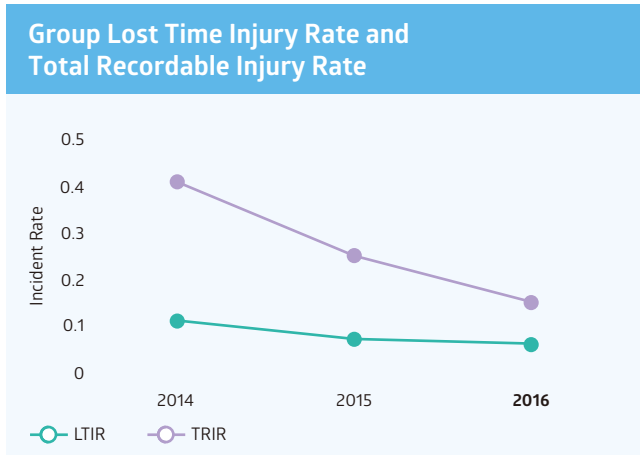


We provide extensive training for our employees to ensure a safe working environment and a high standard of service



## Human Capital

The following charts show the safety performance of all CLP employees and contractors in the Group and individual regions in terms of Lost Time Injury Rate (LTIR) and Total Recordable Injury Rate (TRIR) in 2016. Notwithstanding the fatal incidents, our overall safety performance showed an improvement.



Note: The Lost Time Injury Rate (LTIR) and the Total Recordable Injury Rate (TRIR) are the number of lost time injuries or recordable injuries measured over 200,000 working hours of exposure, which is equivalent to around 100 persons working for one year.

## Increasing Diversity

The energy sector is facing revolutionary changes. In this complex environment, it is essential for our leadership team to have diverse thinking and background in order to strengthen the decision making capability, agility and resilience of our organisation. This diversity can be seen in the tables below.

Percentage of Group Executive Committee (GEC) members by Gender	
Male	69%
Female	31%

Percentage of Group Executive Committee (GEC) members by Nationality	
Chinese	23%
European	23%
American / Canadian	15%
Australian / New Zealander	31%
Indian	8%

Note: The statistics are based on GEC members' passport nationality, which does not necessarily reflect their ethnic origin.

The diversity of our broader workforce is also important, both as a reflection of the different communities in which we operate, and because a sustainable workforce requires a broad base of recruitment. Workforce diversity, particularly of tenure, can also support innovation capability.

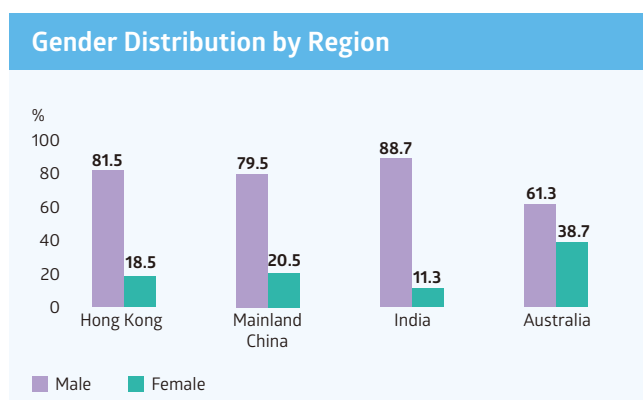
## Diversity and Gender Equality

How we approach diversity takes into account differences in culture, values, traditions and religions. Consequently, we give flexibility to each subsidiary to develop locally specific approaches to diversity. For example, EnergyAustralia's diversity and inclusion programme in 2016 covered improved arrangements for employees returning from parental leave, improved workplace inclusion for the LGBTI community, establishment of a reconciliation action plan aimed at increasing our engagement with indigenous people, and support to address issues of domestic violence.

The most significant and common issue we face as the CLP Group is gender diversity. Demographic trends confirm the business case for this; and as gender equality is embedded in the United Nations Guiding Principles on Business & Human Rights and in the United Nations Sustainable Development Goals (SDGs), the social and economic case for making it a priority is equally strong.

However, we face some challenges in increasing the proportion of female employees from the current figure of 23.6%. The nature of our business requires a high percentage of the workforce to have technical and engineering skills. However, there are supply constraints due to the global shortage of females studying science, technology, engineering and mathematics (STEM) subjects at school and university.

We also face cultural constraints in places like India, which has a relatively low female workforce participation rate. The gender distribution of our employees by region is shown in the chart below.



Given this context, we have identified three priorities that reflect our business needs, align with the UN SDGs, and support the social and economic empowerment of women:

- Women in Leadership
- Women in Engineering
- Gender Pay Equity

For further details on these priorities and initiatives taken in 2016, please see our [Sustainability Report](#).

## Competitive Benefits

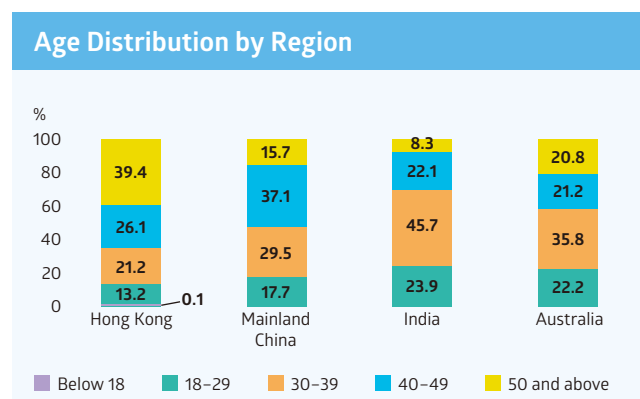
In 2016 a number of initiatives were taken to enhance the sustainability of our benefit schemes for attracting and retaining employees.

### Enhancing Pension Fund Sustainability

Globally there is increasing concern over the adequacy and sustainability of pension schemes because of low investment yields and increasing life expectancy.

In 2016 we reviewed the sustainability of our Hong Kong defined contribution scheme and increased the existing matching contribution scale to further support the shared responsibility of individuals and the Company for making adequate retirement savings.

The age distribution of our workforce is shown below.



## Implementing Family Friendly Policies

We increased our paid maternity leave in Hong Kong from 10 to 14 weeks and paid paternity leave from five to 10 days. While this places us clearly among the market leaders in Hong Kong, we will continue to monitor international trends and best practices.

In Australia, the Keeping you Connected initiative keeps EnergyAustralia's employees on maternity leave connected to the company while on leave, and working parents connected to their families. The company also supports primary carers with 14-week parental leave and encourages return-to-work parents to work 75% of their agreed hours but receive full remuneration for the first four weeks.

## Enhancing Employee Well-being

Medical benefits are not only important for attracting and retaining our staff, but also help maintain a healthy and productive workforce.

Medical cost inflation poses a threat to the sustainability of medical benefits schemes. In Hong Kong, the associated premiums are rising rapidly. Enhancing employee well-being is an important measure to help improve the health status of the workforce, manage the cost of medical claims, and reduce the impact of sickness absence on productivity.

Subject to respect for individuals' confidentiality, we work with health professionals to use aggregate employee health data to identify common health issues affecting our workforce so that fact-based prevention measures can be identified.

We recognise that employee well-being extends beyond physical health to mental health. Our Group Executive Committee was given a briefing by a leading psychiatrist on the impact of mental health issues on the workforce, and we have established a mechanism for addressing any mental health issues in a professional and sensitive manner.

## Human Capital

EnergyAustralia has focused on improved management of “return to work” for long-term absentees and increased mental health support. These efforts have seen an improvement in absence from work statistics in our contact centres and a reduction of workers compensation claims.

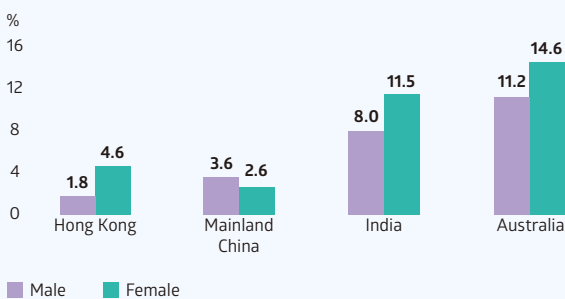
Our ability to retain staff is reflected in voluntary turnover rates lower than local market averages. Below are our voluntary staff turnover rates according to age, region and gender.

## Leveraging Our Core Competencies

We maintain our core competencies through the planned intake of trainees and continuous investment in training and development. In 2016, we recruited 57 apprentices, technicians and graduate engineers in Hong Kong. More than a fifth of them are females. In Mainland China, two of our five graduate engineers under training are women. Further details on employee training are shown below.

### Voluntary Turnover Rate

#### By Region and Gender

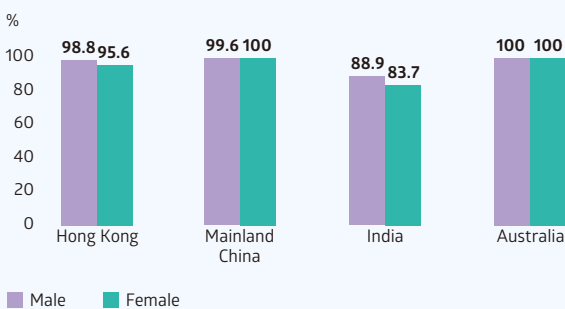


#### By Region and Age Group (%)

	Below				50 and above
	18	18-29	30-39	40-49	
Hong Kong	–	5.4	4.0	1.6	1.5
Mainland China	–	12.0	1.9	1.4	1.2
India	–	10.5	9.9	3.4	6.5
Australia	–	18.3	13.1	10.9	7.1

### Employee Training

#### % of Employees Trained by Region and Gender



#### Average Hours per Employee

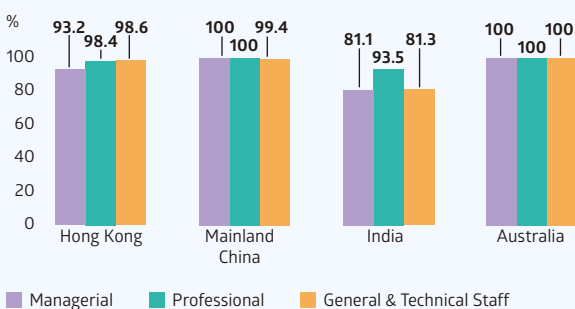
##### By Gender

Male	55.9
Female	27.7

##### By Professional Category

Managerial	29.4
Professional	44.5
General & Technical Staff	55.1

#### % of Employees Trained by Region and Professional Category



##### By Region

Hong Kong	62.9
Mainland China	70.9
India	39.6
Australia	14.3



The effective international deployment of our core engineering capabilities is a critical success factor, both to leverage our core competencies across the Group and to provide staff with career development opportunities. A pool of project engineers in Hong Kong were identified as mobile resources to support projects and provide technical services to assets across the region.

## Fostering an Innovative Culture

We also build new capabilities in order to stay aligned with changes in our business environment. Given the challenges presented by the digitalisation of the energy industry, a Senior Director of Innovation was recruited in 2016 and an Innovation Team was formed with senior staff seconded from various parts of the business. These colleagues have been assigned to lead specific priority innovation projects, following which they will return to their business units in order to ensure cross-fertilisation of innovation skills into the broader organisation. For example, four colleagues were seconded to our Smart Charge venture, co-established with HKT.

## Embracing New Technologies

Our capabilities are extended and broadened by leveraging external strategic partnerships. An example of this is our relationship with École Polytechnique Fédérale de Lausanne (EPFL) which provided us with access to:

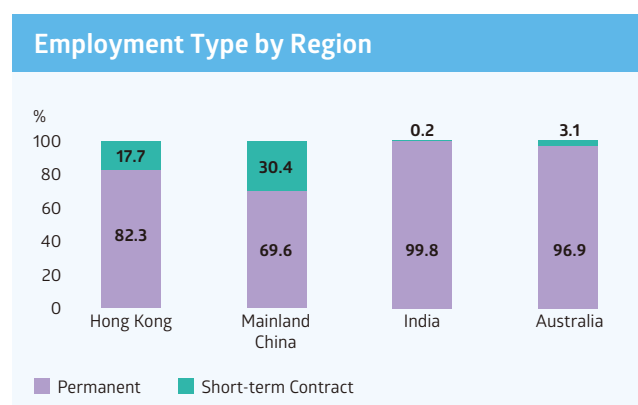
- An executive education programme for 23 employees on the impact of new technologies on the energy sector;
- Internships for two MSc students from EPFL to work on complex technical challenges as part of their MSc studies;
- Technology-related briefings on topics such as smart grids and solar energy to senior management and the non-executive directors; and
- Technology transfer agreements to support our internal innovation capability.

## Short-term Employment and Use of Contractors

A sustainable workforce includes not only our permanent staff, but also short-term contract staff, temporary staff, and labour supplied by external contractors.

While short-term employment contracts are sometimes necessary to meet temporary resourcing needs, the repeated renewal of such contracts is not an acceptable resourcing strategy. We have taken steps to limit the use of short-term employment contracts to a maximum of four years, following which continued employment must be on permanent terms.

Strengthening our understanding and reporting of our use of contractor labour is a priority given the associated risks. In 2016, we initiated a human rights due diligence exercise focused on contractor labour, and reviewed the safety practices and culture of our external contractors. Our workforce by employment type (excluding labour supplied by contractors) is illustrated below.



## Respect for Human Rights

Our human resources policies and procedures are intended to ensure that we comply with local laws and regulations relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare in the markets where we operate.

Given the technical complexities and ambiguities of some laws and regulations, the risk of unintended breaches cannot be prevented entirely. We take immediate action to investigate and address any suspected breaches and issues that are brought to our attention.


We also carry out independent audits of our human resources policies and practices to proactively identify any risks of non-compliance and take remedial actions if such risks are identified.

Occasionally, there are disagreements with individual employees or unions over the interpretation or application of local laws and regulations. In such cases we will first attempt to resolve any issues amicably within locally determined procedures. If negotiation or reconciliation is unsuccessful, we comply fully with the final decisions of any relevant arbitration, tribunal or court.

## Human Capital

With respect to the minimum wage, we comply fully with local legal requirements as well. In practice, our policies and remuneration and benefits often significantly exceed local legal requirements. We place great importance on treating employees fairly, including ensuring a fair wage, fair working hours and fair treatment regardless of gender, race or any other attribute recognised by the laws of the countries in which we operate.

We recognise that our corporate responsibility to respect human rights extends to our network of suppliers and contractors. Working in partnership with the Danish Institute for Human Rights (DIHR), we commenced a pilot due diligence exercise focused on the use of contractor labour in Hong Kong and India. Hong Kong is our largest operational location, where we have experienced some employee relations issues relating to our contractor workforce. We also make extensive use of contractor labour in India, where issues have been raised on areas including safety performance.

The objectives of the due diligence exercise are to identify any salient human rights issues, and to build our organisational capability to manage human rights issues systematically. For further information, please refer to our [Sustainability Report](#). 

## Child and Forced Labour

CLP prohibits the employment of child, forced or compulsory labour in any of our operations. We require all our operations to ensure that they do not use child or forced labour. We have also put an increasing focus on due diligence activities in relation to human rights, and engaged independent consultants to conduct risk assessment regarding our contractor workforce. No such violation was discovered in 2016.

In 2016 we did not identify any operation or supplier as having significant risk of child labour, young workers exposed to hazardous work, or forced or compulsory labour. There was no breach of the laws and regulations in relation to child and forced labour across our Group in 2016.

## Discrimination and Harassment

With respect to complaints of discrimination and harassment, we have clear policies in place, supported by employee training. Our Group-wide Harassment policy sets a common framework of principles and our detailed policies in each country are fully compliant with local legislation.



### Diversity and gender equality are keys to our future growth and sustainability. How does CLP attract females to join an engineering-focused industry?

There is a global shortage in the number of females studying science, technology, engineering and mathematics (STEM) subjects at school and university. As such, we have taken a number of initiatives to encourage female students to study STEM subjects. For instance, we continued with our mentoring programme for female engineering students at Hong Kong universities; organised engineering work placement programmes; and partnered with The Women's Foundation in Hong Kong to promote STEM studies among girls.

To attract and retain female talent, we have also taken steps to create a family-friendly working environment. These include enhancing our maternity leave policy in a number of markets.

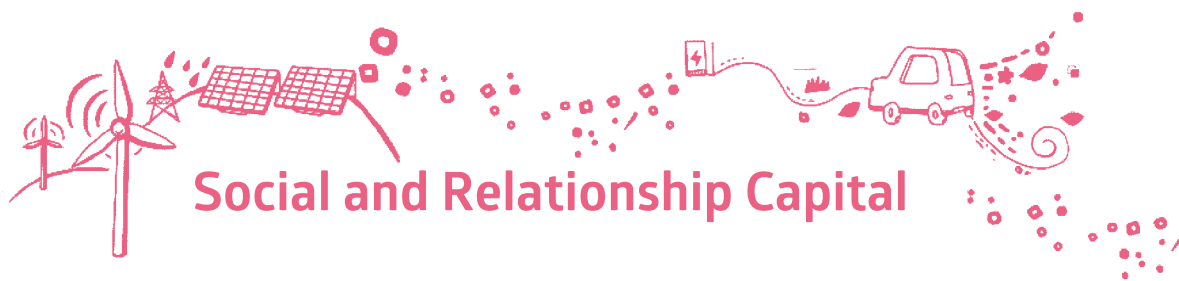
We also recognise the importance of career development for our female employees. In 2016, we launched a Group-wide network of female engineers from India, Australia, Mainland China and Hong Kong to develop gender diversity action plans.



**Shweta Jhamb**  
Assistant Manager – Procurement & Inventory  
Jhajjar Power Limited



**Roy Massey**  
Chief Human Resources Officer



## Social and Relationship Capital

Social and relationship capital primarily describes how we engage with stakeholders to achieve mutual benefits. Maintaining strong relationships both internally and externally is crucial for the sustainability of our business. Our key stakeholders include our customers, employees, shareholders, regulators and the communities in which we operate. During the year, we continued to build trust and understanding with our stakeholders through dialogues and community initiatives.

### Community Initiatives

To ensure we continue to have a social licence to operate, it is critical that the communities we serve not only trust us, but also view our company as one that can contribute to the sustainable development of their future.

As enshrined in CLP's Value Framework, we care for the people and the communities where we operate, and that guides us in devising and implementing our community programmes. In line with the Group's policies on community engagement, we aim to:

- support projects or programmes that reflect the needs and expectations of local communities and are sensitive to prevailing cultures, traditions and values;
- provide support to projects or programmes that are systematically managed with clearly-identified objectives and expected outcomes;
- engage in long-term partnerships with credible international, national, regional and local community organisations, non-governmental organisations, and charities;
- focus our support on projects or programmes that offer the opportunity for our employees to be involved in the activities; and
- regularly evaluate our contributions as well as the outcome and the impact that have been achieved.

In Hong Kong, we conduct a public perception survey every year to understand the public's view on various aspects of the electricity industry as well as the performance of CLP Power Hong Kong. Similarly, EnergyAustralia has since 2014 undertaken community perception surveys to better understand the needs and interests of local stakeholders and communities in which we operate. This helps us understand how we can best support these communities and ensure our engagement and social investment activities align with their expectations.

For many years, we have focused our community agenda on education – the sharing and imparting of knowledge, skills and experience from one generation to the next. We do this because we are convinced that we have a role to play in our future society.

Many of the CLP-initiated programmes centred around energy efficiency and promoting a career in engineering. However in 2016, we took our education commitment to a wider level by extending our reach to kindergartens – a journey from early childhood to adulthood.

### Building Awareness for Energy Efficiency POWER YOU

In Hong Kong, we developed an innovative electricity-themed education kit with story books, finger puppets, a board game and worksheets. It is available to all kindergartens free of charge. This initiative has the dual aim of teaching children about energy production while promoting energy efficiency. The kit has been used by over three-quarters of the kindergartens in Hong Kong, benefitting more than 135,000 students. It also encourages family members and the community at large to adopt energy-saving habits and low carbon lifestyles through the "Please Come and Save the Earth" theme song.



Learn more about the POWER YOU  
Kindergarten Education Kit



POWER YOU is an innovative electricity-themed education kit for kindergarten students in Hong Kong

### Green Elites Campus

At the primary school level, CLP Power Hong Kong continued to organise school visits, support reducing food waste, conduct energy audits, and host a variety of learning programmes. We have awarded 22 primary schools the Green Elites Campus accreditation since the programme inception in the 2014/15 academic year in recognition of their efforts in promoting environmental protection through educational activities, use of school facilities and management, lunch arrangements, transportation and resource allocation.

### Promoting Engineering Careers

In recent years, the number of students pursuing a career in science, technology, engineering and mathematics has dwindled globally. This has in turn affected the pool of potential engineers and technicians on which CLP relies to fill its positions. With this in mind, we have been encouraging young people to consider an exciting career in the power and engineering industries through various initiatives.

### The Engineer in School Programme

This programme provides secondary school students with a better understanding of Hong Kong's energy industry and the power supply system in particular. It also educates them on the importance of environmental protection and energy conservation through job shadowing, day camps and school talks.

In 2016, the programme reached out to about 3,000 students in 14 secondary schools. More than 100 teachers and students

participated in the first Energy Day Camp in December. The programme will continue in 2017.

### Social Investment in Education

In Australia, we encouraged more women and girls to study to become engineers through collaborating with non-profit Power of Engineering. This came about after the newly-established Social Investment Committee of EnergyAustralia chose to champion the themes of education and social inclusion.

In addition to financial assistance, EnergyAustralia provided support in-kind including media advice to promote related events and staff to host workshops aimed at encouraging female high school students to consider engineering careers.

In 2017, the social investment themes of education and social inclusion will be incorporated into our community grants programme to ensure consistency across our entire community engagement programme.

### Reaching out to the Mainland Chinese Community

To further enhance environmental awareness among secondary school students in Mainland China, we continued our signature CLP Young Power Programme in 2016. Some 150 high school students from Nanning in Guangxi and Hong Kong took part in learning tours and seminars, and became our young energy ambassadors. We also contributed to the community by offering grants to schools near our assets to improve school facilities.



## Strengthening Collaboration with Universities and Professional Bodies

### Professorship in Sustainability

As a leading energy provider in the Asia-Pacific region, CLP established a professorship in sustainability at the Hong Kong University of Science and Technology – the first of its kind at a local university. The professorship, which focuses on climate change and sustainable energy, will serve to attract an outstanding scholar and nurture skilled and innovative talent for Hong Kong and CLP.

### CLP Power Low Carbon Energy Education Centre

Moreover, we are sponsoring City University of Hong Kong to establish a low carbon energy education centre on campus to present the challenges posed by climate change and demonstrate the importance of low carbon energy sources in an interactive manner. The opening of the centre is scheduled for the first half of 2017 and guided tours will be offered to the general public.

### Professional Workshops and Symposiums

In November 2016, the CLP Research Institute co-hosted an international workshop with International Electric Research Exchange to discuss how technologies, big data, and their intelligent applications can enhance people's lives.

The workshop was attended by over 100 industry experts, business executives, academics and research professionals from Japan, Korea, Mainland China, South Africa, Germany, the Netherlands, Mexico, Malaysia and Hong Kong.

CLP Power Hong Kong also hosted the fourth Green Building Symposium, where over 300 executives were introduced to some of the latest energy saving technologies and solutions that suit business needs.

## Continuing Dialogues with Policymakers

CLP actively engages with governments at different levels and industry bodies in the markets where we operate to ensure the smooth operation of our businesses. We have regular dialogues with the Hong Kong Government on regulatory and policy matters including the post-2018 regulatory arrangements, gas supply security, air quality objectives, environmental targets and smart city developments. In Australia, we contributed to several reviews of different aspects of the energy market, including the East Coast Wholesale Gas Market and Pipeline Frameworks Review, the Queensland Inquiry into a 50% Renewable Energy Target and the Victorian Hardship Review.




CEO Richard Lancaster (left) and Professor Tony Chan, President of The Hong Kong University of Science and Technology, celebrate the establishment of the CLP Holdings Professorship in Sustainability – the first of its kind among universities in Hong Kong

## Social and Relationship Capital

EnergyAustralia continues to support energy and climate policy that is national, integrated, technology neutral and durable. It is essential to build the confidence needed to invest in transitioning Australia's energy sector to lower emission power generation, while ensuring reliable and affordable energy for consumers.

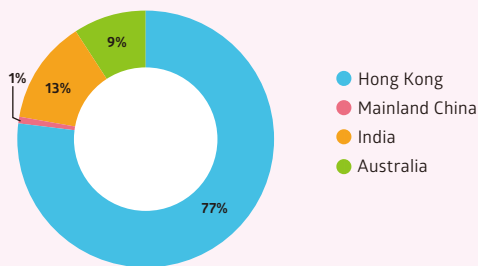
## More Information

Further details of our stakeholder engagement efforts and community initiatives are available in the Business Performance and Outlook section and our [Sustainability Report](#). 

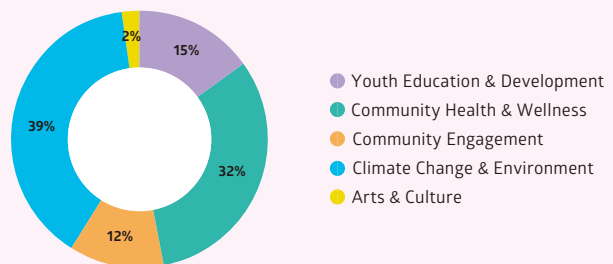
### CLP's Community Initiatives in 2016

#### Our Community Spending

By Region<sup>1</sup>



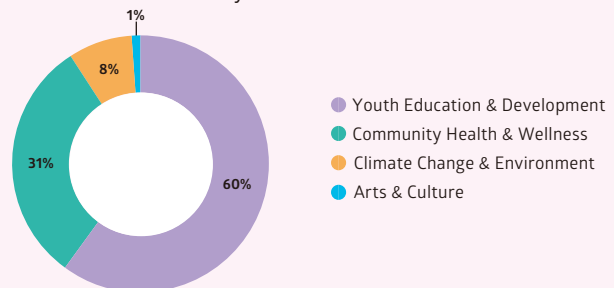
By Theme<sup>1</sup>



#### Our Beneficiaries

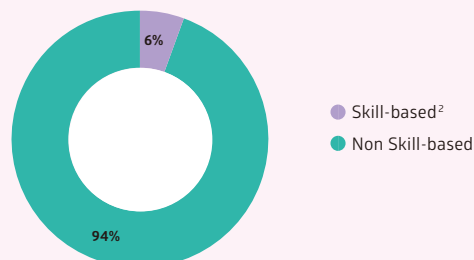
- Over **359,000** direct beneficiaries
- **373** organisations benefitted
- **574** programmes were implemented

Direct Beneficiaries by Theme<sup>1</sup>



#### Contributing Our Time and Expertise

- **13,302** volunteer hours from CLP staff



Notes:

- 1 Figures include rounding adjustments.
- 2 Volunteering work that requires electrical engineering skills.



We are mindful that our operations not only depend on natural resources, but also create impact on the natural environment. At CLP, we are committed to responsibly managing the short-term and long-term impact of our business throughout the entire lifecycle of our projects. We place a high priority on steps to address global climate change through the deployment of renewable resources and steadily reducing emissions. These are in line with technological advances and changing stakeholder expectations around the globe.

## Transition to a Low Carbon Economy

With the Paris Agreement officially ratified in record time in 2016, governments, businesses, organisations, and communities around the world have rallied together to address the imminent challenges of global warming.

In 2007, we voluntarily pledged to reduce the carbon intensity in the Group's portfolio by 75% by 2050 and meeting some interim targets along the way. In 2010, we tightened the 2020 carbon intensity target and set ourselves new 2020 renewable energy targets:

- 28%+ further reduction in carbon intensity from 2007 levels; and
- 20% renewable energy in our generating portfolio.

### Reviewing Our Emissions Reduction Roadmap

While we initially planned to review our roadmap once the Intergovernmental Panel on Climate Change releases its new emissions scenario projections in 2018, we now consider it appropriate to start the review a year earlier given the successful ratification of the Paris Agreement, as well as the release of Recommendations of the Task Force on Climate-related Financial Disclosures by the Financial Stability Board in December 2016.

Over the year, the Group's carbon intensity slightly increased to 0.82kg CO<sub>2</sub>/kWh from 0.81kg CO<sub>2</sub>/kWh in 2015. This was mainly due to increased output from Mount Piper and Yallourn power stations because of higher demand and decreased output from Tallawarra Power Station driven by higher gas prices in Australia. In India, overcapacity and reduced demand in the state of Haryana led Jhajjar Power

Station to lower output. While these factors combined to cause a slight increase in the Group's intensity, total carbon emissions were at a similar level as in 2015.

Meanwhile, the share of non-carbon emitting energy and renewable energy in our portfolio decreased to 19.2% and 16.6% respectively primarily due to the approval of a new gas-fired generation unit at the Black Point Power Station in Hong Kong and a reduction in the capacity of the Yermala Wind Farm in India.

In the Asia-Pacific region where CLP operates, energy security, access and affordability remain the key priorities supporting the continued development of fossil-fuelled assets.

While this makes it challenging for us to achieve our emissions reduction targets, we remain committed to our interim and long-term goals. We continued to expand our renewable energy portfolio with the construction of new projects in Mainland China. In 2016, we added 275MW of new renewable energy capacity to our operating portfolio. We also announced our intention to enter into PPAs to underpin the development of up to 500MW of renewable energy in Australia.

In parallel with our decarbonising strategy, we are determined to ensure that the transition will not result in denial of access to an affordable and reliable electricity supply that is essential for social and economic development and stability. For the emerging economies in which we operate that require new coal-fired power stations to meet their development needs, we see a continuing but limited role for us. If we develop such facilities, we are committed to utilising technology to achieve the highest possible efficiency, while continuing our investment in renewable energy. We have already begun to explore the use of new financing tools such as green bonds and are looking for ways to increase our involvement in renewable-related procurement arrangements where possible.

### Our Online Carbon Credit Sales Platform

Apart from continuing our efforts in reducing our carbon footprint, we believe it is equally important to assist our stakeholders on their decarbonisation journeys.

In 2017, we plan to launch an eCommerce platform that allows users to purchase carbon credits online, in the hope of making it easier for individuals or organisations to offset their carbon emissions. We believe a price on carbon is inevitable.

## Natural Capital

Therefore, offsetting unavoidable emissions is one way to begin incorporating a potential price on carbon into the financial planning and budgeting process for an individual or an organisation. This will be the last component of the three-step range of solutions we plan to offer our stakeholders to assist them in their journeys towards achieving net zero carbon emissions. The solutions are prioritised as:

1. reducing energy use first;
2. transitioning towards using energy generated with low or no carbon emissions next, and
3. offsetting the remaining or unavoidable emissions last.

At EnergyAustralia, customers can now get 100% carbon neutral electricity in their home at no extra cost. For customers who opt for carbon neutral electricity, EnergyAustralia purchases carbon offset units which support projects that reduce emissions, such as renewable energy projects in developing countries or land management and tree planting in Australia, to offset the amount of carbon they release into the atmosphere.

## Mitigating Environmental Impact

As we grow our non-carbon portfolio, there will still be impacts on the environment, such as land use and biodiversity-related ones. We are committed to mitigating these potential impacts through well-planned management and stringent monitoring. In CLP's Value Framework, we stress our care for the environment. We have also put in place an overarching Group Environmental Policy Statement, supported by a suite of standards and guidelines like the HSSE Management System Standard and Sustainability Principles to cover the material environmental issues we face. We also continue expanding and strengthening our data management system to ensure our data reporting and analytical work is robust.

CLP's recent performance in key environmental categories is summarised below:

Environmental Category	Aspect	Parameters	2016	2015
Emissions	Greenhouse gases	Total CO <sub>2</sub> emissions (from power generation)	<b>46,518kT</b>	46,553kT
		Carbon intensity (on equity basis)	<b>0.82kg CO<sub>2</sub> / kWh</b>	0.81kg CO <sub>2</sub> / kWh
	Air pollutants	Total SO <sub>2</sub> emissions	<b>71.2kT</b>	63.4kT
		Total NO <sub>x</sub> emissions	<b>58.1kT</b>	56.3kT
Total particulate matter emissions		<b>8.5kT</b>	9.8kT	
Water discharged	Total water discharged	<b>4,219.2 Mm<sup>3</sup></b>	4,463.0 Mm <sup>3</sup>	
Waste	Total solid waste produced	<b>9,619T</b>	12,096T	
	Total liquid waste produced	<b>1,335kl</b>	3,031kl	
Resource use	Fuel	Total coal consumed	<b>453,904TJ</b>	450,937TJ
		Total gas consumed	<b>86,787TJ</b>	95,591TJ
		Total oil consumed	<b>4,162TJ</b>	2,892TJ
		Non-carbon % (on equity basis)	<b>19.2%</b>	19.5%
		Renewable energy % (on equity basis)	<b>16.6%</b>	16.8%
Water	Total water withdrawal	<b>4,257.0 Mm<sup>3</sup></b>	4,503.0 Mm <sup>3</sup>	
Biodiversity	Ecology	Biodiversity Impact Assessment	<b>Biodiversity impact assessed in all new projects and mitigation measures implemented</b>	Commenced implementation



## Emissions and Waste

As shown in the table on the left, our total air emissions increased to 137.8kT in 2016 mainly due to increased generation at Mount Piper and Yallourn power stations in Australia. CLP also makes every effort to minimise waste through recycling and reusing materials. We continue selling our generation by-products such as ashes and gypsum to other industries for utilisation.

## Water

On our sourcing and management of water resources, we conducted an in-depth assessment of water risk across our portfolio in 2016. The assessment covered parameters such as water availability, water sensitivity, water stress mapping, potential competing use with other stakeholders, and management strategies in place in each of our regions. The results of the assessment indicated that we have a sufficiently robust regime in managing our water risks. We will continue to monitor and manage our water risks, reduce our impacts, and use this precious resource efficiently.

Our facilities also monitor their total water withdrawal and discharge. The largest volume of water we withdraw from water bodies is for cooling purposes and this is confined to our thermal power stations. However, the majority of this water is discharged back to its sources after appropriate treatment to ensure no adverse environmental impact is caused. The water intensity of our power generation process increased from 1.04 m<sup>3</sup>/MWh in 2015 to 1.05 m<sup>3</sup>/MWh in 2016. This was within normal general fluctuations.

Regarding water availability, we manage our water resource risks through a number of means. We assess the water availability in the planning stage of projects including the likelihood of water scarcity in the future. During operations, our power stations will ensure that all licensing requirements and necessary engagements with local stakeholders are in place to maintain our license to operate. Depending on site-specific conditions, operational situations and age, our power

stations have introduced a range of water conservation initiatives. Some new initiatives in 2016 were:

- **Jhajjar Power Station, India** – Flue Gas Desulphurisation (FGD) waste water separation system was optimised to prepare for its full operation towards the end of 2017;
- **Fangchenggang Power Station, Mainland China** – High and low chlorine ion wastewater were collected and stored separately, then used as cold hopper and desulfurisation process water. The annual volume of recoverable water was about 70,000 m<sup>3</sup>;
- **Mount Piper Power Station, Australia** – EnergyAustralia and its partner Centennial Coal announced an enhancement to an existing proposal to build a water treatment plant to support an extension of the Springvale Mine. The mine is the key source of coal supply for Mount Piper and the enhancement will improve the environmental outcomes of the water project and ensure significant long-term investment in the local community.

We also place high emphasis on sharing initiatives across the CLP Group in order to maximise the benefit of our individual power station's efforts. Jhajjar Power Station formed a cross-functional team to conduct a study on water management. Study findings were presented in a sharing session with participants from all CLP operating regions.

## Environmental Regulatory Compliance

In 2016, there was one environmental incident at Sandu I Wind Farm in Guizhou province, which incurred a sanction for forest damage. We have enhanced our project management and technical procedures to improve our future performance at this type of geographically difficult location. In India, there were two environmental licence limit exceedances of particulates emissions at Jhajjar Power Station. No penalty was imposed. Further information is available in the Business Performance and Outlook and Five-year Summary sections and the [Sustainability Report](#). 