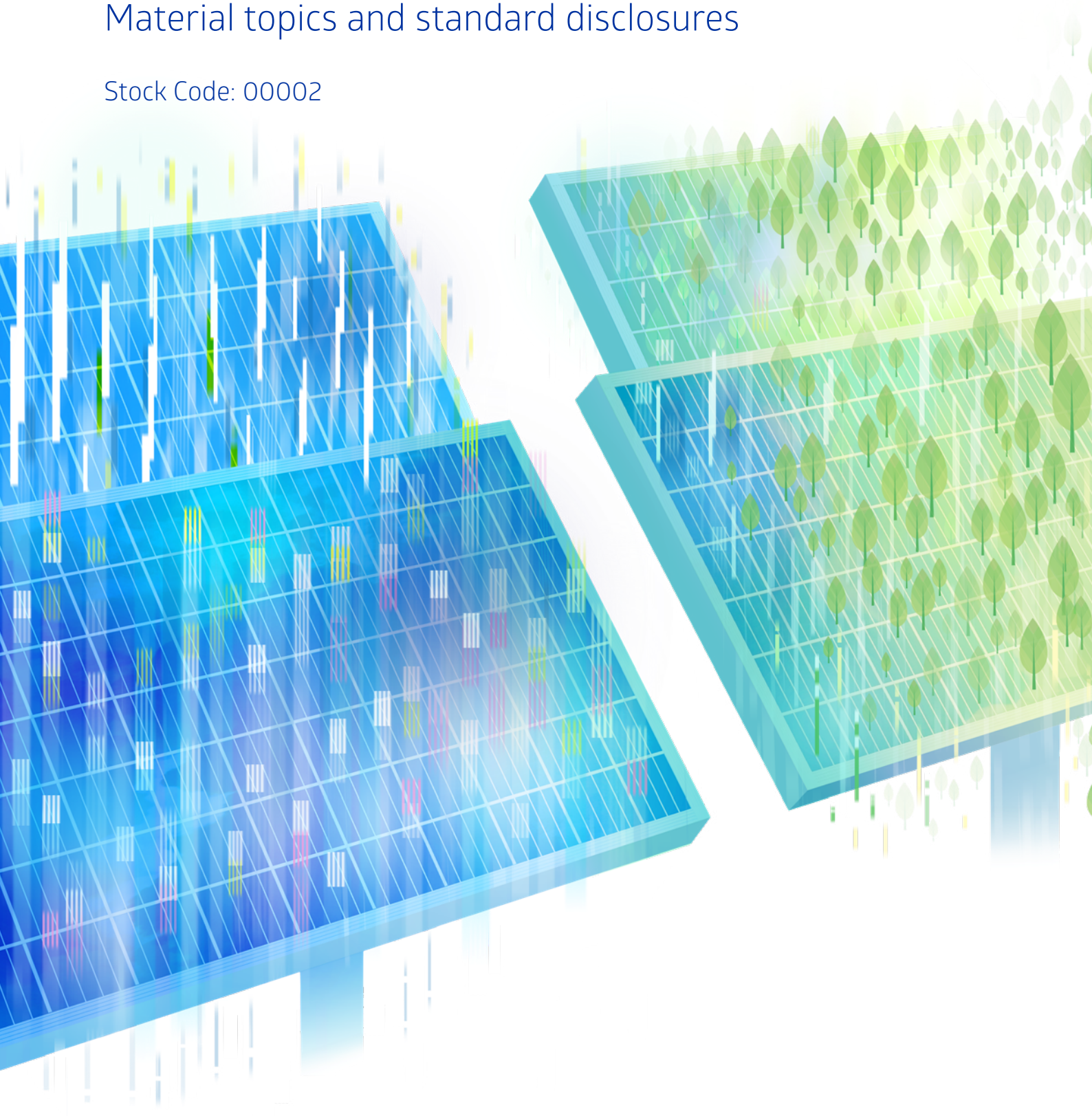
CLP 中電

2019

Sustainability Report

Material topics and standard disclosures

Stock Code: 00002



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Chairman and CEO message

"At CLP, we have for years taken a long-term view on our investments as well as our shared environment. To stay ahead of challenges, we will continue driving change within the Company to build a sustainable business fit for the future."

The Honourable Sir Michael Kadoorie, Chairman (right) and Richard Lancaster, CEO (left)

From significant movements in global environmental and trade issues, through to local circumstances experienced in the Hong Kong and Australian markets, the complexities we faced in 2019 certainly made it one of the most challenging years in our recent memory.

However, we recognise that the nature of our business subjects us to continuous changes and we must be prepared for adaptation. At CLP, we have for years taken a long-term view on our investments as well as our shared environment. To stay ahead of challenges, we will continue driving change within the Company to build a sustainable business fit for the future.

Our long-standing commitment to maintaining high corporate governance standards and sustainable practices underpins our approach to business. We are pleased to see increasing interest in environmental, social and governance issues in society, particularly among investors and regulators. Properly addressing these issues requires vision and a commitment to manage with a long-term view, two things which have always been a hallmark of CLP.

Following a thorough review of transformative global megatrends, we identified decarbonisation and digitalisation as our long-term drivers of change and have strategies in place to take on the resulting opportunities and challenges.

These megatrends, together with intensifying demographic and labour supply issues as well as social and political uncertainties, present significant opportunities and risks for our workforce. There is no single solution: it requires a coordinated and integrated range of strategic initiatives to build an agile, inclusive and sustainable workforce for the future.

Decarbonising our portfolio

Against the backdrop of accelerated climate change, decarbonisation continued to be a key priority of CLP in 2019 as we transition to a Utility of the Future. Late last year we released our updated Climate Vision 2050. At its heart are our pledges to phase out our existing coal-based assets by 2050, at the latest, and not to invest further in any additional coal-fired generation assets. This latest edition is a foundation stone of our business strategy, which provides a roadmap for the decarbonisation of our portfolio in alignment with, and being sensitive to, local policies in each of our markets.

We have also pledged to revisit and strengthen our decarbonisation targets at least every five years as technologies advance and cost structures change, while tracking our progress against the goals of the Paris Agreement.

Our pledges can also be seen in another context. We have been investing in renewable generation technologies since the mid-1990s and are well placed to help position renewable power at the heart of the energy transition. On an ongoing basis, we are actively pursuing further investment opportunities in low-carbon electricity generation, transmission and distribution, as well as in new energy services such as those emerging from the development of "smart cities".

Accelerating our digital transition

Our Group's electricity value chain is increasingly supported by smart energy services. To fully unlock the potential of the future energy system, we need to develop a robust digital transformation strategy with bespoke energy services solutions for each of the local markets in which we operate.

The launch of Smart Energy Connect is a prime example of our recent efforts. As the first online energy app store in Asia, it offers a range of innovative and practical applications to help businesses and organisations in the region manage energy use in a greener and smarter way.

As for our operations, we will continue replacing and enhancing our digital systems and processes to enable our business to deliver improved results, leveraging innovation to facilitate our people in making better decisions while placing importance on cyber resilience and data protection. Over the past year, we made good progress in building up internal expertise and enhancing the awareness of cyber security across our organisation. Going forward, we will continue being vigilant and keep strengthening our cyber resilience.

Addressing the utility workforce challenge

Industry, regional, demographic, social and political drivers are bringing unprecedented change to CLP and are redefining our people agenda. Attracting and retaining skilled resources to meet the needs of energy transition is a key priority. We continued developing leaders of the future, recruiting for new-to-CLP skills, and creating opportunities for our people to gain experience in low-carbon and innovation projects.

Digitalisation requires new skills and ways of working. We commenced providing accredited data analytics training while design thinking began to take hold at CLP for advancing our services and driving people-centric innovation.

We believe that supporting diversity and inclusion is critical to business performance as well as addressing future employment needs. Hence, we continued investing in increasing women's participation in engineering through mentoring and strengthening female engineering networks.

Safeguarding our people

Safety remains an absolute priority for the Group and our target is one of zero harm for everybody. Sadly, we do have to report the work-related death of a team member of one of our subcontractors in Hong Kong. The Board, on behalf of everyone at CLP, expresses its condolences to the individual's family. This regrettable event has further increased our resolve to improve the safeguarding of our people moving forward.

Outlook

In the past months, nowhere was the risk of a changing climate more vividly displayed than by the bushfires in Australia. We have taken steps to consider the resilience of our Climate Vision 2050 against possible climate-related scenarios and will continue refining our analysis to help integrate climate risks and opportunities into long-term business planning. To ensure our transparency, we have also advanced our disclosure in accordance with the recommendations by the Task Force on Climate-related Financial Disclosures and will continue disclosing reliable and consistent information to stakeholders.

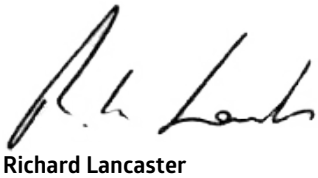
All markets go through transition periods and any country with a legacy of coal generation assets will require its private sector energy partners to be ready for the challenge of decarbonisation. We see ourselves as a ready, willing and highly capable partner in the transition to a low-carbon energy future.

Going through the transition in 2019 was challenging and our results are a stark reminder of the changes in our industry. Nevertheless, we are striving to decarbonise, digitalise our operations, deliver on our investments and keep innovation at the heart of our ongoing development, all while continuing our collaboration with different sectors of the community to run our business with purpose and with an underpinning commitment to sustainability.

The Honourable Sir Michael Kadoorie

Chairman

Hong Kong, 24 February 2020



Richard Lancaster

Chief Executive Officer

Hong Kong, 24 February 2020

About this report

Welcome to the CLP 2019 Sustainability Report

CLP Holdings Limited (the Group) has embarked on a journey to become a Utility of the Future, a transformation which demands a keen understanding of changes occurring in the energy sector, the global economy and society more broadly. CLP's ambition is to pursue best of breed policies, processes and technologies in all of its operations. The Group operates for the long term and seeks to create value for all stakeholders, internal and external, and the communities in which it operates.

Building on the materiality assessment results from last year, CLP engaged a broad range of stakeholders to seek their feedback on material topics. Based on this some adjustments were made to the strategic discussions on the most important environmental, social and governance (ESG) topics facing the Company. In recognition of the need for increased ambition by companies on climate change, CLP has advanced its disclosure in accordance with the recommendations by the Task Force on Climate-related Financial Disclosure (TCFD). The Group also continues to disclose its management approach and performance in relation to a set of secondary topics in the Standard ESG disclosure section.

Feedback on this report is welcomed, and can be sent through the online survey or via email (srfeedback@clp.com.hk). As a token of CLP's appreciation, each stakeholder who sends feedback on or before 30 June 2020 will receive four CLP Carbon Credits, which can be used to offset their carbon footprint.

Materiality assessment

CLP's materiality assessment was updated in 2018 to further consider the operating environment and the Group's strategy in the medium- to long-term. Building on that result, the engagement of external stakeholders was broadened in 2019 to validate the results and to gauge feedback on the level and quality of disclosure.

Assessment process

GRI reference: 102-44, 102-46

The materiality assessment process was guided by the *Applying enterprise risk management to environmental, social and governance-related risks* guidelines published by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and the World Business Council for Sustainable Development (WBCSD) in October 2018.

The assessment process is summarised in the diagram below.

External stakeholder engagement in 2019

In November 2019, CLP conducted two focus group workshops and 15 individual interviews with subject matter experts in ESG reporting, finance and investment, industry, climate change, digital transformation, human rights, gender, and sustainability.

There were two objectives for this exercise:

- To gauge feedback and comment on CLP's material topics; and
- To identify improvement areas on reporting quality, presentation method, categorisation, target setting, and other reporting criteria.

The external stakeholders commended CLP's sustainability governance practices and level of ESG disclosure, and were in a consensus on the prioritisation of the key topics which were most material to CLP. In preparing the 2019 report, CLP has taken on many of their suggestions, including discussing business purpose as an overarching topic and enhancing specific disclosure in each of the material topics. Other recommendations related to improvements in CLP's future sustainability disclosure and operational performance were also shared with internal functions and business units.

Learn more about the materiality assessment results >

1 Horizon scanning and megatrend analysis	2 Identifying material topics	3 Prioritising the material topics	4 Engaging external stakeholders
• Reviewed internal strategy papers and desktop research. • Horizon scanning identified 17 megatrends which may be potentially relevant to CLP. • Interviewed 38 internal subject matter experts to gauge their views and those of their stakeholders and narrowed down the focus to 12 megatrends.	• Identified relevant ESG topics for each of the 12 megatrends, and supplemented with additional information for prioritisation.	• The Sustainability Executive Committee engaged in a workshop to prioritise the material topics. • The Committee considered CLP's level of control over management of the topic; its likelihood to influence the decisions and actions of CLP's stakeholders; and its impact on people, the environment and/or the economy in CLP's markets.	• External stakeholder engagement exercise to gauge feedback on CLP's material topics, content coverage and overall disclosure quality.

Key drivers and megatrends

Megatrends are "large, transformative global forces that define the future by having a far-reaching impact on business, economies, industries, societies and individuals". A megatrend is distinguished from other trends in that it cannot be stopped or significantly altered, even by powerful actors such as governments.

CLP's materiality assessment process started with a megatrend analysis to deepen the understanding of how broad changes in the environment, society, technology and governance were affecting CLP's operating environment.

Starting with the big picture provided the necessary context to review risks and opportunities, thereby making the organisation more agile in responding to changes. This makes it easier to identify and prioritise the ESG topics that CLP should be managing and reporting.

The table below summarises the 12 most important megatrends that were considered. They could be categorised into three big drivers: Decarbonisation, Digitalisation, and Social and Demographic Change. Each of them shapes one or more of the prioritised ESG topics and how CLP responds.

Climate change mitigation and adaptation

The adverse impacts of climate change are growing in frequency and severity, taxing the resilience of built and natural environments. Stakeholders are increasingly focused on how a business identifies, responds and discloses its mitigation and adaptation efforts.

See Climate change

Demand for renewables

Technological innovation, regulatory incentives, cost efficiencies and growing consumer and industrial demand are increasing the commercial viability of clean energy. Renewable power capacity is expected to expand by 50% in the next five years.

See Climate change, Technology

Changing energy mix

Governments, cities, institutional investors and energy companies are leading players in the slow but inevitable transition to a lower-carbon global economy. Clean air initiatives, tighter environmental regulations, support for clean energy technologies, carbon pricing initiatives and green finance mechanisms are prompting a range of energy transition pathways.

See Climate change, Technology

Evolving energy business models

Decentralisation is increasing consumer options for sourcing and managing energy. As a result, traditional utilities may need to change their business models to respond to the competitive pressures associated with distributed solar PV systems, new storage technologies and microgrids.

See Technology, Cyber resilience , Workforce

Technology as enabler and disrupter

New technologies such as the Internet of Things, robotics, and autonomous vehicles are changing the world faster than ever and blurring the lines between industries. But new business opportunities – even whole industries – are also presenting.

See Climate change, Technology,Cyber resilience, Workforce

Smart systems

The world is entering the fourth industrial revolution; a computing revolution which has Artificial Intelligence (AI) and machine learning as its cornerstones. Traditional business models are being challenged by new market entrants that have embraced these technologies.

See Technology

Data privacy and security

An exponential rise in the use of data has increased the scale and severity of successful cyberattacks. With customers increasingly concerned about how their personal information is protected and used, the financial and reputational cost of a major breach can be significant.

See Technology, Cyber resilience

Electrifying transport and energy

Electric vehicles, smart factories and cities, more efficient heating and cooling systems, and rapidly rising energy demand in the developing world are spurring the electrification of energy systems.

See Climate change, Technology

Changing society

Many developing societies are young and growing, with expanding labour forces and increased consumer spending by millennials. Others, especially in the developed world, are ageing, with negative implications for productivity and government budgets. Social inequality is creating significant uncertainty for business.

See Workforce

Digitally adept and diverse workforce

Given the pace of changes resulting from the energy transition and digitalisation of the energy sector, the workforce must be agile. In addition, social and demographic changes, combined with increasing competition for STEM skills, are driving the need for an inclusive and sustainable workforce.

See Technology, Workforce

Changing role of business

The role of business is changing. Stakeholders increasingly expect organisations to demonstrate how they are creating value for communities and the environment, but not for shareholders alone, and to act ethically in their interactions with governments, suppliers and consumers.

See Climate change, Workforce

Geopolitical uncertainty

Strategic competition between global powers, an increase in protectionism and the continuing re-invigoration of Asian economies are increasing global uncertainty, opportunities and threats. The state of global climate change negotiations creates further uncertainty.

See Climate change, Technology, Workforce

Reporting frameworks and content indices

This document references different reporting guidelines and frameworks to ensure reporting is comprehensive and aligns with international best practices. CLP recognises a diversity of methodologies are used around the world to measure the sustainability performance of organisations. The Group welcomes the opportunity to benchmark itself against these well-developed frameworks.

Global Reporting Initiative (GRI)

- The GRI is an international independent organisation which provides widely used standards for sustainability reporting.
- This report has been prepared in accordance with the GRI Standards: Core option. It also reports on the GRI G4 Electric Utilities Sector Disclosures. These are disclosures that cover key aspects of sustainability performance which are meaningful and relevant to the Electric Utility sector. CLP has been reporting with reference to the GRI reporting framework since 2007 and has adopted the GRI Standards for the fourth year since it was launched in 2016.

Download the GRI content index

International Integrated Reporting Council (IIRC)

- The IIRC is a global coalition behind the International <IR> Framework, which has become a widely used guideline for integrated reporting.
- This report applies its guiding principles to illustrate how integrated thinking has been embedded in CLP. In particular, it adopts a forward-looking view and considers the material trends that affect the ability to create value over time.
- CLP's Annual Report has been prepared with reference to this guideline since 2011, and includes a focused discussion of how the Company creates value for stakeholders under different capital structures.

Task Force on Climate-related Financial Disclosures (TCFD)

The TCFD develops voluntary, consistent climate-related financial risk disclosure recommendations for use by companies in providing information to investors, lenders, insurers, and other stakeholders. The recommendations consider the physical, liability and transition risks associated with climate change and what constitutes effective financial disclosures across industries. TCFD covers four main areas of disclosure: governance, strategy, risk management, and metrics and targets. Referencing recommendations by the WBCSD TCFD Electric Utilities Preparer Forum, CLP's climate-related disclosure in these areas has been enhanced in the Annual and Sustainability reports, as well as via CDP – Climate Change.

Read CLP's disclosure in accordance to TCFD

Hong Kong Stock Exchange Environmental, Social and Governance (ESG) Reporting Guide

- In 2019, the Exchange conducted a consultation on Review of the ESG Reporting Guide. The Company has submitted a response in support of the new initiatives for upgrading the disclosure obligations of the existing requirements as proposed in the Consultation Paper. Read the response here.
- Companies listed on the Stock Exchange of Hong Kong (HKEx) are required to meet the ESG Reporting Guide disclosure obligations from financial years commencing on or after 1 July 2020. In this 2019 Sustainability Report and in the Annual Report, CLP has adopted the revised HKEx ESG Reporting Guide published in December 2019. In particular, the materiality assessment process as outlined under the mandatory disclosure requirements has been applied to prioritise CLP's response to the "comply or explain" provisions of the Environmental and Social Aspects.

Download the HKEx content index

Greenhouse gas emissions

- CLP's greenhouse gas (GHG) emissions inventory covers the six greenhouse gases initially specified in the Kyoto Protocol. The Company has also considered the seventh mandatory gas added under the second Kyoto Protocol compliance period, namely nitrogen trifluoride (NF_3), but has deemed it immaterial to operations. In 2019, CLP enhanced its GHG disclosure to also include Scope 3 emissions. Key scope 3 categories are independently assured, and the Group is working towards assuring the total Scope 3 emissions in the future.
- CLP's GHG emissions are reported with reference to: The World Resources Institute (WRI) / World Business Council for Sustainable Development (WBCSD) GHG Protocol, the Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories (2006), the International Standard for GHG Emissions ISO 14064, and relevant local statutory guidelines where applicable.
- To facilitate implementation, in 2007 CLP developed the first version of the Group-wide GHG reporting guideline which referenced the guidelines above. This reporting guideline is reviewed in accordance with CLP practice at least every three years.

Financial data

All financial data in this report is consistent with the figures published in the audited financial statements of the 2019 Annual Report. These financial statements were prepared in accordance with the Hong Kong Financial Reporting Standards (HKFRS) issued by the Hong Kong Institute of Certified Public Accountants (HKICPA) and the requirements of the Hong Kong Companies Ordinance (Cap.622).

Reporting scope and data verification

GRI reference: 102-50, 102-51, 102-52

This report covers the CLP Group's sustainability performance for the calendar year ending 31 December 2019. It is published at the same time as the Integrated Annual Report. The previous report was published in March 2019.

GRI reference 102-45, 102-48, 102-49

CLP reviews its reporting scope regularly to ensure the material impact of the Group's overall portfolio is covered. In 2019, the reporting scopes of the following data points have been adjusted:

- **Employees:** part-time employees are covered in employee metrics reflecting the expectation of increasingly flexible working arrangements in the future.
- **Health and Safety, Environmental (HSE):** any assets that have been operating during the year are included in the reporting scope. In 2019, additions to the reporting scope include the Laizhou II wind farm and Meizhou solar farm in China; Newport and Jeeralang power stations in Australia; Indian wind farms (Andhra Lake, Bhakrani, Chandgarh, Harapanahalli, Jath, Khandke, Mahidad, Samana I & II, Saundatti, Sipla, Tejuva and Theni I & II) and solar farms (Gale, Tornado and Veltoor).

  The HSE data of Satpura Transco Private Limited (STPL) transmission network, acquired by CLP India in November 2019, were not included in the 2019 data points, but will be included in the 2020 reporting cycle. Environmental data of Paguthan power station, the power purchase agreements (PPA) of which expired in December 2018, were not included.
- **Climate Vision 2050:** while CLP continues to report on carbon intensity based on equity, the Company tracks its performance based on equity plus long-term capacity and energy purchase to reflect more holistically on the developments of generation capacity from other sources.

See CLP's portfolio changes for the year 2019 >

Limited assurance is provided by PricewaterhouseCoopers (PwC) on a selected set of environmental, social and governance-related Key Performance Metrics for this report in accordance with International Standard on Assurance Engagements 3000 (Revised), ***Assurance Engagements other than Audits or Reviews of Historical Financial Information***, and, in respect of greenhouse gas emissions, International Standard on Assurance Engagements 3410, ***Assurance Engagements on Greenhouse Gas Statements***.

Below is the definition of the Company boundary for each of the main categories of data included in this report. Please refer to the CLP 2019 Annual Report for more details on the entities included in the consolidated financial statements.

Governance	Includes people employed by CLP entities and their subsidiaries. It does not include non-CLP employees of joint ventures, joint operations or associates.
Finance	Selected financial figures are extracted from the Annual Report and the consolidated financial statements of CLP Holdings Limited and its subsidiaries (the Group) which is in accordance with Hong Kong Financial Reporting Standards (HKFRS) issued by the Hong Kong Institute of Certified Public Accountants (HKICPA). For a detailed description of the financial reporting scope, please refer to the Significant Accounting Policies – Consolidation and Equity Accounting on pages 229-230 of the 2019 Annual Report.
People	Includes people employed by CLP entities and their subsidiaries. It does not include non-CLP employees of joint ventures, joint operations or associates.
Safety	Includes power generation assets, transmission and distribution infrastructure, coal mines, fuel storage facilities and offices: · That are majority owned by CLP or under CLP's operational control, defined as full authority to implement CLP's operating policies; and · That are under construction or in operation during the reporting year. 100% of the performance data for in-scope assets is reported without adjustment based on CLP's equity share, unless otherwise stated.

Environment – Resource use, air emissions, fuel use and environmental compliance

Includes power generation assets, transmission and distribution infrastructure, coal mines and fuel storage facilities:

- That are majority owned by CLP or under CLP's operational control, defined as full authority to implement CLP's operating policies; and
- That are in operation during the reporting year; and
- That pose material impact to the environment.

100% of the performance data for in-scope assets is reported without adjustment based on CLP's equity share, unless otherwise stated.

GHG emissions (on an equity basis)

1. **Scope 1 CO_2e**

   Includes power generation assets, transmission and distribution infrastructure, coal mines and fuel storage facilities:

   – That are owned by CLP, where assets are included on an equity basis (i.e. accounts for the data according to CLP's equity share in the asset); and

   – That are in operation during the reporting year.

2. **Scope 2 CO_2e**

   Includes power generation assets, transmission and distribution infrastructure, coal mines, fuel storage facilities and offices:

   – That are owned or rented by CLP, where assets and offices are included on an equity basis (i.e. accounts for the data according to CLP's equity share in the asset); and

   – That are in operation during the reporting year.

3. **Scope 3 CO_2e - Category 1a: Purchased goods and services (products)**

   Includes the upstream emissions of EnergyAustralia's natural gas retail business, covering the emissions from upstream gas production and transmission, and distribution leakage in the state pipeline systems.

4. **Scope 3 CO_2e - Category 3: Fuel- and energy-related activities**

   Includes the upstream emissions of purchased fuels and electricity for CLP's power generation. In addition, it includes the direct emissions and upstream emissions from generation of purchased electricity that is sold to CLP's customers.

   The upstream emissions of purchased fuels and electricity for CLP's power generation include assets:

   – That are owned by CLP, where assets are included on an equity basis (i.e. accounts for the data according to CLP's equity share in the asset).

   The direct emissions and upstream emissions from generation of purchased electricity that is sold to CLP's customers include:

   – Generation assets whose capacity and energy are purchased by CLP to meet customer demand, where the purchase agreement duration is at least 5 years and where the capacity or energy purchased is no less than 10MW; and

   – The net electricity purchased by EnergyAustralia from the Australian Energy Market Operator (AEMO) in Australia.

5. **Scope 3 CO_2e - Category 11: Use of sold products**

   Includes the downstream emissions of EnergyAustralia's natural gas retail business, covering the emissions from combustion of natural gas supplied to the customers.

GHG emissions (on an operational control basis)

Includes power generation assets, coal mines or fuel storage facilities:

- That are majority owned by CLP or under CLP's operational control, defined as full authority to implement CLP's operating policies; and
- That are in operation during the reporting year; and
- That pose material impact to the environment.

100% of the performance data for in-scope assets is reported without adjustment based on CLP's equity share, unless otherwise stated.

Climate Vision 2050

Operations – Generation capacity, energy sent out

Data are consolidated on an equity basis with two variations:

1. **Equity basis**

   Includes power generation assets:

   - That are owned by CLP, where assets are included on an equity basis (i.e. accounts for the data according to CLP's equity share in the asset); and
   - That are under construction (for generation capacity only) or in operation during the reporting year.

2. **Equity plus long-term capacity and energy purchase basis**

   In addition to (1) above, this scope includes the power generation assets whose capacity and energy are purchased by CLP to meet customer demand where:

   - Purchase agreement duration is at least 5 years; and
   - Capacity or energy purchased is no less than 10MW.

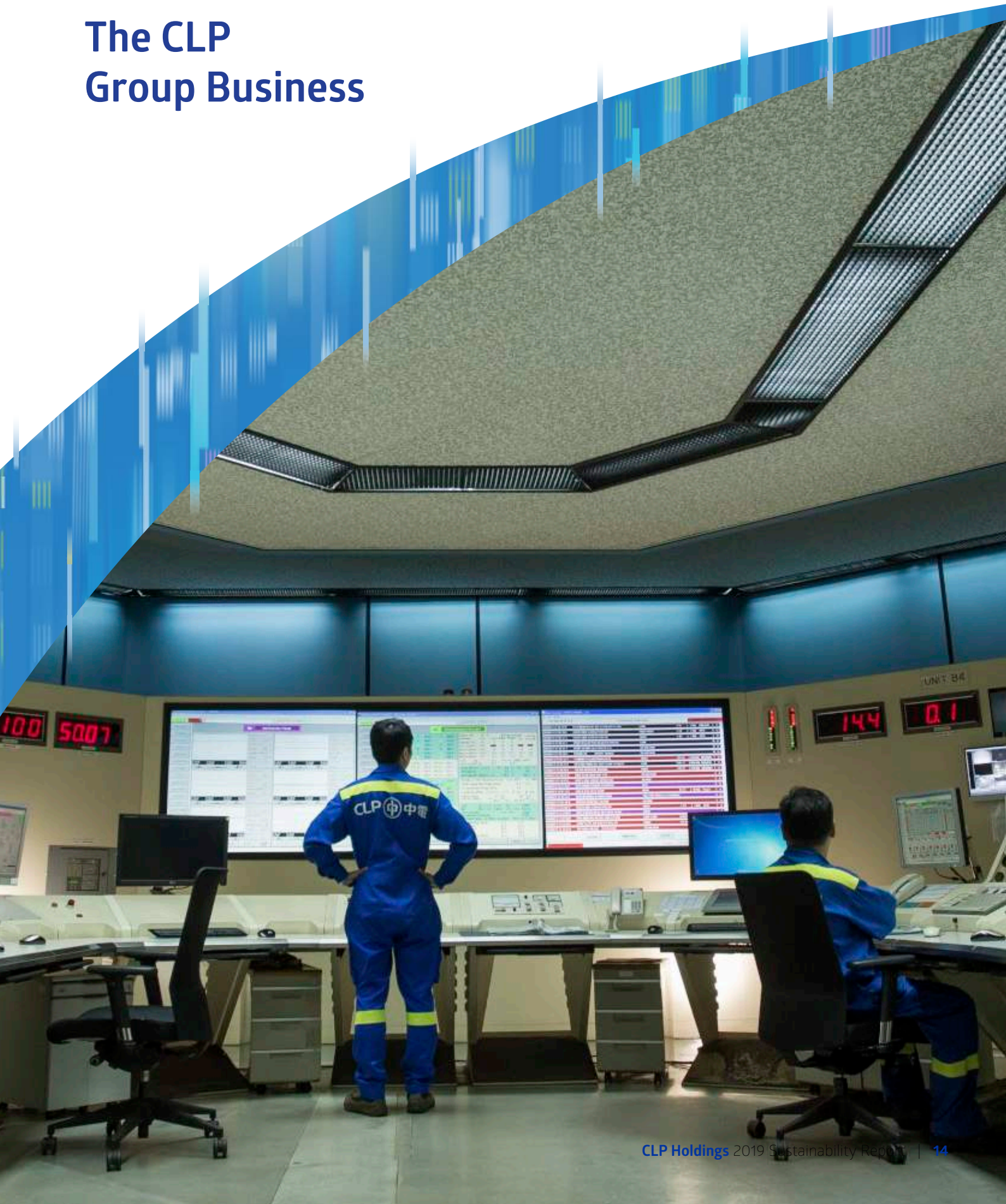
CLP Power Hong Kong carbon emissions intensity of electricity sold

Includes power generation assets involved with the delivery of electricity to CLP Power Hong Kong customers, and:

- The CO_2 and CO_2e emissions are from generation assets in Hong Kong only (as power generation from the nuclear assets does not result in significant carbon emissions); and
- The kWh is from the total electricity sales for CLP Power Hong Kong.

Independent assurance statement ↓

The CLP Group Business



The CLP Group business

Building a Utility of the Future

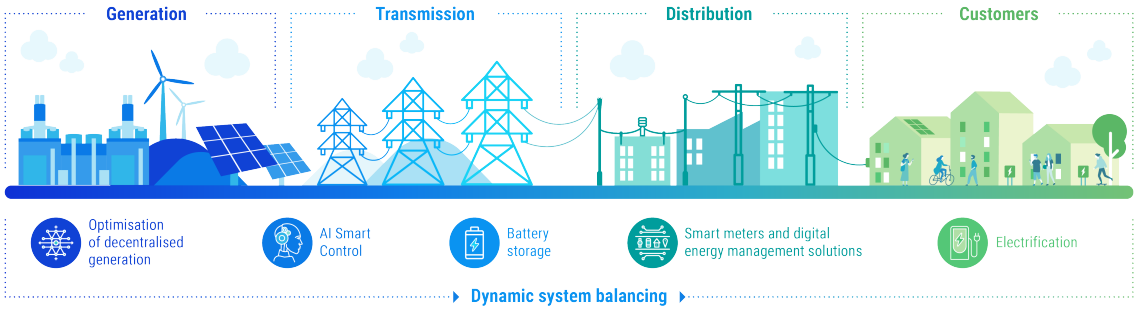
CLP Purpose

To power the sustainable development of communities in which CLP operates by providing reliable and affordable electricity to customers with minimal impact to the environment.

CLP Strategy

To leverage new and emerging technologies to aid the progressive decarbonisation of the CLP portfolio, empower customers in making better energy choices, enhance performance of operations, and to evolve and grow CLP's business along with the transition.

CLP Business model



Where CLP operates

Hong Kong | Mainland China | India | Southeast Asia and Taiwan | Australia

Purpose

The history of CLP mirrors the economic development of Hong Kong and the growth of the Asia-Pacific region. CLP cares not only about shareholders, but also about the communities where it operates.

As an operator and investor in the energy sector in Asia-Pacific for over a century, CLP has been at the forefront of major transformations in the industry and how it serves the markets of the region. In the company's home market of Hong Kong, where CLP was incorporated in 1901, the city has been transformed from a bustling port to a dynamic metropolis on the world stage.

Although the circumstances and CLP's role in each of its markets differ, the Group has an unwavering commitment to its communities:

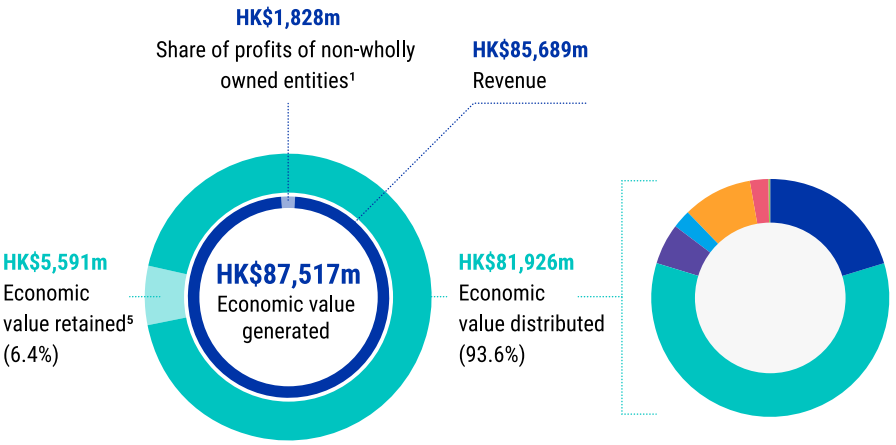
"CLP aims to power the sustainable development of communities in which we operate by providing reliable and affordable electricity to our customers with minimal impact to the environment."

In delivering service, CLP values guide the company's behaviour:

"CLP cares for people, the community and the environment. We care about performance, respect laws and standards and value innovation and knowledge."

The pivotal role of electricity for economic growth and human development cannot be over-emphasised. It is essential for modern infrastructures such as water supply, healthcare, transport and digital technology. Worldwide, 9 out of 10 people now have access to electricity. As CLP operates primarily in developed or emerging economies where access to electricity is almost universal, stakeholders expect more than simply the delivery of safe and reliable energy services.The Company strives to ensure that its electricity is affordable and that it minimises the impact on the environment, in particular greenhouse gas emissions.

CLP emphasises value creation over the long term rather than the short term. The Group's purpose is to do business in a way that also helps serve the communities in which it operates. The value created by the Group is shared amongst different stakeholders in society: in 2019, 93.6% of the economic value CLP generated was distributed to stakeholders, including employees, suppliers and contractors, lenders, shareholders, government and the community at large.



HK$16,712m
Fuel Costs
(Suppliers and contractors)

HK$48,654m
Other operating costs
(Suppliers and contractors)

HK$4,535m
Staff expenses[2] (Employees)

HK$2,033m
Finance costs[3] (Lenders)

HK$7,782m
Dividends (Shareholders)

HK$2,189m
Taxes[4] (Governments)

HK$21m
Donations (Community)

1 Includes share of results (net of income tax) from joint ventures and associates netted with earnings attributable to other non-controlling interests, which represented CLP's share of economic value created together with its business partners.

2 Another HK$1,365 million (2018: HK$1,338 million) of staff costs incurred were capitalised.

3 Finance costs are netted with finance income and include payments made to perpetual capital securities holders. In addition, finance costs of HK$323 million (2018:HK$278 million) were capitalised.

4 Represents current income tax but excluding deferred tax for the year.

5 Represents earnings attributable to shareholders (before depreciation, amortisation and deferred tax) for the year retained.

Strategy

Decarbonisation and digitalisation are at the core of CLP's business strategy, and sustainability is fully integrated into this strategy.

GRI reference: 102-47

The pace of change in the energy industry will continue to accelerate, and disruption will increasingly become the new normal. The linear, traditional electricity sector value chain which stood for decades has morphed into an interconnected, multidirectional mesh of opportunities. Incorporating digital solutions into the core of the energy business will be necessary to master this increasing complexity.

"Against the backdrop of climate change, progressively decarbonising our asset portfolios, empowering our customers in making better energy choices, enhancing performance of our operations, and evolving and growing our business along with the energy transition are fundamental for CLP's strategy."

The Group is committed to a gradual retirement of its coal assets by 2050, and will no longer invest in new coal generation assets. This evolution creates the need to replace the revenue from coal-based generation over time. To this end, CLP is actively pursuing opportunities in clean energy, transmission and distribution, as well as in new energy services.

As part of the transition to a Utility of the Future, CLP has placed sustainability at the centre of its operations, ranging from decarbonisation, adoption of digital technology to talent attraction. As such, CLP does not have a stand-alone sustainability strategy but rather a business strategy to which sustainability is intrinsic.

The table below summarises the topics that are most material to CLP and the reasons why.

Read about other megatrends that are changing CLP's operating environment >

It is clear from generations of experience that it takes time and effort to build and maintain the trusting relationships corporates have with their communities. Across CLP's entire business, the Company seeks to make a contribution to society by leveraging the trust that has been built, and support and collaborate with like-minded organisations to find solutions to mutual challenges together.

Material Topic	Why this is material	How CLP responds
Responding to climate change	Climate change is unarguably the biggest threat CLP is facing. The electric utility industry offers great opportunity to slow down climate change by coupling electrification and decarbonisation: a 2018 report from the Energy Transition Commission projects that increasing the share of electricity to 60% of the total energy mix (up from the current 20%), would help achieve net zero emissions by around 2060.	Read more
Harnessing the power of technology	Digital technologies including artificial intelligence, IoT and big data offer energy companies new ways to enhance performance and serve customer needs. As more renewable energy is introduced into the system, its intermittent nature could pose challenges to system stability and reliability. Digital platforms offer a solution by balancing dynamic customer demand against different generation profiles to optimise cost efficiency, reliability and environmental performance.	Read more
Reinforcing cyber resilience and data protection	CLP's operations are becoming more digital and more information is stored in cyber space. This makes the organisation more vulnerable to cyberattacks. Effective cyber defence becomes fundamental to protect the business. The Group is expected to detect and respond to any incident promptly, and resume normal operations and minimise inconvenience to its customers.	Read more
Building an agile, inclusive and sustainable workforce	Digitalisation and decarbonisation of the energy sector, together with intensifying demographic and labour supply issues and social and political uncertainties, present significant workforce opportunities and challenges. CLP must ensure business continuity through managing generational knowledge transfer; attract and retain the new skills, talents and mindsets of a more diverse workforce; build greater organisational agility; and meet increasing social expectations as a responsible employer.	Read more

Business Model

As a Group, CLP's main focus is on electricity services and its products span the entire value chain from power generation to transmission and local distribution, to gas and electricity retail services supported by smart energy services.

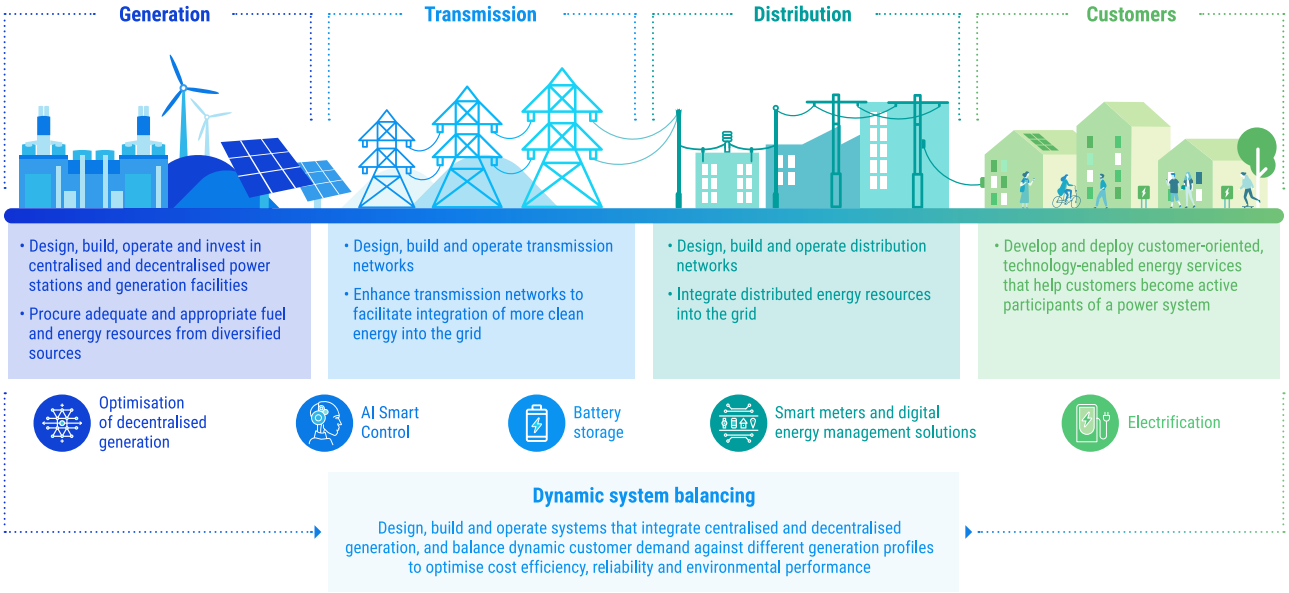
CLP Holdings Limited is headquartered in Hong Kong, where it is listed on the Hong Kong Stock Exchange. Hong Kong is where the largest business operates under the brand of "CLP Power Hong Kong". There are additional business units in Mainland China, India (under the brand of "CLP India"), Southeast Asia, Taiwan and Australia (under the brand of "EnergyAustralia").

In these diverse markets Group companies play different roles across the electricity value chain, depending on local circumstances and market characteristics. Much of the business outside Hong Kong lies in the production of electricity, and all of the business units own sizable generation assets. CLP's generation fleet has a balanced portfolio consisting of coal, gas, nuclear, wind, hydro and solar power facilities. The Group also operates flexible generation assets to manage intermittent and peak demand as well as storage solutions.

In 2019, CLP India entered into the power transmission sector. Through acquisition, 240 km of transmission line has been handed over to CLP India's portfolio in 2019 and the remaining 575 km will be handed over in 2020..

Through the retail businesses in Hong Kong and Australia, CLP serves both commercial and residential customers. Wholesale customers include grid companies in Mainland China and electricity distribution companies and intermediaries in India, which purchase power directly from generating assets.

Electrification and digitisation are changing the electric utilities industry. To capture the opportunities they present, the Group is also deploying various energy services such as battery storage, smart meters and other digital energy management solutions that enable system balancing and the deployment of additional renewable resources.



Portfolio

As of 31 December 2019, the CLP Group companies had 7,960 full-time and part-time employees and a market capitalisation of HK $207 billion. The revenue in 2019 amounted to HK $85,689 million.

CLP's business comprises over 16,000 kilometres of transmission and distribution lines, energy retail activities that serve about 5.15 million electricity and gas customer accounts, and a diversified portfolio of generation assets across five Asia-Pacific markets, using coal, gas, nuclear, wind, hydro and solar. In addition to generation facilities where CLP holds equity interests, the portfolio includes long-term capacity and energy purchase arrangements.

The equity generation capacity in operation and under construction across the Asia-Pacific region stood at 19,238MW as at the end of 2019, which was supplemented by an additional 4,777MW of long-term purchases.

The Group's total electricity sent-out on an equity plus long-term capacity and energy purchase basis decreased to 88,573GWh in 2019 (from 92,333GWh in 2018). The total generation capacity increased from 19,108 MW in 2018 to 19,238 MW in 2019 on an equity basis – and 23,705MW to 24,015MW on an equity plus long-term capacity and energy purchase basis.

Portfolio changes

Under the Climate Vision 2050, CLP is committed to growing its investment in non-carbon emitting energy projects across the Group. In 2019, the Group continued to make significant progress: Generation from non-carbon energy sources contributed 24% of operating earnings (before unallocated expenses), amounting to HK$2,948 million, while capital investments (on accrual basis)[1] in non-carbon energy sources was 8% of total capital investment or HK$967 million.

In addition, non-generation related activity from transmission, distribution, retail and Others delivered 44% of operating earnings, or $5,482 million, while capital investment in these asset types amounted to HK$5,498, representing 46% of total capital investment.

Below are the main changes in the portfolio this year:

- upgrade of gas turbines in Hong Kong Black Point Power Station (25MW addition)
- upgrade of gas turbine in Hallett Power Station, Australia (30MW addition)
- Coleambally Solar Farm (105MW) and Bodangora Wind Farm (67.8MW) in Australia commenced operations in January and April respectively
- acquisition of remaining equity of Veltoor and Gale wind farms (45.9 equity MW) and commissioning of a new solar farm in China (36.13 equity MW)
- acqusition of 815 km of transmission assets in Inda, of which 240km of trasmission line has been handed over to CLP India's portfolio in 2019, and the remaining 575 km will be handed over in 2020; CLP India has also successfully bid for a 250MW wind project at Sidhpur

[1] Capital investments include additions to fixed assets, right-of-use assets and intangible assets, investments in and advances to joint ventures and associates, and acquisition of business.

Generation

Coal | Gas | Nuclear | Wind | Hydro | Solar | Other

Other Energy-related Business

Transmission & Distribution Network | Customer Service | Other

Renewable Energy and Energy Storage Long-term Purchase

Wind | Solar | Storage

Assets wholly or majority-owned and/or where CLP has majority long-term purchase agreements

Assets in which CLP has no majority shareholding and/or majority long-term purchase agreements

This map is for graphical illustration only. Please refer to the 2019 Annual Report for details of CLP's equity share and long-term purchase arrangements.

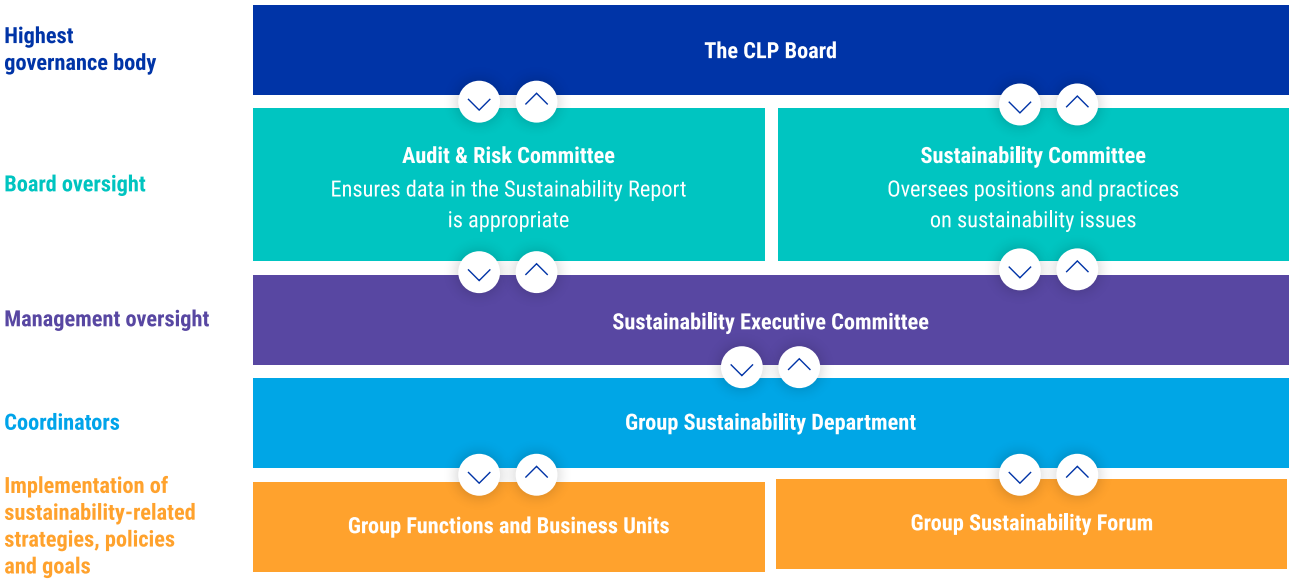
Find out more about CLP's assets and services

View the list of CLP's assets in the Annual Report

Sustainability governance

Overview

A strong governance framework is key to ensuring that the sustainability issues CLP faces are incorporated into the corporate agenda.



Board oversight

The CLP Board has overall responsibility for CLP's ESG strategy and reporting. The governance of sustainability is integrated into the corporate governance structure throughout the Group – from Board-level committees to management-level Group functions and business units.

As one of the Board Committees, the Sustainability Committee has a primary role in overseeing the management of the Group's sustainability issues and is supported by the Sustainability Executive Committee. The Audit & Risk Committee retains oversight and responsibility for short-term business risks and for the assurance of sustainability data.

Read more on Corporate Governance >

In 2019, the two committees as well as the Board spent significant time in consideration of the impact of climate change on CLP:

- **Climate Vision 2050** – This included the consideration of how CLP should be managing its portfolio and projects in light of the risks and opportunities brought by climate change. In reviewing the revised Climate Vision 2050 publication, the Sustainability Committee and the Board not only considered the drafting of the documentation itself, but also the implications, both short term and long term, for the Group's underlying portfolio and projects.
- **Task Force on Climate-related Financial Disclosure (TCFD)** – Another important climate-related work stream was the TCFD disclosures and scenario analysis, where the Sustainability Committee studied and examined the ongoing work in this area. The Committee recognised that this remained a developing area and supported management's work with other electricity utilities and consultants to formulate accurate and meaningful climate-related financial disclosures. The Audit & Risk Committee was briefed on the preparatory work that CLP was doing in the area of the TCFD and the proposed engagement of a consultant to assist CLP in developing the relevant scenarios which would form the basis of the disclosures.

Sustainability Committee

The Sustainability Committee oversees positions and practices on sustainability issues, principally in relation to social, environmental and ethical matters that affect shareholders and other key stakeholders.

The Committee's objective is to oversee management and advise the Board on matters required to enable:

- the CLP Group to operate on a sustainable basis for the benefit of current and future generations;
- sustainable growth by maintaining and enhancing CLP Group's economic, environmental, human, technological and social capital in the long term; and
- the effective management of CLP Group's sustainability risks.

In particular, the Committee reviews and evaluates the adequacy and effectiveness of CLP Group-level frameworks including the Sustainability Framework, Climate Vision 2050, HSSE Framework, and the Responsible Procurement aspects of CLP's Procurement Framework.

Terms of Reference of the Sustainability Committee

Between 1 January 2019 and the date of this report, the Committee met four times (including three times in 2019 and once in 2020). Below is a summary of how the Committee spent its time during the periods.

Read the full report on the Sustainability Committee's activities for 2019

Looking ahead, the Committee will strengthen its role and place a stronger emphasis on overseeing the impact on the Group's strategy of longer-term emerging sustainability issues. This will ultimately support the CLP Group's objective to operate on a sustainable basis for the benefit of current and future generations.

Overview of work conducted by the Sustainability Committee in 2019

	2019			2020
	February	September	November	February
Sustainability matters – risks, opportunities and emerging issues	✓	✓	✓	✓
Sustainability reporting / ESG indices performance	✓	✓	✓	✓
Health, Safety, Security and Environment		✓		
Community investment activities	✓			✓

Audit & Risk Committee

A key responsibility of the Audit & Risk Committee (ARC) is to maintain oversight of CLP's financial control, risk management and internal control processes, by ensuring that adequate systems are in place and followed.

Risks are managed at both the strategic and operational levels to support the long-term sustainability of growth objectives, while at the same time supporting the operational needs of the current business.

In relation to sustainability issues, the ARC is responsible for ensuring the data in the Sustainability Report is appropriate, including assurance of the accuracy of metrics and reporting. CLP's independent auditor is also responsible for assuring key ESG data, and their findings and observations are presented to senior management and the Board through the ARC.

Terms of Reference of the Audit and Risk Committee

Read the full report on the ARC's activities for 2019

Management roles

Sustainability Executive Committee

The Sustainability Executive Committee (SEC) has the strategic responsibility to assess and manage sustainability issues.

The SEC is chaired by the CEO as part of the role's executive-level responsibility for economic, environmental and social matters. Set up in 2016, it comprises the corporate senior management team of:

- Mr Richard Lancaster (Chief Executive Offer), Chairman, also Chairman of the Sustainability Committee;
- Ms Quince Chong (Chief Corporate Development Officer), also a member of the Sustainability Committee;
- Mr Geert Peeters (Chief Financial Officer);
- Mr David Smales (Chief Operating Officer), who was appointed in October 2019 following the retirement of Mr Derek Parkin in September 2019;
- Mr David Simmonds (Group General Counsel & Chief Administrative Officer); and
- Ms Eileen Burnett-Kant (Chief Human Resources Officer), who was appointed in September 2019 following the retirement of Mr Roy Massey in June 2019.

Full biographies of the members are set out on the Group's website

The SEC steers the sustainability strategy of the Group and approves relevant deliverables. In 2019, the Committee convened six times, including before each Sustainability Committee meeting. These meetings provide a platform for the executive team to initiate or develop strategic sustainability projects, shape and receive progress updates on current projects and to engage in strategic discussions on emerging issues. Four of the meetings in 2019 reviewed and advised on strategic sustainability projects, and the other two meetings were designed as special topic workshops to deep dive into emerging issues. Meetings are facilitated by CLP's Director – Group Sustainability.

Key themes discussed in 2019 included:

- climate change-related risks and opportunities, and CLP's response to the TCFD recommendations, including the development of climate scenarios for further analysis;
- Climate Vision 2050 and CLP Group's strategy in decarbonisation, including the strategic decision not to add additional coal-fired power generation assets to the CLP portfolio and the commitment to convert CLP's vehicle fleet to electric under EV100;
- enhancement of labour practices amongst the workforce and supply chain;
- response to ESG-related public consultation;
- performance on key sustainability indices and how benchmarking results can drive improvements in operational performance;
- preparation and development of the Sustainability Report, including reporting standards and the assurance of key metrics.

The CEO and CFO also hold management responsibilities for the assurance of ESG data, and jointly sign off the General Representation Letter connected with the assurance process.

Group Sustainability Department

The Group Sustainability Department (GSD) is led by Director – Group Sustainability and delivers regular reports to and seeks guidance from the SEC and Sustainability Committee.

GSD aims to embed sustainability into existing processes and systems by informing the development of the business strategy and planning processes. The department monitors sustainability issues and informs the SEC and Sustainability Committee of emerging risks and opportunities. It leads corporate reporting on sustainability and facilitates identifying improvement areas for operational performance. GSD also manages the Group's climate change strategy, including reporting the progress on Climate Vision 2050 and TCFD implementation.

GSD is also tasked with developing capacity within the organisation to better manage emerging sustainability risks and opportunities material to the business. It communicates and works closely with other Group functions and business units via the Group Sustainability Forum; a quarterly meeting to share experiences in operationalising sustainability across the Group and to communicate CLP's sustainability vision internally. Awareness raising activities and events are also being held regularly.

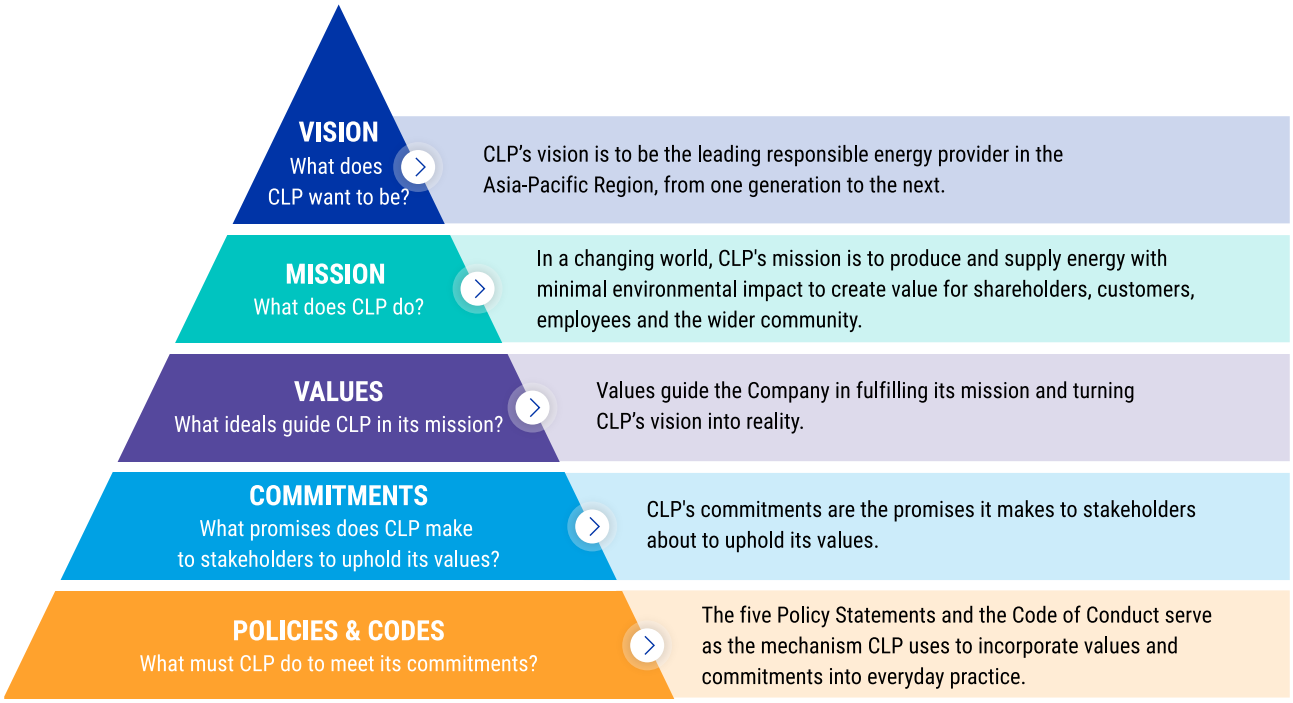
Guiding principles

Value Framework

CLP's Value Framework reflects the moral compass of the Company, articulating the Group's values, as well as its vision, mission and commitments to stakeholders.

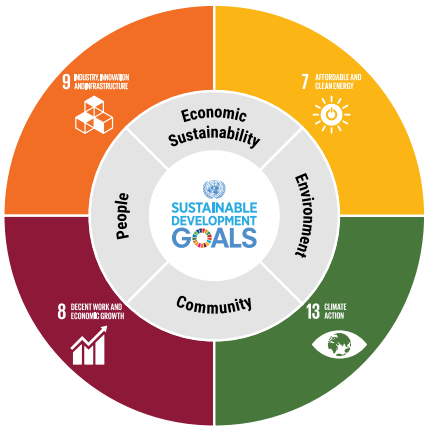
Holding true to a set of deep-rooted and enduring values is particularly important in a fast-changing environment. It helps navigate an ethical way forward in both good and turbulent times. When making any business decision, CLP is guided by the simple idea of 'doing the right thing'. It has helped establish mutually beneficial relationships with stakeholders, avoided the unnecessary risks that arise from short-termism, and has been proven to support CLP's success from one generation to the next.

See CLP's Value Framework and Code of Conduct



SDG Alignment

CLP has prioritised four of the 17 SDGs considered most relevant, and where the Group can make a significant impact.



In 2015, inspired by the announcement of the United Nations Sustainable Development Goals (SDGs), CLP developed its set of Sustainability Principles to guide the Group's activities and better align business objectives with value creation. These Principles cover four focus areas: community, people, environment and economic sustainability, and the prioritised SDGs are aligned with these areas.

Read the CLP Sustainability Principles

In 2019, CLP joined the WBCSD SDG Sector Roadmap working group for electric utilities. This project aims to identify key areas under the SDGs that are of the highest relevance and outlines how the utility sector can best achieve the SDGs. CLP aims to integrate key findings from this work into its operational performance and report accordingly in future cycles.

SDG 13 – Climate Action and SDG 7 – Affordable & Clean Energy

Climate Vision 2050, is the CLP Group's commitment to responding to climate change. CLP's decarbonisation and clean energy targets are in support of SDG 13 and SDG 7 respectively.

- **Decarbonisation targets:** a set of decadal carbon intensity reduction targets spanning out to 2050;
- **Clean energy targets:** renewable and non-carbon emitting capacity targets for 2020 and 2030.

Find out more about Climate Vision 2050

Read more on Responding to climate change

SDG 8 – Decent Work & Economic Growth

SDG 8 makes specific reference to equal pay for work of equal value, which is a target CLP has set to support internal gender diversity initiatives.

CLP has also developed a set of targets to help widen the pipeline of female employees to support the Group's future business strategy:

- **Women in Leadership (WIL) target:** Achieve gender balance in leadership positions by 2030 against a 2016 baseline of 22%;
- **Women in Engineering (WIE) target:** 30% of engineers to be female by 2030 compared to a 2016 baseline of 9%;
- **Ensuring equal pay for work of equal value** is maintained in all CLP Group businesses, that any gender pay equity gap is eliminated, and that CLP meets all relevant local compliance and disclosure standards.

Read more on Building an agile, inclusive and sustainable workforce

SDG 9 – Industry, Innovation & Infrastructure

Digitalisation is core to the CLP business strategy, underscoring commitment to Innovation under SDG 9.

As CLP's digitalisation journey evolves and the Group Innovation function begins to capitalise on the investments made into the changing global energy industry, the Group continues to review relevant metrics and targets which measure progress in support of SDG 9.

Read more on Harnessing the power of technology

Key sustainability ratings and awards

Key sustainability ratings

CLP has maintained its standing in key sustainability ratings. The performance scores received in 2019 were based on 2018 calendar year performance data.

MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM

Dow Jones Sustainability Asia Pacific Index

The DJSI is a globally recognised index which includes companies from a wide spectrum of industries. Inclusion in DJSI is based on a company's score in the RobecoSAM's Sustainability Assessment Methodology. CLP has been a constituent of the Dow Jones Sustainability Asia Pacific Index (DJSI Asia Pacific) and Dow Jones Sustainability Asia Pacific 40 Index (DJSI Asia Pacific 40) since the launch of both indices in 2009.

	2019	2018[1]	2017
Company score	73	69	70
Electric utilities industry average score	45	46	50
Asia-Pacific average score	64	60	67

1 The introduction of a revised scoring methodology means the result cannot be compared directly with that of the previous year.

Hang Seng Corporate Sustainability Index Series Member 2019-2020

Hang Seng Corporate Sustainability Index

The Hang Seng Corporate Sustainability Index helps the market better understand CLP's sustainability performance relative to other Hong Kong and Mainland Chinese companies listed on the Stock Exchange of Hong Kong. CLP has been listed on the Hang Seng Corporate Sustainability Index and Hang Seng (Mainland China and Hong Kong) Corporate Sustainability Index since their inception in 2010. HKQAA conducts the assessment and provides a rating for assessed companies.

	2019	2018	2017
HKQAA Rating	AA-	AA-	A+

FTSE4Good

FTSE4Good

The FTSE4Good Index Series is designed to measure the performance of companies demonstrating strong Environmental, Social and Governance (ESG) practices. CLP was included in the FTSE4Good Index in June 2018.

	2019	2018	2017
Overall Scores	3.7	4.0	3.3

2019 Constituent MSCI ESG Leaders Indexes

MSCI ESG Leaders Indexes

CLP has been included in the MSCI ESG Leaders Indexes (previously MSCI Global Sustainability Indexes) since 2015.

	2019	2018	2017
Overall Scores	AA	AA	A

CDP

CDP, formerly Carbon Disclosure Project, runs a global disclosure system for companies, cities, states and regions to measure and manage their environmental impacts. CLP has provided data for CDP – Climate Change since its launch in 2002, and currently discloses through the Climate Change and Water initiatives.

	2019	2018	2017
CDP Climate Change Score	B	B	B
CDP Water Score	B-	B	A

Key ESG awards

In addition to being benchmarked by global sustainability indices, CLP has also received awards and recognition over 2019 for its sustainability reporting and performance. These are the key awards which recognised CLP.

Best Corporate Governance Awards – Sustainability and Social Responsibility Reporting Award

Hong Kong Institute of Certified Public Accountants

For the ninth successive year, CLP received a Sustainability and Social Responsibility Reporting Award in the Best Corporate Governance Awards presented by the Hong Kong Institute of Certified Public Accountants.

Hong Kong Sustainability Award and the Sustainability Reporting Award

The Hong Kong Management Association

CLP was bestowed with The Hong Kong Management Association's Sustainability Reporting Award in the general category for the eighth successive year since the award was introduced in 2012. CLP also won a Sustainability Award which recognises organisations that demonstrated due consideration to the economic, social and environmental aspects of sustainability, while achieving good business and organisational performance.

Sustainability Reporting Award – Private Sector and Gold Award

Australasian Reporting Awards

The 2018 CLP Sustainability Report won the Sustainability Reporting Award – Private Sector, along with a Gold Award. Besides, the 2017 Sustainability Report was named the winner of the Joint ARA-Hong Kong Management Association Award for Sustainability Reporting.

BDO ESG Awards

BDO Hong Kong

CLP won the ESG Report of the Year, Best in ESG and Best in Reporting awards in the Large Market Capitalisation category.

Best ESG Materiality Reporting (Large Cap) Award

IR Magazine

CLP won the Best ESG Materiality Reporting (Large cap) Award of IR Magazine Awards, Greater China 2019. This award recognises the achievement of companies that produce clear investor-facing communications about ESG issues that are material to their business.

Sustainability Leaders Award – Mega Large Business, Process Sector

Frost & Sullivan and The Energy and Resources Institute (TERI)

The Award recognises companies that are well equipped to respond to the emerging opportunities and risks resulting from sustainability trends, based on a comprehensive assessment process, involving interviews with senior management and front line staff over a three-day period. CLP India was named the Sustainability Leaders in the Mega Large Business category.

Material Topics

Building a Utility of the Future

Decarbonisation at CLP is fundamental to the Company's business strategy. CLP's governance process enables the Company to manage the increasing impacts of physical climate change and the associated transition risks. Alongside this, digitalisation allows CLP to deploy innovative technical solutions that improve energy efficiency and help to safeguard the company's assets. And underpinning these two trends, CLP is transforming into an organisation that relies on an agile, inclusive and sustainable workforce.

GRI reference: 102-44, 102-47

The following sections contain a discussion of how these material topics relate to the company's value proposition, and how CLP is seeking to address these challenges. For a discussion of how CLP makes use of different capitals to address the challenges and opportunities outlined here, please refer to the Capitals section in the Annual Report.

MATERIAL TOPICS

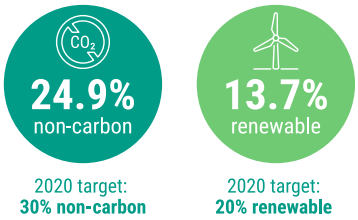
Responding to climate change

Responding to climate change

Investment in transition enablers

- **1m+** Smart meters
- **500+** Electric vehicle charging points
- **118MW** in contributions to demand response programmes
- **8.7GWh** generated through Feed-in Tariff scheme in Hong Kong

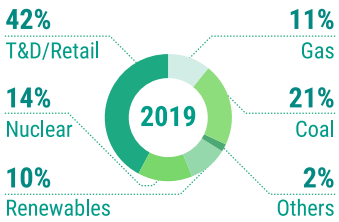
Renewable and non-carbon emitting energy capacity



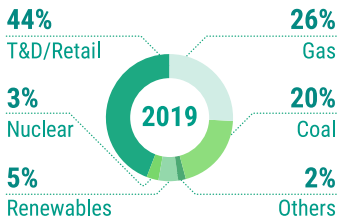
2020 target: **30% non-carbon**

2020 target: **20% renewable**

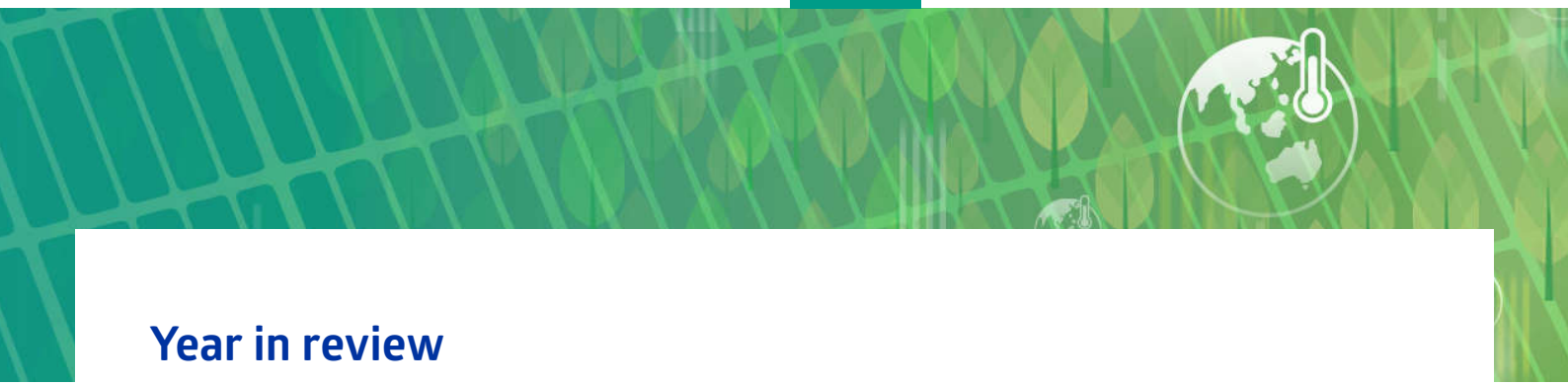
Operating earnings (before unallocated expenses) by asset type



Capital investments (on accrual basis) by asset type



Trajectory of CLP Group's carbon intensity



Year in review

The last year has seen unprecedented pressure on government and business for more ambitious climate action.

The "school strikes for climate" initiated by Greta Thunberg, a determined Swedish teenager, now have a global following of climate activists. Others resorted to different tactics such as the non-violent civil disobedience movement started by Extinction Rebellion. Investors and asset managers have also realised the gravity of the "climate emergency" and are increasingly focused on the materiality of climate-related financial risks to businesses. Pressure on companies to enhance their disclosure in accordance to the recommendations of the Task Force for Climate-related Financial Disclosure (TCFD) has gained significant momentum.

At CLP, mitigating the Group's impacts on climate change is firmly embedded within the business strategy. Board and Senior Management oversight on climate issues is integrated into the organisation's governance and enterprise risk management system. Set in 2007, the Climate Vision 2050 provides the entire CLP Group with a clear trajectory to guide its transition towards a sustainable, low-carbon future, and CLP is firmly committed to SDG 7 and 13 as part of this strategy.

The Group has enhanced its disclosure on climate issues this year and structured the discussion based on the four pillars of the TCFD's recommendations. This will help stakeholders better understand how the Group manages climate-related risks and opportunities, their impact on the business as well as the progress in managing these risks. CLP's Climate Vision 2050 was used as the basis for conducting preliminary scenario analysis to assess the ongoing impact of climate change to the business.

The CLP Group has also enhanced how it measures its climate impact and actions through new quantitative metrics. The Group is now detailing how it will be meeting its 2050 targets going forward, including how much is being invested in different fuel types as well as different energy transition enablers. In 2019, the Group's carbon intensity has decreased to 0.62kgCO_2/kWh, and the proportions of renewable and non-carbon emitting energy of the generation portfolio have increased to 13.7% and 24.9%, respectively. In addition to direct emissions, a comprehensive review of the Group's GHG profile was conducted to measure and manage the carbon footprint along the value chain. For the first time, CLP is disclosing its scope 1, 2 and 3 emissions on an equity basis to provide a more comprehensive overview of its carbon footprint.

The lack of concrete actions from COP25 in Madrid does not impede CLP's ambition to make decarbonisation a reality. To the contrary, CLP will continue to enhance its engagement and partnerships with stakeholders in the transition towards a low-carbon future.

Key metrics

0.62 kgCO_2/kWh

CLP Group's carbon intensity in 2019

Non-carbon emitting energy capacity

Renewable energy capacity

Outlook

The year 2020 will be an opportunity for an interim review of CLP's Climate Vision 2050 and its decarbonisation and clean energy targets.

The lack of significant progress for climate action at COP25 in Madrid may take more time to resolve. Regulatory certainty that supports long-term investment for a low carbon transition is not yet fully in place in many markets. Nevertheless, addressing climate change by decarbonising the Group portfolio will remain a principal focus for CLP's future business development.

CLP is on track to achieve its emission intensity targets, while there remain some challenges in meeting the clean energy targets. Progress has been made in diversifying the Group's portfolio of generation assets by fuel type and geography, but the 2018 strategic partnership with CDPQ in India along with the slower uptake of renewable energy in other key markets has slowed growth in the renewables portfolio in the short term.

The updated Climate Vision 2050 commits the Group not to invest in any additional coal-fired generation assets, and phase out coal from all operations by 2050. There is also a strong commitment to revisit the commitments and targets made under the Vision, and to progressively strengthen them. As a way to track the progress of the targets, CLP will benchmark its ambitions against the globally recognised Science Based Targets initiative backed by the United Nations and accepted internationally.

The decarbonisation of the generation portfolio is only one component in the Group's vision. CLP sees significant growth opportunities in emerging low carbon technologies in transmission and distribution, electric vehicles and smart services.

CLP will also be taking additional steps to further refine its climate scenario analysis, as part of an effort to update the enterprise risk management register on a longer-time horizon. This will enable the enhancement of not only the TCFD-related financial disclosure but also the further integration of climate risks and opportunities into long-term business planning and investment decisions.

Climate Vision 2050

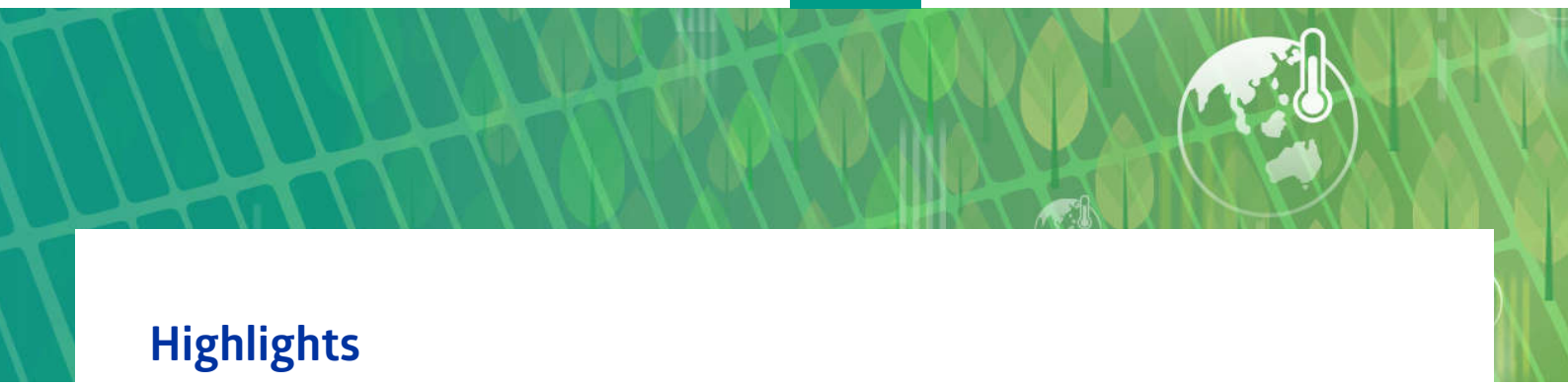
The new publication chronicles how CLP's Climate Vision 2050 has evolved over the years. It is integrated into CLP's strategies on asset portfolio management, guiding the Group in managing climate-related opportunities and risks.

Read more

Response to TCFD

As part of CLP's participation in the WBCSD TCFD Preparer Forum for Electric Utilities, the Company has undergone a comprehensive review of how the recommendations are met and has adjusted its disclosure accordingly.

Read more below



Highlights

CLP's disclosure following TCFD recommendations, the Company's progress against Climate Vision 2050, and their investments that facilitate the transition to a low carbon economy.

Climate-related financial disclosure

By following the recommendations from the TCFD, CLP seeks to disclose transparent, reliable and consistent climate-related information to stakeholders, including capital providers.

In July 2019, the World Business Council for Sustainable Development (WBCSD) published the implementation guide of the TCFD Electric Utilities Preparer Forum. CLP took part in this Forum along with five of its peers to review disclosures and share best practices for the electric utility sector in aligning with TCFD recommendations.

In this year's report, CLP has enhanced further its disclosures in line with what constitutes effective disclosure across the four TCFD areas as recommended by the Forum. Climate change is considered in a holistic way in the business strategy, and is therefore embedded in the governance and management processes and discussed in the relevant sections.

The index table outlines where to find the key elements of how CLP responds to the TCFD recommendations in this report:

Governance	· Sustainability Governance
Strategy	· Climate Vision 2050 (see new publication) · Climate-related scenarios (see below)
Risk management	· Risk Management
Metrics and targets	· Progress towards Climate Vision 2050 targets · How CLP creates value in the low-carbon transition · Investing in climate enablers

Find out more on other climate change-related disclosures >

CASE STUDY

Governance highlights

The Sustainability Executive Committee (SEC) has the strategic responsibility to assess and manage sustainability issues.

It is chaired by the Group Chief Executive Officer and leads and oversees all matters related to sustainability in the CLP Group. David Simmonds, Chief Administrative Officer is responsible for CLP's climate change strategy on the SEC.

Focusing on CLP's implementation of the TCFD recommendations, a cross-functional working group covering key markets identifies, analyses and manages the climate risks and opportunities. This is coordinated by Group Sustainability with participation from fleet management, renewable energy, finance, risk management and investors relations. A broad range of other business functions are also engaged in the process, including business development and planning, legal and policy, innovation, health and safety, environment, human resources, as well as representatives from each business unit.

The SEC reviewed the material risks and opportunities across all key markets and selected scenarios. The SEC will also consider the steps to be taken next to further evaluate the impacts of scenarios on Climate Vision 2050.

Read more on CLP's sustainability governance >

CASE STUDY

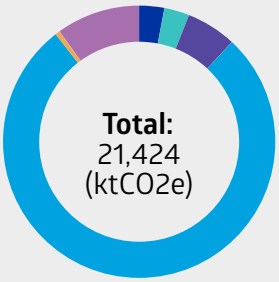
Understanding carbon emissions along CLP's value chain

Most of CLP's carbon footprint arises from electricity generation.

As a result, the greenhouse gas profile and disclosure has been focused on the Scope 1 and 2 emissions. To create transparency and to better manage the carbon footprint of the supply chain, CLP has conducted a comprehensive review of the Scope 3 emissions on an equity basis and will start reporting on this going forward.

Seven out of the 15 Scope 3 categories are considered relevant to CLP. Fuel- and energy-related activities, use of sold products and capital goods are the three that contribute the biggest carbon footprint under Scope 3. Find out more here.

Scope 3 GHG emissions by category



- 1a - Purchased goods and services (products) (3%)
- 1b - Purchased goods and services (non-products) (3%)
- 2 - Capital goods (6%)
- 3 - Fuel- and energy-related activities (78%)
- 5 - Waste generated in operations (0.5%)
- 6 - Air travel (0.04%)
- 7 - Employee commuting (0.02%)
- 11 - Use of sold products (10%)

Climate scenario analysis

The TCFD recommendations call for businesses to consider the resilience of their strategies against climate-related scenarios.

CLP has taken steps to consider the resilience of Climate Vision 2050 against the climate-related scenarios outlined below. These scenarios describe alternative outcomes to enable the Group to carry out deeper analysis of potential physical and transition changes. CLP will continue to monitor the operational landscape to better understand the uncertainty that is embedded within these scenarios.

Scenario	Example trends[1]
Warming of 3-4°C by 2100 (based on IPCC Representative Concentration Pathway 8.5 and IEA Stated Policies Scenario (STEPS))	· Emissions continue to rise, peaking after 2040 and resulting in warming reaching 3-4°C by 2100 · In Australia, the highest monthly rainfall over a 10-year period decreases by 0.7mm by 2050 compared to historic averages[2] · In India, the number of extreme hot days with temperatures above 40°C increases by 23 days per year by 2050 compared to historic averages · Renewables have a 44% share of global electricity generation by 2040 · Carbon pricing reaches USD $36 per tCO2 by 2040[3]
Warming of 1.5-2°C by 2100 (based on IPCC Representative Concentration Pathway 4.5 and IEA Sustainable Development Scenario (SDS))	· Emissions decline from 33 gigatonnes (Gt) in 2020 to less than 10 Gt by 2050, in line with the Paris Agreement to limit warming to 1.5-2°C by 2100 · In Australia, the highest monthly rainfall over a 10-year period increases by 10mm by 2050 compared to historic averages · In India, the number of extreme hot days with temperatures above 40°C increases by 16 days per year by 2050 compared to historic averages · Renewables have a 67% share of global electricity generation by 2040 · Carbon pricing reaches USD $125-140 per tCO2 by 2040

1 Physical climate event figures averaged across CLP Markets of Hong Kong, Mainland China, Australia and India.
2 Historic average references years 1986 to 2005.
3 Mainland China only.

When developing these scenarios, CLP has identified a set of tailored climate-related risks and opportunities relevant to its assets and services across key markets. This exercise referenced third party energy and climate models to understand the scenarios under which these risks and opportunities may be most significant. Scenarios with the most complete qualitative and quantitative coverage of the risks and opportunities identified as material to CLP have been selected for further consideration. These risks and opportunities and how CLP responds are discussed throughout the report, and the summary table below provides easy reference to the relevant sections:

	Risks	Opportunities
Short term (0-1 year)	· Physical risks from extreme weather events · Securing the skills and capability required to implement the climate strategy	· New products and services to help communities decarbonise · Technologies to enhance the performance of the renewable assets
Medium term (1-5 years)	· New regulatory requirements in relation to climate change	· Transitioning to low-carbon energy in Hong Kong to meet the Government's decarbonisation targets · Opportunities arising from transition enablers · Energy management solutions to enhance efficiency at a systemic level, for instance in building smart cities
Medium to long term (5+ years)	· Potential stranded fossil fuel assets	· Growing the non-carbon portfolio to reach the Climate Vision 2050 targets

CASE STUDY

Risk management highlights

Climate-related risks are embedded in CLP's risk management process and risk register. They are identified, assessed and managed alongside all other types of risk as part of the Risk Management Framework.

CLP has established risk profiling criteria to help assess and prioritise each identified risk according to its consequence and its likelihood. Currently, CLP categorises its risk profile into shorter-term regulatory, financial, market, commercial, and industrial & operational risks. To further align with the TCFD, CLP tracks these top-tier risks with the two main climate change-related risk drivers: physical and transition. Examples of physical risks include extreme climate events such as cyclones, bushfires, floods and shifts in climate patterns. Transition risks include policy and legal, innovative technologies, market and reputation shifts. Going forward, the Group is developing an additional risk register that tracks risks and opportunities on the basis of longer-term physical and transition changes.

Read more from the Risk Management Report

Scenario analysis supplements CLP's current risk management processes for climate-related risks and opportunities by providing a longer-term, forward-looking perspective to assessing climate resilience. The scenarios were selected for the purpose of evaluating the impact that climate-related risks and opportunities would have on the business and future financial performance.

The most material risks and opportunities were identified based on their potential impact to the business and the anticipated level of market disruption they may cause.

- The potential impact to the business was analysed based on a longer-term view of what the business would look like aligned with the Climate Vision 2050. Considering the megatrends affecting CLP, the expected changes in the utility sector in the coming decades and progress in the decarbonisation journey, this was deemed more appropriate than comparing it against what the business looks like today.
- The basis for anticipated market disruption was formed from a review of 10 providers of energy, climate and technology scenarios, enabling in-depth discussions amongst a wide range of stakeholders. Material risks and opportunities from CLP's key markets including Hong Kong, Mainland China, Australia and India were consolidated at the Group level.

Moving forward, CLP will continue efforts in refining methodologies and tools for climate risk analysis to maintain a comprehensive and up-to-date understanding of the Group's exposure to material climate-related risks and opportunities and the resilience of current strategy.

Progress towards Climate Vision 2050 targets

CLP continues to make progress towards its decarbonisation targets. In 2019, Group carbon intensity was 0.62kgCO_2/kWh, but meeting the 2020 clean energy targets continues to be challenging.

Climate Vision 2050, first launched back in 2007, is integrated into CLP's strategies on asset portfolio management, including acquisitions and divestments, guiding the Group in managing climate-related opportunities and risks. The last target review was announced in 2018, and CLP recently published the updated Climate Vision 2050, pledging not to invest in any additional coal-fired generation capacity and to progressively phase out all remaining coal assets by 2050. Furthermore, the Group committed to reviewing its targets no less than every five years. These commitments underscore CLP's continued determination to play a part in combating climate change challenges.

Download the updated Climate Vision 2050

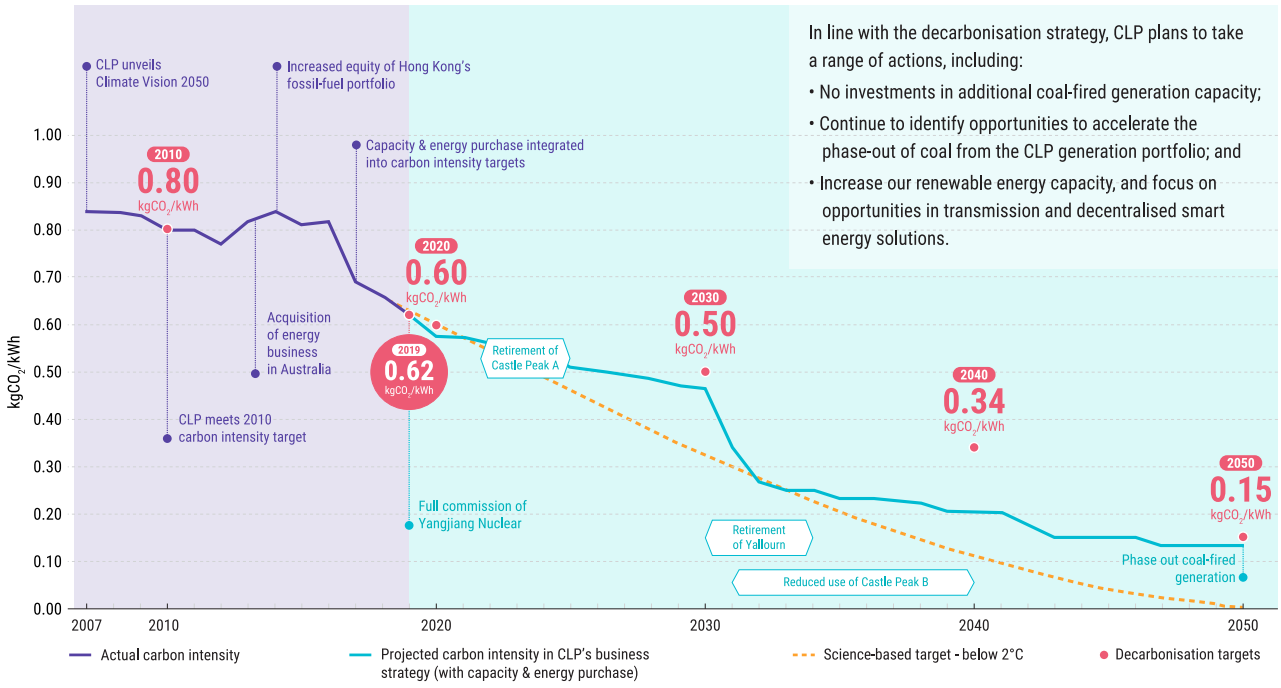
	Carbon intensity ($kgCO_2$/kWh)	Renewable energy capacity (% of total capacity)	Non-carbon emitting energy (% of total capacity)
2020 Targets	0.6	20%	30%
2019 Performance	0.62	13.7%	24.9%

CLP is on track to meet the 2020 carbon intensity target. The Group's carbon intensity decreased to 0.62kgCO_2/kWh in 2019 as compared to the 2018 level of 0.66kgCO_2/kWh. This was mainly contributed by a decrease of total carbon emissions from coal-fired plants, further commissioning of Yangjiang Nuclear Power Station's sixth and final unit since July 2019, an increase of output from renewable assets, as well as additional long-term purchase arrangements in Australia.

There were several major capital investments in 2019 that contributed to the growth of non-carbon portfolio, thereby helping to reduce carbon intensity. Find out more about CLP's portfolio here.

The trajectory of CLP Group's carbon intensity has been updated, in line with the current business plan and long-term decarbonisation strategy. This is presented alongside the Sectoral Decarbonisation Approach (SDA) trajectory of the Science Based Targets initiative (SBTi). This transparent comparison will help CLP stay on course to accelerate the transition to a science-based target.

CLP Group's carbon intensity



Note: The plant retirement timeframes are indicative only.

CASE STUDY

Reducing emissions in Hong Kong

The new CCGT unit at Black Point power station is expected to be in operation in 2020.

CLP's carbon intensity will steadily decrease in the coming years.

The main reduction would come from projects in Hong Kong:

- A new 550MW gas-fired generation unit at Black Point power station featuring combined cycle gas turbine (CCGT) technology is expected to be in operation in 2020. The new unit will assist Hong Kong in achieving the Government's target of increasing the share of gas to around 50% of the fuel mix by 2020. Another gas-fired unit of similar capacity is also planned for commissioning by 2023. The two units will contribute to the gradual phase-out of the oldest coal-fired units at Castle Peak Power Station which are expected to reach the end of their operating life in the mid-2020s.
- Construction of the largest landfill gas power generation system in Hong Kong at the West New Territories Landfill began in 2018. It would be in full operation in 2020 with generation capacity at 10MW. Subject to the availability of additional un-utilised landfill gas, expansion will be further assessed.

Crucial to enhancing the diversity and security of natural gas supply, CLP is now preparing for the construction of an offshore liquefied natural gas (LNG) terminal that will provide a long-term alternative source of gas to meet increased demand. The Government of Hong Kong has approved the Environmental Impact Assessment of the project and granted an environmental permit in October 2018. Progress has also been made in finalising the contractual arrangements for the supply of LNG and the chartering of the Floating Storage and Regasification Unit (FSRU) vessel for the project, which is expected to complete construction before the end of 2021.

The Clean Energy Transmission System connecting the CLP grid to Guangdong is planned to be strengthened by 2025, enhancing the accessibility to clean energy resources to help reduce fossil fuels use in Hong Kong.

Carbon intensity data for CLP Power Hong Kong is available here ›

Hong Kong offshore LNG terminal

WATCH VIDEO ▶

CASE STUDY

Challenges along EnergyAustralia's decarbonisation journey

For over 100 years, Australia's economic growth has been powered by an abundance of thermal coal.

Regions have developed around coal basins and transmission infrastructure has connected this power source to metropolitan centres and manufacturing facilities. While Australia is similarly endowed with excellent solar and wind resources, there are many technical, social and economic challenges in transitioning away from fossil fuels.

The evolution of Australia's energy system has begun, and an ageing coal fleet ensures it will continue. Increasingly, new technologies and community and government ambitions to reduce emissions are changing the mix of energy sources.

EnergyAustralia is committed to reducing GHG emissions in Australia by progressively phasing out coal-fired power, while integrating new, cleaner supplies of electricity. The phase-out of coal fired power should be done over a timeframe that provides for a carefully managed transition.

Blackouts in southern parts of Australia through extreme summer heat in early 2019 illustrate how finely balanced the system is and how little reserve electricity is available. The retirement of several major coal-fired power stations in Australia over recent years, without replacement dispatchable generation, has undeniably reduced the electricity system's ability to provide reliable power. Collaboration between businesses, communities, government and unions will be required to transition at least cost with minimal disruption to people and the economy.

EnergyAustralia has committed to provide at least five years' notice before closing Yallourn power station.

EnergyAustralia plans to run Yallourn Power Station to the end of its technical life in 2032, or as long as policy and regulation permit, and so long as there is not a substantial change in the market. The Company has committed to provide at least five years' notice before closing Yallourn, where circumstances remain in its control. EnergyAustralia is also planning to schedule the retirement of the Mount Piper station at the end of its technical life at around 2043. The Company continues to invest in comprehensive maintenance programs to secure the reliability of these assets.

EnergyAustralia will closely monitor the energy policy landscape in Australia, and the overall development of the wholesale electricity market. While any move to accelerate the retirement of coal-based assets would help bring CLP closer to our science-based targets, the impacts on workers and regions would be important considerations and EnergyAustralia would have to secure the necessary replacement generation to balance the company's commitment to reliability and affordability.

Find out more about EnergyAustralia's GHG emission data in 2019

Download EnergyAustralia's carbon commitments

Creating value in the low-carbon transition

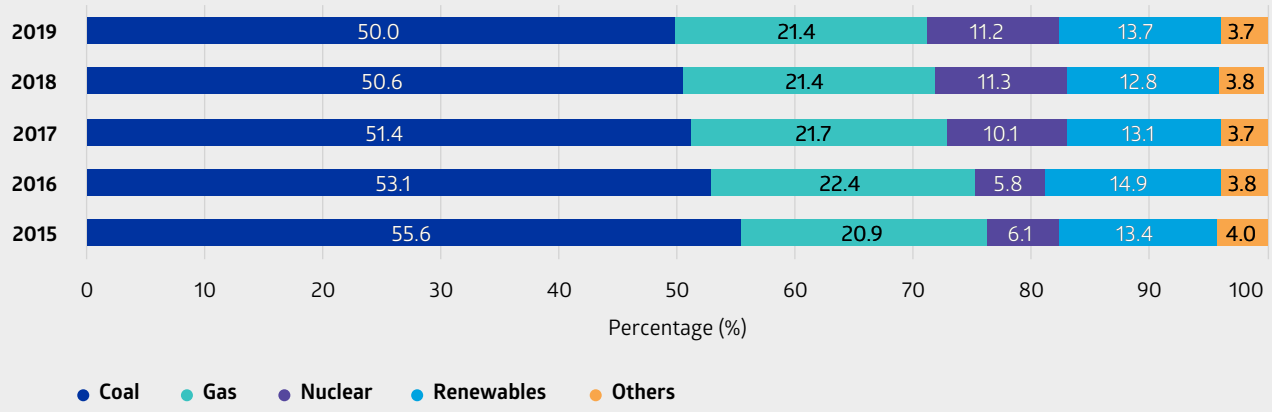
Diversifying CLP's asset portfolio with non-carbon sources of energy helps lower the GHG emissions, as well as reduce the reliance on revenue from fossil fuel-based generation.

The following charts demonstrate how CLP has diversified its investment, portfolio and operating earnings to include a broad range of fuel type and non-generation business activities.

Generation capacity (on an equity plus long-term capacity and energy purchase basis) by asset type

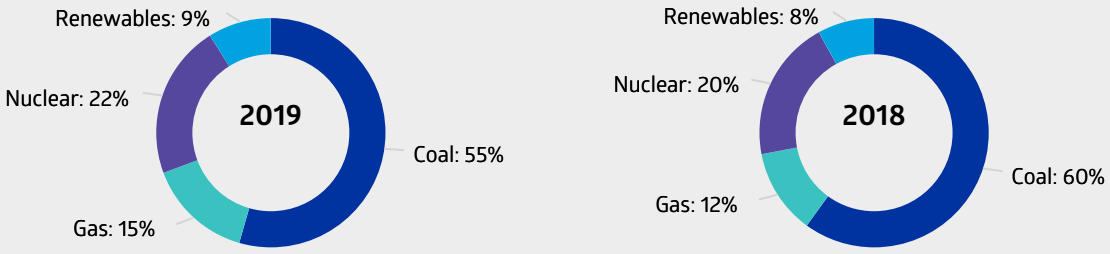
The renewable and non-carbon generation capacity in operation and under construction has increased:

- Renewable generating capacity stands at 2,469 MW, supplemented by an additional 825 MW of long-term capacity and energy purchase; together they account for 13.7% of the portfolio.
- Non-carbon generating capacity stands at 4,069 MW, supplemented by an additional 1,910 MW of long-term capacity and energy purchase; together they account for 24.9% of the portfolio.



Energy sent out (on an equity plus long-term capacity and energy purchase basis) by asset type[1]

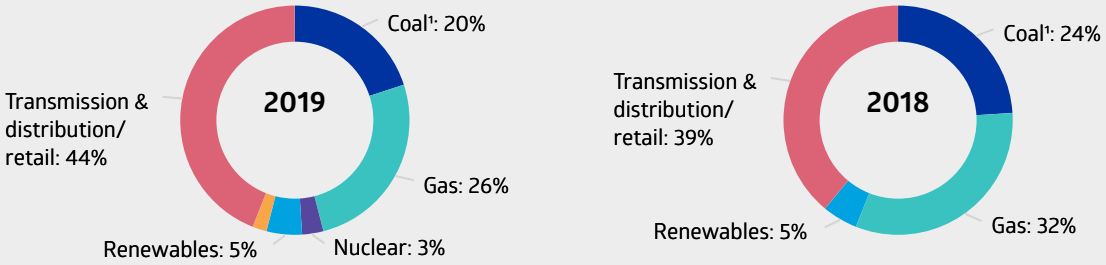
CLP's coal-based generation continues to decrease. Energy sent out from renewable and non-carbon sources accounted for 8.7% and 30.6% of the total, respectively.



1 Percentage figures haven been subject to rounding. Only the major asset types are shown here. For details, pleasae refer to operations data table.

Capital investments (on accrual basis) incurred by asset type

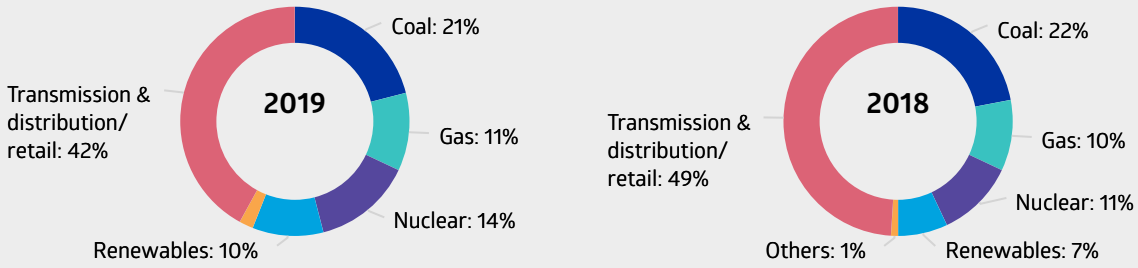
Capital investments into non-carbon generation assets represented 8% of Group capital investments in 2019, supplemented by 44% from transmission & distribution and retail related activity.



1 Capital investments in coal assets include upgrades and efficiency improvements only.

Operating earnings (before unallocated expenses) by asset type

Operating earnings from non-carbon generation assets represented 24% of Group operating earnings in 2019, supplemented by 42% of operating earnings from transmission & distribution and retail related activity.



Investing in transition enablers

CLP is going beyond low-carbon generation to include broader investments in innovative projects and propagating new technologies within the energy economy.

Decarbonisation of the generation portfolio cannot be achieved by simply replacing generation plants that use fossil fuel with those that use non-carbon energy sources. Investment in a broad range of transition enablers is required to transform the energy system. These enablers include decentralised generation and smart energy services, transmission and distribution systems, battery or other energy storage solution, or electric vehicle charging facilities, making full use of advanced technologies and innovation.

Group investment in transition enablers is focused on the Hong Kong and Australia markets, where CLP is engaged in retail business. Below are a few examples of these enablers:

Smart meters

- In Hong Kong, under the 7-year roll-out plan approved by the Government in 2018, up to end-2019, over 420,000 smart meters have been connected, equivalent to a 16% coverage of the service area.
- In Australia, the number of installed smart meters is even higher, at 594,000 with a coverage of over 27%.

Electric vehicle charging facilities

- Over 200 charging points have been installed for customers across Hong Kong; in addition, there are over 300 charging points in CLP premises to support greater EV adoption in Group operations.
- SmartCharge, a joint venture between CLP and HKT, has been actively offering and deploying EV charging solutions in private and public car parks in Hong Kong. There are a number of projects in the construction pipeline and these will be installed in the coming year.
- By the end of 2020, all EnergyAustralia sites will have EV charging facilities.

Demand response programmes

- In Hong Kong, around 1,500 commercial and industrial customers signed up for the demand response programme, and together around 62MW of demand reduction was achieved in 2019.
- EnergyAustralia's demand response contracted capacity now stands at 56MW. Over 20,000 household customers have opted in to the PowerResponse programme.

Customer solution sales

- The Feed-in Tariff scheme in Hong Kong had an encouraging start, with 8.7GWh of electricity generated from renewable sources through the scheme in 2019.
- EnergyAustralia has over 194,000 business and residential solar customers.

As more renewable energy is being introduced to the grid, the challenges posed by its intermittent nature, which does not necessarily follow the local load profile, requires enhanced grid connectivity and system balancing solution on a larger scale.

Transmission and distribution infrastructure

- In 2019, CLP India entered into the power transmission sector. Through acquisition, 240 km of transmission line has been handed over to CLP India's portfolio in 2019 and an additional 575 km will be handed over in 2020.
- The Clean Energy Transmission System connecting the CLP grid to Guangdong is planned to be enhanced by 2025, improving accessibility to clean energy resources and further reducing fossil fuel use in Hong Kong.

Large scale battery storage

EnergyAustralia's Ballarat energy storage system has been responding to demand and supply imbalances since December 2018, and the Gannawarra energy storage system since March 2019, with a total installed capacity of 55MW/80MWh.

- These systems recharge from the grid at night when excess generation capacity is available and prices are low, and provide dispatchable energy during times of peak demand when prices are high, while improving grid stability and reliability at the same time.
- Today, battery storage solutions require a government subsidy. Battery costs will continue to decline over time, allowing the further deployment of storage solutions which help build a flexible energy supply market.

Large scale battery storage at Gannawarra, Australia.

CASE STUDY

EV100 – Greening road transport

Experience in many countries suggests that although good progress is being made with decarbonisation in the power sector, the transportation sector is proving harder to decarbonise, despite it representing a significant proportion of total GHG emissions. With numerous non-carbon sources increasingly available for electricity generation, electrification can make a significant contribution in the global effort to decarbonise transportation.

One of the two EVs recently added to EnergyAustralia's vehicle fleet.

Looking at road transportation, technology is advancing fast in the development of electric vehicles (EV), with many more models becoming available. There are still challenges though, with potential users needing some reassurance over vehicle range as well as the availability of charging points. Total cost of ownership is still sensitive to vehicle purchase price differences and the relative running costs of fossil fuels and electricity. Although constantly improving, EV performance in terms of power and range still falls behind internal combustion engine (ICE) vehicles in some industry specific applications, such as Heavy Goods Vehicles.

Having said that, there is significant potential for reductions in both carbon and roadside air emissions by using EV technologies that are readily available. One example is the suggestion from the public engagement exercise on Hong Kong's Long Term Decarbonisation Strategy to promote adoption of electric vehicles (EVs) in the city. A pilot study showed that commercial EVs have about 30% less emissions on average than their internal combustion engines (ICE) counterparts on the same mileage travelled.

According to the Global EV Outlook published by the International Energy Agency (IEA) in 2019, GHG emissions for a mid-size car on a fuel and vehicle life-cycle basis is about one-third lower for EVs, based on a global average carbon intensity of electricity at 0.518kgCO_2/kWh, which is roughly equivalent to Hong Kong's current fuel mix. The actual carbon intensity of electricity will continue to decline in Hong Kong as the fuel mix shifts to natural gas in the coming years. With this in mind, CLP is actively developing EV infrastructure in Hong Kong by providing free charging facilities to the public and helping individual and commercial organisations to install relevant facilities.

To further demonstrate CLP's commitment to EV development, in 2019, the Company joined the global EV100 initiative run by the international non-profit organisation The Climate Group, a first amongst Hong Kong companies.

CLP has committed to transitioning its fleet of more than 1,000 cars to EVs by 2030 and encouraging more employees to switch to EVs. Specifically, CLP's target is to convert all company vehicles weighing below 3.5 tonnes and half of those weighing between 3.5 and 7.5 tonnes to EVs by 2030, where realistically feasible. The scope includes vehicles in Hong Kong, Mainland China, India and Australia. The shift has the dual benefits of reducing GHG emissions and reducing roadside air pollution. This is particularly important for many of the densely populated Asian cities in which the Group operates.

Helping communities decarbonise

There are different options for customers who want to support the use of clean energy, including the Feed-in Tariff Scheme and Renewable Energy Certificates in Hong Kong, and PureEnergy and GoNeutral Programme in Australia.

Many customers would like to contribute more to combating climate change. In Hong Kong, CLP Power launched the Feed-in Tariff (FiT) Scheme in October 2018 and the Renewable Energy Certificates (RECs) in January 2019 to encourage participation from the community to support local RE development.

The FiT Scheme, where CLP Power will pay for electricity generated by small-scale RE projects connected to its electricity grid, has received a strong positive response from the public since its launch. Read more in the case study below.

Meanwhile, customers who want to support the local development of RE but are unable to accommodate an RE system of their own now have the option of subscribing for RECs which represent the environmental attributes of electricity produced by local RE sources and purchased by CLP. As of end-December 2019, environmental attributes of over 3GWh units were sold through RECs.

Read more on CLP demand-side management efforts in Hong Kong

EnergyAustralia customers can subscribe to PureEnergy, where they can purchase accredited green energy which feeds into the grid on their behalf. The GoNeutral Programme allows residential customers to opt in to fully offset the carbon emissions associated with their home electricity usage, at no added cost to them. Over 220,000 customers have opted in to Go Neutral, making it one of the largest Climate Active certified offset programmes in Australia.

CLP Renewable Energy Schemes

WATCH VIDEO ▶

CASE STUDY

Supporting the growth of renewables in Hong Kong

Cathay Pacific Catering Services (HK) Limited has installed solar panels with a combined size of 3,000 square metres on the rooftop of its facilities.

With the introduction of CLP's Renewable Energy Feed-in Tariff (FiT) scheme in May 2018, CLP Power Hong Kong received overwhelming support from the public with 6,900 applications by the end of December 2019.

More than 80% of these applications have been approved. Upon completion, these projects will represent a total of 90GWh of green electricity a year – equivalent to the annual energy consumption of about 22,000 households and a reduction in carbon emissions of around 45,000 tonnes a year.

Participating customers came from a variety of segments with 80% of applications from village houses, and the remainder from commercial and industrial buildings. Cathay Pacific Catering Services (HK) Limited has installed 828 solar panels with a generation capacity of 299kW and a combined size of 3,000 square metres on the rooftops of its two facilities. It is expected to generate 320,000kWh of electricity a year, which will make their installations the largest system under one customer in the community of the Hong Kong International Airport.

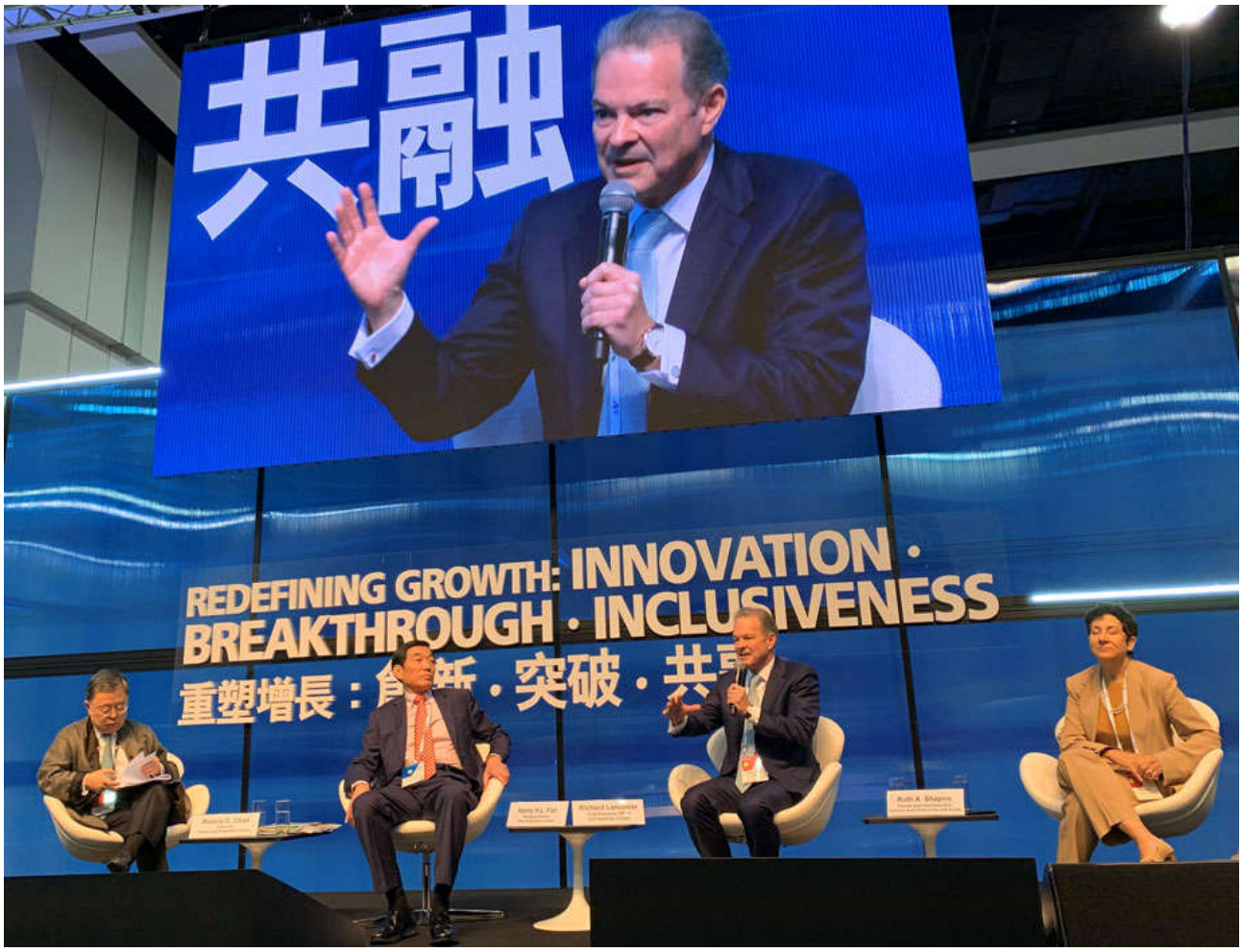
Similarly, another leading educational institution, Li Po Chun United World College of Hong Kong (LPCUWC), has also signed up to the FiT scheme and innovatively developed a solar-scholarship for its students using 100% FiT revenue contribution as funding for students coming from grassroots families. CLP conducted solar assessment to support their installation of 1,168 solar panels, with generation capacity of 403kW and annual generation of 480,000kWh approximately.

CLP has been promoting the awareness of FiT and REC initiatives through a variety of channels. Overall in 2019, CLP organised more than 50 seminars promoting these initiatives to more than 3,000 participants.

LPCUWC's solar scholarship is funded by the FiT revenue from the 1,168 solar panels on the school's rooftop.

Promoting systematic changes for climate actions

No single business or even country can mitigate climate change alone. CLP continues to join other like-minded organisations to promote the systematic changes required and to promote operational business interests.



Richard Lancaster, CEO, speaks at a panel themed "Profit with Purpose" alongside Mr Ronnie Chan (left), Chairman of Hang Lung Properties Limited, Mr Henry Fan (second from left), Chairman of Hong Kong Hospital Authority, and Dr Ruth Shapiro (right), Founder and Chief Executive of Centre for Asian Philanthropy and Society.

Sound public policies are required to balance the social, economic and environmental needs and support the long-term development of communities. CLP participates in a range of industry and professional bodies to discuss the major issues deemed important to ongoing viability and success, in particular climate change and energy.

When joining any organisation, respective Public Affairs teams act as a control point and will consider the appropriateness of the membership request. The Group CEO or respective MD approves the participation, to ensure the position of the organisation supports CLP's mission, in particular its ambition towards decarbonisation.

Following is a list of organisations which are active in climate change and broader energy market policies, and to which CLP devotes significant resources through membership, sponsorship, and other contributions including active participation by senior management. CLP has contributed annually over HKD 250,000 (or equivalent, in cash) on average over the last 3 years to the organisations listed below (by alphabetical order).

Organisation	Description of position	CLP contributions and engagement
Australian Energy Council	The AEC represents 21 major electricity and downstream natural gas businesses operating in competitive wholesale and retail energy markets in Australia.	EnergyAustralia is represented on the Board of the AEC and is an active participant in its various working groups which cover a range of competitive energy market issues. These include reviews of wholesale market operation, competitive retail markets and emissions reduction policies.
Business Council of Australia	The Business Council of Australia is a CEO-led industry association, representing over 100 of Australia's largest businesses. They support transitioning to a more carbon efficient economy with a goal of net-zero emissions by 2050.	The Managing Director of EnergyAustralia is a Director of the BCA. The BCA advocates for a national, bipartisan energy and climate change framework that can deliver against reliability, affordability and sustainability objectives, consistent with EnergyAustralia's position.
Business Environment Council	An independent, charitable organisation established by the business sector in Hong Kong. BEC promotes environmental excellence by advocating for the uptake of clean technologies and practices.	The CEO of CLP has been a Director since 2012 and is currently Chairman of the Board of Directors. The Company actively participates in or sponsors events, public consultations and working groups organised by BEC.
Energy Transition Commission	Supports energy system transition by informing what it will take to create credible, accelerating transitions towards universal, clean energy systems across the world. Current focus is on helping harder-to-abate sectors reach net-zero carbon emissions.	Having joined in August 2018, the CEO of CLP is one of a diverse group of leaders from the public, private and NGO sectors in the Commission.
Free Electrons	An accelerator programme for the electric utilities, where startups work closely with utilities to develop digital solutions to overcome challenges arising from the increase of renewable energy and decentralised energy systems, and facilitate the transition to low carbon energy.	CLP first participated in FreeElectrons during 2018, and has identified collaboration opportunities through the programme. In 2019, CLP hosted FreeElectrons in Hong Kong for a week-long module. Read more here.
International Solar Alliance	The treaty-based, inter-governmental organisation was established in December 2015 at COP-21. In June 2016, the Alliance entered into an agreement with the World Bank to raise US$1 trillion by 2030 to meet the Paris Agreement objectives.	CLP is supporting the Indian Government's plan to deploy solar technology across the country.
World Business Council for Sustainable Development	A global, CEO-led organisation of over 200 businesses, WBCSD is working to accelerate the transition to a sustainable world. It targets the realisation of the SDGs through six work programmes including Circular Economy, Cities and Mobility, Climate & Energy, Food & Nature, Redefining Value and People.	CLP is participating in various initiatives, such as the Climate Policy Working Group, TCFD Electric Utilities Preparer Forum, the Energy Solutions project, and the Redefining Value program.

MATERIAL TOPICS

Harnessing the power of technology

CLP's investment

80
employees across the Group in innovation functions

Innovation investments in 2019 amounted to
HK$127 million

Smart Energy Connect has identified more than
900,000kWh
of potential energy savings from its deployments

Technology solutions

Aerial drones used for renewable energy plant inspections

Centralised Analytics Platform used to optimise performance of the renewable energy portfolio

Building an innovation ecosystem

CLP Power continued its collaboration with **Hong Kong Startup Council** of the Federation of Hong Kong Industries (FHKI)

CLP participated in **Free Electrons,** an accelerator programme partnership with global energy utilities

Partnership with **Startupbootcamp** and **COSBOA** in Australia

Year in review

CLP recognises the potential for digital technology to transform not only the energy industry, but the world.

Embracing innovation helps optimise CLP's existing operations and is also the foundation for developing new products and services for customers. Together, this momentum combines to enable the transition toward a low-carbon economy.

CLP's technology innovation journey reached important milestones in 2019. Big data and artificial intelligence (AI) continue to help improve Group performance. More reliable predictive maintenance solutions and early fault detection through machine-learning models improve safety performance; more accurate load forecasting advances smart grid developments, and robotics process automation solutions automates manual business processes and improves productivity. The launch of Smart Energy Connect (SEC) in Q1 showcases capability to develop new lines of business, and importantly offers a suite of digital products to help customers save energy, cost and time, and advance their own sustainability agenda. Going forward, the range of new capabilities coupled with deep industrial knowledge and geographical footprint will help CLP pursue new opportunities in the low carbon economy. In particular, there is strong potential in the areas of data centres and smart grid developments.

As the Group business evolves, CLP is looking outward to tap into the best minds in the startup community. For the second year, CLP is involved in Free Electrons, an accelerator programme in partnership with global energy utilities, through which potential startup partners were identified. CLP will continue to invest in, and bring in the best technology, entrepreneurs and new business opportunities to build a sustainable, resilient and growing business.

Key metrics

Smart Energy Connect has identified more than **900,000kWh** of potential energy savings from its deployments

80 employees across the Group in innovation functions

Innovation investments in 2019 amounted to **HK$127 million**

Outlook

The digital and utility worlds have been progressing at vastly different speeds. As CLP transforms into a Utility of the Future, a major energy company such as CLP needs to synergise the strengths of each of these worlds to create new value propositions.

CLP's Group presence in diverse geographies, each with a unique set of regulations, infrastructure and market needs, helps to identify project opportunities to cater for these varying energy service areas and emerging markets. CLP is connecting customers across its markets with technology companies to help define key partnership and strategic collaborations to create new services offerings. With the infrastructure needs of cities continuing to expand, there are exciting new opportunities to support urban growth in greener and smarter ways.

The momentum in this innovation journey will only continue. With a focus on the opportunity in energy management of buildings, CLP intends to expand its digital product offering under SEC to provide end-to-end solutions to the customer base. Solution areas include office spaces, schools and university campuses and commercial buildings such as large office buildings, hotels, shopping malls, to name a few. The key areas for future energy saving are mainly through data-driven services such as chiller optimisations and building health monitoring through Internet of Things (IoT)-based solutions.

CLP's investments and venture portfolio champion cutting edge technologies and start-ups that help strengthen the Group's core business, nurture emerging businesses, and support the Group's contribution towards a low carbon economy. CLP's technology-based investments to support the growth of its capabilities and new businesses opportunities will continue in a prudent manner, but driven by strong goals.

CLP's transformation will inevitably change how the Group operates. Underlying the success is the ability to have the right talent to deliver to the Group vision. CLP will continue to develop in-house data science capabilities to develop AI assets to meet the digital transformation strategy, and attract the right external talent.

SmartHub@CLP showcases a smart city future for Hong Kong.

Highlights

Examples of how technology helps CLP improve its performance and develop new business opportunities to advance the sustainability agenda.

Enhancing performance

New technologies provide novel ways to manage CLP assets, transmission grids and customers. They help strengthen and enhance the core business.

Big data and artificial intelligence (AI) technologies enable CLP to collect and analyse large volumes of real time information, as well as automate and optimise the response, thereby improving operational efficiency across the value chain. On the other hand, increasing application of robotics helps reduces the need for manual and high risk work processes, allowing the Company to digitalise its operations.

Drawing on the experience and capabilities 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 their operational performance and efficiency, and to strengthen workplace safety. 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 binoculars have also been trialled for wind turbine blade inspections in India to achieve savings in time and labour requirements.

CLP has built a set of machine learning algorithms to enhance the efficiency of generation assets. As more renewable sources are integrated into the system, technology solutions that reduce uncertainty to the demand and supply of electricity are required to maintain system stability. For renewable assets CLP is using data analytics and artificial intelligence to optimise the performance of the Group's renewable generation portfolio. In 2019, CLP began the roll-out of a Centralised Analytics Platform (CAP) across all its wholly owned renewable assets, totalling 1,916MW installed capacity. CLP has set-up big-data clouds in India and China to capture all the operational data from the renewable portfolio. The CAP can then access this data and perform real-time monitoring, data analytics, equipment performance optimisation and automated reporting. Currently there are seven wind farms and solar parks in India feeding data into the CAP and the remaining assets will be included in 2020.

For the Castle Peak B Power Station, a trial of data science and machine learning helps to predict SO_2 and NO_x emissions based on the physical properties of the coal used and the loading demand of the power station. The model delivers reference data for the coal supply which will help reduce emissions and improve air quality for the community.

Smart grids integrate information and communication systems into the traditional power grid, creating new opportunities to engage customers in energy saving and demand side management. In one example, weather prediction at high resolution coupled with automated smart meter monitoring helps predict customer energy demand and forecast power generation, allowing energy supply to be optimised ahead of demand changes. The model can be fine-tuned for special events, allowing for better plant operation and maintenance scheduling. In addition, algorithms for cable monitoring allow early fault detection and make predictive maintenance possible, further enhancing supply reliability. In 2019, four faults were identified before they disrupted supply and this resulted in around 10,000 Customer Minutes Lost (CML) being saved and 2,000 customers retaining continuous power supply.

Supporting the sustainability agenda

CLP's deep knowledge in the energy sector enables it to expand the service offerings by supporting our customers to manage their energy use and save costs. CLP Smart Energy Connect is one of these key offerings.

The SEC platform provides a comprehensive portfolio of integrated, high-end and low-cost solutions for customers.

Increasingly, customers want more control over their energy consumption to maximise efficiency and minimise costs. Energy management solutions (EMS) is one of the opportunities that has arisen from such demand. It allows customers and facility managers to visualise the status of energy use, and offer greater control over how energy is stored, distributed and used. This reduces energy waste without adversely affecting operations.

CLP Smart Energy Connect (SEC) commenced operations in early 2019 and is one of the newest offerings to customers. It combines a set of energy management solutions, a data platform, and a commercial channel that accelerates the adoption of EMS, and provides a one-stop shop for digital energy innovations.

The SEC platform provides a comprehensive portfolio of integrated, high-end and low-cost solutions for customers. CLP adopted a customer-centric approach during the product development process, and paid special attention to the needs of different customers, be it reducing their carbon footprint, enhancing productivity or brand-building. It is encouraging to see the number of customers steadily growing since the platform's launch.

With buildings in Hong Kong consuming 90% of the electricity, it is quite important to focus on the building space. There are many types of solutions including smart office, lighting and HVAC optimisation, which all help building owners, tenants, and sustainability managers take a data driven approach to achieve energy savings.

By the end of February 2020, SEC introduced more than 25 products through in-house developed solutions and partnerships. Leveraging on CLP's deep energy domain expertise, the Company assists with the design, build, deployment and ongoing support of the featured technology solutions on the platform. In addition, SEC has developed a cloud-based digital energy platform to manage IoT solutions.

CLP's products in this area received initial traction in 2019 with Building Scope winning the Hanson I&T Outstanding Award from the Electrical and Mechanical Services Department (EMSD), Government of Hong Kong. This was an important award as this was through the deployment of the smart building solutions in one of CLP's own properties where an energy savings of 7% were realised along with a reduction of 86 t of CO_2 emissions. Building Scope, an AI software to identify inefficiencies within a building, was established through a

partnership with R&B Technology Holding Co. Ltd. CLP Innovation Ventures Limited, a wholly-owned subsidiary of CLP Holdings Limited, completed a US$2 million investment in R&B Technology Holding Co. Ltd. in January 2020 to deepen the collaboration between the two companies.

Another important milestone was the partnership with the Hong Kong Science and Technology Parks Corporation (HKSTP) to establish CLP's Innovation Hub at Hong Kong Science Park. As a living laboratory, HKSTP supported and piloted the energy management application from CLP. SEC enabled HKSTP to visualise their sustainability impact through SEC's in-house product, Solar Canvas, which helps to communicate to the Park community with over ten thousands of I&T workforce and visitors about Science Park's green energy generation. Solar Canvas connects the data from solar panels installed on six buildings in the Park and displays the energy produced in terms of carbon dioxide emissions avoided.

The impact of the success of SEC goes beyond the platform, as it also provides vital insight on how to manoeuvre the digital energy service landscape. CLP has developed a scalable organisation to support future growth by codifying product sourcing and trial processes, and completed a tailored technology stack to enable greater speed-to-market. There are plans to expand the service area to CLP supply areas outside of Hong Kong in the near future.

CLP Smart Energy Connect helps you save energy, money and time

WATCH VIDEO ▶

Visit CLP Smart Energy Connect

Visit Smart Energy Connect's LinkedIn page for latest news

Read more on CLP's low-carbon transition enablers >

Pursuing new business opportunities

The Group looks beyond CLP and invests in startups or forms partnership with other market players to create strategic value and new business opportunities.

Start-up companies showcase their innovations in smart energy technologies.

Microgrids present one of the focus areas for new business opportunities. A microgrid connects distributed energy resources (DERs) – which can be a power source, load and/or storage facility – and monitors, controls and optimises the DERs to reduce cost, GHG emissions, or maintain reliability. In 2019, working with numerous partner solutions, CLP established a microgrid pilot project at the Hong Kong Science and Technology Park. Outside Hong Kong, CLP is working with Business Units to develop smart microgrid solutions for industrial estates, developments; and commercial and industrial customers. While still at an early stage, with increasing adoption of renewables and decentralised technology, the expectation is that the microgrid market will have strong growth going forward.

The data centre market is also growing throughout the Asia-Pacific region, including in India and Hong Kong. Data centres are intensive energy users and reliant upon reliable power. This sector ties in with provision of sustainable solutions such as green power and energy efficiency, areas in which CLP has a strong edge and is actively pursuing.

As CLP leverages its history as a utility going back a century and moves towards a data-driven organisation, the Company understands the need to connect with emerging technologies and capabilities being developed at a rapid pace in the global marketplace. CLP is systematically scouting for and assessing new technologies for investment and co-development opportunities that are strategically important to the Group, as well as selectively investing in venture capital funds that provide key market insights and deal flow relevant to the energy sector.

CLP's investments and venture portfolio consists of venture capital funds in innovation hubs such as Silicon Valley, a joint venture with Other Sources Energy Group, which has a proven investment track record in clean energy technologies in Israel, and direct equity investments in companies that bolster CLP capabilities for a digital energy future. Another example in the start-up space is an additional investment of approximately HK$100 million (US$12.7 million) in California-based energy management software developer AutoGrid Systems, Inc.

In 2019 CLP strengthened its global ecosystem of strategic partners with more activities in Hong Kong, China, Israel and Australia. As a Group, CLP is now covering the major innovation hubs (USA, China, Israel and Europe) and has established a strong network to engage with startups, strategic partners and strategic customers to source new opportunities.

CLP chooses to invest in promising entrepreneurs and start-ups not only to harness their cutting-edge technology, agility and digital capabilities, but also to co-develop new products and services that can be scaled through the company's presence in various geographies. Through collaborations with startups CLP can act faster and get access to new skills, while in return piloting new products in real situations.

In November 2019, EnergyAustralia launched a new customer innovation platform called On by EnergyAustralia. The purpose of On is to give the Company the capability to trial new solutions with customers, starting with those in New South Wales. EnergyAustralia will use expert insight from customers to learn and iterate its products and services based on their feedback before they become widely available. As part of its commitment through the Energy Charter to use customer needs and preferences to drive innovation, and to make energy simpler and fairer, the first products to be trialled on the new platform are subscription-style energy plans.

Building an innovation ecosystem

At the Group level, CLP continues to play an active role in Free Electrons. In Hong Kong and Australia, the businesses are also keenly engaging with local accelerator programmes.

For the second year CLP has participated in Free Electrons – the global accelerator that is run by ten world class global utilities – and in June the Company hosted the programme in Hong Kong. This unique opportunity offered the chance to have ecosystem partners engage together.

Free Electrons provides a platform for utility companies to go into partnership with start-up companies and fast-track the development of new energy technologies and solutions. Through the programme, CLP has partnered with four startups including a Portuguese company which developed solutions for asset condition monitoring. Two of those projects are currently in the pilot stage.

In 2019 CLP also entered into an extended pilot with one startup from the 2018 cohort, a company which helps to predict the impact of solar integration on grid reliability. As part of the development of adjacent smart home services CLP also continued a trial in the area of health monitoring. The work with these startups was presented during the Connected Cities Conference co-organised by CLP. Together with a workshop on the "future use of buildings", this was a good opportunity to showcase CLP's innovation work to customers.

In Hong Kong, CLP Power continued its collaboration with the Hong Kong Startup Council of the Federation of Hong Kong Industries (FHKI). CLP helps up-and-coming start-ups develop operational skills and practical experience to support business growth, and build connections with traditional enterprises and investors. In 2019, CLP invited startups with high potential to join Free Electrons, and has partnered with one of them to run a customer pilot in the Hong Kong residential market to manage energy demand of air conditioners in the summer of 2019. CLP has successfully tested the operation and collected insightful customer responses for future planning.

Collaboration between CLP Holdings and EnergyAustralia led the Company to support the Australian Technologies Competition, which opened a new network for both companies.

EnergyAustralia continued the partnership with Startupbootcamp, an international accelerator programme for start ups working on innovative energy solutions. The 2019 focus areas were grid transformation, customer empowerment, data monetisation and electric mobility and robotics. The Company continued to work with three startups from this programme.

In support of the business community, EnergyAustralia was the sponsor and host of three 2019 COSBOA Innovation Games events. The Council of Small Business Organisations Australia (COSBOA) teamed up with Paddl Co on a series of events that allowed EnergyAustralia team members to work with small businesses to find innovative solutions to their energy problems.

In 2019 EnergyAustralia also participated in a Kidpreneur competition run by KPMG and Entropolis. Mentors from the Company benefited from a new perspective on the future generation's thoughts on issues facing the energy industry.

Officiating guests and representatives from member utilities unveil the CLP and Free Electrons Ecosystem Immersion Day.

MATERIAL TOPICS

Reinforcing cyber resilience and data protection

Cyber Security Strategy and related improvement programmes approved by the Board

Appointed Senior Director, Group Information Security, implementing a unified cross-CLP cyber security organisation

Reviews of operational effectiveness for cyber controls lead to enhancements in operational technology and other areas

Data Breach Response Plan implemented in Australia

CLP's Information and Operational Technology Cyber Security policies are based on the following principles:

Regulatory Compliance
Controls implemented must meet the relevant statutory requirements

Availability
Ensuring the information is available to authorised users when required

Confidentiality
The protection of the information from unauthorised disclosure

Integrity
Ensuring the completeness and accuracy of information

Year in review

Along the value chain in the electric utility sector, connected technologies such as cloud computing are increasingly being deployed to enhance the visibility of asset performance and improve efficiency.

Facilities such as smart meters and microgrids are collecting ever more information from pro/consumers. Unfortunately, this distributed energy landscape is also introducing new targets for malicious attacks. These attacks can occur in both CLP IT or OT systems:

- **Information technology (IT)**: the technology used to support normal business activities and processes (e.g. email, customer databases, finance systems).
- **Operational technology (OT)**: the technology used to control, monitor, support or manage systems and assets used to generate, transmit, distribute, deliver and manage electric power.

In a 2019 survey of more than 1,700 utilities professionals worldwide, 56% said they experienced at least one shutdown or operation data loss in the last 12 months. The focus has also shifted from attacks on IT to OT: respondents to the same survey agreed that attacks on their OT system have become a greater threat than those on their IT system. It was estimated 30% of attacks on OT systems remain undetected, and on average 72 days is required to respond to a malware attack.

CLP has had no instances of lost production or any operational shutdown due to cyberattack. However, in common with all companies in the Energy Sector CLP faces attacks on a daily basis, from criminals and other threat actors. In 2019, CLP stepped up its governance on cyber security. Cyber security is not a separate issue that is the sole responsibility of a dedicated department, but a business risk that needs to be managed holistically and integrated into daily operations . CLP's enhanced Group Cyber Security team acts as an in-house advisor and reviewer to help raise awareness amongst staff, and establish the system and tools required to protect information and other systems against cyber risks.

In 2019, there were no customer privacy or data loss cases reported in relation to the retail business of CLP Power Hong Kong. In Australia, four complaints were received, three of which have been formally closed by the Office of the Australian Information Commissioner with no further action required by EnergyAustralia.

Key metrics

Cyber Security Strategy and related improvement programmes approved by the Board

Appointed Senior Director, Group Information Security, implementing a unified cross-CLP cyber security organisation

Reviews of operational effectiveness for cyber controls lead to enhancements in operational technology and other areas

Outlook

Cyber resilience is especially important for companies like CLP which provide critical infrastructure. A cyber breach could have a significant impact not only on the Company, but also on the environment and the economy at large.

As electric utilities become more connected and decentralised, the exposure to malicious attack cannot be eliminated. It is only by embedding cyber security into the mindset of all employees and their daily tasks, and continually enhancing organisational capacity that a company can defend itself or respond promptly should an attack occur.

CLP has been making good progress in building up internal expertise and a strong organisational awareness of the importance of cyber security. As the business evolves and the systems that underlie it change, new vulnerabilities arise.

Going forward CLP will be implementing a range of further cyber security measures at a level of people, process and technology, with the Audit & Risk Committee maintaining an oversight. The Group will also continue its awareness raising and emergency preparedness initiatives, so that employees remain continually vigilant.

Highlights

How CLP has enhanced its cyber security governance, built internal capacity in the area, as well as its performance in relation to safeguarding information protection.

Enhancing cyber security governance

The Audit & Risk Committee continues to maintain oversight on the cyber security governance structure, and has endorsed the CLP Group Cyber Security Strategy.

As CLP's operations and value chain is increasingly digitalised, cyber security and defence have to be integrated and not treated as an add-on. This approach starts with a comprehensive governance framework, ensuring the effectiveness of existing and planned cyber security activities and investments.

One of the key responsibilities of the Audit & Risk Committee (ARC) is to assure that adequate risk management is in place and followed, and appropriate remedial actions are taken where needed. Cyber risk is considered as a top-tier risk for the CLP Group and is regularly assessed and reported to senior management through the risk management process. It is also embedded in all projects from the development phases to ensure cyber risks are considered at the early stages.

In 2018, CLP engaged external specialist cyber security consultants to review and make recommendations regarding CLP's future governance structure to respond to the increasing threats. The key recommendations of that report were accepted by the ARC and Management team. In 2019, the ARC continued to monitor the implementation of these recommendations. The Committee was presented with a detailed analysis and a roadmap for the enhancement of the Group's mitigation measures against the potential threats identified. Most significantly, a CLP Group Cyber Security Strategy has been developed and endorsed. Greater collaboration between Group Internal Audit and the Group cyber security function and the development of a regular statistical cyber security report for the ARC are expected.

The Cyber Security team maintain management oversight of cyber security across the CLP Group . The centralised approach helps to ensure that best practices are consistently maintained across all operations.

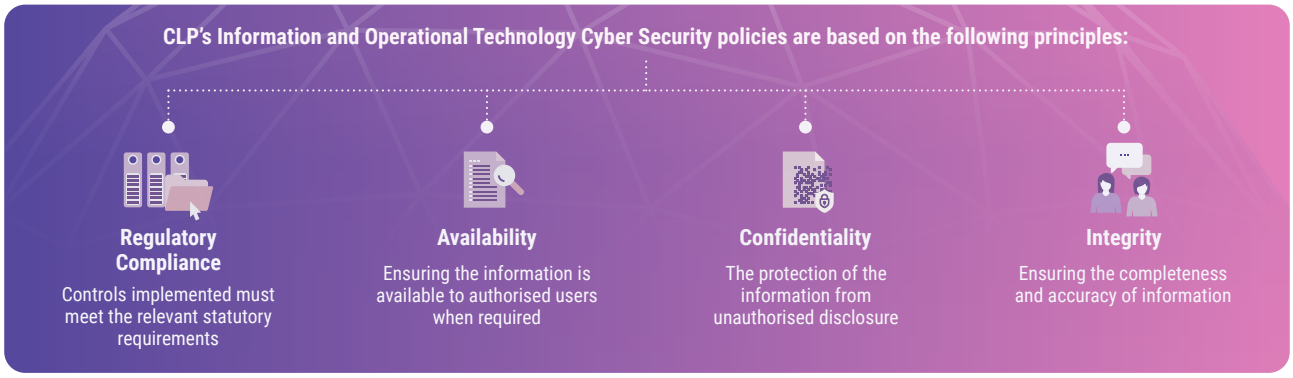
Read more from the Audit & Risk Committee Report

Integrating cyber security and defence into daily operations is essential.

Embedding cyber security practices

The CLP suite of cyber security policies and procedures guides the Company in protecting the information and systems, detecting anomalies early on and responding to any incidents to restore operations and services promptly.

The CLP portfolio is diversified across different countries in the Asia-Pacific. Nevertheless, they are all connected in cyber space. These connections are not necessarily through CLP's own systems but could also be through the systems of suppliers, customers, or even the personal devices of any stakeholders. It is therefore important to ensure sufficient cyber protection measures are in place consistently across all CLP business units, regardless of geographies.



In order to safeguard CLP's information and operations in accordance with these principles, effective security controls, practices and procedures must be implemented by all CLP employees and related business partners at all level across the business. To ensure these technical needs support rather than hamper business needs, the Group Cyber Security team acts as a one-stop-shop in providing cyber security assessment and advisory to different Group functions before any new technologies are deployed. A standardised cyber security requirement has also been developed for vendors so that any procured or outsourced systems are compatible and consistent with those of CLP.

There is no perfect solution to protecting the business, given the rising sophistication and frequency of cyber-attacks and data breaches globally. Early detection coupled with effective response and recovery measures are essential.

The CLP Group Cyber Security Incident Response Process establishes a consistent response protocol upon detection of an incident. The process was tested in regular drills throughout the year.

Find out more about CLP security and cyber security policies and procedures >

Protecting personal data

CLP continues to build a holistic approach to managing and protecting data through the implementation of a variety of processes, roles, controls and metrics.

Personal information is essential to CLP's day-to-day operations, helping it improve the services it provides. These include data from customers, employees (both current and former employees and prospective job applicants), contractors and service providers, in addition to data on business partners, shareholders, visitors and members of the public as they interact with the Company.

The CLP Privacy Principles set out the commitment to protecting personal data. There is also an accompanying CLP Personal Data Protection Compliance Manual that provides guidance to business units with operations in Hong Kong on what these principles mean in practice. Both of these documents are enhanced periodically to ensure they meet the latest regulatory requirements and continue to reflect the expectations of CLP stakeholders.

In 2019, the retail business of CLP Power Hong Kong had no customer data loss cases reported.

In March 2019, one of the Internet portals in Hong Kong was infiltrated. Although the impact was negligible, the incident highlighted the importance of bolstering the cyber resilience of all operations.

EnergyAustralia received notification from the Office of the Australian Information Commissioner (OAIC) in relation to three separate privacy complaints received during the 2019 calendar year[2]. EnergyAustralia has provided the required updates to the OAIC and all three 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 the 2019 calendar year. One of these reported breaches has been formally closed by the OAIC and the Company awaits further instructions from the OAIC in relation to any actions required to be taken for the other seven breaches reported.

Building cyber defence capacity across the organisation

Upholding effective cyber security controls and procedures is the responsibilities of all staff. To this end, a range of awareness-raising activities were conducted throughout the year.

CLP is conscious that some areas of the business may be more vulnerable than others. As a consequence, the Group is investing significant time and resources in enhancing CLP's internal cyber security capabilities. In 2018, CLP established a specialist team of cyber security professionals by training internal experts from electricity operations. This initiative will help embed cyber security practices into CLP day-to-day business. This year, the team had been further enhanced and empowered to maintain management oversight of cyber security across the CLP Group. CLP has appointed a new Senior Director – Group Information Security to oversee the Group's cyber security strategy. CLP will also continue to increase the recruitment of information security experts to add to Group capacity.

A range of awareness-raising activities were conducted for employees throughout the year, including phishing drills, distribution of a regular publication, CyberNews, road shows on OT security across Group offices, and the hosting of Cyber Security Awareness Month during October 2019 in Hong Kong.

In light of the new mandatory data breach reporting obligations legislated under the Australian Privacy Act 1988 (Privacy Act), EnergyAustralia underwent an internal risk assessment to understand its ability to comply. Company-wide communications, employee training and briefing sessions with leadership were conducted to ensure all staff had current privacy and data management training. In addition, a Data Breach Response Plan was implemented, which included the establishment of a Data Breach Response Team to ensure the business has the capability and procedures in place to respond swiftly. The Plan aims to instil a heightened vigilance in CLP staff in relation to potential data breaches, whether in their work or in their personal lives.

[2] The number has been corrected and revised in July 2020 after an internal verification exercise.

MATERIAL TOPICS

Building an agile, inclusive and sustainable workforce

18,000+
employees and contractors

0.11 LTIR
for employees and contractors combined (per 200,000 manhour)

1 fatality
for employees and contractors combined

40.1
average training hours per employee

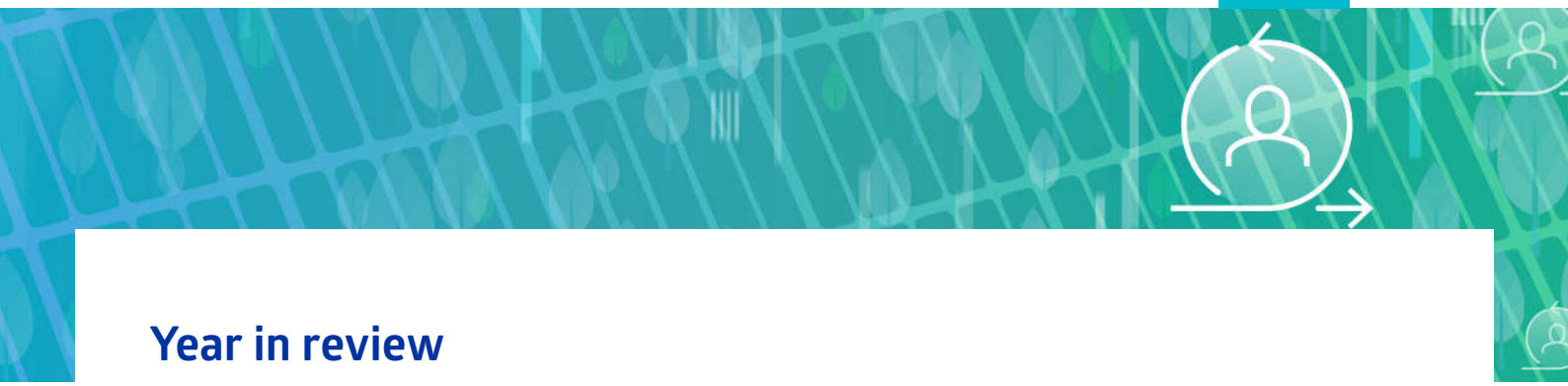
30+
employees participating in CLP and Decoded data analytics programme

900+
Hong Kong employees participated in Design Thinking training to nurture a people-centric innovation culture

24.2%
Women in **Leadership**

11.4%
Women in **Engineering**

200+
Women participating in CLP's **engineering mentoring programme**



Year in review

Over 18,000 employees and contractors contribute their energy, talent and shared values to CLP's customers, investors and stakeholders every day.

They power the Company's success. CLP's leading priority is safety: providing a safe, healthy and productive work environment for its people, complemented with the necessary training, equipment and support. With safety as the foundation, CLP is focused on addressing the significant opportunities and challenges presented by digitalisation and decarbonisation of the energy sector, together with intensifying demographic and labour supply issues and social and political uncertainties.

CLP is committed to ensuring the highest standards of safety across the entire operations and to making continuing improvements in its safety performance. Tragically, a fatal incident resulted in the death of a subcontractor's worker in Hong Kong in early 2019. An improvement review was carried out following the incident, and the Company is continuing its unrelenting efforts to prioritise safety in operations.

This year, CLP maintained its focus on developing pipelines of future general managers and engineering leaders in preparation for energy transition and digitalisation, and to address future skills shortages. Over 50 future leaders participated in executive and management development programmes, and the Company redesigned the Hong Kong-based Graduate Trainee Programmes into a single programme focused on future leadership and technical capabilities for launch in 2020. CLP continued to resource innovation and energy transition-related activities, recruiting from diverse locations and sectors, introduced new technician grade structures and invested in data analytics re-skilling.

CLP believes that supporting diversity and inclusion is critical to business performance as well as addressing future employment needs, and the Company continued to invest in increasing participation of women in engineering through mentoring schemes, and in strengthening female engineering networks to address potential isolation in the workplace.

The Company piloted more agile team structures and working environments in the CLP Innovation Hub at the Hong Kong Science and Technology Park, CLPe Solutions and Customer teams to encourage collaboration and speed up decision-making. Over 900 Hong Kong employees have participated in Design Thinking training since its launch in early 2019, deploying new skills to solve customer and operational problems.

As the electric utility industry evolves, CLP is committed to supporting all its people to thrive in change, and launched two key support programmes in 2019 in Hong Kong: a Home Loan scheme to support eligible employees to acquire their first home, and Boost Health and Wellbeing programme to help build wellbeing and resilience. The Company continued to focus on working practices across the extended workforce, including continuing to strengthen reporting of labour supply and service contractors and exercising more control and oversight over labour supply in Hong Kong.

Key metrics

1
fatality for employees and contractors combined

0.11
LTIR for employees and contractors combined (per 200,000 manhour)

24.2%
Women in Leadership

11.4%
Women in Engineering

40.1
average training hours per employee

Outlook

Industry, regional, demographic and social and political drivers are bringing unprecedented change to CLP and are redefining the people agenda.

There is no single solution to meet this workforce challenge: 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 to share talent effectively across the Group portfolio of businesses. This will support a strategy 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.

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

The changing operating environment also drives the need for greater organisational agility – the ability to adapt and succeed in a rapidly changing environment. The Value Framework provides the backbone, guiding how CLP treats its people. With this as a constant, the Company is focusing on leveraging technology to speed up decision-making, strengthening the culture and practice of innovation, and empowering its people.

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

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

Highlights

CLP's strategies to manage the workforce and empower its people in an increasingly dynamic energy market reshaped by decarbonisation and digitalisation.

Keeping people safe and well

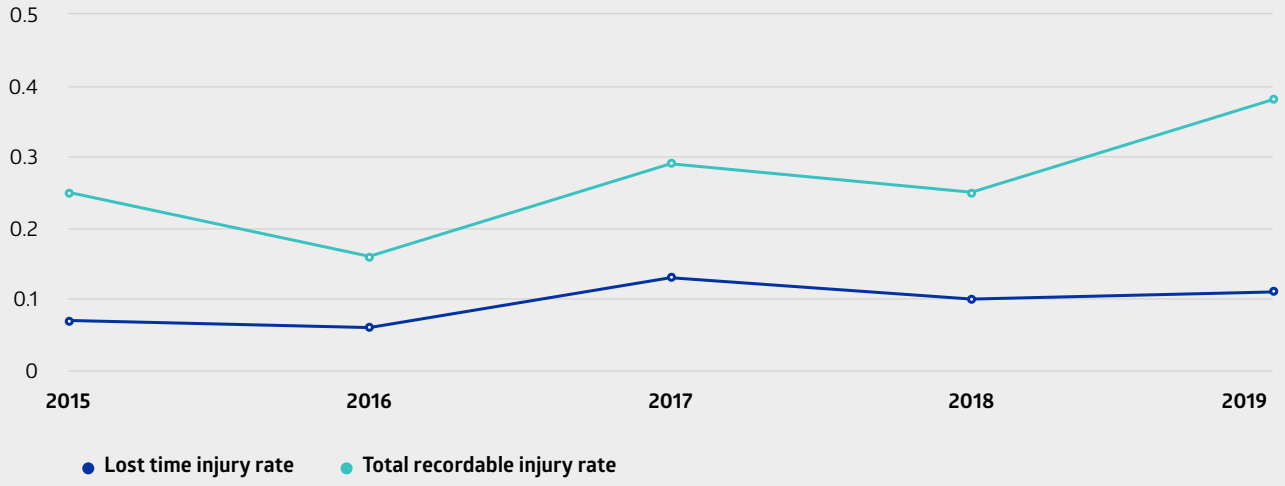
The safety of CLP's people has always been the foremost priority, and the Group remains committed to ensuring the highest standards of safety across the entire operation and ongoing improvements in its safety performance.

Tragically, CLP had one fatal incident that resulted in the death of a subcontractor's worker in Hong Kong in 2019. An internal panel completed an investigation into the incident in order to determine root causes and enable improvements in safety standards and procedures. Investigations into other incidents with the potential to cause serious injuries were also investigated.

The increase in the Group's injury rates in 2019 was driven primarily by the construction of the additional gas-fired generation unit in Hong Kong. The commencement of other planned capital projects will affect the Group's safety risk profile, and safety will continue to be prioritised. At the same time, the data also reflects 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.

Lost time injury rate and total recordable injury rate of CLP Group (employees and contractors combined)[1]

The moderate increase in the Group's injury rates in 2019 was driven primarily by the construction of the additional gas-fired generation unit in Hong Kong.

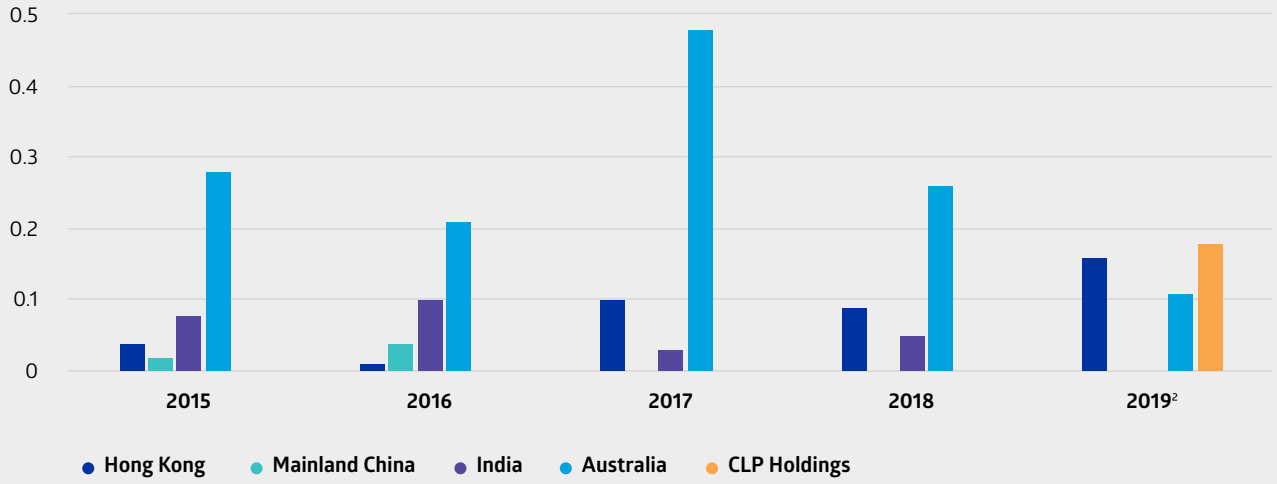


1 All rates are normalised to 200,000 worked hours, which approximately equals to the number of hours worked by 100 people in one year.

	2015	2016	2017	2018	2019
Lost time injury rate	0.07	0.06	0.13	0.10	0.11
Total recordable injury rate	0.25	0.16	0.29	0.25	0.38

Lost time injury rate by region (employees and contractors combined)[1]

The increased LTIR in 2019 was largely due to the performance in Hong Kong. Construction of the additional gas-fired generation unit exposes the Company to a new risk profile.

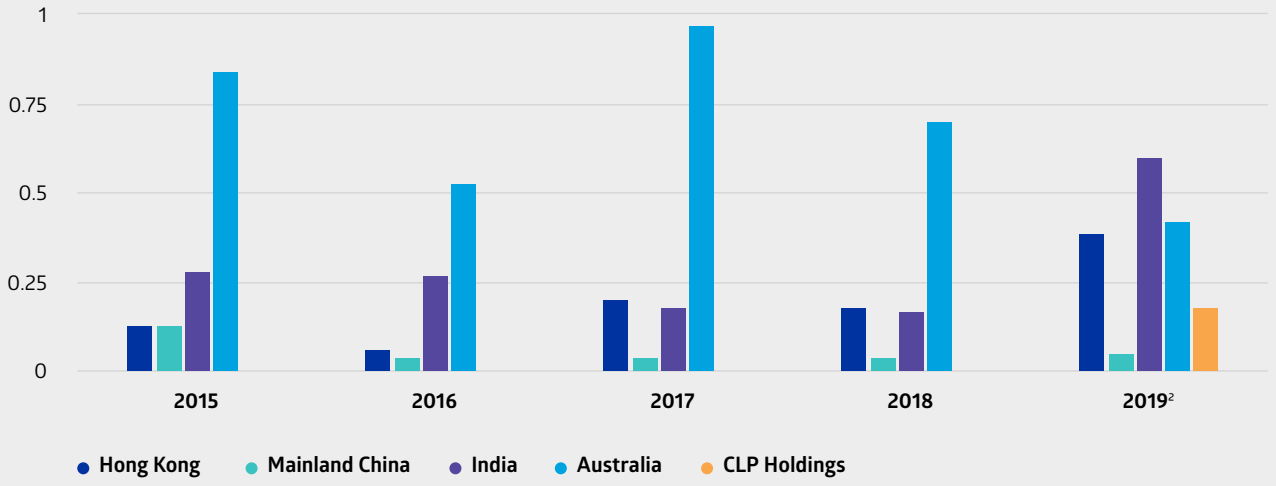


1 All rates are normalised to 200,000 worked hours, which approximately equals to the number of hours worked by 100 people in one year.
2 Starting from 2019, CLPe Solutions is reported under CLP Holdings to align with a change in internal reporting. Before that, it was reported under Hong Kong.

	2015	2016	2017	2018	2019[2]
Hong Kong	0.04	0.01	0.10	0.09	0.16
Mainland China	0.02	0.04	0.00	0.00	0.00
India	0.08	0.10	0.03	0.05	0.00
Australia	0.28	0.21	0.48	0.26	0.11
CLP Holdings	0.00	0.00	0.00	0.00	0.18

Total recordable injury rate by region (employees and contractors combined)[1]

The increased TRIR in India can predominantly be attributed to major maintenance activities, coupled with an overall increased frequency of reporting.



1 All rates are normalised to 200,000 worked hours, which approximately equals to the number of hours worked by 100 people in one year.
2 Starting from 2019, CLPe Solutions is reported under CLP Holdings to align with a change in internal reporting. Before that, it was reported under Hong Kong.

	2015	2016	2017	2018	2019[2]
Hong Kong	0.13	0.06	0.20	0.18	0.39
Mainland China	0.13	0.04	0.04	0.04	0.05
India	0.28	0.27	0.18	0.17	0.60
Australia	0.84	0.53	0.97	0.70	0.42
CLP Holdings	0.00	0.00	0.00	0.00	0.18

The HSE improvement strategy aims to uplift the Group's safety culture across all operating regions, promote more proactive risk management, and engage employees, contractors and other key stakeholders to collectively implement changes to improve safety performance.

CLP is committed to find new and better ways of working, by learning from investigations into incidents, as well as the adoption of best practices. For example, the Group implemented safety improvements in working at height and with other gravitational energies. In addition, Group-wide principles for a safety behavioural framework has been established which sets expectations for all levels of the organisation. CLP continues to support behavioural-safety observation programmes at key assets.

CLP continues to implement consistent standards across the Group for risk management, which includes identifying risks and opportunities.

Read more on safety management and performance >

Managing the workforce responsibly today

CLP is openly addressing the fundamental and challenging issue of what constitutes the company's real workforce. Increasing transparency over the broader workforce including flexible and contingent workers ensures CLP is taking a responsible approach to managing costs and risks.

At the end of 2019, CLP had 7,960 full-time and part-time employees across the Group compared with 7,843[3] in 2018. A total of 4,305 employees were engaged in the Hong Kong electricity and related businesses and 3,294 by the 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.

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 the end of 2019. The reporting methodology was 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			Contractors			Total	
	Average FTE (a)	Permanent %	Fixed-term contract %	Labour supply (b)	Service contractor and sub-contractor (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%**

[3] Year-end total of full-time and part-time employees. Previously-reported data for 2018 includes full-time employees only.

Attracting and retaining tomorrow's workforce

At the end of 2019, CLP's employees had close to 100,000 years of service in total at CLP – a hugely valuable body of experience, skills and knowledge through which the Company delivers value to customers and other stakeholders.

Retaining the organisational knowledge within the Company, 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.

This year, CLP employees received on average 40 hours of internal and external training and development, compared with average 45 hours in 2018[4]. 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.

The development of future executives and high-potential Group engineering leaders continues, in partnership with the International Institute for Management Development (IMD), and 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 response to the energy transition and to address future skills shortages is a key priority. In 2019, CLP introduced new technician grade structures and technician trainee roles in Hong Kong to enhance progression and retention. A group of 22 high-potential engineering leaders participated in a cross-business engineering development programme. The Hong Kong-based Graduate Trainee programmes were reviewed and redesigned into a single programme focused on future leadership and technical capabilities, launching in 2020. In Mainland China, CLP conducted assessment for young local engineers, providing individual development plans and feedback. The Group continued to recruit high potential early- to mid-career engineers to supplement internal development efforts and facilitate international development assignments, as well as strengthen resourcing of innovation and energy transition-related activities and projects, recruiting 29 senior hires in 2019 into critical roles.

Employee training

	2019	2018	2017	2016	2015
Average training hours per employee (hours)[1]	**40.1**	46.1	46.9	49.2	57.2

1 2019 number includes full-time and part-time employees. Numbers in the previous years include full-time employees only.

CASE STUDY

Being a CLP Big Data Pioneer: Data Analytics Programme

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. To date, participants have utilised data analytics techniques to enhance operating efficiency, including reviewing water loss rates in natural gas-firing units, identifying units with sub-optimal operations and increasing the accuracy of predicting failure in wind turbines. At the end of the programme, participants can complete industry qualifications to become accredited Data Science Associates.

4 Includes full-time and part-time employees.

CASE STUDY

CLP Power Academy widens career options for young people

Graduates celebrating at the CLP Power Academy graduation ceremony.

The training and development opportunities provided by CLP go beyond employees. Since its inception in 2017, CLP Power Academy has been offering a range of programmes designed for young people in Hong Kong.

These programmes are suitable for young people with varying academic achievements and work experience. From entry-level courses for secondary school leavers without relevant qualifications to advanced post-graduate degrees for more experienced industry practitioners, the high-quality vocational and professional education programmes at the Academy widen the career options of young people and promote access to opportunities for young people 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 grassroot and disadvantaged young people.

The Academy continued to broaden its range of curricula 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. In September 2019, a new Dual Master's Degree Programme in Future Energy and Power System Operation and Management has been launched, which is collaborated with The Hong Kong University of Science and Technology (HKUST) and The University of Strathclyde (UoS). The Academy will continue to explore opportunities to launch more professional training programmes.

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 training and professional education and training 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.

The work of the Academy is complemented by other CLP programmes, such as the Engineer in School programme. It collaborates with organisations including the Hong Kong Association of Career Masters and Guidance Masters, to promote power engineering as a profession. More importantly, it is hoped that the education and engagement provided by the Academy will empower young people, support their positive development and offer them an alternative career pathway.

Find out more about CLP Power Academy

Supporting diversity and inclusion

A diverse workforce and an inclusive culture support high performance and CLP's ability to operate effectively in the many communities which host the Group's assets.

Given the opportunity presented by increasing levels of female workforce participation, CLP has set several Group-wide gender diversity targets which support the UN SDGs, in particular the commitment to SDG 8 – Decent Work & Economic Growth. CLP's Women in Leadership percentage increased to 24.2% while Women in Engineering increased to 11.4%. This progress reflects the Group's continued commitment and efforts in attracting and developing female employees, and the focus on creating a diverse and inclusive workplace.

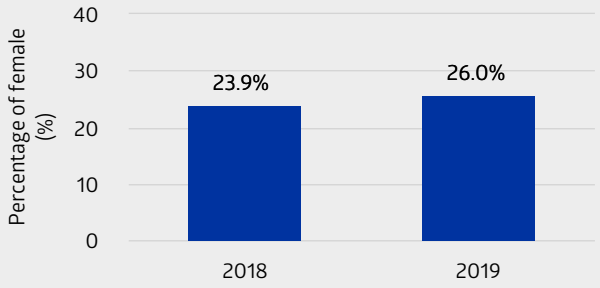
CLP continues to undertake initiatives to encourage more women into the workforce. These included mentoring programmes for over 40 female engineering students to provide exposure to its operations and help them become more work-ready, together with holding the annual Female Engineer Networking event for the first time in India, with over 20 female engineers participating from across the Group. In Mainland China, hiring staff with ethnic-minority backgrounds continues.

Across the Group, the Company continued to enhance leave and flexible working policies, 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.

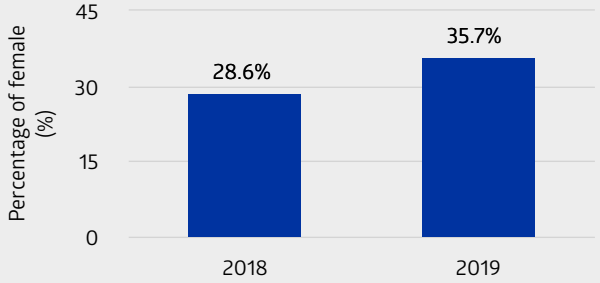
Following certification of the Hong Kong operations as a Fair Wage Employer in 2018, a follow-up assessment was conducted in 2019 and confirmed extended recognition for another year. In Australia, gender pay differentials were addressed in 2018. Analysis conducted on a job grade basis in 2019 showed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

Female representation has increased across all levels in 2019 compared to the previous year, as shown in the charts.

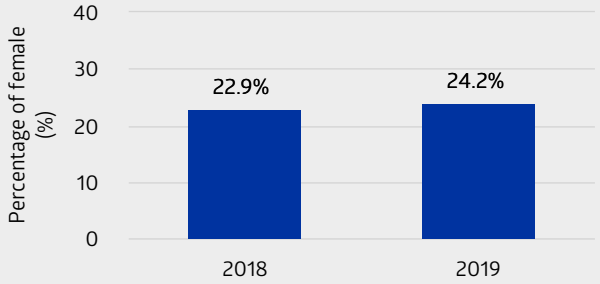
Total employees



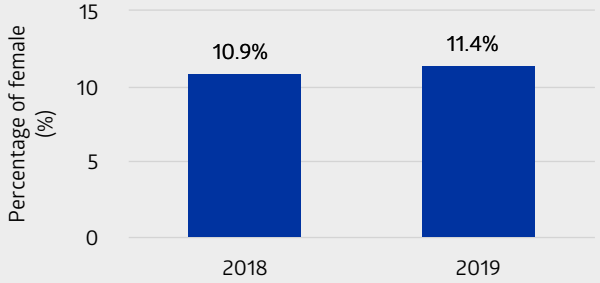
Group Executive Committee (GEC)



Women in Leadership



Women in Engineering



CASE STUDY

Supporting Women in Engineering

Over 20 participants joined the Group-wide female engineer networking events in India in November 2019.

To transform the business into a Utility of Future, CLP needs talented, diverse engineers on board.

To achieve its goals as an organisation, CLP needs people from all backgrounds who want to make a difference and help transform the business. As part of this, the Company has committed to significantly increasing the number of female engineers in each of the businesses over time, and to developing a strong network of female engineers across the Group. A mentoring programme was launched in Hong Kong in 2015 to provide opportunities for female engineering students from local universities to better understand the engineering profession and the power industry, and to support them to pursue a career in engineering. Over 200 women have participated in the programme to date as mentees and mentors, with over 80% indicating an increased interest in an engineering career.

CLP recognises that isolation in the work environment is one of the key reasons for women leaving engineering careers and Group-wide female engineer networking events were organised annually to address this issue. This year, the networking event was held for the first time in India, with over 20 participants gaining insights into renewables technologies and business models, as well as training in career management and storytelling.

Building organisational agility

The complexities of the 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.

In response to these developments and trends, CLP is developing and implementing action plans across the business to simplify processes and ways of working to free its people from non-value adding tasks so they can focus on key priorities. The Company is also accelerating impact through new agile ways of working. Across the Group, the Company is piloting more agile team structures and working environments in the CLP Innovation Hub at the Hong Kong Science and Technology Park, CLPe Solutions and Customer teams to encourage collaboration and speed up decision-making and planned significant working environment changes for the China and EnergyAustralia teams for 2020 launch.

Over 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 throughout the business, and to provide a practical problem-solving framework for product and service development with users' needs in mind. To date, colleagues have applied Design Thinking in projects spanning across digital transformation, productivity, safety and customer services.

CASE STUDY

Applying design thinking on plant digitalisation

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

Applying new ideas and technologies to make work more effective is critical to CLP's future success. CLP Power has launched an organisation-wide initiative to promote Design Thinking at all levels, providing tailored training to teams.

Among many Design Thinking applications this year, a team of maintenance engineers worked together to apply their new skills to reduce risk in regular power station site inspections, many of which take place at height or in confined spaces. Through consultation, drone technology was identified as a potential solution. The team used low-cost materials and tools to simulate the user experience and prototype the solution, before successfully trialling a fully-functional drone model. Inspection safety has improved, and costs reduced. Further technology refinements have now been introduced based on user feedback and the team is working on extending the solution to other parts of the business.

Supporting people to thrive in change

As the electric utility industry evolves, CLP is committed to supporting all its people to thrive in change. This underpins the core value of 'Care for People' as well as being good business practice in constrained labour markets.

Supporting its people to thrive in change means engaging and helping CLP's people to embrace change and strengthen their wellbeing and resilience, in addition to developing more inclusive workplaces, supporting increased gender, age and cultural diversity.

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 additional financial support for employees seeking to buy a first home. The Company recognises that housing affordability is a significant issue for Hong Kong's young people. At the same time, attracting and retaining staff in an increasingly competitive talent market is critical for CLP's long-term sustainability. The Home Loan scheme is an important initiative to address both challenges. Since the scheme was launched, feedback from employees has been very positive and 40 employees have received assistance to date.

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 seek their ideas for the programme, achieving a very encouraging response rate of over 80%. Survey results will drive major initiatives to improve the health and wellbeing of employees in 2020 and beyond.

Demonstrating fair work practices

The commitment to caring for all its people, as a leading responsible employer, has guided how CLP works for nearly 120 years.

The Company's human resources policies and procedures are intended to ensure that it complies 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 where 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. It is recognised that the responsibility to respect human rights extends to the network of suppliers and contractors. In 2019, the Company continued to focus on working practices across the extended workforce, including continuing to strengthen the 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 Group 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 in 2019. There was no breach of laws and regulations in relation to child and forced labour across CLP in 2019.

The Group monitors pay carefully to ensure that it is competitive and rewards employees for individual and company performance. CLP complies fully with any local legal requirements with respect to minimum wage, and in practice, the remuneration and benefits often significantly exceed local legal requirements. The 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, in 2019, CLP received a Good Mandatory Provident Fund (MPF) Employer award and e-Contribution awards from the MPF Schemes Authority in Hong Kong, and an award for the Best ORSO (Occupational Retirement) Scheme from the publication Asia Asset Management.

Standard ESG Disclosures

Key performance metrics

CLP continually improves by managing, monitoring and reporting its performance. These tables present a quantitative overview of the Group's 2019 financial and non-financial performance. The disclosures are selected from the GRI Standards, Hong Kong Stock Exchange ESG Reporting Guide and TCFD Electric Utilities Preparer Forum, as well as other key performance data.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Read the reporting scope

Download the independent assurance statement

Key performance metrics

Governance	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Convicted cases of corruption reported to the Audit & Risk Committee (cases)	**0**	0	0	0	0	GRI 205-3 / HKEx B7.1
Breaches of Code of Conduct reported to the Audit & Risk Committee (cases)	**31**	20	28	21	6	

Financial information	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Total capital investments incurred by asset type (% (HK$M))[1,2]	**100 (12,028)**	100 (12,851)	N/A	N/A	N/A	TCFD
Transmission & distribution/ retail	**44 (5,252)**	39 (4,953)	N/A	N/A	N/A	
Coal	**20 (2,450)**	24 (3,040)	N/A	N/A	N/A	
Gas	**26 (3,113)**	32 (4,098)	N/A	N/A	N/A	
Nuclear	**3 (352)**	0 (0)	N/A	N/A	N/A	
Renewables	**5 (615)**	5 (714)	N/A	N/A	N/A	
Others	**2 (246)**	0 (46)	N/A	N/A	N/A	
Total operating earnings by asset type (% (HK$M))[3]	**100 (12,389)**	100 (15,145)	100 (14,189)	100 (13,173)	N/A	TCFD
Transmission & distribution/ retail	**42 (5,257)**	49 (7,427)	59 (8,392)	59 (7,798)	N/A	
Coal[4]	**21 (2,557)**	22 (3,370)	28 (3,994)	30 (3,905)	N/A	
Gas[4]	**11 (1,402)**	10 (1,533)				
Nuclear	**14 (1,688)**	11 (1,720)	7 (913)	7 (863)	N/A	
Renewables	**10 (1,260)**	7 (924)	4 (629)	3 (455)	N/A	
Others	**2 (225)**	1 (171)	2 (261)	1 (152)	N/A	
Economic value generated, distributed and retained (HK$M)						
Economic value generated						
Revenue	**85,689**	91,425	92,073	79,434	80,700	GRI 201-1

Financial information	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Share of profits of non-wholly owned entities[5]	**1,828**	1,509	609	791	10,299	GRI 201-1
Economic value distributed						
Fuel costs	**16,712**	17,187	15,473	12,785	15,446	GRI 201-1
Other operating costs[6]	**48,654**	43,604	46,325	38,689	41,705	GRI 201-1
Staff expenses[7]	**4,535**	4,449	4,195	3,892	3,649	GRI 201-1
Finance costs[8]	**2,033**	2,107	2,278	2,371	4,183	GRI 201-1
Dividends	**7,782**	7,630	7,352	7,074	6,822	GRI 201-1
Taxes[9]	**2,189**	3,565	2,094	2,032	1,818	GRI 201-1
Donations	**21**	18	14	13	15	GRI 201-1
Economic value retained[10]	**5,591**	14,374	14,951	13,369	17,361	GRI 201-1

1 Capital investments include additions to fixed assets, right-of-use assets and intangible assets, investments in and advances to joint ventures and associates, and acquisition of business.
2 On an accrual basis.
3 Before unallocated expenses.
4 Starting in 2018, operating earnings of coal and gas are reported separately.
5 Includes share of results (net of income tax) from joint ventures and associates netted with earnings attributable to other non-controlling interests, which represented CLP's share of economic value created together with its business partners.
6 Includes impairment provision and reversal.
7 Another HK$1,365 million (2018: HK$1,338 million) of staff costs incurred were capitalised.
8 Finance costs are netted with finance income and include payments made to perpetual capital securities holders. In addition, finance costs of HK$323 million (2018:HK$278 million) were capitalised.
9 Represents current income tax but excluding deferred tax for the year.
10 Represents earnings attributable to shareholders (before depreciation, amortisation and deferred tax) for the year retained.

Safety	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Fatalities (number)[1,2]						
Fatalities - employees only	**0**	1	0	0	0	GRI 403-2 / HKEx B2.1
Fatalities - contractors only	**1**	1	4	3	0	GRI 403-2 / HKEx B2.1
Fatality Rate (number per 200,000 manhour)[1,2,3]						
Fatality Rate - employees only	**0.00**	0.01	0.00	0.00	0.00	GRI 403-2 / HKEx B2.1
Fatality Rate - contractors only	**0.01**	0.01	0.03	0.02	0.00	GRI 403-2 / HKEx B2.1
Lost Time Injury (number)[1,4]						
Lost Time Injury - employees only	**7**[5]	11	11	3	8	GRI 403-2
Lost Time Injury - contractors only	**19**	11	16	10	8	GRI 403-2
Lost Time Injury Rate (number per 200,000 manhour)[1,3,4]						
Lost Time Injury Rate - employees only	**0.07**	0.13	0.13	0.04	0.10	GRI 403-2
Lost Time Injury Rate - contractors only	**0.14**	0.09	0.14	0.07	0.06	GRI 403-2
Total Recordable Injury Rate (number per 200,000 manhour)[1,3,6]						
Total Recordable Injury Rate - employees only	**0.19**	0.19	0.21	0.11	0.18	GRI 403-2
Total Recordable Injury Rate - contractors only	**0.52**	0.29	0.36	0.19	0.28	GRI 403-2
Days Lost (number)[1,4,7]						
Days Lost - employees only	**464**[8]	249[9]	252	9	199	GRI 102-48, 403-2 / HKEx B2.2

1 The system of rules applied in recording and reporting accident statistics complies with the International Labour Organization (ILO) Code of Practice on Recording and Notification of Occupational Accidents and Diseases. Each year's safety data cover the incidents that happened in that calendar year and are based on the latest information available at the time of publication.
2 A fatality is the death of an employee or contractor personnel as a result of an occupational illness/ injury/ disease incident in the course of employment.
3 All rates are normalised to 200,000 worked hours, which approximately equals to the number of hours worked by 100 people in one year.
4 An occupational illness/ injury/ disease sustained by an employee or contractor personnel causing him/ her to miss one scheduled workday/ shift or more after the day of the injury (including fatalities). A lost time injury does not include the day the injury incident occurred or any days that the injured person was not scheduled to work and it does not include restricted work injuries.
5 The health-related lost-time-injury in Australia was reported as lost time injury. It can also be categorised as occupational disease in Australia.
6 Total recordable injuries count all occupational injury incidents and illness other than first aid cases. They include fatalities, lost time injuries, restricted work injuries, and medical treatment.
7 Refers to the number of working days lost when workers are unable to perform their usual work because of an occupational accident or disease. A return to limited duty or alternative work for the same organisation does not count as lost days.
8 158 out of 464 days were carried forward from three incidents in the past.
9 Restated from 253 to 249 per update in Australia.

Environment	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Resource Use & Emissions[1,2]						
Nitrogen oxides emissions (NO_x) (kt)	**47.0**	60.9	59.3	58.1	56.3	GRI 305-7 / HKEx A1.1
Sulphur dioxide emissions (SO_2) (kt)	**44.7**	76.1	81.6	71.2	63.4	GRI 305-7 / HKEx A1.1
Particulates emissions (kt)	**7.7**	8.5	8.3	8.5	9.8	GRI 305-7 / HKEx A1.1
Non-hazardous liquid waste (kl)[3]						
Produced	**59**	52	103	84	199	GRI 306-2 / HKEx A1.4
Recycled	**57**	52	103	84	199	GRI 306-2
Non-hazardous solid waste (t)[3]						
Produced	**13,344**	11,471	20,334	8,317	11,455	GRI 306-2 / HKEx A1.4
Recycled	**4,986**	3,990	3,790	2,963	4,414	GRI 306-2
Hazardous liquid waste (kl)[3]						
Produced	**1,578**	1,685	1,420	1,251	2,832	GRI 306-2 / HKEx A1.3
Recycled	**1,536**	1,648	1,384	1,149	1,176	GRI 306-2
Hazardous solid waste (t)[3]						
Produced	**862**	1,435	857	1,302	641	GRI 306-2 / HKEx A1.3
Recycled	**201**	631	469	260	203	GRI 306-2
Total water withdrawal (Mm^3)[4,5,6]	**5,377.4**	5,153.6	4,480.6	4,256.9	4,503.0	GRI 303-3 / HKEx A2.2
For cooling purpose						
Water withdrawal from marine water resources	**5,319.3**	5,087.3	4,421.7	4,202.3	4,447.6	
Water withdrawal from freshwater resources	**45.7**	53.3	47.6	43.8	45.1	
For non-cooling purposes						
Water withdrawal from freshwater resources	**5.8**	6.0	4.9	4.2	3.8	
Water withdrawal from municipal sources	**6.7**	7.0	6.4	6.6	6.5	
Total water discharge (Mm^3)[5,7,8]	**5,337.1**	5,103.2	4,437.7	4,219.3	4,463.1	GRI 303-4
From cooling process						
Water discharge to marine water bodies	**5,319.3**	5,087.3	4,421.7	4,202.3	4,447.6	
Treated wastewater to freshwater bodies	**0**	0	0	0	0	

Environment	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Wastewater to other destinations	**0**	0.02	0.05	0.06	0.03	
From non-cooling processes						
Treated wastewater to marine water bodies	**1.7**	1.6	1.6	1.5	1.1	
Treated wastewater to freshwater bodies	**14.4**	12.3	12.3	13.7	12.6	
Wastewater to other destinations	**1.7**	1.9	2.0	1.7	1.7	
Wastewater to sewerage	**0.03**	0.03	0.02	0.01	0.02	
Environmental compliance[1]						
Environmental regulatory non-compliances resulting in fines or prosecutions (number)	**0**	0	0	0	1	GRI 307-1
Environmental licence limit exceedances & other non-compliances (number)	**10**	2	13	2	13	GRI 307-1

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Since 2019, numbers at the asset level are aggregated and then rounded.
3 Waste categorised in accordance with local regulations.
4 Starting in 2019, the breakdown of water withdrawal is recategorised into withdrawal for cooling and non-cooling purposes. Numbers of the years 2015-18 are not directly comparable with the previously reported numbers because of the recategorisation, except for marine water resources.
5 Numbers at the asset level are aggregated and then rounded for all years shown herein. They may be adjusted from the numbers reported previously, where they were rounded and then aggregated.
6 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
7 Starting in 2019, the breakdown of water discharge is recategorised into discharge for cooling and non-cooling purposes. Numbers of the years 2015-18 are not directly comparable with the previously reported figures because of the recategorisation, except for marine water bodies.
8 Starting in 2019, Yallourn's "water discharged to third-parties", which was previously reported under "wastewater to sewerage", is reported under "water discharged to other destinations".

GHG Emissions & Climate Vision 2050	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
GHG Emissions[1]						
Total GHG emissions - on an equity basis (kt)[2]	**71,720**	N/A	N/A	N/A	N/A	HKEx A1.2
Scope 1 CO_2e	**50,047**	N/A	N/A	N/A	N/A	GRI 305-1 / TCFD
Scope 2 CO_2e	**250**	N/A	N/A	N/A	N/A	GRI 305-2 / TCFD
Scope 3 CO_2e	**21,424**	N/A	N/A	N/A	N/A	GRI 305-3 / TCFD
Scope 3 CO_2e by category						
Category 1a: Purchased goods and services (products)	**554**	N/A	N/A	N/A	N/A	
Category 1b: Purchased goods and services (non-products)	**539**	N/A	N/A	N/A	N/A	
Category 2: Capital goods	**1,347**	N/A	N/A	N/A	N/A	
Category 3: Fuel- and energy-related activities	**16,671**	N/A	N/A	N/A	N/A	
Category 5: Waste generated in operations	**101**	N/A	N/A	N/A	N/A	
Category 6: Business travel	**8**	N/A	N/A	N/A	N/A	
Category 7: Employee commuting	**4**	N/A	N/A	N/A	N/A	
Category 11: Use of sold products	**2,200**	N/A	N/A	N/A	N/A	
Total GHG emissions - on an operational control basis (kt)[3]						
Scope 1 & 2 CO_2e (from power generation)	**50,676**	52,306[4]	48,082	46,681	46,723	GRI 102-48, 305-1, 305-2 / HKEx A1.2
Scope 1 & 2 CO_2 (from power generation)	**50,412**	52,052[4]	47,921	46,518	46,553	GRI 102-48, 305-1, 305-2 / HKEx A1.2
Climate Vision 2050[1]						
Performance against targets - on an equity basis[2]						
Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)	**0.70**	0.74	0.80	0.82	0.81	GRI 305-4 / HKEx A1.2 / TCFD
Total renewable energy generation capacity (% (MW))	**12.8 (2,469)**	12.5 (2,387)	14.2 (2,751)	16.6 (3,090)	16.8 (3,051)	TCFD
Non-carbon emitting generation capacity (% (MW))	**21.1 (4,069)**	20.9 (3,987)	22.4 (4,350)	19.2 (3,582)	19.5 (3,543)	
Performance against targets - on an equity plus long-term capacity and energy purchase basis[2,5]						

GHG Emissions & Climate Vision 2050	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)	**0.62**	0.66	0.69	0.72	N/A	GRI 305-4 / HKEx A1.2 / TCFD
Total renewable energy generation capacity (% (MW))	**13.7 (3,294)**	12.8 (3,039)	13.1 (3,211)	14.9 (3,551)	N/A	TCFD
Non-carbon emitting generation capacity (% (MW))	**24.9 (5,979)**	24.1 (5,724)	23.2 (5,699)	20.7 (4,931)	N/A	

1 CO_2 emissions of Yallourn and Hallet power stations were used in 2018. Prior to 2018, CO_2e emissions data of these assets were used.
2 Numbers include majority and minority share assets in the CLP Group portfolio.
3 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
4 Restated as per updated data for Hallett power station in Australia.
5 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.

CLP Power Hong Kong - carbon emissions intensity of electricity sold	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
CO_2e emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2e/ kWh)[1]	**0.50**	0.51	0.51	0.54	0.54	
CO_2 emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2/ kWh)[1]	**0.49**	0.51	0.50	0.54	0.54	

1 "Electricity sold" is the total electricity energy sold to CLP Power Hong Kong's customers before adjustment of Renewable Energy Certificates.

Operations	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Generation capacity by asset type (% (MW))[1]						
Total generation capacity - based on an equity basis[2]	**100 (19,238)**	100 (19,108)	100 (19,395)	100 (18,622)	100 (18,180)	TCFD
Coal	**56.0 (10,765)**	56.3 (10,765)	58.8 (11,401)	61.2 (11,396)	62.7 (11,396)	
Gas	**21.8 (4,194)**	21.7 (4,147)	17.7 (3,434)	18.4 (3,434)	16.7 (3,031)	
Nuclear	**8.3 (1,600)**	8.4 (1,600)	8.2 (1,600)	2.6 (492)	2.7 (492)	
Renewables	**12.8 (2,469)**	12.5 (2,386)	14.2 (2,751)	16.6 (3,090)	16.8 (3,051)	
Others	**1.1 (210)**	1.1 (210)	1.1 (210)	1.1 (210)	1.2 (210)	
Total generation capacity - based on an equity plus long-term capacity and energy purchase basis[2,3]	**100 (24,015)**	100 (23,705)	100 (24,554)	100 (23,781)	100 (22,706)	TCFD
Coal	**50.0 (11,997)**	50.6 (11,997)	51.4 (12,633)	53.1 (12,628)	55.6 (12,628)	
Gas	**21.4 (5,139)**	21.4 (5,084)	21.7 (5,322)	22.4 (5,322)	20.9 (4,747)	
Nuclear	**11.2 (2,685)**	11.3 (2,685)	10.1 (2,488)	5.8 (1,380)	6.1 (1,380)	
Renewables	**13.7 (3,294)**	12.8 (3,039)	13.1 (3,211)	14.9 (3,551)	13.4 (3,051)	
Others	**3.7 (900)**	3.8 (900)	3.7 (900)	3.8 (900)	4.0 (900)	
Energy sent out by asset type (% (GWh))[1]						
Total energy sent out - based on an equity basis[2]	**100 (70,949)**	N/A	N/A	N/A	N/A	TCFD
Coal	**62.9 (44,596)**	N/A	N/A	N/A	N/A	
Gas	**14.1 (9,979)**	N/A	N/A	N/A	N/A	
Nuclear	**15.3 (10,888)**	N/A	N/A	N/A	N/A	
Renewables	**7.7 (5,487)**	N/A	N/A	N/A	N/A	
Others	**0 (0)**	N/A	N/A	N/A	N/A	
Total energy sent out - based on an equity plus long-term capacity and energy purchase basis[2,3,4]	**100 (88,573)**	100	100	100	100	TCFD
Coal	**54.8 (48,512)**	60	61	63	63	
Gas	**14.8 (13,073)**	12	15	14	16	
Nuclear	**21.9 (19,400)**	20	15	14	15	
Renewables	**8.7 (7,699)**	8	9	9	6	
Others	**-0.1 (-109)**	0	0	0	0	
Fuel use[5]						
Coal consumed (for power generation) (TJ)	**485,453**	521,568	471,976	453,904	450,937	GRI 302-1 / HKEx A2.1
Gas consumed (for power generation) (TJ)	**107,183**	83,364[6]	91,426	86,787	95,591	GRI 102-48, 302-1 / HKEx A2.1

Operations	2019	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Oil consumed (for power generation) (TJ)	**2,620**	3,807[6]	5,069	4,162	2,892	GRI 102-48, 302-1 / HKEx A2.1

1 Numbers and percentage figures have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
2 Numbers include majority and minority share assets in the CLP Group portfolio.
3 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.
4 Only percentages are available for the years 2015-18.
5 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
6 Restated as per updated data for Hallett power station in Australia.

People	2019[1]	2018	2017	2016	2015	GRI/ HKEx/ TCFD
Total employees by region (number)	**7,960**	7,634	7,542	7,428	7,360	GRI 102-7 / HKEx B1.1
Hong Kong	**4,604**	4,538	4,504	4,450	4,438	
Mainland China	**607**	596	577	560	527	
India	**469**	458	463	435	397	
Australia	**2,280**	2,042	1,998	1,983	1,998	
Total employees eligible to retire within the next five years (%)[2]	**13.9**	16.4	15.1	14.1	13.3	GRI EU15
Hong Kong	**19.5**	20.0	18.6	17.3	16.2	
Mainland China	**14.5**	13.2	10.6	12.1	11.9	
India	**4.8**	4.0	2.4	0.9	0.8	
Australia[3]	**5.4**	12.8	12.2	11.4	10.9	
Voluntary staff turnover rate (%)[4,5]						GRI 401-1 / HKEx B1.2
Hong Kong	**2.4**	2.3	1.9	2.3	2.8	
Mainland China	**2.0**	4.7	3.0	3.4	2.6	
India	**6.6**	5.6	3.5	8.4	9.8	
Australia	**12.9**	13.6	13.8	12.6	13.7	
Average training hours per employee (hours)	**40.1**	46.1	46.9	49.2	57.2	GRI 404-1 / HKEx B3.2

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.
2 The percentages given refer to permanent employees within each region, who are eligible to retire within the next five years.
3 There is no mandatory retirement age in Australia. Retirement age assumption was adjusted in 2019 from 60 to 65 to reflect local norms, which led to a significantly lower percentage compared to previous years. Numbers in previous years adopting the adjusted retirement age for Australia are as follows: 2015 - Australia: 3.8% / Group total: 11.1%; 2016 - Australia: 4.6% / Group total: 12.0%; 2017 - Australia: 4.8% / Group total: 12.9%; 2018 - Australia: 4.6% / Group total: 14.0%.
4 Voluntary turnover is employees leaving the organisation voluntarily and does not include dismissal, retirement, company-initiated termination or end of contract.
5 Includes permanent employees only, except for Mainland China which refers to both permanent and fixed-term contract employees due to its specific employment legislation.

Corporate governance

Corporate governance framework and code

Management approach

CLP's Code on Corporate Governance (the CLP Code) guides the company's policies and underpins its success. The CLP Code covers all CLP businesses and applies to all directors, officers and employees of CLP Holdings and its subsidiaries.

Good corporate governance promotes and safeguards the interests of shareholders and other stakeholders. CLP is committed to maintaining a rigorous framework of corporate governance which upholds the Group's credibility and reputation.

Corporate governance is a matter of culture, driving CLP to continually make conscious decisions around correct behaviours. The table summarises how CLP manages corporate governance through the CLP Code, the CLP Corporate Governance Framework and a comprehensive set of policies and guidelines:

The CLP Code was updated in 2019 to reflect new requirements under the Rules Governing the Listing of Securities issued by The Stock Exchange of Hong Kong Limited and CLP's current corporate governance practices. While embracing the terms set out within the Hong Kong Stock Exchange's Corporate Governance Code and Corporate Governance Report, the CLP Code seeks to go beyond this by advancing a structure that builds on CLP's own standards and experience.

The Board is CLP's highest governance body and actively promotes the success of the Group by directing and supervising all of its affairs in a responsible and effective manner. Some of these responsibilities are discharged through delegation to six Board Committees. The two committees most involved in sustainability-related matters are the Sustainability Committee and the Audit & Risk Committee.

Download the CLP Code on Corporate Governance

Find out more about sustainability governance

How CLP Holdings approaches corporate governance

CLP Code on Corporate Governance	• Commitment of the Board and Senior Management to good standards of corporate governance • Sets out common principles that must be adhered to across the Group
Corporate Governance Framework	• Identifies all key participants in good governance • Guides CLP to uphold the Company's values and conduct affairs with different stakeholders in an ethical, transparent and accountable manner • Defines the framework and process for monitoring the management of the Group • Sets out common principles that must be adhered to across the Group
Specific policies at Group or business unit level	• Provides guidance on appropriate conduct in day-to-day work • Must meet local regulatory requirements or local stakeholder expectations
Systems and Standards, supported by procedures and manuals	• Internal mandatory requirements that guide day-to-day operations and practices
Standard Practices and Guidelines	• Provides details for system/ standard implementation, or voluntary guidance on managing emerging issues and risks • The voluntary guideline adopts a precautionary approach, particularly for environmental aspects, helping us to prepare for new regulations

Year in review

In 2019, the Board spent most time on performance monitoring and leadership & strategy, followed by governance & risk and stakeholder engagement.

The Corporate Governance Report in the Annual Report discloses CLP's governance performance in detail. Following the enhancement of the Board Diversity Policy in early-2019, the gradual refreshment of the Board is underway and this was also extended to the membership of the Board Committees.

CLP continues to take a forward-looking approach in enhancing its corporate governance practices. Recognising a number of signature strengths of the Board, the external Board Review undertaken in 2019 has also identified opportunities to further enhance the Board's contribution to CLP's long-term strategic agenda.

Read the Corporate Governance Report in the 2019 Annual Report

The Human Resources and Remuneration Committee Report covers CLP's Remuneration Policy, including the non-financial metrics considered for executive's remuneration.

Code of Conduct and anti-corruption

Management approach

CLP's Code of Conduct specifies how the company should act with integrity in all activities, and serves as a tool to guard against corruption within the Group.

The Code of Conduct is available to the public and applies across the entirety of CLP Group – including CLP Holdings, its wholly owned subsidiaries, and joint ventures or companies in which CLP holds a controlling interest. All employees of CLP, irrespective of their position and function, are expected to fully adhere to the principles contained in the Code. In the case of joint ventures or companies in which CLP does not hold a controlling interest, the representatives are also expected to act in accordance with the Code and to make a concerted effort to influence those with whom they are working to follow similar standards of integrity and ethical behaviour. Likewise, contractors working for CLP are encouraged to follow the Code for the duration of their contract, and also encourage their subcontractors to do the same.

Download CLP's Code of Conduct

CLP's Whistleblowing Policy encourages employees and related third parties (such as customers and suppliers) who deal with CLP to raise concerns about any real or perceived misconduct, malpractice or irregularity through a confidential reporting channel.

Training and awareness

Training in relation to the Code of Conduct is mandatory for all staff after joining the Company. CLP promotes the Code of Conduct and Whistleblowing Policy to employees on a regular basis, by advising of any updates or revisions. Every four years, the Company conducts a Business Practice Review (BPR) process for all employees in person to refresh a company-wide understanding of the principles of the Code, and help to ensure business practices remain compliant. Any potential issues are raised and reviewed with management. A number of case studies based on past violations are also included to highlight how to properly handle potential and actual situations in which the Code has been violated. Contractors are encouraged to attend the BPR sessions alongside CLP employees.

Monitoring and follow-up

The General Representation Letter (GRL) process is one of the means by which non-compliance with the Code can be reported. The process reinforces personal responsibility for good governance and sets controls at all levels within CLP. For instance, business practices are reviewed and fraud risks in different areas assessed as part of the process, while irregularities or exceptions are reported for the attention of senior management. Managers in the Group are also required to sign the Code of Conduct Compliance Statement on an annual basis.

The CLP-wide reporting system for Code of Conduct violations applies to any alleged or potential breach. All CLP employees are expected to co-operate fully in the investigation of an alleged violation, and disciplinary action applies to any staff member found to be in breach of the Code. The number of breaches of the Code and any cases of corruption are reported annually, with the relevant data verified by a third party.

Operational responsibilities

Potential violations of the Code of Conduct are reported to the Group Internal Audit (GIA) by employees, vendors, contractors and GIA auditors. Communications are received through means such as anonymous letters, emails or phone calls.

GIA regularly reviews compliance with the Code, and investigates any potential violations, except for those related to human resources, which are investigated by Human Resources (HR).

Non-compliance with the Code results in disciplinary action. The Group Code of Conduct Committee, which comprises the Executive Director and Chief Financial Officer, Group General Counsel & Chief Administrative Officer, and Chief Human Resources Officer, reviews and endorses any disciplinary measures taken.

For a quicker response to Code of Conduct violations in Australia, EnergyAustralia has been delegated the responsibility to manage and take action for violations committed by EnegyAustralia employees. EnergyAustralia will inform the CLP Holdings Audit & Risk Committee of cases involving senior EnergyAustalia employees.

For CLP India, a separate Internal Complaints Committee was established to handle complaints of sexual harassment at the workplace in accordance with Indian law.

Year in review

In 2019, CLP completed a review of the Anti-Fraud Policy to better govern issues related to the Code of Conduct and anti-corruption.

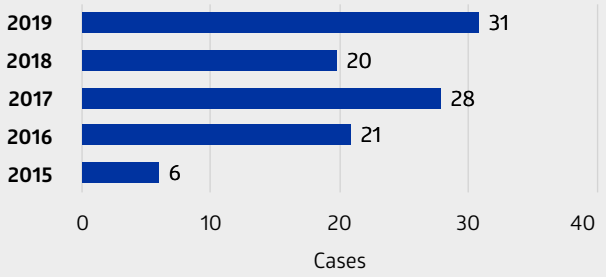
During 2019, there were 31 breaches (compared with 20 in 2018) of the Code of Conduct. In both 2018 and 2019 there were no convicted cases of corruption at CLP, and 20 cases of whistleblowing (compared with 16 in 2018). The relatively higher number of breaches in the last several years reflects the improved identification and stricter enforcement of work place behaviour requirements.

None of the 31 breaches of the Code of Conduct in 2019 was material to the Group's financial statements or overall operations. The breaches were mainly related to issues of workplace behaviour and individuals' ethics and integrity. One of the reported Code of Conduct violations involved an employee at the grade level of senior manager and above.

Learn more about breaches related to Respect for People >

Breaches of Code of Conduct reported to the Audit & Risk Committee

The total number of breaches of Code of Conduct increased from 20 in 2018 to 31 in 2019.



Legal compliance

Management approach

The CLP Group operates in a number of different jurisdictions with different legal and regulatory requirements. Compliance with the requirements in the jurisdictions in which it operates has always been and will continue to be a priority.

Compliance is a basic requirement for maintaining the social licence to operate. CLP's commitment to comply with laws and regulations is specified in the Code of Conduct. There are additional policies, codes and guidelines that apply to operations and practices under the Code of Conduct including competition law compliance, compliance with personal data and privacy, health, safety and environmental (HSE) policies, and human resources policies, amongst others.

CLP is prepared to forego opportunity or advantage in order to maintain the highest standards of corporate governance and integrity. Beyond compliance, CLP voluntarily follows other standards that reflect the company's principles and values.

Monitoring and follow-up

One of the responsibilities of the Audit & Risk Committee is to ensure that CLP is satisfying the compliance principles laid out in the Value Framework and the Code of Conduct, as well as compliance with applicable legal and regulatory requirements such as the Listing Rules, the Companies Ordinance and the Securities and Futures Ordinance. The Committee also reviews regulatory and legal cases. Every six months, Group Legal Affairs compiles a "CLP Group Key Regulatory and Legal Compliances Issues Report", which covers key regulatory compliance issues in addition to legal cases in which CLP is a named defendant for the Board-level Audit & Risk Committee.

CLP is often confronted with changes in the legal and regulatory regimes that affects its operations. The company closely monitors emerging regulations, and ensures that it is prepared for new regulations before they become effective.

Accordingly, CLP reviewed new and amended laws and regulations which came into effect during the 2019 reporting year to identify those which have a significant impact on the business. The threshold applied for assessing the impact of new and amended laws and regulations is whether there is significant investment or expenditure required to ensure compliance. These aspects form part of this review, and the results are described in relevant sections of this report.

1. **Emissions** – air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste
2. **Employment** – compensation, dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination and other benefits and welfare
3. **Health and Safety** – safe working environment and protecting employees from occupational hazards
4. **Labour Standards** – prevention of child and forced labour
5. **Product Responsibility** – consumer data protection and privacy
6. **Anti-corruption** – bribery, extortion, fraud and money laundering.

Year in review

There were no new reportable cases of breaches in legal or regulatory compliance in 2019.

To uphold the spirit of transparency and accountability, CLP reports cases of legal non-compliance annually in the Sustainability Report. These include convicted criminal cases against CLP, and major breaches that resulted in significant fines (greater than HK$1 million) or non-monetary sanctions. CLP's 2019 performance is summarised below, grouped based on the GRI Standards and the HKEx ESG Reporting Guide.

The Company is also exposed to the risk of contractual disputes and litigation in the course of its normal operations. The Group considers each instance separately in accordance with legal advice and will make provision and/or disclose information as appropriate. Refer to Note 30 – Contingent Liabilities in the 2019 Annual Report.

Reportable case of breaches in legal or regulatory compliance in 2019

		Number of cases	Supplementary information
Business Practices	Anti-corruption	No reportable case.	Read more in the Code of Conduct and anti-corruption section.
	Anti-competitive behaviour	No new reportable case in 2019. There is one existing and previously reported case involving Ho-Ping Power Station in Taiwan, in which the CLP Group has a 20% equity interest.	The Ho-Ping litigation is for alleged concerted action with other independent power producers (IPPs) in violation of the **Taiwan Fair Trade Act**. The Taiwan Fair Trade Commission (FTC) in 2013 ruled and fined nine IPPs for alleged cartel behaviour. The FTC's decision was eventually overruled by the Taipei High Administrative Court (THAC) in October 2014. However, the FTC successfully appealed the THAC's decision to the Supreme Administrative Court (SAC), and the case returned to the THAC for re-examination. In May 2017 the THAC ruled again in favour of Ho-Ping and rejected the FTC's decision. In June 2018, the SAC accepted FTC's further appeal and, for the second time, returned the case to the THAC for re-examination. Ho-Ping will continue to defend its position in the THAC.
Employees and contractors	Employment practices	No reportable case.	
	Labour standards (child and forced labour)	No reportable case.	
	Occupational health and safety	No reportable case.	
Customer	Customer privacy	No reportable case.	Find out more from Protecting personal data and the Access to electricity sections.
	Product and service information and labelling and marketing information	No reportable case.	
	Customer health and safety	No reportable case.	
Community	Rights of indigenous people	No reportable case.	
Environment		No reportable case.	Read more in the Environmental regulations and compliance section.

Risk management

Management approach

Effective risk management which considers the need to balance risk and opportunity is critical to the long-term growth and sustainability of the CLP Group's business.

Risk Management Framework

Risk is inherent in CLP's operations and the markets in which the Group operates. CLP aims to identify risks early so they can be understood, managed, mitigated, transferred or avoided. This demands a proactive approach to risk management.

CLP's risk management framework comprises four key elements:

1. Risk management philosophy;
2. Risk appetite;
3. Risk governance structure; and
4. Risk management process.

CLP's overall risk management process is overseen by the Board through the Audit & Risk Committee. There is a strong recognition that risk management is the responsibility of everyone within the Group. Therefore, risk management is integrated into all business and decision-making processes including strategy formulation, business development, business planning, capital allocation, investment decisions, internal control and day-to-day operations.

CLP's risk management objectives are two-tiered:

- **Strategic**
  At a strategic level, CLP focuses on the identification and management of the material financial and non-financial risks associated with the pursuit of strategic and business objectives. In pursuing growth opportunities, CLP aims to optimise risk and return decisions as defined and quantified through a diligent and independent review and challenge process.
- **Operational**
  At an operational level, CLP aims to identify, analyse, evaluate and mitigate all operational hazards and risks. This is done in order to create a safe, healthy, efficient and environmentally-friendly workplace for its employees and contractors. Other considerations include ensuring public safety and health, minimising environmental impact, and securing asset integrity and adequate insurance.

Risk management framework

Emerging risks

CLP recognises that certain external global trends could have a significant impact on its operating environment. These trends encompass significant political, economic, social, environmental and technological changes, and could rapidly evolve and impact on the context in which the company operates. Because of this, these trends are important in the process of identifying risks that could affect CLP's strategic execution and operational performance. Following a review of dozens of prospective megatrends in 2018 plus additional stakeholder engagement sessions conducted in 2019, CLP reaffirmed that purpose underpins the business as outlined in the CLP Group business section. In addition, the following four material topics were identified as priorities:

- Climate change mitigation and adaption
- Technology as an enabler and disruptor
- Risks to cyber security and data privacy
- Ever-changing operating environments require an agile, inclusive and sustainable workforce .

Going forward, CLP will continue to strengthen the integration of ESG risks into its risk management framework and processes, including how climate-related risks at the Group level are consolidated and assessed.

Read more about the key drivers and megatrends affecting CLP >

Year in review

CLP categorises its risk profile into five key risk areas: regulatory, financial, market, commercial, and industrial & operational. These are detailed in the Annual Report.

Climate change-related risks are embedded in these key risk areas and reported in the Risk Management Report of the Annual Report. In this Sustainability Report, CLP reports on how climate change impacts the Group's business in the medium- to long-term. Additional information on climate-related risks is disclosed in the Risk Management Report and through CDP.

Find out more on climate scenarios analysis >

Read about how CLP responds to climate change >

Read more in the 2019 Risk Management Report

CASE STUDY

Holistic assessment of new investment projects

The CLP Group Investment Committee is mandated to review and assess acquisitions, investments, project funding, restructures and disposals proposed by the CLP Group. The Committee is made up of senior management and is chaired by the CEO.

Before major investments receive funding approval from the Investment Committee, they are subject to a multidisciplinary review process which includes both financial and non-financial components. Non-financial considerations include safety, security, social, climate change and environmental risks. Early assessment enables a reduction in the business and reputational risks associated with a project and helps guide stakeholder engagement.

Some financial institutions have adopted the Equator Principles to set minimum standards for determining, assessing and managing environmental and social risk. In 2019, around 50% of CLP's new debt funding supporting Group investment projects with no recourse to CLP Holdings came from banks which have adopted the Equator Principles. This increased from around 40% in 2018.

Details of the non-financial review during pre-development and development of projects are summarised in the table below. For project execution and operation, on-going management is conducted in accordance with CLP operational standards and guidelines.

	Pre-development	Development	Execution and operation
Climate change	**Pre-Investment Carbon Intensity Assessment** · Assesses the proposed project's impact on CLP Group's portfolio carbon intensity levels, and confirms how the potential investment will fit into CLP's Climate Vision 2050		
Health & Safety	H&S reviews the risks associated with technology throughout the project lifecycle and industrial best practices with a focus on preliminary planning for mitigation of critical risks	H&S reviews the onboarding of key contractors by evaluating contractor competence and capabilities, reviewing the terms and specification in contracts. Through targeted interventions CLP challenges the risk exposure to its workforce, with a firm vision to achieving zero harm	
Environment	**Pre-Investment Environmental Risk Assessment – Environmental Due Diligence (EDD)** · Mandatory for any potential acquisition or project · Identifies the environmental-related risks that may be material to the proposed project · Proposes potential mitigation measures and recommendations (e.g. environmental impact assessments, environmental management systems) as part of the budget requirement for project execution	Environmental Impact Assessment (EIA) · Mandatory prior to project construction and applicable to all projects over which CLP has majority ownership or operational control · Supported by a series of Health, Safety, Security and Environment (HSSE) standards and guidelines · Biodiversity Impact Assessment Guideline provides guidance on managing biodiversity risks where appropriate, and considers the IUCN Red List of Threatened Species and national conservation lists of threatened species	On-going management in accordance with CLP operational standards and guidelines
Social	**Social Due Diligence (SDD)** · Mandated for any potential acquisition or project to collect information about the impacts of the target investment or project on its surrounding community · By identifying potential red flags early, it helps CLP develop and maintain a constructive relationship with the host community throughout the project's lifecycle and ensures the Group meets its policy obligations · Assesses the impacts of land acquisition, displacement and resettlement, restriction of access, community safety, influx (i.e. effect on local area services, supplies and infrastructure by the project or operational staff), working conditions and cultural heritage · Suggests mitigating solutions to any issues raised	Work closely with the communities, NGOs and relevant stakeholders where CLP's investment and projects are located to develop social programmes and initiatives that address the needs of the people living or working nearby, in line with CLP's community investment pillars.	

Corporate governance data

Code of Conduct and anti-corruption

Code of Conduct	2019	2018	2017	2016	2015
Breaches of Code of Conduct reported to the Audit & Risk Committee (cases)	**31**	20	28	21	6

Anti-corruption	2019	2018	2017	2016	2015
Convicted cases of corruption reported to the Audit & Risk Committee (cases)	**0**	0	0	0	0

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Safety

Health, Safety, Security and Environment management

Management approach

Integrating Health, Safety, Security and Environment (HSSE) elements into CLP Group assets and processes helps achieve the goal of safe, secure and environmentally responsible operations.

HSSE Leadership

The CLP Group HSSE Management System Standard sets out a structured approach to HSSE risk management, which:

- is executed through a set of standards and guidelines to meet the requirements of the policy statements set out in CLP's Value Framework;
- enables the Group's regional organisations to incorporate HSSE requirements into their business programme; and
- promotes and encourages compliance with the international standards for health and safety and environmental management such as ISO 45001 and ISO 14001.

The Standard contains 15 elements, each of which is supported by a set of expectations which encourage excellence in HSSE performance across the Group, while allowing some flexibility for implementation at a regional level.

The effectiveness of the HSSE Framework is reviewed and evaluated by the Board-level Sustainability Committee. CLP's investment projects also undergo a variety of HSSE assessments. The results are presented to the Group Investment Committee, comprising of senior management and chaired by the CEO, to support decision-making.

Download the HSSE Management System Standard

Download an overview of the safety and environmental management systems of CLP's assets

Goals and targets

To support safe operations, the HSSE plan has clear objectives, programmes, timelines, and quantifiable Key Performance Indicators (KPIs), as well as sufficient resources including HSSE professionals and an appropriate budget.

Operational responsibilities

The Group HSSE Committee, chaired by the CEO, has the highest executive responsibility on HSSE-related issues. The Group Operations Leadership Team and the Global HSE Team conduct monthly meetings to coordinate, monitor and share knowledge and experience in HSSE practices across the Group, with a special focus on achieving an overall higher level of safety performance.

In addition, various HSSE committees have been established to engage employees at the operational level, and this also involves project partners and contractors. HSSE professionals facilitate the overall engagement effort and advise on HSSE matters, while the responsibility for implementing high levels of HSSE standards rests with line management.

Continuous improvement

An annual HSSE improvement programme is developed, approved and communicated to staff and contractors in each region. Recommendations are implemented on agreed timescales and programme processes are monitored regularly.

Hierarchy of operational responsibilities

Group HSSE Committee	• Chaired by the CEO • Has the highest executive responsibility on the issue
Group Operations Leadership Team and Global HSE Team	• Meet monthly to coordinate, monitor and share knowledge and experience • Focus on achieving an overall higher level of safety performance
Specific policies at Group or business unit level	• Engage employees, project partners and contractors at the operational level • HSSE professionals as facilitators
Systems and Standards, supported by procedures and manuals	• Responsible for implementing high levels of HSSE standards

Occupational health and safety

Management approach

Based on the Group-wide HSE Improvement Strategy, each business unit has developed its own action plan for delivery.

The CLP Group's **HSE Improvement Strategy** is based around five pillars, each of which emphasises a key fundamental principle for effective HSE management. It aims to uplift the Group's safety culture across all operating regions, promotes more proactive risk management, and engages employees, contractors and other key stakeholders in collectively implementing changes to improve safety performance. CLP is committed to ongoing efforts to find new and better ways of working, by learning from investigations into incidents, as well as the adoption of best practices. For instance, the Group has implemented safety improvements for working at height and with other gravitational energies. In addition, Group-wide principles for the safety behavioural framework have been established which set expectations for all levels of the organisation. The Company is continuing to support behavioural safety observation programmes at key Group assets.

As part of Enterprise Risk Management, consistent standards continued to be implemented across the Group for risk management, which includes identifying risks and opportunities.

Download an overview of the safety and environmental management systems of CLP's assets

Goals and targets

CLP is committed to ensuring all activities and operations result in zero harm for employees, contractors, customers and the public. The Group's goal is zero fatalities and injuries for employees and contractors. CLP aspires to meet this target as part of its commitment to creating a healthy and safe workplace.

Monitoring and follow-up

The Safety Performance Monitoring and Reporting Standard sets out the safety performance indicators and requirements of safety data reporting. It utilises indicators to show trends which may require more attention to prevent an incident from occurring.

Safety performance is reported internally on a monthly basis. Safety performance data of the assets which fall within CLP's safety reporting scope is collected and presented in the Group Operations Leadership Team and the Global HSE Team monthly meetings.

Training and awareness

Personnel will only be asked to do work in areas in which they are capable and competent to handle. This requires the careful selection, placement, training, ongoing competency assessment and authorisation of employees, with third-party independent assessment where appropriate. A system is in place to identify and deliver the training necessary to ensure individual competence and knowledge to understand the hazards, risks and control measures associated with their work.

At the asset level, they have the flexibility to structure their own Health and Safety organisations and to design more specific approaches in providing relevant health and safety training, as well as monitoring the percentage of contractors who have undergone the training. Safety training requirements are in all contracts and all contractors are expected to undergo safety training relevant to their duties. Spot checks are conducted to ensure compliance.

Continuous improvement

Thorough investigations have been conducted into all incidents with potential to cause serious injuries with the aim of identifying the root causes. CLP is also committed to understanding how behaviours drive safety performance and continues to support behavioural safety observation programmes in each region.

CLP's **Incident Management Standard** sets out the minimum requirements for the implementation and maintenance of a safety incident management system across the Group. In the event of a major incident, the CLP Group Accident Investigation Panel (AIP) and Investigation Report Format Standard are followed. The AIP, chaired by senior members of staff from outside the business unit in which the accident occurred, conducts a thorough investigation. The AIP's reports are critically reviewed by the Group Chief Operating Officer and the regional Managing Director. The intention is to identify root causes and contributing factors in relation to every incident, and ensure they do not occur again.

Year in review

The CLP Group was saddened by one fatal incident that resulted in the death of a subcontractor's worker in Hong Kong this year. There is also a moderate increase in the Group's injury rates in 2019.

The Group is committed to improve its performance as guided by the HSE Improvement Strategy. The following charts show the safety performance of all CLP employees and contractors in the Group and individual regions in terms of the Lost Time Injury Rate (LTIR) and the Total Recordable Injury Rate (TRIR) in 2019. The total number of days worked by contractors and sub-contractors was approximately 3 million man days, assuming a nine-hour work day.

Regional safety performance (employees/contractors)

	CLP Holdings	Hong Kong	Mainland China	India	Australia	Total	Employees and contractors combined
Fatalities (number)	0/1	0/0	0/0	0/0	0/0	0/1	1
Fatality rate (number per 200,000 manhours)	0.00/0.24	0.00/0.00	0.00/0.00	0.00/0.00	0.00/0.00	0.00/0.01	0.00
Lost time injuries (number of cases)	0/2	4/15	0/0	0/0	3/2	7/19	26
Lost time injury rate (number per 200,000 manhours)	0.00/0.48	0.09/0.21	0.00/0.00	0.00/0.00	0.10/0.12	0.07/0.14	0.11
Total recordable injury rate (number per 200,000 manhours)	0.00/0.48	0.19/0.51	0.10/0.00	0.00/0.68	0.31/0.62	0.19/0.52	0.38
Days lost / Days charged (number) - employees only	0	246	0	0	218	464	464
Occupational disease (number) - employees only	0	0	0	0	0	0	0

Read more on CLP's safety performance in 2019 >

Improving HSE management

There are five pillars in the HSE Improvement Strategy, which emphasise key fundamental principles to effective HSE management. The critical theme across all pillars is a focus on reducing the number of serious incidents. Each pillar contains a number of elements which work together to deliver the Strategy in a cohesive manner. The Strategy is being implemented over a three-year period, with the focus initially on putting enablers in place, followed by the embedding and review of actions.

In December 2019, CLP undertook a review of the focus areas for the Strategy and concluded that these are the right drivers to deliver improved outcomes for the business. Examples from this year's activities include:

Uplifting Safety Culture

In tune with making the Zero Harm vision personal to all employees, the China business launched a safety slogan competition. The resultant slogan "Return home safely, the whole family is blessed" was embraced and widely shared and promoted throughout 2019 giving the team ownership and empowerment over their journey. Quality outcomes are born from a solid foundation in work culture, through various activities the Australian team embarked on major cultural change initiatives at both Yallourn and Mt Piper. This is just a snapshot of the important work driving cultural change within the Company and shows the commitment to strengthening CLP's people and culture.

Rethinking Risk

An important lever for driving change is rethinking risks by challenging the way people across the Group work, to find new and better ways to enable success, safely. This is reflected in the diversity of solutions from within regional businesses.

- The use of technological solutions to avoid unnecessary risk exposure for employees featured in the Hong Kong business, with the use of drones avoiding the need for people to work above the ground.
- Simplification of working systems and the rollout of Process Safety initiatives across the group has seen positive response from the workforce across regions.
- In India, Stop Work Authority programme focuses on empowering employees and contractors when they perceive any work to be unsafe.
- In CLPe Solutions, work with the MTR Corporation introduced a new pipe elevated machine for drainage pipe installation work which reduced heavy lifting and working at height.

Involving Stakeholders

Outreaching to stakeholders on the importance of Health, Safety and Environment is a top priority. Leadership is not a verbal commitment – it involves proactive action and continuous dialogue. CLP recognises there is great power in an aligned and collaborative approach and sees great examples of this in EnergyAustralia where the Executive Management team spent time at asset level engaging with the community and the workforce, learning about the HSE challenges faced at the frontline. In China, cross business collaboration enabled learning from outside their own sphere, enabling this new knowledge and approach to be brought back.

Maintaining a Healthy and Engaged Workforce

Further driving improvements in the Health and Wellness of CLP employees, this year marked a strategic focus in this space. With the launch of "Boost" at the CLP Group level, a Health and Wellness survey was launched to understand the needs and wants of employees. This serves as a basis for further rollout of targeted activities in 2020 and beyond. EnergyAustralia proposed a new Health and Wellness strategy to its board. All regions had a focus on mental health and awareness over the second half of 2019, with the assistance of trained experts in the field.

Ensuring Environmental Sustainability

CLP is committed to ensure supporting sustainability by operating in an environmentally responsible manner. Read more in the Environment section.

Read the year's performance relating to Ensuring environmental sustainability >

Safety around CLP's network

Management approach

Customer health and safety concerns are largely related to electromagnetic fields (EMF) arising from the CLP power system.

While the Group's HSSE Management System Standard sets out an overarching approach to managing the safety risks in operations, responsibility is also taken for preserving public health and safety, including for people who work or stay in proximity to electricity supply lines.

CLP operates a transmission and distribution network in Hong Kong and a transmission network in Shenzhen, Mainland China. In November 2019, a transmission network was also established in India. Working near electricity supply lines can pose public health and safety concerns. The Hong Kong and Mainland China operations conduct regular construction site inspections and provide cable plans and safety talks to road work contractors and site management personnel to enhance safety awareness in all locations. The Fangchenggang Incremental Distribution Network project has commenced operation in January 2020, and there will be continuous HSSE-related training and monitoring referencing CLP's safety philosophy and best practices as appropriate.

EMF arising from the power system can be another public health concern. Power supply equipment fully complies with the guidelines issued by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Regular EMF measurements of power supply equipment are carried out jointly with the Electrical and Mechanical Services Department of the government. The measured EMF levels are well below the guideline limits.

Regarding customer health and safety, CLP Power has customer service centres conveniently located in its supply areas in Hong Kong to provide assistance in product safety, as well as advice on energy efficient products, energy saving tips and other account management issues for better quality living. In 2019, there were no reportable case affecting customer health and safety in Hong Kong.

Nuclear safety

Management approach

CLP is the minority owner of two nuclear power stations in Mainland China. The stations have adopted defence-in-depth principles to ensure multiple independent layers of protection.

Since 1985, CLP has held a 25% equity share in the Guangdong Daya Bay Nuclear Power Station (GNPS), which provides roughly 33% of the electricity supplied to CLP's customers in Hong Kong. In 2017, CLP's nuclear portfolio was expanded with a 17% equity investment in Yangjiang Nuclear Power Co. Ltd. which operates Yangjiang Nuclear Power Station (YNPS) in Guangdong. Nuclear power has proved to be a reliable, cost-competitive and clean source of energy. CLP continuously seeks investment opportunities for new capacity in low carbon energies such as nuclear, gas and renewables to realise the Group's decarbonisation vision.

Nuclear risk management

The safe and steady operation of the two nuclear power stations is always the top priority. The defence-in-depth principle is applied across a full spectrum of areas from design, site selection, operation, radiation protection, environmental monitoring, to emergency preparedness. The safety principle of As Low As Reasonably Achievable (ALARA) is also applied to ensure robust radiation protection.

Through adoption of best international practices in its operation (e.g. IAEA Nuclear Safety Standards), a well-trained and qualified workforce, well-established safety practices and procedures, as well as risk analysis and mitigation, the two nuclear power stations have achieved good performances over a long period.

Download HKNIC's brochure "Understanding nuclear power"

Learn more about the contingency plan of GNPS

Nuclear waste management

GNPS follows national policy and international practices for nuclear waste management. GNPS stores its spent nuclear fuel onsite in a dedicated storage pool for each reactor. The back-end management of the fuel cycle remains on site for a number of years before being passed on to a service provider licensed by the Mainland Chinese Government for reprocessing. The service provider is supervised by the National Nuclear Safety Administration (NNSA) and its environmental impact is monitored by the Ministry of Ecology and Environment (MEE). The policy in Mainland China on reprocessing spent nuclear fuel is similar to that of a number of European countries.

As the minority owner of GNPS, CLP is not in a position to report the development of back-end management of the fuel cycle in China, including the status of the planned reprocessing plants for spent fuel.

Low- to intermediate-level solid radioactive waste is packed and stored in a dedicated facility onsite on an interim basis, and is secured to prevent unauthorised access. The waste is transferred to a final repository operated by a service provider, using the shallow burial method commonly adopted in the United States, France and the United Kingdom. The operation of the offsite repository is under the supervision of the national nuclear regulator and relevant nuclear safety regulations.

Monitoring and follow-up

Radiation exposure for workers is closely managed by plant operators both collectively and at individual level as part of operating protocols. Workers incur most of their radiation dosage during planned refuelling outages, when much of the work is undertaken at the nuclear generating units. The level of radiation dosage is typically associated with the number of planned outages carried out at the units, which require inspection and maintenance activities in radiation-controlled areas.

Training and awareness

An on-site training school provides professional nuclear training on operational procedures, which aim to enhance nuclear safety and systematically minimise human error. There is a once every two years requalification mechanism to ensure operators' professionalism and competency in plant operation.

In line with good business practice, GNPS has also provisioned for the expenses associated with the future decommissioning of the plant as required by relevant laws and regulations.

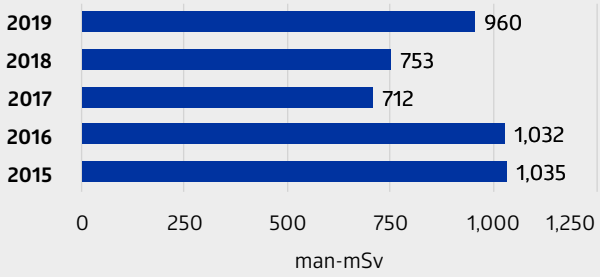
Year in review

GNPS continued to operate smoothly in 2019. There was no Licensing Operational Event in the year.

The total quantity of nuclear waste from GNPS was higher in 2019 than in 2018 due to two planned refuelling outages carried out in the year, as opposed to one outage in 2018. The average dose rate in 2019 was less than 0.4 mSv per person per year. For the purpose of comparison, the background radiation dose rate for Hong Kong is 2.4 mSv per person per year from the natural environment.

Collective radiation dosage for workers

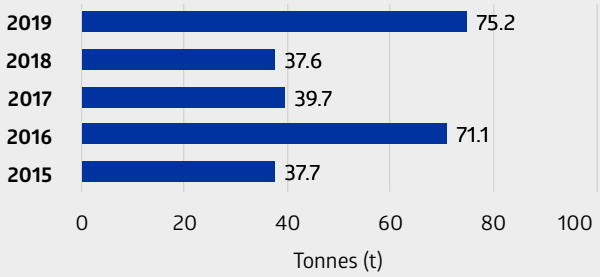
The collective radiation dosage for the year was 960 man-mSv, lower than the 2016 level of 1032 man-mSv when there were also two planned refuelling outages for a like-to-like comparison.



The charts below show the amount of spent nuclear fuel and low- to intermediate-level radioactive nuclear waste from GNPS over the last several years. The amounts of both types of waste are related to the number of planned refuelling outages in each year.

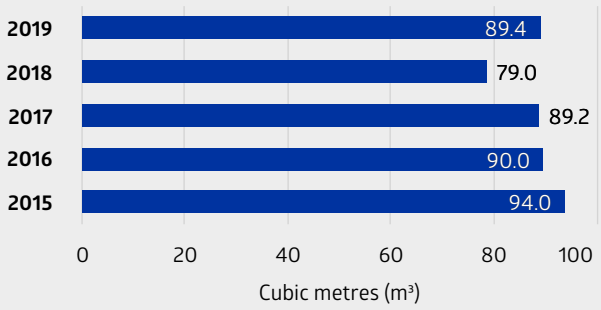
Spent nuclear fuel

The amounts of spent nuclear fuel in 2019 is at the expected level given the two planned refuelling outages, while there was only one in year 2017 and 2018.



Solid radioactive nuclear waste

There is a slight increase in low- to intermediate-level nuclear waste in 2019 due to the extra planned refuelling outages.



Safety data

Occupational health and safety

Group safety performance	2019	2018	2017	2016	2015
Employees and contractors[1]					
Fatalities (number) - employees[2]	**0**	1	0	0	0
Fatalities (number) - contractors[2]	**1**	1	4	3.00	0.00
Fatality Rate (number per 200,000 manhours) - employees[2,3]	**0.00**	0.01	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors[2,3]	**0.01**	0.01	0.03	0.02	0.00
Lost Time Injuries (number of cases) - employees[4]	**7**[5]	11	11	3	8
Lost Time Injuries (number of cases) - contractors[4]	**19**	11	16	10	8
Lost Time Injury Rate (number per 200,000 manhours) - employees[3,4]	**0.07**	0.13	0.13	0.04	0.10
Lost Time Injury Rate (number per 200,000 manhours) - contractors[3,4]	**0.14**	0.09	0.14	0.07	0.06
Total Recordable Injury Rate (number per 200,000 manhours) - employees[3,6]	**0.19**	0.19	0.21	0.11	0.18
Total Recordable Injury Rate (number per 200,000 manhours) - contractors[3,6]	**0.52**	0.29	0.36	0.19	0.28
Days Lost / Days Charged (number) - employees[4,7]	**464**[8]	249[9]	252	9	199
Occupational Disease (number) - employees	**0**	1[10]	0	0	0
Employees and contractors combined[1]					
Fatalities (number)	**1**	2	4	3	0
Fatality Rate (number per 200,000 manhours)	**0.00**	0.01	0.02	0.01	0.00
Lost Time Injuries (number of cases)	**26**	22	27	13	16
Lost Time Injury Rate (number per 200,000 manhours)	**0.11**	0.10	0.13	0.06	0.07
Total Recordable Injury Rate (number per 200,000 manhours)	**0.38**	0.25	0.29	0.16	0.25
Days Lost / Days Charged (number) - employees only	**464**	249[9]	252	9	199
Occupational Disease (number) - employees only	**0**	1[10]	0	0	0

1 The system of rules applied in recording and reporting accident statistics complies with the International Labour Organization (ILO) code of Practice on Recording and notification of Occupational Accidents and Diseases. each year's safety data cover the incidents that happened in that calendar year and are based on the latest information available at the time of publication.
2 A fatality is the death of an employee or contractor personnel as a result of an occupational illness/ injury/ disease incident in the course of employment.
3 All rates are normalised to 200,000 worked hours, which approximately equals to the number of hours worked by 100 people in one year.
4 An occupational illness / injury / disease sustained by an employee or contractor personnel causing him / her to miss one scheduled workday / shift or more after the day of the injury (including fatalities). A lost time injury does not include the day the injury incident occurred or any days that the injured person was not scheduled to work and it does not include restricted work injuries.

5 The health-related lost-time-injury in Australia was reported as lost time injury. It can also be categorised as occupational disease in Australia.
6 Total recordable injuries count all occupational injury incidents and illness other than first aid cases. They include fatalities, lost time injuries, restricted work injuries, and medical treatment.
7 Refers to the number of working days lost when workers are unable to perform their usual work because of an occupational accident or disease. A return to limited duty or alternative work for the same organisation does not count as lost days.
8 158 out of 464 days were carried forward from three incidents in the past.
9 Restated from 253 to 249 per update in Australia.
10 Restated from zero to one due to a hearing loss case in Australia.

Regional safety performance	2019[1]	2018	2017	2016	2015
CLP Holdings[2]					
Fatalities (number) - employees	**0**	0	0	0	0
Fatalities (number) - contractors	**1**	0	0	0	0
Fatality Rate (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors	**0.24**	0.00	0.00	0.00	0.00
Lost Time Injuries (number of cases) - employees	**0**	0	0	0	0
Lost Time Injuries (number of cases) - contractors	**2**	0	0	0	0
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - contractors	**0.48**	0.00	0.00	0.00	0.00
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.48	0.53
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - contractors	**0.48**	0.00	0.00	0.00	0.00
Days Lost / Days Charged (number) - employees	**0**	0	0	0	0
Occupational Disease (number) - employees	**0**	0	0	0	0
Hong Kong[2]					
Fatalities (number) - employees	**0**	0	0	0	0
Fatalities (number) - contractors	**0**	0	4	0	0
Fatality Rate (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors	**0.00**	0.00	0.07	0.00	0.00
Lost Time Injuries (number of cases) - employees	**4**	5	1	0	0
Lost Time Injuries (number of cases) - contractors	**15**	5	9	1	4
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - employees	**0.09**	0.10	0.02	0.00	0.00

Regional safety performance	2019[1]	2018	2017	2016	2015
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - contractors	**0.21**	0.08	0.16	0.02	0.07
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - employees	**0.19**	0.15	0.08	0.00	0.07
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - contractors	**0.51**	0.20	0.29	0.10	0.17
Days Lost / Days Charged (number) - employees	**246**	120	47	0	0
Occupational Disease (number) - employees	**0**	0	0	0	0
Mainland China[2]					
Fatalities (number) - employees	**0**	0	0	0	0
Fatalities (number) - contractors	**0**	0	0	1	0
Fatality Rate (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors	**0.00**	0.00	0.00	0.03	0.00
Lost Time Injuries (number of cases) - employees	**0**	0	0	0	0
Lost Time Injuries (number of cases) - contractors	**0**	0	0	2	1
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - contractors	**0.00**	0.00	0.00	0.06	0.02
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - employees	**0.10**	0.00	0.00	0.00	0.00
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - contractors	**0.00**	0.07	0.06	0.06	0.16
Days Lost / Days Charged (number) - employees	**0**	0	0	0	0
Occupational Disease (number) - employees	**0**	0	0	0	0
India[2]					
Fatalities (number) - employees	**0**	0	0	0	0
Fatalities (number) - contractors	**0**	0	0	2	0
Fatality Rate (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors	**0.00**	0.00	0.00	0.05	0.00

Regional safety performance	2019[1]	2018	2017	2016	2015
Lost Time Injuries (number of cases) - employees	**0**	0	0	0	2
Lost Time Injuries (number of cases) - contractors	**0**	2	1	4	1
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - employees	**0.00**	0	0.00	0.00	0.54
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - contractors	**0.00**	0.06	0.03	0.11	0.03
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - employees	**0.00**	0.00	0.00	0.00	0.54
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - contractors	**0.68**	0.19	0.20	0.30	0.25
Days Lost / Days Charged (number) - employees	**0**	0	0.00	0.00	34
Occupational Disease (number) - employees	**0**	0	0	0	0
Australia[2]					
Fatalities (number) - employees	**0**	1	0	0	0
Fatalities (number) - contractors	**0**	1	0	0	0
Fatality Rate (number per 200,000 manhours) - employees	**0.00**	0.04	0.00	0.00	0.00
Fatality Rate (number per 200,000 manhours) - contractors	**0.00**	0.06	0.00	0.00	0.00
Lost Time Injuries (number of cases) - employees	**3**	6	10	3	6
Lost Time Injuries (number of cases) - contractors	**2**	4	6	3	2
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - employees	**0.10**	0.26	0.43	0.14	0.28
Lost Time Injury Rate [LTIR] (number per 200,000 manhours) - contractors	**0.12**	0.26	0.62	0.46	0.29
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - employees	**0.31**	0.44	0.60	0.37	0.42
Total Recordable Injury Rate [TRIR] (number per 200,000 manhours) - contractors	**0.62**	1.09	1.85	1.06	2.14
Days Lost / Days Charged (number) - employees	**218**	129[3]	205	9	165
Occupational Disease (number) - employees	**0**	1[4]	0	0	0

1 Starting from 2019, CLPe Solutions is reported under CLP Holdings to align with a change in internal reporting. Before that, it was reported under Hong Kong.
2 The system of rules applied in recording and reporting accident statistics complies with the International Labour Organization (ILO) code of Practice on Recording and notification of Occupational Accidents and Diseases. each year's safety data cover the incidents that happened in that calendar year and are based on the latest information available at the time of publication.
3 Restated from 133 to 129 per update in Australia .

4 Restated from zero to one due to a hearing loss case in Australia.

Nuclear Safety	2019	2018	2017	2016	2015
Workers					
Collective radiation dosage for workers (man-mSv)	**960**	753	712	1,032	1,035
Nuclear-related waste					
Spent nuclear fuel (t)	**75.2**	37.6	39.7	71.1	37.7
Low- to intermediate-level radioactive nuclear waste (m^3)	**89.4**	79.0	89.2	90.0	94.0

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Environment

Environmental management

Management approach

The HSSE Framework and the Group-wide Environmental Policy are supported by a suite of standards and guidelines that mandate good practices and align CLP's Group-wide environmental management efforts.

The material environmental issues covered in the HSSE Framework and the Group-wide Environmental Policy include:

- Environmental impact assessments
- Environmental monitoring
- Environmental management system development
- Environmental due diligence
- Data management systems.

Strategies and procedures

The Group HSSE Standard states that the environmental risks associated with a project's operational life-cycle should be appropriately managed. As part of CLP's Pre-investment Environmental Risk Assessment, an Environmental Due Diligence (EDD) is conducted at the project planning stage, followed by a more detailed Environmental Impact Assessment (EIA), during which air emissions and biodiversity assessments are conducted where applicable.

CLP takes great care in conducting all EIAs and is committed to fulfilling the requirements and recommendations stipulated in EIA reports and local regulations. There is also a process in place to ensure the EIA recommendations are implemented. Planning procedures extend beyond compliance in less developed countries, where regulations are not as mature. For instance, CLP mandates an EIA for all major generation projects in India, even though it is not a statutory requirement for renewable energy projects in the country.

The **Environmental Management System Standard** is a management tool that helps identify and manage significant environmental risks arising from operations. It also provides a systematic approach to continually improving the environmental performance of assets. CLP requires power generation assets over which it has operational control to achieve third-party certified ISO 14001 environmental management systems within two years from commencement of operation or acquisition. CLP is pleased to report that in 2019, all assets in this category have successfully certified their environmental management system to the ISO 14001: 2015 standard.

Monitoring and follow-up

The **Group Operations Information System (GOIS)** is a customised system to collect and manage data in relation to asset management, environment, safety and community initiatives. Its built-in data approval sequence and automated presentation and reporting functions strengthen data governance.

CLP recognises that the development of goals and targets can help monitor progress in using environmental resources efficiently. In 2019, the Group started to develop environmental targets for key environmental performance indicators. The data required to support these targets will be collected by the GOIS, enabling regular performance reviews.

CLP has also developed an **Environmental Monitoring** process to be applied at project level. It specifies how environmental conditions should be assessed and assists with the design and implementation of suitable measures.

Read about how environmental aspects are considered in new projects ›

Download the environmental management systems of CLP's assets

Environmental regulations and compliance

Management approach

CLP has developed voluntary standards and new investment assessment approaches to go beyond legal requirements.

It is fundamental that CLP fully complies with applicable environmental laws and regulations in the jurisdictions in which it operates. For new investments, established processes are in place to review relevant environmental requirements.

If an incident occurs at an asset under CLP's operational control, it is classified and recorded in a timely manner in accordance with the internal process, including notification of any fines or prosecution from local authorities.

Year in review

In the year ending 31 December 2019, there was no environmental regulatory non-compliance which resulted in fines or prosecution. However, there was an increase in licence exceedances during the first half of the year.

The increase in licence exceedances was largely due to the new and more stringent SO_2 emission limit introduced since February for Jhajjar Power Plant.

Environmental regulatory requirements are becoming more stringent in many locations. CLP is monitoring these developments closely to prepare for the possibility of additional compliance requirements in future. Any licence exceedances and key emerging environmental regulations that could affect business units are listed below:

Environmental regulatory non-compliance and licence exceedances

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

Key emerging environmental regulations

Hong Kong

- All Hong Kong assets under CLP's operational control maintained full compliance with environmental regulations in 2019.
- CLP Power has concluded discussions with the Hong Kong Government on the new emissions cap starting in 2024. Under the Technical Memorandum, the allowances for air emissions of sulphur dioxide (SO_2), nitrogen oxides (NO_x) and respirable suspended particulates (RSP) will be reduced by 90%, 66% and 65% respectively compared to 2010 levels. The upgrade of all existing combined cycle gas turbine (CCGT) units and the development of two new additional CCGT units will ensure CLP is ready. CLP is also cognisant of the Government's plan to tighten the Air Quality Objectives for which a public consultation was conducted in 2019.

Mainland China

- All China assets under CLP's operational control maintained full compliance with environmental regulations in 2019.
- Since the issuance of "Opinions on Formulating and Strictly Observing Ecological Protection Zone" in 2017, 15 provincial-level regions have already set up their ecological "red line" zones, which aim to safeguard the ecological functions and prohibit any incompatible development project. In addition, a digital platform is being set up by the central government to monitor the ecological "red line" zones across the country. CLP continues to closely monitor the potential impacts on its assets and operations in relation to all relevant environmental regulations.

India

- In India, further to the enforcement of the new SO_2 emission limit by the end of January 2019, there were five minor licence limit exceedances for SO_2 at Jhajjar Power Plant in the first half of 2019 but they did not result in any action by the local authorities.
- In November 2018, the National Green Tribunal (NGT), a judicial statutory body established by the Indian government for adjudicating environmental cases, passed an order directing all thermal power plants, including Jhajjar, that did not dispose of all fly ash up to 31 December 2019, 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 generated since commissioning up to 31 July 2019, the implications of the report are currently being reviewed.
- Deteriorating air quality continues to be a challenge in India and this has captured the attention of the public, the media and policy makers. Therefore, coal-fired power stations face stringent requirements on emissions of particulates, ash utilisation, NO_x and SO_2.
- The Government of India recently announced the National Clean Air Program (NCAP) as a national level strategy to improve ambient air quality within a prescribed timeframe. Since the new air emissions limits at thermal power plants came into force in 2019, Jhajjar has overhauled the Flue Gas Desulphurisation (FGD), Electrostatic Precipitator (ESP) and bag filters to meet the new standards
- CLP India actively participated in the Task Force on Clean Industry under the Clean Air Better Life initiative by the Confederation of Indian Industry and NITI Aayog. CLP India worked with relevant policy makers to promote the prioritisation of cleaner power procurement from energy providers who use advanced emission control technologies and cleaner fuels. With CLP India's clean energy investments, the initiative and the potential regulatory change will offer competitive advantages, and will incentivise the utility sector to accelerate the use of cleaner technologies.

Australia

- In Australia, two brief limit exceedances of NOx emission at Tallawarra occurred in February 2019 but did not result in action by the Environment Protection Authority (EPA). Corrective action was implemented during the station outage in 2019 to prevent a reoccurrence of such incidents. At Newport, there was one minor hydrocarbon exceedance to the wastewater treatment network under the Trade Waste Licence in February 2019. There were also two oil spillage incidents in March and August 2019 at Newport resulting in non-compliance. EPA Victoria was notified and no fines or penalties were imposed. Corrective actions have been taken to prevent a repeat of these incidents.
- Victorian state environmental legislation and regulations are being revised and are expected to come into force from 1 July 2020. Yallourn, Newport and Jeeralang power stations are working to implement risk controls and ensure compliance with these new standards. In addition, CO_2 emissions reduction targets may have implications for Yallourn power station and mine, and the Victorian Government is expected to finalise these targets by the second quarter of 2020.
- Detailed site investigations of per- and polyfluoroalkyl substances (PFAS) in soil and groundwater for Jeeralang and Newport are underway and will be completed in early 2020. The findings will help to identify appropriate management actions as required under the Victorian environmental legislation.

Taiwan

- In 2019, the effluent standards for power plants were revised under the Water Pollution Control Act which was further supplemented by revised regulations on water pollution control measures and test reporting management. The Ho-Ping Power Company (Ho-Ping), in which CLP has a 20% shareholding, is building a wastewater treatment plant in order to ensure compliance in its effluent quality with the revised standards. The treatment plant is expected to be in full operation in the first quarter of 2020.

Air Emissions

Management approach

CLP considers air quality throughout every project's life cycle, from design, construction and operation to decommissioning.

Air quality remains a challenge in many of the geographies in which CLP operates. As the Group expands its renewable and nuclear energy portfolio, air pollutant emission intensities have reduced. Nonetheless, further reductions on the net emissions from thermal power stations remain high on CLP's agenda.

Strategies and procedures

CLP's Power Plant Air Emissions Standard stipulates that any fossil fuel-based power plant developed after the effective date of the Standard is required to operate within CLP's prescribed limits on sulphur dioxide (SO_2), nitrogen oxides (NO_X) and total particulate matter (total PM), or they must fully comply with local regulations, whichever is more stringent.

Apart from incorporating state-of-the-art air emissions mitigation measures into plant management processes, CLP also designs new power stations with advanced generation technologies that produce electricity as efficiently as technology allows, which assists in lowering emissions and greenhouse gases further.

Monitoring and follow-up

The Company continuously monitors air emissions (SO_2/NO_x / total PM) from facilities under its operational control using a continuous emissions monitoring system and/or stack sampling and mass-balance calculation methodologies. In addition, CLP regularly monitors mercury emission using stack sampling in accordance with local regulations.

Year in review

CLP's total air emissions (SO_2 / NO_x / total PM) decreased to 99.4 kt in 2019 with a significant improvement in SO_2, despite an increase in total electricity generation.

Hong Kong

- CLP Power Hong Kong has focused its efforts on reducing emissions by continually optimising the diversified fuel mix and maintaining the effectiveness of emissions control facilities. Despite a more than 80% increase in electricity demand since 1990, CLP Power Hong Kong has managed to reduce emissions of SO_2, NO_x and respirable suspended particulates (RSP) by more than 85%.
- The emission allowances of CLP's power plants in Hong Kong have been progressively tightened over time. In 2010, the Hong Kong Government introduced emission allowances under the first Technical Memorandum (TM) of the Air Quality Control Ordinance. Since then, the emission allowances for SO_2, NO_x and RSP have been tightened by 68%, 38% and 37% respectively. In 2019, the SO_2 emission allowance was further tightened by 4% from the very tight base of 2018. CLP Power Hong Kong has fully complied with these targets.
- From April 2019 onwards, CLP Power Hong Kong began to measure and report mercury emissions in compliance with the new emission limit for the Castle Peak Power Station. All the measurements in the year were well below the limit, achieved through maintaining the effectiveness of emission control equipment and the control of the mercury content in coal. CLP Power Hong Kong is also aware of the high global warming potential of sulphur hexafluoride (SF_6), an insulating gas commonly used in switch gears and transmission lines, and is vigilant in the control of SF_6 leakage throughout the life cycle of electrical equipment.

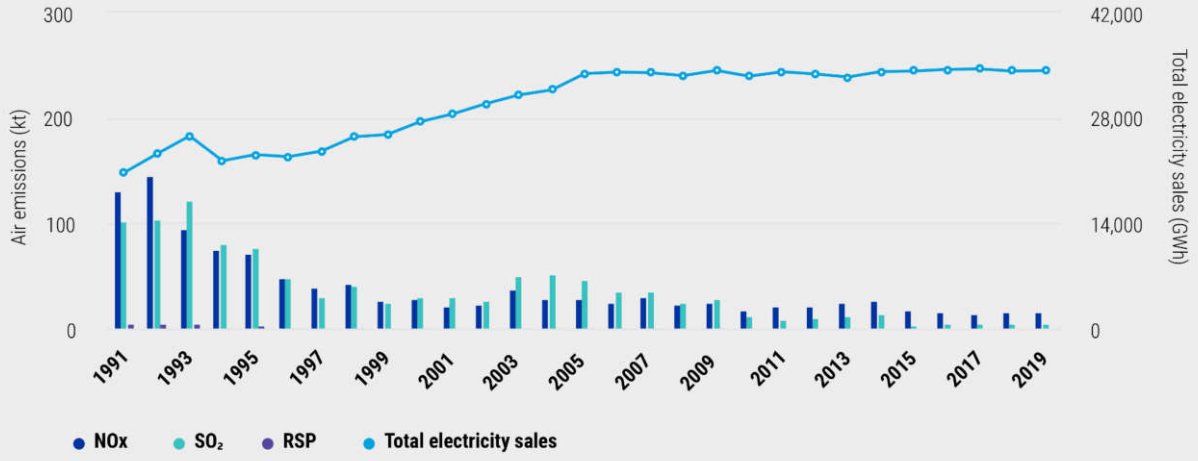
Mainland China

- The Fangchenggang Power Station continued to perform well after the completion of the upgrade in emission control equipment for SO_2 and NO_x. In addition, a pilot project is underway to use the CO_2 from flue gas to cultivate microalgae. This will in the future offset some CO_2 emission from the plant.

India	· CLP India has further reduced SO_2 emissions from Jhajjar Power Plant, and upgraded its continuous emission monitoring system (CEMS) to improve accuracy in measurement.
Australia	· The Tallawarra Power Station upgraded its continuous emissions monitoring system (CEMS) in 2019 to ensure the plant had the most accurate data for keeping emissions as low as possible. Mt Piper installed a CEMS unit as part of a programme to improve emissions monitoring and performance.

CLP Power Hong Kong air emission and total electricity sales since 1991[1]

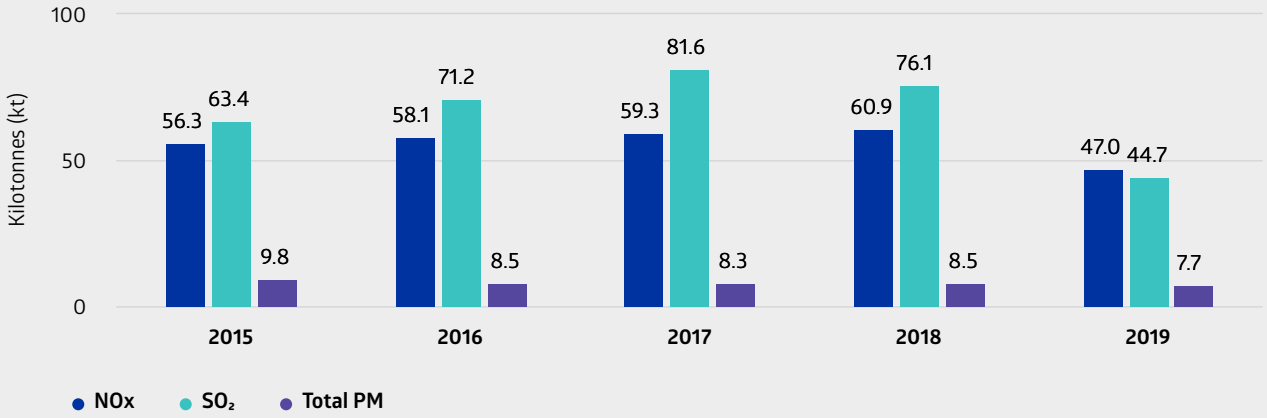
CLP Power Hong Kong sold 34,284GWh electricity in 2019 with lower air emissions than that in 2018.



1 The electricity sales data from 1990 - 1998 is on a financial year basis ending 30 September. The 1998 data covers the period 1 October 1997 - 30 September 1998 and the 1999 data covers the period 1 January 1999 - 31 December 1999.

Group-level air emissions

CLP's air emissions decreased in 2019. Emission control equipment upgrades in the Fangchenggang and Jhajjar Power Plants, as well as reduced generation in CLP's coal-fired power stations together improved SO_2 emissions significantly.



CASE STUDY

CLP India contributes to air quality improvement

In addition to the emission control projects in the Jhajjar Power Plant, CLP India has partnered with the CII Foundation on a community programme to encourage local farmers to adopt sustainable methods of crop residue management in Haryana.

The two-year project will cover an estimated 9,000 acres of farmland and will initially be implemented in six villages in the districts of Rohtak and Fatehabad in Haryana.

The project is being executed with the help of local non-profit partners and farmer groups. It includes a series of community engagement campaigns to raise awareness and capacity amongst farmers for adopting sustainable and eco-friendly methods of straw management. In the second phase of the project, farmers have been provided with in-situ crop residue management farm tools and technologies for better straw management.

The programme will provide financial support to farmer groups for procuring or hiring high-powered tractors (required for operating in-situ machines) and balers (for clearing straw from the field if there is no scope for in-situ straw management). These machines cut the crop residue, mix them with soil to improve soil health, and plant the seeds for the next batch of crops, thereby saving time, energy and money as compared to conventional methods.

Crop residue burning not only contributes towards harmful emissions, but also depletes essential nutrients from the soil. The project aims to stop crop residue burning in the state, which is a fundamental change in the farming practices in the region, thereby improving the local air quality.

Read more on how CLP India helps tackle air pollution

Stubble burning generates heavy smoke and worsen air pollution

Waste

Management approach

The volume of solid and liquid waste CLP operations generate is relatively small, although projects that involve demolition and construction produce more non-hazardous solid waste.

Strategies and procedures

CLP endeavours to reduce both the hazardous and non-hazardous waste it produces, and works with qualified parties and partners to reuse or recycle whenever possible. All wastes are managed according to the waste management hierarchy (i.e. prevent, reduce, reuse, recycle, replace, treat and dispose). CLP seeks to avoid the use of hazardous materials and replace them with alternatives wherever possible. All hazardous and non-hazardous wastes are managed in accordance with local regulations, collected by licensed collectors, or sold for recycling. Waste generated from renewable assets is also managed in the same manner.

At CLP's coal-fired power stations, coal ash from coal combustion and gypsum from the flue gas desulphurisation process constitutes the majority of generation by-products. The aim is to use them as a resource for construction and other applications in line with local regulations and practices rather than disposal.

Monitoring and follow-up

CLP monitors its waste generation monthly by tracking solid and liquid forms of hazardous and non-hazardous waste produced and recycled at its facilities.

Year in review

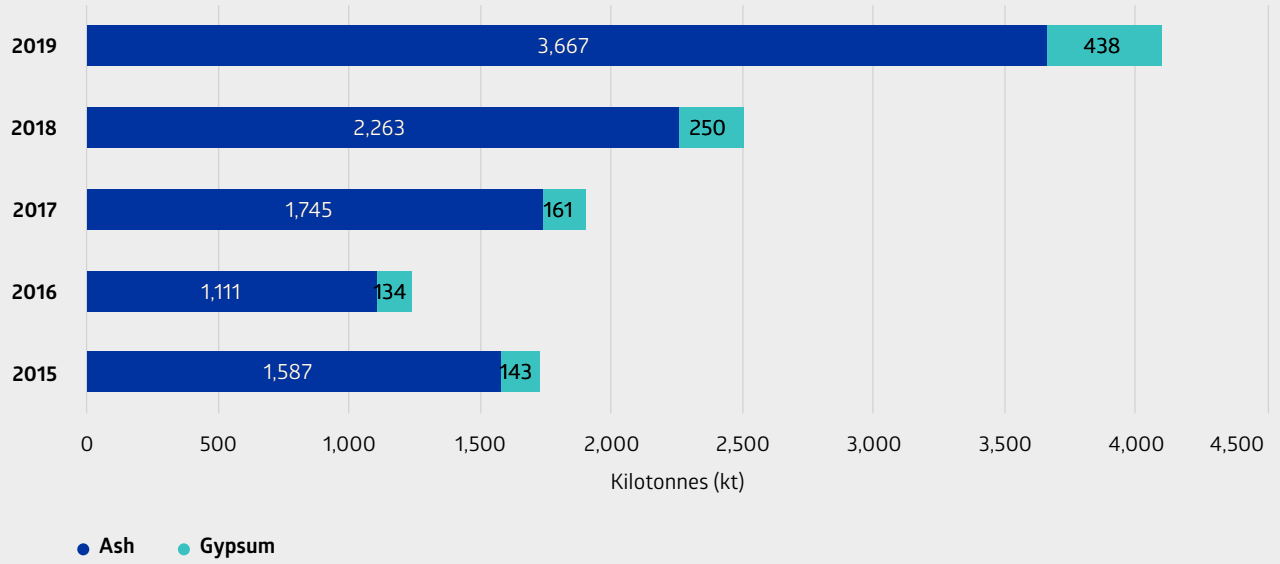
CLP's non-hazardous solid waste increased to 13,344 tonnes in 2019 (compared to 11,471 tonnes in 2018), with the amount being largely dependent on plant maintenance activities. Generation of both solid and liquid hazardous waste decreased in 2019.

CLP continued to sell its generation by-products such as ash and gypsum for use in other industries where feasible. The Group's power stations run different programmes to manage waste, and learnings are shared with both colleagues and contractors to raise awareness and build capacity. Key programmes in 2019 included:

- Jhajjar Power Plant: CLP India has been taking enhancement measures in its ash handling system and actively seeks ash utilisation opportunities with other industries such as road construction, cement plants and brick-making plants. In 2019, Jhajjar achieved 100% utilisation rate of the ash generated, and furthermore cleared all the ash stored in the ash dyke.
- Jinchang Solar Power: CLP China continues to utilise the initiative from solar panel manufacturers to take back any damaged panels for recycling.
- Fanchenggang Power Plant: CLP trialled using white mud, a by-product generated by a paper mill factory, to partially replace the use of limestone in the plant's flue gas desulphurisation process. Around 5,300 tonnes of white mud was used in the trial, reducing use of raw materials in plants and solid waste production from the paper mill.
- CLP Power Hong Kong: Single-use polyfoam meal boxes in staff canteens were all replaced by corn-based biodegradable products, reducing the use of around 26,000 single-use plastic meal boxes a year.

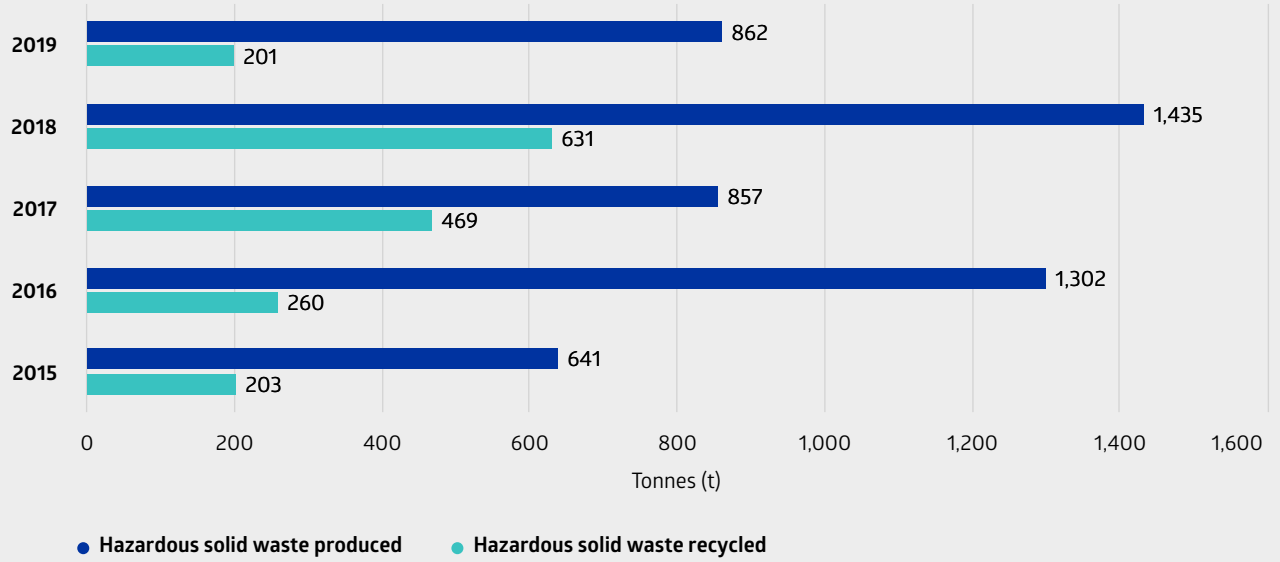
Ash and gypsum by-products recycled or sold

Ash by-product recycling increased in 2019, as Jhajjar Power Plant in India cleared up its ash dyke and utilised the by-product for road construction.



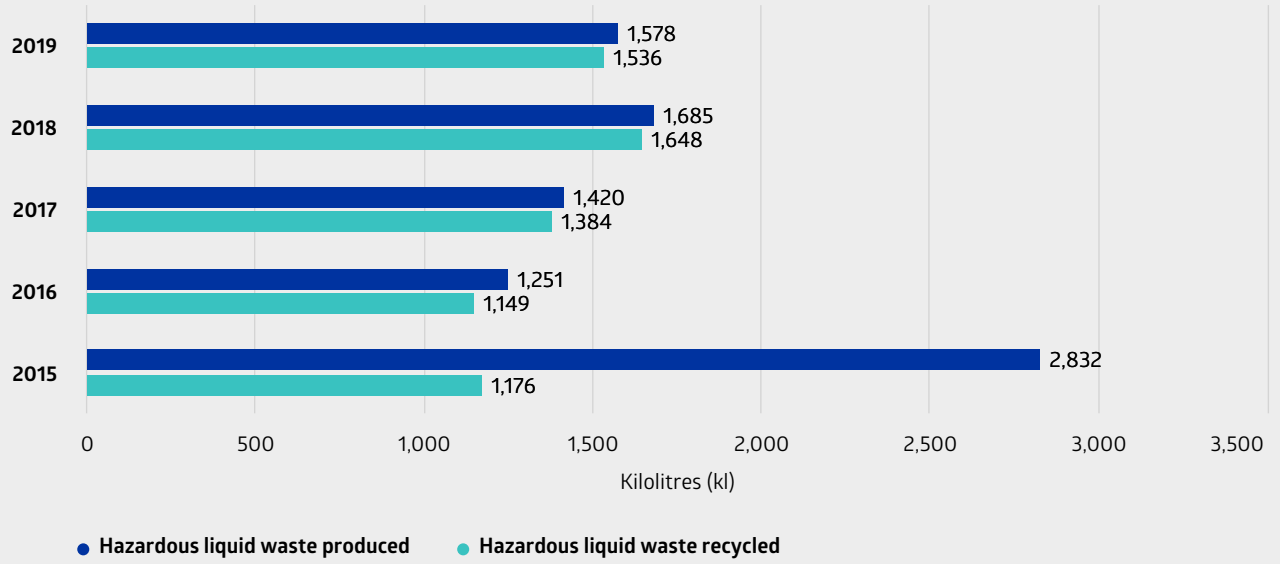
Hazardous solid waste produced and recycled

Total solid hazardous solid waste produced and recycled decreased in 2019, in line with the level of relevant waste-generating activities at each asset.



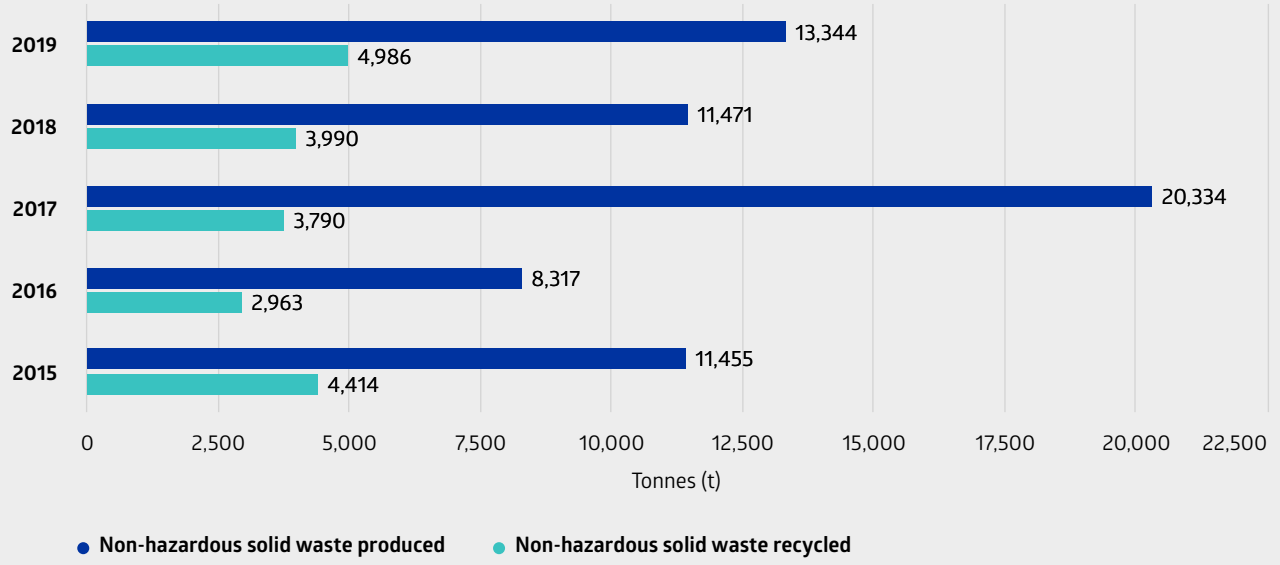
Hazardous liquid waste produced and recycled

Total hazardous liquid waste produced and recycled slightly decreased in 2019, in line with relevant waste-generating activities at each asset.



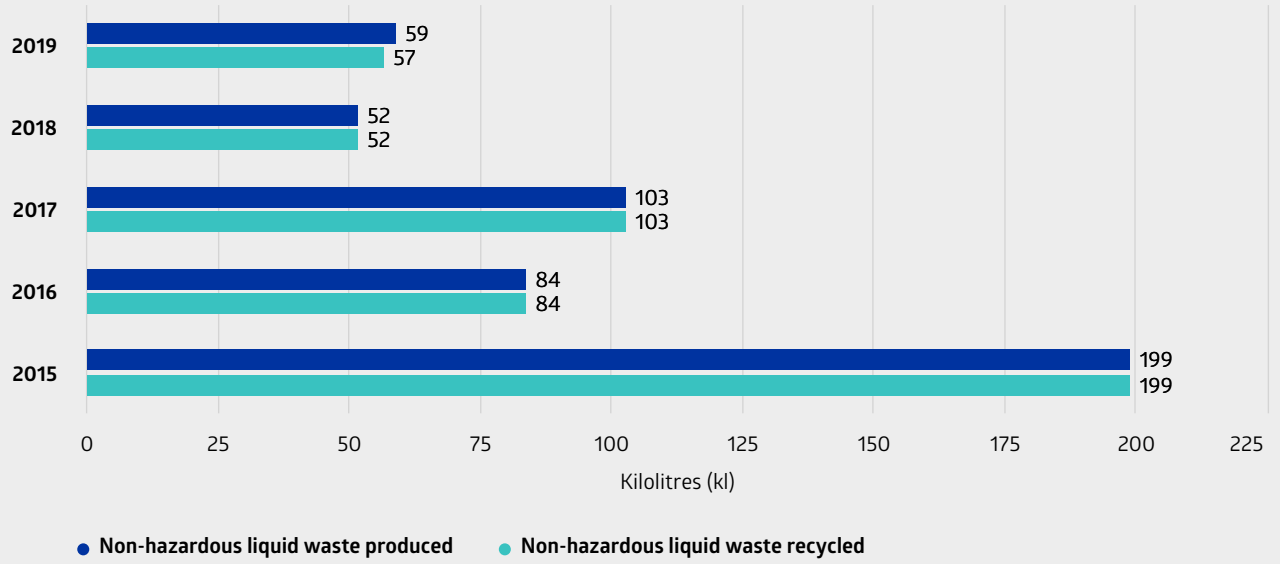
Non-hazardous solid waste produced and recycled

Total non-hazardous solid waste produced and recycled increased in 2019, in line with the level of relevant waste-generating activities at each asset.



Non-hazardous liquid waste produced and recycled

Total non-hazardous liquid waste produced and recycled in 2019 were similar to the amounts produced in the previous year, in line with the level of relevant waste-generating activities at each asset.



Water

Management approach

The CLP Group uses seawater cooling or water re-circulation processes in its plants to minimise water consumption and environmental impacts.

Strategies and procedures

The quantity of water withdrawal and discharge in CLP's operations is dominated by thermal plants using once-through seawater cooling. In this process, large quantities of seawater are used for cooling and returned to the sea with only a slight increase in water temperature. The total volume of water withdrawal and discharge is dependent on the total electricity generated.

Where freshwater is withdrawn for operations, CLP strives to reduce water use and reduce the freshwater intensity of the electricity generated. It is also important to ensure water availability in these plants to ensure operations will not be disrupted.

Monitoring and follow-up

The Company assesses water availability in the planning stage of projects including the likelihood of water scarcity in the future and during plant operations. Engaging with and understanding the needs of local stakeholders is also prioritised, to ensure the licence to operate is maintained. As a result of the water treatment processes put in place, none of CLP's operations significantly impact their respective water receiving bodies.

Also carried out at the planning stage of development projects are water quality impact assessments, in accordance with local requirements. This is to ensure that any impacts associated with the project construction and operation are managed and mitigated to an acceptable level.

In-depth assessments on water risk in the generation portfolio are conducted regularly, including using globally recognised tools such as the World Business Council for Sustainable Development (WBCSD) Global Water Tool and World Resources Institute (WRI) Aqueduct. The assessment covers parameters such as water availability, water sensitivity, water stress mapping, potential competing use with other stakeholders, and the management strategies in place in each of the regions. The results of the assessment confirmed that CLP has a sufficiently robust regime in place for managing water risks.

CLP also participates in the CDP water survey to disclose and benchmark its practices with industry peers in relation to water resource management. The company is committed to continuing to monitor its water use and manage this precious resource carefully.

Year in review

The total water intensity of the CLP Group's power generation process in 2019 was 0.94 m^3/ MWh, decreasing from 1.10 m^3/ MWh in 2018.

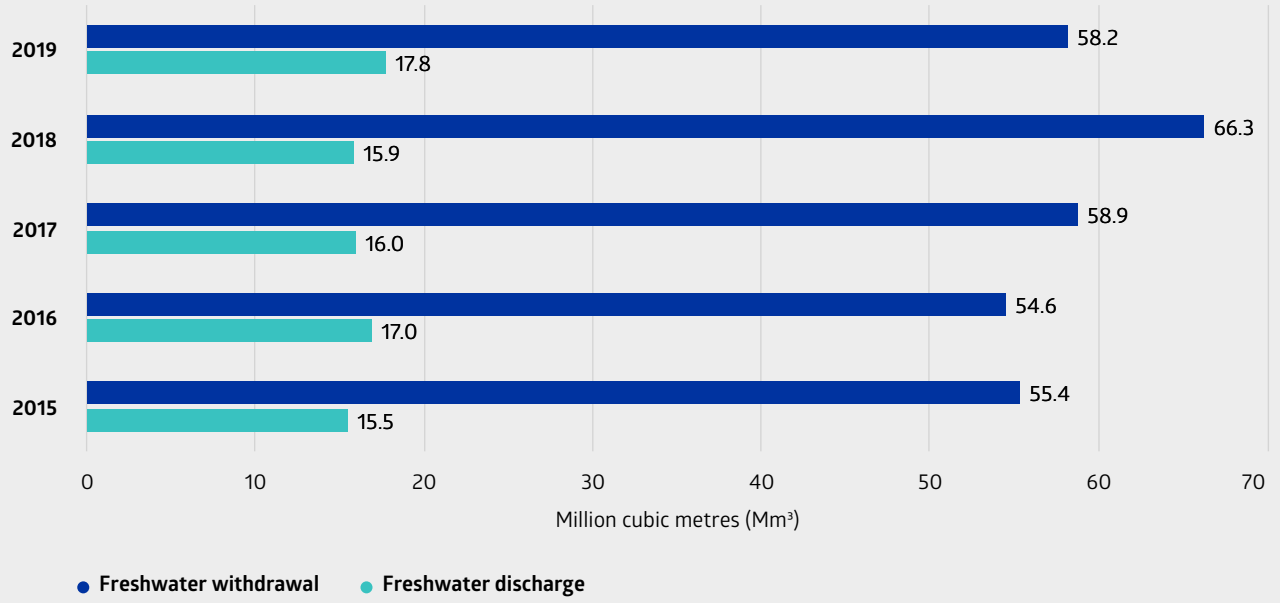
CLP's power stations, in particular the fossil-fuel fleet which uses more water, carry out a range of water conservation initiatives depending on site conditions, operational situations and age. The amount of water which can be recycled depends on factors such as location, power station design, and regulatory requirements. CLP encourages its power stations to track their total water recycling and report this for indicative purposes. Considerable emphasis is placed on sharing initiatives across the CLP Group to maximise the benefit of an individual power station's efforts.

Three of the CLP Group's thermal power stations, Fangchenggang, Jhajjar and Mount Piper, operate on a zero liquid discharge basis. The water is treated internally and recycled or reused in other parts of the power generation process, or for dust control or horticulture. For instance, the Fangchenggang Power Station in Mainland China uses treated greywater to reduce the use of freshwater in the flue gas desulphurisation process. The Jhajjar Power Plant in India operates on the basis of using river water with limited or no water discharge. It is designed with a water re-circulation process, requiring limited quantities of water to be topped up to make up for evaporation losses. In June 2019, CLP India received the Second Runner Up Jury Special Mention Award in an award programme organised by Frost & Sullivan and The Energy and Resources Institute for the Jhajjar plant's achievements in water management.

In Australia, construction of the new 14 km water transfer pipeline and water facility to support the long-term operation of the Mount Piper Power Station was completed in 2019. Since commissioning, water is sourced from the nearby Springvale mine to augment cooling water supplies to the power station. Consequently, the operation of the station will no longer require water from local catchments for its cooling system and therefore there will be no discharge from the mine into the local river systems.

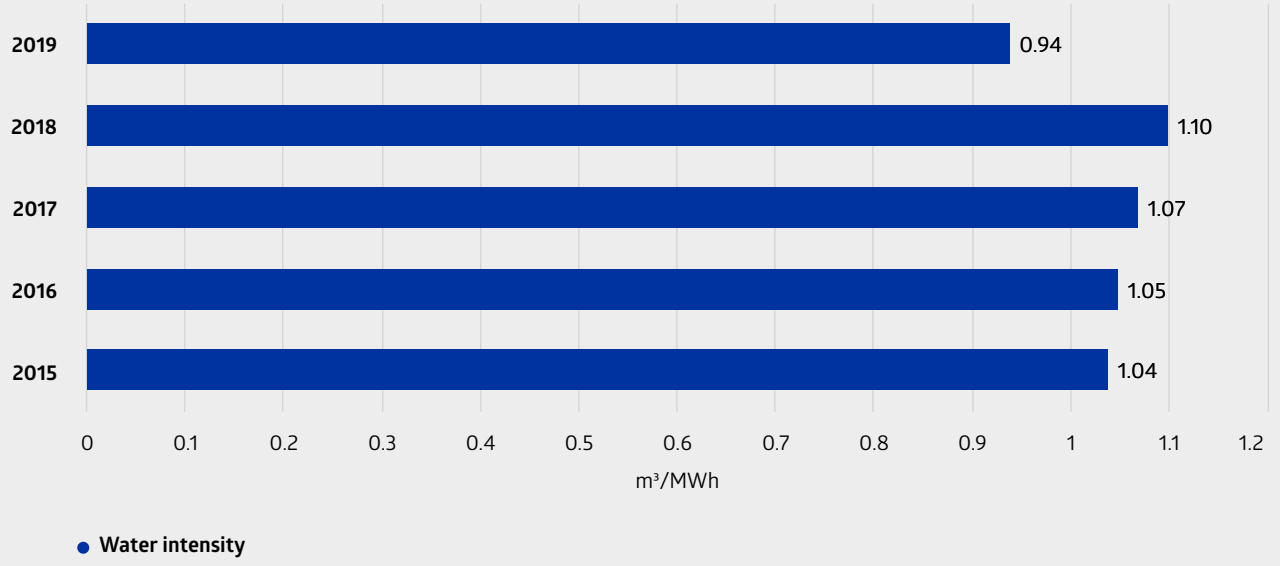
Freshwater withdrawal and discharge

Total water withdrawal and discharge (including water for cooling) decreased in 2019 primarily as a result of less water usage for cooling at Mount Piper Power Station which had a lower electricity sent-out.



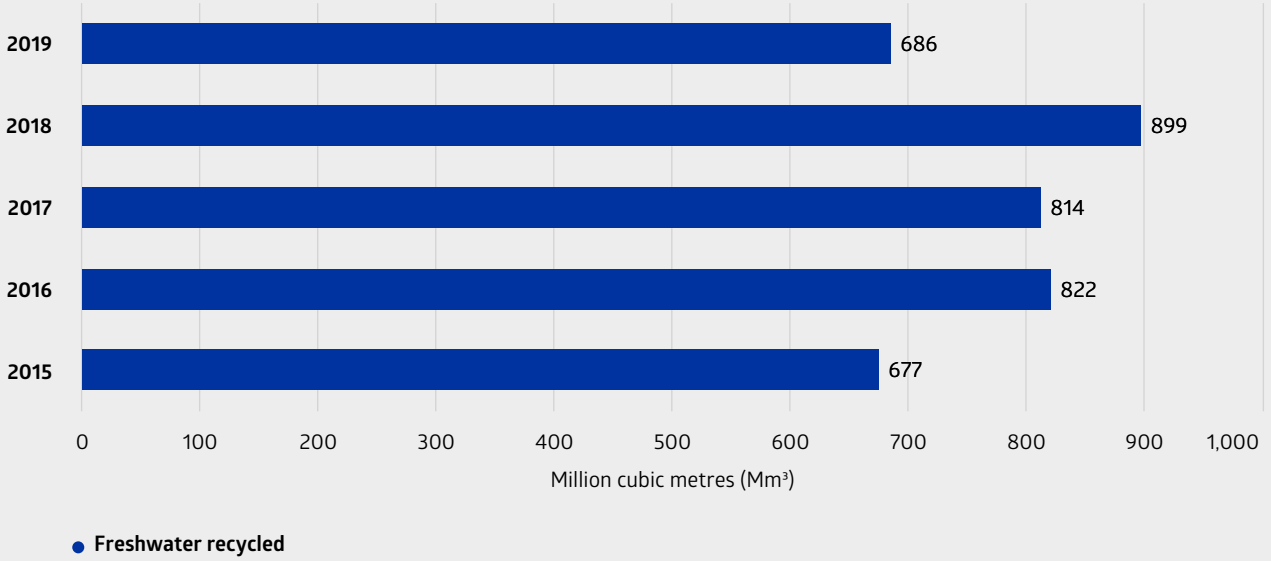
Water intensity of CLP's power generation process

CLP has a lower water intensity (freshwater withdrawal for cooling and non-cooling purposes) in 2019 as a result of a higher percentage of renewable assets in generation portfolio and lower generation in coal-fired power stations.



Freshwater recycled volume

There is a decrease in freshwater recycled volume in 2019 which is mainly due to the lower electricity sent-out from Mount Piper Power Station.



CASE STUDY

CLP's solar farms seek to achieve zero-water for cleaning

CLP's solar farms require water, although in relatively small quantities, for cleaning purposes.

Manual cleaning is the most widely adopted method. However, depending on site conditions (e.g. swamp areas) this may pose safety risks to the cleaners. Cleaning during the daytime also reduces the productivity of the plant.

The Group is currently exploring innovative technology to achieve low water use targets for dust removal on solar panels. In 2019, CLP completed a pilot project to use robotic cleaning which uses brushes instead of water for cleaning of solar panels in the Sihong and Veltoor solar farms in Mainland China and India. These projects did not only achieve zero use of water for cleaning, but could also potentially increase the efficiency of electricity generation.

These successes set a precedent for the wider deployment of the technology in the future.

Dry cleaning robot in Veltoor solar farm in India.

Biodiversity and land use

Management approach

There is no one-size-fits-all approach to managing biodiversity impacts. CLP Group operations interact with local ecosystems in different ways, depending on factors such as location, the level of development in the vicinity and the surrounding environment.

Goals and targets

The Group's goal is "no net loss of biodiversity". Targets are site-specific depending on the different levels of regulatory controls on biodiversity, from assessment requirements to ecological compensation. For example, the target is a net gain in the habitat hectare score at the Yallourn mine's programme in Victoria.

Strategies and procedures

In addition to implementing an internal Environmental Impact Assessment (EIA) standard that mandates an environmental assessment for all new projects, the Biodiversity Impact Assessment Guideline provides a framework for a more systemic assessment of biodiversity impacts. The Guideline under the HSSE management system is applicable to power generation, transmission and distribution, mines and other power-related projects.

During the EIA stage, CLP partnered with qualified personnel to conduct biodiversity impact assessment. The **Biodiversity Impact Assessment Guideline** provides guidance on managing biodiversity risks where appropriate, and considers the IUCN Red List of Threatened Species and national conservation lists of threatened species. Any new operations that could affect the IUCN Red List of Threatened Species and national conservation list species are flagged well ahead of any investment decision. The assessment also describes the baseline conditions, evaluates the magnitude and significance of project impacts, and investigates options for mitigation. If necessary, the assessment contemplates offsets after considering options relating to avoidance, minimisation, and restoration or rehabilitation. The assessment also observes local legislative requirements and references the International Finance Corporation Sustainability Framework.

See CLP's holistic approach in assessing new investment ›

Year in review

CLP continued its ongoing effort in biodiversity conservation and land remediation in 2019.

Biodiversity

Much of the biodiversity work across the Group is ongoing. This includes activities such as vegetation management along transmission lines in Hong Kong, the fish management regime in place at the Jiangbian hydro power station in Mainland China, and the tree management work undertaken by the Jhajjar Power Plant in India.

For the transmission and distribution network in Hong Kong, CLP closely monitors the growth and the condition of trees and vegetation in the vicinity of overhead lines and has a tree inventory to identify any hazardous trees which will affect the overhead's lines operation. To support the Hong Kong Government's Strategy of "Right Tree in the Right Place", any hazardous trees identified will be replaced with native species to support local biodiversity.

The Hong Kong Offshore LNG Project, further to the Environmental Impact Assessment (EIA) approval obtained in October 2018, has commenced marine mammal baseline surveys since June 2019 in the southern and western Hong Kong waters to establish the baseline conditions of the Chinese white dolphins and finless porpoises as part of the Environmental Monitoring & Audit programme.

In Mainland China, the Xundian wind farm has completed its 3-year post-commissioning bird monitoring of the nationally-protected species, black-necked crane. The monitoring was conducted in accordance with the EIA recommendation which considered that the project location is in the vicinity of the black-necked crane provincial nature reserve. Monitoring results together with the expert review panel concluded that there has been no direct impact on the birds due to the operation of the wind farm.

At the Mt Piper Power Station in Australia, CLP has received approval to build the Pipers Flat Rail Coal Unloader to supply the power station with new sources of coal. CLP is also establishing a permanent biodiversity offset area which will improve the long-term biodiversity values of the rail unloader offset site. The biodiversity offset site is close to the power station and the habitats protected include grassy woodlands and dry forests.

Land remediation

The Wallerawang power station in New South Wales continues to progress to the completion of the demolition and rehabilitation of the site. The power station internals have largely been removed. Demolition has been approved and relevant material will be disposed of in an approved new asbestos disposal area. Clean fill from a tunnel project in Sydney has been secured and will be imported to the site to act as capping material for Wallerawang power station assets.

Environment data

Environmental regulations and compliance

Environmental compliance	2019	2018	2017	2016	2015
Environmental regulatory non-compliances resulting in fines or prosecutions (number)[1]	**0**	0	0	0	1
Environmental licence limit exceedances & other non-compliances (number)[1]	**10**	2	13	2	13

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.

Air emissions

Air pollutants	2019	2018	2017	2016	2015
Nitrogen oxides emissions (NO_x) (kt)[1,2]	**47.0**	60.9	59.3	58.1	56.3
Sulphur dioxide emissions (SO_2) (kt)[1,2]	**44.7**	76.1	81.6	71.2	63.4
Particulates emissions (kt)[1,2]	**7.7**	8.5	8.3	8.5	9.8

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Since 2019, numbers at asset level are aggregated and then rounded.

Waste

Waste produced and recycled	2019	2018	2017	2016	2015
Non-hazardous liquid waste (kl)[1,2,3]					
Produced	**59**	52	103	84	199
Recycled	**57**	52	103	84	199
Non-hazardous solid waste (t)[1,2,3]					
Produced	**13,344**	11,471	20,334	8,317	11,455
Recycled	**4,986**	3,990	3,790	2,963	4,414
Hazardous liquid waste (kl)[1,2,3]					
Produced	**1,578**	1,685	1,420	1,251	2,832
Recycled	**1,536**	1,648	1,384	1,149	1,176
Hazardous solid waste (t)[1,2,3]					
Produced	**862**	1,435	857	1,302	641
Recycled	**201**	631	469	260	203

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Since 2019, numbers at asset level are aggregated and then rounded.
3 Waste categorised in accordance with local regulations.

By-products	2019	2018	2017	2016	2015
Ash produced (kt)[1,2]	**3,032**	3,419	3,005	2,121	2,261
Ash recycled / sold (kt)[1,2]	**3,667**	2,263	1,745	1,111	1,587
Gypsum produced (kt)[1,2]	**441**	253	156	136	145
Gypsum recycled / sold (kt)[1,2]	**438**	250	161	134	143

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Since 2019, numbers at asset level are aggregated and then rounded.

Water

Water withdrawal and discharge	2019	2018	2017	2016	2015
Total water withdrawal (Mm^3)[1,2,3,4]	**5,377.4**	5,153.6	4,480.6	4,256.9	4,503.0
For cooling purpose					
Water withdrawal from marine water resources	**5,319.3**	5,087.3	4,421.7	4,202.3	4,447.6
Water withdrawal from freshwater resources	**45.7**	53.3	47.6	43.8	45.1
For non-cooling purposes					
Water withdrawal from freshwater resources	**5.8**	6.0	4.9	4.2	3.8
Water withdrawal from municipal sources	**6.7**	7.0	6.4	6.6	6.5
Total water discharge (Mm^3)[1,3,5,6]	**5,337.1**	5,103.2	4,437.7	4,219.3	4,463.1
From cooling process					
Water discharge to marine water bodies	**5,319.3**	5,087.3	4,421.7	4,202.3	4,447.6
Treated wastewater to freshwater bodies	**0**	0	0	0	0
Wastewater to other destinations	**0**	0.02	0.05	0.06	0.03
From non-cooling processes					
Treated wastewater to marine water bodies	**1.7**	1.6	1.6	1.5	1.1
Treated wastewater to freshwater bodies	**14.4**	12.3	12.3	13.7	12.6
Wastewater to other destinations	**1.7**	1.9	2.0	1.7	1.7
Wastewater to sewerage	**0.03**	0.03	0.02	0.01	0.02

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Starting in 2019, the breakdown of water withdrawal is recategorised into withdrawal for cooling and non-cooling purposes. Numbers of the years 2015-18 are not directly comparable with the previously reported numbers because of the recategorisation, except for marine water resources.
3 Numbers at the asset level are aggregated and then rounded for all years shown herein. They may be adjusted from the numbers reported previously, where they were rounded and then aggregated.
4 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
5 Starting in 2019, the breakdown of water discharge is recategorised into discharge for cooling and non-cooling purposes. Numbers of the years 2015-18 are not directly comparable with the previously reported figures because of the recategorisation, except for marine water bodies.
6 Starting in 2019, Yallourn's "water discharged to third-parties", which was previously reported under "Wastewater to sewerage", is reported under "water discharged to other destinations".

Water intensity	2019	2018	2017	2016	2015
Water intensity of CLP's power generation process (m^3/MWh)[1]	**0.94**	1.10	1.07	1.05	1.04

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.

Freshwater reused/recycled	2019	2018	2017	2016	2015
Freshwater reused/recycled volume (Mm^3)[1]	**686**	899	814	822	677

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Climate change

Climate action finance

Management approach

The CLP Group seeks to obtain socially responsible, sustainable and cost effective financing to support Group investments which reduce the carbon content of energy generated and increase the efficiency of energy usage.

Strategies and procedures

The Climate Action Finance Framework (CAFF) supports the transition to a low carbon economy by attracting socially responsible, sustainable financing. It supports CLP's investments in reducing carbon emissions and increasing energy efficiency. Established in July 2017, the CAFF sets out how CLP proposes to raise climate action bonds (CLP Climate Action Bonds) to invest in projects consistent with both the Group's investment and climate strategies. CLP Group's majority-owned business units may issue bonds under the CAFF, and there are two types of Climate Action Bonds:

- **New Energy Bonds** – the proceeds of which help develop renewable energy, energy efficiency and low emissions transportation infrastructure projects
- **Energy Transition / Emission Reduction Bonds** – the proceeds of which help develop gas-fired power plants to support the transition from coal-fired generation in markets with limited renewable energy resources.

New Energy Bonds are aligned with the Green Bond Principles, which provide guidance in four key areas: the use of proceeds, the process for project evaluation and selection, the management of proceeds as well as reporting. Energy Transition/ Emission Reduction Bonds are aligned with the governance components of the Green Bond Principles, including the process for project evaluation & selection and management of proceeds & reporting.

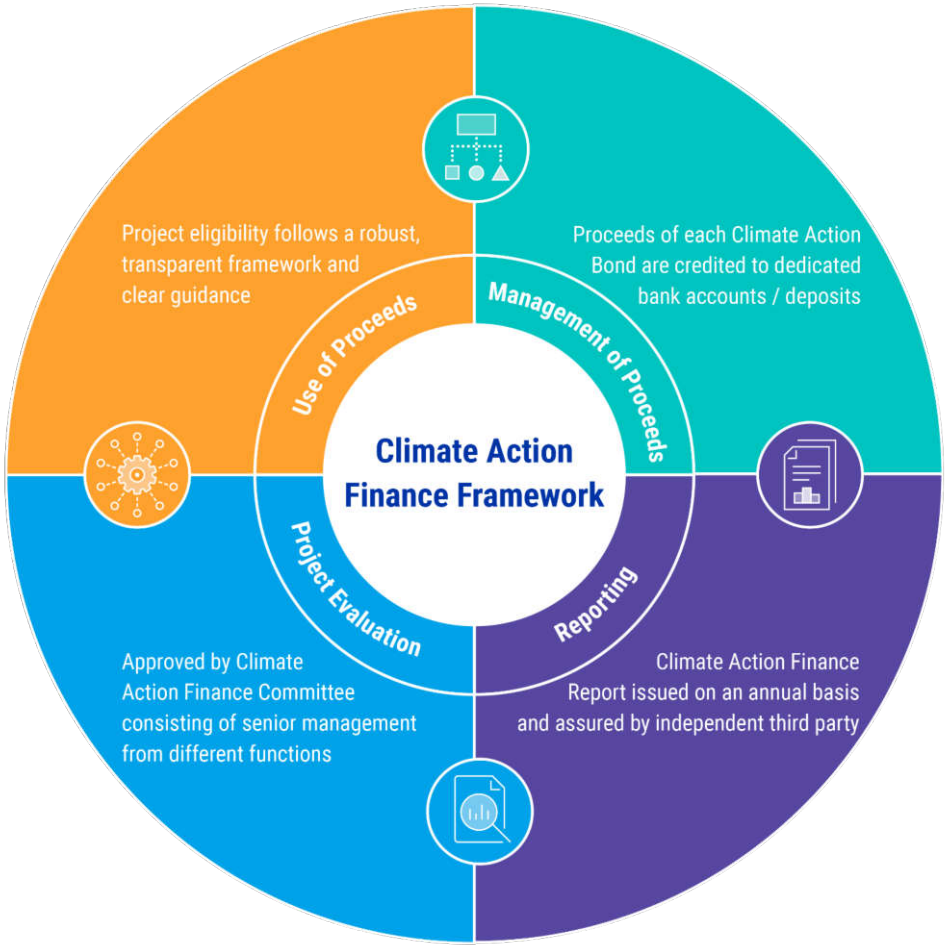
Operational responsibilities

All eligible projects of the CAFF undergo a rigorous review and approval process within a transparent framework and clear guidelines. CLP has established a Climate Action Finance Committee with the responsibility for governing the CAFF. The Committee is responsible for approving the issuance of Climate Action Bonds and determining the eligibility of the proposed use of proceeds. Committee membership consists of the CLP Executive Director and Chief Financial Officer, and senior management from the sustainability, finance and legal departments.

Monitoring and follow-up

All bond proceeds must deliver clear environmental benefits through investment in qualified projects identified by a transparent screening process. Controls are also in place to ensure that bond proceeds are only used for designated green projects. CLP produces a Climate Action Finance Report annually to help track the appropriate use of bond proceeds and provide insight into their estimated environmental impact. The content of the report is independently assured by an auditor.

Climate Action Finance Framework



Year in review

In 2019, the CLP Group issued a New Energy Bond to fund the construction of the West New Territories Landfill energy-from-waste project.

The first Climate Action Bond was issued in July 2017. In 2019, CAPCO issued the second bond under CAFF as a HK$170 million 25-year fixed rate New Energy Bond to fund the construction of the West New Territories Landfill energy-from-waste project in Hong Kong. This was the inaugural green bond for CLP's Scheme of Control business. The energy-from-waste project allows CAPCO to utilise landfill gas as an energy source to offset its coal-fired power generation and reduce emissions from coal burning.

Download CLP's 2019 Climate Action Finance Report

Download the Indepdent Assurance Statement for the 2019 Climate Action Finance Report

Greenhouse gas emissions

Management approach

Greenhouse gas (GHG) emissions are one of the key metrics to measure how the CLP Group tracks progress in decarbonisation.

The GHG intensity of the electricity CLP generates is one of the targets in the Company's Climate Vision 2050. A Group-wide GHG reporting guideline was first developed in 2007. CLP is reporting GHG emissions with reference to the following international standards and guidelines:

- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) of World Business Council for Sustainable Development (WBCSD) and The World Resources Institute (WRI)
- The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard
- The Greenhouse Gas Protocol: Technical guidance for Calculating Scope 3 Emissions (Version 1)
- IPCC Guidelines for National Greenhouse Gas Inventories, 2006
- IPCC 5th Assessment Report, 2014
- International Standard for GHG Emissions ISO 14064-1

CLP obtains emission factors from the local governments and authorities in jurisdictions where the different business units operate. In cases where local emission factors are not available, other recognised sources are referenced.

CLP's GHG emissions inventory covers the six GHGs[5] specified in the Kyoto Protocol. Nitrogen trifluoride (NF_3), the seventh mandatory gas added under the second Kyoto Protocol, was also considered for inclusion, but after evaluation was deemed immaterial to operations.

Scope 3 GHG emissions

CLP has been focused on measuring its Scope 1 GHG emissions as that is the main emission type from its generation business. Conscious of emissions along the value chain, in 2019, the Company conducted a comprehensive review of its Scope 3 emissions, and from this report onwards will add disclosure of Scope 3 emissions to present a more comprehensive view of its footprint along the value chain.

Conducting a Scope 3 screening exercise is the first step to understanding all sources of emissions and identifying the material categories for reporting. Like many industries, electric utilities may have limited influence or control over some Scope 3 emissions categories. CLP will monitor its Scope 3 emissions particularly if they represent an increasing portion of the total carbon footprint.

Scope 3 GHG emissions relevant to CLP by categories

Scope 3 category	Relevance to CLP	Calculation and emission factors
1: Purchased goods and services Emissions from the extraction, production and transportation of goods and services purchased or acquired.	· a) Products-related emissions relate to the upstream emissions of EnergyAustralia's natural gas retail business, including the emissions from upstream gas production and transmission, and distribution leakage in the state pipeline systems.	· Assessed using the average-data method. The quantities of natural gas supplied are multiplied by state-based upstream emission factors to calculate the emissions. · Emission factors source: Australia National Greenhouse Accounts Report 2019.
	· b) Non-products-related emissions relate to the upstream emissions of CLP's purchased goods and services other than natural gas for retail business.	· Assessed using the spend-based method. Country-based World Input-Output Database (WIOD) factors are applied to the financial spend on the purchase of non-products goods and services. · Emission factors source: World Input Output Database Release 2016.
2: Capital goods Emissions from the extraction, production and transportation of capital goods purchased or acquired.	· Relates to the upstream emissions of CLP's purchased capital goods, mainly for infrastructure construction and facility upgrades.	· Assessed using the spend-based method. Country-based World Input-Output Database (WIOD) factors are applied to the financial spend on the purchase of capital goods. · Emission factors source: World Input Output Database Release 2016.

[5] Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarons (PFCs), and sulphur hexafluoride (SF_6).

Scope 3 category	Relevance to CLP	Calculation and emission factors
3: Fuel- and energy-related activities Emissions related to the extraction, production transportation of fuels and energy purchased or acquired.	· Includes the upstream emissions of purchased fuels and electricity for CLP's power generation.	· Assessed using the average-data method. · Upstream emissions (WTT, Well to Tank emissions) of purchased fuels and electricity are calculated by using volumes of purchased fuels and electricity and country-based WTT emission factors, where available. Where such volumes are not available, the ratio of the WTT emission factor to direct emission factor for each fuel type is applied to the Scope 1 & 2 emissions of the generation assets. · Emission factors source: Australia National Greenhouse Accounts Report 2019, 2019 UK Government GHG Conversion Factors for Company Reporting.
	· Also includes the direct emissions from generation of purchased electricity that is sold to CLP's customers. · In addition, includes the upstream emissions from generation of purchased electricity that is sold to CLP's customers.	· Direct emissions and upstream emissions from generation of purchased electricity that is sold to CLP's customers are assessed using the supplier-specific method, which involves using emissions data of generation assets whose capacity and energy are purchased by CLP to meet customer demand. Calculated through multiplying the percentages of capacity and energy purchased by CLP with direct emissions and upstream emissions (WTT, Well to Tank emissions) of the generation assets. · Emissions from generation of purchased electricity that is sold to CLP's customers also include the emissions from the net electricity purchased by EnergyAustralia from the Australian Energy Market Operator (AEMO) in Australia. Assessed using the average-data method, which involves estimating emissions by using grid average emission factors. Calculated through multiplying the net electricity purchased from AEMO with state-based emission factors. · Emission factors source: Australia National Greenhouse Accounts Report 2019, 2019 UK Government GHG Conversion Factors for Company Reporting.
5: Waste generated in operations Emissions from the disposal and treatment of waste generated.	· Emissions from fuel ash and gypsum generated are most material for waste generation.	· Assessed using the waste-type specific method based on waste produced by type. · Calculated through applying emission factors to quantities of fuel ash and gypsum generated at CLP's coal-fired power stations, considering the disposal method. · Emission factors source: 2019 UK Government GHG Conversion Factors for Company Reporting.
6: Business travel Emissions from the transportation of employees for business-related activities.	· Air travel is the most material source of emissions from business travel.	· Assessed using distance-based method. · Air travel emissions for CLP's operations in Hong Kong and Australia are directly calculated using flight distance by travel classes multiplied with corresponding emission factors. Total emissions are calculated through extrapolation based on CLP's financial spend on business travel. · Emission factors source: 2019 UK Government GHG Conversion Factors for Company Reporting.
7: Employee commuting Emissions from the transportation of employees between their homes and their worksites.	· Relates to the emissions of CLP's employees in commuting to the offices, typically includes emissions from automobile travel, bus travel, etc.	· Calculated through the number of CLP's employees, estimated travel mode and average distance travelled by region. · Emission factors source: 2019 UK Government GHG Conversion Factors for Company Reporting.

Scope 3 category	Relevance to CLP	Calculation and emission factors
11: Use of sold products Emissions from the end use of products sold.	· Relates to the downstream emissions of EnergyAustralia's natural gas retail business, including the emissions from combustion of natural gas supplied to customers.	· Calculated through multiplying the quantities of natural gas supplied to customers by state-based emission factors. · Emission factors source: Australia National Greenhouse Accounts Report 2019.

Scope 3 categories that are not considered relevant to CLP

Scope 3 category	Explanation
4: Upstream transportation and distribution Emissions from transportation and distribution of purchased goods and services.	The emissions are covered in Category 1 as the financial spend on transportation and distribution is embedded in the financial spend on purchased goods and services.
8: Upstream leased assets Operation of assets leased by the reporting company, i.e. lessee.	CLP does not operate leased generation assets. The emissions of leased offices are included in CLP's Scope 2 emissions.
9: Downstream transportation and distribution Emissions from transportation and distribution of products sold between the operations and the end consumer, in vehicles and facilities not owned or controlled or paid for by the reporting company.	Electricity and gas are the main products of CLP. Transportation and distribution of the products does not involve vehicles and facilities not owned or controlled by the Group.
10: Processing of sold products Processing of intermediate products sold by downstream companies, e.g. manufacturers.	With electricity and gas being CLP's main products, they are end products without further processing requirement.
12: End-of-life treatment of sold products Waste disposal and treatment of products sold at the end of their life.	With electricity and gas being CLP's main products, there is no end-of-life treatment requirement.
13: Downstream leased assets Operation of assets owned by the reporting company (lessor) and leased to other entities.	Leasing is not a main business for CLP.
14: Franchises Operation of franchises.	CLP does not have any franchising business.
15. Investments Emissions from operation of investments.	CLP reports Scope 3 emissions on an equity basis. This category applies to CLP only when an operational control basis is adopted. It would include the emissions from assets which CLP has minority interests without having operational control.

Goals and targets

As presented in CLP's Climate Vision 2050, the decadal carbon intensity targets have been strengthened in 2018 to reflect the increasing pace of transition in key markets and globally. CLP also created targets for renewable energy and non-carbon emitting generation.

Learn more about CLP's GHG emissions goals and targets in Climate Vision 2050

Monitoring and follow-up

CLP manages the GHG emissions from its generation business by adopting a rigorous Asset Management Framework. Asset performance metrics are utilised and established Engineering Standards and Guidelines are applied, aligning with operational protocol for delivering reliable electricity.

The internal GHG emission reporting guideline is reviewed in accordance with CLP practice at least once every three years.

Year in review

Going forward, CLP will also disclose its GHG emissions on an equity and long-term capacity and energy purchase basis.

CLP has been disclosing the combined total Scope 1 and Scope 2 GHG emissions on an operational control basis for more than a decade. This compilation basis represents the total GHG emissions from generation assets where CLP has direct influence and control on operational matters. This will continue to be disclosed for better year-on-year comparison.

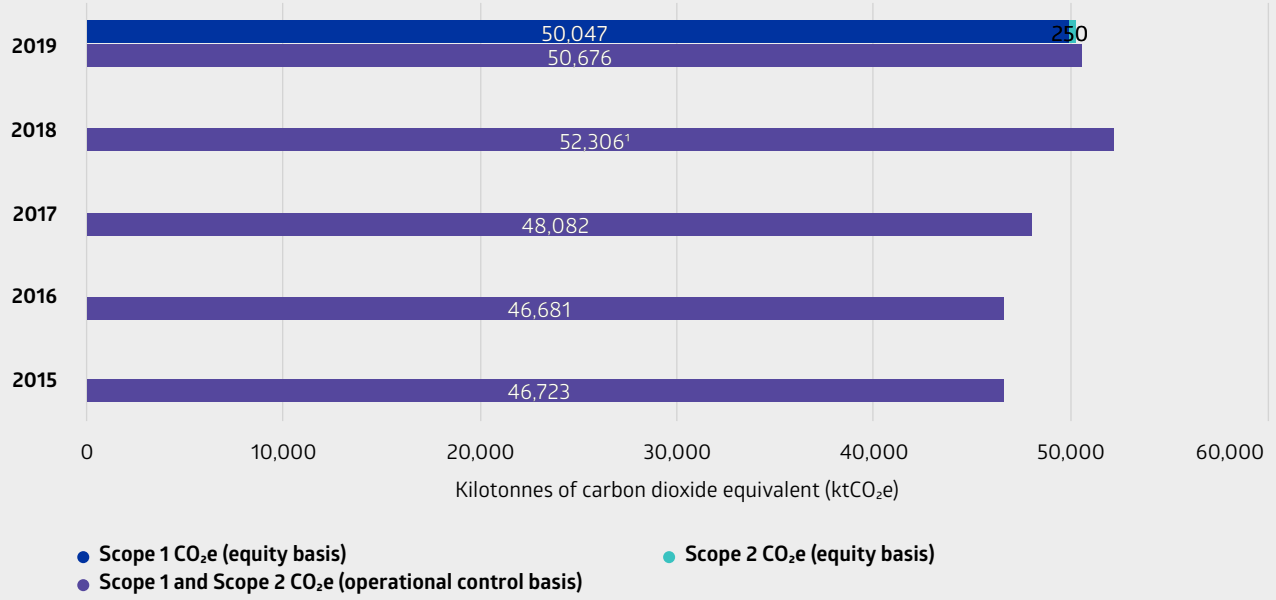
At the same time, a better reflection of CLP's investments in decarbonisation efforts is gauged through GHG emissions based on equity and long-term capacity and energy purchase. Purchase agreements help the Group meet local market needs and usually entail significant investment. In addition, this figure allows customers to better understand the carbon intensity of the electricity CLP provides. In order to qualify for inclusion in this metric, these long-term capacity and energy purchase agreements must have a duration of at least five years and the equivalent capacity of 10MW or more.

CLP's 2019 GHG emissions were compiled on two bases

	GHG emissions in 2019 (kilotonnes of carbon dioxide equivalent ($ktCO_2e$))	
	On an operational control basis	On an equity basis
Scope 1	50,676	50,047
Scope 2		250
Scope 3	-	21,424
Total	**50,676**	**71,720**

Scope 1 and Scope 2 GHG emissions (operational control and equity bases)

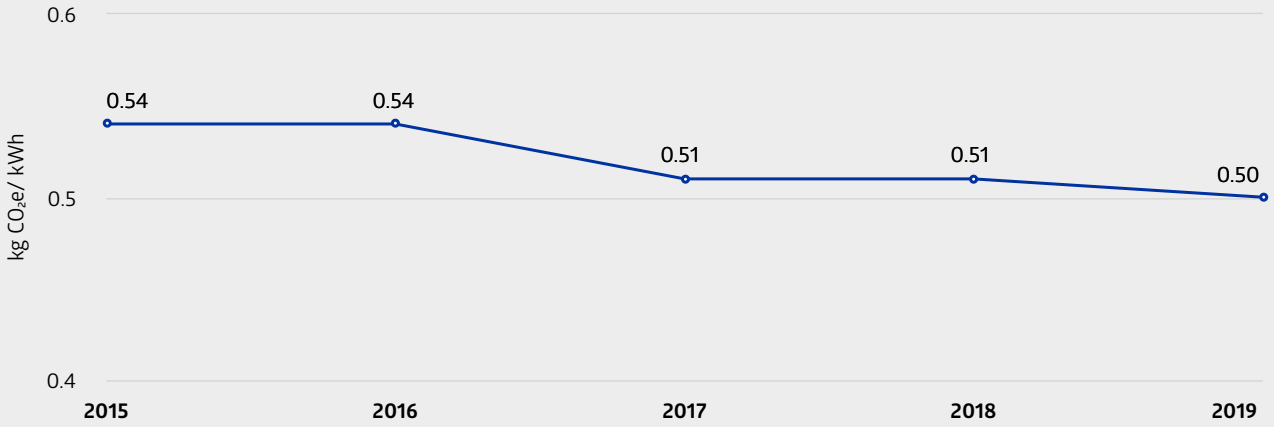
On an operational control basis, the total Scope 1 and Scope 2 GHG emissions has reduced to 50,676$ktCO_2e$ in 2019. CLP started to disclose Scope 1 and Scope 2 GHG emissions on an equity basis separately in 2019, which combined amounted to 50,297$ktCO_2e$.



1 Restated as per updated data for Hallett power station in Australia.

GHG emissions intensity of CLP Power Hong Kong electricity sold

The GHG intensity of the electricity sold in 2019 was 0.50kgCO_2e/kWh, compared to 0.51kgCO_2e/kWh in 2018. The improved GHG intensity is due to the increase of the share of natural gas generation.



Progress of Climate Vision 2050

Under the new reporting basis of including long-term capacity and energy purchase agreements, CLP's progress against its CV2050 targets are summarised below. Intensity measured on an equity only basis continues to be reported to allow for year-on-year comparisons.

CLP's progress towards the Climate Vision 2050 targets

	2020 targets	2019 performance	
	On an equity plus long-term capacity and energy purchase basis	On an equity plus long-term capacity and energy purchase basis	On an equity basis
Carbon intensity (kgCO_2/kWh)	0.60	0.62	0.70
Renewable energy capacity (percentage of total capacity)	20%	13.7%	12.8%
Non-carbon emitting energy (percentage of total capacity)	30%	24.9%	21.1%

Read more about how CLP responds to climate change ›

Scope 3 emissions of CLP

Fuel- and energy-related activities were identified as the most material for CLP among the 15 categories of Scope 3 emissions, followed by *Use of Sold Products* and *Capital Goods*. These three categories account for around 90% of CLP's Scope 3 emissions.

Scope 3 emissions by category

Category	Kilotonnes of carbon dioxide equivalent ($ktCO_2e$)	Percentage (%)
Category 1a: Purchased goods and services (products)	554	3%
Category 1b: Purchased goods and services (non-products)	539	3%
Category 2: Capital goods	1,347	6%
Category 3: Fuel- and energy-related activities	16,671	78%
Category 5: Waste generated in operations	101	0.5%
Category 6: Business travel	8	0.04%
Category 7: Employee commuting	4	0.02%
Category 11: Use of sold products	2,200	10%
Total	**21,424**	**100%**

CASE STUDY

CLP's view on Hong Kong's Decarbonisation Strategy

Land constraints and the densely populated nature of developable land in Hong Kong have always posed a challenge for the city's deployment of large-scale renewable energy projects.

While taking this into consideration, CLP issued a public response to The Council for Sustainable Development's public engagement on the Long-term Decarbonisation Strategy launched in June 2019, expressing support to the need for deep decarbonisation of electricity generation. CLP's response highlighted the challenges and opportunities of different pathways to increase long-term low-carbon electricity generation and/or source more zero-carbon energy through regional cooperation. The potential opportunities associated with latest technologies such as zero-carbon hydrogen or carbon capture and storage were also discussed.

Download CLP Power's response to the consultation paper

CLP's response aligns with the Five-year Development Plan (2018-2023) which outlines a focus on gradually migrating to a generation fuel mix composed mainly of natural gas while reducing the use of coal in electricity generation. The Development Plan also highlights several important capital projects crucial to accelerating CLP's transition to lower-carbon energy, including the new 550MW gas-fired generation units at the Black Point Power Station and the construction of the offshore liquefied natural gas (LNG) terminal that will provide a more secure long-term alternative source of natural gas. It also includes the landfill gas power generation system at the West New Territories Landfill in Hong Kong, as well as the enhancement of the Clean Energy Transmission System connecting the CLP grid to Guangdong. Find out more here.

Preparing for carbon trading

Year in review

As CLP continues to have a number of fossil-fuel based generation plants in operation for the near term, the company is closely monitoring how carbon trading schemes may have a direct impact on operations.

Negotiations on carbon trading at COP25 were focused on Article 6 of the Paris Agreement, with a view to creating a new financial instrument that would enable a transparent trading mechanism for countries to meet national emissions reduction pledges. Challenges remain for negotiators to agree on a framework that will be flexible enough to attract investment while alleviating uncertainty as to how Clean Development Mechanism (CDM) credits, a legacy of the Kyoto Protocol that laid out the rules for a global carbon trading mechanism, would transfer to the new scheme under Article 6.

The Mainland Chinese Government officially announced the establishment of a national Emissions Trading Scheme (ETS) in December 2017. In the initial phase, the national ETS covers only the power sector with a view to gradually expanding to other key emitting sectors. Throughout 2019 the Government focused on the development of market infrastructure. The Ministry of Ecology and Environment (MEE) successively released draft regulations of the national ETS for comments and organised a series of training workshops across the country to provide carbon management knowledge and test allocations for the covered entities. In response, CLP China set up a dedicated carbon management team to monitor its carbon portfolio in Mainland China and the development of the national ETS. The Group's assets are making appropriate preparation for the upcoming carbon market, including the Fangchenggang Power Station, to monitor, report and verify its carbon emissions.

The Government of India has not yet made an announcement pertaining to any domestic compliance and carbon trading schemes. Currently, all renewable energy generation projects of CLP India are registered in Clean Development Mechanism (CDM) and Voluntary Carbon Standard (VCS), and carbon offsets generated from these projects are being traded in the international markets. CLP India is still operating one coal-fired power plant in Jhajjar, Haryana, and is continuing to closely monitor the development of the domestic carbon trading scheme of the national carbon market in India.

CLP has not adopted an internal price on carbon, as this is not foreseen as being strategic for the Group to accelerate its decarbonisation journey. As outlined under CLP's Climate Vision 2050, clear targets have been set that help shape current and future investment decisions. As part of this commitment, the Company is strictly focused on expanding its portfolio of renewable and non-carbon assets, coupled with an increasing focus on transmission and distribution as well as new business opportunities presented by the Group's innovation team. An internal price on carbon would not impact or change the Company's investment decisions.

For the existing portfolio of thermal assets, as outlined above, CLP is tracking the development of domestic and international carbon markets and is making appropriate provisions to prepare for this eventuality. More importantly, the company's thermal assets are already slated to be phased out from the portfolio, and adding an additional complexity of an internal carbon price would not accelerate this decarbonisation trajectory.

Climate resilience

Year in review

CLP has undertaken a number of assessments over recent years to better understand the climate resilience of the Group's assets, and put in place adaptation or mitigation measures.

Extreme weather events are perhaps the most visible and imminent risk that arises from climate change. Recent years have seen many high-impact events including typhoons, floods or droughts, heatwaves and bushfires around the world. These events can cause physical damage to CLP's assets and operational disruption, which in turn, can result in reduced output, increased repair and maintenance costs, and service disruptions for customers. It is critical that CLP's systems are resilient enough to withstand extreme conditions to minimise disruption and to help facilitate faster recovery for affected communities.

Aside from direct physical damage, climate change can also adversely impact the company's operations in other ways. For instance, shifts in rainfall and drought patterns may reduce the availability of raw water for some power plants. Damage to assets along the supply chain, in particular the procurement of fuel, is another way that extreme weather events may affect the Group's ability to reliably deliver electricity.

In response, CLP has put in place adaptation or mitigation measures appropriate for each of its markets. These are summarised below.

Australia	
Supply chain	· As an alternative source for coal for Mt Piper in the lowly probable event where the current coal mine suffers from flood inundation, the Springvale mine has been approved as a coal source and has sufficient fuel for Mt Piper through to 2024. · The Yallourn coal mine is designed for a flooding frequency of 1 in 5,000 years. Site runoff and drains overflow, as well as ash pond overflow or collapse are contained within the site.
Generation	· Equipment cooling is well maintained at power stations. In particular, a cooling tower in Yallourn has been refurbished to improve efficiency. · Due for completion in 2020, the construction of a new water transfer pipeline from the Springvale mine and water treatment facility will significantly augment cooling water supplies to the Mt Piper power station and mitigate the effects of drought. The risk of flooding for CLP's power plants in Yallourn and Mt Piper is low. · A Bushfire Mitigation Plan was established to specify procedures and processes at the Yallourn site to mitigate the spread of fire that either initiates internally or from infiltration of external fires. The procedures also mitigate the initiation of bushfires from "at-risk" electrical lines and provide a controlled reduction in fire risk from the site assets. · At Mt Piper, fire break and undergrowth management reduced the risk to the overland conveying systems from the Springvale mine. Rail operations can be curtailed during extreme weather or fires. · Regular engagement with governments, regulators and local communities on climate change allows EnergyAustralia input to the discussions on transition, policy and regulations likely to impact EnergyAustralia's sites at Mt Piper and Yallourn.

Mainland China	
Generation	· Fangchenggang Power Station (FCG) performed a risk assessment on extreme weather impacts on the operating system and equipment in September 2014. · FCG site was not identified as being flood prone. Improvements works were implemented for the diesel generator as a recommended measure during the 2014 review. · Improvements at FCG also included building a protection wall in the coal yard and additional run-off water storage, and precautionary measures for extreme weather events such as the securing of coal unloaders. · FCG is seawater cooled and unlikely to be impacted by drought.

India	
Generation	· The Company's Jhajjar power plant is most prone to water scarcity. CLP continues to explore various options for increasing reservoir capacity. · Jhajjar power plant is located in the low rainfall region and is not prone to flooding.

Hong Kong	
Supply chain	· Diversify CLP's fuel supplies from multiple source. The Company is preparing for the construction of an offshore liquefied natural gas (LNG) terminal which will enable the company to source gas from the global market.
Generation	· CLP's generation facilities in Hong Kong are generally seawater-cooled and operational impact from drought is limited. · A variety of measures, including ground-level drainage systems, sea walls along power station shorelines, flood gates and flood barriers are in place to guard the Group's power stations in Castle Peak and Black Point against sea level rise and storm surges.
Transmission and distribution	· The structure of transmission towers and the foundations of overhead lines are being strengthened to withstand wind gusts of up to 300km/hour; their foundations and the slopes nearby have also been strengthened with soil nails and deflection walls. · Flood calculators evaluate the flooding risk at substations. Mitigation measures are upgraded for flood-prone transmission and distribution substations. · Line arresters are installed to minimise voltage dips caused by lightning strikes on exposed overhead lines. · Enhanced vegetation management to mitigate power supply disruption caused by overgrown vegetation and reduce wildfire risk; the Company has worked closely with the Development Bureau and other government departments on better vegetation management. · Operational guidelines for equipment and substations take into account operations under high temperature (of up to 45°C). · With installation of smart metres, data at an individual customer level could provide details of supply interruptions, allowing CLP to proactively contact customers and prioritise recovery.
Retail	· In 2019, CLP Power delivered a series of customer engagement events to inform the Group's Hong Kong stakeholders of the initiatives already undertaken to increase the resilience of the system.
Service recovery	· A typhoon response protocol and coordinating system has been established. · Regular drills and post-typhoon reviews are conducted to ensure the smooth execution of contingency plans when needed. · The Company's System Control Centre provides online, round the clock surveillance of the network status. This improves the Company's resource mobilisation in the event of power outages, and enables CLP's emergency services teams to maintain close contact with the System Control Centre and respond instantly to any power incidents. · Establish in-house Unmanned Aerial Vehicle (UAV) Teams for post-typhoon surveillance inspection. · An emergency restoration system enables rapid construction of temporary masts that can shorten the restoration of power supply. · Enhanced capacity of customer services and post-incident customer communication. For instance by installing additional T1 telephone lines and setting-up remote agents, and e-channel for power outage reporting and communications.

Climate change data

Greenhouse gas emissions

Scope 1, 2, 3 emissions	2019	2018	2017	2016	2015
Total GHG emissions - on an equity basis (kt)[1]	**71,720**	N/A	N/A	N/A	N/A
Scope 1 CO_2e	**50,047**	N/A	N/A	N/A	N/A
Scope 2 CO_2e	**250**	N/A	N/A	N/A	N/A
Scope 3 CO_2e	**21,424**	N/A	N/A	N/A	N/A
Scope 3 CO_2e by category					
Category 1a: Purchased goods and services (products)	**554**	N/A	N/A	N/A	N/A
Category 1b: Purchased goods and services (non-products)	**539**	N/A	N/A	N/A	N/A
Category 2: Capital goods	**1,347**	N/A	N/A	N/A	N/A
Category 3: Fuel- and energy-related activities	**16,671**	N/A	N/A	N/A	N/A
Category 5: Waste generated in operations	**101**	N/A	N/A	N/A	N/A
Category 6: Business travel	**8**	N/A	N/A	N/A	N/A
Category 7: Employee commuting	**4**	N/A	N/A	N/A	N/A
Category 11: Use of sold products	**2,200**	N/A	N/A	N/A	N/A
Total GHG emissions - on an operational control basis (kt)[2]					
Scope 1 & 2 CO_2e (from power generation)	**50,676**	52,306[3]	48,082	46,681	46,723
Scope 1 & 2 CO_2 (from power generation)	**50,412**	52,052[3]	47,921	46,518	46,553

1 Numbers include majority and minority share assets in the CLP Group portfolio.
2 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
3 Restated as per updated data for Hallett power station in Australia.

Climate Vision 2050	2019	2018	2017	2016	2015
Performance against targets - on an equity basis[1,2]					
Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)	**0.70**	0.74	0.80	0.82	0.81
Total renewable energy generation capacity (% (MW))	**12.8 (2,469)**	12.5 (2,387)	14.2 (2,751)	16.6 (3,090)	16.8 (3,051)
Non-carbon emitting generation capacity (% (MW))	**21.1 (4,069)**	20.9 (3,987)	22.4 (4,350)	19.2 (3,582)	19.5 (3,543)
Performance against targets - on an equity plus long-term capacity and energy purchase basis[1,2,3]					
Carbon dioxide emissions intensity of CLP Group's generation portfolio (kg CO_2/ kWh)	**0.62**	0.66	0.69	0.72	N/A
Total renewable energy generation capacity (% (MW))	**13.7 (3,294)**	12.8 (3,039)	13.1 (3,211)	14.9 (3,551)	N/A
Non-carbon emitting generation capacity (% (MW))	**24.9 (5,979)**	24.1 (5,724)	23.2 (5,699)	20.7 (4,931)	N/A

1 Numbers include majority and minority share assets in the CLP Group portfolio.
2 CO_2 emissions of Yallourn and Hallet power stations were used in 2018. Prior to 2018, CO_2e emissions data of these assets were used.
3 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.

CLP Power Hong Kong - carbon emissions intensity of electricity sold	2019	2018	2017	2016	2015
CO_2e emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2e/ kWh)[1]	**0.50**	0.51	0.51	0.54	0.54
CO_2 emissions intensity of electricity sold by CLP Power Hong Kong (kg CO_2/ kWh)[1]	**0.49**	0.51	0.50	0.54	0.54

1 "Electricity sold" is the total electricity energy sold to CLP Power Hong Kong's customers before adjustment of Renewable Energy Certificates.

Climate-related financial information

Capital investments	2019	2018	2017	2016	2015
Total capital investments incurred by asset type (% (HK$M))[1,2]	**100 (12,028)**	100 (12,851)	N/A	N/A	N/A
Transmission & distribution/ retail	**44 (5,252)**	39 (4,953)	N/A	N/A	N/A
Coal	**20 (2,450)**	24 (3,040)	N/A	N/A	N/A
Gas	**26 (3,113)**	32 (4,098)	N/A	N/A	N/A
Nuclear	**3 (352)**	0 (0)	N/A	N/A	N/A
Renewables	**5 (615)**	5 (714)	N/A	N/A	N/A
Others	**2 (246)**	0 (46)	N/A	N/A	N/A

1 Capital investments include additions to fixed assets, right-of-use assets and intangible assets, investments in and advances to joint ventures and associates, and acquisition of business.
2 On an accrual basis.

Operating earnings	2019	2018	2017	2016	2015
Total operating earnings by asset type (% (HK$M))[1]	**100 (12,389)**	100 (15,145)	100 (14,189)	100 (13,173)	N/A
Transmission & distribution/ retail	**42 (5,257)**	49 (7,427)	59 (8,392)	59 (7,798)	N/A
Coal[2]	**21 (2,557)**	22 (3,370)	28 (3,994)	30 (3,905)	N/A
Gas[2]	**11 (1,402)**	10 (1,533)			
Nuclear	**14 (1,688)**	11 (1,720)	7 (913)	7 (863)	N/A
Renewables	**10 (1,260)**	7 (924)	4 (629)	3 (455)	N/A
Others	**2 (225)**	1 (171)	2 (261)	1 (152)	N/A

1 Before unallocated expenses.
2 Starting in 2018, operating earnings of coal and gas are reported separately.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Operations

Asset management

Management approach

The Asset Management System Standard sets out a framework to standardise practices across the Group to manage assets across their entire lifecycle from the planning stage to decommissioning.

Strategies and procedures

CLP's **Asset Management System (AMS) Standard** was developed in 2016 to standardise key practices in asset management across the Group. It sets out a framework to ensure best practice is followed 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 into CLP's Health, Safety, Security and Environment (HSSE) Management System and the Project Management Governance System (PMGS) Standards to manage the complete lifecycle of an asset. The AMS contains five key stages and ten asset management elements, as illustrated in the diagram below.

Monitoring and follow-up

CLP has developed and implemented a non-financial data reporting and assurance standard in-house. Relevant staff at asset, regional and Group level are expected to take responsibility for upholding the standard. The customised Group Operations Information System (GOIS) is used to compile operational data. It facilitates data collection and approval and reduces the chance of human error.

Continuous improvement

CLP constantly identifies opportunities to improve the operational efficiency of all Group assets, which help meet the increasingly stringent regulations on emissions and fuel efficiency in certain jurisdictions.

Initial efforts at the project planning stage are critical in determining the operational efficiency or capacity factor range of an asset through its entire lifespan. Projects involving a major asset overhaul require stringent technical and financial scrutiny before commencement.

Opportunities arising from innovation and optimisation, particularly from big data and data analytics are also increasing, with a wide range of potential applications including performance enhancement. Find out more here.

Overview of CLP's asset management

Year in review

In 2019, the total fossil fuel consumption for power generation decreased compared with 2018, with 6.9% less coal and 28.6% more gas and 31.2% less oil used.

Generation assets

The decrease in coal consumption was primarily due to the decreased output from Mt. Piper in Australia, Jhajjar in India and Castle Peak in Hong Kong. The increase in gas consumption was mainly due to increased production at Tallawarra in Australia and Black Point in Hong Kong.

Examples of operational efficiency improvement projects at CLP Group assets can be found here:

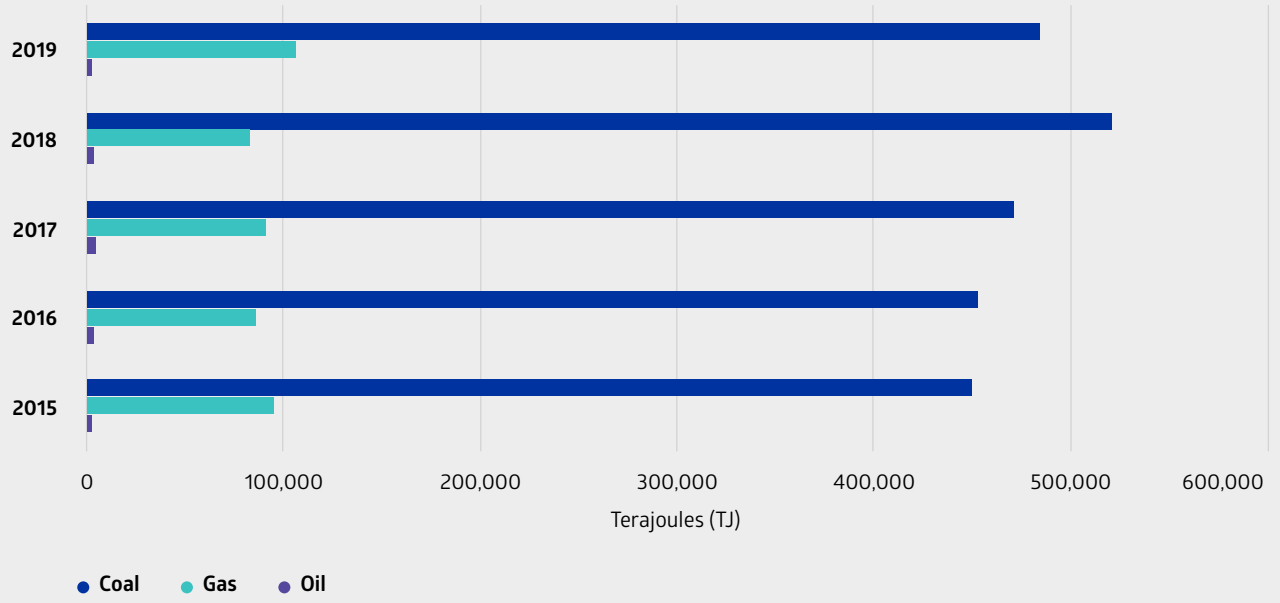
Find out how innovation improves CLP Group's operational performance ›

CLP reports the annual operating performance of its generation portfolio for those assets which fall within the reporting scope. The performance metrics include the availability factor, generation sent-out, thermal efficiency and energy intensity.

Download CLP's asset performance statistics ↓

Fuel consumed for power generation

Compared to 2018, there was a decrease in coal and oil consumption and an increase in gas consumption in 2019 as generation profiles changed.



1 Restated as per updated data for Hallett power station in Australia.

Fuel consumed for power generation (TJ)	2019	2018	2017	2016	2015
Coal	**485,453**	521,568	471,976	453,904	450,937
Gas	**107,183**	83,364[1]	91,426	86,787	95,591
Oil	**2,620**	3,807[1]	5,069	4,162	2,892

Transmission network

To meet Hong Kong's electricity demand growth, CLP reviews future transmission network developments annually in accordance with the latest system maximum demand forecast, area load growth, infrastructure development and generation development. Maintenance and improvement programmes have been developed annually for major assets, based on the analysis of current conditions and performance of assets, level of investment and risk.

CLP continues to improve the reliability of its power supply network. In addition to vegetation management and third-party damage prevention programmes, various measures are taken to further enhance network reliability and minimise customer supply interruption. Examples include:

- Installing on-line condition monitoring systems for switchgear and transformers to allow real-time monitoring and detection of incipient fault conditions
- Continuing the reinforcement of towers for 400kV overhead lines against super typhoons and the refurbishment of switchgear
- Enhancing automatic detection and isolation of faulty sections of overhead line circuits and expediting deployment of smart meters in villages
- Conducting regular reviews and targeted studies on network performance to drive continual improvement.

CASE STUDY

Making clean energy accessible in India

CLP India successfully entered into the transmission sector in 2019.

CLP India has taken action to make low carbon and clean energy accessible through infrastructure development and investment in the transmission sector.

CLP India entered into an agreement with Kalpataru Power Transmission Ltd. to acquire three of its power transmission assets in 2019. One of the three projects, Kalpataru Satpura Transco Pvt. Ltd. (KSTPL), was successfully transferred to CLP India in November 2019, marking the company's entry into the transmission sector. Procedures and guidelines in line with CLP Group standards are being implemented to ensure enhanced operational practices and improved safety standards in the newly acquired transmission assets. CLP India will continue to explore opportunities to expand its transmission portfolio in the coming years.

CASE STUDY

Pursuing opportunities in Mainland China

The Mainland China Government has been restructuring the energy market through regulatory changes and the introduction of more competition. CLP is actively pursuing opportunities from marketisation and smart energy development in Mainland China.

Through TUS-CLP Smart Energy Technology Co. Ltd. (TUS-CLP), CLP's joint venture with TUS-Holdings which is affiliated to Tsinghua University, CLP participates to build and operate an incremental distribution network (IDN) at the Fangchenggang High-Tech Zone. This project is CLP's first investment in distribution grids in Mainland China and will set a solid foundation to expand into similar opportunities in southern China as reform of the electricity sector continues.

The Outline Development Plan for the Greater Bay Area released by the Central Government in 2019 makes the development of smart cities in the region a key focus. In response, CLP has set up a dedicated team to work closely with partners to pursue opportunities in this important emerging sector, with smart energy development a priority. CLP's active participation will contribute to sustainable business growth and to the long-term development of the electricity sector in Mainland China.

Availability and reliability

Management approach

Availability and reliability are two key performance metrics for CLP assets. CLP Power's business in Hong Kong is vertically integrated.

Goals and targets

Targets for each asset are set annually and included in the business plan. Performance is reported on a weekly basis to senior management. Any significant variations to plans are analysed and corrective action is taken where appropriate.

For generation assets, CLP monitors the availability factor – defined as the amount of time that an asset is able to produce full load equivalent electricity over a certain period, divided by the amount of time in that period. Typical values range from 70-90%.

Strategies and procedures

While CLP has generation businesses across the Asia-Pacific region, Hong Kong is the only location where the business is vertically integrated, including a transmission and distribution network. CLP Power Hong Kong is regulated by the Hong Kong Government under a Scheme of Control Agreement (SCA) framework that requires the company to forecast electricity demand and plan for investment to provide a safe and reliable electricity supply to customers. In Hong Kong, CLP uses various measures to maintain high supply availability and reliability. These measures include:

- Maintaining sufficient generating capacity to meet forecast demand as well as planned and unforeseen outages
- Implementing demand side management measures to reduce demand growth and to improve utilisation of existing assets
- Upgrading generation and network facilities to meet new electricity demand
- Adopting advanced technology such as smart grid
- Improving the quality of the power supply to minimise voltage dips
- Enhancing power systems to minimise the impact of adverse weather.

CLP promotes organisational learning and the building of technological capacities across the Group, and insights learned from regional experiences are shared amongst functions to plan for a consistent management framework. This practice facilitates better portfolio management, as well as reducing risks to the Group's operations as a whole.

Year in review

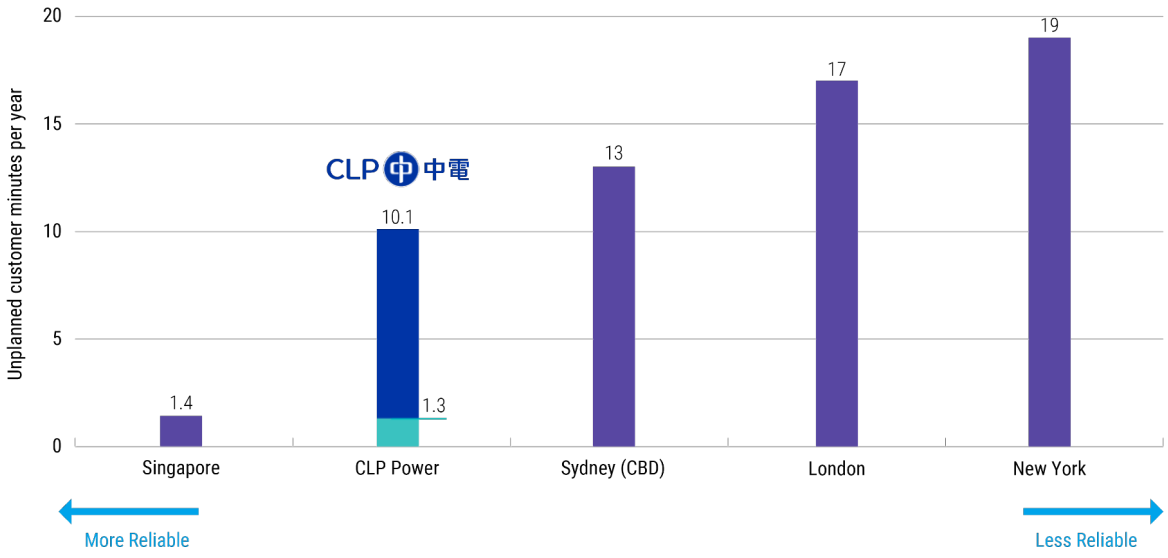
In Hong Kong, CLP maintains a world-class supply reliability of over 99.999%, higher than other major international cities such as London, New York and Sydney.

On a three-year rolling basis, i.e. over 2017 and 2019, a CLP Power customer experienced 10.1 minutes of unplanned power interruptions per year. This was due to the impact of super typhoon Mangkhut in September 2018. Excluding that, the performance would have achieved a three-year rolling average of about 1.3 minutes. This achievement shows the value of a stable and supportive regulatory framework that encourages careful investment planning, as well as the professional expertise of employees in power operations.

CLP's transmission and distribution network in Hong Kong serves about 80% of the population of the city and close to 100% of the population in the company's service area. At the end of 2019, CLP Power had approximately 1,149 km of overhead and approximately 14,881 km of underground circuits at medium or higher voltage. In addition, there were 232 primary and 14,867 secondary substations in Hong Kong. In 2019, the average network loss for the past five years was 3.83%, slightly lower than the 2018 figure of 3.94%.

In 2019, CLP continued to enhance the reliability and security of the supply system and invested around HK$9.1 billion to meet both current and future energy demand. A set of universally recognised supply reliability performance indicators are used from the IEEE 1366-2012 standard to monitor system performance. These indicators are reported annually to the Hong Kong Government.

Supply reliability performance indicators	
System Average Interruption Frequency Index (SAIFI) The average number of supply interruptions for each customer served. Both planned and unplanned interruptions are included.	· The three-year average SAIFI (2017-2019) was 0.17, meaning customers experienced a power interruption approximately once in five years during this period, which was lower than last year's three-year rolling average.
System Average Interruption Duration Index (SAIDI) The average duration of interruptions each customer may encounter in a given year.	· The three-year average SAIDI (2017- 2019) was 0.42 hours including both planned and unplanned interruptions, which was lower than last year's three-year rolling average. · This was an increase on the three-year average SAIDI (2015-2017) of 0.34 hours, mainly due to the impact of super typhoon Mangkhut in September 2018.
Unplanned Customer Minutes Lost (Unplanned CML) The average duration of unplanned power interruptions per customer in a given year. These outages occur without prior notice, and happen as a result of various factors such as weather events, third party damage to the network and equipment faults.	· The three-year rolling average (2017-2019) unplanned CML was about 10.1 minutes, which was lower than the 10.3 minutes recorded last year. Note about 8.8 minutes of unplanned CML was due to the severe impact of Mangkhut in September 2018, without which the performance would have achieved about 1.3 minutes. CLP Power maintains a world-class supply reliability of over 99.999% in Hong Kong, higher than other major international cities as shown in the diagram below.



Remarks:
2017-2019 average for CLP Power was 1.3 minutes excluding Super Typhoon Mangkhut impact (10.1 minutes including Super Typhoon Mangkhut)
2016-2018 average for all other cities
There are no overhead lines in Singapore

Security and cyber security

Management approach

Security management helps CLP protect its people, property, information and reputation against associated security risks.

Goals and targets

CLP's security management process evaluates, in a systematic and risk-orientated way, the security status of any asset operated and owned by CLP. This enables the company to continuously evaluate its security processes and enhance them according to the perceived threat and vulnerability of any given site.

Strategies and procedures

CLP's approach to security can be best understood using the diagram on this page. There are five separate but co-dependent lines of activity, all of which are protected (to a lesser or greater extent) by cyber and physical security measures. These lines of activity are:

- **Information**: data is stored in both hard and electronic formats, and the confidentiality, integrity and availability of this data needs to be protected
- **Operational Technology (OT)**: hardware and software that detects, monitors or controls physical devices (such as a turbine) at CLP assets
- **Information Technology (IT)**: the use of computers to store, retrieve, transmit, and manipulate data or information
- **Personnel**: Staff employed by CLP
- **Brand**: CLP's image, identity and associated reputation.

All these lines of activity are influenced by cyber security, particularly IT, OT and information. They are therefore protected by appropriate cyber security measures and supported by robust and scalable physical security measures. Taken together, they provide comprehensive, layered and flexible protection.

CLP's approach to security

Training and awareness

CLP security staff have a key role in preventing harm to staff and the wider public. Standards of conduct are informed by the Value Framework and Security Management System, which requires each CLP region and their sites to develop an appropriate security system to effectively address the threats faced. All in-house security staff are required to comply with CLP's Code of Conduct on an annual basis. In addition to national regulations and site-specific briefings, third-party vendor security staff receive training on CLP's harassment-free policy, guidance on minimum wage policy and other non-discrimination training during their induction. Their training must be completed before personnel are granted access to their assigned workplace sites.

CASE STUDY

Cultivating a secure cyber environment

Ensuring a secure cyber environment is essential in safeguarding CLP Group operations and assets.

Cyber attacks previously focused on obtaining commercially sensitive information. Today, attacks on operations pose serious threats and could create significant financial damage and potentially threaten lives. Therefore, security of both IT and OT are equally important.

The figure below summarises the security focus of CLP's IT and OT systems. Based on the ISO/IEC27002:2013 framework, a set of Group-level policies have been developed, based on which regional standards and procedures are developed so that they are suited to the context and local regulation of corresponding business units.

Cyber security incident response

The CLP Group remains vigilant in being prepared for a cyber-induced crisis. CLP monitors alerts from its information technology and operational systems and provides continuous upskilling and training for staff to equip them with the skills required to identify and detect anomalies.

The Cyber Security Incident Response Process was developed to:

- Define a consistent response protocol upon detection of cyber incidents
- Provide a detailed process flow showing the interactions between different virtual teams that are likely to be involved in the response
- Define the roles and responsibilities for the virtual teams along with the incident escalation to the Emergency Control Team or the Emergency Management Team as needed.

Processes are regularly reviewed and rehearsed through drills. These firm up the incident response capabilities, improving cyber crisis management, and prepare executives to lead in cyber crisis situations. Ultimately the goal is to restore operations and services as soon as possible.

Cyber Security Incident Response Process

Read more about how CLP reinforces cyber resilience and data protection >

Summary of the security focus of IT and OT systems

Information Technology	Operational Technology
PRIMARY FOCUS	
• Data confidentiality and integrity is paramount • Automating business processes • Information management manipulation	• Safety and protection of the process • Response to human and other emergency interaction is critical • Controlling physical processes
COMPONENT LIFETIME	
3 - 5 years	15 - 20 years
GUIDING POLICIES AND STANDARDS	
Information Security Policy To protect CLP's business information	**Operational Technology Policy** To protect the operations for power generation, transmission and distribution
CLP Group Information Security Policies	CLP Group Operational Technology (OT) Cyber Security Policy
Regional Information Security Standards	Regional OT Cyber Security Standards
	OT Standard Operating Procedures

Emergency and crisis management

Management approach

CLP maintains robust and regularly tested emergency response and crisis management procedures. This framework ensures high levels of preparedness to respond to and recover from any emergency situations in a timely and effective manner, helping to minimise disruption to customers.

CLP's Crisis Management & Emergency Response Structure is outlined in the diagram below. The Group Crisis Management Plan provides a platform for the effective handling of a crisis at the CLP Group level by:

- Outlining crisis management organisation, roles, responsibilities, procedures and processes
- Specifying the tools needed to ensure the collective response is well planned, well executed, and fully integrated across the organisation;
- Describing the relationship and interface between the handling of regional- and Group-level crises
- Detailing the processes that govern internal and external communications during emergencies and crises; this ensures the people responsible for managing a crisis have the necessary information to carry out their responsibilities and that key stakeholders are informed.

The Group-level plan is supported at regional level by Regional Crisis Management Plans which mirror the Group document but are tailored for each region. In addition, detailed emergency response plans have been developed for each asset. These plans are designed to be used by first responders and asset managers.

Training and awareness

As specified in both Group and regional publications, emergency response drills are conducted at least annually at all Group sites, with smaller scale drills taking place more often. Group and Regional Crisis Management plans are reviewed every three years or fewer. Regional crisis management exercises are conducted annually as part of the internal peer review process.

Travel security

As the CLP Group's operational footprint expands, so does the frequency and range of business travel for staff members. Protocols and procedures are in place to adequately prepare staff before travel, support them when they are on the road and to respond quickly in the event of a travel emergency anywhere in the world. In view of emerging risks, information packs are updated regularly to help employees prepare for business trips.

CLP Crisis Management & Emergency Response Structure

		Key documents
Group structure	**Group Crisis Management Team**	• Management System Standard • Emergency Response Guideline • Group Crisis Management Plan
Regional structure • Hong Kong • Mainland China • India • Southeast Asia & Taiwan • Australia	**Regional Crisis Management Team (CMT)**	• Regional Crisis Management Plan
	Asset Emergency Management Team (EMT)	• Asset Emergency Response Plan (Area or Asset Office)
	Asset Emergency Control Team (ECT)	• Emergency Response Plans (Asset*)

Note: An asset is anything owned and operated by CLP, covering power stations, depots, offices, transmission lines, customer service centres, etc.

Year in review

CLP has updated the Group Crisis Management Plan to reflect operational changes related to equipment and personnel changes as well as the inclusion of another back-up Crisis Command Centre (CCC).

At the Group level, communications and administrative drills have been conducted quarterly to ensure that the equipment and procedures are functional and fully understood by the operators.

In terms of business travel, training sessions for supporting staff and for the business travellers themselves continues to be provided on a quarterly basis, to ensure higher levels of understanding and awareness. The unprecedented protest situation in Hong Kong has led to the provision of regular (twice a week minimum) updates to all staff and the development of an information pack for business travellers coming into Hong Kong.

CASE STUDY

Response to COVID-19

The Novel Coronavirus (COVID-19) emerged from the City of Wuhan, Hubei province of Mainland China in late 2019 and began to be monitored closely as it became an epidemic.

In line with the response from the Hong Kong Government, CLP raised its readiness posture, first to "Alert" and then to "Emergency" and implemented its Infectious Diseases Response Plan (HSSEQ-ITN-016) which deploys graduated response measures in order to best protect staff operating in an affected area. At the time of writing, these measures are ongoing and include, amongst others, work from home (WFH), restrictions on assembly, self-quarantine and reporting, reduction on business travel and the provision of endorsed health and hygiene advice. The key lies with regular and trusted communication which is timely and proportionate, proposing sensible measures and knowledge which impart confidence to the staff.

Operations data

Asset management

Fuel use	2019	2018	2017	2016	2015
Coal consumed (for power generation) (TJ)[1]	**485,453**	521,568	471,976	453,904	450,937
Gas consumed (for power generation) (TJ)[1]	**107,183**	83,364[2]	91,426	86,787	95,591
Oil consumed (for power generation) (TJ)[1]	**2,620**	3,807[2]	5,069	4,162	2,892

1 Numbers include operating assets where CLP has operational control during the calendar year. Paguthan power station, the power purchase agreements of which expired in December 2018, was not included in the 2019 numbers.
2 Restated as per updated data for Hallett power station in Australia.

Generation capacity	2019	2018	2017	2016	2015
Based on an equity basis					
Total generation capacity by asset type (% (MW))[1,2]	**100 (19,238)**	100 (19,108)	100 (19,395)	100 (18,622)	100 (18,180)
Coal	**56.0 (10,765)**	56.3 (10,765)	58.8 (11,401)	61.2 (11,396)	62.7 (11,396)
Gas	**21.8 (4,194)**	21.7 (4,147)	17.7 (3,434)	18.4 (3,434)	16.7 (3,031)
Nuclear	**8.3 (1,600)**	8.4 (1,600)	8.2 (1,600)	2.6 (492)	2.7 (492)
Renewables	**12.8 (2,469)**	12.5 (2,386)	14.2 (2,751)	16.6 (3,090)	16.8 (3,051)
Others	**1.1 (210)**	1.1 (210)	1.1 (210)	1.1 (210)	1.2 (210)
Based on an equity plus long-term capacity and energy purchase basis					
Total generation capacity by asset type (% (MW))[1,2,3]	**100 (24,015)**	100 (23,705)	100 (24,554)	100 (23,781)	100 (22,706)
Coal	**50.0 (11,997)**	50.6 (11,997)	51.4 (12,633)	53.1 (12,628)	55.6 (12,628)
Gas	**21.4 (5,139)**	21.4 (5,084)	21.7 (5,322)	22.4 (5,322)	20.9 (4,747)
Nuclear	**11.2 (2,685)**	11.3 (2,685)	10.1 (2,488)	5.8 (1,380)	6.1 (1,380)
Renewables	**13.7 (3,294)**	12.8 (3,039)	13.1 (3,211)	14.9 (3,551)	13.4 (3,051)
Others	**3.7 (900)**	3.8 (900)	3.7 (900)	3.8 (900)	4.0 (900)

1 Numbers include majority and minority share assets in the CLP Group portfolio.
2 Numbers and percentage figures have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
3 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.

Renewable generation capacity	2019	2018	2017	2016	2015
Based on an equity basis					
Total renewable generation capacity by asset type (MW)[1,2]	**2,469**	2,386	2,751	3,090	3,051
Wind	**1,521**	1,521	1,941	2,297	2,366
Hydro	**489**	489	489	489	489
Solar	**451**	369	321	304	196
Other renewables	**7**	7	N/A	N/A	N/A
Based on an equity plus long-term capacity and energy purchase basis					
Total renewable generation capacity by asset type (MW)[1,2,3]	**3,294**	3,039	3,211	3,551	N/A
Wind	**2,049**	1,982	2,401	2,758	N/A
Hydro	**489**	489	489	489	N/A
Solar	**745**	558	321	304	N/A
Other renewables	**10**	10	N/A	N/A	N/A

1 Numbers include majority and minority share assets in the CLP Group portfolio.
2 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
3 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.

Energy sent out	2019	2018	2017	2016	2015
Based on an equity basis					
Total energy sent out by asset type (% (GWh))[1,2]	**100 (70,949)**	N/A	N/A	N/A	N/A
Coal	**62.9 (44,596)**	N/A	N/A	N/A	N/A
Gas	**14.1 (9,979)**	N/A	N/A	N/A	N/A
Nuclear	**15.3 (10,888)**	N/A	N/A	N/A	N/A
Renewables	**7.7 (5,487)**	N/A	N/A	N/A	N/A
Others	**0 (0)**	N/A	N/A	N/A	N/A
Based on an equity plus long-term capacity and energy purchase basis					
Total energy sent out by asset type (% (GWh))[1,2,3,4]	**100 (88,573)**	100	100	100	100
Coal	**54.8 (48,512)**	60	61	63	63
Gas	**14.8 (13,073)**	12	15	14	16
Nuclear	**21.9 (19,400)**	20	15	14	15
Renewables	**8.7 (7,699)**	8	9	9	6
Others	**-0.1 (-109)**	0	0	0	0

1 Numbers include majority and minority share assets in the CLP Group portfolio.
2 Numbers and percentage figures have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
3 Starting in 2018, "long-term capacity and energy purchase" is defined as a purchase agreement with duration of at least five years, and capacity or energy purchased being no less than 10MW.
4 Only percentages are available for the years 2015-18.

Avaliability and reliability

CLP Power Hong Kong	2019	2018	2017	2016	2015
System Average Interruption Frequency Index [SAIFI] (minutes)	**0.17**	0.19	0.18	0.18	0.17
System Average Interruption Duration Index [SAIDI] (hours)	**0.42**	0.46	0.34	0.35	0.39
Unplanned Customer Minutes Lost [CML] (minutes)[1]	**10.13**	10.29	1.57	1.48	1.51

1 The 2018 figure would have been 1.44 minutes without the severe impact of Mangkhut in September 2018, which contributed 8.85 minutes unplanned CML to the 2018 figure.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Community

Stakeholder Engagement Framework

Management approach

The CLP Group is committed to communicating regularly with stakeholders, providing open and transparent channels for their input, reviewing and considering that input and responding in a timely manner to their concerns about CLP business.

GRI reference: 102-43 , 102-44

CLP's Stakeholder Engagement Framework includes the following steps:

- Aligning engagement objectives with business objectives
- Mapping issues and concerns
- Identifying relevant stakeholders
- Developing a communications and engagement plan
- Conducting the engagement activities
- Capturing feedback and reporting on outcomes.

The effectiveness of CLP's approach to stakeholder engagement is captured through a number of measures, which include: stakeholder feedback, outcomes following engagement, positive and/or negative news about the company, brand perception ratings, and recognition and awards.

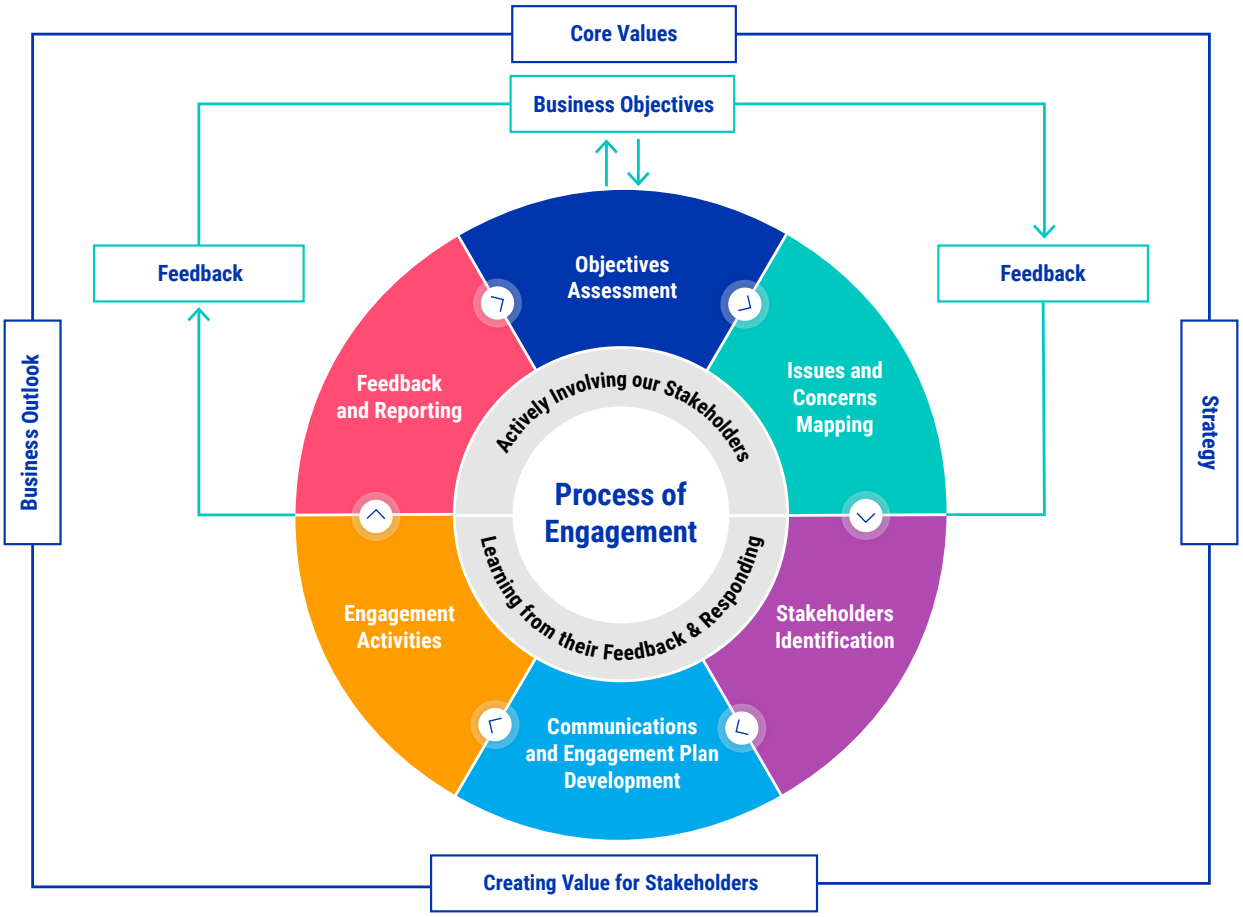
Strategies and procedures

GRI reference: 102-40, 102-42, 102-44

The CLP Group's business activities involve a diverse range of stakeholders. For each project, key stakeholder groups are identified and prioritised based on how they will be impacted, and their influence on the success of the business. CLP has a wide range of easily accessible public engagement channels to enable it to receive concerns, interest or feedback at any time during the year.

The table below summarises key stakeholders and how they are engaged:

CLP's Stakeholder Engagement Framework



Year in review

The CLP Group engages in active dialogues with different stakeholders. Their key concerns in 2019 are presented in this section.

The CLP Group is committed to responding to stakeholders' concerns about the business in a timely manner. These concerns vary depending on the location and context and therefore require different actions or responses. General complaints about the company are typically handled by the Public Affairs team who work with the relevant business units to resolve issues at hand.

Lenders, investors and shareholders

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· CLP Group's business sustainability, financial and operational strategies and performance · Capital allocation and business opportunities across different regions · Dividends, cash flow, financial & debt management · Impacts of financial market liquidity and volatility · Board refreshment and diversity · Delay in renewable energy subsidy payment · Update to Climate Vision 2050, Climate Action Finance Framework and sustainable investment and financing strategies · Regional business opportunities and development.	· Annual General Meetings · Annual and Interim Results Analyst Briefing · Annual and Interim Reports · Announcements, circulars, presentations and media release · Shareholders' visit programmes · Meetings and roadshows · Climate Action Finance Report · Direct engagement on ESG-related matters in the form of meetings and correspondence.	· The CLP Group business · Responding to climate change · Harnessing the power of technology

Governments and regulators

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· Hong Kong - Scheme of Control Agreement (SCA) Development Plan implementation, tariff review, auditing review and CLP's response to public engagement on long-term decarbonisation strategy · Mainland China - Safety, reliability and emergency readiness · India - National Action Plan on Climate Change, Power Purchase Agreement (PPA) and tariff · Australia - Reliability, affordability, supports for customers in financial hardship, market design, carbon emissions and integration of renewable energy.	· Regular working meetings · Regular performance reporting · Written responses to public consultations consultations.	· Responding to climate change · Corporate governance · Safety · Climate change · Operations Refer to CLP Information Kit for information relating to CLP Power Hong Kong.

Suppliers and contractors

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· Contractors' safety · Temporary manpower payments.	· Regular supplier management meetings and engagements (from operational to senior management) · Safety workshops to engage contractors for uplifting their safety awareness and capability · Periodical supplier performance evaluations (Supplier Assessment System).	· Safety · Supply chain

Employees

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· Competitive remuneration and benefits · Career development opportunities · Gender diversity and equal opportunity · Safety performance.	· Employee engagement and safety culture surveys · Employee feedback channels (forms, suggestion boxes, townhall meetings, etc.) · Regular management communications and roadshows · Two-way consultations (e.g. joint consultative committees in Hong Kong) · Employee newsletters and broadcasts · Company intranet portal and internal communication channels · Discussion with trade union representatives in locations where collective bargaining power is recognised.	· Building an agile, inclusive and sustainable workforce · People · Safety

Residential, commercial and industrial customers, electricity boards, grid companies

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· Energy prices, reliability and availability · Tariff adjustment, management and competitiveness · Energy efficiency and conservation · Customer experience · Renewable energy · India – Market entry and management of Corporate Power Purchase Agreement (PPA) for renewable energy.	· Customer Consultative Group, Local Customer Advisory Committees · SME Consultative Group · Customer satisfaction surveys and feedback forms · Customer Service Centres and Customer Interaction Centre · Online service portals · Account managers.	· Responding to climate change - Creating value in the low-carbon transition · Responding to climate change - Helping communities decarbonise · Harnessing the power of technology - Supporting the sustainability agenda · Harnessing the power of technology - Pursuing new business opportunities · Reinforcing cyber resilience and data protection · Climate change · Customers

Legislators, academia, community groups, NGOs, industry and professional organisations

Key concerns/ interests in 2019	Engagement channels	Relevant sections
· Employment opportunities and career development particularly for young people · Community engagement and investment programmes related to education, empowerment of women, health and poverty alleviation, social inclusion, diversity, and eliminating energy poverty · Energy efficiency and conservation · Climate change: decarbonisation and renewable energy development · Progress of key projects and initiatives · Hong Kong - Future fuel mix and supply reliability · Mainland China - Business development and the associated impacts on local communities · Australia – Contribution to local economy, environmental impact of operations, future fuel mix and supply reliability, lifespan of power stations.	· Working committees, advisory committees, panels and meetings · Seminars, lectures and workshops · Public/community events and partnerships on various initiatives · Community investment programmes · Promotion through mass media and social media, including educational videos · One-on-one meetings · Community perception surveys.	· Responding to climate change - Progress towards Climate Vision 2050 targets · Responding to climate change - Helping communities decarbonise · Responding to climate change -Promoting systematic changes for climate actions · Harnessing the power of technology - Building an innovative ecosystem · Building an agile, inclusive and sustainable workforce - Attracting and retaining tomorrow's workforce · Community · Climate change · Operations · Customers

Public policy

Management approach

The CLP Group is committed to supporting the long-term development of the communities it serves, and contributing to the development of sound government policies and laws that balance social, economic and environmental needs.

GRI 415-1 Political contributions

CLP's policy is to remain politically neutral and to avoid making political contributions. For public policy developments which apply to the electric utility industry, the Group develops carefully considered positions and seeks to provide input to support the decision-making process. By bringing its industry expertise to the table, CLP can add value to the discussion on how best to structure rules for the energy industry going forward, as both technology and public demand evolves.

Download CLP's Policy on Making Political Contributions

CLP's responses to public policy consultations – in addition to its Group-wide positions on critical issues such as climate change – are published and accessible on company websites or relevant government websites. For example:

- CLP Power Hong Kong's responses to the consultations on the long-term decarbonisation strategy for Hong Kong, future development of the electricity market and the future fuel mix for electricity generation in past years are available here.
- CLP Group's response to consultations in relation to corporate governance and ESG matters in the Hong Kong market can be found here.
- EnergyAustralia worked with industry to consult with the Australian Government on the National Energy Guarantee (NEG), discussing how the company could best balance the transition to clean energy and maintain reliability in the energy system. That submission can be found here.

None of the CLP Group companies in Hong Kong receive any significant financial assistance from the government outside of those financial incentives or subsidies which are in place to encourage market participants to behave in certain ways. Examples of such incentives include tax holidays and preferential tariffs for renewable investment or financial assistance from export credit agencies.

Year in review

As of 2019, CLP is disclosing the amount spent during the year on memberships dues, donations or sponsorships for organisations that have the objective to influence public policy.

CLP supports and actively participates in a range of organisations to enable the Company to keep abreast of different stakeholders' views and to shape informed policy making. Contributing to policy position papers helps CLP navigate policy uncertainty and respond accordingly.

The table below outlines the total amount CLP has contributed to organisations which seek to influence public policy.

	2019 (in HK $)
Lobbying, interest representation or similar	0
Local, regional or national political campaigns, organisations or candidates	0
Trade associations or tax-exempt groups (e.g. think tanks)	8,044,587[1]
Others (e.g. spending related to ballot measures or referendums)	0

1 The figure has been updated in July 2020 to include contributions to professional organisations in the form of membership, donation or sponsorship, as well as data from EnergyAustralia which was not available at the time of publication in March 2020.

Find out more on CLP's engagement in climate change and energy policy

Community Investment

Management approach

CLP strives to build and maintain the trust of the communities in which it operates. "Doing the right thing" is foundational to both company values and CLP's social licence to operate.

CLP is committed to contributing to programmes which support healthy, resilient and sustainable development over the short- and long-term. In line with the CLP Group Community Initiatives, Sponsorship and Donation Policy on community engagement, the aim is 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
- Support projects or programmes that offer the opportunity for employees to be involved
- Regularly evaluate contributions as well as their outcomes and impacts.

Download the CLP Group Community Initiatives, Sponsorship and Donation Policy

Strategies and procedures

CLP's community initiatives focus on four pillars: Environment, Education and Development, Community Wellbeing, as well as Arts and Culture. These focus areas cover many of the social issues faced by the communities in which the Group operates.

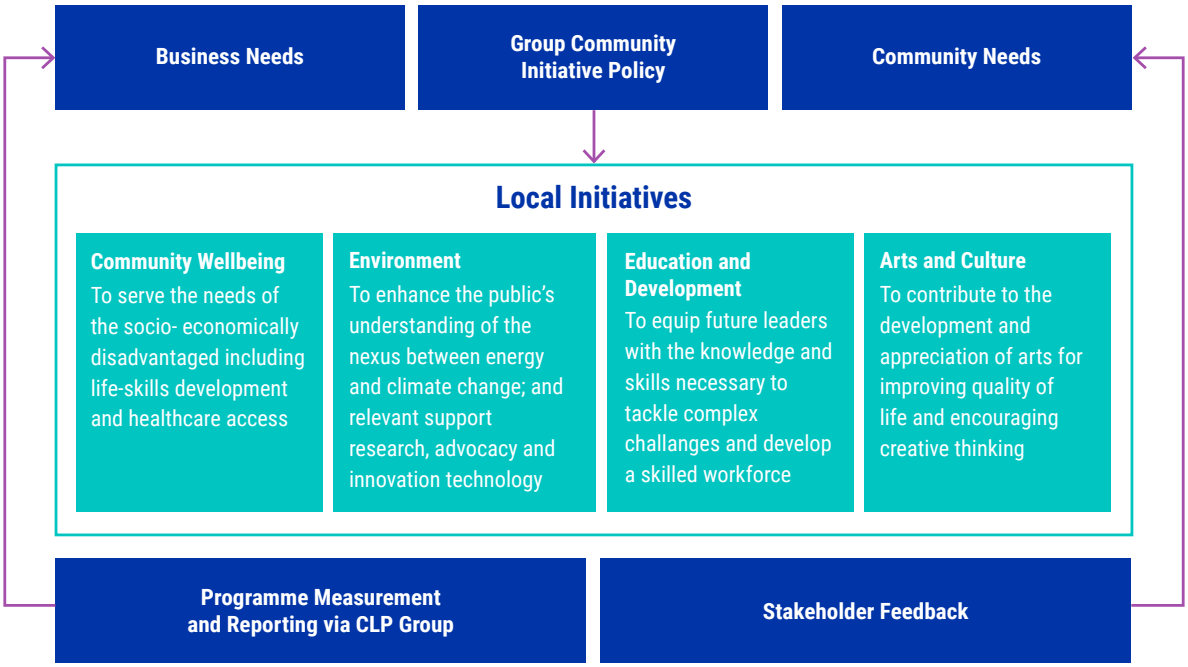
Monitoring and follow-up

CLP has benchmarked different socio-economic impact measurement tools to better evaluate the social impact of its community initiatives. The company has applied the most suitable means to review the effectiveness of its community contributions.

For example, CLP India commissioned the Gujarat Institute of Development Research to assess the effectiveness and impact of selected educational and skill development programmes including Informal Education Evening Classes, the CLP India Scholarship Scheme, Financial Support Programme and Computer Literacy Programme. The study confirmed that these programmes have a positive impact on the enrolment and retention of children in schools, as well as enhancing the overall quality of life for the people living in the villages.

CLP has a standardised online reporting system for reviewing and reporting its community initiatives. The system is designed to enhance the overall effectiveness and efficiency of these initiatives by aggregating data on themes, partners, spending, beneficiaries, volunteer hours and impacts.

CLP's Community Initiative Approach



Year in review

The amount CLP Group donated for charitable and other purposes was HK$20.98 million, up from HK$18.31 million in 2018.

Employee volunteering exemplifies the Company's ties to its communities. Across the different markets, CLP employees devoted their time and expertise in voluntary projects in their communities. The year 2019 marked the 25th anniversary of the CLP Volunteer Team in Hong Kong. In December 2019, CLP Power Hong Kong received the gold award in the volunteer team category of the 10th Hong Kong Outstanding Corporate Citizenship Awards.

Read personal stories of CLP Volunteers

EnergyAustralia's volunteering programme is an important way through which employees connect with their communities, building a genuine understanding of local social issues. In 2019 a focus on increasing the number of volunteering opportunities, as well as new types of opportunities allowed the teams in call centres and power stations to participate more easily. This resulted in an increase of volunteering hours to 5,500 hours in 2019, but importantly also provided the charity partners with an increased number of volunteers through which they could deliver services to their customers.

The introduction of the Workplace Giving programme in 2018 was strongly supported by the Board and Executive Management, who continue to donate 1% of their salaries to the charity partners. In 2019, the strong leadership support and innovative launch campaign saw EnergyAustralia awarded "Best Refresh/Launch" in the Employer category of the Workplace Giving Excellence Awards. Over AUD $377,000 was donated to the Company's charity partners through the programme in 2019.

The CLP Volunteer Team in Hong Kong has been set up for 25 years.

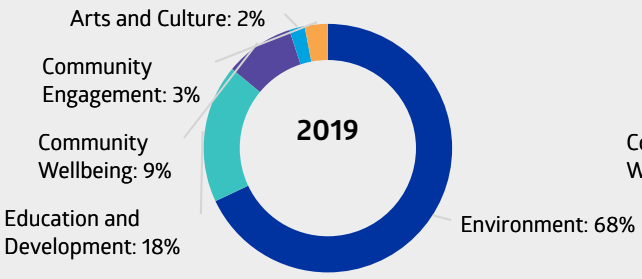
Community spending by theme and geography are summarised in the charts below.

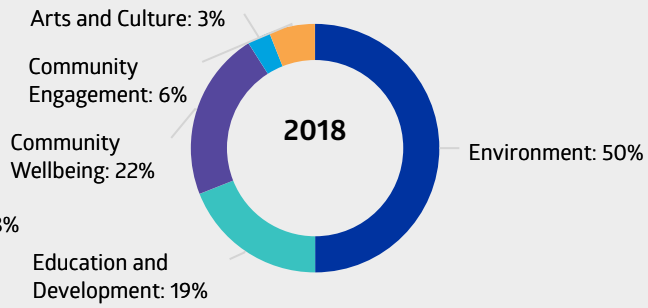
	2019	2018	2017	2016	2015
Amount donated for charitable and other purposes (HK$ million)[1]	20.98	18.31	14.47	12.65	14.52
Volunteer hours (hours)[1,2]	20,015	23,661	19,945	13,302	11,675
Programmes implemented (number)	663	695	647	574	620

1 Numbers have been subject to rounding.
2 2015-2016 numbers refer to volunteer hours of CLP staff only.

Community spending by theme

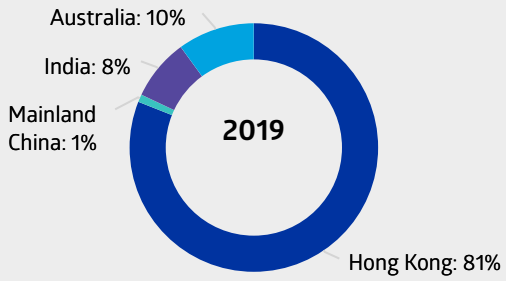
The largest percentage of community spending was directed to environmental initiatives (68%), followed by education and development initiatives (18%).

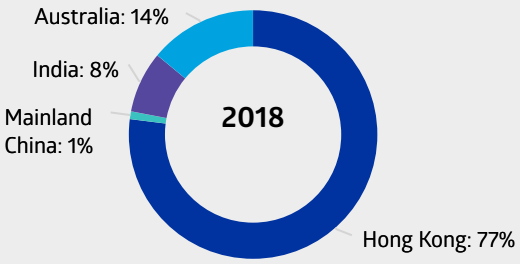




Community spending by region

The largest percentage of community spending was directed to Hong Kong (81%), followed by Australia (10%).





CLP Group programmes benefitted 615,000+ people in 2019, compared to 730,000+ in 2018. In 2019, Education and Development accounted for the majority of direct beneficiaries across all community initiatives (63%).

Education continues to be a key focus as it is the most powerful investment in building a just and prosperous society. CLP community programmes engage with young people at all stages of their educational journey in the communities the company serves, to create value through CLP's expertise and networks to help young people advance their careers and achieve upward mobility.

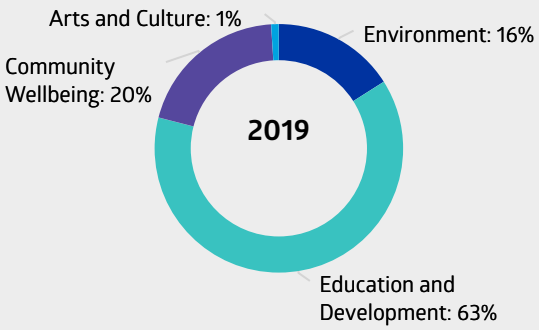
In partnership with the Hong Kong Federation of Youth Groups, CLP Power organised the CLP Energy for Brighter Tomorrows Award for the second year and offered 20 scholarships to secondary students in Hong Kong who have overcome adversity in life and shown a positive life attitude. The awardees are matched with CLP engineers in a one-year mentorship programme which provides them with support and guidance. Information on the programme can be found here.

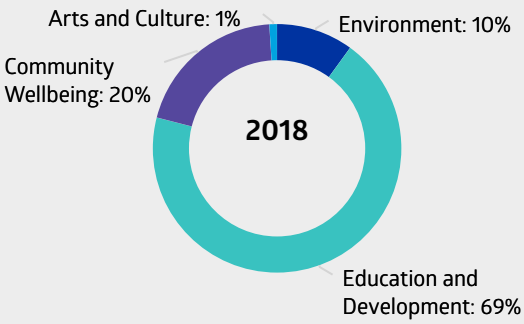
	2019	2018	2017	2016	2015
Direct beneficiaries	615,000+	730,000+	439,000+	359,000+	178,000+
Organisations benefitted[1]	401	434	451	373	418

1 Organisations benefitted include professional bodies, academic institutes, NGOs and community groups.

Beneficiaries by theme

Amongst the 615,000+ beneficiaries in 2019, 63% of them are benefited from education and development programmes.





Find out more about CLP's social capital

Learn more about CLP's demand-side management

CASE STUDY

Financial counselling development initiatives to ease financial hardship

A growing need for financial counselling services from the Australian community has placed pressure on an insufficient number of qualified professionals, who have few career progression opportunities.

In 2018, EnergyAustralia identified an opportunity to support the industry by investing AUD $1.2 million into a three-year financial counselling development programme. The initiative aims to establish a wide-ranging training and professional development plan for the sector, creating a community of people who bring financial professionalism and skills to their workplace, ultimately helping those in the community who are experiencing financial hardship.

Outcomes of the investment include the development and delivery of an educator scholarship programme, a Diploma of Financial Counselling scholarship programme, an accredited Professional Supervision/Mentor scholarship programme and an Advanced Diploma of Financial Counselling scholarship programme for participating states. Partnering with ICAN Learn and state peak financial counselling associations, the programme provides educational opportunities for experienced financial counsellors to add training delivery, supervision, casework specialisation and leadership to their skill sets, generating new career prospects.

In 2019, 85 students were granted scholarships under the initiative to begin their journey into financial counselling and twelve students have already completed their Diploma of Financial Counselling. 25 financial counsellors completed the Professional Supervision/Mentor programme.

EnergyAustralia in partnership with ICAN Learn funded 12 students in Central Victoria to complete their Diploma of Financial Counselling.

CASE STUDY

A milk cooperative initiative empowers 1,500 women

The milk cooperative women self-help groups' gathering in Jamoniya Village, near CLP India's Chandgarh wind project site.

In the Tonkkhurd Block of Dewas (Madhya Pradesh) equal opportunity for women is a distant dream. CLP India introduced Project Uday in 2017 to empower women with an opportunity for an alternative livelihood.

A survey across 18 villages revealed that dairy farming and animal caring were the most suitable alternatives for women. CLP India helped 1,500 women through more than 120 Self-Help Groups in those villages – all linked with local banks to secure future credit support.

The project is co-funded with OEM partner Siemens Gamesa on a 50% basis. CLP India co-crafted this project with an OEM partner in Chandgarh. CLP India believes that working jointly with the OEM partner will create a more impactful programme, compared to having numerous initiatives in the same catchment.

Milk Collection Centres (MCC) started in 14 villages, through which women offer quality milk at fair prices. Today, 120 litres of milk are supplied daily, and approximately more than 600 litres are collected from 14 MCCs, providing employment to around 40 villagers. While this initiative has provided women with leadership opportunities, it has also been instrumental in broadening the mindset in communities. Women now use their income more wisely, particularly in spending on healthcare and children's education. A recent International Women's Day celebration saw 2,000 women from 18 villages where the Milk Federation team showcased their work to government officials and financial institutions. The government officials also committed to provide more benefits from government schemes. After the success of Phase I, Phase II commenced in September 2019 for three years, with CLP India targeting more beneficiaries. It is expected that more milk selling outlets will be started soon. Milk processing units and logistics will be formalised with a focus on branding and marketing to ensure sustainability in business practice.

Community data

Community investment

Programmes	2019	2018	2017	2016	2015
Community programmes implemented (number)	**663**	695	647	574	620

Spending	2019	2018	2017	2016	2015
Community spending by theme (%)[1]					
Education and Development	**18**	19	13	15	20
Community Wellbeing	**9**	22	23	32	46
Environment	**68**	50	41	39	12
Arts and Culture	**2**	3	9	2	4
Community Engagement	**3**	6	14	12	18
Community spending by region (%)[1]					
Hong Kong	**81**	77	81	77	76
Mainland China	**1**	1	2	1	2
India	**8**	8	8	13	3
Australia	**10**	14	9	9	18
Southeast Asia & Taiwan[2]	**N/A**	N/A	N/A	N/A	1

1 Percentage figures have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.
2 Starting in 2016, community spending on Southeast Asia and Taiwan was excluded as minority assets.

Donations	2019	2018	2017	2016	2015
Amount donated for charitable and other purposes (HK$M)[1]	**20.98**	18.31	14.47	12.65	14.52

1 Numbers have been subject to rounding.

Time and expertise contributed	2019	2018	2017	2016	2015
Volunteer hours from CLP staff and family members (hours)[1,2]	**20,015**	23,661	19,945	13,302	11,675
Skill-based (%)[1,3]	**1**	2	4	6	13
Non skill-based (%)[1,4]	**99**	98	96	94	87

1 Numbers have been subject to rounding.
2 2015-2016 numbers refer to volunteer hours of CLP staff only.
3 Skill-based: Volunteering work that requires electrical engineering skills or licenses.
4 Non-skill based: Hands-on, generic services that do not require professional electrical engineering skills or licenses.

Beneficiaries	2019	2018	2017	2016	2015
Beneficiaries (number)					
Direct beneficiaries	**615,000+**	730,000+	439,000+	359,000+	178,000+
Organisations benefitted[1]	**401**	434	451	373	418
Beneficiaries by theme (%)[2]					
Education and Development	**63**	69	42	60	36
Community Wellbeing	**20**	20	35	31	54
Environment	**16**	10	21	8	9
Arts and Culture	**1**	1	2	1	1

1 Organisations benefitted include professional bodies, academic institutes, NGOs and community groups.
2 Percentage figures have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

People

Talent and skills for the future

Management approach

Retaining institutional knowledge, together with transferring skills to a new generation of managers and team members is essential to long-term success, as is developing skills for a low-carbon, digitally-enabled future.

In order to manage this transition, pursue regional growth and address the demographic and labour market challenges of an ageing workforce and competition for STEM-qualified individuals, CLP must find ways to attract and retain a more gender- and culturally-diverse, multi-generational workforce and to share talent effectively across the portfolio of businesses.

Standards and procedures

CLP has a comprehensive training and development framework in place to deliver a wide range of training and development programmes to help people to perform competently in their current roles and prepare them for future business challenges and opportunities, including programmes for all employees and for contractors, where appropriate.

On-going technical and safety training is provided to develop the technical competencies required and ensure safety is a top priority. Strategic, general management and functional management programmes are used to help build future leaders. Training and development programmes are delivered internally (in Hong Kong, through the CLP Power Learning Institute) and in partnership with leading academic institutions including the International Institute for Management Development (IMD), the Ivey Business School, Tsinghua School of Economics and Management, Chatham House and the École Polytechnique Fédérale de Lausanne (EPFL). Expert briefings, workshops and online programmes are conducted on the latest global economic, political and technological trends.

CLP's performance management system provides the basis for identifying individual development needs and company-supported education policies support employee-initiated self-development. CLP recruits externally for critical roles, focused on innovation, digital and renewables capabilities.

Monitoring and follow-up

CLP conducts regular talent and capability reviews, focused on both general management and engineering streams. The reviews monitor and follow up actions to address current and future gaps and opportunities, including the progress of development programmes, recruitment campaigns, initiatives to strengthen gender diversity and cross-business assignments. The effectiveness of this approach is measured by a range of key internal performance indicators including retention of key talent, turnover, gender and ethnic diversity and engagement measures. The Board Human Resources & Remuneration Committee reviews talent and capability progress annually.

Year in review

In 2019, CLP maintained its focus on developing pipelines of future general managers and engineering leaders through a range of development initiatives.

These included:

- Over 50 future leaders participated in executive and management development programmes conducted in partnership with leading institutions.
- The Hong Kong-based Graduate Trainee programme was reviewed and redesigned into a single programme focused on future leadership and technical capabilities, launching in 2020.
- The CLP Power Academy launched its first joint academic and industry-run dual masters' degree programme in power engineering, in cooperation with the University of Strathclyde (UK) and the Hong Kong University of Science and Technology. This programme's objective is to help existing and aspiring engineers to deepen their power engineering knowledge and to strengthen the supply of competent engineers for Hong Kong's power industry. Read more here.
- CLP continued to facilitate industrial placement opportunities for engineering students including a new partnership with the University College London, United Kingdom.
- Through the structured Performance Management System, 100% of employees set annual individual objectives, reviewed achievements and reviewed performance ratings. These are key inputs in the determination of incentive payments and base pay reviews.

Read more on other development initiatives in CLP >

Diversity and inclusion

Management approach

A diverse workforce and an inclusive culture support high performance and CLP's ability to operate effectively in the many communities that host the company's assets. CLP has set several Group-wide gender diversity targets and continues to undertake initiatives to encourage more women into the workforce.

Standards and procedures

CLP's human resources policies encourage the retention of female employees through initiatives including flexible work arrangements, maternity leave and other benefits. CLP's recruitment processes are designed to be fair and non-discriminatory. In Hong Kong, this process follows the Equal Opportunities Commission Code of Practice including the use of consistent selection criteria and in other parts of the Group, CLP complies with local legislation and codes of practice on recruitment. When conducting senior level searches, CLP also requires external recruitment firms to identify diverse candidates, in line with Group Values. In 2018, CLP became a signatory to the International Energy Agency's "Equal by 30" initiative – a commitment by public and private sector organisations to work towards gender equality in the energy sector by 2030.

Monitoring and follow-up

Gender progress is reviewed as part of regular general management and engineering talent reviews. The Board Human Resources & Remuneration Committee (HR&RC) reviews progress versus gender diversity targets annually.

Year in review

In 2019, CLP continued its efforts to create an inclusive working environment for employees.

As at 31 December 2019, 2,068 of CLP's 7,960 employees were female, and the percentages of women in the Group Executive Committee, women in leadership and women in engineering have improved.

Female participation in development programmes continued to improve with female engineers accounting for almost one-third of General Management Development Programme participants, and almost 20% of applications to the new Graduate Trainee programme. CLP continued to support women in engineering with initiatives including the annual Female Engineer Networking event and the mentoring programme for female engineering students. Read more here.

CLP also continued to support The Women's Foundation in Hong Kong and other initiatives such as the Racial Diversity & Inclusion Charter for Employers developed by the Equal Opportunities Commission (EOC) to promote diversity and inclusion in the workplace.

EnergyAustralia progressed initiatives in indigenous participation, supporting working parents, domestic violence awareness, lesbian, gay, bisexual, transgender and intersex (LGBTI) workplace inclusion and encouraging women to work in the energy generation sector. Flexible working guidelines were introduced to help support carers and work is underway on a comprehensive flexible working strategy.

Find more about other diversity & inclusion initiatives ›

Supporting people to thrive in change

Management approach

CLP is committed to supporting all of its people to thrive in change through a long-term focus on strengthening wellbeing and resilience, developing more inclusive workplaces and re-skilling.

CLP recognises that balancing work and family life can have a significant impact on health and relationships which enhance overall wellbeing and productivity at work. Enhancing employee wellbeing is important to help improve the health status of the workforce, manage the cost of medical benefits, and to reduce the impact of sickness absence on productivity.

CLP aims to provide work environments that are free of harassment or discrimination on the basis of gender, physical or mental state, race, nationality, religion, age, family status or sexual orientation; or any other attribute recognised by the laws of the country in which the company operates.

Standards and procedures

The Code of Conduct underpins the approach to supporting people. Family-friendly leave policies and flexible working arrangements are in place in different parts of the business, and work-life balance programmes and workshops are organised for employees covering areas of physical, social and emotional balance. Confidential employee assistance programmes are also offered to assist employees who may encounter work or personal issues and need professional support.

Monitoring and follow-up

CLP uses independent external consultants to conduct regular employee opinion surveys to understand employees' views. In Hong Kong, joint consultative committees have been established which act as an additional channel of communication between the company and employees' selected representatives. Employee benefits are regularly benchmarked to ensure that appropriate support is provided.

Year in review

Two key employee support programmes launched in 2019 in Hong Kong were the Home Loan Scheme which aims to support eligible employees to own their first home, and the "Boost" Health and Wellbeing programme.

Read more on these programmes here.

In Hong Kong, workshops were organised to encourage employees to explore wellbeing, including learning about relationship between nutrition and physical and mental health. Workshops for managers were also developed to guide them in providing support for employees' emotional wellbeing and fostering a supportive workplace community.

As a caring employer, CLP also understands that employees may face periods of greater demands in their personal lives. To support colleagues, the unpaid leave policy in Hong Kong was enhanced.

Leave entitlements were also reviewed and enhanced in India aiming to create a family-friendly and inclusive workplace for employees. Adoption leave has been introduced for male employees.

Fair work practices

Management approach

Core to the people agenda, and to delivering CLP's strategy, is ensuring that the Group complies with all local laws and regulations and demonstrates respect for all of its people, together with values-based management in addressing broader social issues.

GRI reference: 102-41

CLP's commitment

Human rights

In addition to local legal compliance, CLP respects internationally proclaimed human rights across the value chain. The commitment to upholding human rights is outlined in CLP's Value Framework, and there is strong recognition that corporate responsibility to respect human rights extends to a network of suppliers and contractors. CLP prohibits the employment of child, forced or compulsory labour in any of its operations. CLP addresses human rights-related issues including health & safety and impacts on local communities when conducting due diligence for target investment or projects.

Fair wages

CLP 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. It is not Group policy or market practice to provide the same employment benefits to temporary staff as for full-time staff, however the benefits for temporary staff are competitive with local market practice and meet or exceed local legal requirements.

Use of temporary and contractor labour

CLP uses temporary labour for work that is time-bound or peak activity and also engages labour employed by third parties for non-core work and/or work requiring specialist skills. The Group is committed to taking a responsible approach to managing the costs and risks of the contingent workforce including considering whether there is the right strategic balance between the insourcing and outsourcing of capabilities, and whether the working hours and remuneration of workers employed by contractors are fair and reasonable.

Freedom of association

While CLP's management philosophy is that the most appropriate way to engage with colleagues is through direct communication rather than through intermediary organisations, CLP employees have the freedom of association to join organisations and professional bodies of their choice. CLP respects and fully complies with all legal requirements with regards to union membership and collective bargaining.

Standards and procedures

All operations are required to ensure that they do not use child, forced or compulsory labour. Steps taken include stringent checking and control procedures in selection and on-boarding processes, and training for key contractors who provide manpower or services. Following introduction of the Modern Slavery Act 2018 in Australia, the Australian business will commence reporting annually on the risks of modern slavery in its operations and supply chains, and actions to address those risks.

Equal pay for work of equal value is ensured by applying objective and non-discriminatory processes of job evaluation, grading and pay determination. These processes have been confirmed to comply with the Hong Kong Equal Opportunities Commission guidelines on equal pay between men and women under the Sex Discrimination Ordinance. CLP's Group-wide human resources policy guidelines also requires all subsidiary businesses to have similarly objective and non-discriminatory processes in place.

Monitoring and follow-up

CLP carries out independent audits of its human resources policies and procedures to proactively identify any risks of legal non-compliance and take remedial action if such risks are identified. Immediate action is taken to investigate and address any suspected breaches or issues that are brought to the company's attention.

Each year, CLP uses independent external consultants to benchmark the remuneration and benefits with relevant recruitment markets. Decisions on remuneration are subject to the corporate governance process and the approval of the Remuneration Committee in order to ensure that a balance between the interests of both employees and shareholders as key stakeholders.

Year in review

In 2019, CLP continued to focus on working practices across the extended workforce, including continuing to strengthen the reporting of labour supply and service contractors to increase management transparency.

A set of labour standards covering key aspects of the employment relationship in Hong Kong were developed. In the coming year, CLP will continue to undertake reviews and commence engagement with suppliers, with the long-term vision to incorporate these standards progressively into procurement requirements.

The Australian business commenced establishing the cross-functional business capability required to comply with annual Modern Slavery Reporting requirements, in order to prepare for its first report in 2021.

Find out more on CLP's fair work practices >

In 2019, no Group operations were identified in which the right to exercise freedom of association and collective bargaining was violated or at significant risk.

In Australia, CLP engages in collective bargaining with approximately 870 employees via certified enterprise bargaining agreements. These agreements include both notice periods and provisions for consultation and negotiation. EnergyAustralia successfully concluded negotiations for the Retail agreement covering contact centre employees, as well as Hallett and Mt Piper enterprise bargaining agreements which expired in 2019. Negotiations for Yallourn and Newport are in progress. Preparations for negotiation for the Tallawarra agreement and others which will expire in 2020 are underway.

Discrimination and harassment

Management approach

The CLP Value Framework provides a common set of practical guidelines to ensure that behaviours are lawful and comply with policies and licences. It applies to all employees, from the Board down, and defines the values that underpin everyday decisions.

Standards and procedures

The Group-wide Harassment-free Policy sets a common framework of principles and detailed policies in each country are fully compliant with local legislation. Regular refresher training is organised for employees. All new staff in Hong Kong are required to complete an e-learning programme. Each of the businesses has an employee grievance procedure in place that reflects the Value Framework and any applicable local legal requirements. In the case of any employee having concerns, established procedures are followed to address grievances. All complaints of discrimination and harassment are investigated. These procedures ensure fairness and independence in the investigation process, and respect for the confidentiality of the parties involved.

Monitoring and follow-up

CLP takes all breaches very seriously and disciplinary action can range from a verbal warning to dismissal. Read more in the Code of Conduct and anti-corruption section.

Year in review

In 2019, there were seven confirmed breaches of the Code of Conduct (out of 31) related to discrimination and harassment.

The breaches were managed in accordance with CLP's breaches in Code of Conduct handling process. The relatively higher number of breaches reflects the improved identification and stricter enforcement of workplace behaviour requirements.

CLP India business also produced a web-based orientation session to reinforce India's local policy on Prevention of Sexual Harassment at the Workplace, which will be released to all employees in early 2020.

Confirmed Code of Conduct breaches in relation to the following three categories are shown below. Refer to the Code of Conduct and anti-corruption section for additional information.

Number of confirmed Code of Conduct breaches	2019	2018	2017	2016	2015
Harassment	6	3	3	4	1
Discrimination	1	0	2	0	0
Human rights	0	0	0	0	0

People data

Employment practice

Employee headcount and type	2019	2018	2017	2016	2015
Group total					
Total employee headcount (number)	**7,960**	7,843	7,751	7,626	7,640
Full-time (number)	**7,754**	7,634	7,542	7,428	7,360
Part-time (number)	**206**	209	209	198	280
Permanent (average %)[1,2]	**87.8**	87.2	86.7	85.9	86.2
Fixed-term contract (average %)[1,3]	**12.2**	12.8	13.3	14.1	13.8
Hong Kong					
Total employee headcount (number)	**4,604**	4,543	4,515	4,468	4,461
Full-time (number)	**4,603**	4,538	4,504	4,450	4,438
Part-time (number)	**1**	5	11	18	23
Permanent (average %)[1,2]	**85.4**	84.0	83.1	81.5	81.1
Fixed-term contract (average %)[1,3]	**14.6**	16.0	16.9	18.5	18.9
Mainland China					
Total employee headcount (number)	**607**	596	577	560	527
Full-time (number)	**607**	596	577	560	527
Part-time (number)	**0**	0	0	0	0
Permanent (average %)[1,2]	**71.6**	72.1	71.9	70.1	73.4
Fixed-term contract (average %)[1,3]	**28.4**	27.9	28.1	29.9	26.6
India					
Total employee headcount (number)	**469**	458	463	435	397
Full-time (number)	**469**	458	463	435	397
Part-time (number)	**0**	0	0	0	0
Permanent (average %)[1,2]	**98.8**	99.0	99.4	99.8	99.7
Fixed-term contract (average %)[1,3]	**1.2**	1.0	0.6	0.2	0.3
Australia					
Total employee headcount (number)	**2,280**	2,246	2,196	2,163	2,255
Full-time (number)	**2,075**	2,042	1,998	1,983	1,998
Part-time (number)	**205**	204	198	180	257
Permanent (average %)[1,2]	**94.5**	95.9	96.0	97.1	97.7
Fixed-term contract (average %)[1,3]	**5.5**	4.1	4.0	2.9	2.3

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.
2 Average ratio of employees on permanent contract. Numbers in previous years are re-stated to show average ratio instead of ratio at the end of year.
3 Average ratio of employees on fixed-term contract. Numbers in previous years are re-stated to show average ratio instead of ratio at the end of year.

Contractor FTE and type	2019	2018	2017	2016	2015
Group total (full-time equivalent)					
Total contractor	**11,123.9**	10,470.0	N/A	N/A	N/A
Labour supply[1]	**1,573.0**	1,577.0	N/A	N/A	N/A
Service contractor and sub-contractor[2]	**9,550.9**	8,893.0	N/A	N/A	N/A
Hong Kong (full-time equivalent)					
Total contractor	**6,372.6**	5,308.6	N/A	N/A	N/A
Labour supply[1]	**1,309.0**	1,316.0	N/A	N/A	N/A
Service contractor and sub-contractor[2]	**5,063.6**	3,992.6	N/A	N/A	N/A
Mainland China (full-time equivalent)					
Total contractor	**363.2**	423.9	N/A	N/A	N/A
Labour supply[1]	**13.0**	14.0	N/A	N/A	N/A
Service contractor and sub-contractor[2]	**350.2**	409.9	N/A	N/A	N/A
India (full-time equivalent)					
Total contractor	**2,531.9**	2,952.5	N/A	N/A	N/A
Labour supply[1]	**78.5**	80.0	N/A	N/A	N/A
Service contractor and sub-contractor[2]	**2,453.4**	2,872.5	N/A	N/A	N/A
Australia (full-time equivalent)					
Total contractor	**1,856.2**	1,785.0	N/A	N/A	N/A
Labour supply[1]	**172.5**	167.0	N/A	N/A	N/A
Service contractor and sub-contractor[2]	**1,683.7**	1,618.0	N/A	N/A	N/A

1 Labour supply refers to manpower supplied by contractor companies under labour supply agreements. Reporting based on quarterly averages.
2 Estimated service contractor full-time equivalent (FTE) is calculated based on number of manhours incurred and region-specific average weekly working hours in 2019. Numbers in 2018 are re-stated to reflect region-specific working hours instead of weekly hours of 48 for all regions.

Voluntary staff turnover rate	2019[1]	2018	2017	2016	2015
Hong Kong (%)[2,3]	**2.4**	2.3	1.9	2.3	2.8
By age group					
Below 30	**4.4**	5.9	2.3	5.4	5.3
30-39	**4.9**	4.3	3.2	4.0	6.1
40-49	**1.9**	1.7	2.0	1.6	2.0
50 and above	**1.1**	1.1	1.2	1.5	1.7
By gender					
Male	**1.8**	1.7	1.6	1.8	2.5
Female	**4.9**	5.0	3.3	4.6	4.7
Mainland China (%)[2,3]	**2.0**	4.7	3.0	3.4	2.6
By age group					
Below 30	**8.4**	16.4	8.8	12.0	5.9
30-39	**1.9**	5.2	3.3	1.9	4.1
40-49	**0.5**	1.5	1.5	1.4	0.5
50 and above	**0.0**	0.0	0.0	1.2	1.3
By gender					
Male	**2.4**	4.1	2.4	3.6	2.7
Female	**0.0**	7.5	5.3	2.6	1.9
India (%)[2,3]	**6.6**	5.6	3.5	8.4	9.8
By age group					
Below 30	**7.4**	6.4	4.6	10.5	9.9
30-39	**9.3**	7.2	3.4	9.9	11.6
40-49	**2.9**	2.9	3.0	3.4	6.5
50 and above	**0.0**	2.5	2.9	6.5	8.3
By gender					
Male	**6.4**	5.6	3.2	8.0	9.6
Female	**7.5**	5.7	6.0	11.5	11.5
Australia (%)[2,3]	**12.9**	13.6	13.8	12.6	13.7
By age group					
Below 30	**19.3**	18.6	22.7	18.3	15.6
30-39	**14.2**	15.2	13.0	13.1	18.9
40-49	**11.5**	10.5	10.6	10.9	11.2
50 and above	**8.3**	10.6	10.5	7.1	5.5
By gender					
Male	**12.6**	12.3	12.9	11.2	12.6
Female	**13.4**	15.6	15.1	14.6	15.2

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.
2 Voluntary turnover is employees leaving the organisation voluntarily and does not include dismissal, retirement, company-initiated termination or end of contract.
3 Numbers include permanent employees only, except for Mainland China which refers to both permanent and fixed-term contract employees due to its specific employment legislation.

New hire	2019[1]	2018	2017	2016	2015
Group total (number)	**857**	965	835	904	809
By age group					
Below 30	**309**	N/A	N/A	N/A	N/A
30-39	**300**	N/A	N/A	N/A	N/A
40-49	**158**	N/A	N/A	N/A	N/A
50 and above	**90**	N/A	N/A	N/A	N/A
By gender					
Male	**552**	619	540	586	519
Female	**305**	346	295	318	290
Hong Kong (number)	**348**	307	292	280	315
By age group					
Below 30	**157**	N/A	N/A	N/A	N/A
30-39	**121**	N/A	N/A	N/A	N/A
40-49	**48**	N/A	N/A	N/A	N/A
50 and above	**22**	N/A	N/A	N/A	N/A
By gender					
Male	**239**	200	208	196	246
Female	**109**	107	84	84	69
Mainland China (number)	**43**	47	60	40	31
By age group					
Below 30	**16**	N/A	N/A	N/A	N/A
30-39	**25**	N/A	N/A	N/A	N/A
40-49	**2**	N/A	N/A	N/A	N/A
50 and above	**0**	N/A	N/A	N/A	N/A
By gender					
Male	**36**	41	49	32	23
Female	**7**	6	11	8	8
India (number)	**43**	29	48	77	81
By age group					
Below 30	**20**	N/A	N/A	N/A	N/A
30-39	**16**	N/A	N/A	N/A	N/A
40-49	**4**	N/A	N/A	N/A	N/A
50 and above	**3**	N/A	N/A	N/A	N/A
By gender					
Male	**35**	26	42	62	70
Female	**8**	3	6	15	11
Australia (number)	**423**	582	435	507	382
By age group					

New hire	2019[1]	2018	2017	2016	2015
Below 30	**116**	N/A	N/A	N/A	N/A
30-39	**138**	N/A	N/A	N/A	N/A
40-49	**104**	N/A	N/A	N/A	N/A
50 and above	**65**	N/A	N/A	N/A	N/A
By gender					
Male	**242**	352	241	296	180
Female	**181**	230	194	211	202

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Employees eligible to retire within the next five years	2019[1]	2018	2017	2016	2015
Group total (%)[2]	**13.9**	16.4	15.1	14.1	13.3
Hong Kong (%)[2]	**19.5**	20.0	18.6	17.3	16.2
Mainland China (%)[2]	**14.5**	13.2	10.6	12.1	11.9
India (%)[2]	**4.8**	4.0	2.4	0.9	0.8
Australia (%)[2,3]	**5.4**	12.8	12.2	11.4	10.9

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.
2 The percentages given refer to permanent employees within each region, who are eligible to retire within the next five years.
3 There is no mandatory retirement age in Australia. Retirement age assumption was adjusted in 2019 from 60 to 65 to reflect local norms, which led to a significantly lower percentage compared to previous years. Numbers in previous years adopting the adjusted retirement age for Australia are as follows: 2015 - Australia: 3.8% / Group total: 11.1%; 2016 - Australia: 4.6% / Group total: 12.0%; 2017 - Australia: 4.8% / Group total: 12.9%; 2018 - Australia: 4.6% / Group total: 14.0%.

Talent and skills for the future

Technical trainees intake	2019[1]	2018	2017	2016	2015
Group total (number)	**75**	85	117	N/A	N/A
Male	**64**	67	89	N/A	N/A
Female	**11**	18	28	N/A	N/A
Hong Kong (number)	**61**	66	76	N/A	N/A
Male	**51**	50	63	N/A	N/A
Female	**10**	16	13	N/A	N/A
Mainland China (number)	**4**	8	7	N/A	N/A
Male	**4**	7	6	N/A	N/A
Female	**0**	1	1	N/A	N/A
India (number)	**0**	0	6	N/A	N/A
Male	**0**	0	3	N/A	N/A
Female	**0**	0	3	N/A	N/A
Australia (number)	**10**	11	28	N/A	N/A
Male	**9**	10	17	N/A	N/A
Female	**1**	1	11	N/A	N/A

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Average training hours per employee	2019[1]	2018	2017	2016	2015
Group Total (hours)	**40.1**	46.1	46.9	49.2	57.2
By gender (hours)					
Male	**44.8**	51.6	52.4	55.9	59.5
Female	**26.8**	28.5	29.5	27.7	49.7
By professional category (hours)					
Managerial	**26.0**	28.6	28.3	29.4	45.2
Professional	**35.0**	37.9	39.7	44.5	57.0
General & technical staff	**47.1**	55.8	55.5	55.1	58.6
By region (hours)					
Hong Kong	**47.6**	55.2	57.5	62.9	55.1
Mainland China	**66.1**	78.2	71.3	70.9	66.8
India	**23.2**	27.1	36.4	39.6	34.3
Australia	**22.1**	21.1	18.8	14.3	63.5

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Percentage of employees trained	2019[1]	2018	2017	2016	2015
Hong Kong (%)	**92.3**	93.3	99.1	98.2	97.2
By gender					
Male	**94.9**	95.4	99.2	98.8	96.9
Female	**82.2**	84.6	98.5	95.6	98.9
By professional category					
Managerial	**80.6**	87.8	98.7	93.2	98.7
Professional	**93.1**	92.3	99.2	98.4	99.3
General & technical staff	**93.1**	94.7	99.0	98.6	95.4
Mainland China (%)	**100.0**	99.8	91.0	99.6	99.8
By gender					
Male	**100.0**	100.0	91.2	99.6	100.0
Female	**100.0**	99.1	90.2	100.0	99.1
By professional category					
Managerial	**100.0**	100.0	100.0	100.0	100.0
Professional	**100.0**	100.0	100.0	100.0	99.4
General & technical staff	**100.0**	99.7	85.1	99.4	100.0
India (%)	**81.4**	83.2	86.6	88.3	86.4
By gender					
Male	**80.9**	82.5	85.4	88.9	86.3
Female	**85.5**	88.5	96.2	83.7	87.2
By professional category					
Managerial	**87.9**	93.4	79.3	81.1	90.7
Professional	**86.3**	95.8	91.6	93.5	86.1
General & technical staff	**66.4**	53.4	79.5	81.3	85.5
Australia (%)	**100.0**	100.0	100.0	100.0	100.0
By gender					
Male	**100.0**	100.0	100.0	100.0	100.0
Female	**100.0**	100.0	100.0	100.0	100.0
By professional category					
Managerial	**100.0**	100.0	100.0	100.0	100.0
Professional	**100.0**	100.0	100.0	100.0	100.0
General & technical staff	**100.0**	100.0	100.0	100.0	100.0

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Diversity and inclusion

Gender distribution of Group Executive Committee (GEC) members	2019	2018	2017	2016	2015
Male (%)[1]	**64.3**	71.4	69.2	69.2	66.7
Female (%)[1]	**35.7**	28.6	30.8	30.8	33.3

1 Includes Executive Directors (Chief Executive Officer and Chief Financial Officer).

Gender distribution of employees	2019[1]	2018	2017	2016	2015
Group total (%)					
Male	**74.0**	76.1	76.2	76.4	75.7
Female	**26.0**	23.9	23.8	23.6	24.3
Hong Kong (%)					
Male	**79.4**	80.1	81.0	81.5	82.2
Female	**20.6**	19.9	19.0	18.5	17.8
Mainland China (%)					
Male	**82.5**	82.2	80.6	79.5	79.3
Female	**17.5**	17.8	19.4	20.5	20.7
India (%)					
Male	**88.3**	88.6	88.8	88.7	90.2
Female	**11.7**	11.4	11.2	11.3	9.8
Australia (%)					
Male	**57.9**	62.6	61.4	61.3	57.4
Female	**42.1**	37.4	38.6	38.7	42.6

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Gender distribution by region and professional category	2019[1]	2018	2017	2016	2015
Hong Kong (%)					
Managerial - male	**75.7**	75.6	74.5	76.5	76.6
Managerial - female	**24.3**	24.4	25.5	23.5	23.4
Professional - male	**75.2**	76.7	78.0	78.4	79.3
Professional - female	**24.8**	23.3	22.0	21.6	20.7
General & technical staff - male	**83.5**	83.5	83.9	84.4	85.0
General & technical staff - female	**16.5**	16.5	16.1	15.6	15.0
Mainland China (%)					
Managerial - male	**78.9**	76.5	73.3	83.3	90.0
Managerial - female	**21.1**	23.5	26.7	16.7	10.0
Professional - male	**85.2**	84.4	85.0	83.7	83.1
Professional - female	**14.8**	15.6	15.0	16.3	16.9
General & technical staff - male	**81.0**	81.1	78.2	76.9	77.1
General & technical staff - female	**19.0**	18.9	21.8	23.1	22.9
India (%)					
Managerial - male	**90.9**	93.4	94.8	94.3	93.0
Managerial - female	**9.1**	6.6	5.2	5.7	7.0
Professional - male	**89.1**	89.0	89.4	89.9	92.8
Professional - female	**10.9**	11.0	10.6	10.1	7.2
General & technical staff - male	**84.9**	85.7	84.8	84.3	83.8
General & technical staff - female	**15.1**	14.3	15.2	15.7	16.2
Australia (%)					
Managerial - male	**68.6**	72.4	73.0	74.2	71.0
Managerial - female	**31.4**	27.6	27.0	25.8	29.0
Professional - male	**54.5**	57.6	56.1	55.3	58.4
Professional - female	**45.5**	42.4	43.9	44.7	41.6
General & technical staff - male	**61.0**	67.1	65.1	65.4	55.0
General & technical staff - female	**39.0**	32.9	34.9	34.6	45.0

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Gender diversity targets	2019[1]	2018	2017	2016	2015
Women in Leadership (%)[2]	**24.2**	22.9	N/A	N/A	N/A
Women in Engineering (%)[3]	**11.4**	10.9	N/A	N/A	N/A

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.
2 Percentage of females in leadership positions which are defined as positions at Hay Reference Level 19 & above.
3 Percentage of females in employees with a bachelor degree or above qualification in Engineering.

Employee age distribution	2019[1]	2018	2017	2016	2015
Group total (%)					
Below 30	**13.6**	14.6	15.6	16.6	17.3
30-39	**29.3**	28.2	28.1	27.2	26.1
40-49	**26.2**	26.3	25.6	25.4	25.8
50 and above	**30.9**	30.9	30.7	30.8	30.8
Hong Kong (%)					
Below 30	**13.6**	13.7	13.7	13.3	12.4
30-39	**22.7**	21.5	21.6	21.2	20.7
40-49	**25.4**	26.1	25.6	26.1	27.4
50 and above	**38.3**	38.7	39.1	39.4	39.5
Mainland China (%)					
Below 30	**14.0**	15.6	17.0	17.7	18.8
30-39	**34.6**	34.1	32.2	29.5	27.9
40-49	**32.1**	33.5	34.3	37.1	38.3
50 and above	**19.3**	16.8	16.5	15.7	15.0
India (%)					
Below 30	**14.9**	18.3	22.9	23.9	32.0
30-39	**49.0**	48.5	46.7	45.7	42.1
40-49	**23.9**	22.9	22.2	22.1	19.4
50 and above	**12.2**	10.3	8.2	8.3	6.5
Australia (%)					
Below 30	**13.4**	15.4	17.9	22.2	25.0
30-39	**37.1**	36.9	37.2	35.8	34.5
40-49	**26.6**	25.5	23.8	21.2	20.0
50 and above	**22.9**	22.2	21.1	20.8	20.5

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Average length of service	2019[1]	2018	2017	2016	2015
Number of years					
Hong Kong	**16.8**	17.3	17.5	17.7	17.9
Mainland China	**11.4**	13.7	13.7	14.0	14.2
India	**7.2**	6.8	6.1	5.7	11.5
Australia	**5.2**	4.9	5.2	4.4	4.4

1 2019 numbers include full-time and part-time employees. Numbers in the previous years include full-time employees only.

Discrimination and harassment

Confirmed cases of Code of Conduct breaches	2019	2018	2017	2016	2015
Number of cases in relation to:					
Harassment	**6**	3	3	4	1
Discrimination	**1**	0	2	0	0
Human rights	**0**	0	0	0	0

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Customers

Customer portfolio

Year in review

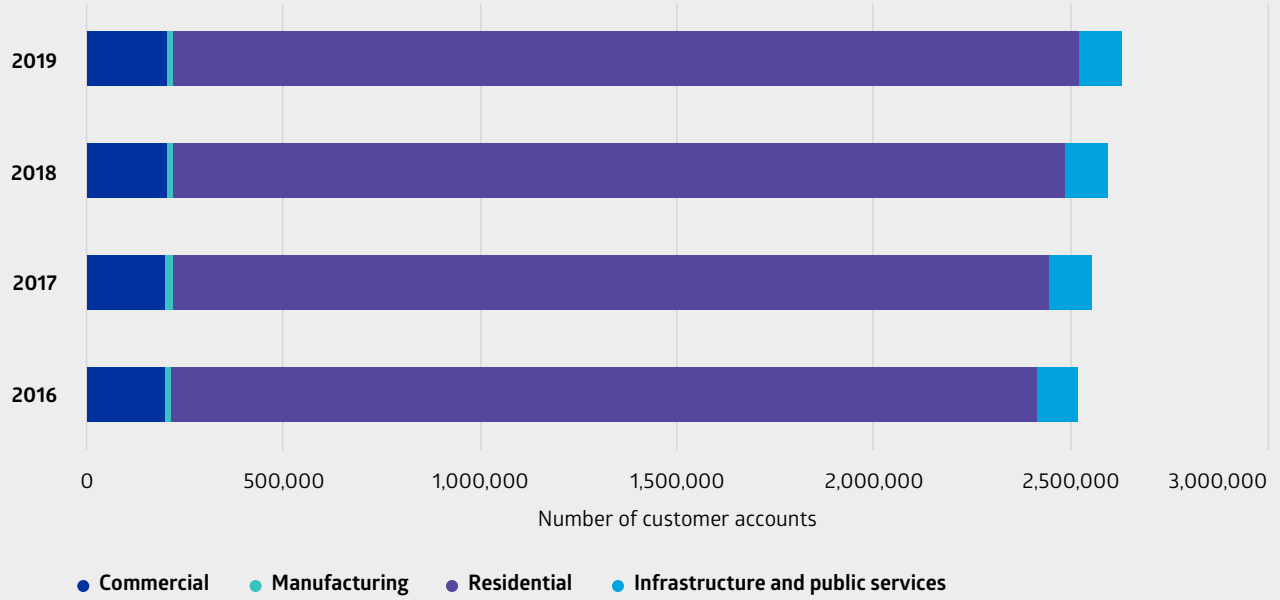
The CLP Group operates retail businesses in Hong Kong and Australia, where the local market structures, regulatory requirements, electricity demand, customer preferences and cultural norms differ significantly.

CLP Power Hong Kong is the sole electricity provider for Kowloon, the New Territories, and most of the outlying islands, serving 2.6 million customer accounts or about 80% of Hong Kong's population. Total electricity sales for 2019 were 34,284GWh which all came from sales to Hong Kong customers.

While CLP's home base Hong Kong is perceived by some as a mature market, there is still a growing demand for electricity. This is largely driven by a number of territory-wide development and infrastructure projects, including the Kai Tak redevelopment, the West Kowloon Cultural District, the Lok Ma Chau Loop, and landmark transport development schemes, such as the Hong Kong-Zhuhai-Macau Bridge, the Hong Kong Boundary Crossing Facilities Island and the Guangzhou-Shenzhen-Hong Kong Express Rail Link. In addition, as Hong Kong becomes a data centre hub, there is a need to ensure highly reliable power supplies to support and facilitate the development of this energy-intensive industry.

Hong Kong customer breakdown

In 2019 there has been gradual growth of customer accounts mainly from the residential sector.



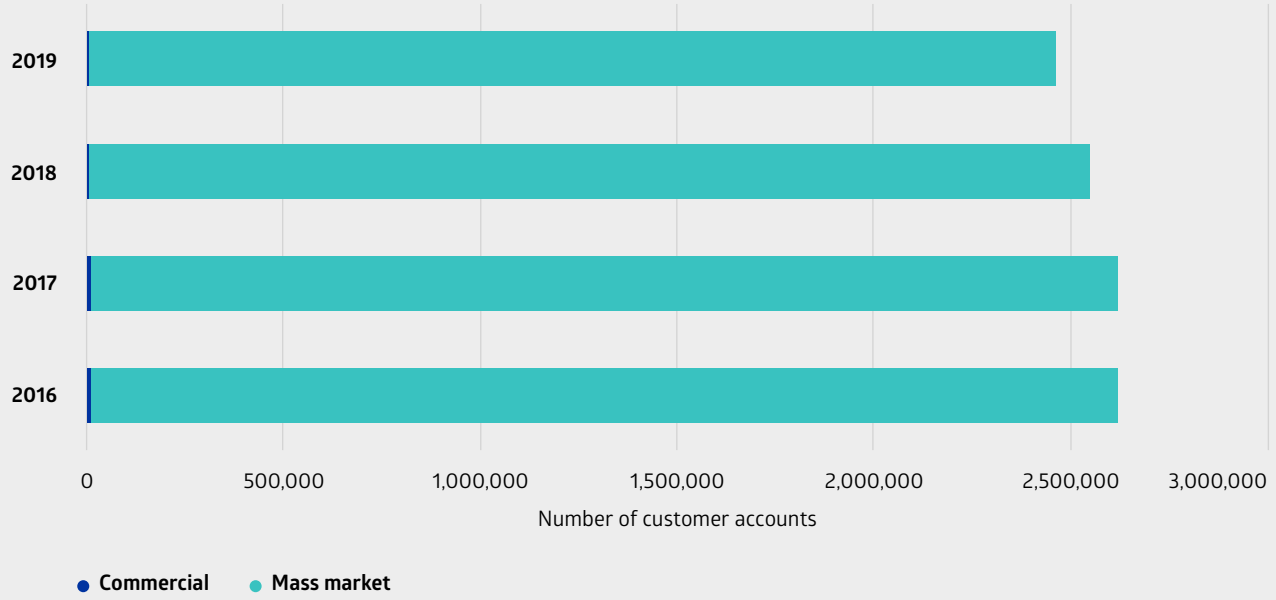
Hong Kong customer breakdown (number of customer accounts)	2019	2018	2017	2016
Commercial	206,792	206,073	203,891	201,582
Manufacturing	17,575	17,966	18,650	19,454
Residential	2,301,200	2,265,151	2,228,438	2,200,009
Infrastructure and public services	110,841	107,893	104,543	103,284

EnergyAustralia retails electricity and gas to customers in New South Wales, Victoria, South Australia, the Australian Capital Territory and Queensland (electricity only). It is among the 30 or so retailers active in the key markets of New South Wales and Victoria.

In 2019 the Australian retail market was characterised by intense competition and volatility. High customer churn across all the states in which EnergyAustralia operates reflected the heightened competition for mass-market customers, while increased transfer activity was stimulated by government intervention and media attention. While EnergyAustralia's churn remained below the market average, lower sales saw customer accounts decreasing to 2.46 million (2018: 2.55 million). However with the mid-year launch of new propositions and tactical plans in place, momentum has increased leading in to the first quarter of 2020.

Australian customer breakdown

There is a gradual decline of customer accounts across the mass market mainly due to intense competition and the flow on effects of government intervention in the retail market. Mass market includes residential and small business customers.



Australian customer breakdown (number of customer accounts)	2019	2018	2017	2016
Commercial	12,599	12,526	13,234	15,238
Mass market	2,453,492	2,537,612	2,610,191	2,609,954

CASE STUDY

Smart System Revolutionise Traditional Wet Markets

CLP Power has teamed up with wet market operators to transform traditional markets in Hong Kong, promoting green living with new shopping experiences.

The Company provides consulting services to operators for the integration of innovative smart technologies and energy conservation into their designs.

Red Market (Kwong Yuen Market) is an exemplary market and won the Smart Energy Outstanding Award at the CLP Smart Energy Award 2018 after a marked improvement in energy efficiency. It houses a smart system that comes with cutting-edge technology. Sun sensors automatically adjust the intensity of the indoor LED lighting system, which keeps the market bright while minimising energy consumption. A new smart ventilation system measures real-time carbon dioxide levels inside the market and adjusts its ventilating power accordingly, ensuring the air quality is optimal for shoppers. Solar panels have also been installed on the roof to generate electricity. The Red Market has indeed become a "green market".

Read more about CLP Smart Energy Award

Access to electricity

Management approach

Access is the ability to use an affordable and reliable electricity supply. Across the Group, CLP has services in place that ensure most challenges, including language, culture, literacy, financial situation or disability, do not prevent people from accessing and using the Company's products.

In Hong Kong, CLP offers a Braille bill to assist those who are visually impaired. EnergyAustralia provides interpreter services for those who have a first language other than English, and also offers hearing-impaired and vision-impaired billing services.

Across the Group, special arrangements are in place for customers facing financial difficulties to avoid having to disconnect their electricity supply.

Year in review

To ensure customers have access to electricity, CLP delivers programmes to assist those in need. In Hong Kong, the total number of disconnections for customers has continuously decreased over the last three years.

CLP understands that although the tariff level in Hong Kong is reasonable and competitive when compared to other major metropolitan cities around the world, it could potentially act as a financial burden to vulnerable groups.

Hong Kong

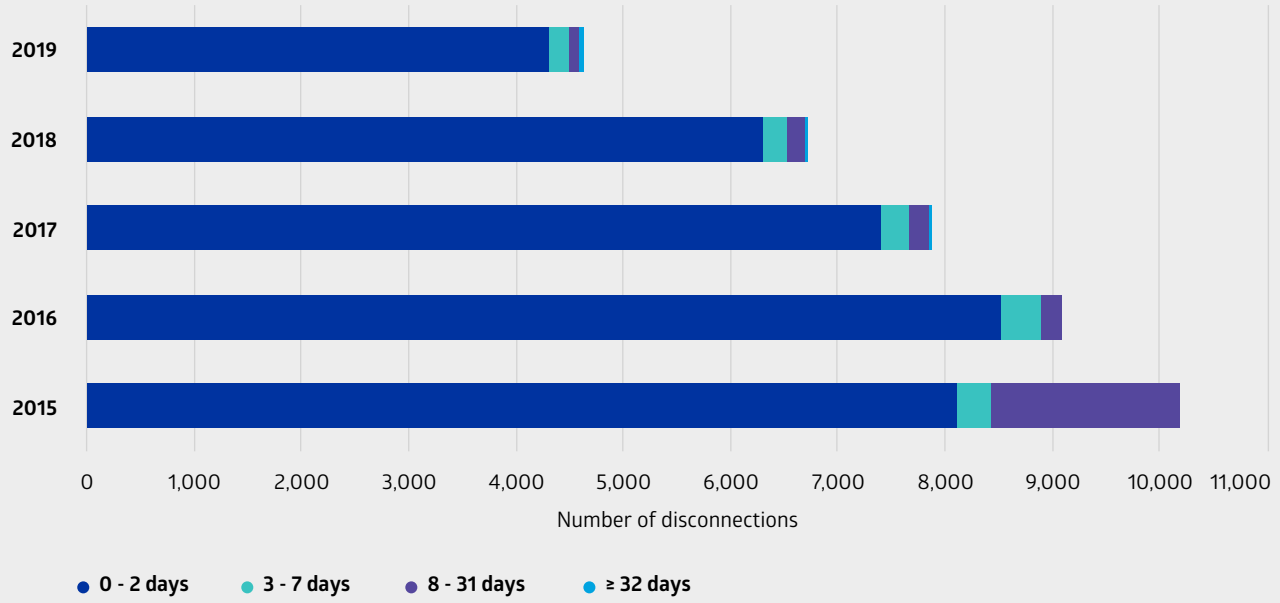
In Hong Kong, CLP Power offers concessionary tariffs for the elderly who receive Comprehensive Social Security Assistance. Special arrangements for customers in arrears are also in place, including programmes to help those at risk of supply disconnection. Payment deferral or interest free payments by instalment are offered in demonstrated cases of hardship.

In January 2019, the CLP Power Connect programme was launched where residential customers are encouraged to save energy and where CLP in return offers financial assistance to disadvantaged groups to offset against their electricity expenses. A total of HK$20 million was allocated to subsidise around 40,000 households in 2019, including single elderly or elderly couple, low income families, the disabled and subdivided unit households, with each receiving an electricity subsidy of HK$500. Back in 2015, the programme was the first of its kind in the world to combine energy saving with a mission to help the less fortunate in society, and helped relieve the electricity costs of around 20,000 underprivileged households from 2015 to 2018.

In extreme cases when customers do not pay for their electricity, CLP Power will communicate with the customers and offers assistances including flexible payment options to avoid disconnection.

Disconnections for CLP Power Hong Kong

The total number of disconnections for Hong Kong retail business continued to decrease five-years in a row. In 2019, there were 4,643 cases, further reduced from 6,722 cases in 2018.



Disconnections for CLP Power Hong Kong (number)	2019	2018	2017	2016	2015
0 - 2 days	4,333	6,319	7,426	8,545	8,128
3 - 7 days	170	225	255	359	313
8 - 31 days	101	168	192	190	1,748
≥ 32 days	39	10	15	9	8

Australia

EnergyAustralia recognises that all customers need to be able to access its products and services fairly and equally. Through the Energy Charter the Company commits to working together to improve affordability and to support customers experiencing vulnerable circumstances. The EnergyAssist hardship programme helps customers by offering tailored payment plans, payment matching and debt waivers. Customers may also be referred to external community organisations, such as financial counsellors. EnergyAustralia monitors the number of customers in the programme, their debt levels and the number of successful completions. In 2019, a 19% year-on-year increase in graduations was achieved, a significant increase across the two years of the programme.

In order to measure the social impact of the programme, EnergyAustralia began a study in late 2018, and noted improvements for beneficiaries across three areas in 2019, including an increase in control, improved comfort and health, and a reduction in financial stress. The Company also encourages adoption of renewable energy generation through different programmes. In August, EnergyAustralia and the NSW Government Department of Planning, Industry and Environment partnered in a 50% co-funded project that installs up to AUD $1 million of solar PV for eligible EnergyAustralia hardship customers living in NSW public housing.

To help make electricity options simpler, fairer and more affordable, EnergyAustralia also began offering fixed prices on all new in-market plans for the duration of the benefit term, and fairer discounts are now applied off the entire energy bill in Australia.

CASE STUDY

A changing regulatory landscape in Australia

Australia saw a significant shift in retail electricity regulation in 2019.

The Default Market Offer (DMO) and the Victorian Default Offer (VDO) were both introduced on 1 July 2019, effectively capping retail electricity prices at lower levels. To comply, EnergyAustralia transferred approximately 173,000 customers – around 10% of its electricity retail customer base – to the new tariffs.

EnergyAustralia approached the change as an opportunity to enhance its competitive standing by launching a new suite of products comprising simple, lower-cost services for existing and new customers.

In November 2019, Victoria's independent regulator responsible for reviewing electricity supply costs announced an increase to the VDO for households and businesses of an average 7.8% in 2020. After reviewing the decision, EnergyAustralia increased tariffs for most customers in the state by a similar amount from 27 January 2020.

Also in November 2019, the Australian Energy Regulator (AER) began proceedings against EnergyAustralia for alleged non-compliance with hardship disconnection rules in relation to eight customers. These proceedings were ongoing at the time this report went to print.

The AER also issued four infringement notices to EnergyAustralia for alleged breaches of the requirements to obtain explicit informed consent in relation to four customers, resulting in penalties totalling A$80,000. Another four infringement notices were issued for failures to promptly appoint a metering coordinator in response to metering installation malfunctions, leading to penalties totalling A$80,000.

EnergyAustralia meanwhile reported a number of incidents to the AER regarding registering life support needs for some of its customers.

The company remains focused on improving its compliance across each of these areas and is fully co-operating with the regulators.

CASE STUDY

Lighting up lives in remote Hakka villages

CLP continues to bring electricity to remove villages, supporting rural revitalisation and eco-tourism by connecting Mui Tsz Lam and Kap Tong to the grid.

A desire to look after people left behind by the march of modernity has characterised the work of the Kadoorie family since the 19th century – and it is a mission which CLP is carrying forward into a new era of technology and super-connectivity in the 21st century.

To support rural revitalisation and eco-tourism development in the Lai Chi Wo area of the northeastern New Territories, CLP Power completed a power supply for the remote Hakka villages of Mui Tsz Lam and Kap Tong in May 2019.

Mui Tsz Lam and Kap Tong are walled villages with long and rich histories, but electricity has been disconnected for over 40 years. Thanks to the installation of pole-mounted transformers and the laying of approximately five kilometres of underground cables, the two villages now enjoy a dependable electricity supply that presents new opportunities to promote ecotourism and preserve the area's Hakka culture. CLP Power has also installed smart meters in homes so engineers can better monitor the new power supply and villagers can understand their consumption patterns and manage their electricity use to save energy.

Customer satisfaction

Management approach

CLP is committed to providing quality service and value to customers. This includes meeting regulatory requirements and delivering on customer service pledges.

Strategies and procedures

CLP customers can access information on products and services in a timely and efficient manner through a number of communication channels, such as a welcome pack for all new customers, information on the CLP Hong Kong websites and CLP Mobile App, and the EnergyAustralia websites and Mobile Apps.

In addition to providing information, CLP strives to effectively respond to customer needs and preferences. The Customer Interaction Centre (CIC) in Hong Kong has an internal service pledge to follow up verbal complaints within 24 hours and to acknowledge written complaints within two working days. All escalated cases are studied thoroughly in order to appropriately resolve the issues customers have raised.

At EnergyAustralia, there are over two million conversations with customers every year, either over the phone or via digital service channels. The Company also engages more than 20,000 customers and stakeholders annually through formal research to help shape business decisions, products and services.

Monitoring and follow-up

To gauge customer feedback about retail services and performance, customer satisfaction surveys are conducted regularly.

In Hong Kong, an external market research consultant conducts an annual telephone survey. The customer satisfaction score considers overall satisfaction towards CLP and a relative rating against an ideal utility in Hong Kong. The score is benchmarked against the public utilities in the energy sector and other public service organisations. The survey also gauges the number of customer enquiries and complaints received by the Customer Interaction Centre (CIC) and Customer Service Centres (CSC).

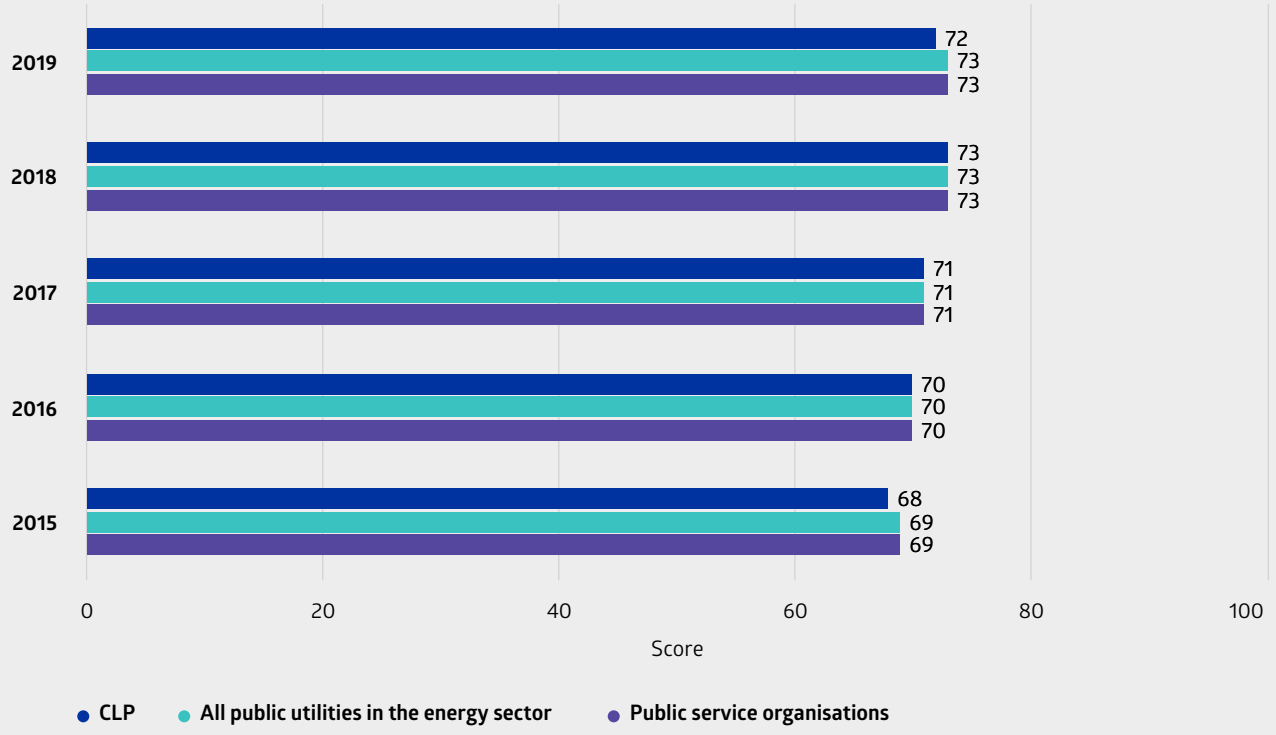
EnergyAustralia has been measuring its **Strategic Net Promoter Score (NPS)** to assess customer engagement since 2012. This is measured monthly via an online survey, which is sent to a representative group of customers. The Transactional Net Promoter Score is also used to track customer satisfaction in relation to specific customer interactions, providing more direct feedback for frontline staff. EnergyAustralia also measures the number of calls and complaints received.

Year in review

CLP Power Hong Kong has maintained a high level of customer satisfaction, and marked improvement was seen at EnergyAustralia. In Hong Kong, CLP received thousands of customer enquiries and no justified cases of complaints in 2019.

CLP Power Hong Kong customer satisfaction score

The customer satisfaction score of Hong Kong retail business in 2019 is similar to 2018 and on par with other public service organisations.



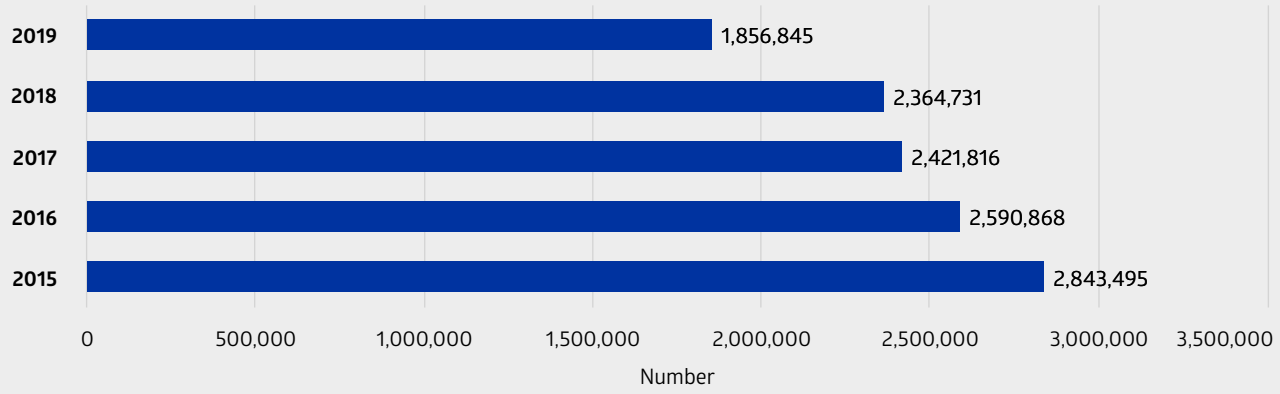
EnergyAustralia has applied a sustained focus on improving customer outcomes over several years. Investing in improved digital channels, billing processes, problem resolution, new customer-centric propositions brought to market and a sustained period of pricing stability has ensured that customers are receiving better value from EnergyAustralia.

The 2019 results are reflective of the combination of these customer experience improvements. Customer calls have reduced by 22.4% and total complaints decreased by 12%. Significantly, implementation of a more customer-centric dispute resolution process improved internal resolution of complaints without further escalation to the ombudsman. Overall, ombudsman complaints were reduced by 29%.

The culmination of improved customer outcomes was a significant improvement in the Strategic NPS through 2019, an increase of 8.8 points from 2018.

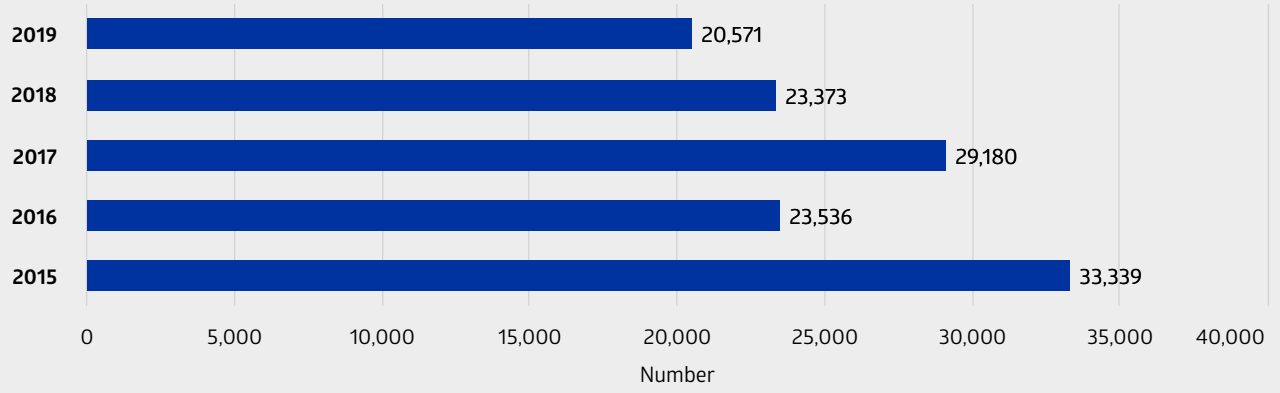
Calls handled by the EnergyAustralia call centre

There is a significant reduction of calls handled by the EnergyAustralia call centre in 2019, by 21% as compared to 2018.



Complaints received by EnergyAustralia

The improvement in customer experience is reflected as a decrease in number of complaints received.



CASE STUDY

An industry united to put customers first

EnergyAustralia Managing Director Catherine Tanna (third from right, front row) joins Australian energy company CEOs to sign the Energy Charter. (Photo by Jess Gleeson)

EnergyAustralia is proud to be a founding member of The Energy Charter, a worldwide energy industry first, bringing companies from across the supply chain together to deliver a better experience for customers and improve affordability during the transition to a clean energy future.

The Company was one of 18 signatories which undertook to embed the Charter principles across the business and evaluate where it was performing well, and where improvements needed to be made.

Programmes addressing issues of employee and customer safety have been put in place to address the identified gaps. EnergyAustralia continues to embed the feedback from conversations with customers in the way products and services are designed. It also continues to collaborate on initiatives that focus on service and affordability improvements for customers, as well as continuing to work together as an industry to meet customer expectations on the energy transition.

The Independent Accountability Panel reviewed all signatories' disclosures and met with each company's CEO. Following a period of public consultation, the Panel issued a report with 32 recommendations across six themes. When preparing for its second disclosure, EnergyAustralia will continue to embed the Charter principles within the business as well as reflecting on the feedback received in year one.

Read EnergyAustralia's Energy Charter Disclosure (30 June 2019)

Customer privacy

Management approach

Under CLP's Code of Conduct, every CLP employee must safeguard the assets – and the resources entrusted to the care of the company, including customer information – from loss, theft or misuse.

In Hong Kong the Personal Data (Privacy) Ordinance (PDPO) governs the protection of personal data of individuals. The Data Protection Principles in the PDPO frame CLP Power's obligations (as a data user) relating to the collection, accuracy, retention, use and security of personal data, and a customer's right to access their personal data.

EnergyAustralia has obligations under the Australian Privacy Act 1988 to ensure that personal information is appropriately used, handled and managed. Further to this, in February 2018, the mandatory data breach reporting obligations under Part IIIC of the Privacy Act 1988 came into effect. This new scheme requires data breaches that are likely to result in serious harm to individuals to be assessed within a specific timeframe and, if notifiable, reported to the Office of the Australian Information Commissioner (OAIC) and to the affected customers.

Strategy and procedures

All employees must follow CLP procedures/ practices and local regulations in relation to personal data privacy. The CLP Group preserves the confidentiality of the personal data provided to it in accordance with the CLP Privacy Policy Statement, which was updated with effect from 1 November 2018. The CLP Personal Data Protection Compliance Manual (2018 version) was brought into effect on 31 October 2018 to provide guidance to business units with operations in Hong Kong.

Monitoring and follow-up

CLP monitors and documents any complaints related to breaches of customer privacy and the loss of customer data. In addition to the CLP Personal Data Protection Compliance Manual, the Customer & Business Development Unit has a written guideline for handling customer data incidents. The guideline includes the classification and assessment of the scope and severity of a data incident, reporting roles and responsibilities, and the incident response strategy and checklist. The Corporate Data Protection Officer also retains a record of data incidents and follow-up actions. CLP's Hong Kong retail business has reported or noted no customer data loss cases in 2019.

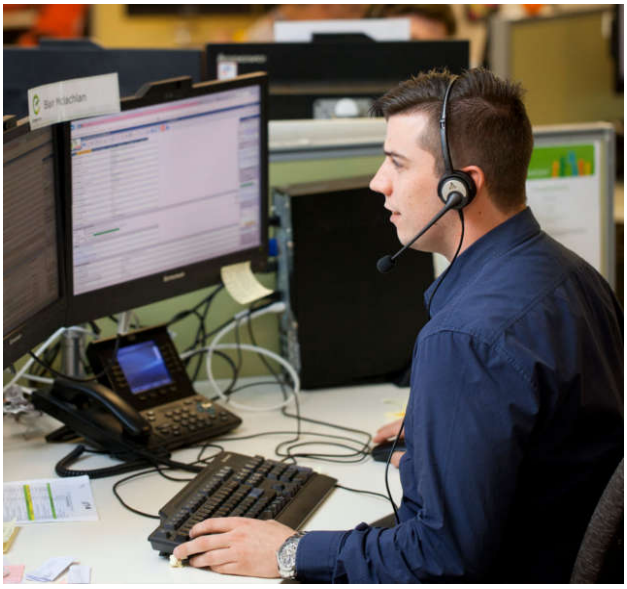
EnergyAustralia has also developed a Data Breach Response Plan and established a Data Breach Response Team. The plan outlines the strategy for assessing, managing, containing and reporting data breaches within required timeframes and includes the articulation of roles and responsibilities. It is enacted each time a potential data breach is identified.

Training and awareness

Customer privacy may be compromised as a result of a cyber security incident, or by the mishandling of customer information by employees. In 2019, training was provided on data protection through Internal Control Awareness Communications, at Legal Review Committee meetings, as well as with all data protection officers and record managers. Within individual business units, CLP runs awareness programmes through newsletters, briefings and refreshers on data protection principles. Industry threats are continuously reviewed with a view to strengthening controls on managing and monitoring networks, systems and mobile devices, data loss and suspicious cyber activities. CLP also regularly reinforces the need for timely reporting of potential privacy incidents and the reporting mechanisms available.

At EnergyAustralia, customer privacy was the focus of briefing sessions with leadership, enterprise-wide communications and employee training to ensure all staff are up-to-date with current privacy and data management.

Read more on how CLP protects personal data ›



Demand-side management

Management approach

Through closer customer engagement, the application of new technology and increased customer awareness of energy consumption, Demand Side Management (DSM) aims to achieve energy efficiency by reducing customers' peak electricity demand.

As part of the continuous efforts to drive towards a greener future, CLP is stepping up its DSM measures. Energy management offers mutual benefits to customers and to the business. For customers, the bills can be reduced, and for power companies, new investment in electricity infrastructure can be deferred.

The CLP Power **Customer Service Quality Policy** also includes a commitment to support customers to use CLP products and services more efficiently and effectively.

Goals and targets

In Hong Kong, CLP's operation is regulated by the Scheme of Control Agreement (SCA), in which the current SCA (2018-2033) has a list of refinements on energy saving and demand side management goals and targets to the previous SCA (2008-2018). It includes:

1. Performance targets for Energy Audit and energy saved from the energy audits under the current SCA are set at about four times the previous targets, which will offer 600 energy audits to business customers a year with total electricity saved expecting to reach 48GWh each year.
2. Demand response programmes are offered to commercial and industrial customers in order to lower the overall system demand, resulting in a lower requirement for investments in new generation units in the long-term. The target for this initiative is to achieve a reduction of up to 60MW from the demand peak.
3. A new five-year energy saving target has been set. CLP must achieve at least 4% of energy savings on the basis of the average annual sales within a five-year period in order to earn incentives. More incentives will be given if the energy saving reaches 5%.

Read more on CLP Power's SCA performance

Strategy and procedures

Drawing on CLP's long expertise in the power industry, residential and business customers and the community at large are encouraged to use energy more efficiently and to change their behaviour so that they can save more energy and help to create a better environment.

CLP aims to change people's habit for energy conservation via:

- Educating the public;
- Providing customers with information and energy-saving tips;
- Equipping customers with tools and technical support; and
- Supporting enablers to make greater energy efficiency possible.

Year in review

CLP provides a number of tools and technical support services to its customers in Hong Kong and Australia.

In Hong Kong, various initiatives were implemented in 2019. More information can be accessed here.

Providing free professional consultancy services and subsidies to help customers enhance energy efficiency:

Initiatives/ tools/ services	Performance and results
Energy Audits is a free service helping commercial and industrial (C&I) customers to save energy and operating costs.	· Helped C&I customers to save over 220GWh of electricity from 2009 to 2019. · Quadruples the number of energy audits from 150 to 600 a year under the current SCA, with total electricity saved expecting to reach 48GWh each year.
Eco-Building Fund provides subsidies for energy efficiency improvement works for residential, commercial and industrial buildings.	· Set an annual target to provide subsidies to 400 residential blocks and C&I buildings for carrying out improvement work to enhance energy efficiency of communal areas of the buildings, aiming at saving 48GWh energy per year. · The target in 2019 was successfully achieved.

Encouraging and supporting local renewable energy generation:

Initiatives/ tools/ services	Performance and results
Feed-in Tariff (FiT) allows customers to install a solar and/or wind power renewable energy system on their premises and connect to the CLP grid to earn FiT payments.	· Received over 6,900 applications by the end of December 2019, with around 84% of the projects representing a total capacity of around 90MW already approved or connected to the grid.
Renewable Energy Certificates offers an alternative way for customers to take part in local renewable energy development.	· Since its launch in January 2019, 3.17GWh units of renewable energy have been sold with the support of businesses such as data centres, banks, hotels, and restaurants in 2019.

Providing tools to customers for better energy usage management:

Initiatives/ tools/ services	Performance and results
Mass rollout of smart meters to support Hong Kong's transformation into a smart city.	· All CLP Power Hong Kong customers' conventional meters are being upgraded to smart meters in phases from November 2018 to 2025.
Eco Power 360, GREENPLUS Energy Billboard and Meter Online are online assessment and/or management tools. The former is for residential customers and the latter two are for commercial and industrial (C&I) customers.	· CLP Power residential customers and C&I customers can make use of these platforms to benchmark their electricity consumption against neighbouring households and industry peers respectively. The platforms also provide consumption projections and recommendations.

Encouraging residential customers to save energy for benefiting disadvantaged groups:

Initiatives/ tools/ services	Performance and results
CLP Power Connect under the Community Energy Saving Fund (CESF) is a city-wide campaign which aims to encourage residential customers to earn rewards and helping disadvantage groups by saving energy.	· Benefitted over 40,000 families, with each receiving a HK$500 electricity subsidy by the end of December 2019.

Learn more about successful cases of Eco-Building Fund

WATCH VIDEO ▶

In Australia, EnergyAustralia implemented various initiatives in 2019 to serve the following purposes. More information can be accessed here.

Encouraging and supporting local renewable energy generation

Initiatives/ tools/ services	Performance and results
Echo Group supports the Comapny's large commercial, industrial and business customers to achieve their saving targets and environmental benefits through specialist solar and LED products.	· The acquisition of 49% of Echo Group was announced in July 2019. Business customers can now access unrivalled advice on effectively integrating bespoke energy efficiency solutions with their energy usage and supply to ensure maximum benefit.

Providing tools to customers for better energy usage management

Initiatives/ tools/ services	Performance and results
E Voltage Pro app gives commercial and industrial customers real-time insights to the National Electricity Market (NEM) demand and generation, energy flows between states and inter-connecters, and spot and wholesale markets.	· By the end of December 2019, the app had 55 users across 31 customers.
Power Responsedemand response programme aims to secure capacity to be called upon at short notice should availability in the national electricity market fall to critical levels. EnergyAustralia has the largest single commitment in the three-year demand response trial.	· By the end of December 2019, over 21,000 EnergyAustralia business and residential customers contribute 51.8MW through the programme (with 14,000 enrolled in 2019).
Easy Plan and Easy Plan Plus are the first products to be trialled as part of EnergyAustralia's new customer innovation platform, On by EnergyAustralia. Like a phone plan, for a regular monthly price, customers have the option of two types of plans: one with different plan sizes with set amounts of electricity usage, or a plan that includes all their usage.	· Easy Plan and Easy Plan Plus were launched at the end of November 2019 and are only available to eligible customers in NSW. To help customers manage their usage and costs, they receive weekly usage alerts as well as access to MyAccount for 24/7 account management. If a customer's usage changes, they can switch their plan once a month at no additional cost.

Customer data

Customer portfolio

CLP Power Hong Kong	2019	2018	2017	2016	2015
Total Hong Kong customers (number)	**2,636,408**	2,597,083	2,555,522	2,524,329	N/A
Commercial	**206,792**	206,073	203,891	201,582	N/A
Manufacturing	**17,575**	17,966	18,650	19,454	N/A
Residential	**2,301,200**	2,265,151	2,228,438	2,200,009	N/A
Infrastructure and public services	**110,841**	107,893	104,543	103,284	N/A

EnergyAustralia	2019	2018	2017	2016	2015
Total Australian customers (number)	**2,466,091**	2,550,138	2,623,425	2,625,192	N/A
Commercial and Industrial	**12,599**	12,526	13,234	15,238	N/A
Mass market	**2,453,492**	2,537,612	2,610,191	2,609,954	N/A

Access to electricity

CLP Power Hong Kong	2019	2018	2017	2016	2015
Total disconnections for Hong Kong retail business (number)	**4,643**	6,722	7,888	9,103	10,197
0 - 2 days	**4,333**	6,319	7,426	8,545	8,128
3 - 7 days	**170**	225	255	359	313
8 - 31 days	**101**	168	192	190	1,748
≥ 32 days	**39**	10	15	9	8

Customer satisfaction

CLP Power Hong Kong	2019	2018	2017	2016	2015
Customer satisfaction score					
CLP	**72**	73	71	70	68
All public utilities in the energy sector	**73**	73	71	70	69
Public service organisations	**73**	73	71	70	69

EnergyAustralia	2019	2018	2017	2016	2015
Customer service					
Calls handled by EnergyAustralia (number)	**1,856,845**	2,364,731	2,421,816	2,590,868	2,843,495
Complaints received by EnergyAustralia (number)	**20,571**	23,373	29,180	23,536	33,339

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Supply chain

Supply chain management

Management approach

CLP procures a wide range of products and services, of significant value, to maintain and develop the electricity supply business to meet customer needs.

Operational responsibilities

Procurement and supply chain management are an integral part of business operations across the CLP Group. CLP procurement professionals aim to develop and implement effective supply market strategies to acquire quality products and services, reduce supply chain risks, realise Group-wide synergies and deliver optimised supply chain value to stakeholders.

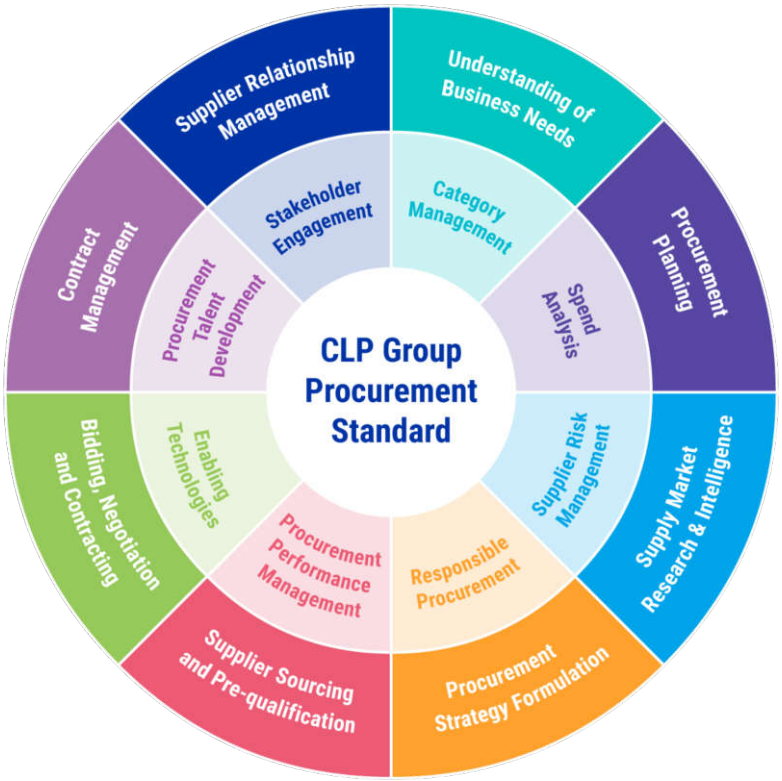
Strategies and procedures

To ensure alignment with business commitments, the **CLP Group Procurement Strategy** supports these objectives through key delivery pillars:

- development of the Group Procurement Standard (GPS)
- Group-level Category Planning, Sourcing and Supplier Management
- cross-regional delivery support on key projects, supplier engagements and improvement initiatives
- federated functional leadership, governance and oversight.

The **CLP Group Procurement Standard (GPS)** aims to drive the consistent adoption of leading practices and capabilities across the Group. It is comprised of sixteen "Process" and "Enabler" elements as illustrated in the figure below, including Responsible Procurement, Supplier Risk Management and Supplier Relationship Management.

The CLP Group Procurement Standard



Group Procurement Standard (GPS)

All procurement commitments comply with CLP policies, which include :

(i) CLP's Value Framework;

(ii) CLP Procurement Values and Principles which highlight the Procurement Missions, Governance, Commitment and Strategies;

(iii) CLP Group Responsible Procurement Policy Statement (RePPS) which highlights the Company's requirements and expectations on suppliers; and

(iv) other procurement policies that governs daily CLP operations.

These day-to-day operations are also guided by CLP's Whistleblowing Policy and Harassment-Free Workplace Policy. As a trusted partner, CLP encourages suppliers to uphold the applicable principles outlined in these two policies.

Procurement is actively involved in supporting category and project steering committees, and ensuring appropriate oversight and governance is applied for procurement decision-making. In addition, procurement commitments are made with reference to clearly defined regional Company Management Authority Manuals (CMAM).

Monitoring and follow-up

Group Category Councils have been established to oversee aggregated future procurement needs, supply market opportunities and risks and the development of procurement strategies. Procurement and business units work in close partnership to formulate sourcing strategies, providing enhanced insights into the supply market. This collaboration has increased CLP's ability in negotiation and managing risk and supplier relationships, resulting in tangible commercial benefits for the businesses.

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.

CLP designs fit-for-purpose sourcing strategies to select suppliers who will best meet its requirements and deliver the most value. Supplier selections are typically conducted through competitive tendering and based on an assessment of the supplier's ability to meet quality, health and safety, environment, delivery, innovation, sustainability and cost requirements. CLP ensures its contracts safeguard stakeholder interests, and reflect suppliers' commitments and obligations, including legal and regulatory compliance, safeguarding intellectual property rights, data confidentiality and security.

CLP segments contracted suppliers into tiers which help determine the appropriate level of governance and engagement. Segmentation is reviewed annually based on relative contract value and potential business impact, including risks in relation to supply chain and sustainability.

In line with the Corporate Risk Framework, CLP periodically assesses its exposure to strategic supplier risks through heatmaps that reveal the likelihood of failure events and their potential impact on the business. CLP then develops and implements mitigation plans with the suppliers to actively mitigate these risks.

Continuous improvement

CLP has enhanced its Supplier Relationship Management process for strategic suppliers to consistently measure delivery performance, drive continuous improvements and ensure alignment through year-round operational, business and executive reviews.

CLP reviews past performance, future business needs, as well as technology and innovation roadmaps regularly with suppliers. While suppliers' performance is measured under a structured framework, they are also invited to provide feedback to CLP to enhance candid two-way communication and continuous improvements in the long run. Specific focus on technology roadmaps and innovation will also empower CLP for future challenges.

Responsible procurement

Management approach

CLP's Responsible Procurement Policy Statement (RePPS) outlines the expectations of suppliers, their suppliers and subcontractors.

These expectations are based on four pillars:

1. Legal Compliance;
2. Respect for People – includes safe working environment, good employment practices, no discrimination and no use of child labour or forced labour;
3. Ethics and Business Conduct – includes transparency in business process, a high standard of business conduct and no conflict of interest; and
4. Environmental Stewardship – including the efficient use of resources, responsible disposal of waste, and the monitoring of environmental performance to improve over time.

CLP believes its commitment to continuous improvement, and its ongoing efforts in encouraging others to adopt best practice can create benefits throughout the supply chain, as well as building good corporate citizenship.

Download the Responsible Procurement Policy Statement

Operational responsibilities

CLP contract terms and conditions outline specific project sustainability requirements and expectations in terms of business ethics. The Company also encourages suppliers to abide by the principles stated in the RePPS and expects them to adopt similar standards and practices when doing business with the CLP Group

The CLP team leading Responsible Procurement engages with key internal and external stakeholders to promote procurement practices aimed at reducing Environmental, Social and Governance (ESG) risks and enhancing supplier capabilities to meet CLP's sustainability requirements.

Strategies and procedures

CLP takes a risk-based approach in implementing responsible procurement across the procurement lifecycle. Sustainability risks are identified and evaluated regularly at category, project and supplier levels against each of the four responsible procurement pillars. This evaluation considers:

- Country-specific risks
- Product/service-specific risks
- Industry/category-specific risks
- Legal and regulatory compliance risks
- Labour practices and sub-contracting risks
- Health and safety risks
- Governance and business conduct risks
- Environmental risk
- Brand and reputational risks.

Specifically, the risk assessment aims to help CLP manage ESG issues, such as labour practices, human rights, modern slavery, child labour, harassment, safety, environment, subcontractor management and anti-bribery along the value chain. The risk assessment result provides insights into sourcing strategies development for categories and risk mitigation for strategic suppliers.

CLP defines critical projects considering their importance to business operations, ESG risk, and contract value. For these critical projects, suppliers are assessed on their sustainability practices through various tools including self-declared questionnaires, proposal evaluation, site visits, and where subcontracting is involved, audits on subcontractors' capability to meet projects' requirements.

Quarterly risk assessments are conducted for strategic suppliers, in conjunction with supplier risk management and supplier relationship management processes. Risk mitigation plans are developed to address identified risks related to delivery performance, supply disruptions and business continuity, and sustainability within the supply chain. Regular meetings with suppliers are conducted to discuss progress of mitigation plans and explore opportunities for further improvement

Continuous improvement

Following the publishing of the ISO Guide on Sustainable Procurement (ISO 20400:2017), a review and benchmarking exercise of CLP's responsible procurement practices against those of other industry leaders were conducted in 2018. CLP Power Hong Kong takes a pilot role in reviewing the Responsible Procurement Policy Statement and developing future roadmap in 2019. The aim is to introduce more definite sustainability requirements on suppliers to further uplift suppliers' sustainability capability and enhance the following in the future:

1. Strategic approach to manage sustainability risk
2. Suppliers' sustainability risk management in supplier selection and supplier relationship management implementation
3. Analysis of sustainability risk for suppliers' location and purchasing categories
4. Suppliers' sustainability performance improvement through key performance indicators, periodical site visit or third-party assessment to assess the sustainability risk.

CLP regularly conducts workshops for contractors to uplift their safety and environmental awareness and capability. To enhance professional development of staff, workshops and training on procurement practices and supplier relationship management are conducted.

Year in review

CLP defines critical projects considering their importance to business operations, ESG risk, and contract value. In 2019, all critical projects being awarded were subject to sustainability risk assessment, which represented 71% of total procurement projects by value (91% in 2018 and 73% in 2017).

In 2019, the Group sourced from 6,362 suppliers representing a total of HK$36.73 billion– 87% of these spend are from local suppliers based in the respective Hong Kong, Mainland China, India and Australia markets. CLP will strengthen analysis of sustainability risk for suppliers' location to better manage supply chain sustainability risk even though a significant share of third-party spend has been with local suppliers. To promote CLP's core value of "Cares for the Community", a number of local non-governmental organisations (NGO) were engaged for purchases.

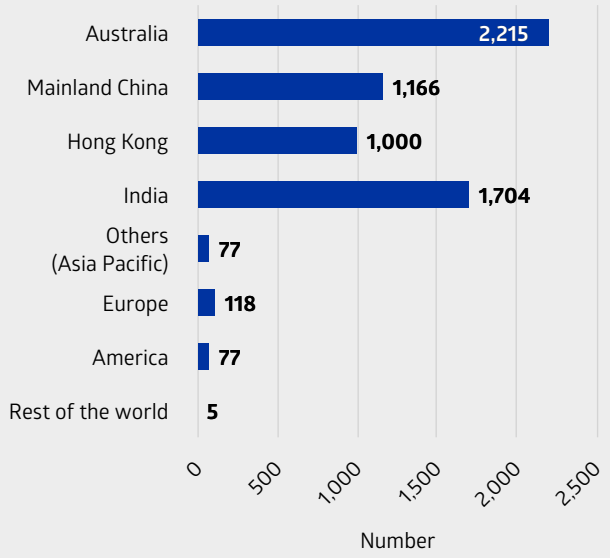
In 2019, CLP has assessed 45 strategic suppliers, which constitute 52% of the year's spend, against sustainability requirements. The CLP team also conducted follow-up site visits with five suppliers with the aim of identifying opportunities to collaborate for improving sustainability performance. All the strategic suppliers have processes and risk mitigation plans in place to manage risk for uplifting their capability continually. Service providers in Hong Kong on temporary manpower service are assessed on the accuracy and timeliness of temporary manpower's pay and working hours against CLP's requirement.

No significant risk findings related to the Responsible Procurement Policy Statement was identified in 2019 amongst these strategic suppliers

As part of the development for the future responsible procurement roadmap, CLP Power has revamped its purchasing categories sustainability risk assessment to strengthen the analysis on raw and residual risk, and labour practice risks. Pilot risk assessment covered key categories, at around 80% of 2019 spend.

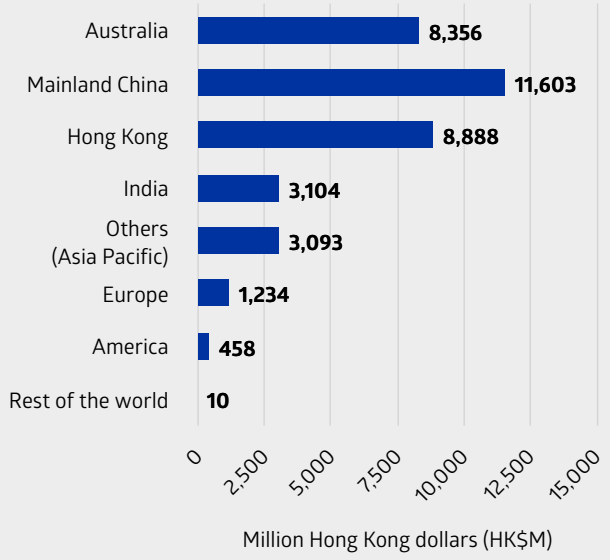
Number of suppliers by region

The CLP Group has the highest number of active suppliers in Australia and India in 2019.



Payment to suppliers by region

The majority of total payments to suppliers in 2019 is shared among the Mainland China, Australia and Hong Kong markets, similar to 2018.



Supply chain data

Responsible procurement

Supplier distribution	2019	2018	2017	2016	2015
Total suppliers by region (number)[1]	**6,362**	5,721	5,536	5,248	5,424
Australia	**2,215**	1,986	1,941	1,922	2,190
Mainland China	**1,166**	1,011	995	1,018	999
Hong Kong	**1,000**	950	899	721	696
India	**1,704**	1,476	1,443	1,366	1,311
Others (Asia Pacific)	**77**	84	70	65	66
Europe	**118**	129	112	95	100
America	**77**	78	69	54	60
Rest of the world	**5**	7	7	7	2

1 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.

Payment to suppliers	2019	2018	2017	2016	2015
Total payment to suppliers by region (HK $M)[1]	**36,746**	39,183	30,868	25,972	30,787
Australia	**8,356**	9,410	7,184	4,877	3,842
Mainland China	**11,603**	10,339	8,343	8,872	12,547
Hong Kong	**8,888**	8,917	7,264	6,301	6,985
India	**3,104**	4,597	2,527	2,355	2,990
Others (Asia Pacific)	**3,093**	4,363	4,467	3,096	3,847
Europe	**1,234**	1,170	830	415	514
America	**458**	380	241	51	60
Rest of the world	**10**	7	12	5	2

1 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.

2019 data shaded in orange have been independently verified by PricewaterhouseCoopers. The assurance scope of past years' data can be found in previous Sustainability Reports.

Glossary

Accelerator programme	A competitive programme that supports the development of startup companies by providing them access to mentorship, networking and sometimes financing opportunities.
Air emissions	The emission of air pollutants such as sulphur dioxide (SO_2), nitrogen oxides (NO_x) and particulate matter (PM).
Capacity purchase	Power generation capacity contracted under long-term agreement.
Capital investments	Includes additions to fixed assets, right-of-use assets and intangible assets, investments in and advances to joint ventures and associates, and acquisition of business.
Carbon credit	A carbon credit is a tradeable instrument which represents either (a) a permit which gives the holder the right to emit one tonne of carbon dioxide or equivalent greenhouse gas ($tCO2_e$) into the atmosphere or (b) a certificate from a project that represents the removal or avoidance of one $tCO2_e$ from the atmosphere. CLP Carbon Credits (https://www.clpcarboncredits.com) are generated from renewable sources (like wind or solar) and can be used to offset carbon emissions generated by governments, organisations or individuals.
Carbon neutral	When the GHG emissions associated with an activity or entity are balanced by carbon removal elsewhere, such as carbon credits, carbon sinks or storage. Also known as net zero carbon dioxide emissions.
Clean energy	Generally refers to power sources that add no extra carbon to the atmosphere. Non-carbon emitting energy, including renewable energy, is considered clean energy in CLP's context.
Climate Action Finance Framework (CAFF)	Launched by CLP Group in 2017 on how it proposes to finance projects with positive climate impact through two types of bonds. Energy Transition Bonds are used for financing of projects delivering significant greenhouse gas emissions reductions. New Energy Bonds are used to finance investments in renewable energy generation, improvements in energy efficiency and low carbon transport infrastructure.
Climate Vision 2050	CLP's Climate Vision 2050 sets out a series of 10-year targets from 2010 to 2050 compared to 2007 levels. These targets are based on the company's generation capacity on an equity plus long-term capacity and energy purchase basis. They consist of decarbonisation targets, measured in terms of the Group's carbon intensity, and clean energy targets, based on the renewable and non-carbon emitting energy share of CLP's generation portfolio.
Combined-cycle gas turbine (CCGT)	A technology used in gas-fired generation to enable significantly higher efficiency by utilising residual heat from gas turbine exhaust to run steam turbine and generating additional electricity.
Decarbonisation	Decarbonisation of the power sector primarily refers to the reduction in the greenhouse gas emissions from electricity generation. At CLP it is measured by the reduction in the carbon intensity, which is expressed in kilograms of carbon dioxide per kWh of electricity sent out.
Decentralised generation / distributed generation	Refers to electrical generation and storage performed by a variety of technologies of a smaller scale located close to the load they serve. In contrast, centralised generation is the large-scale generation of electricity serving multi-loads connected to the transmission network.
Demand response	Demand response programmes encourage participating customers to commit to short-term reductions in electricity demand, helping energy suppliers to keep the grid running optimally during high load periods.
Design thinking	Design Thinking is a human-centred, problem-solving methodology that focuses on the needs of users, enabling organisations to create better products, services and processes that solve users' pain points.
Digitalisation	The application of new information technologies including artificial intelligence and data analytics to help electricity utilities develop new customer-centric services and improve operations.
Dispatchable energy	Refers to power sources that can be used on demand and dispatched at the request of power grid operators according to market needs.

Distributed energy	Includes power generated from sources such as solar panels and wind turbines located close to the users, as well as controllable loads or storage such as electric vehicles and batteries.
Electricity sent-out	Gross electricity generated by a power plant less self-generated auxiliary power consumption, measured at connecting point between generating unit and transmission line.
Energy purchase	Electricity purchased from assets not owned by CLP to meet customer demand as per a long-term contractual agreement.
Energy transition	Transformation of the global energy sector from fossil-fuel based energy systems to low- or zero-carbon sources.
Energy transition enablers	Non-generation products or services that facilitate the energy transition, including energy storage, transmission and distribution, electric vehicle charging points and smart meters, amongst others.
Equity basis	An approach set out by the GHG Protocol Corporate Standard for an organisation to consolidate GHG emissions for the purpose of accounting and reporting GHG emissions. On this basis, the organisation accounts for GHG emissions from operations according to its equity share in the operations.
Feed-in Tariff (FiT)	Payable by Hong Kong power companies under the SoC Agreement to purchase electricity from approved renewable energy projects. Find out more at http://www.clp.com.hk/en/community-and-environment/renewable-schemes/feed-in-tariff.
Flue gas desulphurisation (FGD) facility	Equipment used to remove sulphur oxides from the combustion gases of a boiler plant before discharge to the atmosphere.
Generation capacity	The maximum amount of power that a generator is rated to produce. Also known as installed capacity or nameplate capacity.
Greenhouse gas (GHG)	The emission of gases that contribute to the greenhouse effect causing a changing climate. CLP's GHG emissions inventory covers the six GHGs specified in the Kyoto Protocol. Nitrogen trifluoride (NF_3), the seventh mandatory gas added under the second Kyoto Protocol, was was deemed immaterial to CLP's operations after an evaluation. The GHG Protocol Corporate Standard classifies an organisation's GHG emissions into three 'Scopes'. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 are indirect emissions (not included in Scope 2) that occur in the value chain of the organisation.
Intergovernmental Panel on Climate Change (IPCC)	The United Nations body for assessing science related to climate change. IPCC assessments provide a scientific basis for governments at all levels to develop climate related policies, and they underpin negotiations at the UN Climate Conference – the United Nations Framework Convention on Climate Change (UNFCCC). Find out more on https://www.ipcc.ch.
International Energy Agency (IEA)	An autonomous organisation which works to ensure reliable, affordable and clean energy for its 30 member countries and beyond. Find out more on https://www.iea.org.
Megatrends	Large, transformative global forces that define the future by having a far-reaching impact on business, economies, industries, societies and individuals. A megatrend is distinguished from other trends in that it cannot be stopped or significantly altered, even by powerful actors such as governments. Megatrend analysis is an important tool for companies aiming to drive sustainable growth as competition increases and new disruptive ideas and concepts affect entire industries.
Microgrids	Localised networks with generation, energy storage and load entities, that can operate in tandem with an existing grid or independently. They can potentially be deployed to meet the energy needs of remote areas cost-effectively, forgoing the expenses of transmission grids.
Non-carbon energy / non-carbon emitting energy	Energy from power sources that add no extra carbon to the atmosphere, such as nuclear and renewable energy.
Offshore LNG terminal	Offshore LNG terminals receive cargos of liquified LNG for processing into fuel. The Floating Storage and Regasification Unit (FSRU) is where the LNG cargo is unloaded, stored and regasified for transport to a power station or other users.

Operational control basis	An approach set out by the GHG Protocol Corporate Standard for an organisation to consolidate GHG emissions for the purpose of accounting and reporting GHG emissions. On this basis, the organisation accounts for 100 percent of the GHG emissions from operations over which it has operational control, but does not account for GHG emissions from operations in which it owns an interest but has no control.
Particulate matter (PM)	Microscopic solids or liquid droplets in the air.
Phase out coal-fired generation capacity	In CLP's context, phasing out coal-fired generation capacity refers to (a) the retirement and closure of a coal-fired power asset; (b) the move away from a build-operate-transfer coal-fired project before the end of the contract term or according to the terms of the project; or (c) the divestment from a coal-fired asset.
Power Purchase Agreement (PPA)	A long-term electricity supply agreement specifying deliverables such as the capacity allocation, the quantity of electricity to be supplied and financial terms.
Pumped storage	Method used for large-scale storage of power. During non-peak times, electricity is used to pump water to a reservoir. During peak times, the reservoir releases water for hydroelectric generation.
Renewable energy	Energy that is generated from renewable resources, which are naturally replenished on a human timescale, including sunlight, geothermal heat, wind, tides, water, and various forms of biomass.
Renewable Energy Certificates (RECs)	RECs represent all the environmental attributes associated with electricity produced by local renewable sources in Hong Kong including solar, wind and waste-to-energy power projects, purchased or generated by CLP.
Scheme of Control Agreement (SCA)	The SCA with the Hong Kong Government provides a regulatory framework for the city's electricity industry, enabling CLP Power Hong Kong to operate the facilities and plan new investments to meet the electricity demand of customers, as well as environmental objectives.
Science-based target	A target for greenhouse gas reductions that is in line with the goals of the Paris Agreement to limit global temperature increase to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.
Science Based Targets initiative (SBTi)	A collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UN Global Compact) and is one of the We Mean Business Coalition commitments. The initiative defines and promotes best practice in science-based target setting, offers resources and guidance to reduce barriers to adoption, and independently assesses and approves companies' targets. Find out more on https://sciencebasedtargets.org.
Sectoral Decarbonisation Approach (SDA)	The SDA of the Science Based Targets initiative allocates a 2°C carbon budget to different sectors. This method takes into account inherent differences among sectors, such as mitigation potential and how fast each sector can grow relative to economic and population growth. Within each sector, companies can derive their science-based emission reduction targets based on their relative contribution to the total sector activity and their carbon intensity relative to the sector's intensity in the base year.
Sustainable Development Goals (SDGs)	The 17 SDGs, adopted by all United Nations Member States in 2015, are the blueprint to achieve a better and more sustainable future for all. Find out more on https://sustainabledevelopment.un.org.
Task Force on Climate-related Financial Disclosures (TCFD)	The TCFD seeks to develop recommendations for voluntary climate-related financial disclosures that are consistent, comparable, reliable, clear, and efficient, and provide decision-useful information to lenders, insurers, and investors. The TCFD's members were chosen by the Financial Stability Board to include both corporates and users of disclosures from across the G20's constituency covering a broad range of economic sectors and financial markets. Find out more on https://www.fsb-tcfd.org.
World Business Council for Sustainable Development (WBCSD)	The World Business Council for Sustainable Development is a CEO-led organisation of over 200 leading businesses and partners working together to accelerate the transition to a sustainable world. Find out more on https://www.wbcsd.org.

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