CLP 中電



2022 Sustainability Report

Towards a Sustainable Energy Future

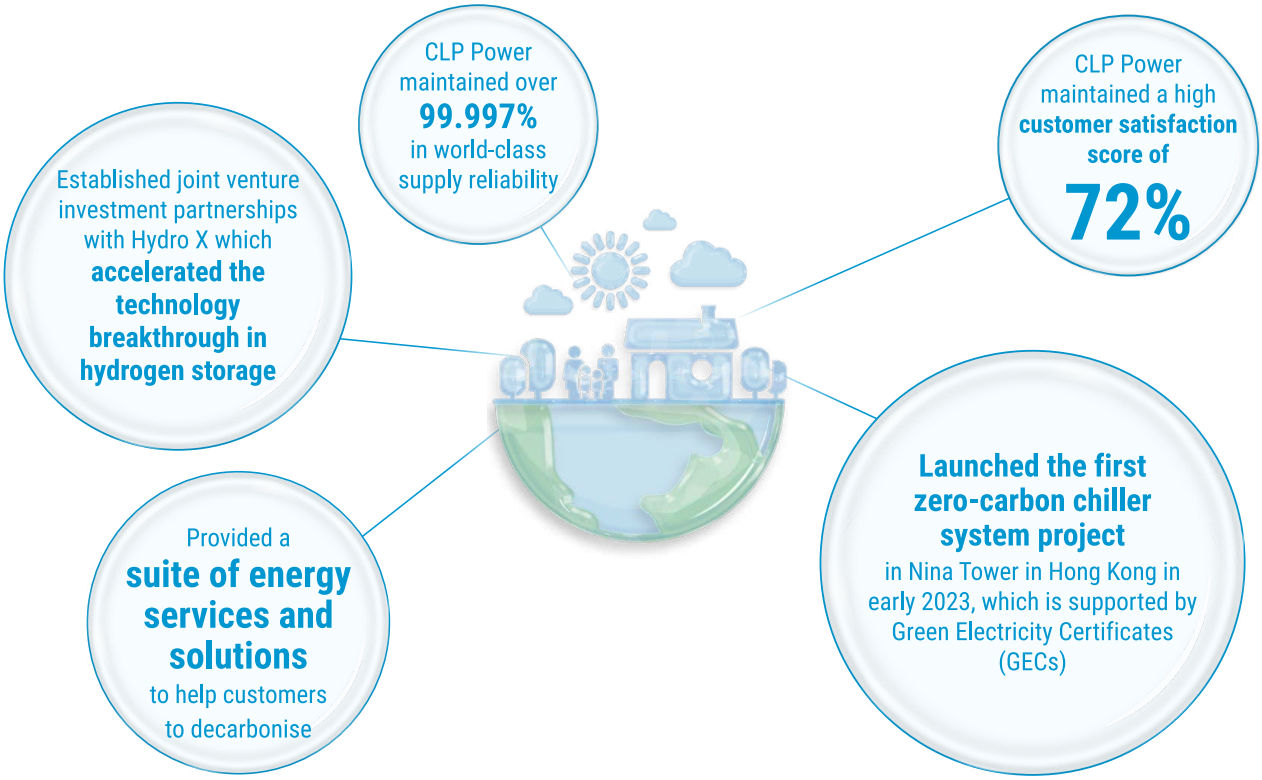
Stock Code: 00002

Customers

Overview

Stakeholders' areas of interest	Relevant material topics
• Access to reliable energy • Asset management • Energy services and solutions • Customer privacy • Customer satisfaction • Security management • Physical security • Cyber security • Emergency and crisis management	**Bolstering energy security and reliability** • Reliable and reasonably priced energy **Aligning business activities with customers, community and employee expectations** • Customer-facing energy solutions **Reinforcing resilience in a changing operating environment** • Cyber resilience and data protection • Building resilience in the face of climate change and an evolving business environment

Outcome for stakeholders



Customer portfolio

CLP operates retail businesses in Hong Kong and Australia, where the local market structures, regulatory requirements, electricity demand, customer preferences and cultural norms differ significantly. Overall, the number of customer accounts in both markets remained stable in 2022, with continued gradual growth reported in Hong Kong from the residential sector.

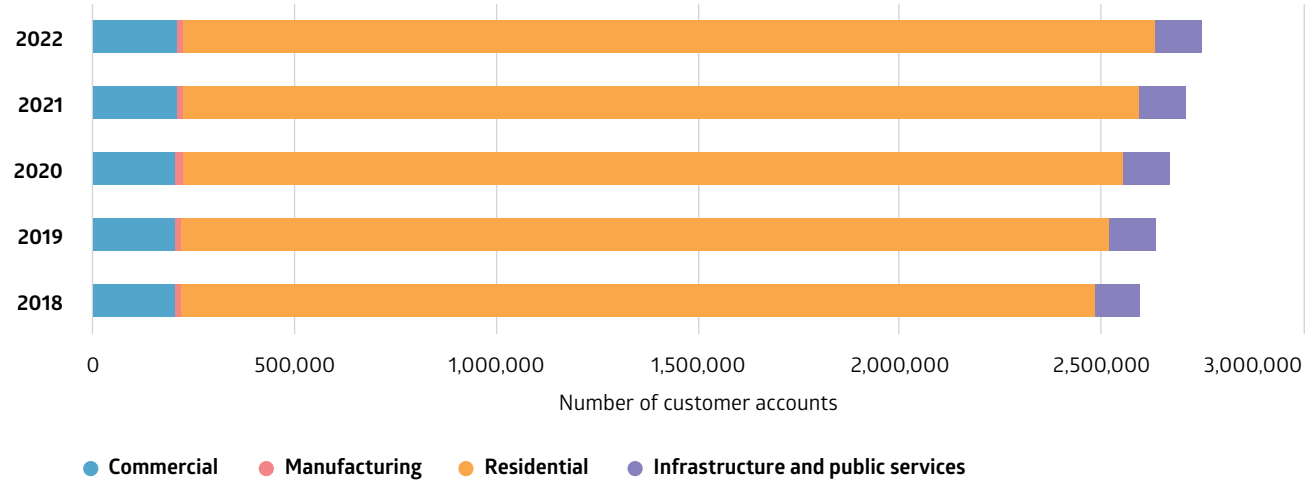
SASB reference: IF-EU-000.A; GRI reference: EU3

CLP Power Hong Kong Limited (CLP Power) is the sole electricity provider for Kowloon, the New Territories and most of the outlying islands of Hong Kong. It serves close to 2.8 million customers and about 80% of Hong Kong's population. Total electricity sales for 2022 were 34,824GWh.

While 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, as well as new local railway infrastructure projects that will improve mobility in Hong Kong. In addition, as Hong Kong is targeted as a prime location for data centres, there is a need to ensure highly reliable power supplies to support and facilitate the development of the energy-intensive data centre industry essential to a modern economy.

Hong Kong customer breakdown

The number of customer accounts continued to grow gradually over the last five years, mainly from the residential sector.

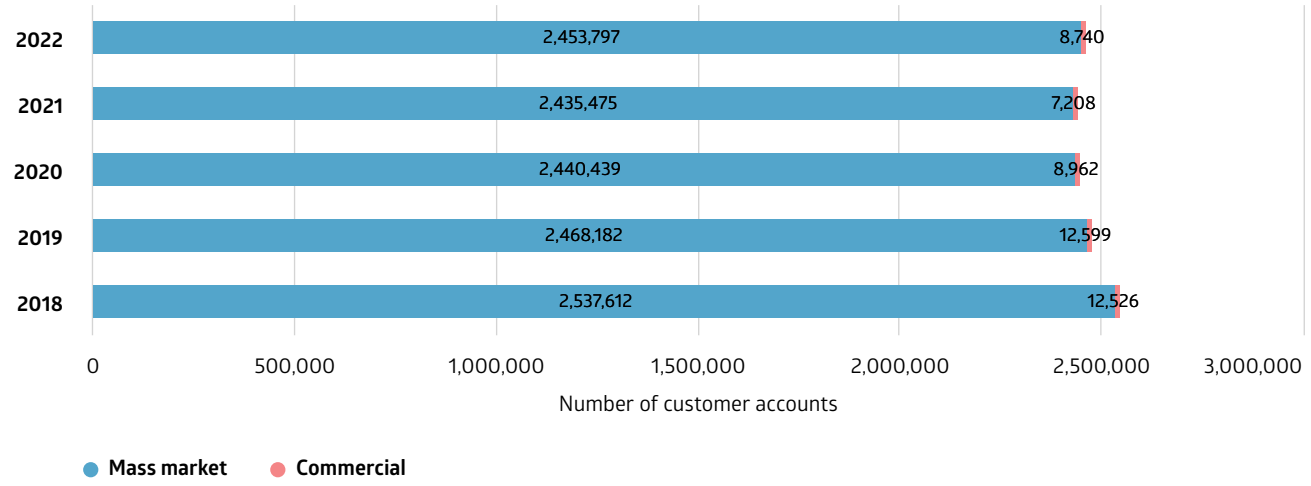


Hong Kong customers breakdown (number of customer accounts)	2022	2021	2020	2019	2018
Commercial	212,251	210,821	208,150	206,792	206,073
Manufacturing	17,191	17,427	17,540	17,575	17,966
Residential	2,407,225	2,369,217	2,333,901	2,301,200	2,265,151
Infrastructure and public services	115,404	113,956	112,245	110,841	107,893

EnergyAustralia sells electricity and gas to retail 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 2022, EnergyAustralia's number of retail customer accounts increased after four consecutive years of slight decline.

Australian customer breakdown

In comparison to 2021, EnergyAustralia's number of customer accounts have grown by about 20,000 in both mass market (an increase of about 18,300) and commercial (about 1,500) categories in 2022.



Access to reliable energy

Our approach

Maintaining high availability and reliability of electricity supply is critical for our corporate and retail customers to support their business operation and daily life respectively. Availability and reliability are two key performance metrics that track CLP's ability to meet its commitments to customers.

GRI reference: EU10

Goals and targets

For generation assets, CLP monitors the availability factor in terms of 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% to 90% and CLP aims to maintain an availability range of 90% and above for newer assets.

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 performance variance is analysed and corrective action is taken where appropriate.

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. In other words, it provides generation, transmission and distribution of power, as well as retail services. CLP Power is regulated by the Hong Kong SAR Government under the Scheme of Control Agreement (SCA) which requires the Company to provide a sufficient and reliable electricity supply at a reasonable price and in an environmentally responsible manner.

In Hong Kong, CLP Power uses various measures to maintain high supply availability and reliability. These measures include:

- Upgrading generation and network facilities to meet new electricity demand;
- Maintaining sufficient generating capacity to meet forecast demand as well as planned and unforeseen outages;
- Developing an additional and economically viable gas supply option that can strengthen energy security through access to competitive gas supplies from global markets using Floating Storage and Regasification Unit (FSRU) technology;
- Adopting advanced technology such as smart grid and implementing demand-side management measures to reduce demand growth and improve utilisation of existing assets;
- Improving the quality of the power supply to minimise voltage dips;
- Enhancing power systems to minimise the impact of adverse weather; and
- Ensuring the workforce is committed and well-trained to maintain and operate the system, and provide support and emergency services around the clock.

Across the Group, CLP promotes organisational learning and builds technological capacities to ensure availability and reliability. Insights learned from regional experiences are shared among functions to plan for a consistent management framework. This practice facilitates better portfolio management and reduces risks to the Group's operations as a whole.

Current innovative projects, promoting availability and reliability, are being pursued in the areas of robotics, asset health, video analytics, energy storage, building information modelling and automation. These projects are initiated by disruptive global start-ups or CLP's own engineers coming up with new innovations through operational experience.

Transmission network

To cope with the territorial development of Hong Kong, CLP reviews future transmission network developments annually. It studies the latest system maximum demand forecast, area load growth, infrastructure development and generation development, and plans accordingly.

Annual maintenance and improvement programmes have been developed for major transmission assets based on the analysis of current conditions and performance of the assets, levels of investment and risk.

The power supply network is most exposed to damage from extreme climate events, potentially leading to service disruptions. In response, CLP continues to improve the reliability of its power supply network through a range of measures.

Find out more in the 2022 Climate-related Disclosures Report

In India, Apraava Energy has adopted the philosophy of predictive and corrective maintenance of its transmission assets. This includes pre-emptive check-ups and assessments on operational clearances, ensuring assets are well structured and maintained with proper setup, hardware and security. Frequent patrolling is carried out for conducting assessments for landscape and assets. The results are used to identify defects and plan for shutdowns if needed.

A mobile application is now used by Apraava Energy for the real-time tracking of site patrols. This shortens the response time for any rectifications. Thermovision cameras are used to help the team find the defect through heat mapping.

The use of drones for site patrolling is under planning, though a ground team will be retained at strategic locations to ensure a speedy response to any damage to critical assets.

Initiatives and progress

In Hong Kong, CLP maintained its world-class supply reliability of over 99.997%. This is a higher rating than that in other major international cities such as London, New York and Sydney.

SASB reference: IF-EU-240a.3, IF-EU-240a.4, IF-EU-550a.2, IF-EU-000.C; GRI reference: 203-1, EU4, EU12, EU26, EU27, EU28, EU29, EU30

CLP's transmission and distribution network in Hong Kong serves about 80% of the population of the city overall and close to 100% of the population within the Company's service area.

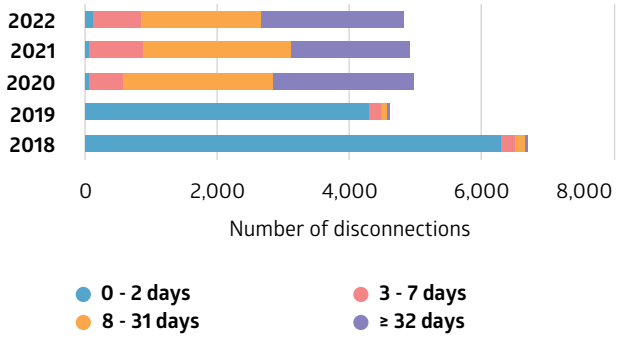
At the end of 2022, CLP Power had approximately 16,678km of circuits at medium or higher voltage. In addition, there were 240 primary and 15,413 secondary substations operating in Hong Kong. As of 2022, the average network loss for the past five years was 3.51%, slightly lower than the five-year average of 3.61% reported in 2021.

To achieve these percentages, a set of universally recognised supply reliability performance indicators is used from the Institute of Electrical and Electronics Engineers standard (IEEE 1366-2012) to monitor system performance. CLP's performance against these indicators is reported annually to the Hong Kong Government.

In India, with the operations and maintenance strategy in place, Apraava Energy has achieved 100% availability for Satpura Transco Private Limited asset and 99.86% availability for Kohima-Mariani Transmission Limited asset for transmission of electricity to customers in 2022.

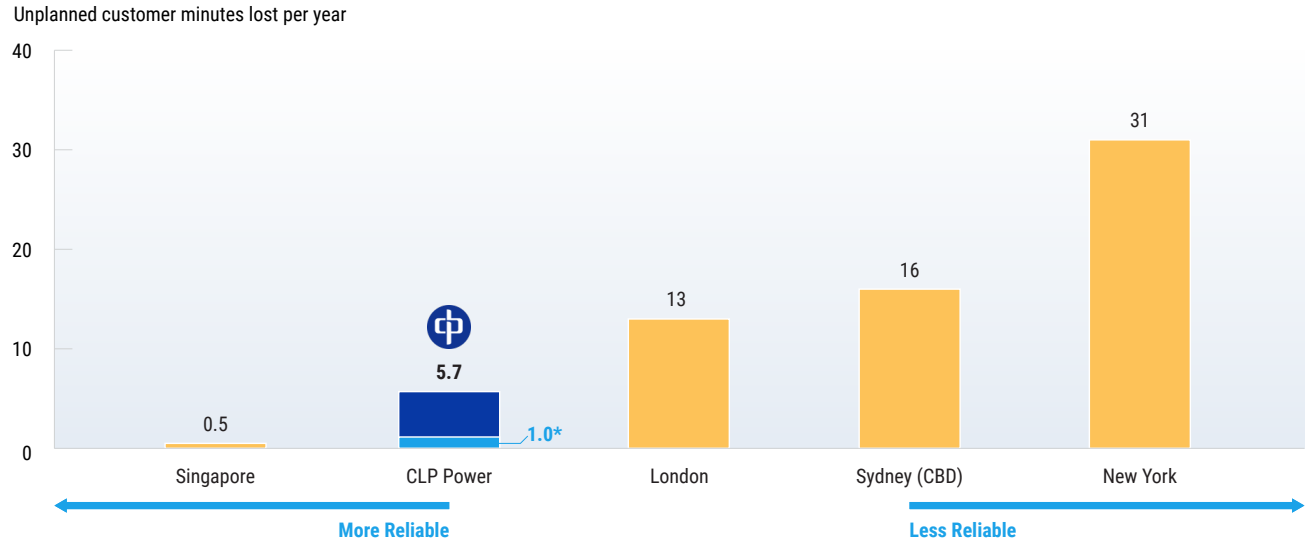
Disconnections for CLP Power Hong Kong Limited

The total number of disconnections for Hong Kong retail businesses was 4,859 cases in 2022, a similar level to 2021 with 4,943 cases.



Total disconnections for Hong Kong retail business	2022	2021	2020	2019	2018
0 - 2 days	144	105	98	4,333	6,319
3 - 7 days	739	796	506	170	225
8 - 31 days	1,817	2,251	2,274	101	168
≥ 32 days	2,159	1,791	2,121	39	10

Comparison of reliability levels between cities



Notes:
1 *CLP Power's unplanned customer minutes for 2020–2022 average was 5.7 minutes. If the impacts derived from the Yuen Long cable bridge fire incident were excluded, the three-year average was 1.0 minute.
2 2019–2021 average for all other cities.
3 There are no overhead lines in Singapore.

Supply reliability performance indicators and results for CLP Power

Indicator	Result
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 (2020–2022) was 0.27, meaning customers experienced a power interruption approximately once in four years during this period. This was higher than last year's three-year rolling average of 0.21. It is mainly due to the impact of a cable bridge fire incident in Yuen Long.
System Average Interruption Duration Index (SAIDI) The average duration of interruptions each customer may encounter in a given year.	• The three-year average SAIDI (2020–2022) was 0.30 hours, including both planned and unplanned interruptions. This was higher than last year's three-year rolling average of 0.23. It is mainly due to the impact of a cable bridge fire incident in Yuen Long
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 (2020–2022) of unplanned CML was about 5.7 minutes, which was higher than the 0.99 minutes recorded last year. It is mainly due to the impact of a cable bridge fire incident in Yuen Long. CLP Power maintains a world-class supply reliability of over 99.997% in Hong Kong, which is higher than other major international cities as shown in the diagram above.

Asset management

Our approach

Asset management refers to how CLP manages and utilises its assets to provide reliable, reasonably priced and low-carbon electricity services to customers and communities. CLP has developed and adopted an Asset Management System (AMS) Standard. It is a framework of standardised practices which manage assets across their entire lifecycle, from the planning stage to decommissioning.

Strategies and procedures

Developed in 2016, CLP's AMS Standard standardises essential practices in managing assets across the Group and ensures best practice. It accords with the ISO 55000 series of standards for asset management systems, as well as the ISO 31000 standards for risk management.

The AMS Standard is integrated into CLP's Health, Safety and Environment (HSE) Management System and Project Management Governance System (PMGS) Standards to comprehensively manage the complete lifecycle of an asset.

The AMS contains five key stages and 10 asset management elements, as illustrated in the diagram below.

Overview of the CLP asset management system



Monitoring and follow-up

CLP's customised Group Operations Information System (GOIS) is used to compile operational data on adherence to the AMS Standard. It features built-in data collection, a data compilation and an approval sequence and dashboard and reporting functions. It follows the CLP Non-Financial Data Reporting and Assurance Standard to ensure robust data governance. Relevant staff at the asset, regional and Group levels have responsibility for upholding the standard.

Continuous improvement

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.

CLP constantly identifies opportunities to improve the operational efficiency of its assets to help meet the increasingly stringent regulations on emissions and fuel efficiency in certain jurisdictions. There are also increasing improvement opportunities arising from innovation and optimisation, particularly from data analytics.

Initiatives and progress

In 2022, the consumption of coal for power generation decreased by 7.5% and gas increased by 6.3% compared with 2021. Accordingly, electricity sent out from coal assets decreased by 11.3% and gas assets increased by 5.7% (on an equity plus long-term capacity and energy purchase basis).

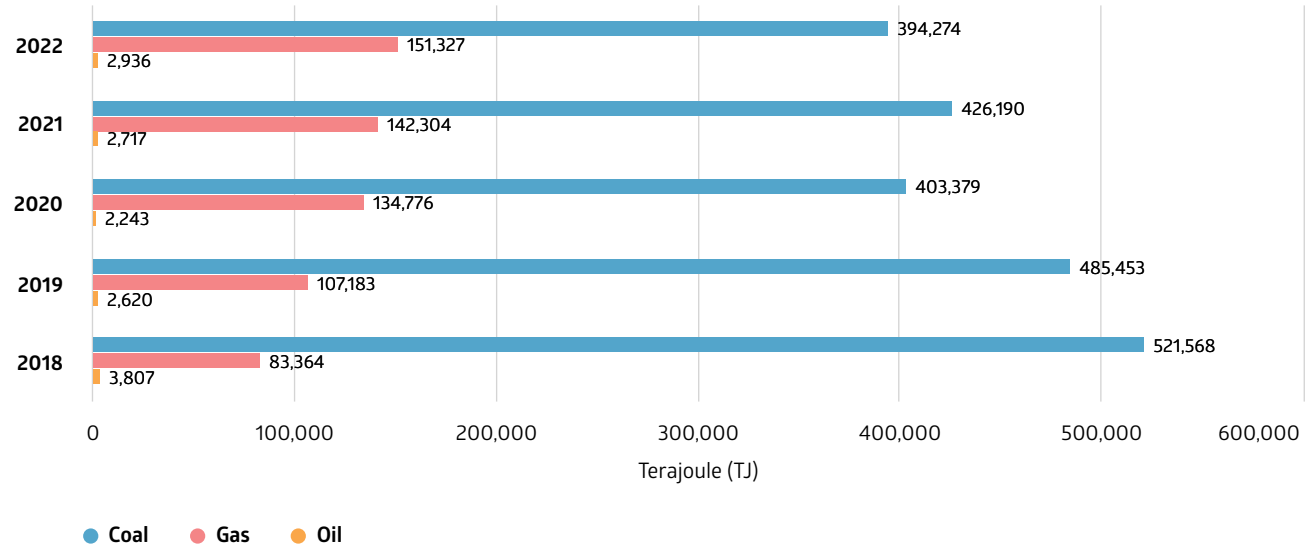
SASB Reference: IF-EU-000.D; GRI reference: 301-1, 302-1, 302-3, 302-4, 302-5, 303-5, 305-1, 305-2, EU11

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

Download CLP's asset performance statistics

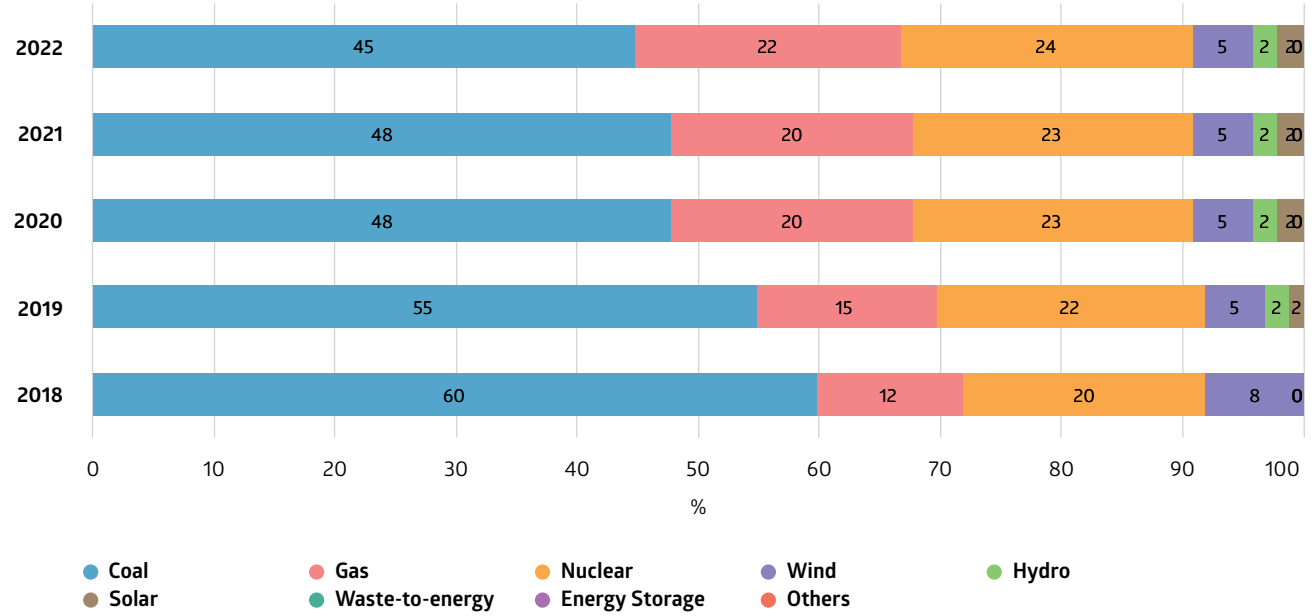
Annual Fuel Consumed for Power Generation

Compared to 2021, there was an overall decrease in fossil fuel consumption for power generation in 2022, with significant reduction in coal consumption.



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

CLP's energy sent out from all asset types decreased to 87,360 GWh in 2022 compared to 91,183 GWh in 2021. High fuel prices due to the global energy crisis reduced energy sent out from coal assets to 45% and increased the energy sent out from the gas (22%) and non-carbon energy portfolio (33%). In addition, a 350MW unit at the coal-fired Castle Peak A Power Station was put in reserve which further reduced energy sent out from coal assets.



1 Numbers have been subject to rounding. Any discrepancies between the total shown and the sum of the amounts listed are due to rounding.

Energy services and solutions

Our approach

CLP actively engages its customers and offers a suite of energy services and solutions to meet different customer needs in the evolving market landscape. Leveraging its digital capability, CLP applies new technologies to drive customers' behavioural change on energy consumption.

Strategy and procedures

Drawing on our long expertise in the power industry, we are implementing various initiatives to encourage residential and business customers and the community at large to use energy more efficiently. Essentially we are asking them to change their behaviour so that they can save more energy and help protect the environment.

CLP seeks to change people's habits and encourage them to conserve energy through:

- Equipping customers with tools and technical support;
- Supporting enablers to make greater energy efficiency possible;
- Providing customers with information and energy-saving tips; and
- Educating the public.

Goals and targets

The CLP Power Customer Service Quality Policy includes a commitment to support customers in using CLP products and services more efficiently and effectively.

In Hong Kong, CLP Power is regulated by the Scheme of Control Agreement (SCA). The SCA (2018–2033) includes:

1. **Performance targets:** Under the current SCA, targets are set to drive the performance of the CLP Eco Building Fund, the CLP Electrical Equipment Upgrade Scheme and energy audits in terms of energy saved per year, number of buildings or customers supported, etc.
2. **Demand response programmes:** This enables commercial and industrial customers to lower the overall system demand, resulting in a lower requirement for investment in new generation units in the long term. The program leverages artificial intelligence (AI) technology, developed by CLP strategic partner Autogrid to help manage the demand reduction. 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:** CLP must achieve at least 4% of energy savings on the basis of average annual sales within a five-year period in order to earn incentives issued under the SCA. More incentives will be given if the energy saving reaches 5%.

Read more on CLP Power's SCA performance

Initiatives and progress

In addition to its SCA obligations, CLP harnesses its digital capability to offer a range of customer-facing solutions and energy services to meet evolving customer expectations.

GRI reference: 2-6, 302-5

To transform into a Utility of the Future, in 2022 CLP merged its Group Innovation team and the traditional technology functions to form the new CLP Digital team. The move accelerated CLP's digital transformation for new energy solutions and paved the way to meet the future demand on innovation talents.

The dedicated team expanded to over 400 staff in 2022, with competence in digital services and solutions, and data services. Coupled with CLP's core energy expertise, the new CLP Digital team will leverage the learnings from the previous Group Innovation and Technology teams and rethink operations through a digital lens, especially in areas of generation, grid, backend operations, sustainability, customer engagement and decarbonised customer base.

CLP's investment and venture portfolio continued to support the Company in developing its energy businesses, generating opportunities in growth markets, delivering strategic value and realising financial value. To drive growth while diversifying risks, CLP adopted a mixed asset approach in building a diversified portfolio as well as exercised a prudent portfolio management approach through in-depth analysis and proactive management.

To enhance its service offerings, CLP also invested in technology licensing, supported accelerator programmes such as the Phoenix Programme, Free Electrons and partnered and co-created customer-facing solutions with suppliers, customers or other partners. These efforts have helped CLP develop a suite of end-to-end products and services along the electric utilities value chain. They are summarised in the tables below.

Improving energy efficiency

Products and services	Updates in 2022
Cooling-as-a-Service (CaaS) Cooling systems are usually the largest power consumer in a building. CLP provides targeted solutions, via chiller retrofitting and replacement services, CaaS and district cooling solutions, to further increase the energy efficiency of buildings. Property managers can focus on providing services to their tenants while CLP can leverage energy and engineering expertise to help reduce the building's carbon intensity, save operational costs and enhance energy consumption efficiency.	• In 2021 CLP China was engaged by Guangzhou Po Park Shopping Plaza to comprehensively upgrade its centralised cooling system and provide cooling services. The upgrade was successfully completed in April 2022 with a new fleet of high-efficiency chiller units installed and Smart Energy Connect Chiller Optimisation Solution in place. The solution will help improve the customer's cooling energy efficiency by over 50%. • Using data collected from environmental sensors and with reference to equipment conditions, chiller settings are continuously adjusted to optmise the chiller performance under different environmental conditions. The solution has been adopted in several projects in Hong Kong and Mainland China. For example, this solution was deployed at a large retail complex in Chengdu, where 16% of energy was saved. • CLP*e* partnered with Shui On Group for the first CaaS project in Hong Kong in 2023. A new cooling plant with PlantPRO system and an AI management system will be installed at Shui On Centre in Wan Chai to enhance its energy efficiency. The new freshwater-cooled chiller plant will have a maximum capacity of 2,100 refrigeration tonnes and is expected to reduce electricity consumption by more than 30% compared with the existing seawater-cooled chiller plant, reducing 370 tonnes of carbon dioxide emissions a year. • In February 2023, CLP*e* signed a Build-Own-Operate-Transfer (BOOT) agreement with Chinachem Group to build Hong Kong's first zero-carbon chiller system at Nina Tower. Under the agreement, CLP*e* will provide design and engineering work to convert the existing air conditioning system into an energy-efficient water-cooled system controlled by the PlantPRO system. Read more in the case study on how CLP*e* works with Chinachem Group to drive towards carbon neutrality goal.

Products and services	Updates in 2022
Solar-as-a-Service (SaaS) Solar photovoltaics (PV) systems convert solar energy into electricity to support energy demand and allow customers to feed electricity back into the grid.	• In August 2022, CLP*e* commenced a 1.24MW distributed solar system at the headquarters of MTR Shenzhen in the Longhua District. More than 2,000 solar panels went into full operation and is expected to generate 1,300MWh of renewable energy per year, and reduce 16,000 tonnes of carbon dioxide emissions associated with electricity during the contracting period. • In 2022, CLP*e* signed 14 agreements with Link Properties Limited to build solar photovoltaic system on the rooftop of its shopping centres. Some of the systems have begun operation and generating renewable energy. • CLP co-developed a solar panel system with Dairy Farm International Holdings on the rooftop of the Wellcome Fresh Food Centre in Hong Kong CLP offers one-stop solar services from system design to construction, and operations and maintenance. This is the largest solar energy system in Hong Kong's retail sector under CLP's Feed-in Tariff scheme.
Integrated Energy-as-a-Service (IaaS) With its extensive energy expertise, CLP*e* customises energy-efficient solutions for commercial and industrial customers by providing design, construction, operation and maintenance services of onsite integrated energy stations.	• In December 2022, CLP*e* entered a Build-Operate-Transfer (BOT) agreement with Guangdong Weixin Biological Technology Limited to invest, build and run an integrated energy station which provides chilled water, steam and compressed air to the company's bio-intellectual industrial park in Qingyuan, Guangdong Province. The project will significantly improve the park's operational and energy efficiency and help develop it into a smart and low-carbon park.
Battery Energy Storage System (BESS) as a Service Tailor-made BESS solutions can greatly improve business performance with safe, efficient and secure energy storage. CLP*e* provides a one-stop service from design, build and implementation. It works with customers to develop fully integrated energy storage solutions that help them meet their goals.	• CLP*e* integrated a BESS at the Construction Industry Council – Zero Carbon Park (CIC-ZCP) in Kowloon Bay, the first zero-carbon building in Hong Kong, which also has a public park featuring renewable energy displays. The BESS is connected to different renewable energy installations featured in the park. The BESS stands in for the renewable energy system at CIC-ZCP during its downtime and peak periods, while also minimising the risk of system instability during maintenance.
Energy efficiency improvement for buildings Buildings contribute significantly to Hong Kong's energy demand. CLP offers various subsidies to support customers' energy-saving retrofitting works. • CLP Eco Building Fund: The fund provides subsidies for energy efficiency improvement works for residential, commercial and industrial buildings. • CLP Electrical Equipment Upgrade Scheme: The scheme for business customers provides subsidies to customers, especially SMEs, to replace or upgrade their lighting and air-conditioners to more energy-efficient models.	• The CLP Eco Building Fund provides HK$100 million a year to subsidise a target number of 400 residential blocks and C&I buildings to carry out improvement works to enhance the energy efficiency of the communal areas. The initiative aims to save 48GWh of energy per year. • In 2022, customers saved around 50GWh of electricity from over 650 buildings from Eco Building Fund. • Since the Electrical Equipment Upgrade Scheme launch in 2019, over HK$76 million in subsidies has been offered to C&I customers for replacing or upgrading their electrical equipment to more energy-efficient models as of 2022.
Energy efficiency improvement for businesses CLP Power partners with financial institution to offer flexible and innovative financing loan solutions to businesses.	• In 2022, CLP Power partnered with DBS Bank (Hong Kong) Limited to offer industry-leading sustainable financing solutions to SMEs which allow them to invest in enhancing energy efficiency and expand their businesses sustainably. The solutions are pegged to CLP Power's energy-saving services, which include sustainability performance targets measured with reference to the assessment methodologies under CLP Power's present energy-saving funding schemes.

Products and services	Updates in 2022
Peak demand management To facilitate long-term reliability of electricity supply, CLP works with customers to manage electricity demand and incentivise reduced consumption during peak demand. Initiatives include: • Demand Response programmes are offered to C&I and selected residential customers in Hong Kong to lower overall system demand, resulting in lesser need to invest in new generation units. • EnergyAustralia's PowerResponse comprises a residential demand response and contracted demand response programme for commercial customers. PowerResponse secures energy capacity which can be called upon within short timeframes for events where availability in the national electricity market fall to critical levels.	• In Hong Kong, peak power demand was reduced by over 130MW because of the activation of CLP Power's demand response programmes on 25 July 2022, when electricity demand reached a new peak of 7,720MW. More than 405,000 of CLP Power's commercial, industrial and residential customers were incentivised as part of the programme. • EnergyAustralia's contracted capacity of PowerResponse is currently 246.4MW, with more than 340,000 residential customers participating.
Energy management technology Innovations in technology will continue to play a large role in improving energy management and efficiency. CLP links customers to a host of solutions and products to monitor, optimise and automate their energy usage and consumption patterns. Solutions and products available to customers include: • Launched in 2019, CLP's Smart Energy Connect (SEC) is a product development platform designed to nurture and validate energy innovations in supporting businesses' decarbonisation journey by optimising energy efficiency and reducing carbon footprint. SEC's solutions cover the whole value chain from energy supply to energy consumption, including innovations for carbon-free energy, grid modernisation, power storage, electric vehicles (EV), building energy management and carbon offsetting. • A mass rollout of smart meters to all CLP Power customers, from 2018 to 2025, supports Hong Kong's Smart City transformation. • Echo Group supports the Company's large commercial, industrial and business customers achieve their saving targets and environmental benefits through specialist solar and LED products. • ResponsePro provides commercial and industrial customers with advance notice and flexibility on whether they participate in demand response events. Participating customers are rewarded with a fixed rate per kWh.	• Sales of smart energy technologies increased more than 45% year-on-year on the SEC platform through CLPe in 2022. • In 2022, SEC's PlantPRO system was installed and deployed in 10 customer properties. The AI management system optimises chiller plant performance. • One more leading Hong Kong property developer adopted the Building Portfolio solution. This cloud-based solution launched by SEC enables the user to manage energy and water consumption of multi-buildings in a single customisable platform. Its AI and analytics platform is deployed across multiple buildings to help identify energy-saving potential and streamline the work of facility managers. It is also an effective tool for measuring and verifying the quantitative benefits of energy conservation measures. As of 2022, there are now more than 90 buildings in Hong Kong managing their energy using the Building Portfolio solution. • More than 10 C&I customers adopted SEC's EC Workspace solution in 2022. The EC Workspace solution helps customers to maximise space efficiency, reduce operating costs, improve employee's productivity and wellbeing through automating the usage of electrical equipment based on environmental data provided by various IoT devices. • CLP invested and formed a strategic partnership with Venturous Group Limited (Venturous), an investor, business builder and operator of Smart Citytech™ infrastructure companies in Mainland China. The partnership will explore business opportunities and potential investments in smart energy technologies in the Greater Bay Area. It combines the capabilities of CLP and Venturous in low-carbon energy and digitalisation to meet growing demand for sustainable energy solutions in the fast-growing region. • CLP Power's customers' conventional meters are being upgraded to smart meters in phases from November 2018 to 2025. Despite a shortfall in the supply of new meters resulting from the global supply chain disruption, CLP Power made further progress with its plan to replace traditional meters with smart meters for all residential and SME customers in Hong Kong by 2025. By the end of 2022, more than 1.78 million smart meters had been connected, covering 63% of the meters in CLP Power's service area. CLP Power's goal of replacing all its customers' conventional electricity meters by 2025 remains unchanged.

Products and services	Updates in 2022
	• In Australia, over 0.61 million smart meters were connected for customers in 2022.
Energy audits CLP provides a free energy audit and various consulting services to commercial and industrial (C&I) customers to help them understand their energy needs and identify opportunities to reduce energy use and operating costs.	• In 2022, CLP Power quadrupled the number of energy audits offered to C&I customers from 150 audits a year to 600 under its SCA with the Hong Kong Government. In doing so, CLP Power exceeded the annual total electricity saved target of 48GWh and helped C&I customers save around 50GWh of electricity.
Energy data and analytics CLP provides a variety of energy consumption analysis tools and complementary products to engage customers and help them make smarter energy management decisions. • At EnergyAustralia, PurchasePro is a self-service web portal which allows business customers to purchase an agreed load progressively rather than commit to a price at a single point in time. • The CLP Power Mobile App in Hong Kong and My Account and the EnergyAustralia App in Australia provide an easy-to-use interface for customers to understand their energy usage and estimate upcoming bill payments. • Smart Energy Online is an online assessment and/or management tool for C&I customers in Hong Kong. Similarly, EnergyAustralia's InsightsPro allows its C&I customers to access real-time consumption and cost data to optimise their businesses' energy usage.	• Approximately a third of EnergyAustralia's C&I customer load is transacted on PurchasePro and over 1,000 EnergyAustralia customers have access to InsightsPro. • Over 2,400 C&I customers in Hong Kong use Smart Energy Online to manage their energy consumption and improve their energy efficiency.
Energy label for electrical appliances The CP Label provides a useful and informative reference for consumers to select products with energy efficiency and cost effectiveness.	• In October 2022, CLP*e*'s flagship e-shop, Domeo, launched the CP Label. This is Hong Kong's first label for electrical appliances which rates energy consumption and selling price as selection criteria. The initiative helps customers choose energy-efficient and cost-effective home appliances and raises public awareness on the importance of energy saving and switching to a low-carbon lifestyle.
Advanced Retro-Commissioning (RCx) Training CLP Power offers an advanced RCx training course comprising classroom training and field visits for energy management employees and engineers who already have a basic understanding of RCx. The RCx training covers advanced learning and techniques such as data analysis, system diagnosis, measurement and verification, further strengthening participants' RCx knowledge and skills while encouraging the businesses to set energy-saving targets.	• On top of the HK$1 million set aside from the CLP Community Energy Saving Fund (CESF) in 2021 which offered training in RCx for employees from nearly 100 businesses, CLP Power further provided HK$2 million from the CESF in 2022 to fund a new series of advanced training. The training offered to commercial and industrial customers assisted them in carrying out the energy-saving improvement works required to reduce carbon emissions from buildings and support Hong Kong's journey towards carbon neutrality. RCx is a systematic and cost-effective energy management solution that allows customers to improve the energy efficiency of their premises by optimising building equipment performance instead of equipment replacement.

Using electricity more widely for transport and industry

Products and services	Updates in 2022
 **Electric vehicle infrastructure** • CLP Power continues to support green motoring and the electrification of vehicles in Hong Kong – a long-term government policy objective set out in the *Hong Kong Roadmap on Popularisation of Electric Vehicles* – CLP Power extended its free charging service for its EV charging stations until the end of 2023. • CLP Power's Eco Charge 2.0 EV Power Supply Support service In 2016, CLP formed Smart Charge (HK) Limited, a joint venture with HKT to provide a one-stop service for EV charging. • In Australia, EnergyAustralia has outlined plans to support the transport industry with vehicle electrification by working with EV manufacturers, fleet operators and their customers to plan and build the infrastructure required to charge their fleet.	• In August 2022, a joint venture between CLP and Qingdao TGOOD Electric Company Limited (TGOOD) was established to invest in the charging infrastructure network in the GBA. The partnership aims to accelerate green transport with smart EV charging networks to support the Chinese Government's strategic plan to integrate resources for the construction of smart energy charging networks to support a green, low-carbon economy. • CLP Power continued to provide free EV charging services to encourage the expansion of green motoring in Hong Kong. By the end of 2022, CLP Power provided more than 50 charging stations covering 160 charging points. • Since the Eco Charge 2.0 service was launched in November 2020, CLP Power has completed preliminary power supply capacity assessments for more than 500 applications, covering over 126,000 parking bays, from owners of private buildings and estate managers by the end of 2022. Professional advices were provided to support the applicants. • To date, Smart Charge has designed, installed and currently manages EV charging infrastructure in residential car parks in Hong Kong covering a combined total of almost 10,000 car park spaces. • CLP will provide around 360 charging points in various CLP premises in Hong Kong to support greater EV adoption across CLP operations. • In Australia, EnergyAustralia has outlined its plans to support the electrification of the transport sector by working with EV manufacturers, fleet operators and their customers to plan and build the infrastructure required to charge their fleet. In 2022, EnergyAustralia focused on building its network of partners vital to the electrification of transport in Australia, including electric bus and truck OEMs (such as Nexport, Ebusco and SEA Electric) and engineering and technology partners (such as Planet Ark Power). The goal is to be a one-stop solution provider for large-scale EV charging infrastructure projects, from vehicle depots, service stations and public parking spaces to shopping malls and gas stations. EnergyAustralia's Green Transport proposition offers its customers tailored solar, battery and EV charging infrastructure solutions with the considerations of their size of the fleet, type of vehicles, routes travelled, kilometres covered and more.

Enabling low-carbon electricity supply

Products and services	Updates in 2022
 **Decentralised renewable energy / rooftop solar** To support the decentralisation of energy and growth of renewables, CLP offers private renewable energy solutions via feed-in tariffs and rooftop solar. • The Feed-in Tariff (FiT) Scheme in Hong Kong allows customers to install a solar and/or wind power renewable energy system on their premises and connect the system to the CLP grid to earn FiT payments. • Under the Solar Home Bundle, EnergyAustralia's customers based in New South Wales have premium solar panels, an inverter and battery installed for a $0 upfront cost on a seven-year plan. Customers pay a competitive usage rate for the electricity used throughout the period and will own the system outright at the end of the seven-year period. The smart software allows customers to manage their power supply in a more reliable and sustainable way.	• Since the Feed-in Tariff (FiT) Scheme's commencement in mid-2018, and as at the end of 2022, CLP Power has received over 22,400 applications. Around 93% of the applications, representing a total capacity of around 336MW, have been approved. About 16,800 applications have been completed and connected to the grid to enjoy FiT. • The FiT Scheme continues to attract customers from various sectors, including business and industry, schools, urban households and village houses. • The Solar Home Bundle was launched as a scale product in September 2021 following the successful trial of the Solar Plus Plan in 2020. By the end of 2022, EnergyAustralia had 332 customers on the Solar Plus plan and Solar Home Bundle. • In 2022, CLP launched a group-wide data analytics platform connecting renewable assets to the CLP grid to collect data for internal analysis and continue improving its services to meet ever-changing customer expectations.
 **Corporate Power Purchasing Agreements (PPAs)** Businesses wishing to increase their direct renewable energy availability may elect to enter Power Purchasing Agreements with CLP. The PPAs provide customers with the most credible and efficient provision of available clean energy.	• With increasing market demand, CLP proactively engages with customers in the property sector to support their renewable energy conversion journey. There was continued interest in the direct purchase of renewables whether as annual purchasing or as 24/7 granular matching. This is evidence of positive momentum in the market. CLP leverages expertise in renewable energy assets, battery storage and energy management indicator to support its corporate customers.

Offsetting emissions that can't be otherwise avoided

Products and services	Updates in 2022
Energy attribute certificates (EACs) CLP offers a range of EACs to support customers' decarbonisation objectives. In Hong Kong, Renewable Energy Certificates (RECs) offer an alternative way for customers to support local clean energy generation. Each unit of a REC represents the environmental attributes of electricity produced by local renewable energy sources, generated or purchased by CLP Power. In Mainland China, CLP China's renewable assets issue Green Electricity Certificates (GECs) which are the only officially recognised renewable energy certificates in Mainland China. They can be used to meet obligations under China's mandatory Renewable Energy Portfolio Standard, or to support voluntary green power trading. In Australia, EACs serve as an option to reduce customers' Scope 2 emissions when decentralised renewables are not a viable option. For example, PureEnergy from EnergyAustralia helps customers support the production of green energy from government accredited renewable sources.	• Since the launch of RECs in January 2019, over 124GWh of RECs have been sold by CLP Power to businesses such as data centres, banks, hotels and restaurants, as well as residential customers. In 2022 alone, close to 100GWh units of REC were sold, a significant increase from the 15.4GWh units sold the prior year. • A commitment to purchase of 300GWh of RECs over a period of six years was made by HSBC in October 2022. This is the largest and longest commitment since CLP Power launched the REC programme. • Hang Seng Bank has committed to purchase close to 154GWh of RECs between 2021 and 2030, equivalent to a reduction of over 60 kilotonnes in carbon emissions associated with electricity over a period of 10 years. • In November 2022, CLP Power announced an agreement with AirTrunk, an Asia-Pacific and Japan hyperscale data centre specialist, to launch a renewable energy solution in Hong Kong, under which AirTrunk will source hourly RECs from CLP Power to provide renewable energy matching at its HKG1 data centre for its customer, Microsoft. The agreement, which will be directly linked to the West New Territories (WENT) Landfill gas power generation units of CLP Power, signifies the first RECs solution linked to an identifiable renewable energy project in Hong Kong. • Green power from CLP China's new renewable projects that have reached grid-parity are bundled with corresponding GECs. For example, the 100MW Qian'an III Wind Farm in Jilin province supports the issuance of Green Electricity Certificates (GECs) in the region. • Around 12,000 EnergyAustralia customers have chosen a GreenPower government accredited PureEnergy option for their electricity supply.
Carbon Credits Carbon credits represent carbon emissions avoided as a result of emissions reduction projects. CLP encourages its customers and businesses to purchase these carbon credits to offset their unavoidable emissions. In addition to selling carbon credits, CLP also collaborates with numerous industries to deliver carbon offset initiatives. EnergyAustralia has various programmes that provide carbon neutral electricity; for example: • The Go Neutral offer allows residential customers to opt in to fully offset the carbon emissions associated with their home gas and electricity usage, at no added cost to them. • Business Carbon Neutral helps business customers offset their electricity emissions for a flat fee.	• CLP continues to promote carbon offsetting and support customers' decarbonisation journey. Customers can offset their unavoidable emissions with CLP Carbon Credits after taking actions to cut down their emissions. CLP signed a multi-year contract with Standard Chartered Bank (Hong Kong) to provide CLP Carbon Credits through the Core Climate platform, the new international carbon marketplace launched by the Hong Kong Stock Exchange in October 2022. • As of the end of 2022, EnergyAustralia has over 488,000 customer accounts choosing to have their energy use offset and over 5 million tonnes of carbon dioxide equivalent have been offset to date. • EnergyAustralia now has the largest Climate Active certified offset offering in the Australian energy sector and the second largest in the country.

Case study

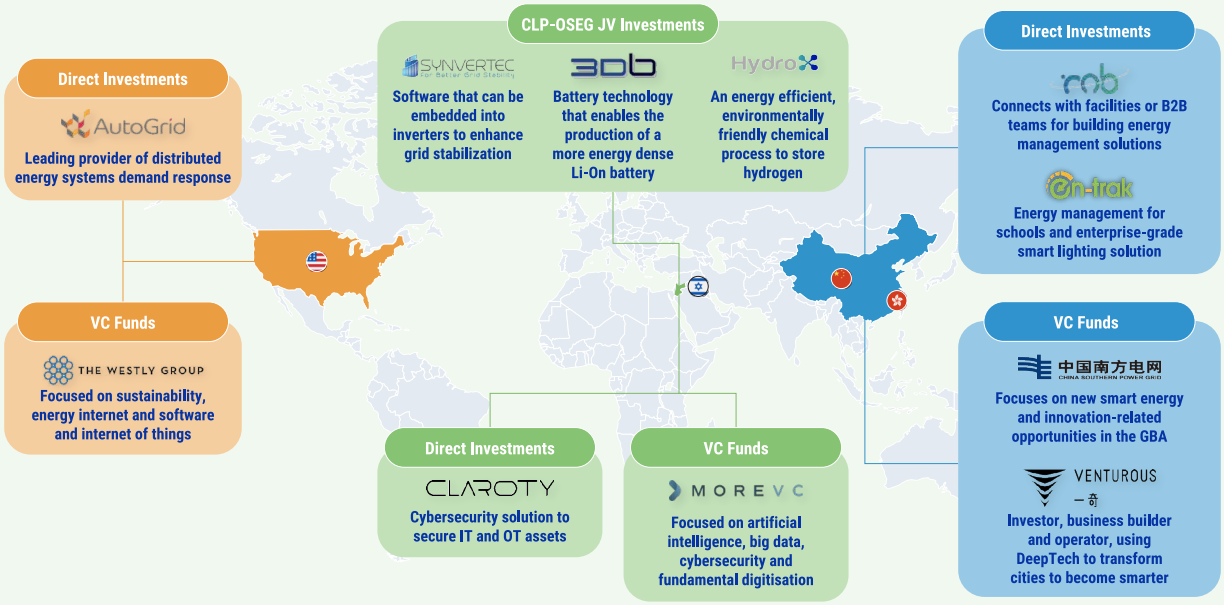
Leading the technology breakthrough in hydrogen storage through investment

CLP's Investment and Venture team took a three-pronged investment strategy covering direct equity investments, venture capital funds and joint venture investment partnerships. Capital has been deployed in strategically significant geographies (Greater China, Israel and the United States) and focus areas such as virtual power plant orchestration, cybersecurity and building energy management.

CLP Group has invested over HK$780 million in venture capital funds since 2017. The benefits derived from these investments are twofold. Firstly, the investment brings direct strategic value to CLP business operation. For example, through AutoGrid's demand response solutions, CLP reduces stress in the network, while Claroty's Operational Technology solutions digitally secure CLP's critical assets. Secondly, it imposes substantial influence to customers and the wider community by offering energy management solutions. For example, CLP supported the Airport Authority Hong Kong to adopt R&B's energy management solutions at Hong Kong International Airport.

Advanced technology in handling hydrogen is the key in driving the transition to green transportation. Hydrogen is the potential fuel source of the future. However, multiple challenges are present throughout its lifecycle – production, storage and transportation. CLP established joint venture investment partnerships with HydroX which develops an energy-efficient, environmentally friendly chemical process to store hydrogen using water and bicarbonate (like baking soda) at near room temperature and pressure. This technology breakthrough in hydrogen storage allows an efficient and safe use of hydrogen as fuel in vehicles which will bring a paradigm shift in transportation and operations across various industries.

CLP's investment to support the Utility of the Future strategy



Case study

Teaming up with Chinachem Group to drive towards carbon neutrality goal

Riding on the successful collaboration with Chinachem Group (Chinachem) in 2019 to promote energy efficiency and decarbonisation, CLP Power continues to support Chinachem on its journey in pursuing carbon neutrality.

Chinachem Group set their sustainability goals for 2030 to further reduce their Scope 1 and 2 operational greenhouse gas (GHG) emissions by 51.8% by 2030. Chinachem collaborated with CLP Power in 2019 to transform the landmark Nina Tower into an operational and energy-efficient twin-towers complex by adopting smart and green technology.

In early 2023, CLP*e* signed a Build-Own-Operate-Transfer (BOOT) agreement with Chinachem to build Hong Kong's first zero-carbon chiller system at Nina Tower. Under the 20-year agreement, CLP*e* will provide funding, design and engineering work to convert the existing air conditioning system into an energy-efficient water-cooled system. PlantPro, an intelligent AI management system, is used to control the chiller plants to collect and analyse data, performing real-time monitoring and adjustments to provide Nina Tower with the most energy-efficient air conditioning. The system is expected to reduce electricity consumption by over 50% compared with the existing system, equivalent to a reduction of 7,000 tonnes of carbon emission a year. The electricity consumed by the chiller plants will be matched by an equal amount of Green Electricity Certificates (GECs) linked to CLP Group's renewable energy projects in Mainland China.

Further, to make revolutionary change in the Hong Kong construction industry, CLP Power together with Chinachem, Gammon Construction Limited and Ampd Energy Limited promoted the use of Battery Energy Storage System (BESS) to the construction industry in Hong Kong. The pitch aims to replace traditional diesel generators operated on construction sites with BESS, and promote industry collaboration toward emission-free construction sites. BESS reduces carbon emissions by up to 85% annually as compared with traditional diesel generators. This successful collaboration on the application of BESS won the Association of Energy Engineers's prestigious Innovative Energy Project of the Year International Award 2022, a highly respected and prestigious competition in the construction industry.

Customer privacy

Our approach

Under the CLP Code of Conduct, every employee must safeguard the Company's assets and the resources entrusted to the Company's care, including customer information, against loss, theft or misuse.

GRI reference: 418-1

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, as well as the rights to access and correct a customer personal data.

Under the *Privacy Act 1988* (Privacy Act), EnergyAustralia has obligations to ensure the appropriate collection, use, disclosure and security as well as access to an individual's own personal information. There are also mandatory data breach reporting obligations in relation to Notifiable Data Breaches. EnergyAustralia is required to report data breaches if there is unauthorised access to, unauthorised disclosure of, or loss of personal information that EnergyAustralia holds where this is likely to result in serious harm to one or more individuals and EnergyAustralia has been unable to prevent the likely risk of serious harm with remedial action. Notifications must be made to the Office of the Australian Information Commissioner (OAIC) and to the affected customers with description of the data breach, the kinds of information involved and recommendations for customers in response to the data breach.

In May 2018, the Australian Government announced that energy data would be included in the Consumer Data Right (CDR). The sharing of product data in the energy sector commenced on 1 October 2022 and consumer data sharing commenced on 15 November 2022. It gives customers the right to share certain of their transaction, usage and product data with service competitors and comparison services. EnergyAustralia was granted an exemption by the Australian Competition and Consumer Commission (ACCC) and must begin data sharing by 15 May 2023.

Strategy and procedures

The CLP Privacy Principles set out the Company's commitment and approach to protecting personal data.

All employees who have to handle or process personal data of any individual for business operation in Hong Kong must follow CLP procedures, practices and local regulations in relation to personal data privacy. The 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 Privacy Policy Statement demonstrates the Company's approach to protecting personal data and is applicable to everyone across its entire operations who handles personal data.

In addition, business units with operations in Hong Kong must implement and abide by the CLP Personal Data Protection Compliance Manual which sets out CLP's data protection compliance framework, including its governance structure and the roles and responsibilities of different functions under the governance structure. This manual also provides guidance on the protection and use of personal data. Adherence to policies and procedures regarding privacy and data protection are further embedded in CLP's Code of Conduct and the compliance management procedures of the Code.

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 Success & Experience 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.

EnergyAustralia has developed and maintains a Data Breach Response Plan which is implemented by a Data Breach Response Team. The plan outlines the strategy for assessing, managing, containing and reporting data breaches within required timeframes and outlines roles and responsibilities. It is enacted each time a potential data breach is identified.

Learn how CLP responds to cyber security incidents →

Training and awareness

In further reinforcing CLP rules to protect customer information, a key focus has been the prevention of unauthorised disclosures to malicious attackers or impersonators. Specific awareness activities, including communications, quality assurance assessment, coaching and additional training for frontline staff, were carried out during the year. Company-wide communications, employee training and briefing sessions with leadership were also conducted to ensure all staff understand current privacy and data management obligations. A Data Breach Response Plan was formulated while a Data Breach Response Team was established to ensure the business has the capability and procedures in place to respond swiftly to such incidents.

Customer privacy may be compromised as a result of a cyber security incident, or by the mishandling of customer information by employees. A compulsory e-learning programme on data protection was given to all employees in 2020 and the e-training has been mandated since 2021 for all new employees.

In addition to this broadly received training, CLP runs tailored and frequent data protection awareness programmes through regular briefings, case sharing, quiz games and refreshers to employees who have regular interaction with protected data such as members of the Legal Review Committee. 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.

At EnergyAustralia, customer privacy remains 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. Privacy training is a compulsory requirement for all new employees and subsequent refresher training is provided to all employees annually.

Initiatives and progress

In 2022, CLP Power reported no cases of customer data loss in Hong Kong. In Australia, EnergyAustralia reported one incident involving the compromise of customer data.

GRI reference: 418-1

CLP Power was awarded the Privacy-Friendly Awards 2021 Gold Certificate by the Office of the Privacy Commissioner for Personal Data (PCPD), Hong Kong, recognising its commitment and effort in protecting personal data privacy of customers and stakeholders. CLP Power was also recognised by PCPD in the inspection for its implementation of a Personal Data Privacy Management Programme, and for adopting security measures to protect customers' personal data systems which conform to international standards.

On 30 September, an incident involving unauthorised access to EnergyAustralia's My Account data platform resulted in data from 323 residential and small business customers being potentially compromised. EnergyAustralia promptly contacted all affected customers to reset their passwords and suspended system access during the incident investigation. While the number of customers affected in this incident was limited, EnergyAustralia took additional measures to ensure the protection of all customer information by setting up additional layers of security in its My Account data platform. This included more complex passwords and the introduction of multi-factor authentication (MFA). EnergyAustralia apologised for the incident and notified the relevant regulatory authorities and Government agencies.

Customer satisfaction

Our approach

CLP is committed to providing quality service and value to customers. This includes meeting regulatory requirements and delivering on customer service pledges.

GRI reference: 417-1

Strategy 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 new customers received by e-mail, information on the CLP Power websites and CLP Mobile App, as well as the EnergyAustralia websites and Mobile Apps. CLP also engages with residential, commercial and industrial customers through satisfaction surveys, online service portals, site visits to its assets, supporting by its account managers and Customer Service Centres and Customer Interaction Centre.

CLP also strives to effectively respond to customer needs and preferences. All escalated cases are studied thoroughly to appropriately resolve the issues customers have raised.

EnergyAustralia averages one to two million conversations with customers every year, either over the phone or via digital service channels. It also engages with more than 100,000 individuals, businesses and stakeholders annually through formal research to help shape business decisions, products and services.

Monitoring and follow-up

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.

In addition to the number of calls and complaints received, EnergyAustralia also measures customer satisfaction through its Strategic Net Promoter Score (SNPS). Customer satisfaction is measured monthly via an online NPS survey sent to a representative group of customers. The Transactional Net Promoter Score (TNPS) is also used to track customer satisfaction in relation to specific customer interactions, providing more direct feedback to frontline staff.

Initiatives and progress

CLP is committed to providing safe and reliable energy for its customers to support their business operation and daily life. The frontline teams have continued to maintain essential support and ensure the reliability of power supply and customer service.

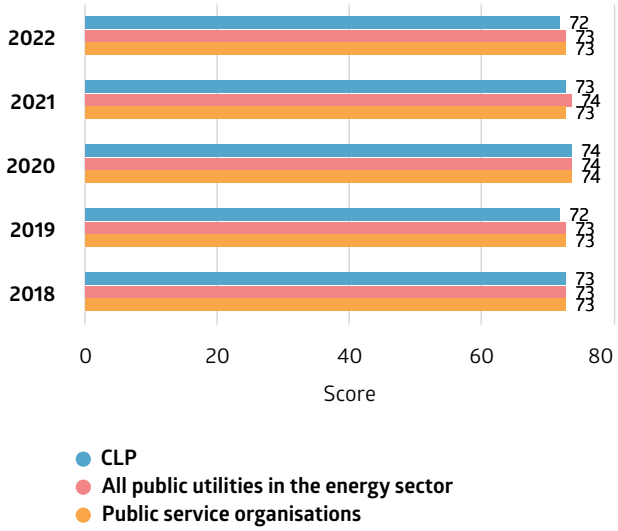
GRI reference: 417-3,418-1

Hong Kong

With the tariff adjustment made due to increasing cost of the international energy market, similar to counterparts in the energy sector, CLP Power's customer satisfaction score dropped slightly, but remains on par with other public service organisations.

CLP Power Hong Kong Limited customer satisfaction score

CLP Power's customer satisfaction score dropped slightly in 2022, though remained on par with other public service organisations.



Australia

While customers have continued to experience the impact of COVID-19 on their day-to-day lives, EnergyAustralia has demonstrated its continued commitment to its customers by focusing on the quality of service they receive. Enhancements were made to the EnergyAustralia app to provide a new channel for customers to interact aligned to their preferences, which has helped drive a 10% reduction in call volumes.

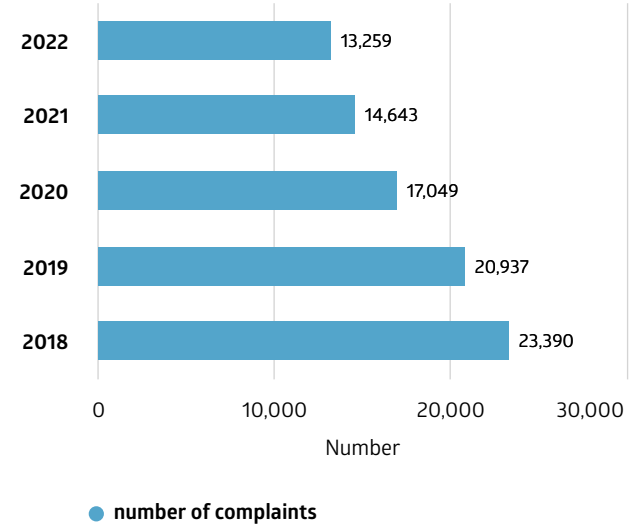
Complaints received by EnergyAustralia

EnergyAustralia's TNPS decreased slightly in 2022 while complaint volumes continued to decline, with total complaints received declining by 9.5% from the 2021 figure. This result was brought about by continued improvements in internal and external dispute resolution practices and operational interventions to address key billing complaint drivers.

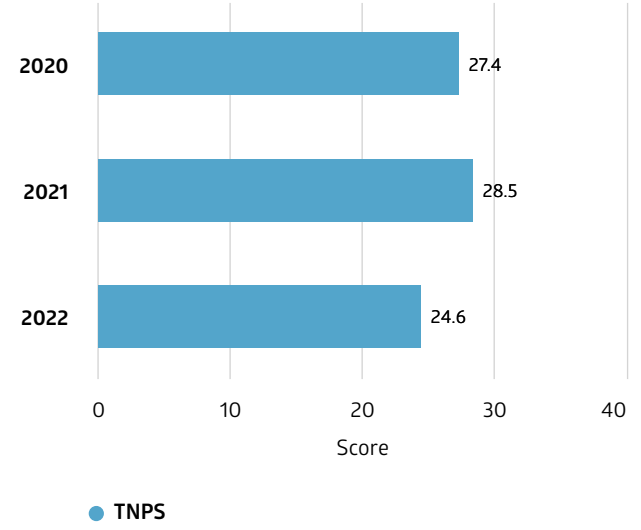
While EnergyAustralia noted a year-on-year decline in total complaint volumes, a 3% decline in the proportion of billing complaints was also achieved. This is the result of ongoing billing improvement initiatives focused on adopting a tailored communication and notification strategy to provide advice to its customers proactively and help them manage their high bills.

Challenges were experienced during the second half of 2022 across the energy industry. They were driven by market uncertainties arising from the energy crisis and market sustainability, and increased cost of living pressures with rising inflation and changing customer behaviour. Despite these challenges, EnergyAustralia continued to go above and beyond to successfully address and resolve customer concerns through timely engagement and effective conversations with its customers. This was reflected in the reduction of complaints.

Complaints received by EnergyAustralia



EnergyAustralia's Transactional Net Promoter Score



Security management

Our approach

CLP's Group Digital's Security serves to protect our people, property, information and reputation against security risks.

Strategies and procedures

CLP's security strategy is guided by the CLP Risk Management Framework, with oversight from the Board. The Group Security Policy was updated in 2021 to define the overarching approach taken to minimise risk to people, including employees, contractors, customers and the public and to manage other business risks to acceptable levels. During 2022 all cyber security-related standards have been updated to take into account technological evolution, changing legislation and emerging good practice. Moreover, a fundamental review of strategy took place, allowing Security team to better place itself to support CLP Digital's initiatives and the transition across the Group to the Utility of the Future.

The policy covers the following areas:

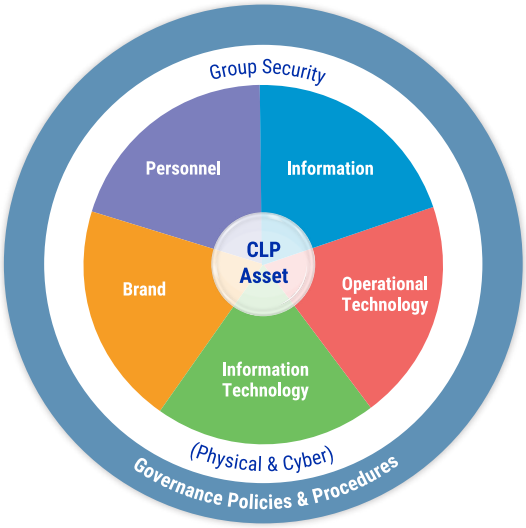
- **Integrated and centralised organisation and governance:** Security is an integrated department within CLP Digital which covers all relevant lines of security activity within the Company, operating independently of the IT and OT governing organisations.
- **Policies, standards and guidelines:** Providing a suite of documents guiding how to manage and monitor risks in line with recognised industry standards.
- **Understanding the threats:** Ensuring decisions related to the application of security measures are appropriately informed and, wherever possible, intelligence driven.
- **Communications and awareness:** Continuously enhancing the security awareness and knowledge of employees and contractors with the objective of encouraging security-positive behaviour.
- **Technical domain:** Ensuring that robust operational detection and response tools are developed, applied and maintained.
- **Liaison:** Maintaining constructive and trusted relationships with external stakeholders such as national cyber security agencies and industry bodies to ensure speedy and effective cooperation when the need arises.

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. 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, needs to be protected;
- **Information Technology (IT):** The IT used to store, retrieve, transmit and manipulate data or information needs to be protected;
- **Personnel:** Staff employed by CLP, both at the workplace and travelling for business, must be safe; and
- **Brand:** CLP's image, identity and associated reputation needs to be protected.

CLP security measures are robust and scalable. They provide comprehensive, layered and flexible protection.

CLP's approach to security



Operational responsibilities

The Group Security team was established in 2020 to ensure cyber and physical security capabilities and efforts complement each other. The team offers an in-house capability across the full range of security skillsets. With internal re-structuring in 2022, the Group Security team was integrated into CLP Digital. This is a strategic move to support the transition to the "Utility of the Future". The Security department remains separate from both the IT and the HSE departments but maintains close working relationships with both. Regular reports are provided by Group Digital to the Board's Audit & Risk Committee (ARC). The ARC seeks assurance that adequate risk management is in place and followed and that appropriate remedial action is taken where needed.

Read the Audit & Risk Committee's report

Physical security

Our approach

The fundamental – and highly effective – form of security is physical security which is applied appropriately to all of CLP's assets. Enhanced measures are used to protect sensitive locations such as data centres, control rooms and transmission and distribution sites.

GRI reference: 410-1

Strategies and procedures

Physical security refers to the physical measures designed to safeguard people, to prevent unauthorised access to equipment, facilities, material and documents and to safeguard them against security incidents. It covers physical barriers (e.g. fences), security lighting, physical access control and surveillance systems.

A body of work has been developed to assist all regions and their assets in establishing or revising their security management documentation. These documents are aligned with international standards for security and contain best practices derived from across the Group.

- The CLP Physical Security Standard lays down the minimum standard of physical security measures expected at every asset owned and/or operated by CLP, regardless of location or role.
- The CLP Physical Security Guideline provides practical guidance on the security requirements expected of all business units, in line with the Group Security Policy and Physical Security Standard. For instance, it includes guidelines on how to identify potential areas of weakness, develop appropriate security countermeasures, as well as prepare a security response plan.
- The CLP Security Vulnerability Assessment Guideline is the flagship document that lays down the process of evaluating the security status of any CLP site. Using a risk-based approach and in close collaboration with the operator, it provides a comprehensive security "health check" covering threats, areas of weakness and offers solutions.
- CLP's Security Due Diligence for Project Design & Construction or Site Acquisition has been developed to support projects in the early stages of an acquisition or a build. Based on the premise that early identification of potential problems can reduce risk and the cost of retrospective correction, all projects and acquisitions undergo this process, regardless of size.
- The CLP Business Travel Risk Management Plan seeks to minimise the security, medical and health risks faced by employees engaged in business travel. On behalf of the Group, Security team in CLP Ditigal leads on business travel security in close cooperation with Group HR and Finance.

Training and awareness

CLP security staff play a key role in preventing harm to staff and the wider public. They are required to always comply with CLP's Code of Conduct and receive related training on an annual basis. In addition to training on national regulations and site-specific requirements, contract security staff receive induction training on CLP's policies including harassment-free workplace, minimum wage guidelines and measures preventing discrimination in the workplace. This induction training must be completed before personnel are granted access to their assigned workplace sites.

For a third successive year, business travel has all but stopped in response to the COVID-19 pandemic. More effort continues to be made in keeping staff across the Group informed on the rapidly changing travel situation and border closures across CLP's portfolio countries and other key destinations, as well as providing bespoke advice to those who have needed it.

Initiatives and progress

One of the examples of leveraging new technology to digitise its operations is CLP's adoption of the remote "Magic Glass" lens technology. CLP deployed this technology to conduct remote Security Vulnerability Assessment of a windfarm site during COVID-19 lockdown to counter the inability of security staff to inspect sites in person in 2022.

Normally, Hong Kong-based security staff along with their onsite colleagues would conduct security inspections every three years on every asset to ensure that appropriate security measures were in place. The "Magic Glass" lens technology enabled Hong Kong-based staff to conduct a real-time survey of a Chinese windfarm site through the eye of a camera carried by an on-site colleague, while being 1,000km away at the time. This equipment was handy and safe to use in the field and could be adapted to a wide range of safety helmets. The "Magic Glass" lens technology was also adopted for safety and management inspections during the construction of the Qian'an third phase wind farm. The adoption of remote inspection technologies complimented onsite inspections and helped improve overall security inspection efficiency.

Cyber security

Management approach

CLP has enhanced its cyber security governance, built internal capacity in the area and improved its information protection.

Strategies and procedures

Cyber security incidents are unique in that the attack occurs in a virtual space and may not cause immediate disruption, as in the case of data leaks, making them difficult to detect or trace. As the workplace and operations are increasingly digitalised, electronic devices could become vulnerable to cyberattacks. CLP therefore strives to protect the Operational Technology (OT) and Information Technology (IT) systems:

- **Operational Technology (OT)** is the hardware and software that detects, monitors or controls physical devices (such as a turbine) belonging to CLP.
- **Information Technology (IT)** is the technology used to store, retrieve, transmit and manipulate data or information.

It is of utmost importance to improve the security culture within CLP and empower business units and regions to employ suitable technologies and processes to protect the Company's assets and systems.

The management of cyber security is documented in two major Cyber Security policies, namely:

- The **CLP Group Information Security Policy**, which sets out the four key information security principles of confidentiality, integrity, availability and regulatory compliance. With reference to ISO/IEC 27002:2013 Information Technology Security Techniques – Code of practice for information security controls, a set of Group-level policies have been developed. Regional standards and procedures have been developed from these policies and tailored to suit the context and local regulations of the business unit; and
- The **CLP Group Operational Technology Cyber Security Policy** defines how to develop, implement and maintain appropriate safeguards to ensure the delivery of critical infrastructure services by CLP. One key focus relates to detection and response in cases of OT cyber security events and to establish recovery capability on the OT systems.

The department's evidence-based reporting from internal testing provides an important feedback loop that enables the Company to pursue continuous improvement. In addition, the team helps project managers and business leaders understand cyber security risks in the context of CLP's business and offers guidance on risk mitigation strategies.

Training and awareness

Our people are another focus in cyber defence. Every employee and associate of the Group is an important cyber defence asset. They need to be equipped with relevant knowledge to raise their awareness and vigilance.

CLP recognises the critical need to continually adapt and enhance its security posture to defend its operations against a complex and dynamic threat spectrum. Insight into the capability and intent of cyber attackers will help CLP develop situational awareness and it offers direction on what measures need to be taken to mitigate associated risks. Continual effort is given to raising cyber security awareness, training and education amongst employees to help them practise good "cyber hygiene".

Security awareness activities at the employee level have included: simulated phishing emails, internal broadcast campaigns, briefings, videos and the introduction of 'Cyber Champions' to promote good cyber practice across a range of departments and functions.

Monitoring and follow-up

CLP continually monitors its IT systems and networks and also seeks out threats to its OT systems. Advances in cyber security technologies have helped improve the detection of cyber security breaches. If suspicious activity is discovered in the IT or OT network environments, immediate action is taken to investigate it and, if necessary, isolate the threat and lead the recovery action.

Initiatives and progress

In early 2022, CLP commenced a cyber security programme to improve detection and response systems for both IT and OT. This programme is on track to deliver a new generation of capabilities to CLP Digital in 2023. As a result, CLP's ability to manage incidents round the clock across the Group was significantly enhanced.

Cyber security continues to be one of CLP's top-tier risks and is regularly assessed and reported to senior management through the risk management process. In spite of further anticipated regulatory changes and the fact that cyber security skillsets are scarce and recruitment is fiercely competitive, CLP will continue to seek to uplift its capacity in the area of process, people and technology and to recruit the expertise required to spearhead the effort.

Read more from the Audit & Risk Committee Report in 2022 Annual Report

Emergency and crisis management

Our approach

Attacks on CLP's operation systems or physical assets could have dire consequences. It is essential to detect any incursion in real time, every time, and remediate the incident before harm results.

CLP Incident Management Process



Strategies and procedures

CLP maintains robust and regularly tested emergency response and crisis management procedures. As the first line of defence, when an incident arises the Incident Management Process (featured below) is followed.

Crisis Management Plan

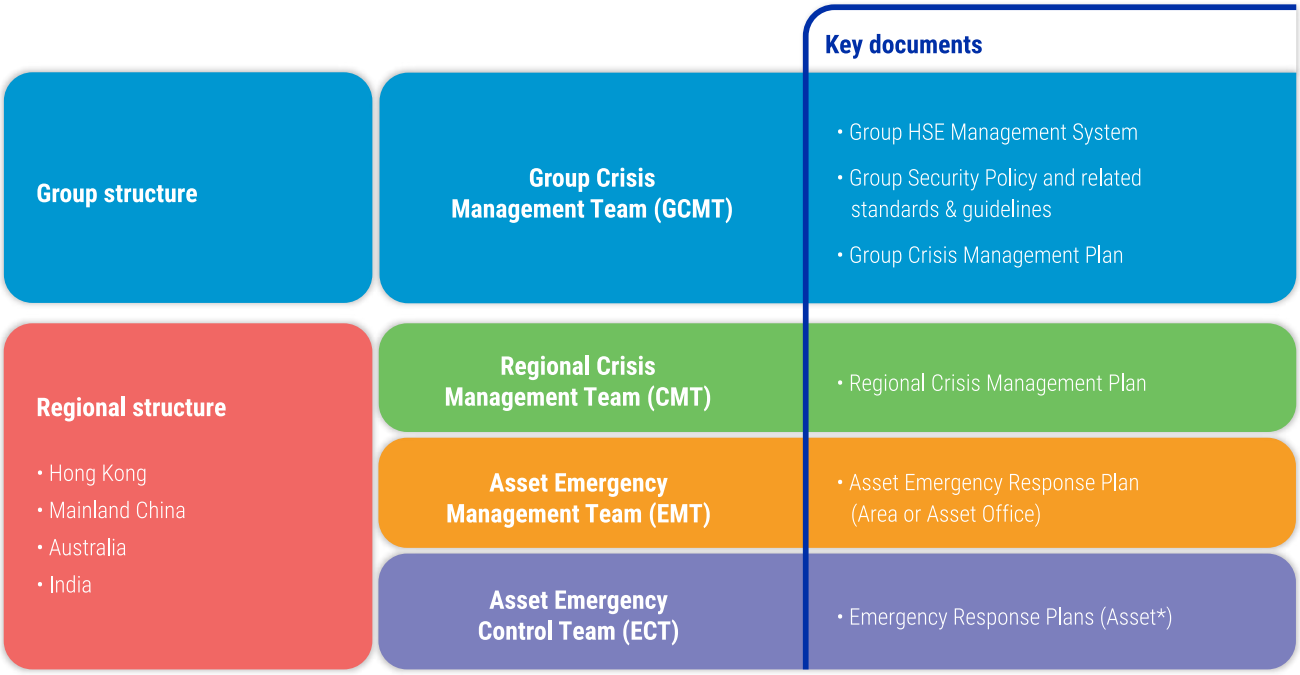
Guided by the Group Crisis Management Plan, CLP ensures high levels of preparedness to respond to and recover from any emergency situations and helps minimise disruption to customers. The Plan is continually reviewed and enhanced to ensure it is in line with operational changes or the broader operating context. It provides a platform for the effective handling of a crisis at the Group level. The plan:

- Outlines crisis management organisation, roles, responsibilities, procedures and processes;
- Specifies the tools needed to ensure the collective response is well planned, well executed and fully integrated across the organisation;
- Describes the relationship and interface between the handling of regional- and Group-level crises; and
- Details the processes that govern internal and external communications during emergencies and crises, ensuring our people who are 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.

CLP's Crisis Management & Emergency Response Structure are outlined in the diagram below.

CLP Crisis Management & Emergency Response Structure



*An asset is anything owned and operated by CLP, covering power stations, depots, offices, transmission lines, customer service centres, etc.

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 at least every three years. Regional crisis management exercises are conducted annually as part of the internal peer review process.

Initiatives and progress

CLP continues to enhance its crisis management capability to ensure the organisation can respond promptly and effectively when an incident occurs.

From a crisis management perspective, the emphasis of the Company has been on maintaining and enhancing capability. Initiatives of the year included:

- Adopting cloud-based technology for CLP's Crisis Communications Billboard (CCB) to better facilitate incident management;
- Reviewing and improving notification and communication tools; and
- At Group level, conducting crisis management communications and administrative drills to ensure that the equipment and procedures are functional and fully understood by the operators.

Case study

Crisis management in action during the cable bridge fire incident

On 21 June 2022, a CLP Power cable bridge in Yuen Long caught fire, affecting power supply to around 175,000 customers in Yuen Long, Tin Shui Wai and part of Tuen Mun, causing the largest blackout handled by the Company in more than a decade.

CLP Power activated its emergency incident response and power supply was first restored to essential services including hospitals and railways. With the tremendous effort of the engineering teams and emergency supply arrangement, CLP Power restored power supply to around 90% of the affected customers in around seven hours after the incident and subsequently to the remaining customers within 13 hours. The task was made more difficult as all cables inside the cable bridge had been burnt, meaning that the restoration operation was largely hands-on. Close cooperation and liaison with emergency services proved key to allowing effective handling of the operation on the ground by CLP Power's engineering teams. At Group level, a small special committee was convened to coordinate the flow of information and decision-making at Board and Government level. Immediately after the incident, an investigation panel comprising experts in power, civil and fire engineering was set up to find out the cause of the fire and make recommendations.

CLP Power maintained close communication with relevant government departments and ensured that they received all necessary support in the investigation and follow-up actions to the incident. The investigation findings were submitted to the Hong Kong Government and then communicated to the public in a timely manner. The Company also coordinated with community leaders and related organisations to provide updates, possible assistance and support to affected customers during the power interruption.

Our people

Overview

Stakeholders' areas of interest	Relevant material topics
• Workforce size and mix • Fair and ethical work practices • Fostering diversity and inclusion • Talent and skills development • Supporting employees to thrive in change • Health, Safety and Environment management • Occupational health and safety	**Aligning business activities with community, employee and customer expectations** • Organisational agility • Workplace safety and wellbeing

Outcome for stakeholders

