



# Business Performance and Outlook

The Group is building a Utility of the Future for energy users in Asia Pacific to support the region's low-carbon, digital transformation.





SmartHub@CLP

# Hong Kong

Supports the city through an important journey of decarbonisation while maintaining a safe and highly-reliable electricity supply to 2.64 million customers.

## Financial and Operational Performance

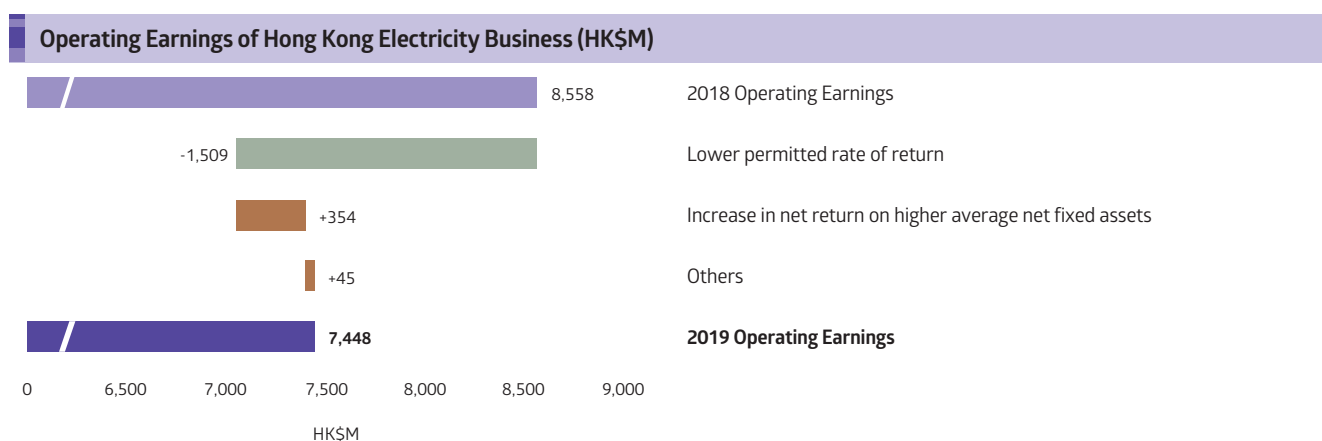
### Overview

CLP continued to provide Hong Kong with a safe and highly reliable electricity supply in an environmentally-friendly way and at a reasonable cost throughout 2019. Sales of electricity within Hong Kong rose 1.8% to 34,284GWh as warmer weather lifted demand in the residential, commercial as well as infrastructure and public services customer sectors. A new local demand peak of 7,206MW was reported on 9 August 2019, 51MW higher than the previous record set in 2017. The figure would have been 62MW higher had CLP not actively pursued demand response initiatives to ask key customers to reduce electricity use.

In addition to this underlying growth, major local infrastructure developments, including the commencement of the Guangzhou-Shenzhen-Hong Kong High Speed Rail (Hong Kong Section) and the Hong Kong-Zhuhai-Macao Bridge, also resulted in more electricity use. There were no sales to Mainland China in 2019, after the expiry of the electricity supply contract with Shekou in June 2018.

In 2019, the number of customer accounts rose to 2.64 million, compared with 2.60 million in 2018. CLP places a very high importance on continuing to deliver positive outcomes for its communities and customers, and in doing so throughout 2019 it achieved an overall supply reliability of 99.999%.

Operating earnings declined 13.0% from 2018 to HK\$7,448 million due to the full-year impact of the reduced permitted rate of return in the Scheme of Control agreement that came into effect in October 2018. CLP's performance is summarised below:

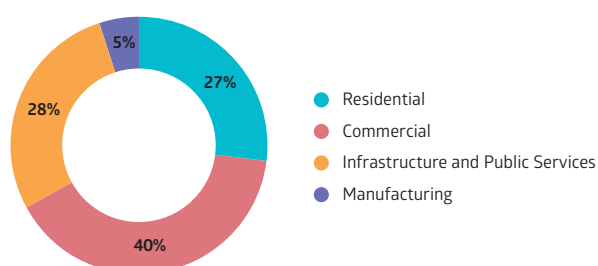


### Local Electricity Sales in 2019

#### Year-on-Year Change

	Increase / (Decrease) GWh		%
Residential	260	▲	2.8
Commercial	159	▲	1.2
Infrastructure and Public Services	244	▲	2.6
Manufacturing	(41)	▼	(2.4)

#### Share of Total Local Sales



To support the Government's environmental policy, CLP is using substantially more natural gas for electricity generation in 2020. This resulted in a 3-cent increase in the Fuel Cost Adjustment to 30.8 cents per unit of electricity in 2020. The Average Basic Tariff was raised by 1.2 cents per unit of electricity, but the increase would be offset by a Rent and Rates Special Rebate for the entire year. Therefore, the Average Net Tariff increased 2.5% to 121.8 cents per unit of electricity from the beginning of the year.

### Continuing the Decarbonisation Journey

The Hong Kong Government is developing a long-term decarbonisation strategy and as part of this exercise, in June 2019 the Council for Sustainable Development launched a public engagement exercise on ways to reduce the city's carbon emissions. In its response, CLP highlighted two broad directions that could increase the supply of low-carbon electricity: adding local gas-fired generation, and sourcing more zero-carbon energy via regional cooperation. Both

options present opportunities and challenges, and elements of each option could be combined. Once a future policy direction is set, CLP will use its power expertise to work with the Government and the community in delivering a practical and reliable electricity supply solutions for the city's future.

The Government has previously established a fuel mix target of increasing gas-fired power generation to around 50% in 2020. In full support of this, CLP has continued to make progress in the construction of a 550MW Combined Cycle Gas Turbine (CCGT) unit at Black Point Power Station which is currently being commissioned. Preparations for another CCGT unit on an adjacent site is also underway with the Front-End Engineering Design (FEED) process commencing from mid-2019. CLP expects to apply for the environmental permit for this second unit in 2020, with completion scheduled by

the end of 2023. Once commissioned, the two new gas units will be among the world's most efficient and will help with the replacement of coal-fired generation units at Castle Peak A Power Station.

This energy transition has implications for the fuel supply chain and CLP has therefore taken additional steps to increase the diversity of sources of natural gas and ensure security of supply. At present, CLP receives gas from CNOOC through the Yacheng pipeline from Wenchang and other gas fields in the South China Sea under the new contract with CNOOC. CLP also takes supplies through an undersea pipeline connecting the West-East-Pipeline Phase II at Dachan Island in Shenzhen to Black Point as part of a 20-year supply contract with PetroChina that began in 2013.



**KMB is a big supporter and promoter of electric vehicles. In what way can a utility like CLP support the future of e-mobility?**

**Mr Roger Lee**

Managing Director

The Kowloon Motor Bus Company (1933) Limited



Along with power plants, motor vehicles and marine vessels are the main sources of carbon emission in Hong Kong. Moreover, diesel vehicles, particularly trucks, buses and light buses, are the major contributors of street-level pollution. An increased penetration of e-mobility will therefore help the city decarbonise and improve air quality. Underlying our commitment, CLP became the first Hong Kong company to join EV100, a global initiative by the Climate Group to accelerate the transition to electric vehicle, in 2019. We pledged to convert our entire fleet of vehicles below 3.5 tonnes, as well as half of those between 3.5 and 7.5 tonnes, to EVs by 2030 across our Asia-Pacific markets. We are also committed to continuing our collaboration with KMB and other partners to enable the electrification of the transport sector.

KMB is a champion of e-mobility in Hong Kong and a key partner of CLP. We are pleased to support KMB in the deployment of smart technologies in major bus depots, which will comprise eBus charging facilities, renewable energy and smart building systems. We are also working closely with KMB to explore technical requirements for eBuses, including the evaluation of different standards and technologies of charging systems. Last but not least, we are supporting KMB to roll out electronic systems at bus stops across the city to display estimated time of arrival (ETA) information of bus services, which will enable passengers to plan their journeys and save time. We look forward to working hand-in-hand with KMB to contribute to a cleaner, lower-carbon transportation sector in Hong Kong.



**TK Chiang**

Managing Director  
CLP Power Hong Kong

To access competitive supplies from the global LNG market for the long term, CLP is developing an offshore LNG terminal in Hong Kong waters, jointly with The Hongkong Electric Co., Ltd. Significant progress was made in 2019 as the FEED process for the offshore jetty facility and the subsea pipelines was completed. The Engineering, Procurement and Construction contract was awarded in January 2020, putting the project on course to begin construction in 2020 and to be completed by the end of 2021. A long-term time charter agreement was signed with Mitsui O.S.K. Lines, Ltd. for a Floating Storage and Regasification Unit, and a long-term LNG supply agreement was signed with Shell Eastern Trading (Pte) Ltd. Once completed, this facility will enhance and diversify CLP's fuel supply, adding supply security and the flexibility to access competitively-priced gas from around the world.

In addition to the large-scale developments noted above, CLP continues to invest in other sustainable power generation facilities. The West New Territories Landfill project started commissioning from December 2019 which will use waste gas from landfills to generate enough energy to power around 17,000 residential households per year.

Transportation currently accounts for around 18% of Hong Kong's greenhouse gas emissions and CLP is playing a key role to facilitate the decarbonisation of the sector. During the year CLP increased its electric vehicle (EV) fleet and began to upgrade its network of free EV charging stations across the city. Moreover, CLP has been supporting the network extension by MTR which forms part of the Government's "rail first" policy.

## Helping Customers Optimise Their Energy Use

Building a sustainable future for Hong Kong requires effort from all sectors of society, including energy consumers. CLP therefore launched a broad range of initiatives to encourage customers to embrace greener lifestyles.

The new Eco Building Fund provided subsidies for more than 600 residential and commercial buildings to install energy-efficient equipment in 2019, saving around 50GWh of electricity. Commercial and industrial customers also took advantage of CLP's Energy Audit service to find ways to lower their electricity bills and in 2019, CLP helped over 600 business customers save around 55GWh of electricity potentially.

The Renewable Energy Feed-in Tariff (FiT) scheme, which encourages customers to install solar or wind energy generation systems, had received more than 6,900 applications by the end of 2019. Around 84% of projects, representing a total capacity of around 90MW, have already been approved or connected to the grid. In addition, there was a positive response to the offer of Renewable Energy Certificates (RECs) since January 2019 for CLP customers to support local renewable energy generation.

Accurate and timely information about electricity usage is extremely useful to customers who want to change their consumption habits. In November 2018, CLP started a programme to replace conventional electricity meters with smart meters for all of its customers by 2025. By the end of 2019, around 421,000 smart meters had already been connected.

## Renewable Energy Feed-in Tariff Scheme

### Online Application and Tracking



Application via CLP App or CLP website



Tracking application progress



Online tracking of the amount of electricity generated after the renewable energy system is connected to the grid

## Progress



Received more than **6,900** applications



Around **84%** of projects, representing a total capacity of around **90MW**, have been approved or connected to the grid



### Supporting Hong Kong in Difficult Times

The social unrest experienced by Hong Kong in the second half of 2019 saw the economy face some of its most challenging times in recent history. As the city's biggest utility company, CLP is committed to helping customers through this difficult period.

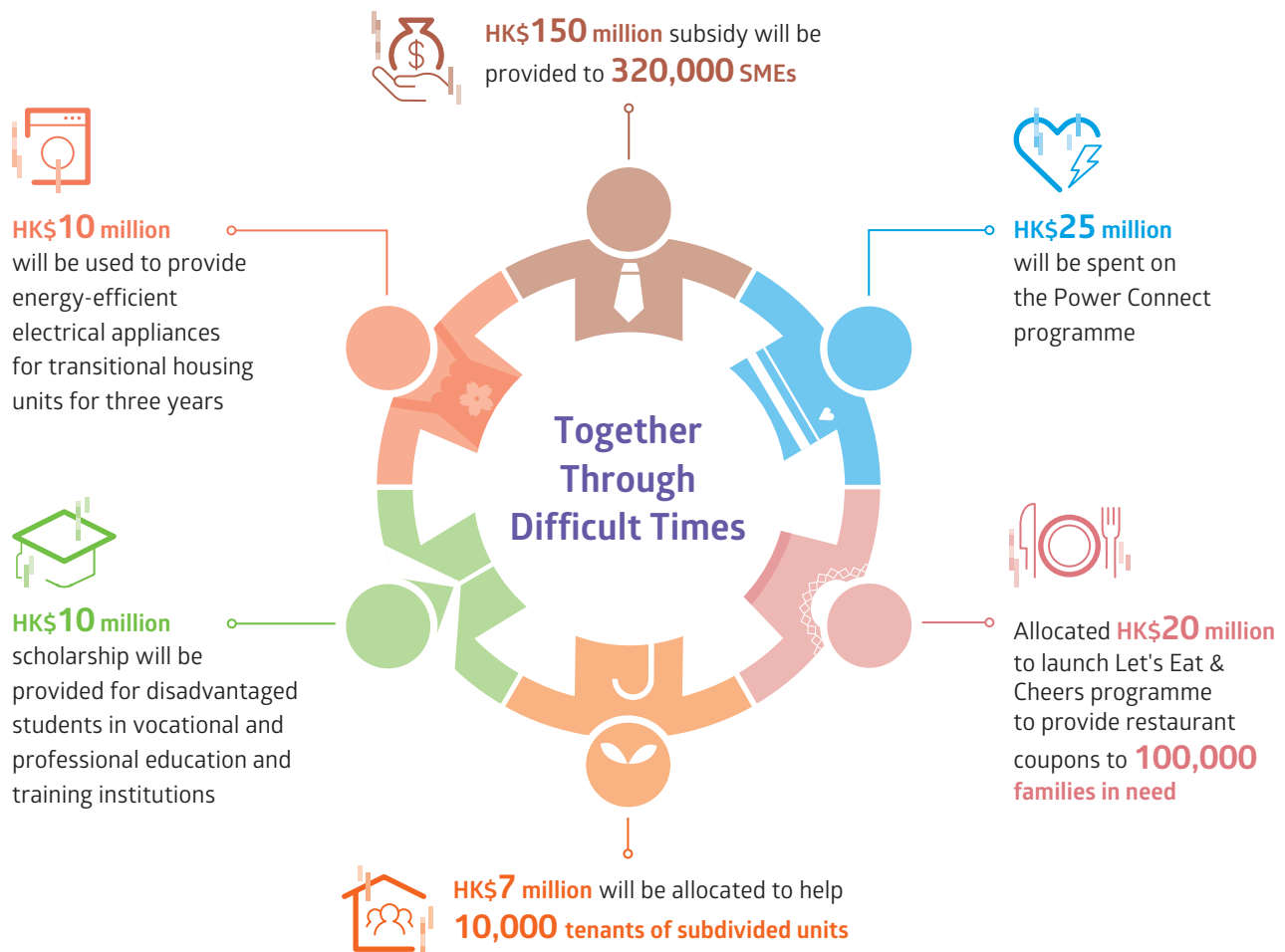
CLP has launched an over HK\$200 million relief programme to help ease the burden on small businesses and underprivileged people. Measures include a subsidy to offset the upward adjustment in Average Net Tariff for 320,000 small and medium-sized enterprises (SMEs) for the first six months of 2020, in addition to the Rent and Rates Special Rebate.

Below are details of some of the initiatives in the relief programme:

### The Power of Innovation

CLP has been acting as an innovation accelerator by adopting cutting-edge technologies in its operations and introducing innovative products and services to customers. We brought Free Electrons, the global energy start-up accelerator programme, to Hong Kong for the first time in 2019. The event connected utility companies with some of the world's most innovative start-up companies behind new technologies that deliver smarter and cleaner energy. They included Hong Kong-based Ambi Labs, whose products help users enhance air conditioning comfort with artificial intelligence technologies. CLP began piloting Ambi Labs' products with residential customers, promoting them on its online platform to help bring them to a wider audience.

New products and solutions from start-up companies, along with other smart city technologies and innovative energy solutions, were demonstrated at CLP's new SmartHub@CLP exhibition centre which showcases the Company's role as a smart city enabler and a pioneer of smart living.



In recent years, more businesses have started to look at Hong Kong as a potential location to set up data centres, taking advantage of the city's first-class infrastructure and connectivity. CLP supports this drive and is committed to providing a reliable electricity supply to further strengthen Hong Kong's role as a regional hub for these important facilities.

## Environmental Performance

### Environmental Regulatory Compliance

All Hong Kong assets under CLP's operational control maintained full compliance with environmental regulations in 2019.

CLP complied with all the emissions caps set by the Government in 2019. It has achieved this while maintaining supply reliability and by optimising its diversified fuel mix and maintaining the effectiveness of its emissions control facilities. It also complied with the new mercury emissions limit set from April 2019 onwards for Castle Peak.

### Air Emissions

The Government launched a public consultation in July 2019 following the completion of the Air Quality Objectives (AQOs) Review in 2018. Based on the review's findings, Hong Kong's air quality will be further improved by 2025 through the implementation of a variety of ongoing and new measures, including CLP's increased use of gas-fired electricity generation. Legislation for the proposed tightening of the AQOs will begin in 2020. CLP is committed to playing a key role in achieving better air quality and long-term decarbonisation for Hong Kong.

## Social Performance

### Stakeholder Engagement

To promote environmental initiatives to stakeholders, more than 50 roadshows, seminars, and workshops were held in 2019 to explain the details of the FiT and RECs schemes to members of the public and industry partners.

Over 240,000 residential customers have signed up to the CLP Power Connect programme since its launch in January 2019. The programme operates under the company's Community Energy Saving Fund and aims to encourage residential customers to save energy year-round, earning rewards while simultaneously helping people in need. It offers electricity subsidies of HK\$500 for 40,000 underprivileged households. The first batch of subsidies were paid out from May onwards.

As construction of the offshore LNG terminal continued, CLP conducted meetings and briefings to update stakeholders on the project's latest status and to hear their views.

### Community Initiatives

CLP has grown hand-in-hand with Hong Kong through the decades and treasures its close bond with the community. It has focused on youth engagement and caring for people in need in recent years, and in 2019 CLP launched and supported 403 initiatives aimed at creating a more caring and harmonious society.



Free Electrons connects utility companies with innovative start-up companies behind new, smarter and cleaner energy technologies.

Some of the initiatives are detailed below. For further details of individual programmes, please also refer to the Social and Relationship Capital chapter of this report on pages 91 to 94.



### Environment

- The Green Elites Campus Accreditation Programme reached around **10,000 students**, educating primary school students on green living.
- The Green Studio, a mobile classroom that educates the public on environmental protection, has welcomed more than **180,000 school children and visitors** since 2009.
- Launched a series of public education videos on climate change on the CLP website and other social media platforms with over **10,000 views**.
- The CLP Energy Innovation for Smart City Competition attracted more than **60 teams** from secondary schools.



### Community Wellbeing

- Set up the fourth CLP Hotmeal Canteen in Sham Shui Po with its non-governmental organisation partner. The four Hotmeal Canteens have served more than **670,000 hot meals** since 2011.
- More than **240,000 residential customers** have signed up for the Power Connect programme, relieving the electricity cost of some **40,000 underprivileged households** and helping to install **40 individual electricity meters** in **10 subdivided flats**.



### Volunteering

- CLP Volunteer won the Gold Award under Volunteer Team Category in the 10th Hong Kong Outstanding Corporate Citizenship Awards organised by the Hong Kong Productivity Council.
- More than **1,600 CLP volunteers** contributed close to **11,600 hours** of services to the community.



### Education and Development

- The CLP Power Academy partnered with education institutions to offer a variety of part-time programmes ranging from certificate courses to master's degree programmes, attracting more than **500 applications** for around **240 available places**.
- Power Kid Mobile App was launched to enable children to learn green knowledge with their parents. It was downloaded nearly **20,000 times**.
- The Power Kid Channel's 3D cartoon videos featuring *POWER FOUR* to help children learn about electricity and conservation have reached **3.3 million views**.
- CLP engineers have shared basic energy saving and power journey knowledge with more than **40,000 kindergarten pupils** through the POWER YOU Kindergarten Visitation Programme since 2017.

## Outlook

Hong Kong is on an important journey of decarbonisation. CLP will do its best to support the Government's environmental goals and emission reduction targets. Besides moving decisively on investments to add gas-fired capacity and enhance gas supply reliability, it is leading the way in the development of renewable energy in Hong Kong through the FiT and RECs schemes.

In 2020, for the first time, around half of the electricity sold by CLP will be generated by natural gas. Added to the around one-third zero carbon energy from Daya Bay, this represents

a significant milestone on the road to lower emissions. However, the switch to gas – which costs more than coal or nuclear energy – will inevitably lead to upward pressure on tariffs. To ease this, CLP is committed to continuing to implement stringent cost control measures across its operations.

Hong Kong is CLP's home. It remains committed as ever to work with the Government and the community to support the city through challenging times and steer it towards a dynamic new chapter of growth and opportunity in a greener, brighter future.





Laiwu III Wind Farm

# Mainland China

One of the largest external independent power producers in Mainland China concentrating on low-carbon energy, including nuclear power and renewables.

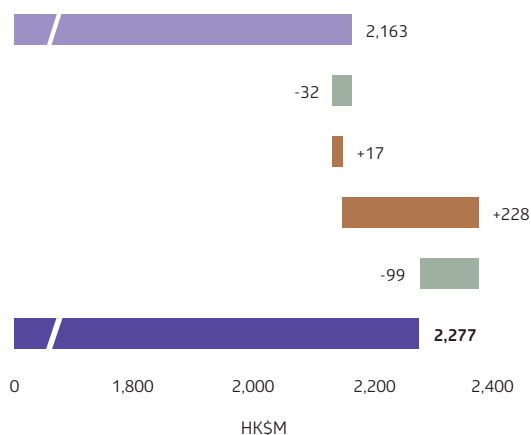
## Financial and Operational Performance

### Overview

The economy of Mainland China grew by 6.1% in 2019, its slowest rate in 29 years, putting pressure on electricity demand. CLP was affected by the slowdown, although to a lesser degree than other power companies because its diversified portfolio and the steady performance of its non-carbon assets helped weather some of the fluctuation.

Operating earnings in 2019 increased 5.3% to HK\$2,277 million. CLP's performance in Mainland China is summarised below:

Operating Earnings	2019 HK\$M	2018 HK\$M	Change %
Nuclear Energy	1,688	1,720	(1.9)
Renewable Energy	547	530	3.2
Thermal Energy	264	36	633.3
Operating and Development Expenditure	(222)	(123)	80.5
<b>Total</b>	<b>2,277</b>	<b>2,163</b>	<b>5.3</b>



#### 2018 Operating Earnings

Nuclear: Progressive commissioning of Yangjiang Units 5&6 offset by higher service and statutory charges, planned outages and lower VAT refund

Renewables: Contributions from new solar projects and higher water resource partially offset by lower wind resource

Thermal: More generation and lower coal costs at Fangchenggang

Renminbi depreciation

#### 2019 Operating Earnings

### Nuclear Energy Portfolio

Nuclear energy projects play a pivotal role in the transition towards a low-carbon economy and represent CLP's main source of income in Mainland China, amounting to around two-thirds of operating earnings for the year.

The sixth and final generating unit of Yangjiang Nuclear Power Station was commissioned in July 2019, contributing higher earnings to the Group. However, that contribution was more than offset by higher service and statutory charges, planned outages and lower value-added tax (VAT) refund.

The full operation of the project represents a milestone in CLP's decarbonisation efforts, adding 1,108MW of non-carbon generation capacity to its portfolio and helping the company towards its Climate Vision 2050 targets. Daya Bay Nuclear Power Station, meanwhile, continued to operate steadily.

### Renewable Energy Portfolio

Renewable energy projects are another major source of income in Mainland China. While earnings from renewable projects were higher in 2019, the performance of different asset types was mixed.

CLP's solar energy portfolio grew through the acquisition of a 100% stake in Meizhou Pingyuan Solar Power Station in Guangdong Province in January 2019, the first time CLP has bought an operating renewable project in Mainland China. The acquisition raised both output and earnings. Performance of CLP's other solar projects remained stable.

Earnings from hydro energy projects were higher too, largely because abundant rainfall in the first half of the year led to increased generation from the Huaiji plants in Guangdong. This, however, was partially offset by the impact of lower rainfall at Yang\_er Hydro Power Station in Yunnan Province.



Wind energy projects, on the other hand, reported lower earnings due to reduced wind resources in Shandong Province although the situation of grid curtailment in northeast China has improved. In Shandong, the CLP Laizhou II project was commissioned in June while construction began on the Laiwu III project in the second quarter of 2019.

In the past year, payment of subsidies from the Central Government for renewable energy projects had been delayed with the total amount due increasing to RMB1.14 billion (HK\$1.27 billion) as of 31 December 2019.

## Thermal Energy Portfolio

CLP's only majority-owned coal-fired project in Mainland China, Fangchenggang Power Station, recorded good performance in 2019. Its utilisation was higher due to economic growth in the Guangxi Zhuang Autonomous Region and less competition from hydro power generation due to low rainfall. The plant continued its evolution into an integrated energy provider by supplying steam and carbon dioxide (CO<sub>2</sub>) to a nearby factory, thereby helping to secure more generation hours. The granting of approval for direct unloading of imported coal at the Fangchenggang Power Station dedicated jetty also helped to lower fuel costs.



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**At present, the broad application of cutting-edge digital technologies such as Artificial Intelligence (AI) and Big Data is bringing about profound changes in China's energy and power sectors as well as economic development as a whole. The deep integration between energy transformation and digital revolution is the future trend. As such, how is CLP promoting digitalisation and the adoption of such technologies as AI?**

**Ms Mary Nan**  
Chief Executive Officer, CYZone

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In Mainland China, we are leveraging digital technologies to improve operations, boost efficiency and enhance safety. For example, data analytics and AI technologies are used to monitor the operations of different assets including wind, solar and coal-fired generation facilities. Performance data is transferred and managed on cloud-based systems for analysis, giving us greater insights into plant operations and potential issues. To enhance access for mobile users, we have also developed wireless applications for various plant operations.

In some of our solar assets, data from thermal cameras fitted to aerial drones is analysed using AI algorithms to identify potential performance issues and defects in equipment. Drones are also deployed for plant inspection and security management. Besides, we have adopted robotic application at Fangchenggang Power Station for working at height, and increased the use of robots for cleaning photovoltaic panels at our Sihong solar plant. We have also introduced location identification and access control system in key office locations and plants for better management, while virtual reality technology is being applied in simulation training of operation and maintenance staff. These digital technologies are playing a bigger role in building intelligent power plants with higher management efficiency.

In addition, we launched a trial in 2019 at one of our hydro plants at Huaiji using facial recognition combined with AI to create a virtual fence on site. This allows us to monitor trespassers and have better access control. We look forward to sharing the experience with other assets and a wider application of the innovative technology.



**SH Chan**  
Managing Director - China

## Mainland China

The table below shows the performance of CLP's renewable energy and thermal energy projects in Mainland China.

	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup> GWh		Availability %		Utilisation %	
		2019	2018	2019	2018	2019	2018
		<b>Renewable Projects – Performance</b>					
<b>Wind</b>	884.6	<b>1,793</b>	1,771	<b>98.1</b>	97.0	<b>24.4</b>	24.9
Wholly-owned	493.5	<b>1,052</b>	983	<b>97.2</b>	95.5	<b>25.9</b>	25.5
Qian'an I and II	99	<b>261</b>	231	<b>99.3</b>	98.2	<b>30.6</b>	26.5
Penglai I	48	<b>93</b>	98	<b>99.6</b>	99.7	<b>21.9</b>	23.6
Laiwu I & II <sup>2</sup>	99	<b>160</b>	183	<b>99.4</b>	99.4	<b>18.9</b>	21.6
Xundian I	49.5	<b>154</b>	135	<b>99.7</b>	99.6	<b>36.2</b>	31.8
Sandu	99	<b>203</b>	209	<b>88.1</b>	82.5	<b>24.0</b>	24.1
CLP Laizhou I & II <sup>3</sup>	99	<b>181</b>	127	<b>99.8</b>	99.8	<b>27.0</b>	30.1
Minority-owned	391.1	<b>741</b>	788	<b>99.2</b>	98.8	<b>22.6</b>	24.3
<b>Solar<sup>4</sup></b>	328.3	<b>581</b>	458	<b>99.9</b>	99.9	<b>20.3</b>	19.9
Jinchang	85	<b>162</b>	124	<b>99.8</b>	99.9	<b>21.9</b>	21.4
Sihong	93.4	<b>139</b>	133	<b>100</b>	99.9	<b>17.0</b>	16.3
Xicun	84	<b>174</b>	166	<b>100</b>	100	<b>23.7</b>	22.6
Huai'an	12.8	<b>20</b>	20	<b>99.9</b>	100	<b>17.9</b>	17.6
Lingyuan <sup>5</sup>	17	<b>33</b>	15	<b>100</b>	100	<b>23.5</b>	21.4
Meizhou <sup>6</sup>	36.1	<b>52</b>	N/A	<b>99.7</b>	N/A	<b>16.4</b>	N/A
<b>Hydro</b>	489.3	<b>1,758</b>	1,604	<b>93.1</b>	90.6	<b>41.4</b>	39.0
Dali Yang_er	49.8	<b>134</b>	182	<b>93.0</b>	92.6	<b>30.9</b>	41.9
Huaiji	109.5	<b>436</b>	278	<b>88.4</b>	88.9	<b>46.9</b>	29.9
Jiangbian	330	<b>1,187</b>	1,144	<b>94.6</b>	90.9	<b>41.1</b>	41.6
<b>Thermal Projects – Performance</b>							
<b>Majority-owned</b>							
Fangchenggang I & II	1,806	<b>7,720</b>	5,787	<b>95.8</b>	86.7	<b>51.7</b>	38.8
<b>Minority-owned</b>	2,147.2	<b>9,272</b>	9,924	<b>91.6</b>	90.0	<b>53.1</b>	55.4
Shiheng I & II	370.4	<b>1,246</b>	1,511	<b>90.1</b>	83.6	<b>41.8</b>	50.7
Heze II	176.4	<b>907</b>	973	<b>91.0</b>	92.9	<b>62.9</b>	67.7
Liaocheng I	352.8	<b>1,649</b>	1,731	<b>87.3</b>	78.8	<b>57.2</b>	59.2
Panshan	206.7	<b>810</b>	930	<b>91.2</b>	96.6	<b>47.8</b>	54.9
Sanhe I and II	219.5	<b>1,008</b>	1,048	<b>97.0</b>	94.5	<b>56.1</b>	58.4
Suizhong I and II	564	<b>2,368</b>	2,473	<b>93.7</b>	91.9	<b>51.1</b>	53.3
Zhungeer II and III	257.4	<b>1,284</b>	1,258	<b>91.3</b>	95.4	<b>63.1</b>	61.8

Any minor discrepancies in totals are due to rounding of figures

Notes:

- 1 Indicates CLP equity sent-out.
- 2 The data of Laiwu I & II have been combined to align with reporting practice in Mainland China.
- 3 CLP Laizhou II was commissioned in June 2019. The data of CLP Laizhou I & II have been combined to align with reporting practice in Mainland China.
- 4 Alternate Current (AC) capacity is used to align with the calculation method for other power plants in the CLP portfolio.
- 5 The project commenced commercial operation in July 2018.
- 6 The project was acquired in January 2019.



## Innovation

CLP has taken part in the development and operation of an incremental distribution network (IDN) at Fangchenggang Hi-Tech Zone to provide electricity supply services to customers in the park – the Group's first investment in distribution grids in Mainland China. The project provides a solid foundation for similar opportunities in southern China as reform of the electricity sector continues. It started services in January 2020 and CLP's involvement was through TUS-CLP Smart Energy Technology Co. Ltd., its joint venture with a subsidiary of TUS-Holdings which is affiliated to Tsinghua University. The IDN project demonstrates CLP's capability in supporting the further development of smart distribution grid and smart energy solutions in Mainland China.

## Environmental Performance

### Environmental Regulatory Compliance

All assets under CLP's operational control in Mainland China maintained full compliance with environmental regulations in 2019.

### Air Emissions

CLP continued to explore innovative technologies to further reduce emissions and greenhouse gases in 2019. A pilot project was launched using flue gas generated from Fangchenggang as a source of CO<sub>2</sub> to cultivate microalgae in partnership with a nearby farm.

There was a significant decrease in sulphur dioxide (SO<sub>2</sub>) since the completion of the emissions control retrofit project at Fangchenggang by the end of 2018. However, as output was approximately 33% higher in 2019 compared with a year earlier, nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM) increased. As a result, total air emissions remained at a similar level to that in 2018.

## Social Performance

### Stakeholder Engagement

Continuing its practice from past years, CLP management held a wide-ranging series of meetings with Government officials and business partners in Mainland China in 2019 to strengthen its stakeholder relations. Talks were held with Government officials at national levels including the National Energy Administration, the Hong Kong and Macao Affairs Office, the Liaison Office of the Central People's Government in Hong Kong, as well as senior officials from various provinces.

Chairman Sir Michael Kadoorie joined a Hong Kong delegation that travelled to Beijing to take part in the celebration of the 70th Anniversary of the founding of the People's Republic of China on 1 October 2019.

2019 marked the 40th anniversary of CLP's power supply to Guangdong. A celebratory dinner was arranged with China Southern Power Grid Co., Ltd. (CSG) in Hong Kong to commemorate the occasion and to further cement CLP's ties with CSG.

CLP is exploring new business opportunities in the Guangdong-Hong Kong-Macao Greater Bay Area (Greater Bay Area) and stepped up stakeholder engagement in the region. Company management met with senior officials of Guangzhou, Foshan and Zhaoqing, and signed the Strategic Cooperation Framework Agreement for Power Utilities Supporting the Development of the Greater Bay Area with major industry partners in Beijing. CLP also participated in the Guangxi Integration with the Greater Bay Area Forum in Hong Kong, and signed a Memorandum of Understanding with CSG to explore opportunities in electric vehicle charging in the region.

## Community Initiatives

CLP launched a broad range of initiatives in the communities surrounding its power stations in Mainland China in 2019 with a focus on education, environmental protection, and community wellbeing. A three-year programme was launched

to support underprivileged ethnic minority students and villagers in Guangxi and to help preserve their culture.

Some key projects are detailed below, while further information can be found in the Social and Relationship Capital chapter on pages 91 to 94.



### Community Wellbeing

- Donated daily necessities to around **5,000 underprivileged villagers, elderly home residents, and children in need** in **8 provinces**.
- Made donations to **600 residents** in Jiangbian in Sichuan.
- Installed a water purifying system in a community in Penglai in Shandong, ensuring clean water supply for **300 residents**.
- Made donations to build a water cellar in Yunnan, benefitting **1,000 villagers of the Yi ethnic community**.
- Erected safety signs and built road speed bumps in a village in Laizhou in Shandong to improve road safety for **1,500 villagers**.



### Environment

- Published a bilingual book on environmental protection in Mandarin and Tibetan to strengthen awareness of environmental protection among Tibetan primary school students and their families.
- Conducted talks on environmental protection to over **1,100 students** and **2,700 residents** in **10 provinces**.
- Made donations to upgrade the rubbish processing system in Fangchenggang in Guangxi, benefitting **2,800 residents**.



### Volunteering

- CLP volunteers contributed close to **1,700 hours** in organising charity events and visits.



### Education and Development

- Organised Support-a-Student and Support-a-School programmes for more than **1,300 students** from **22 schools**.
- Provided financial subsidies to disadvantaged secondary school and college students in Guangxi, Guizhou and Yunnan.
- Arranged electrical safety talks for more than **1,400 students** from **21 schools** in **6 provinces**.
- Arranged site visits to Fangchenggang Power Station in Guangxi and Sihong Solar Power Station in Jiangsu to strengthen students' knowledge about power generation and environmental protection.



## Outlook

The economy of Mainland China is in a period of structural change in which heavy industry is giving way to more diverse commercial activities and expanding domestic consumption. This transformation has had an impact on demand for electricity and is expected to lead to an oversupply in some parts of China.

Reforms, meanwhile, are continuing in the electricity market, particularly in relation to market sales, the introduction of a carbon trading regime and the development of trading mechanism for renewable energy certificates. In response, CLP has formulated strategies based on market conditions in different provinces and regions to secure more sales and is carefully observing the evolution of market regulations in order to capitalise on the opportunities arisen from the market reforms.

Overall, about half of CLP's total generation volumes across all projects were through market sales in 2019, and the proportion of market sales is expected to rise continuously. Although tariffs under the market mechanism are generally lower than the benchmark tariff, sales strategies and initiatives in different provinces and regions have helped improve dispatch levels.

While coal remains an important source of fuel in Mainland China, it is gradually being replaced by non-carbon sources because of the recognition for cleaner air. CLP will therefore continue to develop its non-carbon portfolio to play a part in the energy transition.

Because of a decline in manufacturing costs, subsidies to renewable energy providers have been scaled back. Going forward, therefore, CLP will opt for renewable projects that can achieve grid parity or compete with conventional projects on cost. In view of the increasing competition for new wind and solar projects, CLP will also explore offshore options.



2019 marks the 40th anniversary of CLP's power supply to Guangdong.



Chandgarh Wind Farm

# India

Pursuing growth in low-carbon areas, non-generation opportunities and other customer-focused businesses.



## Financial and Operational Performance

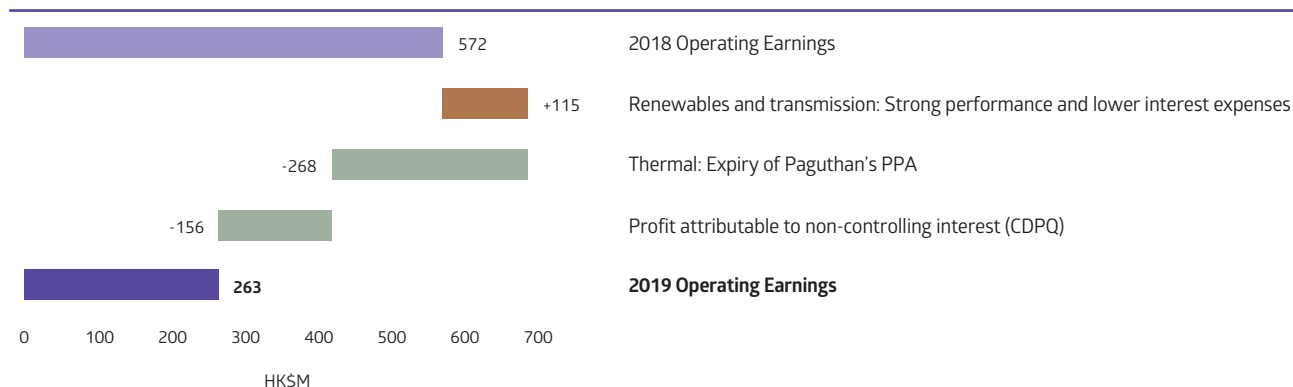
### Overview

CLP India continued to expand its portfolio and explore new business opportunities in 2019. The performance of operating assets was strong, with Jhajjar Power Station and renewable energy assets reporting higher earnings.

Operating earnings attributed to the CLP Group were nonetheless 54.0% lower than in the previous year. Paguthan Power Station did not report any significant generation during 2019 after a power purchase agreement (PPA) expired in December 2018, resulting in an operating loss. In addition, a 40% stake in CLP India was sold to the Canadian pension fund Caisse de dépôt et placement du Québec (CDPQ) in December 2018, thereby diluting our share of earnings.

CLP's performance in India is summarised below:

Operating Earnings	2019 HK\$M	2018 HK\$M	Change %
Renewable Energy and Transmission	359	244	47.1
Thermal Energy	60	328	(81.7)
Profit attributable to non-controlling interest (CDPQ)	(156)	-	
<b>Total</b>	<b>263</b>	<b>572</b>	<b>(54.0)</b>



### New Horizons

CLP India entered the power transmission sector in 2019 by agreeing to acquire three transmission assets from Kalpataru Power Transmission Ltd. and Techno Electric & Engineering Co. Ltd. One of the projects, Satpura Transco Private Ltd. (STPL), formerly known as Kalpataru Satpura Transco Private Ltd., was successfully transferred to CLP India in November 2019. STPL reported an availability of 100% in 2019. The other two projects, Alipurduar Transmission Ltd. and Kohima Mariani Transmission Ltd., are expected to be taken over by CLP India in 2020. The acquisitions represent a milestone for CLP India, which has now broadened its portfolio to include two of the three main segments in the country's power value chain. They will also enable CLP India to expand its geographic reach across the country and reinforce its commitment to expand its low-carbon investments.

CLP India also made its first successful bid for a wind project at competitive auction in 2019, securing about 250MW in wind capacity which it plans to develop in Sidhpur in Gujarat

state. When the project is commissioned in 2021, it will be the biggest of all wind assets in the CLP Group.

### Renewable Energy Portfolio

Renewable energy projects accounted for about 85% of CLP India's operating earnings in 2019. The wind energy portfolio performed well thanks to better operational management. Availability reached 95.8%, an increase on 2018's 95.4%, while output also improved marginally.

Performance of the solar energy portfolio was stable, helped by higher availability and generation at the Veltoor Solar Farm. A pilot project for dry cleaning of PV modules was initiated to reduce water consumption. The Veltoor plant won a number of awards including Outstanding Renewable Energy Generation Project (Solar) at the Indian Federation of Green Energy's India Green Energy Awards 2019, Top Plant of 2019 in the renewable energy sector by the Power Magazine, and Best Performing Project of the Year (100MW and below) in the India Solar Week Excellence Awards.

## India

The performance of our renewable energy projects is summarised in the table below.

	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup>		Availability		Utilisation	
		GWh		%		%	
		2019	2018	2019	2018	2019	2018
<b>Wind</b>	554.5	<b>1,046</b>	1,723	<b>95.8</b>	95.4	<b>21.5</b>	21.3
Andhra Lake	63.8	<b>129</b>	229	<b>95.7</b>	93.6	<b>23.1</b>	24.6
Bhakrani	61.4	<b>84</b>	130	<b>94.6</b>	95.6	<b>15.6</b>	14.6
Chandgarh	55.2	<b>106</b>	190	<b>98.3</b>	96.8	<b>22.0</b>	23.7
Harapanahalli	23.8	<b>55</b>	90	<b>95.9</b>	99.1	<b>26.4</b>	25.9
Jath	36	<b>73</b>	112	<b>97.8</b>	97.0	<b>23.0</b>	21.3
Khandke	30.2	<b>58</b>	88	<b>91.1</b>	85.5	<b>22.0</b>	20.0
Mahidad	30.2	<b>59</b>	99	<b>92.1</b>	97.2	<b>22.1</b>	22.6
Samana I	30.2	<b>58</b>	90	<b>93.8</b>	95.7	<b>22.0</b>	20.4
Samana II	30.2	<b>63</b>	100	<b>93.4</b>	96.3	<b>24.0</b>	22.7
Saundatti	43.2	<b>81</b>	129	<b>97.9</b>	97.2	<b>21.4</b>	20.5
Sipla	30.2	<b>49</b>	73	<b>96.1</b>	94.0	<b>18.5</b>	16.6
Tejuva	60.5	<b>121</b>	206	<b>97.6</b>	97.8	<b>22.6</b>	23.3
Theni I	29.7	<b>56</b>	99	<b>95.7</b>	94.5	<b>21.5</b>	22.8
Theni II	29.7	<b>54</b>	88	<b>97.9</b>	93.0	<b>20.7</b>	20.3
<b>Solar</b>	102	<b>182</b>	112	<b>96.8</b>	98.8	<b>22.8</b>	23.1
Veltoor	60	<b>106</b>	101	<b>99.3</b>	99.2	<b>23.3</b>	23.7
Gale	30	<b>54</b>	6	<b>96.4</b>	98.4	<b>22.7</b>	22.2
Tornado	12	<b>22</b>	5	<b>85.0</b>	98.6	<b>20.8</b>	22.7

Note:

1 Indicates CLP equity sent out.

### Thermal Energy Portfolio

Jhajjar achieved a commercial availability of 89.2% in 2019 on the back of improved coal supply and operational management. The plant also recorded a satisfactory financial performance as it collected higher capacity charges from increased availability.

As part of its efforts to comply with the Government's environmental requirements, the Jhajjar project became one of the first in India to successfully dispose of 100% of ash generated by the plant.

In recognition of its high safety standards, Jhajjar became the first CLP India asset to receive the ISO 45001:2018 certification, and also won the Greentech Safety Gold Award.

Despite repeated attempts by CLP India to sell output from Paguthan on the Indian Energy Exchange, the plant did not undertake any significant commercial generation over the course of the year.

The table below shows the performance of our thermal energy projects in India.

	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup>		Availability		Utilisation	
		GWh		%		%	
		2019	2018	2019	2018	2019	2018
<b>Coal</b>							
Jhajjar	792	<b>3,465</b>	6,691	<b>89.8</b> <sup>2</sup>	90.1 <sup>2</sup>	<b>53.8</b>	62.1
<b>Gas</b>							
Paguthan	393	<b>0</b>	365	<b>100</b> <sup>3</sup>	96.2 <sup>3</sup>	<b>0</b>	6.5

Notes:

1 Indicates CLP equity sent out.

2 Technical availability. Jhajjar's commercial availability was 89.2% in 2019 and 77.2% in 2018.

3 Technical availability.

## Environmental Performance

### Environmental Regulatory Compliance

Further to the more stringent SO<sub>2</sub> emission limit at the end of January 2019, there were five minor licence limit exceedances at Jhajjar in the first half of 2019, while the flue-gas desulfurisation (FGD) units became fully operational. None of them resulted in any action from authorities.

### Air Emissions

To meet India's new compliance requirements, the FGD units at Jhajjar went into partial operation in the second half of 2018 and full operation from February 2019 onwards. The units significantly reduced SO<sub>2</sub> emissions from 5.02 kg/MWh\* in 2017 to 2.75 kg/MWh\* in 2018 and 0.74 kg/MWh in 2019.

PM emission in 2019 was 0.15 kg/MWh, same as 2018. The combustion optimisation carried out in 2018 helped reduce NO<sub>x</sub> emissions in 2018 and 2019 to 0.85 kg/MWh\* and 0.93 kg/MWh respectively, compared with 1.36 kg/MWh\* in 2017.

\* Restated by using electricity sent-out, instead of gross output, to calculate the intensity.

### Water

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.

Despite the continuous operation of the FGD units since February 2019, water consumption remained stable at 2.47 m<sup>3</sup>/MWh in 2019 which is substantially below the statutory authorisation of 3.5 m<sup>3</sup>/MWh.

## Social Performance

CLP India's community investment initiatives in 2019 focused on strategic partnerships with a special emphasis on youth and women empowerment.

Among the many initiatives, CLP India funded the construction of a centralised kitchen near Veltoor. Together with another similar kitchen near Saundatti Wind Farm, around 30,000 children in 315 Government schools received hot mid-day meals sponsored by CLP India in 2019. The services help to keep children in school while giving them nutritious meals.

In Jhajjar, CLP India launched in partnership with the Confederation of Indian Industry an ambitious project to improve air quality by promoting alternatives to stubble burning. The project, covering 9,000 acres of land in six villages in Haryana near Jhajjar, involved the deployment of different technological tools in fields, and mass awareness campaigns to encourage behavioural change by farmers.

A 1,500-seat mini sports stadium with training support for youngsters was developed in Khanpur Kalan village near Jhajjar. Several water harvesting initiatives were also launched to improve water security in CLP India's catchment communities.



Renewable energy projects including solar farms account for about 85% of CLP India's operating earnings in 2019.



Some of the other impactful community projects conducted by CLP India are highlighted in the graphic below. More details can be found in the Social and Relationship Capital chapter on pages 91 to 94.



## Environment

- Engaged around **800 students** in environmental activities including seed ball making, learning about medicinal plant and awareness programmes on renewable energy.
- More than **3,300 saplings** were planted in schools, village offices and community spaces.
- 42 water structures** were repaired or constructed. Training programmes on sustainable agriculture were also held for **316 farmers** in Khandke.
- 16 village ponds** with an estimated water harvesting capacity of **30 million litres** were de-silted in Samana and Mahidad. Water initiatives were also launched at Veltoor.



## Community Wellbeing

- An overhead water tank with a storage capacity of **200,000 litres** was constructed in Khanpur Khurd village near Jhajjar to benefit around **6,000 residents**.
- 5,800 villagers** benefitted from initiatives including the repair of drinking water structures in Khandke village, construction of water tanks for Samana and Mahidad villages, and the distribution of water filters to schools and communities.
- Provided doorstep primary healthcare services to **63,000 people** in **58 villages** in Andhra Lake, Sipla Bhakrani, Tejuva, Veltoor, Paguthan and Jhajjar.
- Sports equipment was provided to **990 young people** at schools and communities in Samana, Mahidad and Veltoor.



## Volunteering

- Employees and their families contributed more than **1,200 volunteer hours** in activities such as beach cleaning.



## Education and Development

- A milk cooperative initiative at Chandgarh benefitted **1,500 women**. An International Women's Day celebration welcomed **2,000 female participants** from the area.
- Exposure tours, training of master trainers and other action plans were developed with the Self-Employed Women's Association with aims to support **4,000 women** in **73 villages**.
- Funded **283 young people** to receive trainings in wrestling, basketball, football, cricket, hockey and other sports.
- The CLP India Scholarship Scheme provided financial assistance for **874 underprivileged students**.

## Outlook

Although the country's economic growth and electricity demand both slowed down in 2019, CLP India remains confident in the future of the country's power market, particularly in its potential for low-carbon projects as India undergoes an energy transition.

There are risks in a rapidly-changing energy market. Of particular concern is the evolution of the financial health of the state distribution companies to whom CLP India sells renewable energy. Total receivables relating to revenue from our renewable projects increased to HK\$805 million as of 31 December 2019. CLP will therefore continue to seek out

quality projects such as our recent acquisition of transmission assets and the new greenfield wind development project we successfully bid for in Gujarat.

As there is no commercial market for the output of the Paguthan plant, CLP India will explore whether there are opportunities to utilise the site.

For the longer term, CLP India will continue to diversify its revenue stream and expand its non-generation operation in transmission, distribution and other customer-focused businesses. Innovation and new business models will also be pursued as and when the opportunities arise.



**Are you happy with the progress we have made on the agreement to acquire stakes in three power transmission assets? What are CLP India's future plans in this space?**

### Praveen Khatri

Deputy Manager of Operation & Maintenance  
Jhajar Power Station, CLP India



There has been a noticeable growth in private investment in India's grid infrastructure projects, driven by the Government's decision to increase the number of transmission projects available for tariff-based competitive bidding, which enables private sector participation. With significant renewable capacity scheduled to come online and the Government's focus on rural electrification, the Government has identified 66,500MW of transmission projects to be built by October 2021 in phases\*. Therefore, the Ministry of Power is putting priority on developing renewable energy transmission projects.

This is a great opportunity for companies like ours. We have already expanded into the transmission sector by entering into an agreement with Kalpataru Power Transmission Ltd. and Techno Electric & Engineering Co. Ltd. to acquire their stakes in three power transmission assets. We have had the intent of entering this segment for some time and were glad to have found the right assets to mark our entry. We took over the first asset in 2019 and are currently pursuing requisite approvals to complete the transaction for the other two assets.

India is a primary growth market for our shareholders CLP and CDPQ, and they share a vision to invest in a low-carbon, clean energy portfolio. The transmission assets acquisition will enable us to diversify our earnings base, expand our geographical reach across the country and reinforce our commitment to grow our investments. We will continue to look for the right assets and act as India's partner in modernising and building a robust transmission grid.

\* Details can be found in a press release titled *Ministry of New and Renewable Energy refutes reports expressing doubt on India's renewable energy target* issued by the Government of India on 10 October 2019: <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1587655>



### Rajiv Mishra

Managing Director - India





Lopburi Solar Farm

# Southeast Asia and Taiwan

Keen to invest in renewable energy generation in the region to support global efforts to reduce carbon emissions.



## Financial and Operational Performance

### Overview

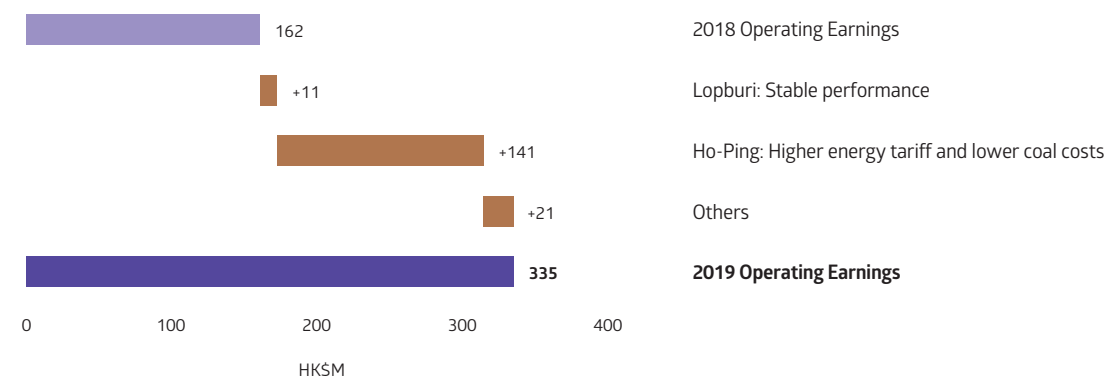
The coal-fired Ho-Ping Power Station in Taiwan continued to deliver a stable supply of electricity in 2019. The plant also produced sound financial results due to lower coal costs and a higher energy tariff. Under its PPA with Government-owned Taiwan Power Company, Ho-Ping's annual energy tariff was increased in 2019 to reflect higher coal costs in the previous year.

In Thailand, the Lopburi solar plant operated steadily with higher levels of solar irradiance.

In late 2019 CLP published its updated Climate Vision 2050 and gave an undertaking not to invest in any additional coal-fired generation assets. As a result it is in the process of withdrawing from two legacy coal-fired power plant developments in Vietnam.

CLP's performance in Southeast Asia and Taiwan is summarised below:

Operating Earnings	2019 HK\$M	2018 HK\$M	Change %
Renewable Energy	80	69	15.9
Thermal Energy	272	131	107.6
Operating and Development Expenditure	(17)	(38)	(55.3)
<b>Total</b>	<b>335</b>	<b>162</b>	<b>106.8</b>



### Outlook

In accordance with Taiwan's Electricity Act of 2017, Ho-Ping will invest in renewables in the coming years. CLP will also continue to explore ways to expand its renewable energy footprint in Thailand, and will explore new investment opportunities in renewable generation in Vietnam.



Geelong Customer Service  
Call Centre

# Australia

Operates a customer-focused energy business serving 2.47 million accounts across southeast Australia.

## Financial and Operational Performance

### Overview

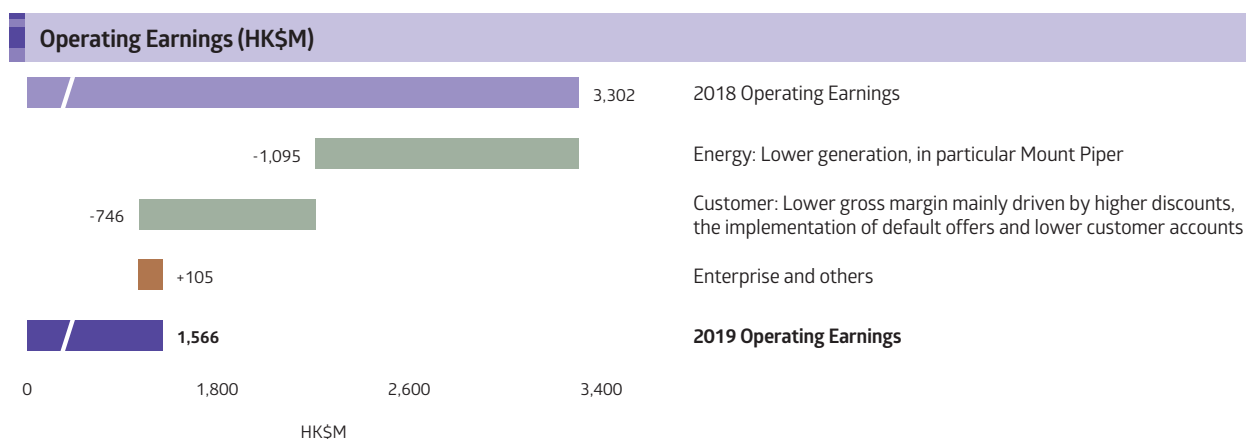
The Australian market provided a sharp reminder of its volatile nature in 2019 with EnergyAustralia's business enduring one of its most challenging years since it began a programme of value restoration in 2014.

The introduction of regulated pricing in July represented the most significant change to energy retailing in years while retail competition remained intense. Wholesale market prices continued to track around historical highs, reflecting the energy supply-demand imbalance in Australia. Unfortunately, operational issues reduced output at its two largest plants, which meant EnergyAustralia was not able to fully participate in the wholesale market.

Consequently, EnergyAustralia's operating earnings declined 52.6% from a year earlier to HK\$1,566 million. An anticipated reduction in future earnings from its retail business associated with the introduction of regulated retail prices led EnergyAustralia to record a one-off, non-cash impairment of goodwill of HK\$6,381 million as part of the Group's 2019 interim results.

The erosion in its financial performance was disappointing. Nonetheless, EnergyAustralia's value-restoration programme has set a solid foundation for the business, allowing it to withstand some of the worst of the headwinds. It has already identified good opportunities to operate more efficiently and reduce costs so that it can better navigate the challenging market conditions ahead.

EnergyAustralia's performance in 2019 is summarised below:



### Focusing on Customers

Prices for all existing EnergyAustralia customers were either unchanged or reduced in 2019, reflecting sustained and intense competition and a significant shift in retail electricity regulation.

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.

EnergyAustralia approached the change as an opportunity to launch a new suite of products comprising simple, lower-cost services. Existing customers were proactively approached well ahead of the changes to seek to ensure they were on the best plan.

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.

EnergyAustralia recorded an improved Net Promoter Score, showing an improved inclination of its retail customers to recommend the company to other people. Market churn has reduced across all states since the introduction of regulated pricing, and EnergyAustralia continued to perform better than the market average. However, customer accounts decreased by 84,000 or 3% over the course of the year.



## Australia

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.

It remains focused on improving its compliance across each of these areas and is fully cooperating with the regulators.

### Managing the Challenges

EnergyAustralia's generation fleet dealt with a number of operational challenges in 2019. Output at Yallourn Power Station in Victoria was restricted by a combination of planned and forced outages, and the implementation of new safety measures following an investigation into a workplace fatality in late 2018. The new measures were implemented for all four power generation units by mid-November 2019 and

availability is expected to progressively return to previous levels in 2020.

Mount Piper Power Station in New South Wales (NSW) produced substantially less energy in 2019 than in the previous year due to disruptions to the fuel supply from Springvale, the single coal mine supplying the plant. Improved levels of supply were eventually achieved in November 2019 after the underground mining operations at Springvale moved to a new seam and temporary facilities were opened to enable deliveries of coal by rail from a second mine source. EnergyAustralia is working to secure long-term improvements to fuel security for the power station. Meanwhile, work has started on a turbine upgrade which will increase Mount Piper's capacity by 60MW without the plant needing to burn additional coal. The work is scheduled for completion in 2021.

EnergyAustralia's gas-fired power facilities in NSW, Victoria, and South Australia operated with high reliability throughout the year, supporting its generation portfolio through periods of reduced baseload generation. Capacity at Hallett Power Station has increased 30MW in early 2020 following successful upgrade works.

Wholesale prices on average remained higher during 2019, largely due to market-wide baseload reliability issues, prolonged drought impacting hydro-electricity generation mainly in NSW, and delays to the integration of new renewable energy capacity.

The table below shows the performance of EnergyAustralia's renewable energy and thermal energy generation projects:

Renewable Energy and Thermal Energy Projects – Performance							
	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup> GWh		Availability %		Utilisation %	
		2019	2018	2019	2018	2019	2018
<b>Wind</b>							
Cathedral Rocks	32	85	84	90.4	90.2	31.0	30.8
<b>Gas</b>	1,563	2,758	1,487	82.1	85.8	21.0	11.3
Newport	500	1,176	502	89.8	89.0	29.0	12.3
Jeeralang	440	227	107	84.2	95.3	6.0	2.8
Hallett	203	33	23	84.6	85.4	1.9	1.4
Tallawarra	420	1,322	855	69.5	72.4	36.6	23.8
<b>Coal</b>	2,880	13,309	17,565	78.7	81.2	57.4	75.0
Mount Piper	1,400	4,355	8,193	83.1	85.4	38.4	71.2
Yallourn	1,480	8,954	9,371	74.6	77.2	75.3	78.6

Any minor discrepancies in totals are due to rounding of figures

Note:

1 Indicates CLP equity sent out and capacity purchase.

## Towards a Low-Carbon Future

EnergyAustralia continues to advocate and support development of a modern, cleaner energy system for the country – one that will benefit all customers no matter where they live or how much they earn.

It believes the components of such a system exist: wind and solar power, supported by storage, demand response, energy efficient technology, and flexible generation.

EnergyAustralia has committed to PPAs over the years representing over 820MW, underpinning new wind and solar power projects. These include Coleambally Solar Farm and Bodangora Wind Farm in NSW, which commenced operations in January and April 2019 respectively. The performance of these renewable energy projects is set out in the table below:

Renewable Energy Generating Capacity under Contract to EnergyAustralia			
	Offtake for EnergyAustralia MW	Electricity Sent Out GWh	
		2019	2018
<b>Wind</b>			
Boco Rock	113	365 <sup>1</sup>	367 <sup>1</sup>
Bodangora	68	163 <sup>1</sup>	N/A
Gullen Range	165.5	491 <sup>1</sup>	481
Mortons Lane	19.5	66 <sup>1</sup>	66 <sup>1</sup>
Taralga	107	312 <sup>1</sup>	299 <sup>1</sup>
Waterloo Stage 1	55.5	153	166
<b>Solar</b>			
Coleambally	105	249	N/A
Gannawarra	50	88	69
Manildra	46	109	2
Ross River	93	216	21

Note:

<sup>1</sup> Publicly available data from the Australian Energy Market Operator.

To accelerate the integration of intermittent solar and wind power into the national grid, EnergyAustralia continued to assess potential investments in new, flexible generation and storage projects.

It is considering building a second gas-fired plant at the site of its existing gas-fired plant at Tallawarra in NSW to provide fast-start dispatchable generation that will support the integration of renewable energy and contribute to reliability and stability. The implications of the determination made by the Civil Aviation Safety Authority against the plan are being considered and EnergyAustralia is assessing options.

EnergyAustralia continues to evaluate other flexible capacity projects including pumped hydro projects at Cultana in South Australia and Kidston in Queensland.

EnergyAustralia's demand response contracted capacity now stands at 56MW. The programme, part of an Australian Government initiative, rewards residential and large commercial and industrial customers for curtailing demand at peak periods. The company has exceeded its initial 50MW commitment, with more than 20,000 residential and large commercial and industrial customers committing to the programme.

EnergyAustralia operates the largest battery trading portfolio of any retailer in the National Electricity Market, presenting 80MWh of storage. The assets are providing valuable insights into the role of large-scale, commercial storage in a modern energy system.

**New Business**

In July 2019, EnergyAustralia expanded its offer to commercial and industrial customers through the acquisition of a 49% interest in Echo Group, a rooftop solar and LED lighting company.

It also launched “On by EnergyAustralia” in October, a separate test-and-learn retail platform. “On by EnergyAustralia” allows for the rapid in-market trials of new products and the first market trial is of subscription-based electricity plans.

EnergyAustralia’s partnership with the Startupbootcamp programme, which is aimed at fast-tracking new energy-related start-up businesses, entered its second year. After receiving more than 1,000 applications, 11 start-ups from around the world pitched their ideas to potential investors and members of the business community. EnergyAustralia continues to liaise with the participants and looks forward to their success stories.



**Given the ongoing reforms and challenges in the Australian energy market, what is CLP’s strategic positioning there and how would CLP adapt its strategy to remain relevant?**

**Ms Elaine Wu**

Head of Asia ex Japan Power Utilities and Environmental Equity Research  
J.P. Morgan



After all the rapid changes to Australia’s energy market, EnergyAustralia remains one of the biggest suppliers of power to the country’s homes and businesses, backed by a 5,000MW asset portfolio. Just as the path to a cleaner energy future brings challenges, it provides opportunities for investment. We’ve already made commitments worth A\$3 billion to buy wind and solar power and we have the largest battery trading portfolio of any retailer in Australia.

Australia gets a relatively high proportion of its power from renewable generation. The transition to a system underpinned by wind and solar has added volatility. That means dispatchable coal- and gas-fired capacity is needed in the medium-term for stability. So, we’re investing in our existing coal-fired assets to make them as efficient as possible. At the same time, we’re exploring investments in gas-fired power, renewables, microgrid technology, small-and-large-scale storage and pumped hydroelectricity.

Energy companies will have to win the trust of both household and business customers if they are to continue to prosper. Under our strategy we’ll stand closer to our customers and become energy partners, not just energy suppliers. We’re developing next generation services that will put EnergyAustralia at the heart of homes and businesses, selling smart energy management solutions as well as energy itself. We’ll help control energy usage, which in turn will help balance supply and demand. Customers want cleaner, reliable and affordable energy, and EnergyAustralia is well-placed to be the retailer they turn to, and trust, for all their energy needs.



**Catherine Tanna**

Managing Director – Australia



## Environmental Performance

### Environmental Regulatory Compliance

EnergyAustralia was not subject to any fines or prosecutions arising from environment-related regulatory non-compliances in 2019.

There were two brief exceedances of NO<sub>x</sub> emissions at Tallawarra in February 2019, neither of which resulted in action from the Environment Protection Authority (EPA). Corrective action was taken during a station outage in 2019 to prevent any future incidents. In addition, there were two oil spillage non-compliance incidents and one minor hydrocarbon exceedance to the Trade Waste Licence at Newport Power Station. The EPA was notified and no fines or penalties were imposed. Investigation and corrective actions have been taken to prevent a repeat of similar incidents.

### Air Emissions

Overall CO<sub>2</sub> emissions from EnergyAustralia's power stations decreased in 2019 compared with 2018. Yallourn saw a 7% drop due to improved efficiency and a 4.5% reduction in output. Emissions from Mount Piper were 42.8% lower after output fell by 46.8% while those at Tallawarra were 48.1% higher as output rose 54.6%. Generation at Hallett was 43.5% higher, resulting in a 26% increase in emissions.

## Social Performance

EnergyAustralia maintained its commitment to support the wellbeing of both its employees and the communities in which it operates, with volunteer activities increasing 47% in 2019 compared with the previous year.

In September 2019, the company published its inaugural report under the new Energy Charter, a world-first customer initiative aimed at uniting the energy industry to deliver better service for Australians. EnergyAustralia is a founding member of this initiative that asks energy companies from across the supply chain to commit to a set of principles to improve affordability and the customer experience and to better meet customer and community expectations in the transition to a modern energy system. The report provided a frank assessment of the service EnergyAustralia provides which will stand as a baseline for driving improvement.

EnergyAustralia's Workplace Giving programme, launched in 2018, raised more than A\$364,000 in its first year with an employee participation rate of 61%. The programme was recognised at the Workplace Giving Excellence Awards as the best launch project in the business category.

The company's LGBTIQ+ (Lesbian, Gay, Bisexual, Transgender, Intersex and Queer) support network Prism marked its fourth year of operations in 2019. For the second consecutive year, it was awarded silver status by the Australian Workplace Equality Index. Prism continues to be widely supported with membership covering one third of the EnergyAustralia workforce.



EnergyAustralia is a partner of the Startupbootcamp programme which supports start-up companies that innovate and disrupt the energy sector.

Some of EnergyAustralia's major community initiatives are detailed below. Please also refer to the Social and Relationship Capital chapter on pages 91 to 94 for more information.



## Community Wellbeing

- Provided and installed **27 air-conditioning units** in the Ozanam House, a landmark facility developed by VincentCare that provides holistic services to homeless Victorians. Also worked with VincentCare to install demand response technology to reduce energy costs and provide payments of **A\$2,250** for participating in each demand response event.
- Launched a new “innovate” reconciliation action plan, which focused on developing and strengthening relationships with Aboriginal and Torres Strait Islander peoples, engaging employees and stakeholders in cultural awareness programmes and developing innovative strategies to empower Aboriginal and Torres Strait Islander peoples.
- Extended its partnership with the Sydney Opera House to support a series of events held in cooperation with Prism, the Aboriginal Academy and Women’s Network.



## Environment

- Installed **12 solar-powered light poles** in the Yarra Park precinct, which will save **1.3 tonnes of carbon emissions** a year, equal to the amount generated by powering an average Victorian home for four months.



## Volunteering

- **1,277 volunteering opportunities** contributed more than **5,500 hours** of charity work.



## Education and Development

- Delivered a Financial Counselling Development Programme in the second year of partnership with ICAN Learn to build and strengthen career development opportunities for financial counsellors in Australia. To date, **85 scholarships** have been awarded for people to gain certification to become financial counsellors.
- **8 students of the Women's Aboriginal AFL Academy** were invited to join selected employees and Sydney Opera House guests for a cultural immersion experience, followed by a visit to the annual Garma festival to learn about history, social and policy issues.

## Ensuring a Safe Workplace

Safety is EnergyAustralia's leading priority. Following two workplace fatalities in 2018, it has finalised detailed investigations and implemented the key recommendations. In 2019 EnergyAustralia had its best ever safety performance. Currently it is prioritising new programmes on employee wellbeing and the development of centralised safety risk databases.

## Outlook

Wholesale electricity prices in Australia are expected to decline in the coming year as additional renewable energy capacity is added to the system.

Operationally, EnergyAustralia's focus will remain the optimisation of its generation portfolio, enhancing asset reliability. It will continue to work to ensure it is able to secure adequate fuel supply for the Mount Piper Power

Station in both the short and long term. It will also explore the integration of flexible capacity options, including pumped hydro and gas-fired generation. These are the types of projects with the potential to safeguard and enhance the reliability and affordability of power as the country moves towards a low-carbon future.

There is no sign the intense competition and acute focus on electricity pricing in retail markets will ease. EnergyAustralia will continue its work to improve the customer experience and ease pressure on household budgets, while managing costs.

EnergyAustralia will continue to press the case for a clear and stable national policy that supports the development of a modern, cleaner energy system for the good of Australia and at an acceptable and affordable cost to customers and taxpayers.