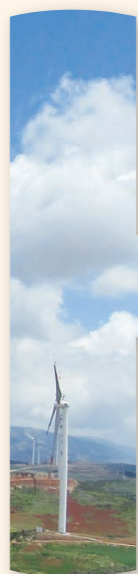


# Business Performance and Outlook

We continue to transform into a Utility of the Future to capitalise on changes resulting from the decarbonisation and digitalisation of energy.

# Change



# Transform

# FUTURE

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# Hong Kong

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Deploying advanced technology to  
**enhance performance**  
of our **expanding** power system  
and deliver **superior** customer services

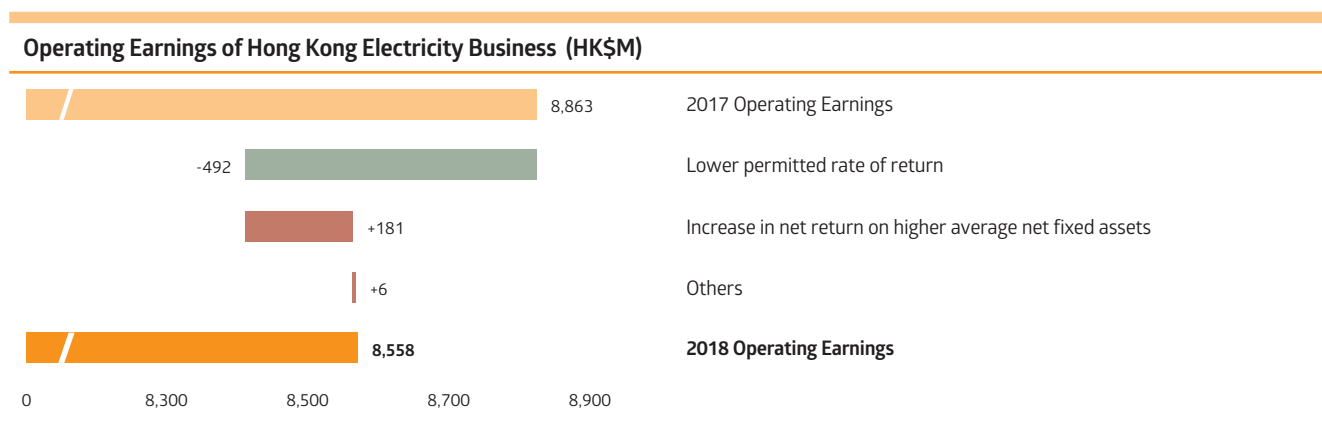
## Financial and Operational Performance

### Overview

CLP continued to deliver a dependable, safe, and environmentally responsible service in 2018, a year in which the number of customer accounts increased from approximately 2.56 million to 2.60 million.

Sales of electricity within Hong Kong rose slightly by 1.5% to 33,662 gigawatt hours (GWh) compared with the previous year. The increase was driven mainly by demand from the commercial, and infrastructure and public services sectors. Sales to Mainland China decreased 58.5% to 556GWh as our contract to supply electricity to Shekou in southern China expired in June 2018. As a result, total electricity sales in 2018 saw a marginal decrease of 0.8% to 34,218GWh.

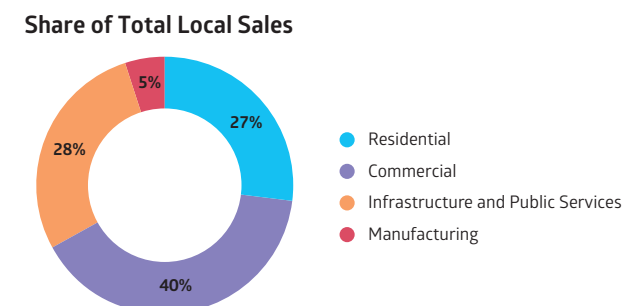
Our performance in Hong Kong is summarised below:



**Local Electricity Sales in 2018**

**Year-on-Year Change**

	Increase / (Decrease)	
	GWh	%
Residential	(26)	↓ (0.3)
Commercial	205	↑ 1.6
Infrastructure and Public Services	355	↑ 4.0
Manufacturing	(36)	↓ (2.1)



In 2018, operating earnings from our electricity business decreased 3.4% from the previous year to HK\$8,558 million as the new Scheme of Control (SoC) Agreement came into effect from October with a permitted rate of return set at 8.00% compared with 9.99% previously. The Agreement provides a clear and certain regulatory framework for

the future development of the electricity sector in Hong Kong, enabling us to plan ahead and make the appropriate investments to meet the Government's energy policy objectives.

### Overcoming a Severe Test of Our Resilience

Our power system experienced one of the biggest challenges in its history in September when Hong Kong was battered by Typhoon Mangkhut, the most powerful storm to hit the city for decades. Although our generation units and power grid remained intact and power supplies to the majority of our customers were maintained, the severity of the storm and its consequential damage to our network in rural areas were unprecedented. Power supplies to some of our customers were affected, in particular those in remote areas where roads were blocked by fallen trees and debris, making access and repair work extremely difficult.

Despite the enormous challenges, our employees and contractor workers carried out the restoration work safely and efficiently, with an aim to bring power back to the affected customers in the shortest time possible. The effectiveness of the response was testament to the investment we have made in strengthening our infrastructure over the years, and underscored our commitment to serve customers reliably in the most extreme situations.

## Hong Kong

With the frequency and intensity of extreme weather events expected to increase because of the impact of climate change, CLP is allocating more resources to further enhance the resilience of our network and the coordination with other stakeholders and the Government on vegetation management and response during these critical periods.

### Investing for a Cleaner Tomorrow

We are increasing our investments to integrate more clean energy into the power system in support of Hong Kong's transition to a low-carbon future. In July, the Government's Executive Council approved CLP's Development Plan for October 2018 to December 2023 which includes provisions for significant investment to address and mitigate the effects of climate change.

The HK\$52.9 billion of capital projects planned over the period include the construction of a second gas-fired generating unit of around 550MW at Black Point Power Station. The new unit, expected to be ready by 2022/2023, will adopt an advanced combined-cycle gas turbine (CCGT) design. With the first 550MW advanced CCGT due to go into operation in 2020, the two new units will support the Government's environmental and fuel mix objectives, allowing the gradual phaseout of the four oldest coal-fired units at Castle Peak Power Station when they reach the end of their operating life in mid-2020s.

Another important project necessary to support the increase in gas within our fuel mix is the construction of an offshore LNG terminal, which will allow us to purchase competitively-priced LNG directly from more diversified global sources. An environmental permit has been granted after a thorough review of the project's Environmental Impact Assessment Study by the Environmental Protection Department. We have commenced preparation for site investigation and front-end engineering design, while good progress has also been made in finalising the contractual arrangement for the supply of LNG and the chartering of the Floating Storage and Regasification Unit (FSRU) vessel for the project.

Under the SoC Agreement, a number of green initiatives have been introduced to encourage community's participation in moving Hong Kong towards a smarter, greener future. The Feed-in Tariff (FiT) scheme, which enables customers to generate their own renewable energy, received over 1,400 applications up to the end of 2018. For those customers who want to support the development of renewable energy but do not have the opportunity to build their own system, they can purchase Renewable Energy Certificates (RECs) which represent locally generated renewable energy starting from January 2019. Other initiatives include the new CLP Eco Building Fund, the Community Energy Saving Fund (CESF) and energy audits to help our customers save energy and to raise public awareness about the need for power conservation.



Our new combined-cycle gas turbine generator at Black Point Power Station will help support the Hong Kong Government's carbon reduction goals.

## Transforming into a Utility of the Future

Innovation and technology are the driving forces behind Hong Kong's transformation into a smart city. In 2018, CLP implemented a range of significant initiatives to support this vision.

One of the most broad-reaching programmes is the introduction of smart meters across our supply area to replace 2.3 million conventional meters in phases from now to 2025. Smart meters provide customers with a range of digitalised services and solutions to encourage energy saving. They also give CLP greater end-to-end visibility of conditions in the power system, enabling improved fault detection, reduced repair times during critical events, and faster power restoration. Their introduction will enhance overall supply reliability and power safety for customers.

As part of our innovation journey, we deployed the best available technology and ideas in our operation to make sure our assets perform at the highest standard. These included using robots to inspect boilers to enhance safety and operational efficiency, and adopting the airborne Light Detection and Ranging (LiDAR) scanning technology for overhead line and tower maintenance. Analytics models on operational data such as emission analysis and meter irregularity detection have also been developed to improve asset performance.

## Powering Hong Kong's Growth

CLP is fully committed to meeting the development needs of Hong Kong through supporting a large number of territory-wide development and infrastructure projects with our expanding power supply network. Major projects include the Kai Tak redevelopment, the West Kowloon Cultural District, the Lok Ma Chau Loop, and landmark transport development schemes such as the Hong Kong-Zhuhai-Macao Bridge, the Hong Kong Boundary Crossing Facilities Island and the Guangzhou-Shenzhen-Hong Kong Express Rail Link. In addition, as Hong Kong becomes a data centre hub, we will ensure highly reliable power supplies to support and facilitate the development of this energy-intensive industry.

In December 2018, we signed a Power Supply Collaborative Agreement with the Hong Kong Airport Authority, under which CLP will build new substations and provide power supply facilities for the three-runway system.

## Reinforcing Our Safety Culture

Safety is our utmost priority. Throughout 2018, we continually improved our safety performance and have reduced our injury rates. To reinforce our safety culture, we took steps to strengthen our safety management system through safety leadership training, work processes streamlining and work practice review with worldwide benchmarking. More details can be found in the Human Capital chapter on pages 81 to 87.

## Environmental Performance

### Air Emissions

Improving air quality is a critical step in creating a greener and healthier living environment in Hong Kong. We deploy a comprehensive and robust system for our generation portfolio and continuously monitor our environmental performance to ensure full compliance and explore opportunities for further improvement.

We complied with all the emission caps set by the Government in 2018 while maintaining supply reliability and a reasonable tariff level by optimising our diversified fuel mix, and maintaining the effectiveness of our emissions control facilities.

Although the power sector is no longer the largest emitter of air pollutants in Hong Kong, we will continue to look for cleaner fuel and new technologies to help us reduce emissions further.

### Environmental Regulatory Compliance

All Hong Kong assets under our operational control maintained full compliance with environmental regulations in 2018.

## Social Performance

### Stakeholder Engagement

As CLP prepared to implement the initiatives under the new SoC Agreement, we sought stakeholders' views before their launch. The FiT scheme was of particular interest to the community as it was a new concept. More than 4,400 members of the public and industry practitioners attended 40 roadshows, seminars and workshops that we organised to explain the details of the scheme.

The CESF went into operation in January 2019 with around HK\$70 million in the first year to carry out the CLP Power Connect programme and Electrical Equipment Upgrade Scheme to promote energy saving and to support around 40,000 underprivileged households including elderlies, disabled, low-income families and tenants of subdivided flats.

To deepen stakeholders' understanding of our plan for an offshore LNG terminal, briefings and meetings were held, and educational animated videos were produced. Comments

from stakeholders about the potential environmental impact and mitigation measures were gathered and adopted where possible during the Environmental Impact Assessment period.

Taking advantage of Hong Kong's emergence as a centre for technology and innovation, we hosted a Smart Energy Symposium in June to discuss smart technology and the latest energy saving solutions with other businesses and organisations. The ideas brainstormed at the symposium will help us design products and services to allow customers to manage their energy use more efficiently.

We also became a collaborator for the STARS Programme organised by the Federation of Hong Kong Industries and the Hong Kong Startup Council to nurture a new breed of entrepreneurs. Our colleagues served as mentors for the participating start-up companies and introduced their products to potential customers. And to promote e-sports and smart gaming, we set up the CLP x e-Sports Academy at the Hong Kong e-Sports & Music Festival in August.

**Hong Kong International Airport (HKIA) has been applying innovation and technology to become a smart and one of the world's greenest airports for better passenger experience and operation efficiency. CLP as our close business partner, could you tell us how CLP would support Hong Kong Airport Authority (AA) to become smarter and greener?**

At CLP, it has been our ongoing commitment to adopt technology and use innovation to improve our operational efficiency and deliver better customer experience. Likewise, we are always doing our utmost to support customers to deploy innovative technologies.

CLP will provide our full support to AA to make our very own HKIA, one of the world's main hub airports, the smartest and greenest. Under the Power Supply Collaborative Agreement we signed in December 2018, CLP will build new substations and power supply facilities for the three-runway system and related infrastructure to ensure reliable power supply. In addition, we will collaborate with AA on innovative technologies such as the Battery Energy Storage System (BESS). The BESS will be the largest commercial battery system in Hong Kong and will help HKIA increase backup power supply to support future developments. It will also enable many innovative energy management applications, such as peak demand management and integration of renewable energy within the HKIA. We will continue to explore new technologies and provide the latest energy saving tools to support the growth of AA in the long term.



**Mr Alex Kwan**  
Executive Director  
Engineering & Technology, Airport Authority Hong Kong



**TK Chiang**  
Managing Director  
CLP Power Hong Kong

## Community Initiatives

CLP has grown hand-in-hand with Hong Kong through the decades and we treasure our bond with the community. Youth engagement and caring for the needy have been our focuses in recent years. We continued to work with the community in 2018 through rolling out and supporting 398 initiatives aimed at creating a more caring and harmonious society.

Some of our 2018 programmes are outlined below. For more details, please also refer to the Social and Relationship Capital chapter of this report on pages 88 to 92.

## Community Wellbeing

- Continued to operate **3 CLP Hotmeal Canteens** with our charity partners and provided over **540,000 hot meals** to underprivileged individuals since 2011.
- More than **3,750 elderly people** and **people in need** have celebrated festivities with CLP volunteers since the Sharing the Festive Joy programme began in 2014.

- Over **650,000 residential customers** have saved **32GWh** of electricity through the Power Your Love programme since its launch in 2015, relieving the electricity costs of some **20,000 underprivileged households** every year.

## Education and Development

- CLP Power Academy worked in partnership with other education institutions to offer part-time programmes ranging from certificate to bachelor's honours degree, attracting more than **840 applications** for around **200 available places**.
- CLP's Energy for Brighter Tomorrows scholarship scheme offered scholarships with a one-year mentorship programme to **20 secondary students**.

## Environment

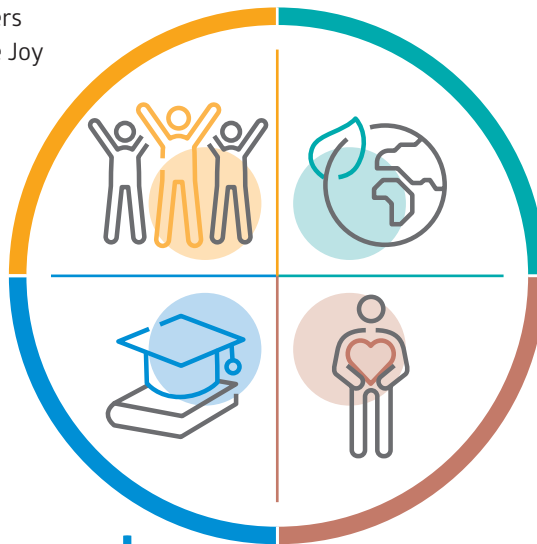
- Green Elites Campus Accreditation Programme has reached over **51,000 students** since 2014, educating primary school students to develop green living habits.
- Green Studio, a mobile classroom to educate the public on climate change and environmental protection, has received more than **160,000 school children** and **visitors** since 2009.

## Volunteering

- More than **1,600 CLP volunteers** contributed over **16,200 hours** of services to the community.

- Since 2017, CLP engineers have shared basic knowledge about energy saving and power journey with **21,400 kindergarten pupils** through the POWER YOU Kindergarten Visitation Programme.

A team of cartoon characters **POWER FOUR** was created to help children explore the world of electricity and acquire energy saving knowledge in a fun way.



### Outlook

Hong Kong is our home and CLP's core market. In October 2018, the new SoC Agreement came into effect, providing many benefits to our customers and shareholders. The coming years will reflect both the lower permitted rate of return and the growth in asset base resulting from the investments agreed with the Government. We will work tirelessly to deliver our 2018-2023 Development Plan in support of the Government's carbon reduction targets and environmental policies, while providing the vital electricity infrastructure needed to ensure a reliable and stable electricity supply for Hong Kong's continuing dynamic development.

As part of a broad-ranging series of measures to meet those environmental goals, we are pressing ahead to develop the offshore LNG terminal and to construct the two new CCGT units. We are also committed to playing a leading role in the development of renewable energy in Hong Kong by connecting the Government's large-scale waste-to-energy projects along with other smaller-scale projects to our grid, while exploring other utility-scale renewable energy opportunities.

We will implement the improvement measures and work closely with relevant government departments to prepare

CLP for managing the challenges of adverse weather due to climate change including the increasingly serious typhoons with the objective to minimise the impact to our customers and to our systems.

As Hong Kong transforms itself into a smart city, we will play our part by providing a greener, smarter, and highly reliable energy system whether through direct investments, such as in smart meters, or by acting as a coordinator for others, such as accelerating power supply service for data centre operations; assisting elderly home operators with innovative solutions to ease their operations and help improve the quality of life of senior citizens; supporting wet market modernisation and central kitchen transformation. We will connect different trades and industries and help them adopt smart, green solutions that meet their business needs.

The Council for Sustainable Development is planning a public consultation in 2019 on a decarbonisation strategy for Hong Kong in the coming years. We fully support the development of a low-carbon economy and will provide our professional insights on the options for decarbonising our energy supply while maintaining the world-class reliability Hong Kong depends upon.



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# Mainland China

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Yangjiang Nuclear Power Station

Seizing the

**growth opportunities**

generated by the country's

**low-carbon** transformation

## Financial and Operational Performance

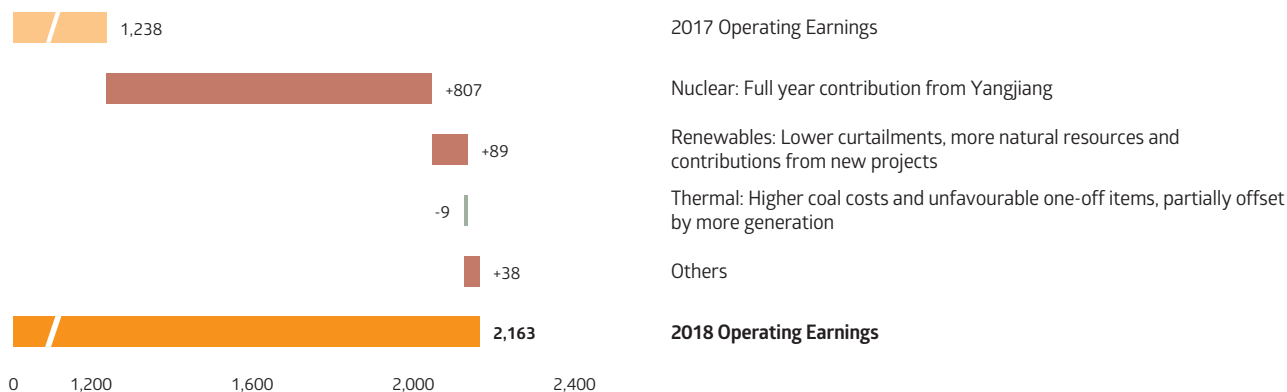
### Overview

Electricity demand remained strong in Mainland China in 2018, growing 8.5% from 2017. At the same time, the country moved forward with its transformation to a low-carbon economy. With our diversified generating portfolio and a focus on nuclear and renewable energy projects, CLP was able to participate in the growth opportunities in the energy sector.

Our operating earnings rose 74.7% to HK\$2,163 million over the course of the year. Earnings from our nuclear projects, the biggest contributor to the total, saw an increase of 88.4%. This was achieved through a full-year earnings contribution from Yangjiang Nuclear Power Station and the commissioning of a new generating unit at the plant.

Our performance in Mainland China is summarised below:

Operating Earnings of Mainland China	2018 HK\$M	2017 HK\$M	Change %
Nuclear	1,720	913	88.4
Renewables	530	441	20.2
Thermal	36	45	(20.0)
Operating and Development Expenditure	(123)	(161)	(23.6)
<b>Total</b>	<b>2,163</b>	<b>1,238</b>	<b>74.7</b>



### Nuclear Projects

The operations of our two nuclear projects in Guangdong Province were excellent with both plants maintaining good safety performances and achieving record outputs.

In July, the fifth generating unit at Yangjiang was commissioned ahead of schedule. Construction of the sixth and final unit is progressing well and it is expected to go into operation in the second half of 2019. Meanwhile, the Daya Bay plant achieved a utilisation rate of 95%.

### Renewable Projects

Our renewable energy portfolio achieved another year of strong growth in 2018, largely due to the better performance of our wind and solar projects on the back of more natural resources and supportive Government policies, reducing grid curtailments. The Government plans to establish renewable portfolio standard in 2019 and set renewable consumption targets for each province. It slowed down new approvals to curb excess capacity growth. In addition, we benefitted from an expanded high-voltage transmission system that allows cross-regional power supply from regions where most wind and solar projects are located to high-consumption coastal areas.

During the year, we continued to add new renewable energy generation capacity by acquiring the remaining 49% share in the Jinchang solar plant in Gansu Province from our partner in May and commencing commercial operation of the Lingyuan solar plant in Liaoning Province in July. In Shandong Province, we completed construction of the CLP Laizhou II wind plant in November to prepare for its connection to the grid, and we committed to the construction of the Laiwu III wind project.

As a result of lower grid curtailments in Gansu and north-eastern provinces, more natural resources, and contributions from new projects, the output of our solar and wind projects increased 20% and 12% respectively in 2018. Meanwhile, generation of our hydro projects remained steady.

### Thermal Projects

Despite the pressures of high coal costs and coal import restrictions at certain ports, Fangchenggang Power Station reported a solid performance in 2018. This was mainly because of higher production in response to strong demand

powered by Guangxi's economic growth, and reduced competition from hydro plants.

The Fangchenggang project also made strong efforts to secure guaranteed generation hours by deepening cooperation with the Fangchenggang City Government, as we reposition the plant to be an integrated energy provider. As part of a strategic cooperative framework agreement CLP signed with the Government in July, we support Guangxi's policy to promote a circular economy through buying white clay, a by-product from a nearby paper mill, to replace some of the limestone used in our flue gas desulphurisation (FGD) facility. Our project also supplies steam and carbon dioxide to a neighbouring high-technology factory that grows microalgae for use in its products. These ecological initiatives have been recognised by the Government, which in turn has granted us higher minimum loading.

Contributions by our minority-owned coal-fired projects were very modest, reflecting the impact of an unfavourable combination of lower utilisation, lower tariffs and high coal prices.



Chairman Sir Michael Kadoorie led a group of senior management to visit Yangjiang Nuclear Power Station in May 2018.

## Mainland China

The table below shows the performance of our projects in Mainland China.

	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup> GWh		Availability %		Utilisation %	
		2018	2017	2018	2017	2018	2017
<b>Renewable Projects – Performance</b>							
<b>Wind</b>	835.1	<b>1,771</b>	1,582 <sup>2</sup>	<b>97.0</b>	99.1 <sup>2</sup>	<b>24.9</b>	22.9 <sup>2</sup>
Wholly-owned	444	<b>983</b>	838	<b>95.5</b>	99.4	<b>25.5</b>	23.8
Qian'an I and II	99	<b>231</b>	180	<b>98.2</b>	98.5	<b>26.5</b>	20.8
Penglai I	48	<b>98</b>	88	<b>99.7</b>	99.8	<b>23.6</b>	20.9
Laiwu I	49.5	<b>76</b>	69	<b>99.2</b>	99.8	<b>18.0</b>	16.5
Laiwu II <sup>3</sup>	49.5	<b>108</b>	25	<b>99.6</b>	98.9	<b>24.4</b>	25.9
Xundian I	49.5	<b>135</b>	127	<b>99.6</b>	99.4	<b>31.8</b>	29.2
Sandu I	99	<b>209</b>	238	<b>82.5</b>	99.8	<b>24.1</b>	27.5
CLP Laizhou I	49.5	<b>127</b>	112	<b>99.8</b>	99.6	<b>30.1</b>	26.5
Minority-owned	391.1	<b>788</b>	744	<b>98.8</b>	98.7	<b>24.3</b>	22.0
<b>Solar</b> <sup>4</sup>	292.2	<b>458</b>	382	<b>99.9</b>	99.8	<b>19.9</b>	18.9
Jinchang	85	<b>124</b>	66	<b>99.9</b>	99.9	<b>21.4</b>	17.4
Sihong	93.4	<b>133</b>	138	<b>99.9</b>	99.7	<b>16.3</b>	17.0
Xicun	84	<b>166</b>	166	<b>100.0</b>	100.0	<b>22.6</b>	22.6
Huai'an <sup>5</sup>	12.8	<b>20</b>	12	<b>100.0</b>	98.7	<b>17.6</b>	17.5
Lingyuan <sup>6</sup>	17	<b>15</b>	n/a	<b>100.0</b>	n/a	<b>21.4</b>	n/a
<b>Hydro</b>	489.3	<b>1,604</b>	1,533	<b>90.6</b>	87.8	<b>39.0</b>	37.2
Dali Yang_er	49.8	<b>182</b>	183	<b>92.6</b>	80.3	<b>41.9</b>	42.3
Huaiji	109.5	<b>278</b>	341	<b>88.9</b>	87.4	<b>29.9</b>	36.7
Jiangbian	330	<b>1,144</b>	1,009	<b>90.9</b>	89.1	<b>41.6</b>	36.7
<b>Thermal Projects – Performance</b>							
<b>Majority-owned</b>							
Fangchenggang I & II	1,806	<b>5,787</b>	3,248	<b>86.7</b>	80.6	<b>38.8</b>	21.9
<b>Minority-owned</b>	2,255	<b>9,954</b>	10,216	<b>90.0</b>	95.4	<b>55.4</b>	55.5
Shiheng I & II	370.4	<b>1,511</b>	1,843	<b>83.6</b>	91.8	<b>50.7</b>	61.3
Heze II	176.4	<b>973</b>	735	<b>92.9</b>	88.2	<b>67.7</b>	50.9
Liaocheng I	352.8	<b>1,731</b>	1,779	<b>78.8</b>	95.9	<b>59.2</b>	60.9
Panshan	206.7	<b>930</b>	938	<b>96.6</b>	93.8	<b>54.9</b>	55.4
Sanhe I and II <sup>7</sup>	219.5	<b>1,048</b>	1,005	<b>94.5</b>	97.2	<b>58.4</b>	57.2
Suizhong I and II	564	<b>2,473</b>	2,555	<b>91.9</b>	95.9	<b>53.3</b>	55.0
Zhungeer II and III	257.4	<b>1,258</b>	984	<b>95.4</b>	98.6	<b>61.8</b>	48.5
Shenmu <sup>8</sup>	107.8	<b>30</b>	376	<b>100.0</b>	100.0	<b>29.2</b>	45.5

Any minor discrepancies in totals are due to rounding up of figures

Notes:

- 1 Indicates CLP's equity sent-out.
- 2 Restated to reflect the divestment of CGN Wind JV in December 2017.
- 3 The project went into commercial operation in October 2017.
- 4 Alternate Current (AC) capacity is used to align with the calculation method for other power plants in the CLP portfolio.
- 5 The project went into commercial operation in June 2017.
- 6 The project went into commercial operation in July 2018.
- 7 A 30MW retrofit expansion was completed in 2017.
- 8 The project ceased operations on 28 February 2018.

## Innovation

In line with the Group's strategy to transform into a Utility of the Future, resources have been dedicated to expand our innovation capability. One of our focus locations is the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) in southern China, which aspires to become a globally leading innovation and technology centre.

In July, we formed a joint venture with a subsidiary of TUS-Holdings Co., Ltd., a company affiliated to China's prestigious Tsinghua University, to develop and deploy new energy and smart city technologies amid growing demand for digitalised energy infrastructure and services in Mainland China, particularly in the GBA. One area of opportunity being pursued is integrated energy systems for industrial parks on the Mainland as park owners switch to systems that combine the supply to customers of electricity, heating and air-conditioning services.

In addition, the CLP-TUS joint venture, together with the Guangxi subsidiary of China Southern Power Grid Co., Ltd. and a unit of the local government, was selected as the successful bidder to invest in and operate the Fangchenggang High-tech Zone incremental distribution network project.

Under a 30-year franchise agreement, we will provide integrated energy solutions including electricity distribution and other value-added smart energy services for customers in the park. This investment fits our strategy to take advantage of the opportunities offered by digitalisation and market reform, and gives us an entry point into the energy distribution and retail business in South China.

## Environmental Performance

### Air Emissions

Following the completion of the Fangchenggang emission control retrofit project in 2018, the plant now meets the Government's stringent new energy saving and air emissions requirements. Despite an increase of nearly 80% in output compared with 2017, total air emissions at Fangchenggang were lower than a year earlier. This is a testament to the effectiveness of the retrofit.

### Water

At Fangchenggang, a water recycling system has been installed to collect used water from the coal yard. The water is used for damping down the dust from coal piles and general cleaning after sewage treatment.

**Our reporter had the pleasure to visit Sihong Solar Power Station in Jiangsu in November 2018, and was hugely impressed by the use of robots for the cleaning of solar panels. In recent years, new technologies such as artificial intelligence (AI) and big data are being rapidly adopted by businesses. How are these technologies applied at CLP? What is CLP doing to promote the use of these technologies in the wider energy industry?**

CLP welcomes the wider adoption of new technologies in the energy industry. Robots deployed in our Sihong solar plant in Jiangsu for cleaning photovoltaic (PV) panels have enhanced operations and improved generation efficiency by up to 3%, while lowering labour costs and optimising management. We are also exploring the deployment of drones in security management of CLP China's sites.

Our efforts on new technologies including AI and big data reflect our view on the importance of digitalisation in facilitating the transformation of the energy sector. As different parts of the energy infrastructure are digitalised, both efficiency and reliability of power generation will be improved, leading to a greener and smarter grid.

AI and big data analytics will optimise energy consumption and management for next-generation renewable energy and intelligent power grids. To further drive digitalisation, we are gaining access to the latest smart energy technologies from all around the world by collaborating with and investing in innovative solution providers. Our partnerships with these companies are mutually beneficial as we work together to pilot new products and services that can potentially be deployed in CLP's businesses throughout the Asia-Pacific region.



**Mr Li Tongxin**  
Deputy Editor-in-Chief  
China Energy News



**SH Chan**  
Managing Director - China

### Environmental Regulatory Compliance

All China assets under our operational control maintained full compliance with environmental regulations in 2018.

### Social Performance

#### Stakeholder Engagement

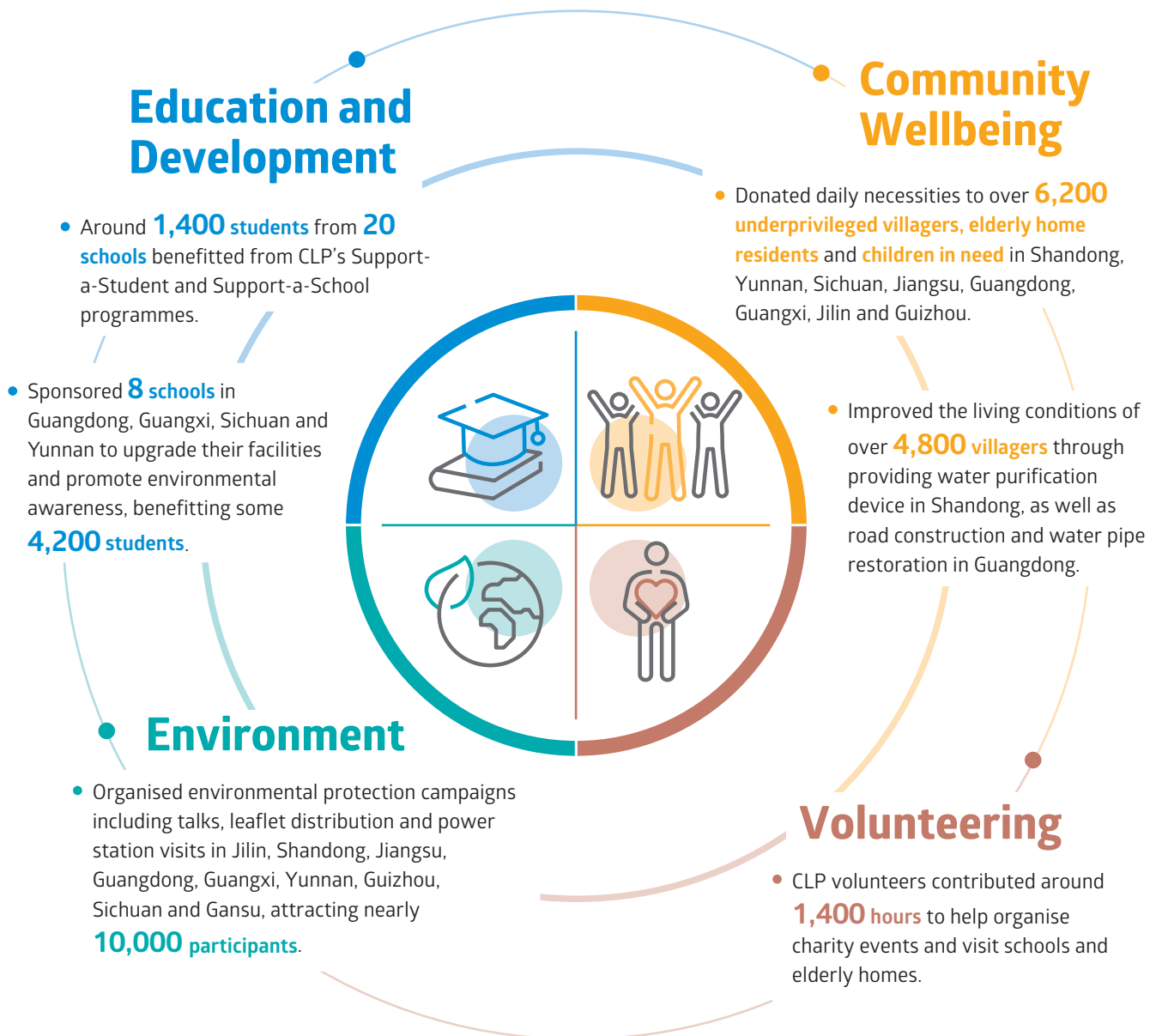
We met regularly with Government officials and business partners in 2018 to reinforce our relationship with them and promote CLP's standards of corporate governance and operational excellence.

Following the acquisition of a 17% stake in Yangjiang Nuclear in Guangdong in late 2017, Chairman Sir Michael Kadoorie led a delegation of senior management to visit the plant. CLP and China General Nuclear Power Corporation (CGNPC), our

partner at both the Yangjiang and Daya Bay power stations, took the opportunity to renew our Strategic Partnership Agreement which was first forged in 2007. The move strengthened our relationship with CGNPC and allowed us to explore further cooperation opportunities in low-carbon energy.

#### Community Initiatives

Community initiatives were conducted at our sites around Mainland China in 2018 with an emphasis on promoting education, environmental protection, and community well-being. Some of our key projects are highlighted below while more details can be found in the Social and Relationship Capital chapter on pages 88 to 92.



## Outlook

Mainland China is one of CLP's key growth markets. Looking forward, our focus will continue to be the expansion of our low-carbon portfolio. The recent announcement of air quality targets confirms the Central Government's commitment to shift its energy mix towards cleaner sources. The Government has also set three-year targets for allowing more renewable energy onto the grid. These new policies provide a supportive environment for us to expand our renewable energy portfolio.

We will continue to pursue new projects in a disciplined and selective manner. With the planned commissioning of the whole of the Yangjiang plant by 2019, we expect low-carbon projects to remain the key drivers for our business in Mainland China.

At the same time, we will continue our efforts to increase utilisation of the Fangchenggang plant. In late 2019, a centralised heat supply system in the Economic Development Zone of Fangchenggang is expected to start. We expect this to help us secure a better dispatch order and higher minimum loading. These assurances will help the plant achieve higher utilisation, especially during the wet season when there is more hydro output.

As our innovation initiatives in Hong Kong and Australia begin to reap results, we hope to apply the experiences to Mainland China, particularly in the GBA. We will seek to explore further partnerships in independent decentralised generation and distribution to deliver more technology-enabled energy solutions to our business partners and customers.

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# India

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## Expanding investment

to meet **growing** demand

for **clean** energy



## Financial and Operational Performance

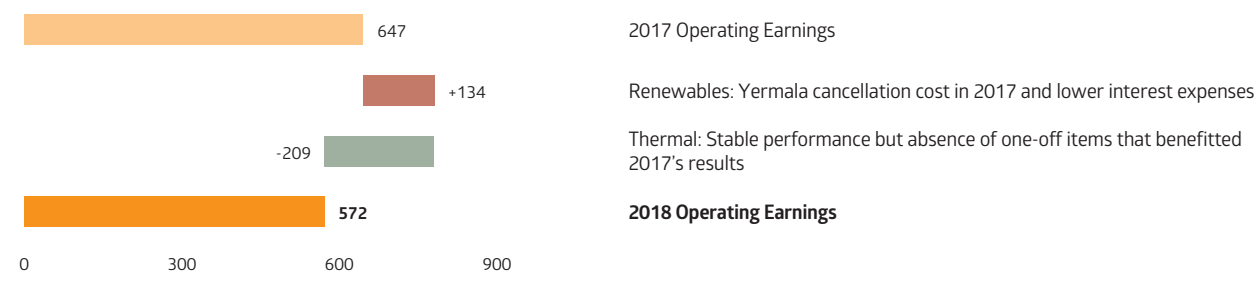
### Overview

2018 was a significant year for CLP India. We introduced Caisse de dépôt et placement du Québec (CDPQ) as our strategic shareholder to focus on jointly expanding our green energy investment at a time when energy demand continues to be strong, growing 6% year-on-year. Operationally, the business continued to report a stable performance.

While operating earnings decreased 11.6% to HK\$572 million, earnings from our renewable energy portfolio grew, helped by higher output. Although load factor and sent-out of Jhajjar Power Station set new records, demonstrating its importance to the system, the plant reported lower earnings largely because of coal supply issues. Its financial performance was also affected by higher operation and maintenance (O&M) costs and the absence of one-off items that benefitted 2017's results.

Our performance in India is summarised below:

Operating Earnings of India	2018 HK\$M	2017 HK\$M	Change %
Renewables	244	110	121.8
Thermal	328	537	(38.9)
<b>Total</b>	<b>572</b>	<b>647</b>	<b>(11.6)</b>



### Renewable Projects

We continued to expand our renewable energy portfolio throughout the year. In February, our first solar project at Veltoor, Telangana state, was commissioned and the plant has been operating steadily since. The farm was awarded the world's first solar project quality certification from DNV GL, a global quality assurance and risk management company, in recognition of its high standards of safety and technical compliance. Veltoor is one of the CLP Group's most advanced solar assets, deploying best-in-class tracking technologies that are capable of following the sun's path through the day to maximise efficiency.

We also added two new solar projects to our portfolio after acquiring the Tornado project and a 49% stake in the Gale

project from our long-term partner Suzlon. Both plants are fully operational and located in Dhule, Maharashtra state. Following the takeover, CLP India's health, safety, security and environment, and O&M systems are being implemented. CLP has an option to acquire the remaining 51% stake in the Gale project in future.

Our wind farms reported the highest-ever output on a combined basis as improved availability of our machines allowed us to capitalise on higher wind resources.

To gain better operational control of our assets, we took over O&M responsibility for the Khandke wind project in the state of Maharashtra from our current partner. The move allowed us to ensure that the operation is in line with CLP's safety and operational standards and is expected to yield higher generation and revenues in the long run.

## 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		%		%	
		2018	2017	2018	2017	2018	2017
<b>Wind</b>	554.5	<b>1,723</b>	1,693	<b>95.4</b>	94.5	<b>21.3</b>	20.9
Andhra Lake	63.8	<b>229</b>	200	<b>93.6</b>	92.6	<b>24.6</b>	21.4
Bhakrani	61.4	<b>130</b>	144	<b>95.6</b>	91.3	<b>14.6</b>	16.0
Chandgarh	55.2	<b>190</b>	177	<b>96.8</b>	97.3	<b>23.7</b>	22.0
Harapanahalli	23.8	<b>90</b>	93	<b>99.1</b>	99.6	<b>25.9</b>	26.7
Jath	36	<b>112</b>	105	<b>97.0</b>	97.7	<b>21.3</b>	20.1
Khandke	30.2	<b>88</b>	79	<b>85.5</b>	88.1	<b>20.0</b>	17.9
Mahidad	30.2	<b>99</b>	91	<b>97.2</b>	90.7	<b>22.6</b>	20.7
Samana I	30.2	<b>90</b>	96	<b>95.7</b>	93.3	<b>20.4</b>	21.7
Samana II	30.2	<b>100</b>	104	<b>96.3</b>	93.9	<b>22.7</b>	23.6
Saundatti	43.2	<b>129</b>	132	<b>97.2</b>	97.0	<b>20.5</b>	20.9
Sipla	30.2	<b>73</b>	71	<b>94.0</b>	89.5	<b>16.6</b>	16.2
Tejuva	60.5	<b>206</b>	185	<b>97.8</b>	98.1	<b>23.3</b>	20.9
Theni I	29.7	<b>99</b>	114	<b>94.5</b>	94.1	<b>22.8</b>	26.4
Theni II	29.7	<b>88</b>	102	<b>93.0</b>	98.0	<b>20.3</b>	23.5
<b>Solar</b>	56.1	<b>112</b>	23	<b>98.8</b>	99.6	<b>23.1</b>	18.9
Veltoor <sup>2</sup>	29.4	<b>101</b>	23 <sup>3</sup>	<b>99.2</b>	99.6	<b>23.7</b>	18.9
Gale	14.7	<b>6</b> <sup>4</sup>	n/a	<b>98.4</b> <sup>4</sup>	n/a	<b>22.2</b> <sup>4</sup>	n/a
Tornado	12	<b>5</b> <sup>4</sup>	n/a	<b>98.6</b> <sup>4</sup>	n/a	<b>22.7</b> <sup>4</sup>	n/a

Notes:

- 1 Indicates CLP's equity sent out.
- 2 Veltoor was fully commissioned in February 2018.
- 3 Based on the capacity that was operational as at 31 December 2017.
- 4 Based on operations after the completion of CLP India's investments in November 2018.

## Thermal Projects

The Jhajjar plant maintained high utilisation in 2018 after most of the technical issues affecting its performance over the last few years were resolved. With a low cost basis and high efficiency, we were able to deliver a high dispatch. However, our performance was constrained by an industry-wide issue of limited coal supply. Although coal delivery to Jhajjar reached a record high, we still didn't have enough coal to meet all the demand from our customers. As a result, commercial availability did not reach the 80% requirement to allow the plant to fully recover all capacity charges.

Our Paguthan plant also performed well. Since its power purchase agreement (PPA) ended in December, we continue to explore long-term alternatives for this excellent asset but acknowledge that our options could be limited given the current gas shortages. We also made a provision against the amount withheld by our previous customer Gujarat Urja Vikas Nigam Limited regarding an ongoing deemed generation dispute, due to the expiry of the PPA and uncertainty over the timing of recoverability.

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

	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup>		Availability		Utilisation	
		GWh		%		%	
		2018	2017	2018	2017	2018	2017
<b>Coal</b>							
Jhajjar	792	<b>6,691</b>	5,463	<b>90.1</b> <sup>2</sup>	82.5 <sup>2</sup>	<b>62.1</b>	50.4
<b>Gas</b>							
Paguthan	393	<b>365</b>	376	<b>96.2</b>	95.5	<b>6.5</b>	6.7

Notes:

- 1 Indicates CLP's equity sent out.
- 2 For the sake of consistency, technical availability is reported in the table. Jhajjar's commercial availability was 77.2% in 2018 and 78.9% in 2017.

## Environmental Performance

### Air Emissions

Emissions of all major pollutants including particulate matter (PM), sulphur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) at Jhajjar were lower in 2018 compared with the previous year. PM emissions decreased from 0.24 kg/MWh in 2017 to 0.14 kg/MWh in 2018 because of improved operations, the replacement of fabric filters and the FGD units that started trial operation in the second half of 2018 to meet India's new compliance requirements with effect from 31 January 2019. We also reduced NO<sub>x</sub> emission from 1.27 kg/MWh in 2017 to 0.81 kg/MWh in 2018 due to combustion optimisation. In addition, the FGD units brought the level of SO<sub>2</sub> down from 4.71 kg/MWh in 2017 to 2.63 kg/MWh in 2018.

### Water

We launched a number of initiatives to improve water reuse at Jhajjar, resulting in an increase in the cooling water cycle of concentration from 5.57 in 2017 to 6.05 in 2018, despite additional water being required for the FGD in the second half of the year. The plant's water consumption was 2.14 m<sup>3</sup>/MWh in 2018 with the FGD in operation, compared with 2.11 m<sup>3</sup>/MWh in 2017 before the FGD was operational and the statutory limit of water use is 3.5 m<sup>3</sup>/MWh.

## Environmental Regulatory Compliance

We reported two environmental non-compliance incidents at Jhajjar over the course of the year:

In January 2018, due to power interruption impacting coal feed into boiler, oil firing was initiated and fabric filter was bypassed. This resulted in PM exceedance for three hours, with average PM value reaching 463.16 mg/Nm<sup>3</sup> against a limit of 50 mg/Nm<sup>3</sup>. For the full year, the plant's average PM value was 26.16 mg/Nm<sup>3</sup>.

In November 2018, the National Green Tribunal (NGT) passed an order directing all thermal power stations which had failed to dispose of all fly ash to pay a penalty, and in January 2019 the Haryana State Pollution Control Board requested that Jhajjar pay Rs 50 million. However, we are of the view that Jhajjar is compliant with the requirements and have sought guidance from the Central Pollution Control Board on the interpretation. Jhajjar collaborated with the Association of Power Producers and filed a petition before the Supreme Court, pursuant to which the Supreme Court has stayed the NGT order and directed the thermal power stations to approach the NGT.



Renewable energy plays an increasingly important role in India's energy mix, supporting the country's sustainable development.

## Social Performance

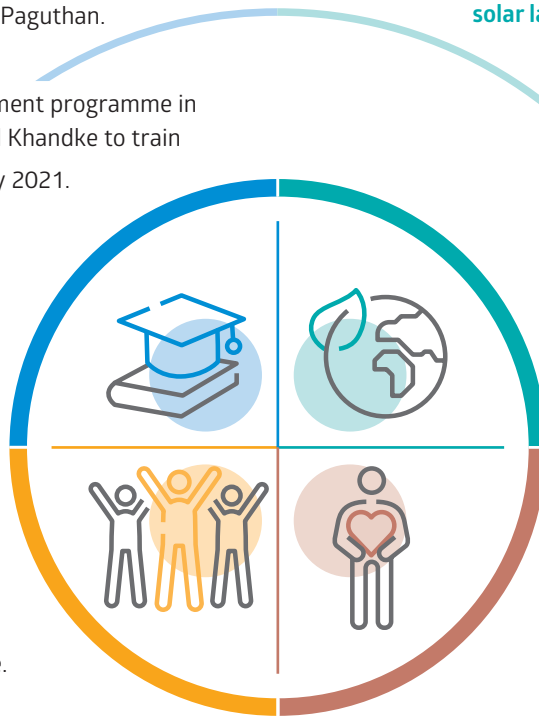
Education remains a key area of focus for our community initiatives in India. In 2018, the CLP India Scholarship scheme, our flagship education initiative, supported 395 students including 203 girls from villages near eight of our business locations. We plan to expand the programme to cover

1,000 students in 2019. Furthermore, we plan to introduce special incentive for the top 20% students with a special focus on girls' education.

Some of the other key projects we conducted in 2018 are highlighted below while more details can be found in the Social and Relationship Capital chapter on pages 88 to 92.

## Education and Development

- More than **350 youngsters** joined the Digital Literacy programme in Jhajjar and Paguthan.
  - Initiated skill development programme in Jath, Andhra Lake and Khandke to train **450 young people** by 2021.
- Continued to train **73 young adults** at the Wrestling Academy at Jhajjar where **9 wrestlers** including **5 girls** won **23 titles** at different competitions.
- **395 students** (including **203 girls**) across **8 business locations** received financial assistance under the CLP India Scholarship Scheme.



## Environment

- Installed **17 solar street lights** in villages near Veltoor and distributed **140 home solar lanterns** in Veltoor and Tejuva.

## Volunteering

- CLP volunteers and their families contributed more than **1,300 hours** of community services.
- **5,000 students** joined the Mid Day Meal Scheme in **27 schools** near Saundatti.
- Undertook drinking and service water initiatives in Khandke, Samana, Mahidad, Theni and Jhajjar, benefitting over **7,000 people**.

## Community Wellbeing

- Treated more than **22,000 cattle** in the veterinary camps conducted in villages around Jhajjar and Tejuva, benefitting about **550 families**.
- Our primary healthcare services and health awareness programmes benefitted more than **69,000 people** across **7 sites**.
- More than **3,700 women** are participating in our livelihood enhancement programmes in Jath, Chandgarh, Samana, Mahidad and Veltoor.

## Outlook

The Indian electricity market is expected to report sustained growth in the coming years on the back of healthy economic expansion nationwide and continued efforts to achieve access to electricity for all citizens. This provides a sound foundation for CLP in one of our major growth markets.

We believe renewable energy presents the biggest growth opportunities as India has set an ambitious goal of reaching 175GW of clean energy generation by March 2022. In agreement with our new partner CDPQ, we intend to focus on growing CLP India's non-carbon generating business, particularly in renewable energy and transmission. The partnership provides strong financial resources for growth from the business existing platform. We will be evaluating both greenfield and brownfield opportunities, and we are currently working on a number of opportunities in each of these segments. These opportunities include participating in auctions conducted by the central and state Government

agencies to develop utility scale wind and solar projects. We are also exploring potential acquisition targets of wind and solar projects.

In 2019, we plan to assume control of more wind projects to optimise our operational performance.

In Jhajjar, we will continue to work with the Government to resolve the coal supply issue to improve the plant's availability.

As mentioned earlier, we will explore other longer-term commercial possibilities for Paguthan amid the challenge posed by gas shortages.

India is set to hold general elections in the second quarter of 2019. We will monitor the situation and continue to work with the Government to raise the availability of electricity for customers across India while meeting the country's clean energy objectives.

### CLP has previously indicated that India is a growth market for the group – how does the recent partial sell down in India fit with this strategy?

India is a promising market and has seen many positive changes in the power sector in the last few years. With the Government's focus on providing uninterrupted electricity to all the households, long-term and capital-intensive investment is required to expand and enhance its power infrastructure. In this context, India provides an opportunity for us to create capacities across the value chain of the power sector, especially on the generation front and therefore, it remains a primary growth market for CLP.

Further, there has been a focal shift towards increasing the current contribution of renewables to India's energy mix. India is reputed as the second most attractive renewable energy market in the world and the Government of India has set an ambitious goal to generate 175GW of clean energy by March 2022. This aligns well with CLP's focus on expanding investments in low-carbon areas. We believe that having a partner with a similar vision will help us further develop the business. CDPQ shares CLP's commitment to expand clean energy investments in India to support the country's economic development. Additionally, CDPQ's strong track record in acquisitions complements CLP's traditional strength in greenfield development. Taken together, the partnership will help CLP India capture the significant growth opportunities currently available in India.



**Mr Simon Powell**  
Executive Director, UBS Investment Research  
Head of Asian Utilities Research, UBS AG



**Rajiv Mishra**  
Managing Director – India

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# Southeast Asia and Taiwan

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**Strengthening**  
operations and  
performance

## Financial and Operational Performance

### Overview

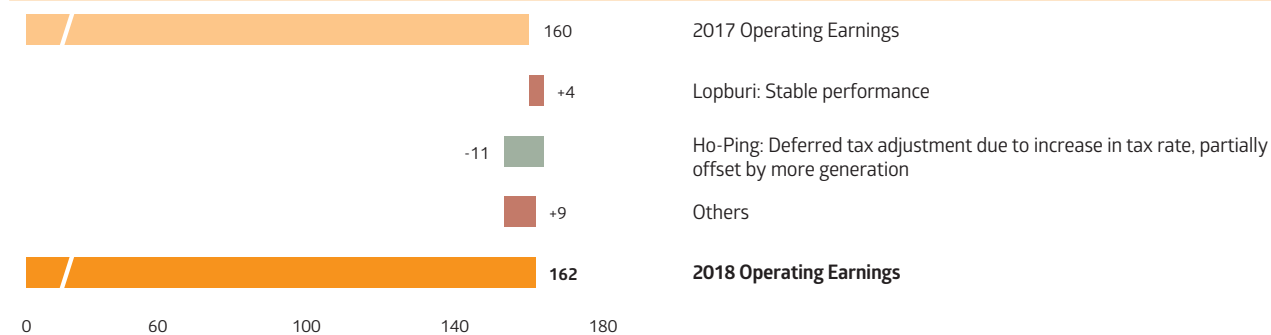
Ho-Ping Power Station in Taiwan saw good operational performance in 2018 after a strengthened permanent transmission tower was completed in the first quarter to replace the one damaged by a typhoon the previous year. However, the financial performance of the plant was adversely impacted by high coal prices. Sadly, a contractor employee passed away while working on a lighting fixture in August. To prevent serious injuries and fatalities in future, senior safety professionals from CLP engaged with Ho-Ping's management to enhance the plant's safety training and system.

In Thailand, the Lopburi solar project operated smoothly throughout the year, producing steady power generation and sound financial results.

In Vietnam, we continued our negotiations with authorities regarding the commercial and financial arrangements for our two legacy coal-fired projects – Vung Ang II and Vinh Tan III.

Our performance in Southeast Asia and Taiwan is summarised below:

Operating Earnings of Southeast Asia and Taiwan	2018 HK\$M	2017 HK\$M	Change %
Renewables	69	65	6.2
Thermal	131	142	(7.7)
Operating and Development Expenditure	(38)	(47)	(19.1)
<b>Total</b>	<b>162</b>	<b>160</b>	<b>1.3</b>



### Outlook

Our key target in 2019 will be to make investment decisions with respect to our entry into Vietnam. We will meanwhile continue to enhance our existing operations in Taiwan and Thailand.

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# Australia

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Cathedral Rocks Wind Farm

Supporting transition to a cleaner and

**modern energy** system



## Financial and Operational Performance

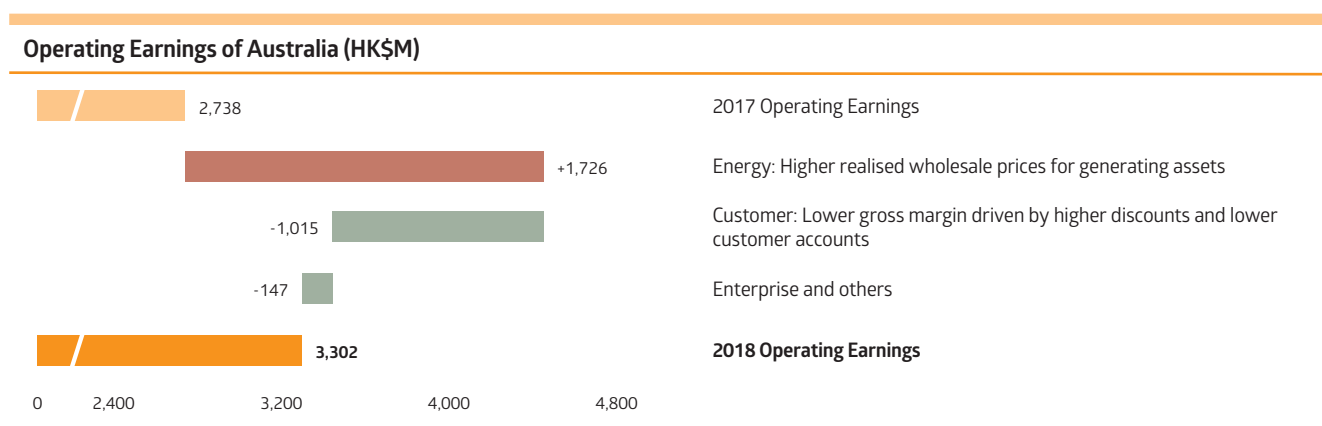
### Overview

While uncertainty about energy and emissions policy in Australia was not resolved in 2018, EnergyAustralia continued to play its part in contributing to a cleaner and modern energy system. We also engaged in public debate to express support for a national approach to policy to create a more investment-friendly environment.

In the absence of a clear policy, retail and wholesale markets remained volatile amid a tight supply-demand balance and intense public scrutiny of the energy sector.

Overall, operating earnings from EnergyAustralia increased 20.6% from a year earlier to HK\$3,302 million, reflecting the strong operating performance of our generation portfolio in a tight market with high wholesale prices. Improved profitability from our generation assets allowed EnergyAustralia to commit around A\$320 million in 2018 to measures aimed at lowering or maintaining prices for customers in the short run, and investments, acquisitions and projects to help make energy affordable and reliable over the long term.

Our performance in Australia is summarised below:



### Customer

The Australian retail market in 2018 was very competitive. Market churn was high across all the states in which EnergyAustralia operates with Government intervention and media attention stimulating heightened competition for mass-market customers and increased market transfer activity. While EnergyAustralia's churn remained below the market average, we made fewer sales and margins were put under pressure. Customer accounts decreased by 73,300 or 2.8%.

To ease pressure on customer bills, EnergyAustralia decided not to pass on around A\$55 million of rising costs in parts of the energy chain. These costs paid by EnergyAustralia include higher costs from some networks, increased costs of environmental compliance schemes, the costs of a programme to install smart meters, and a new payment difficulty framework.

From the beginning of 2018, we removed fees for paper bills and over-the-counter transactions. From 1 January 2019, we are providing an automatic 15% discount for concession customers on "standing offer" tariffs including pensioners, veterans, and customers with healthcare cards.

We extended our *Secure Saver* programme, which provides customers with certainty by capping their electricity and gas rates for two years. We also launched a new *No Frills* plan for those who prefer simple, every-day low rates for electricity and gas.

*Go Neutral*, a Government-certified carbon neutral offset programme launched in 2016, was extended to the end of 2020. To date, 206,000 customers have signed up for the scheme.

EnergyAustralia continued to apply a previously announced A\$10 million additional investment in hardship support measures, including waiving energy debts for around 1,000 vulnerable customers.

## Energy Production

Our generation fleet continued to support Australia's transition to a cleaner, modern energy system as renewable power and storage projects are integrated into the National Electricity Market (NEM). However, wholesale electricity prices remained relatively high in 2018 following the previous sudden closure of large coal-fired plants in Victoria and South Australia. During the year EnergyAustralia acquired additional flexible capacity, in the Newport and Jeeralang gas-fired plants, for an enterprise value of A\$205 million and invested around A\$144 million in maintenance and upgrades to our generation assets.

Mount Piper Power Station in New South Wales produced substantially more energy in 2018 than in the previous year on the back of greater certainty of the fuel supply. Work is progressing on a water treatment plant to support operations at Mount Piper and is expected to be completed by mid-2019.

Gas-fired power facilities in New South Wales, Victoria and South Australia maintained high reliability throughout the year, shielding customers from extreme pricing events caused by extreme weather and system constraints. The Yallourn power station in Victoria, meanwhile, produced less energy than in 2017 because of unscheduled maintenance.

The table below shows the performance of our generation projects.

Renewable and Thermal Projects – Performance							
	Installed Capacity Equity MW	Electricity Sent Out <sup>1</sup> GWh		Availability %		Utilisation %	
		2018	2017	2018	2017	2018	2017
<b>Wind</b>							
Cathedral Rocks	32	84	81	90.2	91.5	30.8	29.4
<b>Gas</b>	1,566	1,487	2,631	85.8	90.1	11.3	19.6
Newport	500	502	966 <sup>2</sup>	89.0	92.1 <sup>2</sup>	12.3	12.2 <sup>2</sup>
Jeeralang	440	107		95.3		2.8	
Hallett	203	23	20	85.4	91.5	1.4	1.2
Tallawarra	420	855	1,644	72.4	84.9	23.8	45.5
Wilga Park <sup>3</sup>	3	n/a	n/a	n/a	n/a	n/a	n/a
<b>Coal</b>	2,880	17,565	16,826	81.2	79.5	75	72.4
Mount Piper	1,400	8,193	6,880	85.4	75.8	71.2	60.1
Yallourn	1,480	9,371	9,946	77.2	83.0	78.6	84.1

Any minor discrepancies in totals are due to rounding up of figures

Notes:

- 1 Indicates CLP's equity sent out and capacity purchase.
- 2 Performance of Newport and Jeeralang was jointly reported as Ecogen in 2017 before EnergyAustralia acquired the plants in 2018.
- 3 The Wilga Park power station, operated by Santos, is fired by exploration gas from the Narrabri coal seam gas project, in which EnergyAustralia has a 20% equity stake.

## Towards a Low-Carbon Future

EnergyAustralia is continuing to invest in new electricity supplies and projects to ensure reliability of the electricity system.

In 2018, we completed a programme to help financially underpin the development of 500MW of new renewable projects across eastern Australia. The table below lists the projects supported by the programme.

Projects	Installed Capacity / Offtake for EnergyAustralia MW	Commission date
Coleambally Solar Farm (NSW)	150 / 105	January 2019
Manildra Solar Farm (NSW)	46 / 46	December 2018
Ross River Solar Farm (Queensland)	116 / 93	November 2018
Gannawarra Solar Farm (Victoria)	50 / 50	April 2018
Bodangora Wind Farm (NSW)	113 / 68	April 2019 (expected)

With these projects progressively going into operation along with our previous commitments to renewable generation, EnergyAustralia continued power purchase agreements with existing renewable energy operations during the year, as shown in the table below.

<b>Renewable Generating Capacity under Contract to EnergyAustralia</b>			
	<b>Offtake for EnergyAustralia MW</b>	<b>Electricity Sent Out GWh</b>	
		<b>2018</b>	<b>2017</b>
<b>Wind</b>			
Boco Rock	113	<b>367</b> <sup>1</sup>	347
Gullen Range	166	<b>481</b>	451
Mortons Lane	20	<b>66</b> <sup>1</sup>	59
Taralga	107	<b>299</b> <sup>1</sup>	282
Waterloo Stage 1	56	<b>166</b>	147
<b>Solar</b>			
Gannawarra	50	<b>69</b>	n/a
Ross River	93	<b>21</b>	n/a
Manildra	46	<b>2</b>	n/a

Note:

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

We also committed A\$50 million to two commercial-scale battery projects in Victoria and have the rights to charge and dispatch energy from the projects into the NEM until 2030 and 2033. The two projects have a combined storage of 80MWh, giving EnergyAustralia the largest battery storage portfolio of any retailer in the NEM. The first project is already in operation.

We are now assessing potential investments to accelerate the integration of solar and wind power into the national grid by adding capacity to help mitigate the intermittency of renewable generation. These include new gas-fired power plants in New South Wales, pumped hydro projects, and the expansion of our demand response capability.

### **New Business**

EnergyAustralia has joined an Australian Government initiative to deliver 200MW of energy reserve or “demand response” by 2020 through 10 pilot projects in New South Wales, Victoria, and South Australia. This is an innovative programme which deploys underutilised assets and involves both large commercial and industrial customers as well as residential customers curtailing demand at critical peak periods. We are managing two of the 10 projects and contributing 50MW to the programme.

In 2018 we completed the first year of our partnership with the Startupbootcamp Accelerator programme, which is aimed at fast tracking new energy-related start-up businesses. The

inaugural programme ended with 10 start-ups from around the world pitching their ideas to potential investors and members of the business community. EnergyAustralia has committed to be the major sponsor for the Startupbootcamp Accelerator programme for three consecutive years and is currently working closely with three start-ups from the 2018 programme to develop new products and services.

### **Environmental Performance**

#### **Air Emissions**

Overall, emissions from our Australian power stations have remained consistent compared to 2017. Yallourn achieved a 5% decrease in emissions in 2018 due to a drop in generation. Mount Piper, meanwhile, saw a 16% increase in emissions with a 19% rise in energy output. Emissions at each of our gas-fired generators decreased following lower generation in 2018.

#### **Environmental Regulatory Compliance**

EnergyAustralia was not subject to any fines or prosecutions arising from environmental-related regulatory non-compliances in 2018. In July, Yallourn exceeded its carbon monoxide emission limits for three brief periods. We assessed there was no harm to the environment and the Environment Protection Agency in Victoria was notified. Corrective action has been taken to prevent a repeat of this incident.

## Social Performance

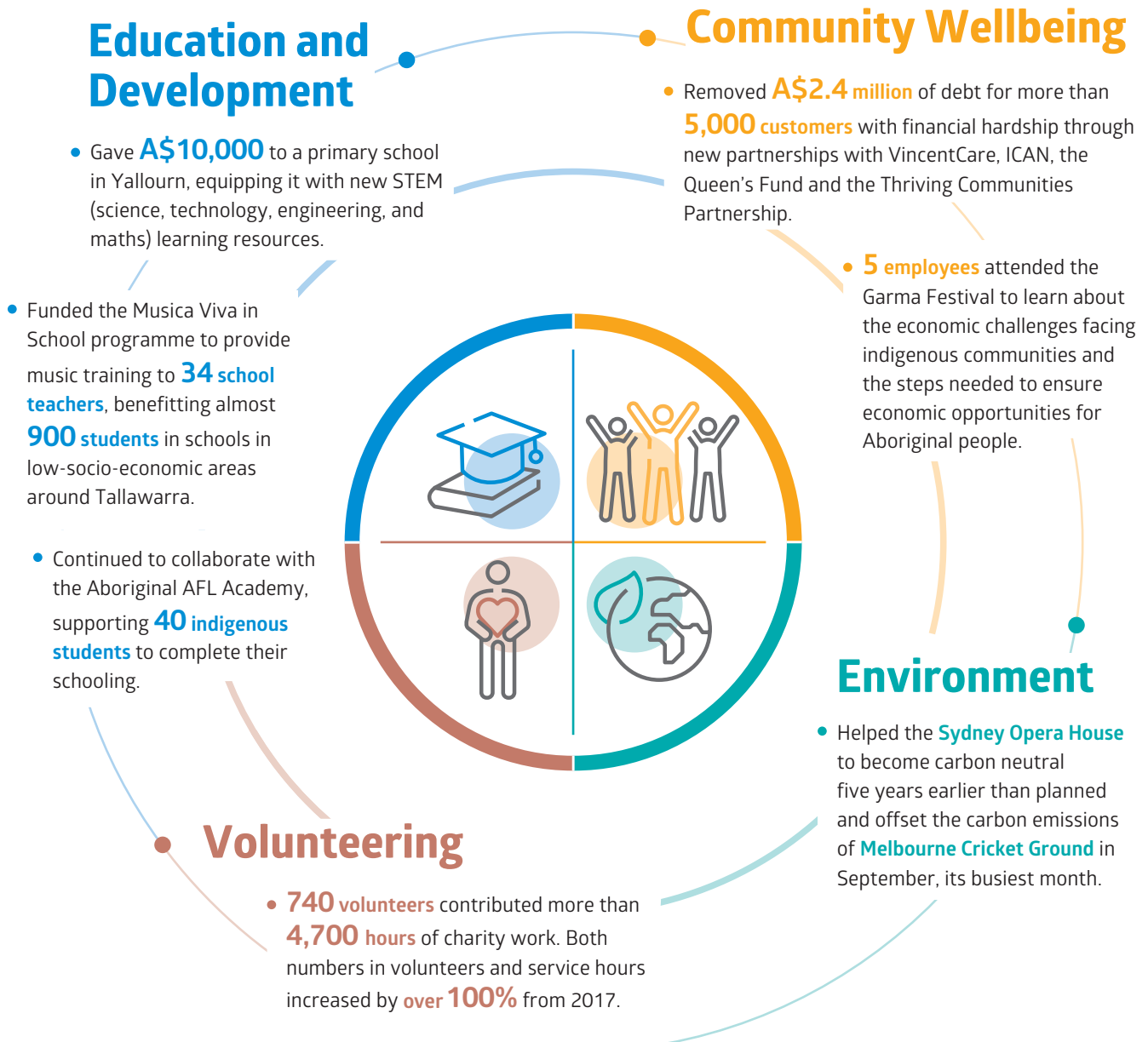
EnergyAustralia made it easier for employees to participate in a widening selection of community activities in 2018. As a result, we were encouraged to see a 154% increase in our volunteering hours from 2017.

In October, we launched our Workplace Giving programme with nine charity partners, with employee donations commencing in 2019. As a demonstration of our commitment to the programme, EnergyAustralia donated A\$1 per week per employee from 1 October to 31 December 2018. In addition, the Executive Management Team and Board have donated 1% of their salaries since 1 October 2018.

We continued to support our partners Sydney Opera House and the Melbourne Cricket Ground (MCG), working with the

Opera House to make it carbon neutral five years ahead of schedule. In September, which is the busiest month for the MCG due to the AFL Final Series, we fully offset the carbon emissions at the ground including the impact of over 400,000 people who travelled to and from the venue.

As part of our Reconciliation Action Plan to increase engagement with Aboriginal and Torres Strait Islander people and communities, EnergyAustralia actively supported initiatives to raise awareness of the economic challenges and the steps needed to ensure economic opportunities for Aboriginal people while strengthening and preserving their culture. These include changes to procurement and recruitment policies to support greater participation in the wider workforce.



Our LGBTI (Lesbian, Gay, Bisexual, Transgender, and Intersex) network PRISM expanded in 2018 to include more than a third of our workforce. PRISM was named Australian LGBTIQ+ Network of the Year from the Australian Workplace Equality Index and was a finalist for the Michael Kirby LGBTIQ+ Inclusion award by the Australian Human Resource Institute.

Our major community initiatives are highlighted on page 66. Please also refer to the Social and Relationship Capital chapter on pages 88 to 92 for more details.

### Ensuring a Safe Workplace

Safety is our utmost priority. We were therefore deeply saddened by two fatal workplace incidents in 2018. Detailed investigations, both independent and internal, are in progress for Yallourn. Investigations into the NSW solar installation incident have been completed and we are in the process of implementing the recommendations. We are also completing risk assessments and reviewing safety controls. Details can be found in the Human Capital chapter on pages 81 to 87.

### Outlook

In the absence of a durable and sustainable energy policy, market conditions are expected to remain tight. Operationally, our focus will remain on optimising our generation portfolio, enhancing asset reliability and exploring the integration of flexible capacity options, including pumped hydro and gas-fired generation.

We expect competition in the retail market to remain intense. Against this background, we will continue our focus on improving customer experience and easing pressure on household budgets.

It will remain our priority to work with Federal and State Governments and advocate for a clear and stable national energy policy. This will provide the confidence for the investment required to transition Australia to a more reliable, affordable and sustainable energy system. We are committed to contributing to those investments to safeguard the reliability and affordability of power supply in Australia as the country moves towards a low-carbon future.

**EnergyAustralia has partnered with Startupbootcamp in a 13-week accelerator programme, aimed at supporting entrepreneurs scale their industry changing businesses. How important are new technologies and innovations to the Australian energy industry? How can these help your customers?**

The transition to a cleaner, modern Australian energy system has already started. Long-term success means delivering reliable, affordable and cleaner power for families and businesses, wherever they are.

The question is how it's delivered.

We have some brilliant minds at EnergyAustralia. But we don't have a mortgage on pioneering new technology and approaches. The talented, bright people at the start-ups in our Startupbootcamp Accelerator programme are applying their minds to renewable energy, electric mobility, the Internet of Things, data monetisation, artificial intelligence and machine learning. Right now, we're facing some great challenges in energy and the Accelerator programme participants have chosen to be part of the solution. I've spent three decades in the energy industry and rarely – if ever – have I been so optimistic that the pieces of the puzzle are falling into place. It's exciting to think that the next great idea, the next great advance in energy, might be one that comes from our programme.

The Accelerator programme is helping bring great ideas out of workshops and garages around the world.



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