CLP's Climate Vision 2050

2021 EDITION

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CEO'S MESSAGE

Our climate is rapidly shifting. Natural disasters not only pose serious risks to our operations but could also impact the communities that rely on the energy services we provide.

As in many other parts of the world, the markets we operate in are experiencing the harmful effects of climate change. It would not be hard to imagine that worse is yet to come. Indeed, scientific evidence overwhelmingly suggests that the frequency and severity of natural disasters will only increase. The costs on human, plant and animal life would be severe.

This means we must act now. As one of the largest investor-owned power businesses in Asia Pacific, we have a responsibility to our stakeholders to ensure a reliable and affordable supply of energy, as well as to minimise the impact of our operations on the climate. Since the launch of the Climate Vision 2050 in 2007, a lot has changed. And we have too. **As part of becoming a Utility of the Future, we are now committed to achieving net-zero greenhouse gas emissions by 2050.**

A net-zero global energy sector will change the way energy is produced, transported and consumed. To play a part in this transformation, we are progressively phasing out coal for power generation while investing in other streams of business, including power transmission, distribution and retail, renewable and other non-carbon emitting energy, as well as energy and infrastructure services. There are many obstacles ahead but also more opportunities.

We are accelerating our plans to phase out CLP's coal-based assets by 2040, a decade earlier than previously pledged. **In the interim, we have science-based targets in place to do our part in limiting global warming to well-below 2°C above pre-industrial levels.**

We maintain our commitment to strengthen our decarbonisation targets at least every five years, in recognition of the need to further raise our ambition in line with the 1.5°C pathway. This will enable us to consider the rapidly evolving climate science, as well as the latest policy drivers, technological advancements, global standards, industry trends and community needs.

Rising to the challenges of climate change requires a collective effort from communities, governments and businesses. Working together with our partners, we will develop new ways to decarbonise, and to empower our customers with smarter energy solutions. CLP aspires to move towards a net-zero future – for the communities we serve, for the natural world we rely upon, and for the business opportunities that our green ambition will yield.

Our updated Climate Vision 2050 is a testimony to our commitment to make decarbonisation a reality.

Richard Lancaster
CHIEF EXECUTIVE OFFICER

September 2021

As part of becoming a Utility of the Future, we are now committed to achieving net-zero greenhouse gas emissions by 2050.

ABOUT THE CLP GROUP

VISION

CLP's vision is to be the leading responsible energy provider in the Asia-Pacific region, from one generation to the next.

Founded in 1901, the CLP Group (CLP) is one of the largest investor-owned power businesses in Asia Pacific. Hong Kong-listed CLP Holdings Limited is the holding company for the Group. It operates in Hong Kong, Mainland China, Australia, India, Southeast Asia and Taiwan, with business activities ranging from power generation, transmission and distribution to retail and energy services. Across its markets, CLP employs over 8,000 people and serves over five million customer accounts.

CLP is exploring the feasibility of using hydrogen at the gas-fired Black Point Power Station in Hong Kong (pictured) while its subsidiary EnergyAustralia is proceeding to build Australia's first net-zero emissions hydrogen and gas capable Tallawarra B Power Station.

THE GLOBAL OPERATING ENVIRONMENT

INCREASING POLICY SUPPORT AND BUSINESS LEADERSHIP

An increasing number of countries around the world, particularly here in Asia Pacific, have elevated their climate ambitions. China has committed to a goal of peaking emissions by 2030 and achieving carbon neutrality by 2060, while Hong Kong and major Asian economies such as South Korea and Japan have announced similar goals for 2050. These commitments provide the critical policy clarity needed for businesses to plan for the transition to a net-zero economy.

Financial frameworks, such as the recommendations set out by the Task Force on Climate-related Financial Disclosures (TCFD), have been effective in mobilising providers of financial capital and enabling companies to communicate decision-useful climate-related financial information to investors and lenders.

In response, business leaders are taking bolder action. In 2021, more than 1,000 businesses with a combined market capitalisation of over US$15 trillion are working with the Science Based Targets initiative (SBTi) to reduce their emissions in line with climate science. Over 800 companies, including CLP, have already set science-based targets.

The latest analysis from the United Nations Intergovernmental Panel on Climate Change calls for immediate, rapid and large-scale emissions reductions in order to limit global warming to 1.5°C. This underscores the need to transform our energy system. As the International Energy Agency points out, the world has a viable pathway to building a global energy sector with net-zero emissions by 2050.

These new benchmarks, in conjunction with increased expectations from investors, communities and customers, are driving businesses to transform how they operate and innovate for the future.

CLP'S OPERATING ENVIRONMENT

With an enormous and increasingly affluent population, power demand in Asia-Pacific countries is growing exponentially. In reducing emissions, there are significant challenges to overcome as coal is currently the main source of energy supply in the region. We recognise the environmental impact of coal-fired power generation and the increasing emissions reduction ambitions in our operating markets including Hong Kong, Mainland China, Australia, and India. In our transition away from coal, we will strive to ensure our customers' reliable and safe access to electricity at affordable rates.

CLP has a central role to play in this transformation. In Hong Kong for instance, electricity generation is the largest contributor of greenhouse gas (GHG) emissions, representing around 66% of total emissions in 2019, followed by transport (18%) and waste (7%).

By lowering the carbon intensity of our energy supply, we are also supporting and enabling our customers in their ambitions to reduce their own emissions and carbon footprint.

ACCELERATING OUR RESPONSE TO CLIMATE CHANGE

Mitigating climate change impacts is firmly embedded in CLP's business strategy.

CLP has a strong track record for measuring and reporting on its Scope 1 and 2 GHG emissions. In 2019, CLP began to include Scope 3 GHG emissions in its climate disclosure to present a more comprehensive and transparent picture of its footprint across the value chain.

In 2020, Scope 1 GHG emissions accounted for nearly 73% of CLP's total GHG emissions; total Scope 3 emissions were 27%; and Scope 2 emissions represented less than 1%.

DELIVERING ON OUR COMMITMENTS

Following the release of CLP's first Climate Vision 2050 in 2007, the Group has continued to strengthen its targets while taking meaningful and effective steps towards decarbonisation.

In 2010 and 2020, CLP fulfilled its decarbonisation targets by reducing the carbon intensity of its generation portfolio to below 0.8kg CO_2/kWh and 0.6kg CO_2/kWh respectively.

Reducing carbon intensity

In line with CLP's decarbonisation plan, the Group's carbon intensity was reduced in 2020 through the operation of a new combined-cycle gas turbine unit at Black Point Power Station in Hong Kong, replacing output from the coal-fired Castle Peak Power Station in Hong Kong, and reduced output from Jhajjar Power Station in India.

Increasing clean energy sources

CLP saw increases in nuclear power generation from the Guangdong Daya Bay and Yangjiang stations in south-eastern China in 2020. The Group's total energy sent out from renewable assets also increased year-on-year from 2019[1]. Following Canadian pension fund Caisse de dépôt et placement du Québec's (CDPQ) acquisition of a 40% stake in Apraava Energy (formerly known as CLP India) in 2018, 400MW of new renewable energy capacity has been added into Apraava Energy's portfolio up to the end of 2020. These initiatives have been crucial in the delivery of CLP's commitments to decarbonisation.

STRENGTHENING OUR TARGETS

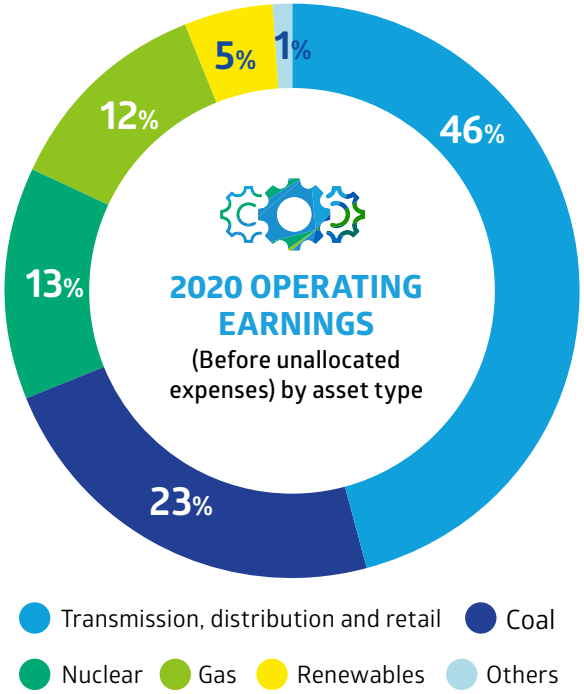
In 2021, we conducted a strategic review of our commitments under the Climate Vision 2050 by engaging with internal and external stakeholders, including the Board of Directors, the Sustainability Executive Committee, relevant business units, and our investors. The new targets were then reviewed and approved by the Sustainability Committee and the CLP Board.

During the review process, we:

- benchmarked CLP's approach against industry standards;
- reviewed business planning assumptions in the modelling of our updated Climate Vision 2050;
- conducted a climate change scenario analysis in consideration of climate-related physical and transition risks and opportunities; and
- identified strengths and opportunities in our efforts to reduce GHG emissions.

A major focus at CLP is managing the pace of change and striking a balance between financial sustainability, environmental best practice and social responsibility while taking market needs and regulatory changes into account. It will involve careful planning and engagement with authorities, communities and relevant stakeholders to ensure an orderly and just transition.

In 2020, around two thirds of CLP's operating earnings were contributed by power generation from non-carbon emitting sources; power transmission, distribution and retail; and other non-generation activities.

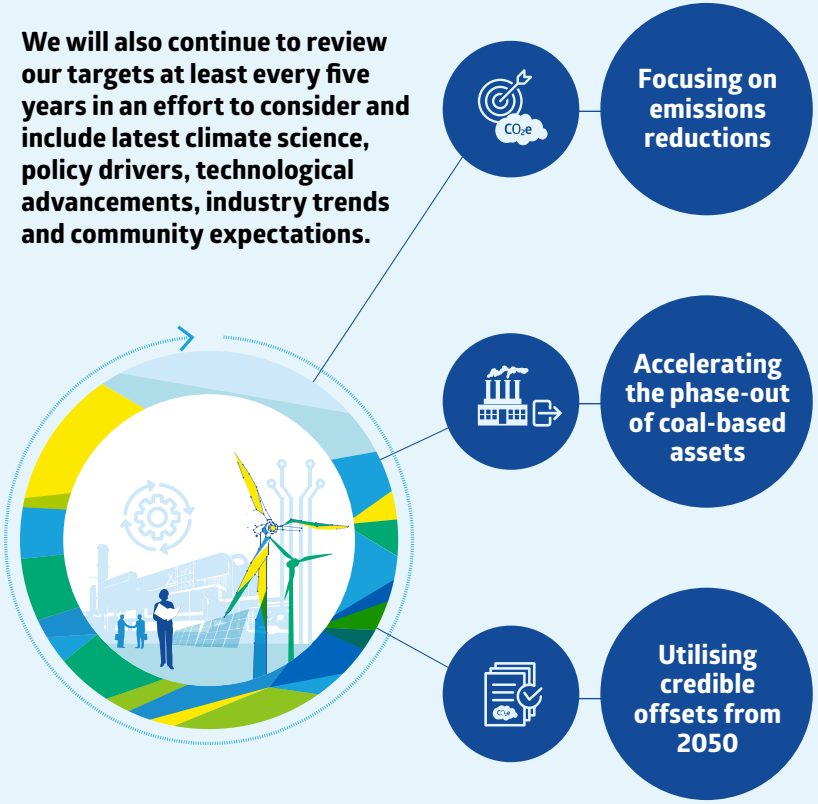


1 Based on an equity plus long-term capacity and energy purchase basis.

OUR NET-ZERO COMMITMENT

At CLP, we have strengthened our targets in pursuit of a more ambitious commitment of net-zero GHG emissions across the value chain by 2050.

We will also continue to review our targets at least every five years in an effort to consider and include latest climate science, policy drivers, technological advancements, industry trends and community expectations.



Setting science-based targets for 2030

In addition to setting ambitions for 2050, CLP has set new interim targets for 2030, to align with the Paris Agreement goal of limiting global warming to well-below 2°C above pre-industrial levels.

We are committed to:

52% reduction in the Group's Scope 1, 2 and 3 GHG emissions intensity[2] of electricity sold. The new target of 0.3kg CO_2e/kWh has been considerably strengthened relative to the previous one of 0.5kg CO_2/kWh.

50% reduction in Scope 1 and 2 GHG emissions intensity[3] of electricity generated to 0.36kg CO_2e/kWh.

28% reduction in absolute Scope 3 GHG emissions[4] from the combustion of the natural gas supplied to customers in line with the SBTi's requirements.

These targets for 2030 are set based on our 2019 emissions levels.

Strengthening interim targets for 2040

To support our targets for 2030 and 2050, we have also strengthened our 2040 interim target to lower our Scope 1, 2 and 3 GHG emissions intensity[2] of electricity sold to 0.1kg CO_2e/kWh, much reduced from our previous target of 0.34kg CO_2/kWh.

We will also progressively phase out our coal-based assets by 2040 – a decade earlier than pledged previously. We will accelerate our transition where market conditions allow, taking a considered approach that limits any effect on power supply and reliability in the interests of the communities we serve. At the same time, we will maintain our position on ceasing the development of new coal-fired power generation assets within our portfolio.

Reaching net-zero emissions by 2050

Where we are not yet able to reduce our emissions by the year 2050, any residual GHG emissions attributable to the Group will be addressed through the purchase of valid offset credits.

We will also keep track of international standards and industry practices to ensure our net-zero target is aligned with the norms.

2 These targets cover the Group's generation and energy storage portfolio. They are set on an equity plus long-term capacity and energy purchase basis to reflect the Group's investment in energy transition and to align with the SBTi's guide for vertically integrated power companies.

3 This target covers the Group's generation and energy storage portfolio and is based on equity.

4 This target is based on equity and covers the Group's Category 11 of Scope 3 emissions – use of sold products.

Retiring less representative climate change targets

CLP decided to retire its renewable and non-carbon emitting energy capacity targets in consideration that absolute GHG emissions and emissions intensity have emerged to become more widely recognised globally for measuring the emissions reduction progress of electric utilities.

Decarbonising the energy system requires a multi-pronged approach. In the transition, we may seek to retain the capacity provided by a number of thermal assets to underpin supply reliability, even as we cease using them for daily power generation. We will complement renewables with energy storage and other technologies to help ensure power reliability and accessibility, as well as include zero-carbon fuels such as green hydrogen. As technology advances, more options are becoming available to reduce or neutralise the impact of more emissions-intensive power plants, which could lower the significance of the share of renewable and non-carbon emitting energy as an indicator of a company's GHG emissions reduction progress.

CLP'S KEY TARGETS AND COMMITMENTS

BY 2030

Meet science-based GHG emissions intensity targets

0.3kg CO_2e/kWh
↓52% from 2019

0.36kg CO_2e/kWh
↓50% from 2019

SCOPE 1
Emissions from CLP's owned or controlled sources

+

SCOPE 2
Emissions from the generation of purchased electricity for CLP's own use

GHG emissions intensity of electricity generated

BY 2040

Phase out coal-based assets

0.1kg CO_2e/kWh
↓84% from 2019

+

SCOPE 3 CATEGORY 3
Emissions from the generation of purchased electricity sold to CLP's customers

GHG emissions intensity of electricity sold

BY 2050

Achieve net-zero GHG emissions across CLP's value chain

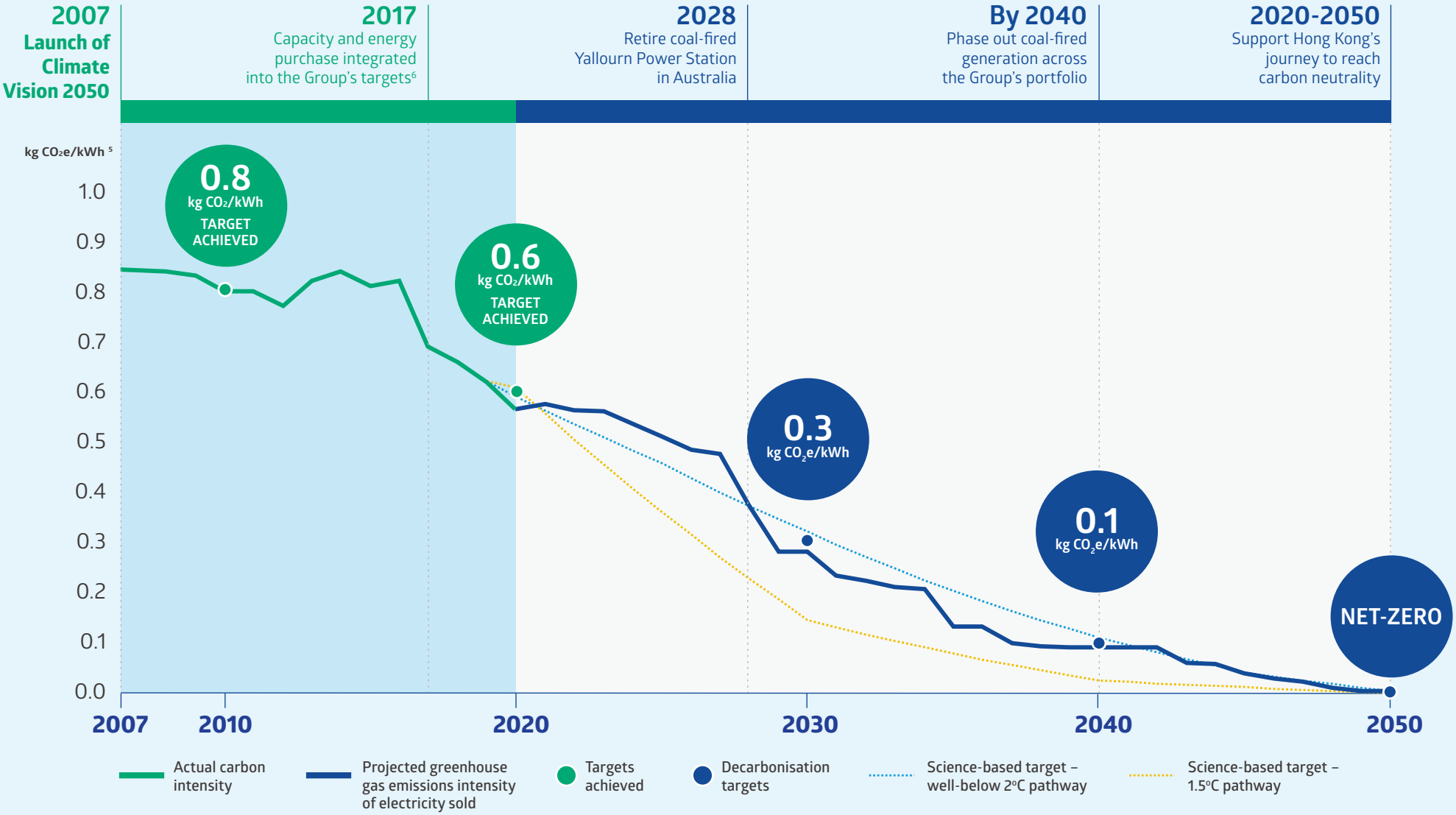
NET-ZERO

+

SCOPE 3 OTHER CATEGORIES
Emissions from CLP's suppliers and customers as well as other sources

GHG emissions across the value chain

CLP'S PAST AND PROJECTED GREENHOUSE GAS EMISSIONS INTENSITY



5 CLP's trajectory from 2007 to 2020 is based on the Group's carbon intensity (kg CO_2/kWh). Going forward, in line with global best practices, CLP will report the Group's GHG emissions intensity based on kg CO_2e/kWh.

6 CLP's trajectory from 2017 to 2050 is on an equity plus long-term capacity and energy purchase basis.

OUR APPROACH

MANAGING CLIMATE RISKS AND ENABLING THE ENERGY TRANSITION

Short- to medium-term goal:
We are focusing efforts on progressively phasing out coal for power generation.

Long-term goal:
We will investigate and assess the use of new energy technologies such as green hydrogen, energy storage solutions and wider deployment of renewable energy as an alternative to natural gas.

HONG KONG

CHALLENGES

In Hong Kong, CLP's Castle Peak Power Station has been a key generating asset supporting Hong Kong's economic growth for over three decades, providing reasonably-priced electricity. We have already announced plans to phase out coal for power generation at Castle Peak A Power Station progressively in the next few years. As government climate policy is moving forward to align with international expectations, we also aim to gradually phase out coal at Castle Peak B Power Station from the mid-2030s onwards.

OPPORTUNITIES

As the backbone of CLP's business, Hong Kong is where we always see investment opportunities in decarbonisation and digitalisation. We support the government's ambition for the city to become carbon neutral by 2050. We are facilitating local renewable energy development through the Feed-in Tariff scheme and exploring the feasibility of developing an offshore wind farm in Hong Kong waters. In the near to medium term, we also plan to increase our lower-carbon electricity supply by introducing more gas-fired generation and importing more electricity from non-carbon emitting generation into our grid. In the long term, we aim to switch our gas-fired generation facilities to operate on green hydrogen when the technology becomes more mature and commercially viable.

We will continue to engage with the government to support Hong Kong in becoming carbon neutral. This will likely require both the decarbonisation of the electricity sector and significant growth in the use of clean electricity in the transportation industry and households.

MAINLAND CHINA

CHALLENGES

In Mainland China, our non-carbon emitting assets already contribute most of our earnings and we will continue our transition away from coal-fired assets in the region by 2040.

OPPORTUNITIES

CLP will pursue low-carbon projects to support China's environmental targets for 2030 and its goal to achieve carbon neutrality by 2060. We will continue to explore investment opportunities in renewables, energy infrastructure and energy-as-a-service, with a particular focus on the Greater Bay Area.

Two large-scale renewables projects have been added to our portfolio. The first was Laiwu III Wind Farm in Shandong province, commissioned in 2020. The entire three-phased Laiwu project is currently CLP's largest operating wind farm (149MW). The second project is the 100MW Qian'an III Wind Farm in Jilin province, which commenced construction in 2021 and will include a 5MW battery storage system. We are also pursuing opportunities to increase the adoption of rooftop solar power generation, and to invest in offshore wind projects in the region.

AUSTRALIA

CHALLENGES

In Australia, Yallourn Power Station in Victoria's Latrobe Valley, which is owned by CLP's subsidiary EnergyAustralia, will retire in mid-2028, four years ahead of schedule. Based on current projections, Yallourn's early retirement has the potential to reduce CLP's carbon intensity by around 20% by 2030.

CLP will continue to review the retirement schedule of Mount Piper Power Station in New South Wales, taking into consideration environmental and social factors, as well as the need to ensure supply stability and reliability for the communities that rely on the plant's energy production.

OPPORTUNITIES

We plan to continue our focus on progressing the investments which will deliver a cleaner and more flexible generation portfolio in the future; optimising the operation of our energy assets; and pursuing excellence and cost reductions in customer service.

EnergyAustralia plans to build a 350MW battery facility close to its Jeeralang Power Station. If constructed today, this would be one of the largest battery facilities in the world, and it will help smooth the power market transition in Victoria as Yallourn closes. This project is due for completion by 2026. The company is also developing the gas-fired Tallawarra B Power Station, which will be Australia's first net-zero emissions gas peaking plant. It will be designed to incorporate the use of green hydrogen.

In Queensland, construction has begun on the 250MW Kidston pumped hydro energy storage facility. While EnergyAustralia will not own this asset, it has secured the operational dispatch rights for the facility after its completion in 2024.

INDIA

CHALLENGES

Jhajjar Power Station in Haryana is a coal-fired asset in which CLP currently has a 60% equity ownership held through Apraava Energy. Since the plant began operations in 2012, Apraava Energy has been making efforts to lower its sulphur dioxide emissions. In the longer term, we aim to phase out coal-fired generation before 2040.

OPPORTUNITIES

In India, CLP's focus remains on new zero-carbon investments in renewable generation and transmission assets. For example, Apraava Energy has commenced construction of the 252MW Sidhpur Wind Farm in Gujarat – our largest wind farm project to date. It also expects to complete the acquisition of Kohima Mariani Transmission Limited – our first inter-state transmission project – in the second half of 2021.

We will continue to monitor the fast-evolving policy changes in the Indian power market and explore investments in line with the government's support for renewable energy development.

LEVERAGING TECHNOLOGY TO PARTNER WITH CUSTOMERS

We are committed to investing in best-in-class technologies and innovative programmes to reduce our GHG footprint within our operations. At the same time, we recognise the role we can play in supporting governments, communities and businesses to reduce their emissions.

Many of our customers are embarking on their own decarbonisation journeys. Through our emerging energy-as-a-service infrastructure, we provide end-to-end product offerings to help make a difference.

CLP'S PORTFOLIO OF SOLUTIONS TO HELP CUSTOMERS DECARBONISE

In both Hong Kong and Australia, CLP plans to progressively increase the adoption of smart meters to help customers track their energy use and costs.

In Hong Kong specifically, CLP has invested in a suite of programmes to help commercial and residential customers improve their energy efficiency and encourage them to save energy. To promote the development of wind and solar projects, we also provide feed-in tariffs for eligible customers and offer Renewable Energy Certificates to those interested in supporting the growth in local renewable energy and reducing their own carbon footprint.

In Mainland China, CLP is focused on meeting growing demand for diversified energy solutions, including centralised cooling systems, energy solutions for data centres, and energy management systems for buildings, particularly in the Greater Bay Area.

We are also partnering with innovators to ensure we can access and deploy the latest and best-in-energy technology. This includes a portfolio of strategic investments in leading global innovation hubs within China, the United States and Israel, covering technologies such as demand response management, smart buildings, cybersecurity, and hydrogen storage. These investments not only strengthen our business in terms of our efficiency and offerings, but also contribute to our bottom line.

CLP will continue to invest in power transmission and distribution systems and batteries, as well as other innovative energy storage solutions. We are also looking at opportunities to accelerate the electrification of transport in our markets.

ABOUT CLIMATE VISION 2050

CLP's Climate Vision 2050 sets out the blueprint of the Group's transition to net-zero GHG emissions leading up to mid-century.

Launched in 2007 with a focus on the ambition to mitigate CLP's climate impact, Climate Vision 2050 has been instrumental in informing CLP's business strategy and guiding its investment decision-making. It is also an integral part of CLP's broader climate strategy, which covers key considerations around climate adaptation and scenario analysis, among others. This vision will underpin our long-term success as a business.

CLP is a staunch supporter of the United Nations Sustainable Development Goals. In line with SDG 7 – Affordable and Clean Energy and SDG 13 – Climate Action, we recognise our responsibility as an energy company to address the risks of climate change by reducing our GHG emissions.

We are aligning with the goals set out in the Paris Agreement through science-based targets to limit global warming to well-below 2°C above pre-industrial levels. In the meantime, we remain committed to ceasing the development of new coal-fired power generation assets and progressively phasing out our coal-based assets by 2040.

Globally, our collective approach to decarbonisation needs bolder action. CLP acknowledges its responsibility to play a leading role in these efforts. Our Climate Vision 2050 was further updated in 2021 to align with climate science and industry best practice. It also aligns with the growing expectations of our investors, customers, regulators, employees and other stakeholders.

We will continue to pursue efforts to limit global warming to 1.5°C and further review our targets at least every five years. Drivers for acceleration will include step changes in climate and energy policy, technology advances as well as support from governments in the markets where CLP invests. We are committed to seeking a just transition and striking a balance between financial sustainability, environmental best practice and social responsibility while taking market needs and regulatory changes into account.

To find out more about CLP's approach to decarbonisation and sustainability, visit

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