



Sharing our Planet



Sustainability
at HKEI

Sharing
our Planet

Serving
Hong Kong

Working
with Partners

Everyone has a responsibility to safeguard the environment. At HK Electric, we invest continuously in new technologies and initiatives to minimise the impact of our operations and enhance the public's environmental awareness.





Management Approach

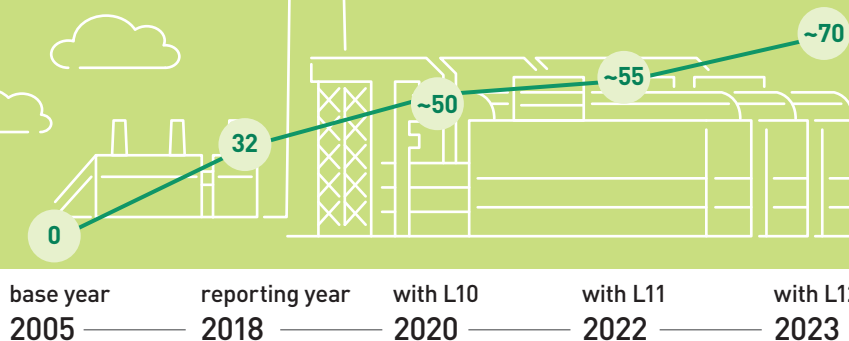
HK Electric's commitment to safeguarding the environment is articulated in our Environmental Policy, which we updated in 2018 to place renewed emphasis on low-carbon power generation at Lamma Power Station and support for wider application of renewable energy (RE) in the community.

Under the leadership of our Environment Committee, environmental considerations are fully integrated across all areas of our business in compliance with comprehensive environmental and energy management systems certified to international standards ISO 14001 and ISO 50001. We strive for continuous improvement and continually monitor our performance with reference to specific and measurable targets.

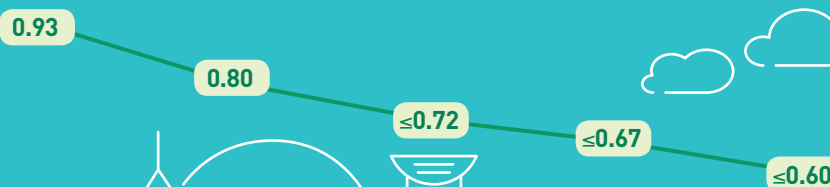
In recognition of the fact that we cannot achieve our environmental objectives in isolation, we work closely with our stakeholders. We are also committed to promoting broader environmental awareness through our public education programmes.

New Era of Gas-Fired Power

Proportion
of gas-fired
generation (%)



Carbon emissions
per unit of
electricity sold
(kg CO₂e/kWh)





TAKING ACTION ON CLIMATE CHANGE

To help combat climate change, HK Electric is taking a proactive approach to reducing greenhouse gas emissions. Our corporate management strategy is also focused on adaptation to climate change to help bolster our city's resilience in the face of more extreme weather conditions.

Transitioning to Low-Carbon Power Generation

Switching to natural gas is a clean and effective way to produce fewer carbon emissions than coal-fired power generation. This is essential for supporting the Government to achieve Hong Kong's 2030 carbon intensity reduction target under the Climate Action Plan 2030+. We aim to increase the proportion of natural gas in our fuel mix for power generation at Lamma Power Station to about 70% by 2023 and continue to phase down our remaining coal plants in the next decade.



Drum-lifting for L10 on 7 August 2018 marks the completion of the installation phase for all major components of this new gas-fired unit.

As part of this switch, in 2018, we made progress in the construction of two new gas-fired units, L10 and L11, while initiating work on a newly-approved gas-fired unit, L12. These units, which feature advanced efficiency-enhancing technology, are progressively replacing five coal-fired units and one aging gas-fired unit by 2023. Two coal-fired units already retired in 2017 and 2018 respectively upon reaching the end of their asset lives.

To ensure the commercial and operational viability of our strategy, we are working with CLP Power to develop an offshore liquefied natural gas (LNG) terminal using Floating Storage and Regasification Unit (FSRU) technology, which will diversify Hong Kong's natural gas supply sources. A second gas source will be added for our Lamma Power Station, increasing our access to competitively-priced gas in the global LNG market and mitigating potential gas supply risks. The Government granted an Environmental Permit for the new LNG terminal in 2018 and we plan to commence construction of this facility in 2020 with the goal of putting it into operation in 2022.

Building Climate Resilience

Our strategy to adapt to climate change is to assess potential risks to our business, adopt resilient designs and conduct regular operational reviews in order to implement timely enhancement measures. We have contingency plans and emergency procedures in place throughout our operations, and conduct regular practice drills and reviews.

In 2018, we initiated a pilot study on strategic use of CCTV to monitor the degree of storm surge at our distribution substations. We also conducted a review of the anti-flooding design of new distribution substations. During the year, we installed tide gauges and anemometers on Lamma Island as part of a joint study we are undertaking with the Hong Kong Observatory on tides and storm surge. These would help us understand and prepare for extreme weather events.



Adapting to Climate Change

Possible extreme weather events		Our precautions
	Rising sea levels and more erratic rainfall	• Anti-flooding systems at Lamma Power Station • Flooding alarms, bund walls, sump pumps and switchgear stands at substations subject to flooding risk • Advising management offices of buildings with flooding risk to install anti-flooding systems at their switch rooms
	Longer periods of higher ambient temperature	• Converting 11-kV open-ring distribution feeders to 22-kV closed-ring feeders to enhance supply reliability and increase cable capacity
	Stronger typhoons and more powerful thunderstorms	• Underground and submarine cables • Standby typhoon emergency teams

Promoting Renewable Energy

HK Electric operates a commercial-scale solar power system and a commercial-scale wind power station – Lamma Winds, which generated a total of 1,786 MWh of green electricity in 2018.

Looking to the future, we are committed to supporting the Government's policy of promoting development of RE in Hong Kong. In 2018, we launched a range of new Smart Power Services to encourage public participation in RE generation, including through Feed-in tariffs and RE certificates. Please refer to the Serving Hong Kong chapter of this report for more information.

IMPROVING AIR QUALITY

Air pollution in the Pearl River Delta region has long been one of the most important issues impacting the health and well-being of our community. Air emissions produced locally in Hong Kong come significantly from coal-fired power plants and traffic.

Emissions at Lamma Power Station

HK Electric has been progressively reducing emissions in line with Hong Kong's Air Quality Objectives. As summarised in the table that follows, we employ a range of emission control facilities at Lamma Power Station to limit the quantities of specified emissions, namely sulphur dioxide (SO₂), nitrogen oxides (NO_x) and respirable suspended particulates (RSP).

In 2018, we continued to meet the emission allowances for SO₂, NO_x and RSP specified by the Government and started a review with the Government on formulating new emission allowances for 2024 and onward.

Our strategy of switching to gas-fired generation which has a higher efficiency and less NO_x emissions than coal-fired generation, and nearly zero SO₂ and RSP emissions will also contribute to better air quality in Hong Kong. Moreover, the heat recovery steam generators of the new gas-fired units L10, L11 and L12 will feature Selective Catalytic Reduction systems to further reduce NO_x emissions.



Emission Reduction Performance

Year End	2005 (Base year)	2008 (Before the start of the previous SCA)	2018 (End of the previous SCA)	2023 (Forecast)
Total number of coal-fired units	8	8	6	3
Number of coal-fired units with:				
Flue gas desulphurisation plant	3	3	6	3
Low-nitrogen-oxides combustion system	3	3	5	3
Electrostatic precipitator	8	8	6	3
Total number of gas-fired units	0	1	2	4
Number of gas-fired units with:				
Selective catalytic reduction system	Not applicable	0	0	3
Proportion of gas-fired generation (%)	0	16	32	~70
Air Emissions				
SO ₂ (kT)	31.0	26.2	2.87	≤2.21
NO _x (kT)	18.5	14.4	7.79	≤4.91
RSP (kT) [#]	1.5	0.59	0.20	≤0.12

[#]The figure for 2005 refers to Particulates.

Automatic and Open Monitoring

HK Electric has installed a total of six air quality monitoring stations in the south of Hong Kong Island and in Cheung Chau to monitor, round the clock, the impact of Lamma Power Station on the ambient air quality. These stations are fully automatic with broadband connection for data communication and remote control, minimising resources and carbon footprint for site maintenance. The monitoring results are submitted to the Authority and are published on our website.



Drive EVs • Charge Easy

HK Electric supports the widespread adoption of Electric Vehicles (EVs) in Hong Kong because they produce zero emissions on the road and could play an important role in helping improve roadside air quality.

At the end of 2018, 17 EV chargers were available for public-use at our 12 charging stations situated in every district on Hong Kong Island. Subject to traffic conditions, EV drivers can access one of our charging stations within 15 minutes' driving distance of any location on Hong Kong Island, and they will continue to enjoy free EV charging services until the end of 2019.

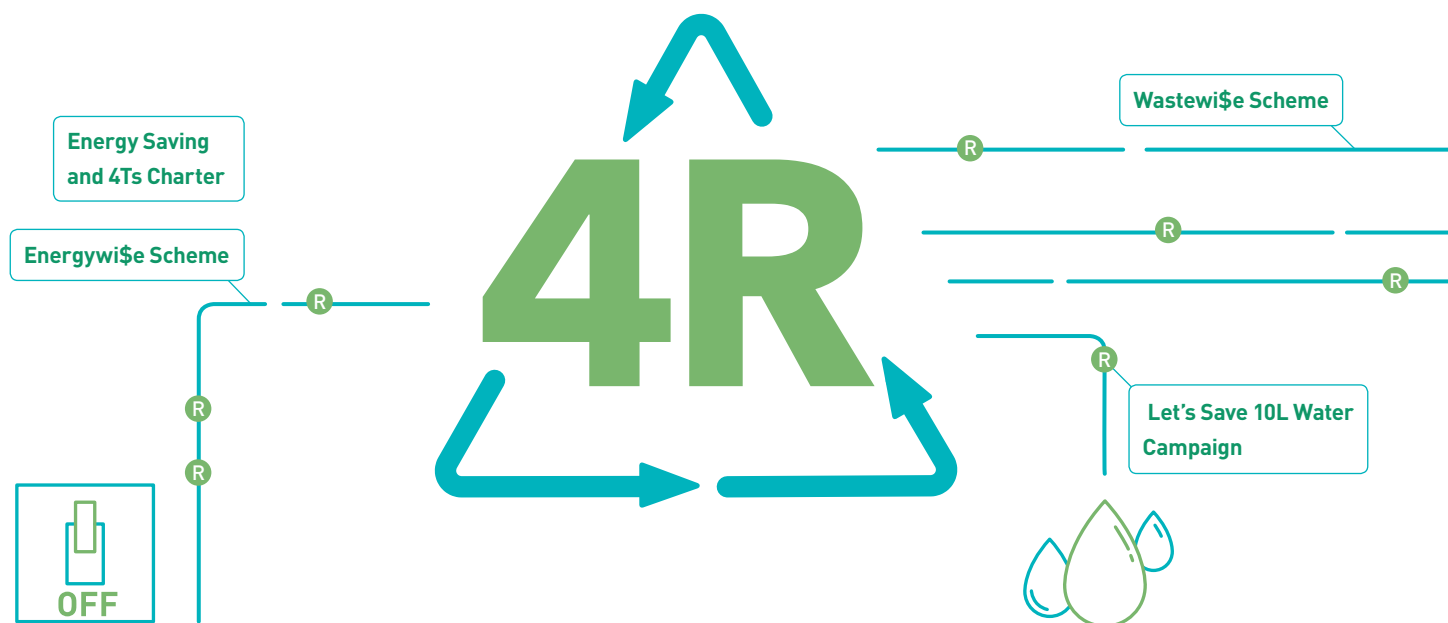
During the year, we handled 329 enquiries from customers and received 319 applications for installation of new EV risers and EV chargers in residential and commercial buildings.

We also owned and operated 132 EVs at the end of 2018 representing more than 43% of our vehicle fleet. Year-on-year comparison of fuel consumption declined by 6.5% in 2018.



RESPONSIBLE RESOURCE MANAGEMENT

In line with our Environmental Policy, HK Electric strives to reduce the environmental impacts of our business by optimising consumption of resources, including energy, and reducing waste. We regularly engage our employees on environmental issues and cultivate a culture of 4R – Reduce, Reuse, Recover and Recycle – throughout our organisation.



Energy Savings

The vast majority of Hong Kong's energy-saving opportunities arise in our built environment. At HK Electric, we have established energy-saving targets for our main buildings to minimise our carbon footprint and we conduct regular carbon and energy audits to evaluate opportunities for further energy savings. As recommended in previous audits, we installed additional energy meters in our main buildings in 2018 to enhance monitoring of energy consumption patterns for fine-tuning our energy-saving plans.

During the year, we removed unnecessary lights in office areas, corridors and stairwells where excessive illumination was identified, and retrofitted LED lamps in our buildings. We also completed upgrading of air-conditioning units in Lamma Power Station and the aged chillers of our Head Office, replacing them with more energy-efficient models.

In 2018, we also reduced distribution losses in our power system by optimising the arrangement of normal open points in our distribution networks.

Water Resources

A water collection system is in operation at Lamma Power Station to collect rainwater and plant processing water for reuse. In 2018, more than 122,000 m³ of water was collected and reused, thereby reducing our consumption of fresh water and discharge of wastewater.

In order to avoid significant impact on natural water bodies, wastewater from Lamma Power Station is properly treated, by removing oil, grease, suspended solids and heavy metals, before subsequently being discharged.

We also pay attention to water saving in the ongoing development of the new L10 and L11 gas-fired plants. Wastewater storage and treatment facilities have been installed to recycle and reuse wastewater produced during bore piling.



Waste Management



Our business produces different forms of waste, all of which we manage and dispose of responsibly according to the requirements in relevant laws and regulations.

Ash and gypsum, two by-products from coal-fired power generation, are the main types of non-hazardous waste generated by our operations at Lamma Power Station. These materials are supplied to third parties as inputs for industrial use. We also generate hazardous wastes in our operations, such as waste oil, which is recycled or disposed of by licensed contractors under a trip-ticket system.

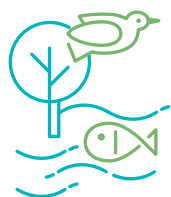
In order to go beyond regulatory compliance in our waste management practices, we work with the Government and NGOs on various recycling initiatives. In particular, we strive to reduce food and plastic wastes from our staff canteens.



Food Wise Charter



Food Waste



Biodiversity

We are strongly committed to conserving the ecological habitat of Lamma Power Station and the surrounding environment. In addition to controlling the impacts of air and noise emissions, excessive illumination and human disturbance on plants and animals, we also have a planting programme in place to promote biodiversity through the cultivation of native tree and shrub species.

Greening
Partner Charter

In the course of developing new projects, we pay close attention to safeguarding biodiversity. In 2018, for example, we completed marine ecological and fisheries baseline reviews to facilitate the conservation of marine ecology in the vicinity of Lamma Power Station Navigation Channel which we will have some improvement works. We will also avoid underwater percussive piling during the peak occurrence season of finless porpoise to minimise impact on them during construction of the forthcoming offshore LNG terminal project.



Red-whiskered Bulbul



March 2018
near New Control Building

In a survey of bird life at Lamma Power Station from December 2017 to June 2018, 16 out of the top 20 most common bird species found in Hong Kong are identified.



Food Wise Culture

Case
Story 2

A typical day at our staff canteen



① **HK\$1 discount for
advance meal booking**



→ ② **Meal preparation
according to demand**



→ ③ **Flexible serving size of the main meal**

Rose Chow, Manager (Administration Services) of HK Electric, is responsible for overseeing the administration in our Head Office, including the staff canteen. Each day, the canteen needs to prepare over 300 meals for our colleagues, and minimising food waste is one of the company's environmental objectives. Let's take a look at how Rose ensures this objective is achieved over the course of a typical day.

Every morning, the canteen operator makes an estimate of the ingredients needed for the preparation of the day's meals. "We have a meal booking system that encourages our colleagues to order their lunches one day in advance, with an HK\$1 discount, and it enables the canteen operator to have a more accurate estimate of ingredients", Rose says.

Lunch is served on a staggered basis starting at noon. Our colleagues serve themselves rice and soup so they can take only the amount they need, and at the service counter, we encourage them to indicate the size of serving they want for the main meal. After finishing the meal, everyone is expected to separate out their leftovers to facilitate food-waste processing.

As Rose explains, "Through this, our colleagues came to realise the amount of food they are discarding, and they may think about taking less next time."

In the afternoon, it's time to clean up. All surplus food in the kitchen is neatly packed for donation to Food Angel, a local NGO who redistributes excess food to people in need.



Rose Chow

Manager
(Administration Services)

“We hope that through our food wise initiatives, we can influence our colleagues to implement the reduction-at-source principle and understand its importance.”



→ ④ Separating out leftovers for further treatment



→ ⑤ Donating surplus food to Food Angel



Meanwhile, the canteen operator weighs the amount of food waste that has been collected with a view to monitoring, better controlling and reducing food waste. “After installing a new model of food-waste decomposer in April 2018,” Rose says, “we can turn the food waste into fertiliser even more efficiently .”

HK Electric signed the Food Wise Charter in 2013 and keeps promoting food-wise culture among employees. In fact, even though the number of daily meals prepared has remained about the same, the amount of daily food waste generated by our staff canteen in 2018 has decreased by more than 70% since 2013.



Food Wise Recipe Sharing

There is a Food Wise Recipe Sharing section on the company's intranet portal where recipes specially designed to make good use of food trimmings are shared. We have received enquiries from colleagues, saying that their wives wish to know more about this cooking style. And we have received very creative food-wise recipes from employees too.



Outstanding Happy Green Ambassadors job-shadow an EV technician to learn more about EV operations.



Green Energy Dreams Come True competition lets student realise their STEAM dreams.



EDUCATION AND AWARENESS

We believe that greater public education, awareness and participation are essential for Hong Kong to achieve its environmental objectives.

Smart Power Campaign

For many years, we have promoted energy efficiency & conservation (EE&C), RE and low-carbon lifestyle choices to the general public, particularly young people, under the banner of our Smart Power Campaign (renamed Happy Green Campaign in 2019).

In 2018, the focus of the campaign was to groom and inspire young people to become green Key Opinion Leaders (KOLs); namely, identifying and supporting young leaders to advocate green lifestyle choices to their peers by sharing ideas and experiences. We recruited more than 60 secondary school students to become green KOLs under our Happy Green Ambassador programme.

During the year, our Happy Green Schools network continued to expand, with more than 420 schools participating in various Other Learning Experience (OLE) activities such as visits to HK Electric's facilities, eco-tours, school talks and training on operating green campus TV programmes.

We also continued to implement our Green Energy Dreams Come True programme, which is an annual competition for teams from local secondary schools. The 2018 competition focused on Science, Technology, Engineering, Arts and Mathematics (STEAM). Thirteen team proposals were shortlisted covering topics such as RE, EE&C and sustainability. The teams received seed money of up to HK\$50,000 each to implement their projects along with technical mentorship from HK Electric engineers.

Promoting Eco-Heritage

2018 marked the 13th year of Green Hong Kong Green (GHKG), a programme co-organised by HK Electric and a local green group Conservancy Association that features guided tours on Hong Kong and Lamma islands. The programme aims to foster public awareness of and appreciation for Hong Kong's eco-heritage resources, such as flora and fauna in our country parks and along our coastlines, as well as rural and urban landmarks that have environmental, cultural or historical value for our community and future generations.



Our In-house Campaign to Support United Nations' World Environment Day 2018



Low-carbon Pledges

Employees and their families pledged to "go green" around the four basic necessities of life: apparel, diet, living and transport



Energy Efficiency Competition

Our major office premises competed to implement the most effective energy-saving measures over the summer



Low-carbon Recipe Design Contest

Employees submitted and voted on recipes for their favourite healthy, less-meat meals



Sharing & Caring

Employees donated used clothes and books to charity

During the year, 1,160 participants took part in 92 eco-tours. Particularly well received were new thematic tours conducted by guest speakers. These included two Family Tours to Aberdeen Country Park, a Digital Photography Tour to Lung Fu Shan Country Park and the Waterworks Heritage Tour to Tai Tam Country Park, which help revitalise the existing routes with new angles and points of interest.

Support for Environmental Campaigns

HK Electric supports a range of environmental campaigns organised by green groups and the Government. We strive to raise environmental awareness among our employees and encourage them to support green initiatives.



Thematic tours on digital photography allow participants to learn ecology and photography in one go.



HK Electric's exhibit featuring virtual reality games to promote energy saving and RE applications at Eco Expo 2018.



Never too old

Case
Story 3

to be “Smart”

“At my age, I may not benefit much from better environmental protection myself, but I am sure we can help the next and future generations by making our planet more sustainable.”



Paul Tsoi

Smart Power
Ambassador

Age is never a hurdle for learning new skills and giving back to society. With this belief in mind, 54 elder students from the U3A Network, co-founded by HK Electric and the Hong Kong Council of Social Services to promote lifelong learning, completed their training and examinations in 2018 to become Smart Power Ambassadors, sharing what they learned in saving the planet with those around them.

Paul Tsoi is a local retiree in his 60's and an active member of the Tung Wah Group Hospitals Wilson T.S. Wang District Elderly Community Centre in Sha Tin. “Before I joined the Smart Power Ambassadors Training Programme,” he says, “I only knew little about environmental protection. But now I feel the urgency for everyone to help save the planet.”

Low-carbon lifestyle tips from Paul:



Adjusting the
angle of our
electric fans



Riding more
public transport





Through a combination of workshops and on-site learning, Paul and the other Ambassadors have gained valuable knowledge in global warming, energy efficiency and low-carbon living, as well as promotion and presentation skills for community outreach. "I was most impressed by the visit to the Zero Carbon Building," says Paul "where I learned that small changes like adjusting the angle of our electric fans can help conserve energy. If everyone paid attention to small things like this in their daily lives, then together we could make a big impact on protecting the environment."

Since becoming a Smart Power Ambassador, Paul has taken his first steps towards a low-carbon lifestyle by driving his car less and riding more public transport. He is also inspiring others to do the same, such as volunteering to spread green messages at our Smart Power roving exhibition in Shau Kei Wan. He also took proactive moves to interview and learn from building owners who had implemented an energy saving project under HK Electric's Smart Power Fund.

Paul is looking forward to leading more community outreach activities through his elderly centre and taking part in further training to become a green docent at the new Smart Power Gallery.



Smart Power Ambassador Training Programme

Building on the success of an initiative to train secondary school students, the Smart Power Ambassadors Training Programme was launched in 2018, targeting mature students from the U3A network. Training covered a range of topics from climate change, energy efficiency and renewable energy to waste reduction, recycling and trees conservation.