

Sharing the Same Planet

We

Address
Climate
Change

Ensure
Cleaner Air
for All

Conserve
Natural
Resources

Encourage
Smart Use
of Energy

Advocate
a Green
Lifestyle

>33%

electricity output
from natural gas

>102,000m³
water reused

>85,000

participants learned
about energy saving under
Smart Power Campaign



At HK Electric, we understand that as a major public utility we have a responsibility to protect and preserve the environment. Accordingly, we are investing substantial resources to minimise the impacts of our operations.

Our commitment to protecting the environment and supporting sustainable development is articulated in our Environmental Policy, the implementation of which is overseen by our Environment Committee.

In order to integrate environmental considerations into our business, we have put in place comprehensive environmental and energy management systems conforming to ISO 14001 and ISO 50001 standards. We also have annual environmental management programmes, with measurable targets, that help us achieve continuous improvement in our environmental performance.

Green education is a primary focus of our efforts to raise awareness of environmental issues among our customers and the public, especially with regard to the smart use of energy. Moreover, we provide funding as well as a variety of services to help customers enhance energy efficiency and conservation.

Shared Concerns

Climate Change | Air Quality

- Climate change is a global concern, and everyone must take a proactive approach to combat it.
- As clean air is essential to maintaining good health, the power sector, including HK Electric, has a particular responsibility to reduce its emissions.
- It is challenging for HK Electric to continually reduce its emissions given the substantial cuts it has already achieved.
- Other challenges include the high cost and long lead time needed to develop low-carbon power plants and the uncertainties of the future electricity market.

Natural Resources

- It is vital to preserve limited natural resources and protect the environment for future generations.
- HK Electric must do more to minimise its use of natural resources, including fuel and water, as well as reducing the waste and by-products it generates, such as waste water, waste oil, ash and gypsum.
- As its facilities continue to age, HK Electric has to invest in rejuvenating these assets.

Energy Use

- Demand-side management is an effective way of minimising the environmental impacts associated with energy use.
- HK Electric is committed to promoting the smart use of electricity as this initiative will create long-term environmental benefits for the sustainable development of our society.

Green Lifestyle

- Raising community awareness is essential to sustainable development.
- HK Electric recognises its responsibility in promoting an eco-friendly, low-carbon lifestyle among its customers and the general public.
- Instigating behavioural change calls for innovative and inspiring programmes.

Address Climate Change

We share the international consensus on the urgent need to contain the risk of global warming.

Wherever possible, we choose low-carbon methods of power generation – particularly natural gas and renewable energy (RE) – that contribute to the global efforts of carbon reduction. Energy saving practices have also been adopted at every level of our operations in order to minimise our carbon footprint.

Adapting to climate change is also an integral part of our corporate management. We have put in place measures to maintain our operations and services under extreme weather conditions, such as typhoons, heavy rainstorms and severe flooding.

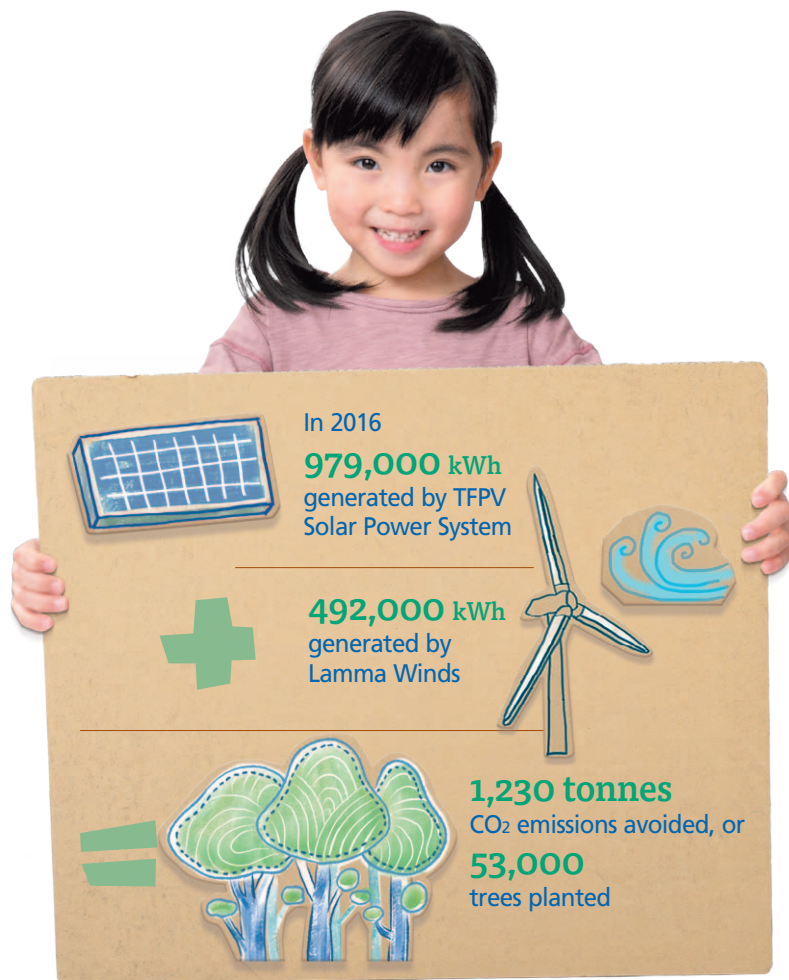
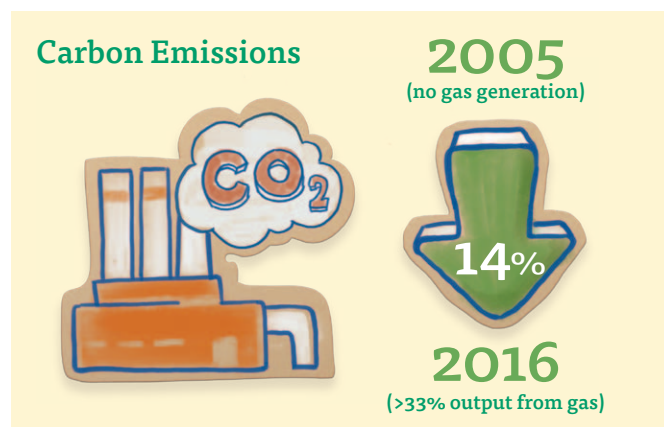
The Low-carbon Alternative: Natural Gas

In 2016, the power we generated from natural gas comprised over 33% of our total output. To further reduce carbon emissions, we are now working to increase the use of natural gas in line with the results of the Government's public consultation on Hong Kong's future fuel mix conducted in 2015.

After receiving the Government's approval for our new L10 gas-fired generating unit in November 2015, we began piling works in early 2016 and moved on to erecting the civil superstructure at the year end.

In September 2016, the Government gave us the green light for the construction of another gas-fired generating unit, L11. This unit will replace an ageing, less efficient gas-fired plant scheduled to retire in 2022.

Both L10 and L11 will feature advanced technology that will reduce carbon emissions by about 25% compared with the gas-fired plant due to retire. After the commissioning of L10 and L11 in 2020 and 2022 respectively, the electricity we produce through gas-fired generation will increase to about 50% and 55%, contributing to achieving the Government's carbon intensity reduction target for the city.



In another important development during the year, we partnered with CLP Power Hong Kong Limited to conduct an Environmental Impact Assessment for the construction of an offshore liquefied natural gas (LNG) terminal. Using floating storage and regasification unit technology, the terminal will give us direct access to the international gas market and greater bargaining power in ensuring a secure and competitive long-term gas supply for Hong Kong.

Power from the Sun and Wind

In addition to natural gas, we continue to harness RE that eliminate all emissions.

One of these efforts is wind power generated by our Lamma Winds facility – an 800 kW wind turbine and the first and only commercial-scale set-up in Hong Kong – on Lamma Island. Another is solar energy through our 1 MW TFPV Solar Power System at Lamma Power Station. Both facilities demonstrate the potential of large-scale RE developments in Hong Kong.

Energy Saving in our Buildings

Since buildings account for a significant portion of electricity consumption in Hong Kong, we continue to follow up on the energy saving opportunities identified in our latest building energy audits. We also conduct annual carbon audits to find additional opportunities for reducing greenhouse gas emissions of our main office buildings.

In the summer of 2016, HK Electric once again supported the Government's Energy Saving Charter on Indoor Temperature by maintaining temperatures at 24-26°C in our buildings.

To improve the energy efficiency and reliability of the air-conditioning systems at our Electric Centre and Electric Tower, we completed the replacement of the buildings' aged chillers in 2016. We also started similar chiller replacement in our Hongkong Electric Centre.

To reduce Lamma Power Station's carbon footprint, we retrofitted buildings there with 93 LED lights, saving more than 14,000 kWh of electricity annually. We also upgraded the heating, ventilation and air-conditioning systems of some of the main buildings.

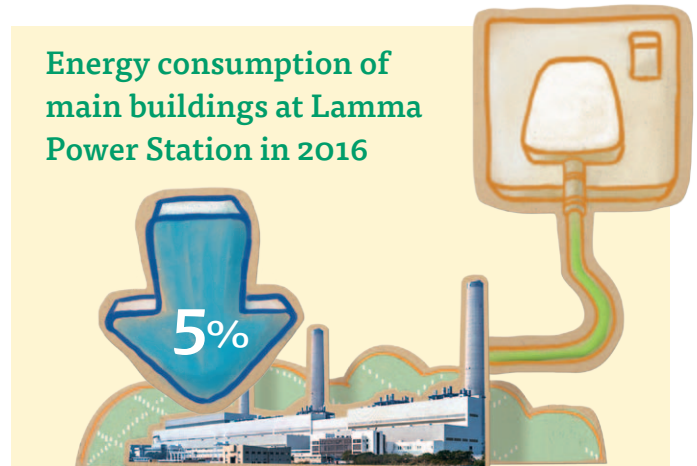
In February 2016, our new IT Service Operations Centre at Electric Tower was awarded LEED Gold Rating Certification by the U.S. Green Building Council for its design, construction, operation and maintenance.

In recognition of our energy saving efforts, we received Energywise and Carbon Reduction certificates under the Hong Kong Green Organisation Certification Scheme.



HK Electric supports the Government's External Lighting Charter by switching off external lighting of its premises at a preset time.

Energy consumption of main buildings at Lamma Power Station in 2016



Adapting to Climate Change

HK Electric has been preparing for adverse weather conditions by assessing risks, adopting resilient designs, conducting operational reviews and taking the appropriate enhancement measures.

In our transmission network, we mainly use underground and submarine cables, which make our power system less susceptible to lightning and inclement weather. Similarly, we have equipped our power plant and coastal transmission and distribution stations with anti-flooding systems.

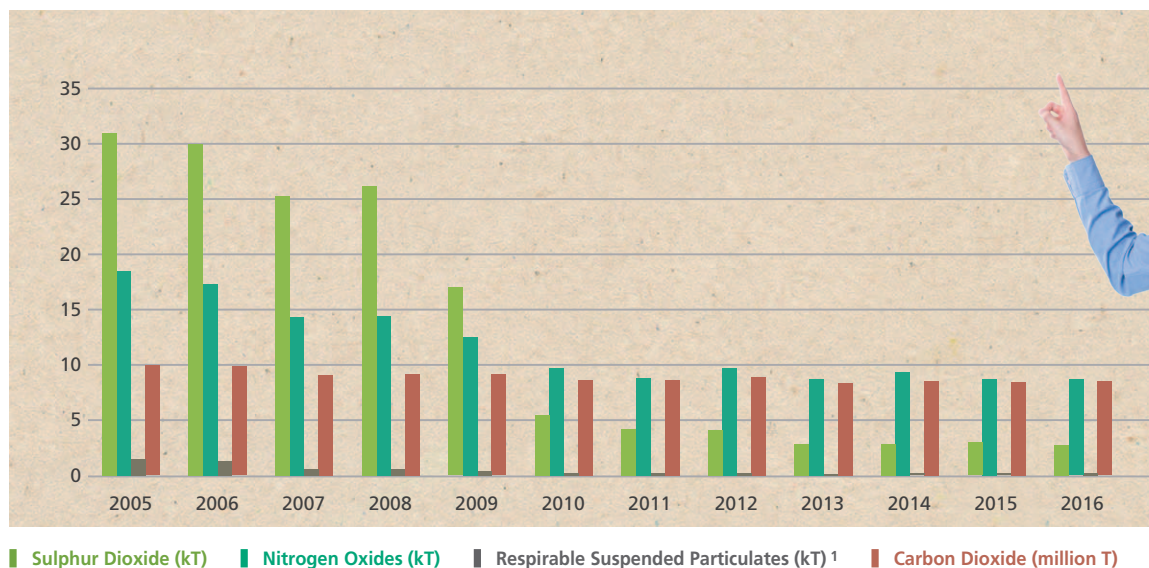


Cable tunnels in our electricity network make it less susceptible to extreme weather.

As extreme weather may affect our fuel supply, we closely monitor the fuel supply chain and procure fuel from various sources around the world. The offshore LNG terminal we are proposing will help further diversify our fuel procurement.

Since high ambient temperatures could increase the possibility of failure of our power plant components and electricity network, we monitor critical plant components and important cable sections, and identify performance enhancement measures. In 2016, we continued to convert our 11 kV open-ring distribution feeders to 22 kV closed-ring feeders to enhance reliability and increase cable capacity.

Emissions from Lamma Power Station



¹ The figures for 2007 to 2016 refer to respirable suspended particulates while the figures for 2005 and 2006 refer to particulates.



Ensure Cleaner Air for All

Our initiatives for harnessing RE and increasing the use of natural gas in our fuel mix will not only reduce our carbon emissions but also emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and respirable suspended particulates (RSP), thereby contributing to better air quality in Hong Kong and the Pearl River Delta region.

In 2016, we continued to use low-sulphur coals in order to reduce our SO₂ emissions. As low-sulphur coals usually have less ash content, it will also lower particulates emissions. In our 2016 coal purchasing portfolio, one-third were low-sulphur coals.

By using RE and cleaner fuels as well as other emission reduction facilities such as flue gas desulphurisation plants, low-nitrogen-oxide burner systems and electrostatic precipitators, Lamma Power Station has been able to meet the emission allowances set by the Government.

During the year, we worked closely with the Government to further reduce the power sector's emissions and agreed to adopt a set of tighter emission allowances for 2021 onwards as compared with 2020 levels. Where practicable, we will adopt advanced emission reduction technology such as the Selective Catalytic Reduction system in our new L10 and L11 gas-fired units. The application of this system will reduce the NO_x emissions of each new unit by 90% as compared with a conventional gas-fired plant. It is expected that by 2022 when both new units are in operation, the three types of air emissions will drop a substantial 75-90% as compared with the 2005 levels.

Conserve Natural Resources

As natural resources are limited, environmental conservation will remain a significant issue for both the global community and HK Electric.

Developing a 4R Culture

In line with our Environmental Policy, we will continue to minimise our consumption of resources and reduce wastage according to the 4R principle – Reduce, Reuse, Recover and Recycle.

One example is the system we installed at Lamma Power Station for collecting rain water and plant processing water for reuse. In 2016, we collected more than 102,000 m³ of water for reuse, thereby reducing the corresponding amount of town water used by the Station and the same amount of waste water discharge.

Construction of a new demineralisation plant at Lamma Power Station began in October 2016 and is scheduled for completion by the end of 2017. It will incorporate reverse osmosis and electro-deionisation technology to reduce the amount of chemicals needed to demineralise water during operation.

We also follow best practicable waste management practices in order to minimise our impacts on the environment. Ash and gypsum are power generation by-products (also our major non-hazardous wastes) and are collected for industrial use. Hazardous wastes such as waste oil are recycled or disposed of through licensed collectors and facilities under a trip-ticket system.

To address the food waste problem in Hong Kong, we continued to reduce food waste at source in our canteens by adopting an advance booking system for meals and donating surplus food to Food Angel. We also encouraged waste separation and the use of food waste eliminators.

During the year, we received Wastewi\$e certificates and food waste management awards from the Government and NGOs recognising our 4R efforts.

To encourage more customers to go green, we launched an incentive scheme in 2016 encouraging e-bill registrations and e-payments. Customers using e-bills will also receive a QR code on their smartphones for making payments at convenience stores.

Support for Biodiversity and Other Green Initiatives

At Lamma Power Station, we continued our efforts in conserving the existing ecological habitat and planted diverse species of native trees and shrubs to attract local wildlife. We also took biodiversity into consideration in our development projects, such as the forthcoming improvement of the Lamma Power Station Navigation Channel.

In 2016, our employees and their families participated in various green initiatives, including the United Nations' World Environment Day. HK Electric supported this initiative with a one-month campaign asking colleagues to go green around the four basic necessities of life: apparel, diet, living and transport. More than 1,000 colleagues participated in the event. A new element of the year's campaign was a Good Green Practice competition to enhance environmental awareness and sharing of green practices among employees.

During the year, we continued to extend our support to local green groups on their green activities including WWF's Earth Hour, World Green Organisation's Green Heroes and Green Walk, The Conservancy Association's Eco Rangers, Friends of the Earth (HK)'s No Car Day and others.



HK Electric volunteers clear litter dumped along the hiking routes and promote the "Bring the Litter Home" message at Green Power's "Clean Up the World in Hong Kong" event.

Encourage Smart Use of Energy

Recognising that energy efficiency is a key element of sustainable development, HK Electric advocates the smart use of energy through green educational programmes and support for customers wishing to enhance the energy efficiency of their buildings.

Energy Efficiency Campaigns

Every year, we set aside approximately \$2.5 million in an education fund for energy efficiency and conservation awareness programmes for the public, particularly the younger generation.

The year-long Smart Power Campaign promotes energy efficiency and a low-carbon lifestyle through a wide array of programmes and activities. Continuing with the theme of "Be Green, Be Happy" in 2016, the Campaign attracted more than 85,000 participants in various activities.



The winning team shares how their green energy dreams come true.

For the year's Green Energy Dreams Come True competition, 12 teams were selected and granted funding of up to \$50,000 each to promote energy efficiency or RE. In addition to monetary support, our young engineers provided technical advice to the teams on how to implement their ideas. A final presentation was conducted in December. The team from Cotton Spinners Association Secondary School was named champion for their innovative idea of turning recycled materials into toys and gadgets. Other winning entries included a proposal for a hydroponic farm and an energy efficiency monitoring and promotion scheme.



Happy Green Community Ambassadors learn more about HK Electric's solar power system.

Under our ongoing Happy Green Schools label scheme, we organised school talks on energy conservation, visits to our Lamma Power Station, Lamma Winds and Smart Power Centre, eco-heritage tours and "Green Campus TV" training classes. During the year, we expanded the number of Happy Green Schools to about 350.

In 2016, we recruited about 30 secondary school students as Happy Green Community Ambassadors and invited them to join a one-day training camp. The training included a visit to Lamma Power Station to appreciate the green measures of our power generation, as well as tips on presentation skills. The students then acted as "tour guides" at roving exhibitions to introduce HK Electric's green journey and offer advice on a low-carbon lifestyle. Three outstanding ambassadors were selected to meet our management and to job shadow our environmental engineers.

With the help of the student ambassadors, the exhibitions attracted around 7,000 visitors at various locations across the territory.

We also began converting our former pay-in centre in Sheung Wan into a display centre showcasing the latest energy-efficient technology and electric appliances.

Energy Conservation

During the year, HK Electric once again provided a free energy audit service to non-residential customers, and more than 50 audits were carried out. To make this initiative more practicable, we provide interest-subsidised loans under the Energy Efficiency Loan Scheme to non-residential customers implementing energy saving initiatives identified in the energy audits.

Through our Smart Power Fund, we subsidise owners of residential buildings to improve the energy performance of their building service installations for communal use on a 50/50 matching basis. In 2016, we approved funding of about \$1.6 million for eight applications, bringing the total number of successful applications to 29 since the Fund's inception in 2014. Approved projects included the installation of more energy-efficient lift driving systems, public lighting and air-conditioners. From 2017, HK Electric will double the upper limit of the subsidies to \$400,000 and, for cases demonstrating exceptional improvements in energy efficiency, up to \$500,000.

We also provide our customers with consumption and benchmark information on their electricity bills to help them understand their power usage. For our commercial customers, we offer a load profile enquiry service to help manage energy use more efficiently.

On our corporate website, we offer two online tools – Electricity@Home and Electricity@Office – that allow customers to conduct virtual energy surveys, with details on power used for home appliances, energy efficiency, power quality and tariffs charged. We also launched a new version of our carbon calculator to assist customers in finding out the carbon emissions associated with their energy consumption.

Furthermore, we explored the adoption of an Advanced Metering Infrastructure and undertook a trial of Smart Meter Data Analytics. The results of this pilot programme indicated that features such as load patterns, neighbourhood comparisons, high consumption alerts and bill projections can provide a better picture of customers' energy consumption patterns and will help us formulate a strategy for future development.



Our engineer helps non-residential customers identify energy saving opportunities.

Advocate a Green Lifestyle

An effective way to enhance environmental awareness among members of the public is to allow them to appreciate the benefits of a modern and eco-friendly lifestyle.



The Green Hong Kong Green programme is named an Outstanding Partnership Project by The Hong Kong Council of Social Service.

A Showcase of our Eco-heritage

To raise awareness of the ecological value of Hong Kong and Lamma Islands, HK Electric and The Conservancy Association joined hands to implement the Green Hong Kong Green (GHKG) programme.

During the year, training and refresher courses were held for eco-leaders to improve their skills in leading tours and educating the public on eco-tourism. Throughout 2016, 111 eco-tours for about 1,400 participants were arranged on the eight eco-heritage routes of Hong Kong and Lamma Islands. Most popular were the night safari tours available only in summer, during which participants enjoyed close encounters with insects and amphibious animals rarely seen during daylight hours.

The highlight of the year was the fourth GHKG Eco-tour Festival held on 20 November 2016 at Belcher Bay Park, in which about 1,100 people took part in a variety of fun and educational activities under the theme of nature conservation. This was the first time the Festival was held in the urban area, as we reminded the public not to forget the hidden eco-heritage treasures there, and to appreciate and preserve them.

We also make good use of social media to promote the project. Our GHKG App, featuring the eight eco-heritage routes, was made available for free download. By the end of 2016, the App had been downloaded 25,926 times, while 8,370 fans joined the programme's Facebook group.

Through this project, we hope that people will visit Hong Kong's eco-heritage sites more often, appreciate the beauty of these natural attractions and feel a greater sense of pride in their city.

Promoting Electric Living

Switching from gas to electrical appliances helps save energy, improve indoor environments and reduce fire hazards. To promote commercial electric kitchens, we worked with the International Association of Gourmet Master Chefs & Hospitality Executives to arrange a workshop on 24 August 2016 at our Smart Commercial Kitchen, ahead of the Gourmet Worldwide Chefs Competition. More than 40 local and international chefs who had entered the competition attended the workshop.

In another initiative, we supported the Eco-Chef Training programme, which recruits and trains the underprivileged to help them return to the labour market. This programme helps ease the shortage of chefs in the Hong Kong catering industry as well.

We also supported the International Kam Cha Competition 2016, organised by the Association of Coffee and Tea of Hong Kong. Equipment such as electric hot-tops and water boilers were used to prepare Hong Kong-style milk tea in the competition.

In addition, we helped organise a joint promotion for electric cooking in the catering industry together with the OpenRice website and Facebook. Residential customers could sample food from the environmentally friendly electric kitchen and enjoy discounts at participating shops.

During the year, we began converting the Heat Pump & Commercial Equipment Display Area at our Electric Centre into an Automated Commercial Kitchen. This new display centre, opened in January 2017, showcases the latest automated kitchen designs to address the manpower shortage in the catering industry, as well as to save labour costs, improve work safety and prepare food with consistent quality.



Our newly opened Automated Commercial Kitchen helps promote the benefits of electric cooking.

At our Home Management Centre (HMC), we conducted 943 cooking and special interest courses for 10,108 students to promote electric living. We also ran our annual Hong Kong Secondary School Cooking Competition and hosted a cookery workshop for visually-impaired students at Ebenezer School. A total of seven school visits to the HMC were arranged during the year.

In addition, we worked with organisations and media partners to promote electric cooking among the general public. They included the Hong Kong Federation of Youth Groups, Evangelical Lutheran Church Social Service, Sing Tao Ohpama.com and Ms. Bertha Lee, a cook specialising in dried seafood.

Over the years, the HMC has served its purposes well in enhancing the taste and quality of life of the local community. However, with more and more similar courses available on the market, we decided, after thorough consideration, to terminate the operation of the HMC at the end of 2016 in order to make better use of our resources.



Secretary for the Environment, Mr. Wong Kam-sing (right), and HK Electric's Managing Director, Mr. Wan Chi-tin, demonstrate the use of smartphone apps to power up EVs.

The Future of Transport: Electric Vehicles

EVs are growing in popularity as an environmentally friendly means of transport. At HK Electric, we support the use of EVs as these vehicles help improve roadside air quality. At the end of 2016, we had a total of 107 EVs, representing over 37% of our vehicle fleet.

Making charging facilities available is the key to encouraging more people to drive EVs, we therefore provide support to parties interested in setting up charging installations. We also enhanced our Customer Information System to support billing for individual EV chargers and continued to offer six EV standard charging stations and four EV quick charging stations at various locations on

Hong Kong Island. These are open to the public free of charge – a service we have extended to the end of 2017. In December 2016, we upgraded two of the six standard charging stations to support medium charging. We are now working on expanding our charging network with three new multi-standard quick charging stations and upgrading the other existing standard charging stations to support AC quick charging for reduced charging times.

On 28 September 2016, we organised a seminar – Smart EV • Smart Charging – as well as an exhibition on EVs and EV supply equipment, which attracted about 200 participants from owners' corporations, management companies of office buildings and shopping malls, as well as other stakeholders. During the seminar, HK Electric introduced three new initiatives to enhance our EV charging support service. These included a Smart EV Charge Easy Online Advisor tool for creating preliminary proposals on the installation of EV charging facilities, a system for showing the occupancy status of HK Electric's quick charging stations, and a trial booking system for quick charging facilities through our Low Carbon App.

In 2016, our EV service team made site visits and provided technical advice on the installation of EV charging facilities to over 70 residential and commercial buildings in our service territory.

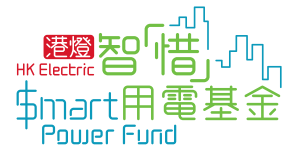
To demonstrate the speed and performance of zero-emission EVs, we supported the first-ever Formula-E race held in Hong Kong. As the event's official energy partner, HK Electric provided a reliable energy supply and electricity-related technical support, as well as a free charging service to the EVs in the celebrity race.



Our EV mini-website is revamped to provide information on smart charging systems.

Case Story

Brighter Ways to Save Energy



In 2013, Yick Fat Building in Quarry Bay was featured in the blockbuster movie *Transformers: Age of Extinction*.

But even more appealing than the bright lights of Hollywood for the building's owners was the opportunity to save energy – and money – with a new lighting system in the common areas of the 44-year-old building.

Thanks to the financial support from HK Electric's Smart Power Fund, they were able to replace more than 500 lights with modern T5 fluorescent tubes.

Launched in 2014, the Smart Power Fund was set up to subsidise owners of residential buildings on a matching basis so they could carry out energy efficiency enhancement projects.

Chairman of the Incorporated Committee of Yick Fat Building, Ms. Annie Lee said that the new system had increased the brightness inside the building even though fewer tubes were used.

"It is more environmentally friendly and more energy-efficient," said Ms. Lee. "The residents here also welcome the improvement, especially the elderly. With the matching funds from HK Electric, each resident could pay less. And we found that the power consumption from lighting has been reduced by around 40%."



The Smart Power Fund helps brighten Yick Fat Building more efficiently.



Inspection of the lift upgrading works at Tai On Court.

Another successful case is Tai On Court in Shau Kei Wan, which has two lifts that date back to 1982. The lifts were replaced, with the upgraded energy saving features, including new motors and a control system, partially subsidised by the Smart Power Fund.

The Incorporated Owners originally learned about the Fund through an environmental consultant. Upon approval of the funding, the project kicked off in December 2015 and was completed in May 2016. With HK Electric's support, the building owners were able to enjoy savings on the project cost as well as the reduced power consumption charges of up to 30% due to the enhancement.

Following these successes, HK Electric has relaxed the upper limit of the subsidy granted under the Smart Power Fund to encourage more energy efficiency enhancement initiatives in the community.



HK Electric's staff introduces the Fund at a property management training class.