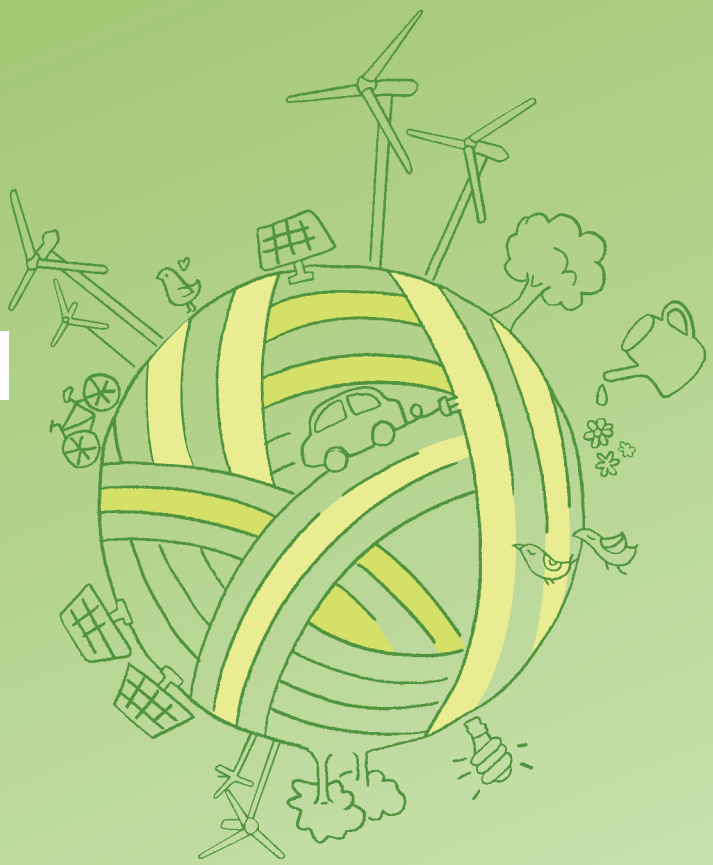
Ensuring Sustainable Energy for All

from Supply to Demand



ISSUES:

Air Quality and Climate Change	Environmental Conservation	Supply Reliability and Sustainability	Demand Side Management

The fundamental role of any power utility is to guarantee the availability and reliability of electricity supply. Robust management is reflected in the form of excellent electricity supply reliability to help support Hong Kong's economic development and to sustain its position as one of the world's key trade and financial centres. Balancing this, and of equal importance, is the impact that the supply of energy has on our environment.

Our management approach strives to balance out the above issues and is manifested in the various policies and management systems we have implemented to drive our business forward, namely our corporate environmental and quality policies, and our environmental management, quality management and assets management systems. We also have an Environment Committee in place to oversee the Company's adherence to the environmental policy.

Air Quality and Climate Change

STAKEHOLDER EXPECTATIONS

Ensuring clean air and blue skies has become one of the most important issues for the Hong Kong community. The risks posed by negative changes to our air quality and climate have potential impact on our lifestyles and Hong Kong's reputation as Asia's world city.

Adopting low carbon fuel mix, strengthening emission control and enhancing energy efficiency have environmental benefits on local air quality as well as global climate change and are the responsibility of the whole community. Undoubtedly, a key imperative that is driving community sentiment is the demand for greater use of cleaner fuel and renewable energy, and a general move towards a low carbon future.

RISKS AND CHALLENGES

Rising Expectations on Emission Reduction

The energy sector is considered to be one of the major emitters of greenhouse gases and other emissions that have impacts on air quality. As a power utility company in Hong Kong, the business nature of HK Electric requires the burning of fuel which is inevitably carbon dioxide (CO_2) intensive. The challenges are for the Company to continue to take significant steps to reduce emissions. These include replacing the use of traditional coal with natural gas and renewable energy in order to reduce emissions of not only CO_2, but also respirable suspended particulates (RSP), sulphur dioxide (SO_2) and nitrogen oxides (NOx). Also, it is a challenging opportunity for the Company to explore renewable, and potentially more expensive, energy sources.

The challenge is further heightened by the rising expectations of stakeholders and the changing regulatory environment in Hong Kong where the HKSAR Government has been gradually tightening the emission allowances on our generation facilities since 2006, in particular after the implementation of the new air quality objectives set with reference to the World Health Organisation's guidelines.

Policy Uncertainty

In the aftermath of the Fukushima incident in 2011, many countries have been reviewing the safety of using nuclear power. Similarly, the HKSAR Government will further revisit the fuel mix proposed in 2010, taking into account the views of the local community and developments in mainland China's nuclear power safety policies. It will strive to strike a balance among the four competing energy policy objectives of safety, reliability, affordability and environmental protection. This poses uncertainty for the Company in respect of the need for importing nuclear power and developing infrastructures to meet the new fuel mix decision or developing other alternative low carbon generation facilities, all of which require adequate lead time for planning and construction.

ACTIONS AND ACHIEVEMENTS

Harnessing More Renewable Energy

Power Assets is proud to be pioneering the development and utilisation of renewable energy (RE) in Hong Kong. We have developed and are now operating the first commercial scale grid-connected wind turbine, namely Lamma Winds, and the largest thin film photovoltaic (TFPV) solar power system in the city. We have also expanded the capacity of this solar power system from 550 kW initially to nearly 1 MW.

In 2012

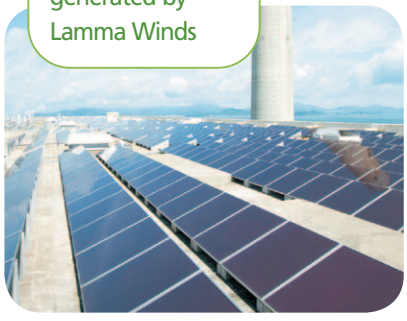
854 MWh generated by TFPV solar system

+

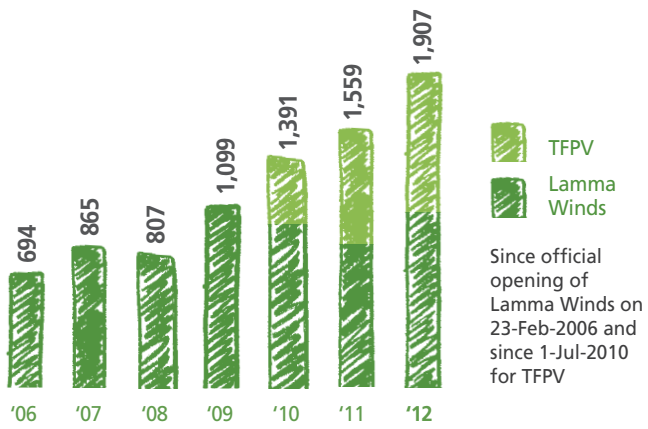
1,053 MWh generated by Lamma Winds

=

1,600 tonnes CO_2 emission avoided, equivalent to about **69,000** trees planted



Renewable Energy Generation (MWh)



We are looking at further ways of using RE. Significant progress continues to be made at our planned 100 MW offshore wind farm located off Lamma Island, which is now scheduled for completion by the end of 2017. It is expected to generate about 175 GWh of energy annually, enough for 50,000 families. This will offset 150,000 tonnes of CO_2 emission and the burning of 62,000 tonnes of coal. To prepare for this, we commissioned a wind monitoring station in 2012 at the proposed offshore wind farm site to collect meteorological and oceanographic data.

It is the first offshore wind farm project in Asia to adopt LiDAR (Light Detection and Ranging) technology on a wind monitoring station. The monitoring station is powered by three small wind turbines and 14 solar PV panels.

The LiDAR technology reduced the required height of the wind monitoring station and in turn reduced the construction cost. Since March 2012, promising wind data has been collected, indicating that the proposed site has adequate wind resources for the development to proceed.

In line with our vision to excel in the power business in global markets, Power Assets is committed to leveraging its expertise and capabilities in RE where feasible. During the year, we expanded into the RE power transmission business in Australia by investing in a power transmission link that will connect a 130 MW wind farm in Victoria to the power grid. The Australian Government is committed to ensuring that the equivalent of at least 20% of Australia's electricity comes from renewable sources by 2020. Looking ahead, we shall continue to seek similar opportunities in global markets.

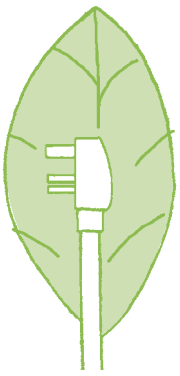
Increasing Use of High Quality Fuels

Recognising the risks posed by negative changes to air quality and climate, HK Electric is adopting an environmental policy which ensures we generate electricity efficiently. We use natural gas and cleaner coal to reduce emissions.

In 2012, we maintained a significant portion of natural gas in our fuel mix, with

over 30%

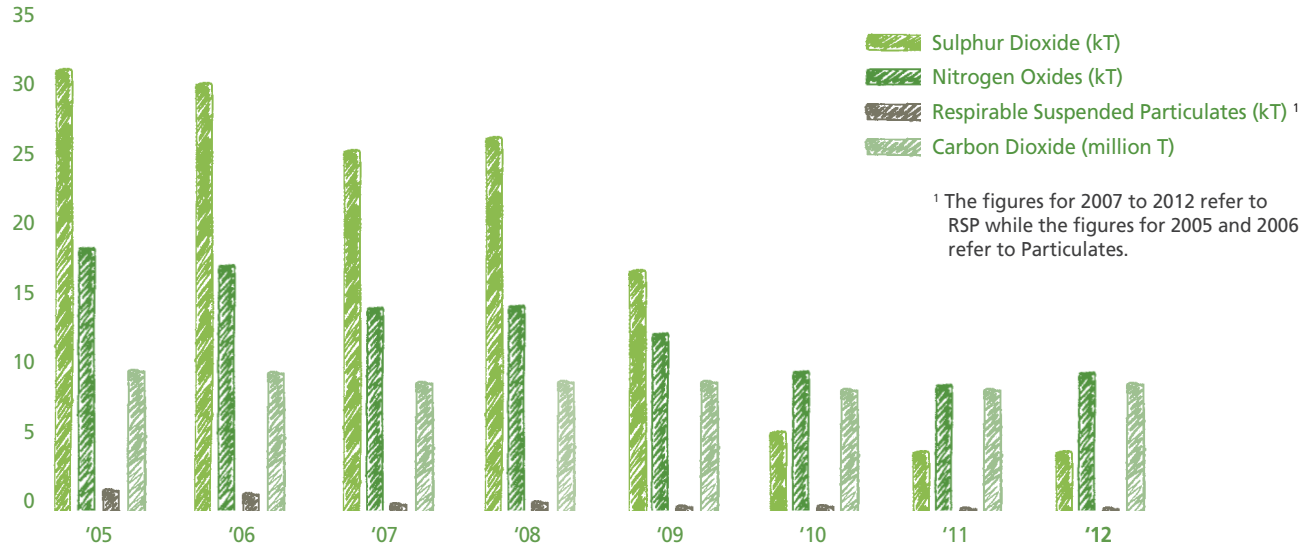
of our power output derived from natural gas.



We also successfully modified five main coal-fired generation units at our Lamma Power Station to handle a wider range of coal types including low calorific value coal with low sulphur content. Consequently, more low sulphur coal was procured and used in 2012 to ensure minimal emissions. Besides the lower sulphur content, the overall ash content from the coal we purchased in 2012 was also reduced, leading to a lower overall particulate emission. Moreover, subsequent to the completion of the modification of the six older coal-fired units to allow the use of ultra low sulphur diesel (ULSD), we utilised ULSD as start-up fuel for all coal-fired units in 2012, which helps reduce SO_2 emission further.

With the continual good performance of the emission reduction facilities and our efforts to harness more RE, source more low-sulphur and low-ash coal, and secure natural gas for power generation, the SO_2 and RSP emissions in 2012 were further reduced by 2% and 9% respectively as compared with 2011. NOx emission of the same period rose by 10% and CO_2 emission by 4% due to increased sales and exceptional energy transfer to CLP after a typhoon in July 2012. Nevertheless, the air emissions of our Lamma Power Station in 2012 were below the emission allowances set by the HKSAR Government. HK Electric will continue to fully support the Government's proposed new Air Quality Objectives and the associated initiatives for further improving Hong Kong's air quality.

Emissions from Lamma Power Station



Enhancing Operational Efficiency

Enhancing the efficiency of our power plants also helps reduce emissions. During the year, HK Electric carried out a much needed upgrade of the Unit L4 coal-fired unit at the Lamma Power Station. The Unit has been operating for more than 20 years and replacing the outdated High Pressure and Intermediate Pressure Turbine leads to a significant improvement in efficiency. Despite the complexity of this project, it was accomplished within four months. Since the upgrade, the efficiency of the turbine has improved by 1.8%.

On the transmission front, we enhanced the computer control for our network to facilitate automatic switching of 11 kV capacitor banks at all electrical zone substations, so as to have better control on the power factor and hence reduce the energy loss during electricity transmission.

Managing our Carbon Footprint

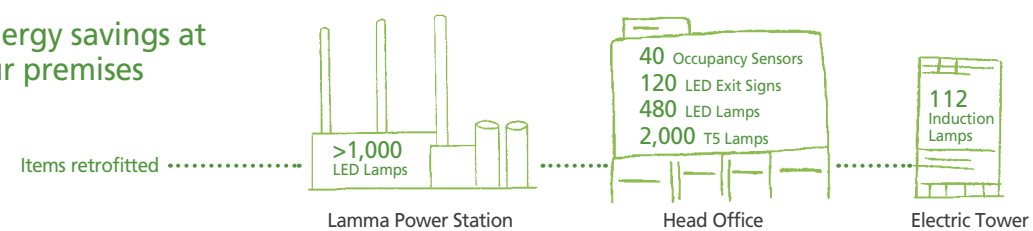
Power Assets is committed to promoting a low carbon economy and improving air quality by reducing our own carbon footprint, while partnering with the community to reduce emissions. We conduct regular carbon audits at specific premises and implement a wide range of energy-saving measures. We received three Carbon "Less" Certificates under the Hong Kong Award for Environmental Excellence Awards Scheme for reducing the carbon footprint of our Head Office and that of the buildings at our Lamma Power Station.

We share the increasing concern of building energy efficiency and have set up an energy management system to enhance the efficiency of the buildings at our Lamma Power Station, with energy audits conducted for three buildings in 2012. In support of the Manifesto on Energy Efficiency in Buildings organised by the World Business Council for Sustainable Development, we will conduct energy audits for more of our premises in the coming years.

We have taken numerous measures to reduce our own energy consumption and hence carbon footprint. In 2012, we were awarded two Energywi$e Labels under the Hong Kong Award for Environmental Excellence Awards Scheme.

We also place great emphasis on the transparency and credibility of our carbon performance disclosure. We commissioned an independent accreditation body to verify the greenhouse gas assertions of our Hong Kong business following the ISO 14064 standard. A significant achievement during the year was our inclusion in the Global 500 Carbon Disclosure Leadership Index of the Carbon Disclosure Project. Power Assets is the first Hong Kong company included in the Index.

Energy savings at our premises



Total Energy Saved annually (kWh)	>50,000	120,000	150,000

Expanding Electric Vehicle Fleet

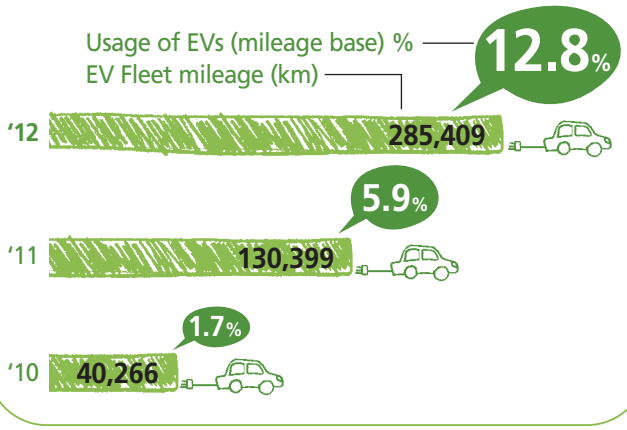
HK Electric continues to introduce electric vehicles (EVs) into its corporate fleet so as to reduce roadside emissions. During 2012, seven additional EVs were added to the corporate fleet taking the total number to 45, equivalent to over 15% of our full fleet.

One goods van was installed with a solar air-conditioning system to provide clean energy when idling. We also aim to progressively phase out diesel-engine vehicles in favour of EVs at the Lamma Power Station. In the interim, we continue to use bio-diesel in some of our diesel-engine vehicles.

We further support the Government's promotion of EV usage to improve roadside air quality. We built more EV quick charging stations in public car parks across Hong Kong Island, bringing the total numbers of HK Electric's quick and standard charging stations to 10. These stations are free for use by the public till the end of 2013. Similarly, we extended our EV leasing scheme to 2013 in order to let our customers continue to experience eco-driving by renting our EVs.

Addition of EVs to the corporate fleet in 2012

- 2 electric mini goods vans
- 3 electric mini pickup trucks
- 2 iMiEV electric cars



Financial Secretary of the HKSAR Government, Mr. John Tsang, demonstrates how to charge an EV at one of our charging stations.

HK Electric also supports the HKSAR Government in further developing Hong Kong's mass transportation systems so as to provide a low carbon form of transport. To this, we will continue to provide substantial technical support and build the necessary electricity infrastructure for the MTR's West Island and South Island Lines.

Preparing for the Future

With some coal-fired units nearing the end of their asset life, HK Electric has been planning to construct additional gas-fired combined cycle (CCGT) units, subject to discussions with the HKSAR Government. Four major CCGT suppliers were approached in 2012 with a view to assessing the practicality of achieving the tightened emission standards newly proposed by the HKSAR Government. This was also supplemented with a consultancy study on the installation of Selective Catalytic Reduction Systems to the CCGT units for reducing NOx emission.

HK Electric sponsors the first "Innovative Eco-Vehicle Design Competition" organised by The Federation of Hong Kong Electrical & Mechanical Industries Trade Unions.

Environmental Conservation

STAKEHOLDER EXPECTATIONS

Environmental issues pose concern for the global community as we face a future where resource and environmental conservation are set to become even more significant to everyday life.

We acknowledge the high expectations from stakeholders on corporations like us to adopt a thoroughly sustainable approach utilising broad measures that range from using resources and handling waste in an environmentally responsible manner to protecting the ecological environment.

RISKS AND CHALLENGES

Use of Resources and Production of Waste

By its very nature, the processes of power generation, transmission and distribution consume natural resources such as fuels and water. They also produce waste such as wastewater and used oils, and by-products such as ash and gypsum. The challenges of both minimising resource usage and safe disposal of the waste and by-products without causing harm to the environment pose an ever more important challenge for the energy sector.

Possible Impacts on Biodiversity

Without careful feasibility studies and planning, energy infrastructure projects can have a potentially detrimental impact on biodiversity. The opportunities presented by renewable energy may seem to be an antidote to such concerns as global warming and environmental degradation. Yet even these new forms of energy sources can pose a threat to biodiversity if they are implemented without careful assessment and due diligence.

ACTIONS AND ACHIEVEMENTS

Embracing Environmental Management

As part of our mission, one of the fundamental undertakings of Power Assets in all our activities is to care for the environment. By drawing up and adhering to a strict policy on our environmental performance, we are further improving our capabilities in this area and acting in a responsible manner in respect of the best practice for environmental conservation.

To continually improve on environmental performance and minimise the impact of our operations on the environment, we continued to implement a 4R policy, namely to **R**educe, **R**euse, **R**ecover and **R**ecycle materials and resources. Our efforts were recognised with two Wastewi$e Labels under the Hong Kong Award for Environmental Excellence Awards Scheme.

Housekeeping measures were taken in our office buildings to reduce electricity and water consumption. Our individual business units also continued their paper saving practices. In 2012, we achieved a 3% reduction in both town water and electricity consumption in our main office buildings and an 8% reduction in paper consumption as compared with 2011. We also joined the Environmental Protection Department's programme on "Source Separation of Commercial and Industrial Waste". The Programme aims to encourage the setting up of an effective mechanism to facilitate waste separation and recycling.

With the successful experience with the two food waste eliminators at Lamma Power Station, we install two more at our office buildings with catering facilities.

We consider the environmental performance of our buildings paramount and we strive to ensure they are energy efficient and not wasteful, in turn limiting their greenhouse gas emissions. During the year, the design and construction of our Lamma East Store Building was granted a platinum award by the Business Environment Council in accordance with the Building Environmental Assessment Method (BEAM) for New Buildings.

At our Lamma Power Station, we continued to collect and recycle wastewater and rainwater in 2012, which amounted to a total of 120,200 m^3 and was equivalent to 4.9% of the Station's total water consumption. Furthermore, 100% of our used lube oil was sent to a competent agent for recycling, while all gypsum and most of the ash produced were sold for industrial use. Our recycling programme at Lamma Power Station continued with various kinds of materials, including plastic wares, waste paper products, used toners, printer cartridges, compact fluorescent lamps and scrap metals.

We are pleased to see an increase in the environmental awareness of our employees at Lamma Power Station, as evidenced in the overall score of 61 recorded in the latest Environmental Climate Index Survey conducted for our employees in 2012, over 58 obtained in 2010.

To help save paper and lower carbon emission, we again launched another e-bill promotion campaign in April 2012 with a one-off incentive of $30. As in the previous year, customers could opt for donating the $30 incentive to one of the four designated green groups. As a result of the campaign, we achieved another 6,639 new e-bill subscriptions. We intend to launch a new round of e-bill promotions in 2013 to encourage at least a further 5,000 customers to switch to e-bills.

Preserving Biodiversity

To achieve sustainable development and to protect the environment, we engaged a consultant to undertake a biodiversity study for our Lamma Power Station in 2012. The study aimed to identify species around the power station and to develop a conservation plan for them. Relevant action plans were devised based on the consultant's findings and recommendations.

Lamma Power Station is home to numerous bird species.

As we move forward with our offshore wind farm project near Lamma Island, we are making every effort to ensure its impact on biodiversity will be minimal. An example is the adoption of a Light Detection and Ranging (LiDAR) system in the wind monitoring station instead of using a conventional wind monitoring mast. This has substantially reduced the overall height, foundation depth of the station as well as its marine footprint, thus minimising disturbance to the marine ecology. We have an ongoing dialogue with stakeholders through the Stakeholder Liaison Group and the Fisheries Review & Consultation Committee specifically established for the project. The objective of the latter is to review in consultation with the fishery sector the feasibility of opening up the wind farm for fishing activities and to explore measures such as artificial reefs to enhance fishery resources within the wind farm waters.

Eco-campaigns

Our two eco-projects, Green Hong Kong Green (GHKG) and Green Lamma Green II, aim to promote the eco-heritage of Hong Kong Island and Lamma Island and to enhance public awareness of preserving such valuable resources. Co-organised with the Conservancy Association, the GHKG programme entered its final year in 2012, with three new eco-heritage routes developed in Lung Fu Shan, Tai Tam and Aberdeen Country Parks, and training of eco-leaders completed. Refresher courses and 18 practice tours were organised for eco-leaders and 312 participants joined these tours to learn about the ecology, heritage and history of Hong Kong Island.

Under the Green Lamma Green II project, a total of 38 eco-tours were held along the three existing routes on Lamma Island for around 559 participants in 2012. Two new eco-heritage routes, including a day route and a night tour, were developed and training of eco-leaders completed.

More than 100 eco-leaders are trained up for the five new eco-heritage routes.

Supporting Community Green Initiatives

Power Assets actively fosters a culture of volunteering and takes the lead to encourage our employees to support meaningful green causes.

About 50 employees rushed to the rescue when the Company responded to an urgent call for assistance in cleaning up two beaches at Lamma Island after 150 tonnes of plastic pellets were washed up in the aftermath of Typhoon Vicente in July.

Our volunteers also took part in many other green initiatives during the year including the "No Hill Fire in Lamma" campaign during Ching Ming and Chung Yeung festivals by the Conservancy Association, "Clean Up the World in HK" by Green Power; "Tree Planting Challenge" by Friends of the Earth Hong Kong and mikania removal at the Mai Po Reserve by WWF.

The Company also continued to support local green groups in their efforts to protect the environment. We responded to WWF's call for action on climate change and participated in "Earth Hour 2012" by switching off the external and decorative lighting at nine of our buildings for one hour, and provided system loading data for WWF to assess the impact of the campaign.

For the third consecutive year, we supported the "Take a 'Brake' Low Carbon Action – Corporate Green Driving Award Scheme", initiated by Friends of the Earth Hong Kong to promote car fuel efficiency. We improved fuel efficiency by over 7% and reduced fuel consumption by more than 9% during the action period.

Our engineers tailor-make simple but practical tools to speed up the plastic pellets cleaning process.

Supply Reliability and Sustainability

STAKEHOLDER EXPECTATIONS

Excellent electricity supply reliability helps support Hong Kong's economic development and sustain its position as one of the world's key financial centres. It also serves as the crucial backbone for most homes and businesses. Supply reliability can however be easily taken for granted and any disruption may frustrate our customers.

Public expectations for sustainable and cleaner electricity extend to all aspects of the power supply process, most of which have been addressed in the *Air Quality and Climate Change* and *Environmental Conservation* sections of this chapter. We also recognise that the CSR performance of our business partners has implications on the comprehensive approach to sustainability taken in our power supply. This presents an opportunity for us to set an example and ensure that all stakeholders in the energy supply chain adopt the same philosophy on CSR and environmental issues.

RISKS AND CHALLENGES

Supply Reliability

Delivering a safe and reliable supply of electricity in response to the demands of a modern metropolis such as Hong Kong is an increasingly complex and challenging undertaking. The congested infrastructure that typifies our compact cityscape poses inherent challenges for power utilities. The existing power generation, transmission and distribution infrastructure in Hong Kong must be constantly maintained and upgraded, while minimising the disruption that may cause to the community and customers.

Furthermore, global climate change is causing more severe weather. Typhoons and Super Typhoons pose an increasingly significant threat to supply reliability and safety.

Securing Quality Fuel

Fuel cost amounts to a significant portion of our running cost, and fuel quality also affects our generation efficiency and environmental performance. It is therefore critical for us to secure a supply of quality fuel at a reasonable price.

CSR Competence of Business Partners

Power Assets adopts high standards to ensure we behave responsibly in respect of our environmental and CSR commitments, and it is important to ensure these commitments are adhered to throughout our supply chain. To generate and supply electricity, we rely on a range of suppliers for raw materials and services. The key challenge

for our supply chain is to strike a balance between satisfying our customers in a cost-effective manner, while ensuring our needs for materials and services are met in a sustainable way.

ACTIONS AND ACHIEVEMENTS

Continuous Improvement to Ensure Supply

One of the Company's core missions is to deliver excellent supply reliability. We have delivered on this pledge unwaveringly for decades and have superior systems in place to ensure our high standards will continue.

>99.999%

In 2012, HK Electric continued this excellent track record, achieving a high supply reliability rating of over 99.999% for 16 consecutive years, with our customers experiencing on average less than one minute per year of unplanned power interruption.

Our mechanism to deliver this high level of reliability includes a PAS 55-1 asset management system for our apparatus and an ISO 9001 quality management system for core business processes. To enhance our network reliability, we commissioned five additional 132 kV ring main units and five additional 132 kV circuits at various locations across Hong Kong Island in 2012. Our power networks of 11 kV or above also have back-up cables to cater for contingency situations.

We are gradually phasing out the use of overhead lines for improving network reliability and minimising visual impact. We utilise primarily 275 kV and 132 kV underground and submarine cables in our transmission network, and now only a few 132 kV overhead lines remain in use. Because of our cable network's physical robustness against adverse weather, we were able to maintain a highly reliable power supply all year round. In 2012, a new 275 kV circuit was added inside the existing 5.7 km Nam Fung – Parker Cable Tunnel.

We conduct regular network reliability and operational reviews to further enhance supply reliability. We deployed advanced cable diagnostic techniques to identify and replace weak components, enabling us to avert potential cable faults that might adversely affect supply. As a result, the number of 11 kV cable faults (other than those damaged by third parties) dropped to an all time low of 39 cases in 2012. Another example of this forward thinking approach was the enhancement of a sophisticated computer programme to reduce the supply restoration time following certain types of fault. Consequently, our engineers managed to restore supply to customers within one minute for eleven 11 kV fault cases, thus reducing the supply interruption time. We have also enhanced our gas insulated switchgear systems which are now under the watch of an advanced online partial discharge monitoring system.

Our System Control Centre monitors our network round the clock and is able to restore supply within minutes after fault.

In early 2012, we also improved the reliability of the two gas-fired units at our Lamma Power Station by segregating the original single gas supply chain for the two units into two separate chains, one for each unit, preventing them from tripping at the same time.

Securing Quality Fuel

We continued to take steps to safeguard our coal supply through close monitoring of the supply chain and diversification of procurement. With the completion of the coal mills enhancement programme at our Lamma Power Station in 2012, a total of five coal-fired units can now be fuelled by a wider range of coal types, including low sulphur coal. The Company now sources coal from Indonesia, Australia and Russia, while natural gas is mainly sourced from Australia and Qatar. During the year, the coal market softened and enabled us to secure reliable and quality coal at lower price levels.

CSR Standards in Supply Chain

Power Assets encourages its suppliers to behave responsibly and to report their CSR performance. We have a Code of Practice for Suppliers in place to define ethical, human and labour rights, health and safety, and environment protection standards for suppliers, contractors, and consultants. We expect our business partners in our supply chain to follow the Code of Practice so far as it is practicable. Our supplier of the thin film photovoltaic panels used in the solar power system, for instance, verified its greenhouse gas emissions inventory at organisational level and acquired the ISO 14064 certification.

Demand Side Management

STAKEHOLDER EXPECTATIONS

As the climate change debate continues to capture attention among our population, the HKSAR Government and local NGOs have higher expectation of power companies to promote energy efficiency.

Following the HKSAR Government's consultation on measures needed to combat climate change, we welcomed the public's call for power companies to provide more transparent information about electricity consumption patterns on their bills.

In line with better education and greater awareness, consumers are also seeking more interaction with and advice from power companies on steps they can take to lower their carbon footprints and save energy.

RISKS AND CHALLENGES

Running Successful Programmes

To make an education programme successful requires adequate resources as well as creative and innovative ideas to encourage wider public participation. It is also important to foster a culture of sharing in order to spread the green messages, in particular to the younger generation.

Possible Impact on Our Local Business

The increasing trend towards energy efficiency and conservation may have impact on our local power business. Yet we are firmly committed to supporting this green initiative and we will address this challenge by seeking alternative business development opportunities, which are described in greater details in the *Business Development* section of this chapter.

ACTIONS AND ACHIEVEMENTS

Commitment from the Top

We believe sustainability does not just concern minimising the negatives, but is also about realising the positives. We do not behave merely as a supplier to our customers and partners. Where feasible we work with organisations and individuals in partnership to achieve sustainable solutions and to help them benefit from our knowledge and best practices.

Our commitment to supporting and engaging our stakeholders is best reflected in the work of our CSR Committee, which is chaired by the Group Managing Director. Such commitment from senior management ensures a sufficient allocation of human and financial resources to achieve our objectives.

Free Energy Audits

To raise awareness of best practices in energy consumption, we provide free energy audit services to help our customers identify energy-saving opportunities at their business premises. Together with other initiatives to help small and medium enterprises (SME) optimise their business start-up, we also help them in selecting the right tariff type and enhancing the energy efficiency of their operations by providing tariff advisory services and energy audits. Once a new SME business has been running for three months, we will provide load profile advisory services on request, facilitating better use of energy to drive business success.

In 2012, we are named "The Best SME's Partner" by the Hong Kong General Chamber of Small and Medium Business.

Over 50 energy audits were carried out in 2012. To supplement this activity, we continued the provision of our HK$12.5 million per annum loan fund for non-domestic customers to implement energy saving initiatives identified in energy audits. Similarly, we allocated about HK$2.5 million a year to an education fund for promoting energy efficiency.

Low Carbon Awareness in Office

We helped WWF to conduct verification for the participants of its Low-Carbon Office Operation Programme (LOOP) Labelling Scheme in 2012. LOOP has been established to enable Hong Kong companies and organisations to reduce their greenhouse gas emissions generated from office operations by adopting managerial and technological best practices and changing staff behaviour in respect of energy efficiency.

Saving Energy by Going Electric

HK Electric encourages customers to switch from gas appliances to electrical appliances as this helps save energy, as well as immediately improves indoor environments and reduces waste heat and gas to the vicinity. We continued to host courtesy visits to our Electric Commercial Kitchen Centre and Electric Domestic Kitchen Centre and offer free professional consultation for restaurant owners, elderly centre owners, NGOs, students, property developers, and electrical and mechanical services consultants.

HK Electric also assists the hotel industry in adopting eco-water heating systems. For example, the Holiday Inn Express HK SOHO, which opened in 2012, generates hot water using four electric heat pumps that extract waste heat from the building air-conditioning system.

Handy Consumption Information

Through various initiatives for different types of customers, the Company helped them familiarise with their electricity usage patterns. Data such as electricity consumption tracking, monthly per capita electricity consumption, and carbon dioxide (CO_2) emissions per unit of electricity consumed, are now included in bills for domestic customers.

We also help business customers to better understand their electricity consumption patterns and to devise their energy efficiency programmes. In 2012, load profile enquiry services were provided to 75 commercial customers with smart meters installed as part of our energy advisory services.

The "Electricity@Home" and "Electricity@Office" facilities on HK Electric's websites allow our domestic and commercial customers to conduct virtual energy surveys for their homes and offices. The functions also offer useful information about energy efficiency and conservation, power quality and tariffs, safety tips and a guide to purchasing electrical appliances.

Carbon-Smart Buildings

The Climate Change Business Forum, an initiative of the Business Environment Council in Hong Kong, sets out to find optimal solutions for retrofitting the commercial building stock in Hong Kong to improve energy efficiency. Power Assets participated in the Carbon-Smart Buildings project offering technical support, resulting in a very practical and useful guide for tenants and owners of commercial properties.

More Sharing under Clean Energy Fund

The HK Electric Clean Energy Fund aims to foster environmental education in Hong Kong by promoting better understanding of renewable energy (RE). Since its establishment in 2006, the Fund has sponsored 116 renewable energy projects. With the Fund entering its seventh year, applications are classified into two categories with project sponsorship of up to $15,000 and $100,000, depending on the scale and complexity of the application. To encourage more students to engage in the projects and

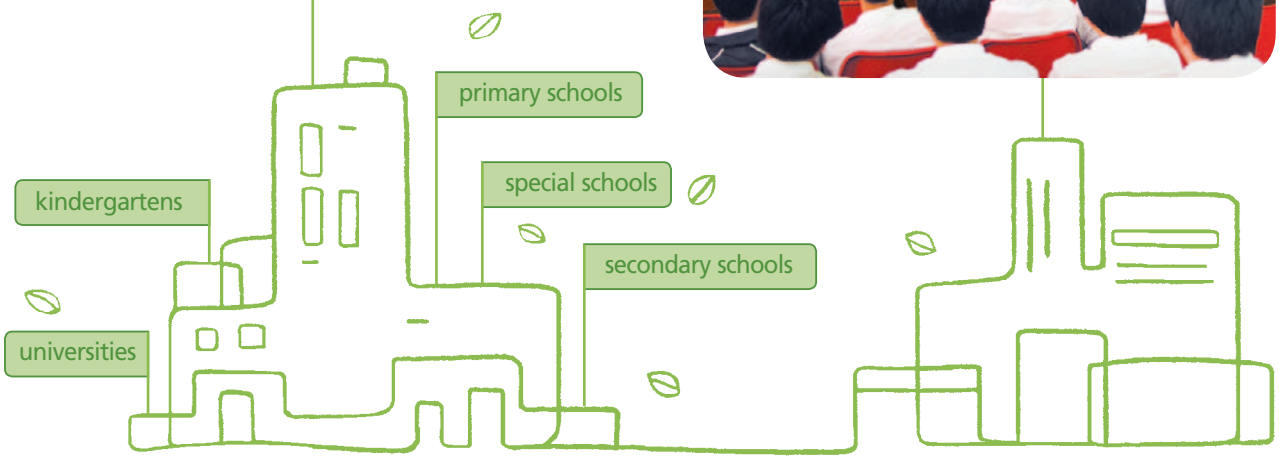
Customers can now understand more about their electricity usage patterns with the enhanced bill.

provide them with Other Learning Experiences (OLE – a key feature of the senior secondary curriculum in Hong Kong) in environmental conservation, we included "students' participation" as one of our criteria for the Fund's application in 2012.

Based on the adjudicators' assessment, 30 applications including 12 kindergartens, five primary schools, nine secondary schools, three special schools and one university, were recommended for sponsorship. Besides projects promoting RE and low carbon activities, previous awardees were also encouraged to apply for funding to enhance their existing RE installations.

Under the Fund's "Clean Energy • iShare" networking platform, which promotes better understanding of RE and low carbon messages, we collaborated with the Hong Kong Institution of Engineers and organised four school talks and one field trip. Over 500 students attended the activities. The Fund also sponsored The University of Hong Kong (one of the successful applicants of the Fund in 2011/12) to develop and build a working prototype of a mini hydro power plant in rural Thailand. We also organised a visit for secondary students interested in water turbine models to the University, where the project team shared their knowledge and experience. Schools can also share interests and ideas through the Fund's Facebook fans page.

A total of 101 applications were received for our Clean Energy Fund in 2012, a record number since the scheme started in 2006.



Green Education in Schools

Be Green, Be Happy – Smart Power Campaign 2012

During the year, we again launched our annual Smart Power Campaign to encourage the public to adopt a low carbon lifestyle and realise the benefits of green living. The 2012 campaign was kicked off at the "Low Carbon Bazaar" (see the case story following this section), with the theme "Be Green, Be Happy". A record of over 90,000 participants took part in various activities organised under the Campaign.

A "Happy Green School" label programme was launched in 2012, and 115 secondary, primary and special schools participated. More than 18,000 students from these schools participated in various low carbon activities, such as "bring your water bottle day" or "bring your handkerchief day". Four primary and three secondary schools were recognised for their outstanding performance in organising such activities. Students also benefited by participating in the OLE activities, including school talks and visits to our Smart Power Centre. In 2012, we organised 19 guided tours to our Smart Power Centre for various stakeholders including academia, schools, professional institutions, hotel associations and hospitals to promote energy efficiency and electrical safety among the community.

The "Be Green, Be Happy" essay writing competition attracted more than 7,500 submissions and 55,000 votes in the public voting.

Our popular "HK Electric Low Carbon App" was upgraded in December 2012 to provide more features, including more downloadable "low carbon recipes", and a "Be Green, Be Happy" section to share stories and tips on green living. The App also provides 25-month electricity consumption record enabling customers to monitor electricity usage.

Through roving exhibitions staged at shopping centres, the general public gain knowledge in the smart use of electricity.

Advocacy Through Our Employees and Their Families

More than 1,000 employees took part in the corporate green campaign organised in support of the 40th anniversary of World Environment Day. The campaign, held between 21st May and 20th June, appealed to colleagues to go green around the four basic necessities of life: apparel, diet, living and transport through the selection from a list of 17 Low Carbon Pledges. A reduction of at least 25 tonnes of CO_2 emission was estimated during the month-long event, equivalent to the CO_2 absorbed by about 1,000 trees in a year.

New features in the HK Electric Low Carbon App include "eco-quality home" to promote low carbon electrical appliances.

In support of the World Environment Day, used-clothing collection boxes are placed at various premises of the Company.

CASE STORY

LOW CARBON DREAMS COME TRUE

Educating the younger generation on how to pursue a sustainable environment has always been a commitment of the Company. The "Low Carbon Bazaar" organised in February 2012 as part of our Smart Power Campaign was a case in point of encouraging students to move towards a low carbon future.

"Best Marketing Award" winner CMA Choi Cheung Kok Secondary School was one of the 21 schools running green businesses, selling DIY low carbon products at the Bazaar. Designing a low carbon and fashionable LED lamp using recycled ring-pulls from cans, the school team learned more about energy and recycling through handcrafting their dream products for sale.

Team member Kwok Hoi-yiu enjoyed participating in the activity. "Creating a product that is low in carbon emission required a lot of research, trial and error. HK Electric's programme was a valuable lesson teaching me how to apply knowledge and creativity to help protect the environment," he said.

Each participating team received sage advice from some of HK Electric's young engineers and a subsidy of $3,000 to fund its business. The activity provided a good opportunity for students to learn through hands-on experience.

Some 3,000 members of the public attended the Bazaar where over 50 types of DIY products, ranging from shopping bags made from old clothing to mobile phone chains made out of computer keyboards, were created for sale at the 25 booths. With a matching donation by the Company to the sales proceeds, the Bazaar raised around $90,000 for two local green groups, WWF-Hong Kong and Friends of the Earth (HK).

Green Education around the World

In Australia, Power Assets' electricity distribution associates, CitiPower and Powercor also engaged schools and students in conservation activities. The CitiPower Powercor Junior Landcare "Powerful Partnerships" Grants Programme encourages environmental partnerships between schools and Landcare groups across the two businesses' distribution areas of inner Melbourne and central and western Victoria. In 2012, the programme provided grants, enabling 10 schools to attend "Plant Out" days, where students participated in tree planting on a local farm and enjoyed educational talks on the benefits of trees to the farming landscape.