PROJECT CLEAN AIR

Certification Scheme for Clean Air Charter

Final Report

For

The Hongkong Electric Company Limited

Prepared by

BUSINESS ENVIRONMENT COUNCIL 商界環保協會

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1. INTRODUCTION

Founded in 1889, The Hongkong Electric Company Limited (HK Electric) is one of the world's longest established power companies. HK Electric has a strong commitment to environmental protection while providing a safe and reliable electricity supply to the community. HK Electric is responsible for the generation, transmission and distribution of power to Hong Kong Island, Ap Lei Chau and Lamma Island.

HK Electric continuously invests in the best practicable technologies to minimize environmental impact and sustain a higher level of environmental performance. A number of measures are in place to address the concerns about environmental challenges associated with the provision of electricity to the society. These include the increased use of natural gas, retrofitting more FGD Flue Gas Desulphurisation plants (FGD) developing wind farm in Hong Kong, introducing solar energy and supporting the comprehensive application of the electric vehicles over the territory. HK Electric is committed to meeting the HKSAR Government's target on the reduction of sulphur dioxide (SO2), nitrogen oxides (NOx) and respirable suspended particulates (RSP) emissions. Also, effective environmental management systems, certified to the standards of ISO 14001, are implemented to attain continual improvement.

This report outlines the findings of the Business Environment Council (BEC) from a walk through audit and interview with HK Electric's representative, Mr. Kenneth Fung – Environmental Engineer.

Based on the pre-audit questionnaire completed by HK Electric, it was determined that HK Electric fits into Group C category of the certification scheme, showing that the organisation has comprehensive management systems and means in place to identify and verify the implementation of energy efficiency / emission reduction programmes that are in compliance with the Clean Air Charter.

The site visit was conducted at the Hongkong Electric Centre by Ms Annie Yeung on 20th August 2013. The purpose of this audit was to verify HK Electric's commitments to the Clean Air Charter.

2. OBSERVATIONS AND COMPLIANCE

Based on the site meeting, HK Electric's programmes and practices on reducing air emission were reviewed. In general, a systematic approach on addressing the Clean Air Charter's commitments has been implemented as follows:

- A corporate environmental policy endorsed by Group Managing Director has been established and implemented. Under the directive of the Managing Director, HK Electric is committed to protecting the environment and supporting sustainable development.
- Reporting to the Director of Operations, General Manager (Generation), General Manager (Transmission & Distribution, T&D) and System Operations Manager oversee daily electricity generation and supply activities to ensure that continual improvement in the environmental performance can be achieved.
- Reporting to the Group Managing Director, the General Manager (Corporate Development) who chairs the corporate-wide Environment Committee, is responsible for coordinating all environmental matters to ensure the implementation of their Environmental Policy.
- Reporting to the Group Managing Director, the General Manager (Projects) is responsible for the execution of all Company's new power generation and transmission infrastructure projects governed by the IMS certified to ISO 14001.
- The Director of Operations directed environmental related saving initiatives including the reduction of electricity consumption in T&D's office/ operational buildings and the consumptions had been monitored and reported regularly
- Assigned by senior management, a task force consisting of Operations Engineers, Maintenance Engineers, Chemists, Energy & Performance Engineers and Environmental Engineers from various Divisions of HK Electric is responsible to monitor air emissions and energy/ performance for the operation of power facilities:
  i. Intensive environmental monitoring and audit programmes (EM&A) had been conducted in accordance with EM&A manuals and conditions of relevant environmental licences/ permits.
  ii. Environmental performance data have been recorded, evaluated and reported to the authorities.; and
  iii. Environmental performances on air emissions as well as energy and waste reduction programmes are reviewed under the environmental management systems for continuous improvement.

- Members of the committees (representing individual operation Divisions of HK Electric) under the relevant environmental management system (EMS) jointly handle all environmental-related issues including energy and emission management. . The Environmental Committee coordinates and monitors the implementation of overall corporate energy saving initiatives. Energy audit teams had been formed to manage the energy consumptions in HK Electric's office/ operational buildings.
- The objectives and targets on the reductions in air emissions and energy consumption for 2013 have been set and the progress has been closely monitored.
- Director of Operations and members of the committees under the relevant EMS oversee to carry out environmental reviews at least once per year to scrutinize environmental performance, determine areas for improvement, and set up new objectives and targets.
- The directions of top management on air emission / energy reduction are set in form of

environmental objectives and targets for implementation by improvement programmes in the EMS. Members of committees representing individual Departments are obligated to implement the relevant environmental programmes to accomplish the defined targets.

- Improvement programmes for air emission / energy reduction under the EMS have been implemented in design, construction and operational stages to sustain a higher level of environmental performance for its premises and facilities.

Regarding the six commitments of the Clean Air Charter, the table below summarizes the achievements of HK Electric:

Commitments	Actions done
1) Operate to a recognized world class standard, or the standards established by the Hong Kong / Guangdong governments on emissions of air pollutants, even if it is not a requirement to do so here. (Relevant to industrial operations, power plants and business with direct emissions)	In view of the main activities of HK Electric, the direct emissions are mainly from combustion of fossil fuels in the power plants (i.e. coal, Ultra Low Sulphur Diesel (ULSD) and natural gas). Emissions include SO_2, NOx and RSP. Environmental aspects on air emissions have been identified and registered under the EMS, for which reduction targets are set in form of environmental programs for continual improvement. Approaches of meeting the Government's emission caps for Lamma Power Station have been identified and vigorously followed. Register of environmental aspects has been reviewed and updated as necessary or at least once a year. HK Electric's power facilities are operated in accordance with the requirements of ISO 14001. The electricity generation of HK Electric is governed by relevant licences issued by the HKSAR Government under the relevant Environmental Ordinances in accordance with the defined standards on environmental performance and a guidance note on the Best Practicable Means for Electricity Works in HK. Responsible Environmental Engineer(s) review(s) the Government Gazettes and EPD's website weekly and monthly respectively in order to keep track of any news or amendments of legal requirements. Complaints regarding air emissions are handled according to relevant handling procedures established in the EMS. Dedicated hotlines are available for receiving complaints or enquiries from the public and other stakeholders.
2) Use continuous emissions monitors (CEMs) at significant sources, e.g. large and medium plants. (Relevant to large / medium industrial operations and power plants)	Lamma Power Station is equipped with Continuous Emissions Management Systems (CEMS) to monitor emissions. CEMS data are continuously fed directly to the Environmental Protection Department (EPD) to monitor compliance with stack emissions limits in the licences. Emission data of Lamma Power Station have been verified by an independent verifier.

Commitments	Actions done
	 SO_2 Gas Analyzer for the chimney inlet in Lamma Island Intensive environmental monitoring and audit (EM&A) programmes are conducted by an in-house environmental team and results are verified by an independent environmental checker in accordance with EM&A manuals and conditions of environmental permits/ licences. Internal and external environmental audits are also carried out annually for the EMS.
3) Publish information on energy and fuel use, as well as total emissions of air pollutants annually and timely, if emissions are significant.	The HK Electric's performance in terms of data publishing is on par with both local and international standards and organisations. The plant operating statistics including energy and fuel figures are made available in annual Sustainability Report, which is distributed to HK Electric's stakeholders and made available to the public in the Corporate Website. In addition, quarterly emissions data for power generating facilities are published in HK Electric's corporate website. Greenhouse gas (GHG) emissions from all of their operations in Hong Kong have been verified in accordance with the ISO 14064 requirements by qualified independent assessor. GHG emissions and efforts in reducing GHG emissions have been reported annually through the Carbon Disclosure Project. In 2012, HK Electric became the first Hong Kong company to be included in the Global 500 Carbon Disclosure Leadership Index of the Carbon Disclosure Project and also firstly entered the Dow Jones Sustainability Asia Pacific Index.

Commitments	Actions done
4) Undertake to adopt energy-efficient measures in their operations.	HK Electric has been continuously investing to adopt practicable technologies to minimize environmental impact on air emissions to sustain a higher level of environmental performance, including: <u>Energy saving</u> • The overall thermal efficiency of Lamma Power Station has been increased from 35.1% to 36.0% in recent years attributed largely to the operation of the new highly efficient Unit L9. • For building services system, HK Electric has achieved 3% reduction in electricity consumption in its main office buildings through the following energy saving practices: i. Air-conditioning management including switching off chillers outside office hours, raising chiller water temperature, setting a higher target for room temperature; ii. Switching to use energy-saving lighting devices like T5 fluorescent tubes, LED lamps, occupancy sensors; and adopt de-lamping where suitable; iii. Promoting smart selection and use of electrical appliances; iv. Adopting renewable technologies (wind power, solar power) v. Adopting administrative and housekeeping practices cutting down the running and standby time of building facilities.  Installation of T5 fluorescent tubes <u>Prevent Air Pollution</u> • HK Electric has been gradually increasing its gas-fired generation since 2006 with the commissioning of its first gas-fired unit. After another gas-fired unit is operated as a base load machine starting from 2010, gas-fired generation has been increased to around 30% of its total electricity generation, which significantly reduced coal consumption for power generation.

Commitments	Actions done
	• HK Electric has completed the retrofitting of the 4th Flue Gas Desulphurisation (FGD) plant and Low Nitrogen Oxides (NOx) Burner on an existing coal-fired generating unit, L5, in Lamma Power Station in mid-2009. Two more FGD plants and one more Low NOx Burner have brought on production line for L4 and L2 since April 2010.  Retrofitting of Flue Gas Desulphurisation (FGD) plant. • HK Electric has commissioned a solar thin film photovoltaic (PV) system of 550kW capacity on the roof tops of the station buildings in Lamma Power Station since July 2010. It had cumulatively generated more than 2.26 million units of green electricity, saving about 1,880 tonnes of carbon dioxides. The capacity of this PV system has recently been increased by installing further PV panels in other suitable areas of the power station, achieving a total capacity of up to 1MW targeting for completion in 2 phases, the first phase by June 2012 and the second phase March 2013. It is expected to generate more than 1.1 million units of green electricity annually, which is equivalent to reducing 915 tonnes of carbon dioxide emission.  Solar thin film photovoltaic (PV) system of 1MV capacity on the roof tops and suitable areas in Lamma Power Station.

Commitments	Actions done
	• HK Electric has procured more coal with low sulphur content after signing the Clean Air Charter in 2010 with an aim to minimize the overall SO_2 emission from its power station. • With the successful commissioning of Hong Kong's first commercial scale wind turbine (800kW capacity) on Lamma Island in early 2006, HK Electric is embarking on developing a 100MW offshore wind farm in the Southwest Lamma Channel. The plan aims to produce enough energy for about 50,000 families in Hong Kong, representing 1-2% of their annual electricity output. An environmental impact assessment (EIA) study was completed at the end of 2009, and was approved by EPD in May 2010. HK Electric has conducted the full-year wind measurement for the proposed offshore wind farm project at southwest Lamma Island in February 2013. The results indicated that rich wind resources and better-than expected power generation capacity, revealing that this is an ideal location for the development of an offshore wind farm in Hong Kong.  Wind Monitoring Station for developing a 100MW offshore wind farm in the Southwest Lamma Channel. • HK Electric has provided shore power supply to contractors' barges and conducted a study on the feasibility of providing shore power supply to coal vessels.
5) Identify and encourage business-relevant measures to be taken on days when air pollution is high.	• HK Electric has implemented an email alert system that automatically notifying relevant staff members about EPD's Air Pollution Index (API) data when high outdoor air pollution level. Besides, real-time API data are also being posted in its Corporate Intranet for easy reference by its staff. • During the environmental awareness training courses, staff members are reminded to reduce the outdoor activities, and to use less electricity at home and at work as far as possible when the outdoor air pollution level is high.

Commitments	Actions done
6) Share air quality expertise in business with others.	• HK Electric publishes its Sustainability Report every year so as to share its sustainability performance as well as its plans and targets for the future with regard to its stakeholders and the environment. • HK Electric has maintained a close partnership with its stakeholders through various channels such as meetings, enquiry services, visits, seminars, community activities, reports and websites. • HK Electric applied and received the following certification / award for 2012 from HKAEE: i. Gold Award under Sectoral Awards – Public Organisations and Utilities ii. Two "Class of Excellence" Wastewi$e Labels iii. One "Class of Excellence" & one "Class of Good" Energywi$e Labels iv. Two "Class of Excellence" & one "Class of Good" IAQwi$e Labels • HK Electric has sponsored and supported various environmental programmes organized by NGOs. Also, HK Electric has encouraged its staff members to participate such environmental activities regularly. HK Electric has also run its own outreach programmes to promote energy efficiency and reduction in air emissions:: i. Smart Power Campaign: Smart Power Campaign, launched by HK Electric since 2003, is an annual event to promote energy efficiency and conservation messages among the public, in particular the younger generations. 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. Four primary and three secondary schools were recognized for their outstanding performances in organising such activities. Students also benefited by participating in the activities, including school talks and visits to the Smart Power Centre. In 2012, HK Electric organised 19 guided tours to the 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.  P8 ctric Co., Ltd.

Commitments	Actions done
	ii. Clean Energy Fund: The "HK Electric Clean Energy Fund" aims at supporting the study and development of renewable energy applications in local schools. Since its inception, the HK Electric Clean Energy Fund sponsored 77 kindergartens, primary and secondary schools as well as tertiary institutes with a total funding of over HK$6 million to implement various projects, including the installation of a meteorological station, a sky garden, a green gallery powered by solar energy, wind turbine, wave energy collector and production of a renewable energy teaching kit. Under the Fund's "Clean Energy •iShare" networking platform, which promotes better understanding of Renewable Energy and low carbon messages. HK Electric collaborated with the Hong Kong Institution of Engineers and organised four school talks and one field trip in 2012. Over 500 students attended the activities.  iii. HK Electric provides both domestic and commercial users with energy efficiency guidelines. HK Electric also provides its commercial and industrial customers with free energy audit services with a view to helping them to identify energy saving potentials for improving energy efficiency at its business premises. In relation to the energy audit service, in collaboration with banks, HK Electric also provides interest-subsidized loans under the Energy Efficiency Loan Scheme to help non-Government commercial and industrial customers to implement energy saving initiatives identified in energy audits. HK Electric also promotes the use of highly energy efficient equipment such as heat pump and induction cooking equipment to its commercial clients (e.g. hotels, elderly centres, restaurants and the trade unions such as Hong Kong Federation of Restaurants & Related Trades and Hong Kong Laundry Services Association). Through organizing courtesy visits, trade shows and seminars, HK Electric encourages its customers to deploy the above-mentioned equipment which is energy saving and free of local air pollutants.

Commitments	Actions done
	iv. To help business customers to better understand their electricity consumption patterns and to devise their energy efficiency programmes, HK Electric provides its commercial customers with load profile enquiry services to installed with smart meters on request as part of its energy advisory services. Apart from this, the "Electricity@office" on its website allows commercial and SME customers to conduct virtual energy surveys for their offices, and help them to optimize the use of electricity. v. HK Electric has established the “Green Purchasing Guideline” which factored the environmental friendliness into the processes of purchasing commodities and choosing suppliers. All contractors and suppliers are required to comply with its environmental requirements stipulated in the purchasing specifications. For example, in order to reduce marine emission, HK Electric works together with the coal ship owners to explore and implement shore power. vi. HK Electric has developed a Code of Conduct for Suppliers which is available in its Company website that outlines the health and safety, environment protection, ethical, and human and labour rights standards. All domestic and international suppliers, contractors, and consultants of HK Electric as well as their employees are expected to follow this Code to report their CSR performance, and to influence their business partners in their respective supply chain as far as practicable.

3. CONCLUSION

The Hongkong Electric Company Limited has demonstrated their commitments towards the Clean Air Charter’s commitments and is recommended to be certified under the Clean Air Charter.