Care for the Environment

The Group continues to demonstrate its dedication to working for a better environment through its various contributions to environmental preservation.

ENVIRONMENTAL POLICY

KMB is committed to building a better environment through environmental conservation and protection.

KMB recognises the potential environmental impacts associated with its services and is dedicated to mitigating and minimising these impacts by implementing the following measures:

- Preventing pollution and continuously improving our environmental performance through the establishment and achievement of objectives and targets
- Conserving resources by reducing waste at source and recycling and reusing resources
- Minimising and controlling emissions from our buses by implementing control measures and by providing professional bus repair and maintenance engineering services
- Enhancing staff environmental awareness by providing training in relation to our environmental policy and our environmental objectives and targets, as well as in relation to the potential environmental impacts arising from our operations
- Communicating our environmental policy and relevant environmental requirements to our contractors and suppliers, and making the policy available to the public
- Responding to environmental inquiries from external parties promptly and ensuring effective communication on environmental issues internally
- Ensuring compliance with all applicable local environmental legislation and other relevant requirements

EXCELLENCE IN ENVIRONMENTAL MANAGEMENT

ISO 14001 is the internationally recognised standard for environmental management systems, providing a framework for organisations to manage aspects of their operations that affect the environment. As early as 2003, KMB's Sha Tin and Lai Chi Kok Depots were awarded ISO 14001 certification from the Hong Kong Quality Assurance Agency.

In 2010, KMB was recertified with Green Mark Certification by the Q-Mark Council of the Federation of Hong Kong Industries for the period from 1 May 2010 to 30 April 2013. This certification demonstrates that KMB's four main depots at Kowloon Bay, Lai Chi Kok, Sha Tin and Tuen Mun meet the prescribed standards in respect of the delivery of franchised bus services and the repair and maintenance of buses under the Hong Kong Green Mark Certification Scheme. As the first public transport organisation in Hong Kong to receive this certification, KMB undergoes quarterly surveillance audits to ensure that the most rigorous environmental management standards are maintained for the length of each certification period.

Retreading trebles the life span of a bus tyre

We seek to reduce the potential environmental impacts associated with our services in the following four main areas: environment-friendly buses, green use of consumables, environmental waste treatment and green workplace.

ENVIRONMENT-FRIENDLY BUSES

KMB and LWB strive to build a better environment through continuous upgrading of our bus fleet with the latest environmental technology and equipment. New buses introduced to our fleets generally have environmental performances far exceeding the legal requirements in Hong Kong. The Group is pleased to fulfill its role as an industry leader by introducing innovative technologies and equipment that improve our environmental performance and contribute to the development of a sustainable environment in Hong Kong.

The zero-emission gBus is expected to become operational in 2014

Euro IV and Euro V Engines

With the aim of further enhancing emission standards, KMB pioneered the launch of Euro IV and Euro V double-deck buses in May 2006 and February 2009 respectively. Currently, it operates the largest fleet of Euro IV and V buses in Hong Kong.

At 31 December 2012, 23 urea solution dispensing units were installed at KMB's depots to further improve the environmental performance of Euro IV and Euro V buses. 435 KMB Euro IV and Euro V buses are equipped with a Selective Catalytic Reduction ("SCR") catalytic converter, which when used with urea solution can reduce the emission of nitrogen oxides, since ammonia formed from the solution can convert nitrogen oxides into nitrogen gas and water vapour. To meet the future growth in the number of environment-friendly buses operated by KMB, the depots at Tseung Kwan O and Tsing Yi will be equipped with urea solution dispensing units in 2013 and more such units will be installed at the depots at Lai Chi Kok, Kowloon Bay, Tuen Mun and Yuen Long, bringing the total number of urea solution dispensing units to around 47 by the end of the year.

A total of 355 buses are equipped with Euro III, Euro IV or Euro V engines in the fleets of the Group's Non-franchised Transport Operations Division (comprising the SBH Group and New Hong Kong Bus Company Limited).

Green Fleet

At the end of 2012, KMB and LWB had a total of 3,985 buses, all of them meeting the strict exhaust emission standards of the European Council of Environmental Ministers. In order to bring their exhaust emissions to higher Euro standards in terms of particulate matter, a total of 3,135 buses have been equipped with either Diesel Oxidation Catalysts ("DOC") or Diesel Particulate Filters ("DPF"). Compared with emission levels in 1992, the year when the Euro I emission standard was first introduced in the European Union, the average particulate emission levels of the entire KMB bus fleet has been reduced by about 93%, while the level of nitrogen oxide emissions has been reduced by about 59%.

The number of KMB and LWB buses meeting the respective emission standards at 31 December 2012 is shown below:

	Number of Buses			Emission Level (in terms of particulate matter)		
Engine Type	**KMB**	**LWB**	**Total**	**Euro II**	**Euro III**	**Euro IV/V**
Euro I#	653	–	653	653	–	–
Euro II	200	–	200	200	–	–
Euro II*	1,334	84	1,418	–	–	1,418
Euro III	42	9	51	–	51	–
Euro III*	1,056	8	1,064	–	–	1,064
Euro IV	106	32	138	–	–	138
Euro V	429	32	461	–	–	461
	3,820	**165**	**3,985**	**853**	**51**	**3,081**

Equipped with DOC

* Equipped with DOC or DPF

Exploring Zero- and Low-emission Bus Technologies

We have been putting a great deal of effort into enhancing environmental protection by exploring various kinds of zero-emission technologies in recent years.

We conducted trials of the zero-emission supercapacitor bus (the "gBus") in Hong Kong from August 2010 to April 2011, during which a satisfactory result was achieved. Following the trials of the first generation gBus, KMB introduced the next generation of supercapacitor bus (the "gBus^2"), which has double the electricity storage capacity and hence twice the driving range.

The performance of the gBus^2 in its trials from March to September 2012 was satisfactory. The gBus^2, after being fully charged, can run continuously for 8-10 kilometres, which is equivalent to a journey from Tsim Sha Tsui to Kwai Fong. This is twice the driving range of the first generation gBus, which means fewer charging stations need to be installed en-route. This is an advantage when operating on Hong Kong's busy roads and represents savings in infrastructure costs. It is also means that the gBus^2 can operate on some short-distance routes without any charging stations en-route.

In common with the first generation, the gBus^2 is powered by supercapacitor technology and does not require an extensive network of continuous overhead cables to operate. Because of the rapid charging rate of supercapacitors, charging can be conducted at bus stops while passengers board and alight, taking approximately 30 seconds to store enough electricity in the gBus^2 to run an extra kilometre. In line with KMB's commitment to environmental protection, used supercapacitors and batteries will be collected by suppliers for recycling.

At the end of March 2012, KMB submitted a proposal to the HKSAR Government and received approval for the proposed trial deployment of supercapacitor buses on two routes. They are Route 284, a circular route in Sha Tin, and a new route, numbered 5M, a circular route running between Fuk To Street in Ngau Tau Kok and Tak Long Estate in the Kai Tak Development Area, with a total of four bus stops. Charging stations are proposed to be set up at two bus stops. The routes are expected to be operational from early 2014.

At the same time, we continue to explore other zero-emission technologies, including the battery-electric bus (the "eBus"), which has made significant advances in its operating range. In September 2012, KMB took delivery of its first fully battery-powered single-deck bus, which was jointly developed by KMB and a renowned electric bus manufacturer for road testing to assess its suitability for Hong Kong's operating environment.

The HKSAR Government has earmarked HK$180 million for Hong Kong franchised bus companies to purchase 36 electric buses for trial runs on a number of routes to assess their performance under different conditions. KMB and LWB will be receiving funding assistance from the Government to procure 14 single-deck eBuses and eight gBuses for trial deployment.

With funding support from the HKSAR Government, KMB placed an order for three diesel-electric air-conditioned 3-axle 12-metre double-deck buses in the third quarter of 2012. Upon their arrival in Hong Kong in 2014, these hybrid buses will be deployed for trial operation on urban routes.

Since zero-emission buses are more operationally flexible and require significantly less capital investment than other zero-emission mass transport solutions such as rail, we will continue to work with the HKSAR Government to explore the feasibility of deploying these buses in areas that are especially suited to such services, in particular, busy corridors and the Kai Tak Development Area. We will continue to follow the development of the latest bus technologies and will collaborate with our manufacturers and suppliers to develop zero-emission buses suitable for Hong Kong's unique operating environment.

GREEN USE OF CONSUMABLES

Near Zero Sulphur Diesel

Since 2009, Near Zero Sulphur Diesel ("NZSD"), which contains only 0.001% sulphur, has been adopted on all KMB and LWB buses. NZSD significantly reduces the exhaust emission levels of sulphur oxides and particulates, helping bring about a cleaner environment.

Synthetic Transmission Oil

Since being introduced fleet-wide in 2005, synthetic transmission oil has reduced waste oil by 80% and lengthened the oil drain interval from 30,000 to 150,000 kilometres.

Since 2001, KMB has collected for recycling a total of 5,782 cartridges from printers and fax machines in support of the cartridge recycling programme run by Friends of the Earth (HK).

Eco-Driveline System

The Eco-Driveline System has been a standard feature on all our new buses since its introduction in 2003. The system has proved to be effective in reducing exhaust emissions by an average of 6% to 10% compared with conventional drivelines through improvement in fuel economy. The system integrates a high-torque engine, a six-speed double-overdrive automatic gearbox controlled by a sophisticated gear-shift programme and an optimised final drive to provide a smoother and more comfortable ride.

Electrostatic Filters

KMB has equipped its air-conditioned buses with electrostatic filters, which provide effective filtration of very fine particles. Electrostatic precipitation involving multi-layered collecting plates enables the filters to capture micron-sized contaminants and particles such as dust and pollen more effectively than traditional air filters. Tests demonstrate that electrostatic filters can filter out 80% of fine dust. At the end of 2012, 1,338 KMB buses had been equipped with electrostatic filters.

Foam-element Air Filters

KMB and LWB continue to replace traditional paper-element air filters with high performance foam-element air filters with an average life span of about 12 months, six times longer than that of conventional paper filters. While maintaining the operational performance of our buses, the use of foam-element air filters significantly reduces the amount of solid waste requiring disposal.

Variable Capacity Air-conditioning Compressor

All KMB buses ordered after 2008 are equipped with power-saving variable capacity air-conditioning compressors. The compressors provide more adaptive and refined thermal control in the bus compartment in the most fuel-efficient manner, coping well with the dynamic urban operating environment in all weather conditions.

Tyre Retreading and Recycling

In 2012, 30,800 used tyres were retreaded in KMB's retreading workshop, bringing the total number of tyres retreaded since 1972 to more than 750,000. Additionally, more than 19,000 scrapped tyres and 220 tonnes of tyre chips, which would otherwise have been disposed of in Government landfills, were collected by an agent for recycling into various rubber products. Through retreading, the life span of a new bus tyre, which can typically be used for seven months, can be extended by around 14 months, as each tyre can generally be retreaded twice.

Cartridge Recycling Programme

KMB has supported the cartridge recycling programme run by Friends of the Earth (HK) since 2001. At the end of 2012, KMB had collected for recycling a total of 5,782 cartridges from printers and fax machines.

ENVIRONMENTAL WASTE TREATMENT

To reduce the amount of solid waste requiring disposal, KMB has in place a company-wide waste reduction programme. Excellent results were again achieved in 2012 in the recycling of commonly used items, including the plastic cartridges used in fax machines and printers, rechargeable batteries, fluorescent tubes and waste paper. Since 2009, around 637 kilograms of print circuit boards, which would otherwise have been disposed of in Government landfills, have been collected by a recycling agent. In recognition of our achievements in environmental preservation, KMB was once again granted the "Class of Excellence" WasteWi$e Label by the Environmental Campaign Committee in 2012.

Environmental Treatment of Chemical Waste and Waste Oil

During 2012, around 329,000 kilograms of solid chemical waste were first treated and stored by type in areas set aside at our bus depots, then disposed of by a registered chemical waste collector at the Government's Chemical Waste Treatment Centre. In addition, some 738,000 litres of waste oil were collected from our depots and other bus

maintenance sites by a registered waste oil recycling agent for recycling or disposal in accordance with the statutory standards.

Waste Water Recycling

KMB adopts a number of environment-friendly measures in its daily operations. KMB's depots are equipped with 11 automatic waste water treatment and recycling systems with a daily treatment capacity of 520 cubic metres. Chemicals are added to separate solid impurities from the waste water that is produced during daily depot operations, then the impurities are disposed of at landfills and the treated water discharged into public drains. 70% of the water that is used every day to clean our bus fleet is treated and recycled through these systems, helping reduce water consumption. A "Save Water" campaign is in place to remind our depot and headquarters staff to conserve water.

Waste Scrap Metal Recycling

In 2012, more than 851 tonnes of scrap metal from aged bus parts that were replaced at the daily, monthly, half-yearly and annual inspections were collected from KMB depots for recycling, significantly reducing the disposal of solid waste. About 95% of that metal was scrap iron, which, together with non-ferrous metals, can be recycled repeatedly at low cost and with low energy consumption, especially when compared with the costs of the refining process from the original ores. To enable more effective scrap collection, KMB has set up collection points at its four main depots and its overhaul centre. The collected scrap metal is handled by waste collectors appointed by KMB in accordance with its annual tendering process for recycling and re-use.

GREEN WORKPLACE

Dedicated green facilities promoting energy conservation installed at all our depots include waste water treatment and recycling systems, and environment-friendly fire service systems. Energy-saving features are also built into the lighting, air-conditioning and ventilation systems. Air sampling is conducted regularly in depot areas to ensure that a healthy work environment is maintained.

Building on the success of a pilot scheme at Sha Tin Depot which saw high bay lamps replaced with long-life energy saving fluorescent tubes and resulted in a 12% saving in electricity consumption, KMB is progressively adopting energy efficient lamps in its depots as part of its commitment to promoting a low carbon economy. In 2012, the use of energy saving induction lamps at Kowloon Bay Depot reduced monthly electricity consumption by 11%. Lamp replacement work is currently underway at KMB's other depots.

KMB was the first organisation in Hong Kong to participate in the fluorescent tube recycling campaign. In 2012, around 72,000 used fluorescent tubes were sent to the Government's Chemical Waste Treatment Centre for recycling, bringing the total number recycled to around 537,000 since KMB launched the campaign in 2006. KMB has set up five collection points at Lai Chi Kok Depot, Kowloon Bay Depot, Sha Tin Depot, Tuen Mun Depot and the KMB Overhaul Centre to gather used fluorescent tubes from around 3,800 buses, more than 2,000 bus-shelter light boxes at bus shelters, and the bus depots themselves. Whenever a fluorescent tube is replaced, the packing material of the new tube is used to wrap the old one. The used fluorescent tubes are then stored in a designated area, from which a licensed contractor collects them for recycling. The contractor will remove the mercury from the used tubes before crushing them into glass granules, allowing the retrieved mercury, glass granules and other metal parts to be reused.

At the Group's Lai Chi Kok headquarters, the Green Office concept drove both the design and renovation of the premises. In addition to the use of pre-set timers to turn lights off when they are not needed or when natural light is sufficient, air-conditioning thermostats are set to 25.5°C to conserve energy and enhance air quality in support of the Government's Action Blue Sky Campaign. Lower-energy LED lighting has also been introduced in common areas of the headquarters building such as the main lobby to reduce both electricity consumption and the demand for air-conditioning.

Self-developed Filter Compressing Machine

With the introduction of the in-house developed Filter Compressing Machine at KMB's Sha Tin Depot, the volume of solid chemical waste in the form of disposed fuel or oil filters has been reduced by 60%. In addition, the waste oil squeezed from the filters during the compressing process can be recycled.