

# Sustainability Report

## Care for the Environment

Our environment-friendly bus fleets are entering a new era.



### Environmental Policy

KMB and LWB recognise the potential environmental impacts of their services and are committed to mitigating and minimising these impacts in the following ways:

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

## Environmental Management

KMB has been ISO certified for Environmental Management System (ISO14001) at its two largest depots. KMB's four major depots and LWB's depot are subject to quarterly surveillance audits to ensure compliance with stringent environmental management standards. Environmental working groups were set up to handle environmental issues and ensure the implementation of the ISO systems. Under the guidance of Senior Management, the Engineering team is introducing new and innovative technologies on the bus fleet and in bus operations.

## Environmental Bus Fleet

We are committed to creating a better environment by investing in environment-friendly buses that meet the strict exhaust emission standards of the European Council of Environmental Ministers. At the end of 2018, there were 2,837 air-conditioned Euro V buses, six Euro VI buses (including three Euro VI diesel electric hybrid buses), ten battery-electric buses and seven supercapacitor buses in the KMB fleet, and 208 air-conditioned Euro V buses and four battery-electric buses in the LWB fleet. In collaboration with our suppliers, we have been replacing older bus models with the latest, more energy-efficient bus models to enhance the environmental performance of our bus fleets. The average age of the KMB bus fleet has decreased to around seven years, while that of LWB has decreased to around four years.

## Upgraded Double-deck Bus with Solar Panels as Standard Feature

KMB introduced the second generation in-house developed solar panel double-deck bus in 2018. The "Solar Panel Bus 2.0" reduces the saloon air temperature by around 8-10°C compared to a bus with no solar panel. The cooling time will be 50% faster compared to the first generation the solar panel bus, and it is estimated that the bus will save up to 3% in fuel consumption. The bus passed the Transport Department's Vehicle Type Approval, and the solar power system will become a standard feature on all newly purchased buses delivered from the second half of 2019.

When the engine is turned off, the solar energy captured will enable the two extraction blowers in the air ventilation system to extract hot air from the bus compartment through a specially designed duct for enhancing air circulation. When the engine is turned on, the system supplies electricity to the USB chargers and also drives the ventilation fans of the air-conditioning system and engine compartment.

Compared to the first generation solar panel bus, the efficiency of total solar panel is increased by 10% and the coverage area on the rooftop is increased by 40%. The airflow in the air ventilation system can be improved by 250% to help reduce the saloon air temperature.

## Exploring New Zero-emission Bus Technologies

KMB and LWB strive to improve environmental protection by exploring various kinds of zero-emission technologies.

- KMB and LWB have further explored the use of an electric bus ("eBus") with a 324 KWh Lithium Iron Phosphate battery power pack capable of delivering 200km of zero-emission bus transport; and
- KMB has introduced the latest version of the "gBus", the supercapacitor-powered 12-metre air-conditioned single-deck bus, which testifies to KMB's vision for green public transport in the future. The gBus is characterised by long working hours and frequent start-stop duty cycles, as the supercapacitor can be recharged more quickly and undertake many more charging/discharging cycles. The gBus is powered up by an overhead pantograph or a plug-type charging port.



KMB's engineering team developed the second generation solar panel double-deck bus



KMB and LWB have introduced electric patrol cars for back-up support

## Fuel Consumption

KMB and LWB consumed 8,400,000 gigajoules (GJ) of diesel oil in the reporting period, including the bus fleets and vehicles other than buses. To reduce oil consumption, a number of measures have been adopted on the KMB and LWB bus fleets and across its operations:

- The aircraft-style “Posilock” fuel filling system is used to refuel buses;
- Ambient sensors are installed on air-conditioned buses to save energy by reducing unnecessary cooling;
- The use of synthetic gearbox oil extends the oil drain interval from 30,000 to 150,000 km, reducing waste oil by 80%; and
- The mileage-based oil change scheme brings about a 40% reduction in engine oil consumption and waste oil.

## Total Tonnage of Greenhouse Gas Emissions

The greenhouse gas emissions (Scope I and II) of KMB and LWB are around 139 tonnes of CO<sub>2</sub> equivalent per bus.

## Emissions Reduction

KMB and LWB adopt the latest technologies to reduce roadside emissions and maintain good air quality in its bus compartments.

To meet the stringent exhaust emission standards laid down by the European Council of Environmental Ministers, we use Near Zero Sulphur Diesel, renew the bus fleet with the latest low-emission models and upgrade older buses by retrofitting exhaust treatment devices, including Diesel Oxidation Catalysts, Diesel Particulate Filters and Selective Catalytic Reduction units.

In 2018, KMB and LWB emitted around 133 tonnes of particulate matter (PM) and 1,850 tonnes of nitrogen oxides (NOx). In 2018, KMB and LWB had improved emissions of particulate matter and nitrogen oxides by 77% and 56% respectively compared to 2013.

The final batch of KMB and LWB buses have been retrofitted with a Selective Catalytic Reduction device, which can reduce the emission of nitrogen oxides, as the ammonia formed from the urea solution converts nitrogen oxides into nitrogen gas and water vapour.

As part of its commitment to conserving the environment, KMB and LWB are not only investing in and upgrading the technologies of their bus fleets, but also its patrol cars. KMB and LWB have introduced 20 electric patrol cars for back-up support and have set up electricity-recharging facilities at their main depots.

## Checks on CO<sub>2</sub> Concentration

Each year, 80 KMB buses and 15 LWB buses from passenger-intensive bus routes are selected for a data-logger measurement of indoor CO<sub>2</sub> concentration, with the buses generally demonstrating compliance.

## Tyres

In 2018, 32,100 used KMB and LWB tyres (equivalent to a saving of 1,920 tonnes in solid waste disposal at landfills) were retreaded at KMB’s appointed contractors. More than 18,600 scrapped KMB and LWB tyres, which would otherwise have been disposed of at landfills, were collected by an agent for recycling into various products.

## Fluorescent Tubes

In 2018, KMB and LWB sent a total of around 8,810 used fluorescent tubes to the Government’s Chemical Waste Treatment Centre for recycling.

## Oil and Chemicals

In 2018, around 190,000 litres of solid chemical waste were treated and stored according to type in designated areas at bus depots before being disposed of by a registered chemical waste collector at the Government's Chemical Waste Treatment Centre. Around 247,200 litres of waste oil were recycled or disposed of in accordance with the statutory standards.

Around 135,000 kilograms of waste lead-acid batteries were disposed of by a licensed contractor in compliance with Environmental Protection Department ("EPD") instructions, including some which were exported to overseas facilities approved by the EPD under the Basel Convention.

## Metals

In 2018, KMB and LWB sent a total of around 750 tonnes of metal to recycling companies.

## Water Consumption and Waste Water Treatment

KMB and LWB are committed as responsible corporate citizens to reduce their water consumption and properly treat their effluents before discharge. KMB and LWB have consumed around 322,000 cubic metres in the reporting period that is the average water consumption per bus is 0.2 cubic metres per day, decreased by 2% compared with 2017. Our depots are equipped with 11 automatic waste water treatment systems handling 610 cubic metres per day.



Our depots are equipped with automatic waste water treatment systems

## Green Measures in the Office

The Green Office concept drives both the design and the renovation of our premises. The air-conditioning thermostats are set to 25.5°C to conserve energy and protect air quality in line with the Government's Action Blue Sky Campaign. Lower-energy LED lighting is used in all newly renovated office spaces, on the ceilings of depots and in the common areas of our headquarters building, including the main lobby, to reduce electricity consumption and the demand for air-conditioning.

In 2018, KMB and LWB installed a default setting on all computers to revert to a screensaver after a designated period of time. It is a good practice to raise the awareness of staff to the need to save electricity and conserve the environment.

## Electricity Consumption

KMB and LWB consumed around 118,000 GJ of electricity in 2018, a reduction of 8.5% compared with 2017. During the reporting period, we continued to explore environment-friendly initiatives and invested in the latest technologies to minimise energy use and reduce greenhouse gas emissions. Over 13,500 fluorescent tubes were changed to LED lights on the ceilings of KMB's four main depots and LWB's Siu Ho Wan Depot. After the implementation of these saving measures, the use of energy-saving LED tubes helped the Group reduce its total electricity consumption by around 10%.



The use of energy-saving LED tubes helps reduce electricity consumption