

Care for the Environment

Our commitment to innovation and concern for the environment are helping us to usher in a new era.



Environmental Policy

We recognise the potential environmental impacts of our services and are committed to mitigating and minimising these impacts in the following ways:

- ③ Preventing pollution and continually improving our environmental performance by establishing and achieving objectives and targets;
- ③ Conserving resources by reducing waste at source, and recycling and reusing resources;
- ③ Minimising and controlling emissions from buses by adopting control measures and providing professional bus repair and maintenance engineering services;
- ③ 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;
- ③ Communicating our environmental policy and environmental requirements to our contractors and suppliers, and making the policy available to the public;
- ③ Responding to environmental inquiries from stakeholders promptly and ensuring effective communication on environmental issues internally; and

- ③ Ensuring compliance with all applicable local environmental legislation and other relevant requirements.

Environmental Bus Design

We are dedicated 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 2017, KMB had 2,372 air-conditioned Euro V buses, four Euro VI buses (including three diesel electric hybrid double-deckers), ten battery electric buses and four supercapacitor electric buses in the fleet, and LWB had 192 air-conditioned Euro V buses and four battery electric buses in the fleet. We have invested a total amount of HK\$910 million on upgrading our bus fleet. In collaboration with our suppliers, we have been gradually replacing older bus models with the latest, more energy-efficient bus models. The average energy use per kilometer of Euro V/VI buses was 23-27% less than that of Euro II/III buses. In recognition of its achievements in environment-friendly transport, KMB won the Bronze Award in the Transport and Logistics category of the 2016 Hong Kong Awards for Environmental Excellence.

First Euro VI Diesel Bus in Hong Kong

To drive an emission-free future, KMB has introduced the first Euro VI diesel double-deck bus in Hong Kong. This bus marks a NEW stage, standing for “Natural”, “Evolutionary”, and “Wise”, in KMB’s commitment to environmental protection in

Hong Kong. Compared to the Euro V double-decker, the Euro VI bus’s emissions of major pollutants are reduced considerably, with emissions of nitrogen oxides, hydrocarbons and particulate matter reduced by 80%, 72% and 50% respectively. In terms of performance, the bus’s more efficient engine reduces fuel consumption and lowers noise levels, while the Electronic Stability Programme significantly reduces the risk of roll and skid in all conditions.

Exploring New Low-emission and Zero-emission Bus Technologies

KMB and LWB have put great effort into improving environmental protection by exploring various kinds of zero- and low-emission technologies.

- ③ In 2017, KMB introduced the first in-house developed double-deck bus equipped with a solar power system. The system serves as an auxiliary electric power supply and drives the air ventilation system, which reduces the bus compartment’s air temperature by around 5-10°C during prolonged exposure to the sun, enhancing bus services and contributing to environmental protection.
- ③ KMB and LWB have further explored the use of the battery electric bus (“eBus”) powered by 340kWh Lithium Iron Phosphate batteries capable of delivering 180km of zero-emission bus transport.



The aircraft-style "Posilock" fuel filling system is used on both KMB and LWB buses to prevent spillage

☉ 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 the abilities of fast charging using its overhead charging pantograph and sustains multiple charging/discharging cycles. Thus its application in routes with long operating hours and frequent start stop duty cycles is promising.

Fuel Consumption and Greenhouse Gas Emissions

KMB and LWB consumed around 8,552,000 gigajoules (GJ) of diesel oil in 2017, including the bus fleets and vehicles other than buses. To reduce fuel 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.

Mostly contributed by mobile source combustion, the greenhouse gas emissions (Scopes I and II) of KMB and LWB were around 146 tonnes of CO₂ equivalent per bus per year.

Emission Reduction

KMB and LWB adopt the latest technologies to reduce roadside emissions and maintain good air quality in the 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. The Eco-Driveline System, a standard feature on new buses since 2003, reduces exhaust emissions by 6%-10% compared with conventional drivelines by improving fuel economy. In 2017, KMB and LWB emitted around 130 tonnes of particulate matter (PM) and 1,810 tonnes of nitrogen oxides (NO_x). As at 31



KMB introduced the first Euro VI diesel bus to Hong Kong

December 2017, KMB and LWB had improved emissions of particulate matter and nitrogen oxides by 96.16% and 75.72% respectively compared to 1992. 683 KMB and LWB buses had 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. 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 CO₂ Concentration

Each year, 80 KMB buses and 15 LWB buses from passenger-intensive bus routes are selected for a data-logger measurement of indoor CO₂ concentration, with the buses generally demonstrating compliance.

Tyres

In 2017, 30,000 used KMB and LWB tyres (equivalent to a saving of 1,800 tonnes in solid waste disposal at landfills) were retreaded internally at workshops and by appointed contractors. More than 19,000 scrapped tyres and seven tonnes of tyre chips from KMB and LWB, which would otherwise have been disposed of at landfills, were collected by an agent for recycling into various products.

Fluorescent Tubes

In 2017, KMB and LWB sent a total of around 17,000 used fluorescent tubes to the Government's Chemical Waste Treatment Centre for recycling.

Oil and Chemicals

In 2017, around 248,000 kilograms 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 624,800 litres of waste oil were recycled or disposed of in accordance with the statutory standards. Around 186,000 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.

Water Consumption and Waste Water Treatment

Though no major issue concerning sourcing water has been encountered, KMB and LWB are committed to reducing water consumption and to properly treating effluents before discharge. In 2017, KMB and LWB consumed around 352,000 cubic metres of fresh water that is, the average water consumption per bus was 0.22 cubic metres per day. Our depots are equipped with 11 automatic waste

water treatment systems that handle 610 cubic metres per day.

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.

Electricity Consumption

KMB and LWB consumed around 129,000 GJ of electricity in 2017. We continued to explore more environment-friendly initiatives and invested in the latest technologies to minimise energy use and reduce greenhouse gas emissions. Over 2,500 high bay lights were changed to LED lights on the ceilings of KMB's four main depots and LWB's Siu Ho Wan Depot. Such long-lasting lighting uses up to 70% less energy than traditional lights.



KMB and LWB have added battery electric buses to their fleets