Sustainability Report
Care for the Environment

Care for the Environment

Our environment-friendly bus fleets are driving us into a new era.

Environmental Policy

KMB and LWB recognise the potential environmental impacts of bus 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 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 enquiries 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 ISO14001 certified for its Environmental Management Systems for the two largest depots. KMB's four major depots and LWB's depot are subject to quarterly surveillance audits to ensure compliance with a set of stringent environmental management standards. Environmental working groups have been 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 applicable to both bus fleets and bus operations.

Environmental Bus Fleet

We are committed to creating a better environment and minimising the impact of climate-related issues by investing in environmental-friendly buses that meet the strict exhaust emission standards of the European Council of Environmental Ministers. At the end of 2019, there were 221 Euro VI buses (including three Euro VI diesel-electric hybrid buses), 2,830 Euro V buses, ten battery-electric buses and eight supercapacitor buses in the KMB fleet, and 225 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 become 7.2 years, while that of LWB has become 5.5 years.

KMB and LWB spare no effort in introducing the latest technologies into their bus fleets to minimise the environmental impacts

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KMB and LWB continue to explore the possibilities of renewable energy and zero-emission bus technologies

Exploring Renewable Energy and Zero-emission Bus Technologies

KMB and LWB strive to improve environmental performance by exploring various kinds of renewable energy and zero-emission technologies, which shows KMB and LWB's determination to introduce green public transport in Hong Kong.

- KMB introduced the first in-house developed solar power system installed on a double-decker in 2017. The system reduces the air temperature in the compartment by around 8-10°C compared to a bus without such a system. With an efficiency upgrade in 2018, the cooling time improved by 50%, saving up to 3% in terms of fuel consumption. The first batch of buses with a solar panel was deployed in October 2019;
- KMB and LWB are exploring 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 "gBus", the supercapacitor-powered 12-metre air-conditioned single-deck bus. 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 can be powered up by an overhead pantograph or a plug-type charging port in the depot.

Checks on CO_2 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_2 concentration. Our buses generally demonstrate compliance with the requirement.

Greenhouse Gas Emissions

KMB and LWB seek to minimise their greenhouse gas emissions through the judicious application of the latest technologies and relevant measures.

Total Tonnage of Greenhouse Gas Emissions

The total direct greenhouse gas emissions (Scope I) and indirect greenhouse gas emissions (Scope II)[1] of KMB and LWB are around 574,800 and 17,260 tonnes of CO_2 equivalent respectively. The total carbon intensity is 135.8 tonnes CO_2 equivalent per bus.

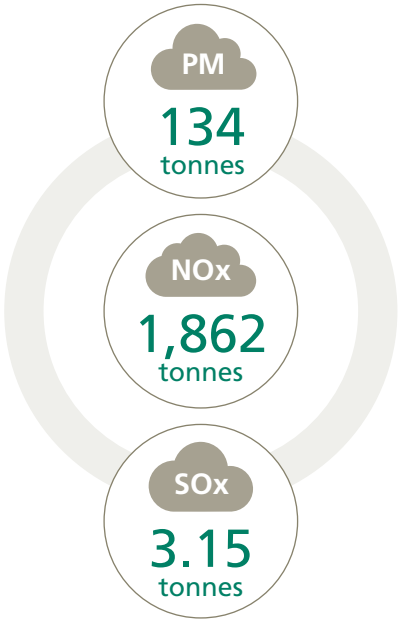
Emissions Reduction

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

[1] The emission factors of greenhouse gas emissions due to electricity consumption are obtained from the sustainability reports of CLP Power: 0.51 kg CO2-e/kWh.

including Diesel Oxidation Catalysts, Diesel Particulate Filters, and Selective Catalytic Reduction units to meet the high standards of exhaust emissions laid down by the European Council of Environmental Ministers.

In 2019, KMB and LWB emitted around 134 tonnes of particulate matter (PM), 1,862 tonnes of nitrogen oxides (NOx) and 3.15 tonnes of sulphur oxides (SOx)[2].



The latest 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 our commitment to conserving the environment, KMB and LWB are investing in upgrading the environmental performance of not only the bus fleets, but also the patrol cars. KMB and LWB have introduced 20 electric patrol cars for back-up support and have set up electricity-recharging facilities at the main depots.

Consumption and Waste

KMB and LWB take all practicable measures to reduce the consumption of precious resources and streamline waste disposal procedures. We aim to handle and dispose of all materials in compliance with present laws and regulations and in a responsible manner without creating risks to human health or the environment.

Energy Consumption

KMB and LWB consumed around 8,285,000 gigajoules (GJ) of diesel oil in the reporting period, 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.

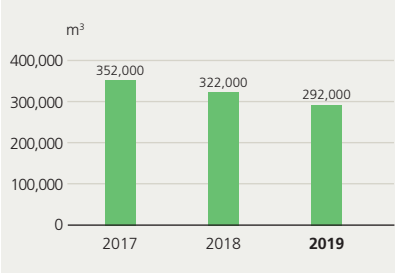
Electricity Consumption

KMB and LWB consumed around 121,700 GJ (33,820,000 kWh) of electricity in 2019, an increase of 2.5% compared to 2018. The energy intensity, by electricity in total, for the reporting year was 0.044 GJ per square feet (12.2 kWh per square feet). The number of bus stops increased by 0.09% compared to 2018 causing the increase of electricity consumption. We continued to explore environment-friendly initiatives and invested in the latest technologies to minimise energy use and reduce greenhouse gas emissions. Over 100 flood lights were changed to LED flood lights at the rooftop 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 flood lights helped the depots reduce its total electricity consumption by around 10%. In addition, we have changed 22 chiller fan coil units to VRF air-conditioning units at Sha Tin Depot. These installations bring a reduction of electricity consumption in that depot by around 30%.

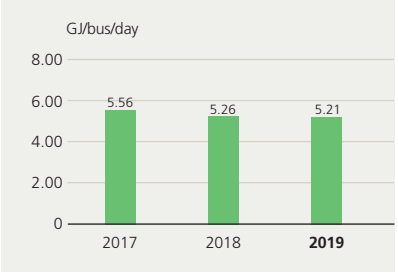
KMB and LWB have installed electric patrol car recharging facilities in their main depots

[2] The emission factors were taken from "Appendix 2: Reporting Guidance on Environmental KPIs" published by the Hong Kong Stock Exchange.

Total Water Consumption of KMB & LWB



Total Diesel Oil Consumption of KMB & LWB



Water Consumption and Waste Water Treatment

KMB and LWB are committed as responsible corporate citizens to reducing water consumption and properly treating effluents before discharge. KMB and LWB consumed around 291,600 cubic metres in the reporting period, with the average water consumption per bus being 0.18 cubic metres per day. Our depots are equipped with 11 automatic waste water treatment systems handling 548 cubic metres per day. Two water recycling systems were upgraded in two KMB depots. The water used for bus washing was collected and recycled, bring a reduction in total water consumption at depots of around 10%.

The new generation environment-friendly air-conditioning system is equipped with electronic air filters that help improve in-vehicle air quality

Waste Generation

KMB and LWB are committed to good waste management through responsible storage and disposal of waste, recycling and reusing resources whenever feasible. Significant types of waste generated in our operations are reported as follows:

Tyres

In 2019, 32,300 used KMB and LWB tyres (equivalent to a saving of 1,938 tonnes of solid waste disposal at landfills) were retreaded by KMB's appointed contractors.

Fluorescent Tubes

In 2019, KMB and LWB sent a total of around 3,600 used fluorescent tubes to the Government's Chemical Waste Treatment Centre for recycling.

Oil and Chemicals

In 2019, around 27,280 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 102,000 litres of waste oil were recycled or disposed of in accordance with the statutory standards.

Around 118,000 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.

With their environmental-friendly design, the automatic waste water treatment systems properly treat effluents, while the fuel filling system prevents spillage

Metals

In 2019, KMB and LWB sent a total of around 707 tonnes of metal to recycling companies.

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 2019, KMB and LWB implemented a default setting on all computers to revert to a screensaver after a designated period of time. This measure serves as a good practice to raise the awareness of staff to the need to save electricity and conserve the environment.