

SUSTAINABILITY REPORT

Caring for the Environment



82 electric buses in fleet

We are driving into a new and green era with our eco-friendly bus fleets and many other sustainable innovations and technologies. We strive to become a carbon-neutral bus operator to set a new industry standard in Hong Kong.





Good Health and Well-Being



Clean Water and Sanitation



Affordable and Clean Energy



Industry, Innovation and Infrastructure



Sustainable Cities and Communities



Responsible Consumption and Production



Climate Action

Environmental Policy

We recognise the inherent environmental impacts of our bus services and we 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;
- Ⓐ Reducing our environmental footprint and combating climate change;
- Ⓐ Enhancing staff environmental awareness by providing training in line with our environmental policy, objectives and targets, as well as in relation to the potential environmental impacts arising from our operations;
- Ⓐ Communicating our environmental policy and requirements to our suppliers and making the policy available to the public;
- Ⓐ Responding to environmental enquiries promptly and ensuring effective internal communication on environmental issues; and
- Ⓐ Ensuring compliance with all applicable local environmental legislation and other relevant requirements.

Environmental Management

KMB has been ISO 14001:2015 certified for the Environmental Management Systems implemented in its 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 the Senior Management, the Engineering Team is introducing new and innovative technologies applicable to both bus fleets and bus operations.



- Ⓐ In collaboration with the Environment and Ecology Bureau, the "KMB Green Journey" events introduce the latest environmentally friendly bus fleet to members of the public

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TCFD

TASK FORCE ON
CLIMATE-RELATED
FINANCIAL
DISCLOSURES

Adopting TCFD Reporting

The Task Force on Climate-related Financial Disclosures ("TCFD"), developed by the Financial Stability Board ("FSB"), aims to provide a framework for climate-related reporting and offers recommendations on the type of information companies should disclose to better inform investors and other stakeholders of the potential risks and opportunities associated with climate change.

TIH adopted the framework recommended by TCFD, discussing in detail the risks and opportunities associated with climate change, the potential impact on our business, and the actions we are taking to cope with these risks and opportunities. TIH is committed to communicating our approach and strategies through the TCFD's four thematic areas: governance, strategy, risk management, and metrics and targets.

Governance

The overall strategic planning and accountability for the Group's sustainable development rests with TIH's Board-level Committee, which determines the sustainability strategy

and oversees its progress. The Board-level Audit and Risk Management Committee is appointed to oversee strategic ESG-related issues concerning TIH, including climate-related strategies, policies, actions and disclosures. It informs the Board of the strategic risks and opportunities presented by climate change, which forms part of the Board's discussion of TIH's strategic plans.

Our ESG Task Force, under the oversight of the Committee, implements the Board's ESG strategy and policies to drive sustainable initiatives throughout our operations, including safety, environmental protection, staff welfare, community engagement and volunteering. The ESG Task Force is also responsible for optimising environmental performance, raising staff awareness of corporate social responsibilities, sharing knowledge and industry best practices and working with the Enterprise Risk Management Task Force of the Company to assess new emerging ESG-related risks.

Our Vision and Strategy

To ensure our business remains resilient against climate change, we consider potential impacts on different business units and develop plans to mitigate and adapt to climate change. When refining our business strategy, the Group recognises that sustainable development is crucial for long-term success. The Group has identified physical risks, including more frequent extreme weather events, and transition risks, such as regulatory changes and customer



demands, which may affect operations to varying degrees. By identifying and effectively managing the financial risks and opportunities associated with climate change, the Group acknowledges the potential for growth that comes with transitioning towards a low-carbon economy.

As such, to align with the National 14th Five-Year Plan and the emission reduction target of the Hong Kong SAR Government, the Group has determined a clear roadmap on upgrading its whole fleet with new energy buses. In addition, we have set a 3-year six environmental targets for key performance indicators for the financial year ("FY") 2023. Using FY 2019 as the baseline, we plan to reduce the carbon intensity and energy intensity, comprising carbon footprints of bus, oil consumption, electricity consumption and water consumption. We are pleased to announce that both KMB and LWB have reached positive results in six environmental targets by 2023, with more details disclosed from pages 44 to 45.

Risk Management

We have incorporated climate-related risks into the Group's Enterprise Risk Management, utilising a systematic approach and consistent risk assessment criteria to identify and manage risks. Accurate risk information is provided to the Management to assist them in decision-making and risk control without compromising cost-effectiveness and efficiency.

A Key Risk Indicator Report ("KRI Report"), summarising the Group's major risks as identified by the Management, is submitted to the Audit and Risk Management Committee three times a year. The KRI Report offers a comprehensive profile of the major risks and outlines the established mechanism for monitoring them.

Our Environmental Targets

In 2023, TIH appointed an external consultant to review the environmental performance of the Group. To move forward, the Board has already established new Environmental Targets for the period from FY 2024 to FY 2028. We have ensured consistency in our targets by once again using FY 2019 as the baseline year. Additionally, we have expanded the scope to include Hong Kong Franchised Public Bus Operations, Hong Kong Non-franchised Transport Operations and Property Holdings and Development, incorporating six modified environmental targets that specifically address Diesel Consumption (Scope 1), Electricity Consumption (Related to Property/ Real Estate Operations only) (Scope 2), GHG Emissions (Scope 1&2), Water Consumption, Solid Chemical Waste (Hazardous), and Metal Waste (Non-hazardous).



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Environmental Targets for Key Performance Indicators by FY 2028

(Baseline: FY 2019)

GHG Emissions

(Scopes 1 & 2)

CO₂e tonnes
(Absolute)

-11%

'000 CO₂e tonnes/km
(Intensity)

-34%

Diesel Consumption

(Scope 1)

'000 GJ/km
(Intensity)

-33%

Metal Waste (Non-hazardous)

'000 kg/km
(Intensity)

-7%

Solid Chemical Waste (Hazardous)

'000 kg/km
(Intensity)

-13%

Electricity Consumption

(Related to Property/Real Estate Operations only) (Scope 2)

kWh/m²
(Intensity)

-35%

Water Consumption

m³/no. of buses
(Intensity)

-34%





▲ LWB signs its first sustainability-linked loan facility with BOCHK, demonstrating the Group's commitment to promoting green transportation

Green Finance

LWB recently closed a HK\$200 million sustainability-linked loan facility with Bank of China (Hong Kong) Limited ("BOCHK") in 2023, bringing the Group's total green loan and sustainability-linked loan facilities to HK\$3,800 million. This figure represents more than 50% of our overall loan facilities, demonstrating the Group's significant efforts to propel Hong Kong towards achieving zero emissions through the use of green finance.

We have established key sustainability performance targets that focus on reducing greenhouse gas emissions from our buses, increasing green procurement practices, and enhancing average training hours for employees. Moving forward, TIH Group will continue to identify suitable financing solutions that will drive Hong Kong's transportation industry into a new era of sustainability.

Greenhouse Gas Emissions Reduction

KMB and LWB seek to minimise greenhouse gas emissions by judicious application of the latest technologies and interventions.

Environmental Bus Fleet

We invest in eco-friendly buses that meet the strict exhaust emission standards of the European Council of Environmental Ministers to create a better environment and minimise climate-related impacts.

At the end of 2023, the KMB fleet comprised 855 Euro VI buses (including three Euro VI diesel-electric hybrid buses), 2,934 Euro V buses, and 56 battery-electric buses, including an addition of 24 new-generation electric buses; while the LWB fleet consisted of 156 Euro VI buses, 116 Euro V buses and four battery-electric buses. The new double-decker electric buses are zero-emission buses that meet the latest standards of KMB, including equipped with solar panel systems, and providing free 5G Wi-Fi internet connection services and featuring ventilation windows. The majority of these buses have been deployed on routes passing through busy corridors to improve the roadside air quality in high-traffic areas.

We have been replacing older bus models with the latest and more energy-efficient bus models to enhance our bus fleet's longevity and environmental performance to achieve zero emissions. The average age of the KMB bus fleet is 7.5 years, while that of LWB is 4.4 years.



▲ The first batch of electric double-deckers has been deployed in the Anderson Road Development Area, receiving strong support from a large number of locals on its maiden trip

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Exploring Renewable Energy and Zero-emission Bus Technologies

KMB and LWB strive to explore renewable energy and zero-emission technologies, demonstrating KMB's and LWB's determination to introduce green public transport in Hong Kong. Attaching great importance to pursuing the Government policy of achieving carbon neutrality by 2050, KMB and LWB have rolled out an electrification roadmap. In the long run, KMB hopes that new energy buses will be deployed in the entire fleet to help make Hong Kong a green city. Currently, KMB and LWB have 30 single-deck electric buses. Together with the 52 double-deck electric buses, KMB and LWB have over 80 electric buses, forming the largest electric bus fleet in Hong Kong.

Other environmental facilities in KMB and LWB's bus fleet:

- Ⓐ KMB has introduced the third-generation solar panels on double-deckers, which reduce the air temperature in the bus compartment and supply power to electronic devices in the bus compartment, thereby reducing fuel consumption. The third-generation solar panel bus can save 3-4% of fuel consumption on each bus daily, which is equivalent to reducing about six tonnes of carbon emissions per bus annually. The system has now become a standard feature in newly purchased buses;
- Ⓐ About 30,000 solar panels are installed on buses, at depots and bus stops. Up to 13 million kilowatt-hours (kWh) of electricity will be generated annually, equivalent to the annual electricity consumption of 4,176 households in Hong Kong, reducing about 12,587 tonnes of carbon emissions. As two franchised bus companies with the largest solar panel systems in Hong Kong, KMB and LWB aim to lead the public transport industry toward the new green era and promote carbon neutrality;
- Ⓐ KMB has successfully designed wind curtains that help reduce energy wasted due to the loss of cooled air of buses and obtained patents that were granted by the Intellectual Property Department. The facility, installed at the rear exit of a bus, will be activated when the exit door is opened, creating an airflow to separate the hot air outside from the cooled air inside. According to tests conducted at the ambient temperature of 32°C, the temperature measured in the area near the exit door inside a bus compartment with wind curtains is 4°C lower than that in a bus without. KMB installed the facility on 600 buses; and
- Ⓐ The scheme to retrofit the fleet with lower-powered LED strips, which will create a softer and more comfortable travel environment for passengers compared to the old LED lighting, is completed. This initiative helps reduce the carbon emissions of our buses by 5,600 tonnes of carbon emissions per year. The old LED light strips will be reused across bus depots and bus stops for lighting.



- Ⓐ The 52 electric double-deck buses self-purchased by KMB, with solar panel systems being a standard feature in its new purchases, have made a substantial contribution to achieving carbon neutrality in Hong Kong

CO₂ Concentration Checks

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. Our buses generally demonstrate compliance with the requirements.

Emissions Reduction

KMB and LWB adopt the latest technologies to reduce roadside emissions and maintain good air quality in bus compartments. We have in place a number of measures to meet the high standards of exhaust emissions laid down by the European Council of Environmental Ministers, which include using near-zero sulphur diesel, renewing bus models and upgrading older buses by retrofitting exhaust treatment devices such as diesel oxidation catalysts, diesel particulate filters, and selective catalytic reduction units.

As part of our environmental protection commitment, KMB and LWB invest regularly to upgrade the environmental performance of their bus fleets and patrol cars. KMB and LWB have introduced electric patrol cars as back-up support and set up electricity-recharging facilities at their main depots.

Energy Saving

KMB and LWB take all practicable measures to reduce resource consumption and streamline waste disposal procedures. We handle and dispose of all materials in compliance with applicable laws and regulations, and in a responsible way without posing risks to human health or the environment.



ⓐ KMB adopts the aircraft-style "Posilock" refuelling system to prevent fuel spillage

Fuel

To reduce fuel consumption, a number of measures have been adopted throughout the KMB and LWB bus fleets and across all operations:

- ⓐ The aircraft-style "Posilock" fuel filling system is used to refuel buses;
- ⓐ Ambient sensors are installed on air-conditioned buses to reduce unnecessary cooling;
- ⓐ The use of synthetic gearbox oil extends oil drain intervals to reduce waste oil by 80%; and
- ⓐ The mileage-based oil change scheme reduces engine oil consumption and waste oil by 40%.

ⓐ KMB has installed a total of 30,000 solar panels on bus roofs, bus stops and other facilities, enhancing the utilisation of renewable energy

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Ⓜ To enhance eco-working awareness among employees, KMB promotes a “Clean and Green” environmental protection culture by launching activities such as The Bus Terminus Cleanliness Competition and The Bus Terminus Energy Reduction Competition, and selecting the best bus terminus practice every month

Electricity

We continue to explore environmentally friendly initiatives and invest in the latest technologies to minimise energy use and reduce greenhouse gas emissions.

In addition to our one-off LED light replacement and continuous housekeeping measures, we have dynamically adjusted our electricity consumption pattern in accordance with the latest operation scales, including the adjustment of illumination time of parking depots and the optimisation of equipment used to support our facilities' operation duration.

We cooperate with a power company to install 30,000 solar panels at depots, bus termini, bus shelters and other facilities to extend the application of renewable energy and reduce greenhouse gas emissions.

Green Measures in the Office

The Green Office concept drives both the design and renovation of our premises. We run our air-conditioning systems at 25.5°C to align with the Government's Action Blue Sky Campaign and save energy. Operating hours have also been rearranged to reduce energy waste during non-office hours. High-efficiency air conditioning units are installed in all newly renovated offices. Moreover, we have also set up recycling arrangements for used toners, plastic materials and used papers and have regularly promoted good housekeeping practices for energy saving to all staff members.

Waste Reduction

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:

Waste Water

As responsible corporate citizens, KMB and LWB are committed to reducing water consumption and properly treating effluents before discharge. Our depots are equipped with nine automatic wastewater treatment systems handling 400 cubic metres per day. The water used for bus washing was collected and recycled, reducing total water consumption at depots by around 4%. Newly setup rainwater collection and water recycling systems have been introduced in some of our satellite depots.

Tyres and Metals

Used KMB and LWB tyres were retreaded by KMB's appointed contractors, and waste metals were sent to recycling companies.

Oil and Chemicals

Solid chemical waste is processed and stored by type in designated areas at bus depots before disposal by a registered chemical waste collector at the Government's Chemical Waste Treatment Centre, while waste oil is recycled or disposed of in accordance with the statutory standards. In the reporting period, KMB and LWB have improved the engine oil replacement cycle by changing new engine oil with extended oil drain intervals to reduce solid chemical waste.

Batteries are disposed of by a licensed contractor complying with the instructions of the Environmental Protection Department ("EPD"), with some of them exported to overseas facilities approved by the EPD under the Basel Convention.



Ⓜ The fleet is now using a new tyre model to extend the lifespan of tyres and reduce solid waste disposal

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CASE STUDY



KMB's double-deck electric buses entering service validates their suitability for Hong Kong and lays a crucial foundation for green transportation

Hong Kong has stringent operational requirements for double-deck buses. They must accommodate passenger capacity and load capacity, in addition to dealing with all-weather air conditioning, narrow and winding roads, and steep slopes. KMB recognises the long-term negative impacts of climate change on a global scale and has introduced new energy buses to reduce carbon emissions and improve roadside air quality. The engineering team of KMB closely collaborates with bus manufacturers from the Mainland and overseas to bring in "zero-emission" electric double-deck buses that not only meet daily operational needs but are also well suited for use in Hong Kong.

Among the discussions surrounding various new energy buses, particular concern has been raised about the charging time and the environmental benefits of electric buses. Typically, buses are

parked at depots for approximately 4 to 5 hours overnight for cleaning, simple maintenances and repairs. Electric buses take advantage of this period for charging meaning the charging process for electric buses not only has no impact on daily operations but also takes only about two hours. Electric buses are able to travel up to 300 kilometers, which is sufficient to meet the operational needs of nearly 80% of KMB buses for an entire day.

In order to meet the fast-charging needs of electric buses, KMB has installed sufficient direct current (DC) fast charging facilities at bus depots. Each charging facility can accommodate up to three electric buses charging simultaneously every night, reducing the waiting time for buses in need of a charge. KMB is preparing to build two

multi-storey electric bus depots in Tuen Mun and Tai Po which will provide 850 bus parking spaces. These depots are expected to be complete and operational within three to five years.

KMB is currently collaborating with two electric bus manufacturers, including China's BYD and the United Kingdom's Alexander Dennis Limited. Recently, the Hong Kong exclusive electric double-deck bus, Alexander Dennis Enviro500EV, participated in the manufacturer's product launch event in the United Kingdom. The manufacturer showcased the latest electric double-deck bus in Hong Kong to 150 bus service operators and suppliers from around the world. The design of the electric bus, combining a sense of modernity, technology and environmental friendliness, has garnered unanimous praise from global bus industry leaders.



KMB has faced various challenges in the development of new energy buses, particularly in the area of technology. In the past, bus manufacturers predominantly produced two-axle electric single-deck buses with left-hand drive, and they had limited experience in manufacturing three-axle electric double-deck buses in both China and Europe. In view of this, to meet the high passenger capacity and endurance requirements in Hong Kong, KMB has engaged in extensive discussions and exchanges with bus manufacturers during the early stage of the electric double-deck bus development, with a particular focus on the operational requirements and relevant production techniques specific to Hong Kong. When KMB's first electric double-deck bus arrived in Hong Kong for vehicle type approval by the Transport Department, both KMB and the bus manufacturer made continuous adjustments to ensure compliance with the specified requirements of the Transport Department and the bus's full suitability for use in Hong Kong.

Since electric double-deck buses entered into service, they have gained popularity among the public. Their mechanical performance and endurance have received positive feedback, affirming that KMB's electric buses are well suited for Hong Kong. As an engineer, I am highly encouraged by this. In addition to its continuous efforts in sourcing electric double-deck buses suitable for local use, the company is actively collaborating with bus manufacturers to engage in in-depth discussions on maintenance, repairs, and battery technology for electric double-deck buses. This ensures that electric buses provide the public with a safe, reliable, quiet, and comfortable service.

Brad Leung, KMB Assistant Engineer

