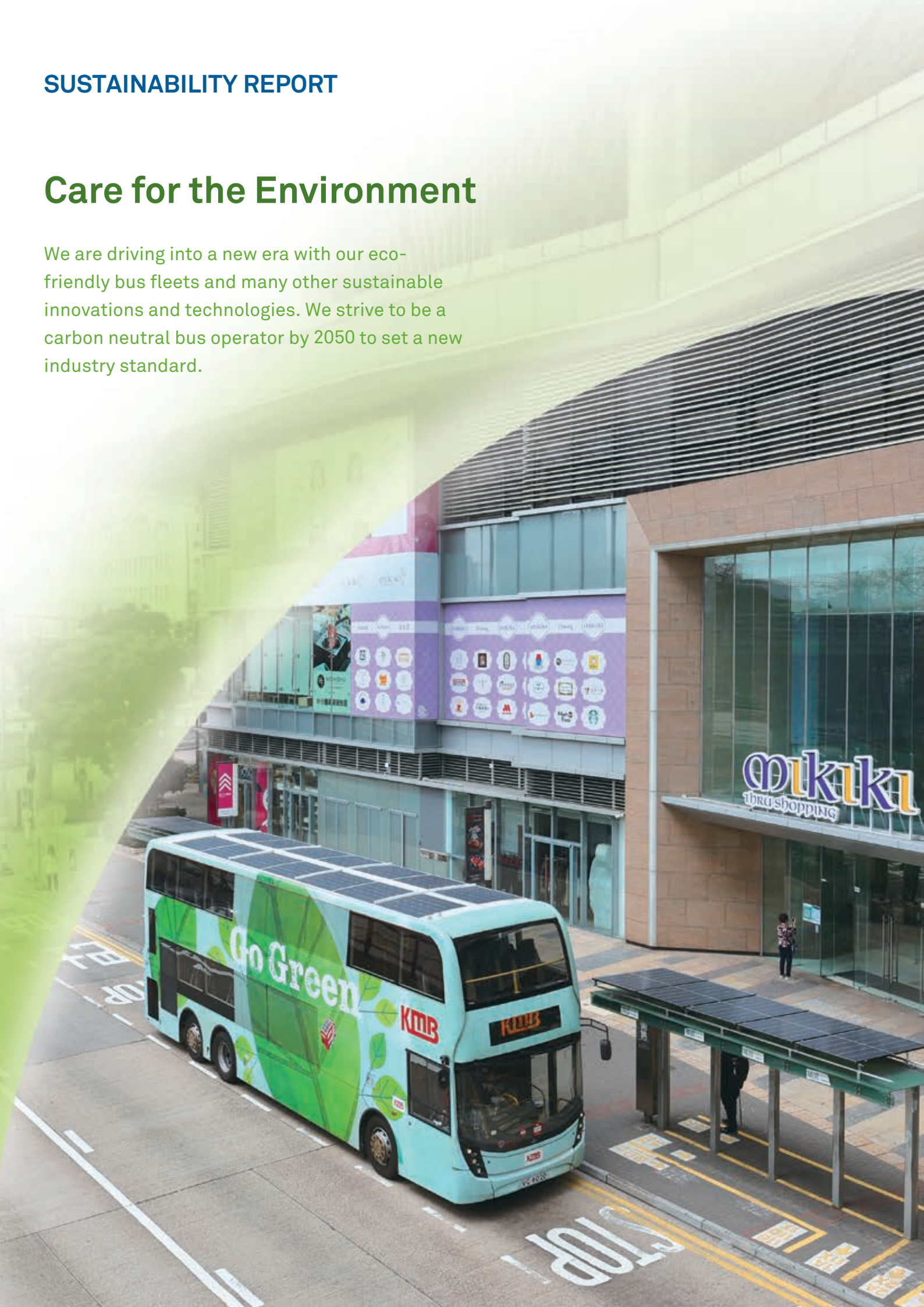


## Care for the Environment

We are driving into a new era with our eco-friendly bus fleets and many other sustainable innovations and technologies. We strive to be a carbon neutral bus operator by 2050 to set a new industry standard.





### 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 and environmental 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 communications on environmental issues; 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 the senior management, the Engineering Team is introducing new and innovative technologies applicable to both bus fleets and bus operations.



KMB and LWB commit to employing eco-friendly buses to foster carbon neutrality in Hong Kong



# SUSTAINABILITY REPORT



## Adopting TCFD reporting

The Task Force on Climate-related Financial Disclosures (“TCFD”), established by the Financial Stability Board, was set up to define how reporting could take account of climate-related issues. We adopted the framework recommended by TCFD, discussing in detail the risks of climate change, the potential impact on our business, and the actions we are taking to cope with these risks.

## Governance

TIH’s Board has overall accountability for managing all risks and opportunities, including climate change. The Board-level Committee, Audit and Risk Management Committee, was appointed to oversee strategic ESG-related issues related to 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 short- to long-term plans.

## Our Environmental Targets

### Target by FY 2023

(Baseline: FY 2019)



#### Carbon Footprint of Bus

tCO<sub>2</sub>e per million km

Progress by FY2021: **-1.29%** (On Track)



#### Diesel Oil

GJ per million km

Progress by FY2021: **-1.42%** (On Track)



#### Electricity

kWh per m<sup>2</sup>

Progress by FY2021: **-37.50%\*** (On Track)



#### Water

m<sup>3</sup> per bus

Progress by FY2021: **-19.72%\*** (On Track)

\* The electricity and water consumption will be increased in the coming two years due to the implementation of anti-epidemic measures and reduction of using diesel oil buses.

## Our Visions and Targets

To align with the National 14<sup>th</sup> Five-Year Plan and the emission reduction target of the HKSAR Government, the Group has outlined a vision of upgrading the whole fleet with new energy buses by 2050. Hence, we have set short-term Environmental Targets for the financial year (“FY”) 2023. Using FY2019 as the baseline, we plan to reduce the carbon intensity and energy intensity, comprising carbon footprint of bus, oil consumption, electricity consumption and water consumption. Meanwhile, the Group is undergoing an in-depth ESG checking and planning to establish long-term targets to reach our 2050 vision.

## Risk Management

We have integrated climate-related risks into the Group’s Enterprise Risk Management. A Risk Key Performance Indicator (“Risk KPI 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 Risk KPI Report provides a comprehensive profile of the major risks and the mechanism established for monitoring these risks.

## 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 2021, there were 584 Euro VI buses (including three Euro VI diesel-electric hybrid buses), 2,935 Euro V

buses and ten battery-electric buses in the KMB fleet, and 119 Euro VI buses, 117 Euro V buses and four battery-electric buses in the LWB fleet. The latest Euro VI double-decker features a glass window that shows the staircase leading to the upper deck. Sunlight is directed onto the stairs, enhancing the brightness in the bus compartment, safety and passengers' experience. The majority of these buses have been deployed on routes passing through low-emission zones to improve the air quality in busy districts. 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 emission". The average age of the KMB bus fleet is 6.6 years, while that of LWB is 6.0 years.



KMB has purchased 16 new single-deck electric buses as a step forward to the vision of upgrading the entire fleet to new energy buses by 2050

# SUSTAINABILITY REPORT

## Exploring Renewable Energy and Zero-emission Bus Technologies

KMB and LWB strive to explore renewable energy and zero-emission technologies, demonstrating KMB and LWB's determination to introduce green public transport in Hong Kong. To attach great importance to pursue the Government policy of achieving carbon neutrality by 2050, KMB and LWB introduce the electrification roadmap and plan to install over 22,000 solar panels in order to illustrate its development blueprint for new energy and electric buses.

- ✔ KMB plans to introduce 500 electric buses by 2025, accounting for one-eighth of the whole bus fleet. In the long run, KMB hopes that new-energy buses will be deployed in the entire fleet by 2050 to make Hong Kong a green city. KMB and LWB have 30 single-deck electric buses, together with the 52 double-deck electric buses privately purchased this year. It is expected to have over 80 electric buses by 2022;
- ✔ KMB has introduced the third generation solar panels on double-deckers. The system reduces the air temperature in the compartment by around 8-10°C compared to a bus without such a system. It supplies power to the fans of the air-conditioning system, thereby reducing fuel consumption. The third generation solar panel bus can save 5-8% of fuel consumption on each bus daily, which

is equivalent to reducing about six tonnes of carbon emissions per bus annually. The system becomes a standard feature in new purchase buses;

- ✔ Hydrogen fuel cell bus, alternative new energy technology, is being explored with bus manufacturers for the route with longer driving range. KMB will collaborate with different potential suppliers for hydrogen supply in order to follow the latest Government policy for the pilot trial scheme; and
- ✔ About 22,000 solar panels will be installed on buses, at depots, and bus stops. Up to ten million kilowatt-hours (kWh) of electricity will be generated annually, equivalent to the annual electricity consumption of 2,300 households in Hong Kong, and reducing about 5,400 tonnes of carbon dioxide emissions. As a franchised bus company with the largest solar panel system in Hong Kong, KMB and LWB aim to lead the public transport industry toward the new green era and promote carbon neutrality.


## 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. Our buses generally demonstrate compliance with the requirement.



To promote green public transport in Hong Kong, KMB and LWB lay out an electrification roadmap and install solar panels at bus stops and on bus roofs



 CASE STUDY



## Solar Bus to Reach Carbon Neutrality

To address the global warming crisis, KMB has been actively promoting the use of renewable energy. The third generation solar power devices installed on bus roofs generate electricity that drives 16 fans in the air-conditioning system. Ventilators powered by solar panels will start when the temperature in the saloon reaches 35°C or above after the bus engine stops. The hot air inside the bus will be vented, lowering the temperature by 8 to 10°C and saving seven litres of fuel per bus each day while reducing the fuel consumption by 5 to 8%, equivalent to six tonnes of carbon emission per year. KMB has been developing solar energy devices on buses since 2017. The third generation has a larger coverage area than previous ones. Solar panels are only 2mm thin and can be

directly pasted on bus roofs without installing aluminium frames, reducing the weight added to buses from 110kg to 70kg. The device also supplies electricity to the fans in the air conditioning system, increasing the energy efficiency by 33% when compared to that of the previous generation.



**Reducing 8%**  
of fuel consumption per bus daily



**Reducing 6 tonnes**  
of carbon emission per bus annually



Eric Cheung, Engineer at KMB

“ Summer in Hong Kong is hot. The temperature inside bus compartments rises when buses are parked outdoor under bright sunlight. We used to start engines and air conditioners to cool the bus interiors before picking up passengers, causing higher fuel consumption. In view of this, we have conducted studies on installing solar panels on bus roofs to supply electricity to exhaust fans on buses to vent the hot air out; that is, using solar energy to solve the heat problem brought by the sun. We have been improving our solar panel designs by introducing ultra-thin solar panels as thin as 2mm. The new design makes the panels weigh less and have a larger coverage area that almost doubles the power supply efficiency. We have played a team effort throughout the process and are very happy to contribute to environmental protection. ”

# SUSTAINABILITY REPORT

## Emissions Reduction

KMB and LWB adopt the latest technologies to reduce roadside emissions and maintain the good air quality in bus compartments. We have a number of measures, including using Near Zero Sulphur Diesel, renewing the models and upgrading older buses by retrofitting exhaust treatment devices, such as Diesel Oxidation Catalysts, Diesel Particulate Filters, and Selective Catalytic Reduction units, to meet the high standards of exhaust emission laid down by the European Council of Environmental Ministers.

As part of our environmental protection commitment, KMB and LWB make continuous investments in upgrading the environmental performance of bus fleets and patrol cars. KMB and LWB have introduced electric patrol cars for back-up support and set up electricity-recharging facilities at the 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 we do it in a responsible way without posing risks to human health or the environment.

## Fuel

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 reduce unnecessary cooling;
- ✔ The use of synthetic gearbox oil extends the oil drain interval to reduce waste oil by 80%; and
- ✔ The mileage-based oil change scheme reduces engine oil consumption and waste oil by 40%.

## Electricity

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

Besides 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 adjustment of illumination time of parking depots and optimisation of equipment used to support our facilities' operation duration.

We cooperate with a power company to install Solar Photovoltaic Systems consisting of more than 3,500 solar power panels at depots, bus termini and bus shelters to strengthen the application of renewable energy and reduce greenhouse gas emissions.

## Green Measures in the Office

The Green Office concept drives both the design and the renovation of our premises. We run our air-conditioning system 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. Solar film will be installed on building windows to isolate the outside heat effect and reduce electricity consumption and the demand for air-conditioning. We have also set up recycling arrangements for used toners, plastic materials and used papers.

## 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 ten automatic waste water 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 set up rainwater collection and recycling system has been introduced in some of our satellite depots. We would continue to install more rainwater collection and recycling systems in some other bus depots in the coming years so as to increase water consumption saving.

## Our Environmental Targets

### Target by FY 2023

(Baseline: FY 2019)



### Solid Chemical Waste

kg per million km

Progress by FY2021: **-3.79%** (On Track)



### Metal

kg per million km

Progress by FY2021: **-1.28%** (On Track)

## Tyres and Metals

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

## Fluorescent Tubes

KMB and LWB sent used fluorescent tubes to the Government's Chemical Waste Treatment Centre for recycling.

## Oil and Chemicals

Solid chemical waste is processed and stored by 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, while waste oil is recycled or disposed of in accordance with the statutory standards.

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.

