







#### EMISSION & ENERGY

Accelerating efforts to integrate solutions to enhance fuel and energy efficiency in business operations and activities. This will also include the commencement of our alignment to the TCFD.

#### **RESOURCE EFFICIENCY**

Minimising our environmental footprint and affiliated impacts through water and waste management.

#### **SUSTAINABLE TRANSITION**

Driving innovative solutions to provide accessible and low carbon transportation for all.

As Sustainability has gained significant footing amongst businesses as well as our various stakeholders and regulators, we have geared our initiatives towards achieving our long-term target of net zero operations by 2050 and promoting a greener community as Singapore's leading public transport provider.

Aligned with the Singapore Government's focus on sustainability, the Land Transport Authority's Land Transport Master Plan 2040 (LTMP) outlines strategies for a cleaner and greener public transport network. This plan, along with the Singapore Green Plan 2030, establishes ambitious targets for sustainable commuting by 2030 and 2040. Furthermore, the GreenGov.sg report reinforces this commitment by detailing plans to improve public transport infrastructure and transition to cleaner energy sources for public buses. In resonance with the Singapore government's commitment to

introduce greener buses, SBS Transit works closely with LTA to achieve our targets of 50% of the bus fleet running on clean energy by 2030, and the entire fleet by 2040. We believe that our efforts and initiatives will contribute towards enabling this change and transition.

#### **EMISSIONS & ENERGY**

#### WHY THIS ISSUE IS MATERIAL

Being a public transport service provider, we are conscious of the environmental impact and emissions associated with our day-to-day operations. We are committed to actively seeking innovative solutions to minimise our environmental footprint. Our vision is to offer state-of-the-art sustainable transportation options to our customers while maintaining our commitment to deliver reliable and affordable public transport services. To achieve this, we dedicate our resources to identifying opportunities to reduce our emissions.

#### **HOW WE MANAGE THIS**

As a subsidiary of ComfortDelGro, we strongly position ourselves in line with ComfortDelGro's commitment to the Science Based Targets Initiative (SBTi) of absolute contraction using sector specific decarbonisation pathways in line with 1.5°C trajectories.

We are dedicated to reducing our environmental footprint by utilizing energy in a responsible and efficient manner. To achieve this, we are implementing various measures, such as integrating green and renewable energy sources whenever feasible, incorporating energy-saving designs and equipment in our facilities, and analysing consumption patterns to identify opportunities for ongoing enhancements and preventive maintenance, ultimately optimizing our energy usage.

To accomplish our broader energy objectives, we will:

- a) Identify areas of significant energy consumption and implement effective energy usage practices in these areas;
- b) Develop plans and targets to better manage energy consumption;
- c) Review energy consumption data and progress of energy conservation projects every quarter; and
- Take necessary actions to comply with all legal requirements, procedures and instructions.

Both SBS Transit's Bus and Rail Energy Efficiency Workgroups are accountable for guiding our initiatives regarding energy consumption in line with our climate commitments. The Workgroups meet regularly to track and review SBS Transit's energy performance, as well as monitor the progress of the energy saving initiatives implemented. The Workgroups strive to improve energy efficiency and reduce affiliated wastage with a key focus on energy consumptions by rail tractions, and air-conditioners, as they constitute the bulk of our energy usage. A monthly energy consumption and energy efficiency trending report is generated to measure the successes of our energy saving initiatives. In doing so, we can detect issues early on and deploy any necessary energy curbing initiatives which allow us to achieve our emission reduction goals. We keep our stakeholders engaged and wellinformed of ongoing initiatives and actions through quarterly briefings,

email messaging, and materials relating to the reports.

To further enhance our commitment to energy efficiency, SBS Transit will undertake an expansion in the development of solar energy projects. The use of solar energy ultimately results in a reduced demand on traditional sources of energy, such as grid electricity generated from non-renewable sources. Leveraging the successes of our solar initiatives in previous years, SBS Transit aims to progressively scale up our solar energy projects to increase our generation capacity.

#### **OUR GREEN INITIATIVES**

Energy Efficiency at our Premises
In our commitment to reducing our
environmental impact and energy
costs, we're actively optimising energy
usage across our premises.

This includes initiatives like adjusting Air-handling unit (AHU) systems based on passenger flow at NEL and DTL stations, replacing air conditioners with more efficient units at bus locations (saving an estimated 12,000 kWh annually), and implementing energy audits. DTL's recent in-depth level-3 audit led to immediate chiller optimisation and air-conditioning adjustments, projected to save 570,000 kWh monthly. Similarly, an audit at NEL stations identified a need for asset replacement due to limited further optimisation potential and declining efficiency.

## **Solar Energy Generations at Depots and Interchanges**

Currently, solar energy is generated at 3 premises: Ulu Pandan Bus Depot, Yio Chu Kang Bus Interchange and Gali Batu Train Depot. The generation capacity of our solar energy projects has doubled since 2019, demonstrating SBS Transit's commitment to increasing the availability of renewable energy.







SOLAR GENERATED (KWH)	2019 (BASELINE)	2021	2022	2023
Ulu Pandan Bus Depot	860, 690	860,036	810,664	806,385
Yio Chu Kang Bus Interchange	-	199,322	185,879	182,666
Gali Batu Train Depot	1,203,000	1,334,000	3,323,259	3,333,526
Total	2,063,690	2,393,358	4,319,802	4,322,577

## Supporting the Shift to Environmentally Friendly Buses in Singapore

SBS Transit continues to work closely with the LTA to support the implementation of the LTMP 2040, aiming to transition the bus fleet to cleaner energy buses by 2040. To date, we have integrated 32 electric and 25 hybrid buses into our operations with plans to introduce more over the next few years. To ensure compliance with NEA and EU emission standards up to Euro 6, our current diesel buses use high-performance fuel with additives to minimise exhaust emissions. To maintain optimal fleet performance, we prioritise preventive maintenance and send buses for rigorous inspections on a bi-annual basis.

#### Optimising Train Deployment for Energy Savings

SBS Transit is conducting an ongoing trial to optimise train schedules, trip times, and dwell times to improve deployment and match customer travel patterns. This not only reduces wasted resources and optimises train usage compared to fixed schedules, but also explores capturing regenerative braking energy for significant fleet-wide energy savings.





#### **Building and Construction Authority (BCA) Green Mark Award Platinum**

In 2023, SBS Transit has been recertified with the BCA Green Mark Award Platinum SUPER LOW ENERGY award for Ulu Pandan Bus Depot through:

- A fully natural ventilated bus parking area
- Photovoltaic solar system with a capacity of 700 kWp
- Extensive use of energy efficient light-emitting diode (LED) fittings for the entire depot
- Energy efficient lifts integrated with a Variable Voltage Variable Frequency drive system and sleep mode function
- NEWater System as alternative water source for non-portable uses such as bus washing
- Extensive use of water efficient fittings with rated Excellent (✓✓✓) under the PUB Water Efficiency Labelling Scheme
- Use of refrigerants that are less damaging to the ozone layer



#### Use of Telematics System (iSafe) to Promote Eco Driving

The iSafe system, implemented by SBS Transit in October 2020, combines two sensing components on buses - the SAGE telematics system providing real-time feedback on negative driving habits and Mobileye offering a comprehensive view of driver behaviour. This system focuses on monitoring driver behaviour and identifying instances of excessive idling and revving to promote safe and

eco-friendly driving practices. Through immediate alerts, Bus Captains are encouraged to avoid inefficient driving habits.

The information gathered is analysed by Interchange Managers through the iSafe Portal and to assess the driving proficiency of each driver, enabling them to recognise strengths and areas needing improvement. Bus Captains can also track their performance

using the iLink mobile application. Leveraging on the iSafe data and safety records, we have introduced SBS Transit iLearn, to identify Bus Captains who need additional corrective and preventive trainings to improve their driving techniques. The adoption of these systems has not only resulted in a reduction in accident rates over time but has also brought about enhancements in fuel economy and efficiency in fuel consumption.



## TECHNOLOGY EMPLOYED WITHIN THE ISAFE SYSTEM

REVVING BRAKING ACCELERATION SPEEDING IDLING CORNERING

Headway Warning and Monitoring Forward Collision Warning Lane Departure Warning Pedestrian Warning

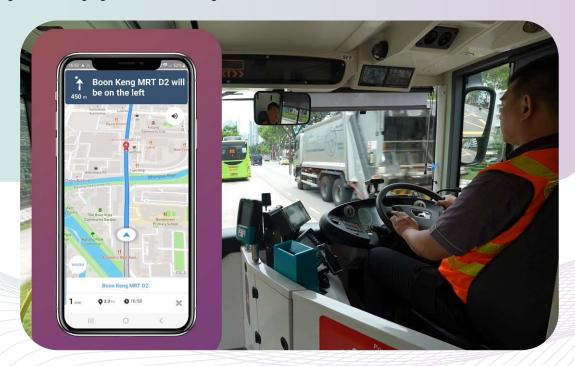




iSAFE Portal for Interchange Managers to track the performance of Bus Captains

#### **Digitalising Training with the Bus Bridging Navigator Application**

As Singapore's largest public bus operator, SBS Transit, keeps the nation moving with over 3,500 buses serving 220 routes. During train disruptions, our Bus Captains activate special bridging routes to ensure seamless connectivity. As these disruptions are infrequent, annual refresher training equips Bus Captains with the necessary familiarity of bridging routes. To further minimise fuel emissions and enhance training quality, SBS Transit developed the innovative Bus Bridging Navigator Application, reducing the need for in-person on-site training. When fully implemented by Q1 2024, this initiative is expected to deliver up to 80% fuel savings from bridging bus route training.

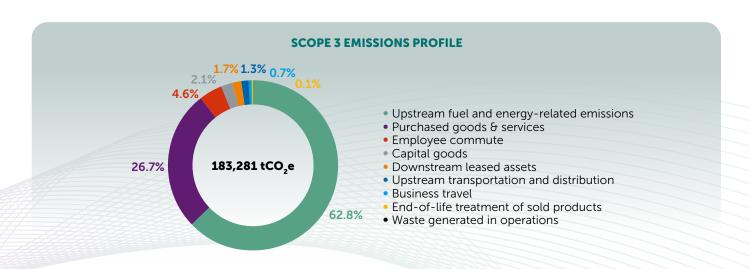


#### **OUR PERFORMANCE**

To assess our environmental impact, we conducted a comprehensive review of our greenhouse gas emissions in 2023. This inventory, aligned with the GHG Protocol, accounts for all our Singapore operations under our operational control.

Despite ongoing efforts to improve energy efficiency and reduce emissions, our 2023 Scope 1 and Scope 2 emissions saw a year-on-year increase of 1.7% and 2.9% respectively. This is attributed to increased operations, improved calculation methods and a more refined emissions boundary, which now includes all entities and assets under our operational control. Previously categorised as Scope 3 (Upstream Leased Assets), these emissions are now reflected in Scope 1 and 2, providing a more comprehensive picture of our environmental impact.

To assess our total environmental impact, we went beyond Scopes 1 and 2 and conducted a detailed analysis of Scope 3 emissions following the GHG Protocol. This analysis focused on the categories most relevant to our operations.



Improved data collection has allowed us to refine our Scope 3 reporting by calculating emissions for previously screened Categories 6 (business travel) and 13 (downstream leased assets) in 2023. This methodology will continue for these categories.

To achieve our energy saving targets and realise our absolute reduction target of 25% lower Scope 1 and 2 fleet emissions by 2030, our Bus Operations prioritise fuel reduction through optimizing bus schedules, promoting eco-driving behaviours, and deploying buses based on its fuelefficiency. By strategically deploying our most fuel-efficient models on high-mileage routes, we aim to improve overall fuel efficiency and minimise environmental impact. This approach is regularly reviewed and updated in line with changes in our bus fleet and service offerings to ensure long-term sustainability. In addition, we have

developed a data analytics tool to track the deployment and fuel consumption of our buses since September 2022 to enhance monitoring. The progress of emission targets is monitored and reported to the Board for review.

In a testament to our commitment to transparency and accountability, SBS Transit was recognized by the SGX Sustainability Reporting Review 2023 as a frontrunner for its Scope 3 disclosures. The report offers a comprehensive analysis of Singapore's listed issuers' sustainability reporting practices, serves as a valuable resource for companies to benchmark their performance, identify improvement areas, and share best practices.

#### LOOKING FORWARD

SBS Transit will continue its collaborative efforts with LTA on the installation of solar panels, including at Seletar Bus Depot and Sengkang Depot by 2024. On top of this, we will be embarking on the installation of solar panels at four other premises in 2024. These initiatives are expected to meet our short-term target of achieving 7 MWp generation capacity by 2030.

To further improve energy management and achieve a reduction in consumption for Rail, we are looking to implement an energy dashboard to track the electricity usage of our tunnel ventilation systems and environmental control systems to ensure efficient power utilisation. Additionally, we will explore innovative cooling solutions to minimise electricity consumption for air conditioning in stations and depots.

As we continue to transition to low-carbon transport solutions and reduce our carbon emissions, we are exploring the feasibility of using carbon credits to offset our residual emissions at selected locations.

GRI 302-1: Energy Consumption within the Organisation TR-RO-11a.3, TR0401-03: Total Fuel Consumed

FUEL TYPE (LITRES)	2019 (BASELINE)	2021	2022	2023	% CHANGE FROM BASELINE YEAR
Non-Renewable Fuels (Diesel)	152,176,790 (99.999%)	133,538,848 (99.997% of total fuel use)	134,131,446 (99.998% of total fuel use)	140,251,592 (99.999% of total fuel use)	-8%
Non-Renewable Fuels (Petrol)	3,145 (0.001%)	3,588 (0.003% of total fuel use)	2,481 (0.002% of total fuel use)	1,873 (0.001% of total fuel use)	-40%

#### GRI 302-1: Electricity Consumption

ENERGY TYPE (kWh)	2019 (BASELINE)	2021	2022	2023	% CHANGE FROM BASELINE YEAR
Electricity Purchased <sup>3</sup>	452,960,274	420,974,535	408,298,271 (Of which 1.33% is consumed by tenants)	407,775,255 (Of which 1.43% is consumed by tenants)	-10%
<b>Renewable Electricity Consumed</b>	1,839,993	2,149,746	4,108,822	4,106,206	123%
Cooling Consumption (krWh)	4,946,368	3,863,716	4,417,239	4,548,126	-8%

#### GRI 302-1: Electricity Sold

ENERGY TYPE (kWh)	2019 (BASELINE)	2021	2022	2023	% CHANGE FROM BASELINE YEAR
<b>Electricity Sold</b>	223,696	243,612	210,981	216,365	-3%

#### GRI 302-3: Energy Intensity

ENERGY INTENSITY TYPE	2019 (BASELINE)	2021	2022	2023	% CHANGE FROM BASELINE YEAR
Total Electricity Intensity (kWh/S\$M Revenue)	313,424	322,788	272,160	269,708	-14%
Total Fuel Intensity (litres/S\$M Revenue)	105,367	101,875	88,519	91,841	-13%

All types of energy within the organisation have been factored into the calculation of the intensity ratios presented.

Due to improvements in data collection, tenant consumption data can be obtained for 2022 onwards. Tenant consumption of electricity purchased is 1.33% (5,446,768 kWh) and 1.43% (5,849,623 kWh) for 2022 and 2023 respectively and has been included in our overall consumption for comparative purposes, taking a conservative approach.

GRI 305-1: Direct (Scope 1) GHG Emissions<sup>4</sup>

GRI 305-2: Energy Indirect (Scope 2) GHG Emissions

GRI 305-3: Other indirect (Scope 3) GHG Emissions<sup>5</sup>

GHG EMISSIONS (tCO <sub>2</sub> e)	2021	20226	2023
Scope 1	380,194	397,731	404,531
(Direct Emissions)	(48% of total emissions)	(51% of total emissions)	(53% of total emissions)
Scope 2	173,334	165,229	170,239
(Indirect Emissions from Electricity)	(22% of total emissions)	(21% of total emission)	(23% of total emissions)
Scope 3	238,955	217,982	183,281
(Indirect Emissions)	(30% of total emissions)	(28% of total emissions)	(24% of total emissions)

Scope 1 includes  $CO_2$ ,  $CH_4$  &  $N_2$ 

SCOPE 3 CATEGORY	SCREENED OR CALCULATED	METHODOLOGY	2023 EMISSIONS (tCO <sub>2</sub> e)
1. Purchased Goods & Services	Calculated	GHG Protocol: Spend-based method	49,031
2. Capital Goods	Calculated	GHG Protocol: Spend-based method	3,106
3. Upstream Fuel & Energy Related Emissions	Calculated	GHG Protocol: Average-data method	115,084
4. Upstream Transportation and Distribution	Screened	Calculated estimation based on spend based screening	3,924
5. Waste	Calculated	GHG Protocol: Waste-type specific method	112
6. Business Travel	Calculated	GHG Protocol: Distance-based method	1,212
7. Employee Commute	Screened	Calculated estimation based on employee headcount intensity	8,353
12. End-of-life Treatment of Sold Products	Calculated	GHG Protocol: Waste-type specific method	9
13. Downstream Leased	Calculated	GHG Protocol: Asset-specific method (buildings) & Lessee-specific method (vehicles)	2,450

#### GRI 305-4: GHG Emissions Intensity<sup>7</sup>

EMISSIONS INTENSITY (tCO <sub>2</sub> e/S\$M/REVENUE)	2021	2022	2023	
Scope 1 and 2	422.4	371.5	376.4	
Total (Scope 1, 2 and 3)	604.6	515.4	496.4	

<sup>4</sup> All GHG emissions calculations were completed in accordance with the GHG Protocol. Our emissions were calculated using a mix of US EPA, DEFRA 2022 and 2023 and EMA emission factors, where applicable.

<sup>5</sup> All GHG emissions are calculated in carbon equivalent ( $CO_2e$ ), and this also includes all appropriate GHG such as methane ( $CH_4$ ) and nitrous oxide ( $N_2O$ ).

With an improvement in our data collection and calculation, our Scope 1 GHG emissions have been restated to include refrigerant emissions. This has resulted in a 2% increase in overall 2022 GHG emissions compared to the level previously reported. The improvement in tenant emissions calculation, resulted in a shift from Scope 2 emissions to Scope 3 emissions compared to previously reported figures.

<sup>7</sup> Due to the restatements of the GHG emissions, emissions intensity figures for 2022 have been updated accordingly.

### CLIMATE CHANGE ADAPTATION AND MITIGATION

#### WHY THIS ISSUE IS MATERIAL

The World Economic Forum's Global Risks Report 2023 outlines the environmental threats over the next two years, such as natural disasters, climate change challenges, environmental damage incidents, and resource crises, with a longer-term risk of biodiversity loss and ecosystem collapse in the next decade. The report emphasised the need for collective action to prepare for future crises and create a more stable world. In addressing climate change risks, SBS Transit has undertaken a screening exercise to identify the key climate risks impacting our operating environment.

#### **HOW WE MANAGE THIS**

SBS Transit has pledged its support for the recommendations by the TCFD and voluntarily disclosed its climaterelated financial disclosures in four key areas (i. governance, ii. strategy, iii. risk management, and iv. metric and targets) as recommended by the TCFD. A standalone report has been published in November 2023, providing information and greater understanding on our management strategies relating to climate-related risks and opportunities to our stakeholders. To understand the climate-related risks and opportunities associated with SBS Transit within specific timeframes under two climate scenarios, we conducted a screening exercise

dedicated to identifying climate-related risks and opportunities. Through this screening process, we managed to pinpoint potential financial risks and opportunities applicable to SBS Transit. Additionally, this assessment facilitated the identification of potential financial risks that were subsequently quantified in the scenario analysis. The detailed parameters and scope of analysis done are presented in the table below (Table 1).

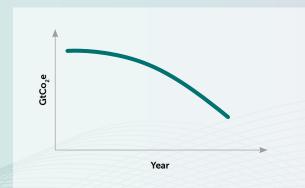
#### TABLE 1: SCOPE AND PARAMETERS OF CLIMATE-RELATED RISK AND OPPORTUNITY SCREENING

PARAMETERS	SCOPE	
Countries	Singapore	
Baseline year	2022	
Timeframe	<ul><li>Short-term: up to 2030</li><li>Medium-term: up to 2040</li><li>Long-term: up to 2050</li></ul>	
Scenarios explored	<ul> <li>1.5°C warming (NGFS Net-Zero by 2</li> <li>&gt; 3°C warming (NGFS Current Polici</li> </ul>	
Risks	<ul> <li>Transition risks</li> <li>Carbon pricing</li> <li>Changing customer expectations</li> <li>Low carbon economy transition policies &amp; regulations</li> <li>Reputational risks</li> <li>Technology shifts</li> </ul>	Physical risks     Floods     Heatwaves (Rising mean temperatures)     Storms and cyclones     Wildfires     Rising sea levels     Droughts (Water scarcity)

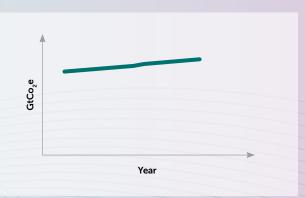
The comprehensive climate scenario analysis was conducted using two distinct scenarios: a 1.5°C warming scenario and a >3°C warming scenario. The 1.5°C scenario, known as the orderly scenario, assumes the implementation of climate policies and significant decarbonization efforts. On the other hand, the >3°C scenario, referred to as the hot house scenario, assumes limited and inadequate climate policies and actions to address the impacts of climate change (as shown in Figure 2).

#### FIGURE 2: CLIMATE SCENARIOS EXPLORED

## SCENARIO 1: ORDERLY SCENARIO (LIMITED TO 1.5°C WARMING, RCP 2.6)



## SCENARIO 2: HOT HOUSE SCENARIO (LIMITED TO >3°C WARMING, RCP 8.5)



Orderly scenarios display the assumption that climate policies and actions are introduced and adopted early on and become gradually more stringent. In this scenario, according to the Network for Greening the Financial System (NGFS), the physical risks are relatively subdued but the transition risks are expected to be relatively higher.

Physical risks in this scenario are relatively subdued as policies and measures have been introduced to mitigate and adapt to the intensifying climate change. As policies and measures are introduced early, transition risks are expected to be relatively higher.

Hot house world scenarios display the assumption that climate policies are implemented in some jurisdictions, but overall global efforts are insufficient to halt significant global warming. In this case, physical risks are expected to be high whereas transition risks are expected to be lower.

Physical risks are expected to be high as policies and measures are uneven and insufficient to mitigate and adapt to the intensifying climate risks such as increased frequency of extreme weather patterns. On the other hand, as there are staggered efforts on the policy front, transition risks are expected to be lower.

The different short, medium and long-term timeframes defined serve as a guide in our target setting and strategic decision making. The time horizons selected for this exercise were leveraged from our risk management time horizons, that are used in strategic planning. This enables us to effectively prioritise and select appropriate interventions for key sustainability related risks and opportunities that may arise in the given time horizons, while also enabling us to future-proof our actions.

The analysis utilised 2022 as the baseline year, incorporating our most recent financial data at the time the analysis was conducted. The full process of the climate risk scenario analysis is summarised in the illustration below (Figure 3).

#### STEP 4 STEP 1 STEP 2 STEP 3 Identify the full Mapping of Climatepotential impacts list of potential Quantitative related risk and climate-related stemming from and qualitative opportunity the screened and climate scenario risks and screening opportunities as shortlisted risks analysis exercise per the TCFD and opportunities

FIGURE 3: FOUR STEPS OF CLIMATE SCENARIO ANALYSIS

The screening analysis considered both transition risks and opportunities, as well as physical risks and opportunities over the time horizons within each scenario. Examples of climate-related risks were taken from Table 1 of <u>TCFD's Final Recommendations Report</u>.

Transition risks emerge from actions associated with transitioning towards a low-carbon economy. These risks can arise from newly implemented climate policies and regulations, the adoption of low-carbon technologies, the implementation of carbon pricing mechanisms, or shifts in consumer preferences and market sentiments.

Physical risks, on the other hand, result from the direct consequences of climate change. These risks can be chronic, occurring gradually over time (e.g., increasing temperatures or rising sea levels), or acute, manifesting as extreme events (e.g., floods, storms, or wildfires).

The outcomes of the screening exercise are summarised in Figure 4, which highlights the potential risk levels. The figure presents only the selected climate-related risks that are likely to have a moderate or high impact on our business operations and financials. It is important to note that certain physical and transition risks, such as storms and typhoons, which have minimal or negligible effects on SBS Transit's operations within the specified timeframes and climate scenarios, have not been included in the presentation of results.

SINGAPORE 1.5°C warming Heatwaves (rising mean temperatures) **PHYSICAL** Floods Droughts/ Water scarcity >3°C warming Heatwaves (rising mean temperatures) Rising sea levels Carbon pricing Changing customer expectations 1.5°C warming Technology shifts Reputational risks **TRANSITION** Policies and regulations Carbon pricing Changing customer expectations >3°C warming Technology shifts Reputational risks Policies and regulations Legend

FIGURE 4: CLIMATE-RELATED RISK SCREENING RESULTS

Potential impact magnitude\*:

- Moderate risk
- High risk
- \* Magnitude is determined through well referenced literature and data sets on climate risk indicators and is determined through observed and projected trends in physical risks from the Climate Analytics' Climate Impact Explorer and the World Bank Climate Change Knowledge Portal.

The outcomes of the scenario analysis is the basis of SBS Transit's overarching sustainability strategy, and any key takeaways have been implemented into our business unit's operational strategies for effective management of relevant climate-related risks and opportunities.

#### **OUR PERFORMANCE**

Based on the mapped risks, we were able to perform an in-depth quantitative climate scenario analysis to identify the potential financial exposure to climate-related risks and opportunities and strengthen our understanding of the expected financial impacts to our business as well as our business' resilience to the identified risks (Step 4 in Figure 3). It must be noted that the analysis' results for physical risks were determined on the assumption that no action was undertaken by SBS Transit to mitigate and adapt to the pertinent climate risks. The results also do not differentiate between business units.

To assess the extent of financial impact of physical climate risks to our business, the scenario analysis modelled how vulnerable our assets are to extreme weather conditions.

This exercise allows SBS Transit to assess the resilience of our existing decarbonisation strategy, determining additional areas that require improvement to mitigate future risks. Additional resilience measures will be evaluated and implemented according to the relevance and magnitude of risks.

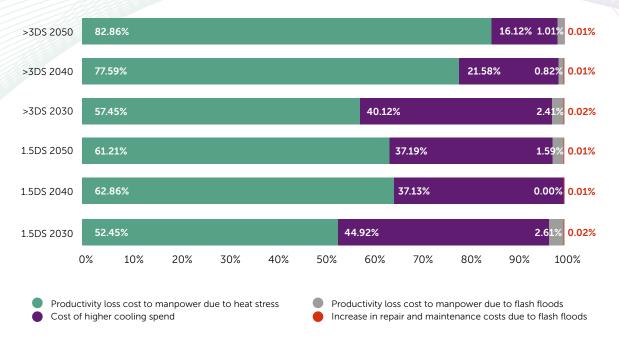
Overall, in the assessment of both physical and transition risks, it was determined that some risks apply directly to SBS Transit as 'first-order' risks, which are expected to have a direct and material impact on the business. For example, physical risks such as floods can cause damage to our property. On the other hand, 'second-order' risks have a more indirect impact and are experienced by SBS Transit through cost passthrough. For example, SBS Transit does not experience direct implications of carbon taxes. Due to the nature our operations, however, the indirect

impact of increasing carbon taxes may be felt as the electricity prices continue to rise in the future. As carbon taxes do not directly affect SBS Transit currently and remain as a second-order risk, the transition risk of rising carbon prices is excluded from the overall direct financial impact diagram below (Figure 5). However, as this risk is relevant when talking about transitioning to a lower carbon economy, it is explored separately under a 'what if' scenario in the Transition Risks section below.

Through the scenario analysis, we can conclude that unmitigated climate risks result in potential additional financial impact for the respective year.

Among the quantified physical risks, costs of higher spending on cooling due to rising temperatures appears to be the most significant<sup>8</sup> first-order risk in terms of potential additional financial impact in all timeframes and scenarios.

#### FIGURE 5: PROPORTION OF ADDITIONAL FINANCIAL IMPACT BY CLIMATE RISK 9, 10



<sup>8</sup> Risk impacts estimated based on our current inputs are considered to be majorly financially material if the financial impact is >5% of SBS Transit's 3-year average EBITDA (2020, 2021 and 2022).

<sup>9</sup> Impact from carbon costs is not considered in the total additional financial impacts as it is an indirect impact and is explored separately. The total financial impact thus consists of the physical risk impacts only.

<sup>10</sup> This study estimates the annual additional and proportionate financial impacts for a single year and does not model the rate of change of impacts across 2022 and 2050 (i.e., impacts are not cumulative). Therefore, should a physical climate risk event occur, the impact would be larger. Refer to Appendix 2 of the TCFD report for more information.

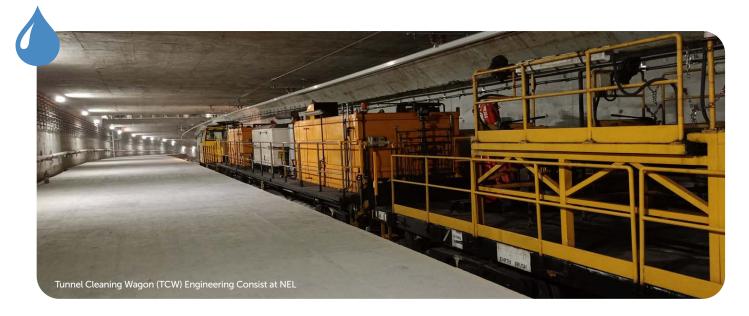
Nevertheless, transition risks are still considered to be potentially impactful. Potential carbon prices in the form of carbon taxes presently remain a second-order risk to SBS Transit, and they may account for a large proportion of the additional financial costs in future. The impact from carbon tax has been modelled on a 'what if' scenario basis, i.e. if carbon taxes were applicable to SBS Transit, the potential impact was quantified. If left unmitigated, carbon taxes could approximately account for 47% to 61% and 23% to 31% of SBS Transit's total financial impact caused by climaterelated risk under the 1.5°C and >3°C scenarios respectively.

For a more detailed explanation on each quantified risk, please refer to our 2023 TCFD report here.<sup>11</sup>

#### **LOOKING FORWARD**

The climate scenario analysis represents the initial phase in enhancing our comprehension of the challenges confronting our operations. SBS Transit is committed to proficiently reduce and adjust to these physical climate risks. We have implemented essential frameworks, standard operating procedures, and our Business Continuity Management Policy to ready ourselves for potential business disruptions like flash floods and increased average temperatures. Climate related plans such as haze contingency plans are developed to manage the impact of climate change. Individual locations develop their business continuity plans to manage any potential climate impact which they are to review and update their

plans on an annual basis. Our Business Continuity Management efforts have been validated by our ISO 22301 certification where external auditors would benchmark our business continuity management efforts against the ISO standards. Strategies within our **Business Continuity Management Policy** to manage sustainability-related risks and opportunities include conducting annual Table-Top and Ground Deployment Exercises to practice and validate our Business Continuity Plans are in place as well as training and familiarising staff with their respective Incident Management Plans or through the Rail Emergency Preparedness (REP) training road map. These resilience strategies and frameworks are tested regularly to affirm the efficacy of the mitigating measures we have put in place. Moving forward, we strive to constantly evolve our standard operating procedures with the risks and opportunities identified.



#### **RESOURCE EFFICIENCY**

We focus on optimising resource efficiency by assessing the influence of our water usage, materials efficiency, and disposal methods. This section outlines the initiatives undertaken to minimise consumption and implement strategies for waste and water reduction, reuse, and recycling.

#### WATER

#### WHY THIS ISSUE IS MATERIAL

We acknowledge fresh water as one of earth's finite and indispensable natural resources and recognise the urgency to preserve its accessibility. The precarious levels of fresh water availability is influenced not just by the impacts of climate change, but also the escalating requirements of an expanding economy. We seek to preserve the sustainability of water as a crucial resource and hence have implemented effective management and usage optimisation strategies, along with education of our stakeholders to engage in responsible consumption of water to fulfil our sustainability goals.

#### **HOW WE MANAGE THIS**

Water is extensively used for day-to-day tasks at SBS Transit such as cleaning vehicles and premises, operating sanitary facilities, and supporting chilled water systems for air-conditioning. The water supply at our facilities is from municipal and NEWater sources.

We ensure that all wastewater generated is directed to government-operated water reclamation projects for proper treatment. In addition, our Water Management Workgroup actively oversees and manages the water usage across our operations, actively pursuing water conservation and recycling initiatives.

In line with our Water Policy, we are committed to intensifying our water conservation endeavours through various means. This includes the installation of water-efficient taps and fittings with at least 2 ticks at all locations under the Water Efficiency Labelling Scheme. Additionally, we analyse consumption patterns to identify areas for improvement. We strive to continuously refine our practices to enhance the efficiency of our water usage.

## OUR INITIATIVES Recycling Condensate Water from Air Handling Units

In response to Singapore's limited water resources and rising average daily temperature causing an increasing demand for air-conditioning, a project was undertaken to collect water condensate from AHUs and reuse it for the condensate supply line. This initiative was fully implemented at 13 NEL stations, that will see annual water savings of approximately 32.5 megalitres.

#### Optimising Track and Tunnel Washing Efficiency

In our ongoing efforts to reduce water consumption, we continuously analyse and explore opportunities to enhance our operational efficiency. Through thorough engineering studies and trials, we have optimised the track and tunnel washing schedules for NEL, resulting in an estimated saving of 3 megalitres. This initiative will be implemented at DTL by Q1 of 2024, as we continue to prioritise water conservation.

#### Enhancing the Efficiency of the Automatic Bus Wash Systems

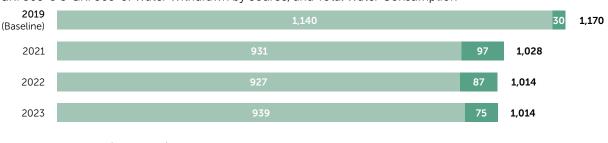
All depots are fitted with the Automatic Bus Wash Systems (ABWS) that improve overall water efficiency and minimises water consumption through a water recycling system. To further reduce water usage, targeted improvements were made to increase the volume of captured recycled water as well as the efficiency of the final rinse process with upgraded nozzles. These measures directly translated to a more efficient wash process and a reduction in our water consumption.

In recognition of the substantial water efficiency gains achieved, this initiative was proudly awarded the Water Efficiency Awards (Projects) 2024 by the PUB.

#### **OUR PERFORMANCE AND LOOKING FORWARD**

From our efforts to implement water conservation measures and initiatives in 2023, the water consumption figures stayed relatively stable, with a slight reduction of consumption compared to 2022, despite the rise in our operational capacities. We remain committed to lowering water usage by refining our processes, such as adjusting nozzles to control and optimise water flow and improving data accuracy through the installation of smart water meters at our rail stations. Additionally, plans are in place to expand our water catchment structures to enhance their capacity for recycling purposes.

GRI 303-3 & GRI 303-5: Water Withdrawn by Source, and Total Water Consumption



- Utilities (Municipal)
- Utilities (SG: NEWater)

SGX Core Metrics: Water Consumption Intensity

WATER INTENSITY (MEGALITRES/S\$M REVENUE)	2019 (BASELINE)	2021	2022	2023
<b>Total Water Consumption</b>	0.81	0.78	0.67	0.66

## WASTE MANAGEMENT AND CIRCULARITY

#### WHY THIS ISSUE IS MATERIAL

As a nation with limited land resources, effective waste management is a crucial concern, as emphasised in the Singapore Green Plan 2030. Inadequate waste management can result in diverse environmental repercussions. SBS Transit is conscious of our waste impact and has implemented fresh measures to minimise waste generation and enhance recycling endeavours.

In the context of waste management, it's crucial to consider methods of waste disposal, recycling, and opportunities for reduction. We believe efforts should be directed towards minimising waste generation by implementing changes in work processes and optimising waste collection. Proper management of waste and end-of-life considerations are vital, as unchecked waste can rapidly accumulate and potentially worsen issues such as land scarcity,

health concerns, pollution, and other negative socio-environmental impacts.

#### **HOW WE MANAGE THIS**

SBS Transit primarily generates waste from vehicle replacement parts and general waste. The Waste Workgroup is dedicated to overseeing and ensuring proper handling, disposal, recycling, and reduction of waste through a variety of initiatives and measures. This includes active monitoring of waste management and generation in daily operations. The Workgroup also seeks to facilitate the exchange of best practices among departments and business units, initiating improvements where deemed necessary.

SembWaste and BNL Waste Management handles the collection of general waste and mixed recyclables, while specific recyclables are collected by recycling companies approved by the NEA.

Our commitment extends to reducing the overall waste generated by

implementing the waste hierarchy endorsed by the NEA. We aim to integrate the 3Rs waste management system at every stage of our operations wherever possible, in line with our Waste Policy.

The elements of the waste and recycling management hierarchy are outlined as follows:

- Reduce reduce waste generation and implement lean purchasing systems
- Reuse reuse any discarded items in a way that is the same or similar to what it was originally intended
- Recycle recover used products and reprocess them to make new products

To achieve our waste objectives, we have implemented several policies, including a review process before purchase to avoid unnecessary wastage and the deployment of condition monitoring systems to optimise and maximise the replacement of spare parts.

#### **OUR INITIATIVES**

SBS Transit is dedicated to contributing towards the ambitions set by the Singapore government within the Singapore Green Plan, which aims to reduce waste sent to landfills by 20% by 2026, and with the Zero Waste Masterplan which sets an additional target to further reduce the amount to 30% by 2030 from 2019 baseline figures.

#### **REDUCE**

#### PUSHING THE ENVELOPE FOR PARTS & COMPONENTS LIFE

Our waste reduction programme prioritises extending parts and component lifespans. A systematic review process, combining field data, engineering assessments, and Maintenance Failure Review Board approval, identifies opportunities for either lifespan extension or transitioning to condition-based replacements. This rigorous approach ensures safety and operational integrity while achieving substantial annual material savings (51.1 tonnes in 2023).

This is in addition to the Point machine condition monitoring system that provides real-time supervision, pre-empting faults before a serious failure can occur. When the monitored data deviates from the threshold parameters set, an automatic alert will immediately be sent to our maintenance team, optimising frequency of parts replacement, and reducing parts waste. A full rollout for NEL will be completed by December 2024, with DTL slated to complete installation at terminal stations by Q4 2024.

#### **3D ADDITIVE MANUFACTURING**

This year, we embarked on the adoption of Additive Manufacturing (AM), allowing for on-demand 3D printing for train parts. This will contribute towards reduced inventory storage and material wastage, shortened wait times, lower transportation costs, and decreased carbon emissions, all while upholding reliability and performance standards. We have completed several in-house AM projects this year which reduces material wastage while improving system reliability and reducing maintenance effort. Moving forward, SBS Transit will be working with LTA on the Joint Industrial Programme, which brings together the AM capabilities of original equipment manufacturers and National Additive Manufacturing Innovation Cluster to expand the AM adoption for Land Transport Industry.



#### **Rail Guard Switch Block**

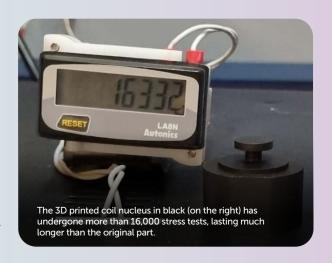
With AM, the new Switch Block has an improved installation design that will reduce the failure rate and contribute an estimated saving of 50 manhours per year on maintenance effort.

#### **Switch Point Dust Cover**

The newly designed dust cover using AM is not only recyclable, but stronger and more durable. Hence, reducing failure rates and material wastage due to regular changeouts.

#### **Contactor Coil Nucleus**

We collaborated with Alstom to 3D print and certify a stronger metallic part to replace the failed coil nucleus of the NEL trains. This reduced lead time and provided a new life for existing contactors, minimizing material wastage.



#### **REUSE**

## REUSING SERVICEABLE COMPONENTS IN CCTV SYSTEMS

To minimise waste, SBS Transit redeployed serviceable CCTV components from 247 retiring buses to other buses. Reusing these components reduces the need for virgin materials in our ecosystem and lowers the environmental impact of our operations by diverting an estimated 1,008kg of waste from disposal.

## DONATION OF DOUBLE DECKER BUS TO ITE COLLEGE WEST AS A LEARNING LAB

Demonstrating our commitment to both sustainability and social responsibility, we transformed a decommissioned double-decker bus into a state-of-the-art training classroom for ITE College West's Bus Engineering Lab. By refurbishing both the upper and lower decks, we created a conducive learning environment for students. This initiative not only contributed to their educational experience but also gave the bus a second life, diverting it from the scrapyard.

#### TYRE RETREAD PROGRAMME

Whilst ensuring the roadworthiness and quality of our buses remain a key priority for SBS Transit, we concurrently strive towards circularity by maximising our resources. As part of this effort, we continued our tyre retreading programme which involves retreading our tires twice before decommissioning them. In 2023, we were able to reuse over 21,200 tires resulting in a reduction of 1,166 tonnes of tire waste.







#### RECYCLE

#### **BATTERY AND OIL RECYCLING**

This year, we have continued to advance our battery recycling programme, which is supervised by our licensed NEA-appointed recycling companies. In 2023, we successfully recycled 241 tonnes of batteries, ensuring responsible handling and preparation for resale for export to countries like South Korea and India, where the batteries are processed for metals and metal compounds. In addition, our technicians and maintenance engineers undergo training to ensure proper management and disposal of engine and transmission oils in a responsible manner. This training covers safe use, handling, and disposal of hazardous fluids using Material Safety Data Sheets during regular safety toolbox meetings. Within this year, a total of 262 tonnes of oil has been successfully recycled.

## OUR PERFORMANCE AND LOOKING FORWARD

In 2023, we documented a cumulated waste volume of 6,461 MT, which is an increase from the 2022 levels by 1,510 MT. Out of the cumulated waste volume, 50.4% was directed to disposal. This increase could be due to the expansion of our operations from 2022, as well as the inclusion of Open Top Container waste attributed to an improvement in data collection and measurement methodologies.

We recognise that more can be done to reduce the amount of waste generated, and hence will be looking into better identifying waste sources and types to improve current waste processes and strategically target specific streams of waste. We will also look into innovative ways of reducing, reusing and recycling in order to reduce the amount of waste directed to disposal and our impact on the environment.

#### GRI 306-3: Waste Generated

TOTAL WASTE GENERATED (METRIC TONS)	2021	2022 (BASELINE)	2023
Hazardous	504	1,336	1,346
Non-Hazardous	580	3,615	5,115 <sup>12</sup>
Total	1,084	4,951	6,461

#### GRI 306-4: Waste Diverted from Disposal

WASTE DIVERTED FROM DISPOSAL (METRIC TONS)	2021	2022 (BASELINE)	2023
Hazardous Waste			
Recycled	498	1,331	1,343
Non-Hazardous Waste			
Recycled	580	604	645
Reused	1,467	1,252	1,218

All hazardous waste diverted from disposal were recycled, none are reused

#### GRI 306-5: Waste Directed to Disposal

WASTE DIRECTED TO DISPOSAL (METRIC TONS)	2021	2022 (BASELINE)	2023	
Hazardous Waste				
Incineration (without energy recovery)	6	5	3	
Non-Hazardous Waste				
Incineration (without energy recovery)	-	1,759	3,25212	

All waste directed to disposal were incinerated, none directed to landfill

Due to an improvement in data methodologies, classification and calculation methods, our waste data for 2023 includes Open Top Container waste. This resulted in an increase of 1,269 MT from the original figure derived. Data is not available for 2021 and 2022, hence the figures in past years have been maintained. As we look to maintain a high level of accuracy regarding data measurement, collection, and progress, moving forward, SBS Transit will reassess our waste reduction targets with respect to the baseline year to better reflect our initiatives and objectives in waste reduction.

#### **SUSTAINABLE TRANSITION**

#### WHY THIS ISSUE IS MATERIAL

Aligned with Singapore's Green Plan, the LTA has significantly increased investments in infrastructure deployment and capability development to reduce reliance on fossil fuels and internal combustion engine vehicles. The ultimate objective is to reduce land transport emissions by 80% by 2050. Encouraging the use of public transport plays a vital role in achieving this target. As the backbone of Singapore's transport system, public transport is the most sustainable mode of motorised transportation when compared to cars and motorcycles.

On a per passenger-kilometre basis, a car consumes nine times the energy of a bus and 12 times the energy of a train.

In line with the Singapore government's sustainability objectives, SBS Transit recognises the significance of sustainability education and engagement for its employees, commuters, and the public. With engagement efforts to increase the environmental awareness of our stakeholders, we aim to foster a culture that values sustainability while instilling a sense of ownership and responsibility. This also cultivates an environment of collaboration and cooperation, enabling employees to work together towards a shared goal.

#### **HOW WE MANAGE THIS**

At SBS Transit, our goal is to offer dependable and easily accessible public transportation that prioritises climate-friendly options. To fulfil our sustainability commitments and meet our targets throughout the organisation, we emphasise the importance of adopting a sustainability mindset from our frontline staff to our head office. We believe in engaging our customers on this journey, encouraging them to choose sustainable options by utilizing public transportation.

Our main objective is to foster a green corporate culture across all departments, ensuring that our employees are aware of the actions they can take on a daily basis to think, act, and operate in a sustainable manner









#### **OUR INITIATIVES**



#### **Growing with our Electric Fleet**

To support the LTA's decarbonisation plan to electrify 50% of the public bus fleet by 2030 and transition the entire fleet to clean energy by 2040, we are actively providing training programmes to our technicians to be equipped in handling high voltage vehicles safely. Since 2022, 65 of our technical staff have been certified under the National Electric Vehicles Specialist Safety course. This course equips individuals with skills to maintain and service electric and diesel hybrid vehicles safely. Prior to this, they attained the Certificate of Competency at the Expert level in a course that we had jointly developed with the ITE College West on handling high voltage buses. The rest of our 480 technicians will continue to be put through the basic module of this course to equip them with basic knowledge of working with these systems.

With a fleet of 32 electric and 25 hybrid buses, SBS Transit collaborates closely with the LTA to increase the number of electric public buses serving Singapore, aligning with LTA's goal of achieving a fully clean-energy powered public bus fleet by 2040.

#### **Continuous Development of our Rail Network**

In 2023, six new trains were introduced to our NEL fleet, with two of the new trains equipped with sensors to monitor track conditions during operations. This addition would allow SBS Transit to manage an increase in passenger capacity on the NEL, especially with the opening of the Punggol Coast station on the NEL in 2024. Our expansion plans aim to improve convenience of our commuters, increase public transport usage and reduce reliance on private transportation, in line with Singapore's Green Plan and sustainability strategies. We constantly monitor environmental and social impacts of our expansion plans, focusing on emissions, water usage, and waste generation to mitigate any negative effects.

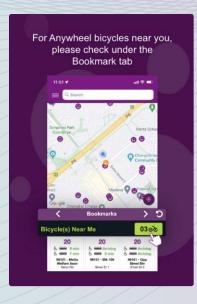
We continue to collaborate with the LTA to seamlessly integrate greener vehicles into our fleet through proactive monitoring and feedback of the current electric fleet, meticulously monitoring their performance and investing in the development of charging schedules to ensure smooth operations and minimal downtime. This multi-pronged approach positions SBS Transit as a leader in sustainable public transport, paving the way for a cleaner and more efficient future.

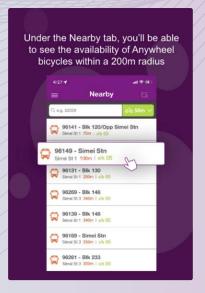


## Walk, Cycle, Ride Campaign – Partnership with AnyWheel

To further support LTA's Walk, Cycle, Ride campaign, we partnered with AnyWheel, a last-mile transport solution, to display bicycle availability near bus stops in real-time through our app. This also provides an easy access link that directs app users to the AnyWheel app for searching and unlocking bicycles during their journey.









## Introducing Public Transport as a Greener Alternative

In 2023, we partnered with Methodist Girls' School to support their Green Commute initiative, which aimed to inspire students to adopt sustainable practices by promoting the use of the MRT as their preferred mode of transportation. For four consecutive Mondays, starting from 27th February 2023, students travelled to school from the Sixth Avenue and Beauty World stations. Parent chaperones and staff members were present at the stations, with some accompanying the younger students on their journey. The event allowed students to explore new ways to get to school, while in parallel, educated them on the benefits of taking greener transportation.

## MAINTAINING OUR ENVIRONMENTAL ENGAGEMENT EFFORTS

At SBS Transit, we understand the importance of educating our stakeholders about preserving natural resources for a sustainable future. We promote environmental awareness and conservation through social media, traditional communication, and staff involvement in organizing activities. We use electronic direct mails to highlight the importance of natural resource preservation within our company and share them on our internal display boards and social media platforms.



#### **Engaging & Training our Staff**

Building upon the efforts of previous years, we have continued to organise quarterly sustainability sharing sessions where we educate our colleagues on relevant topics like waste reduction, energy conservation, water efficiency, carbon emissions reduction, and sustainable sourcing. By increasing staff participation and ownership, these sessions contribute to a more cohesive and engaged workplace.

In October 2023, we launched the first session of our Lunch Time Talk series where external subject matter experts are invited to share their insights on sustainability-related topics. The talk was well-received by staff, who appreciated the opportunity to learn more about sustainability and how they can make a positive impact in the workplace and in their personal lives.





#### SG Clean Day Largest Clean-Up

In a demonstration of our commitment to community service and sustainability, 250 of our staff were part of the record-breaking SG Clean Day event on 13th May 2023, joining over 4,000 volunteers to clean up public spaces. Organised by Public Hygiene Council, this engagement reminded us that every action, no matter how small, can make a significant impact in building a cleaner and greener future.

We have also continued to organise our monthly Take Public Transport to Work campaign, which aims to encourage employees to utilise public transportation for a minimum of one day during the final week of each month. In 2023, with over 1,300 employees participating in this initiative we avoided an estimated 20.55 tonnes of carbon dioxide emissions.

By engaging staff in these initiatives, the company is working towards building a sustainable corporate culture that is committed to environmental stewardship.



#### OUR PERFORMANCE AND LOOKING FORWARD

SBS Transit is dedicated to consistently delivering dependable and accessible public transportation services that cater to the needs of all users while offering environmentally friendly transport options. As part of our commitment

to a sustainable transition, we adhere to all applicable environmental laws and regulations in Singapore. In the fiscal year 2023, we are proud to report that we maintained a flawless record of compliance, with zero instances of non-compliance with environmental laws and regulations. This achievement

highlights our unwavering commitment to environmental stewardship and sustainability, ensuring that we operate in a manner that is both responsible and in harmony with our natural surroundings.