

Singapore Green Bond Report

Financial Year 2024

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1. Foreword



Indranee Rajah

Minister in the
Prime Minister's Office

Second Minister for
Finance and National
Development

Chair of the Green Bond
Steering Committee

Climate change remains one of the defining challenges of our time. For Singapore, it is an existential issue.

Despite the impact of recent geopolitical developments and international economic conditions on the global climate change agenda, Singapore remains committed to concrete climate action. To achieve our national climate targets, we are pressing on with comprehensive mitigation and adaptation measures.

These measures include efforts to green our power grid by installing solar capacity, advancing solar power research and exploring other emerging low-carbon technologies. At the same time, we will continue to support businesses in improving energy efficiency, expand clean public transport options and strengthen sustainability in urban planning. Beyond reducing emissions, we also work with researchers to better understand climate change, improve our forecasting capabilities, and explore ways to better protect our coastline.

Singapore cannot do this alone, and we want to work with like-minded partners. Forging strong international partnerships is essential if we want to make any headway in combating climate change. Today, we collaborate with over 20 countries in carbon markets development. We are also committed to increasing clean energy imports, which will support the development of renewable energy in the region and pave the way towards an ASEAN power grid.

Green finance will help to facilitate these efforts. This is why the Government announced in 2022 that it will issue up to S\$35 billion in public sector green bonds by 2030. This third edition of the Singapore Green Bond Report provides an update on the progress we have made and reflects our commitment to a robust green bond programme and high-quality issuances. Earlier this year, the Ministry of Finance ("MOF") also published an Occasional Paper titled "Green Budgeting in Singapore: A Progress Update", which shares our experience in incorporating environmental sustainability considerations, including climate risk management and the use of green financing, into our financial policies and planning to achieve better outcomes.¹

As we press on with our national sustainability agenda, I encourage industry partners to share your feedback on how we can make our green bonds a preferred investment for the global investment community. The path ahead will be challenging, but together, we can create a greener and more sustainable future for generations to come.

¹ The Occasional Paper, which was published in January 2025, can be found at <https://go.gov.sg/greenbudgetingop2025>.

2. Key Updates

This Singapore Green Bond Report for the Financial Year (“FY”) 2024 covers the allocation of proceeds from Singapore’s sovereign green bonds (i.e. Green Singapore Government Securities (“SGS”) (Infrastructure) bonds) issued under the Singapore Green Bond Framework dated June 2022, as well as the expected environmental impact arising from the financed Eligible Green Expenditures for FY2024 (i.e. between 1 April 2024 and 31 March 2025).²

This section summarises key updates on our Green SGS (Infrastructure) issuances, the allocation of proceeds in FY2024, and the corresponding expected impact. Readers can refer to the subsequent sections for more details on Singapore’s overarching climate commitment and strategy, the Singapore Green Bond Framework, and our methodology for estimating the impact of our allocated green bond proceeds that were also covered in our previous reports.

2.1 Green SGS (Infrastructure) Issuances

The Government issued a new 30-year Green SGS (Infrastructure) bond (“Jun-54”) via syndication in June 2024, with an issuance size of S\$2.5 billion, and re-opened the 50-year Green SGS (Infrastructure) bond (“Aug-72”) via auction in October 2024, with an issuance size of S\$1.5 billion. The Jun-54 was Singapore’s first 30-year sovereign green bond, and drew strong market demand that allowed the Government to issue at the top end of the targeted size range, with an overall subscription rate of 2.4 times. The re-opening of the Aug-72 in October 2024 was the first issuance of Green SGS (Infrastructure) bond via auction, and the third tranche of 50-year sovereign green bonds. Demand for the Aug-72 was also healthy, particularly among investors with a preference for long-dated bonds, with an overall subscription rate of 1.6 times.

2.2 Allocation Report

In FY2024, S\$2.8 billion of green bond proceeds, comprising S\$2.4 billion of the tranche proceeds from the re-opened Aug-72 issued in September 2023 (i.e. second tranche) and S\$0.4 billion of the Jun-54 proceeds, were allocated to finance the expansion of the electric rail network in Singapore, namely the Jurong Region Line (“JRL”) and Cross Island Line (“CRL”).³ As a result, 100% of the second tranche of Aug-72 proceeds (or S\$2.8 billion) and 16% of the Jun-54 proceeds (or S\$0.4 billion) have been allocated as at 31 March 2025.

Unallocated proceeds of the Jun-54 and the re-opened Aug-72 issued in October 2024 (i.e. third tranche) totalling S\$3.6 billion are expected to be fully allocated to the JRL and CRL by the end of FY2026.

² The Singapore Green Bond Framework was subsequently updated in January 2025, and will apply to all Green SGS (Infrastructure) bonds issued thereafter. The updated Framework can be found at <https://go.gov.sg/sgbfjan2025>.

³ Allocation figures presented in billion are rounded to one decimal place. Please refer to Table 1 for the exact figures.

Singapore Green Bond Report

Financial Year 2024

Table 1: Allocation of Green SGS (Infrastructure) Bonds

Green SGS (Infrastructure) Bonds	Issue Date	Issuance Size (S\$)	Proceeds allocated up to FY2023 (S\$)	Proceeds allocated in FY2024 (S\$)	Total allocated proceeds as at 31 March 2025 (S\$)	Total unallocated proceeds as at 31 March 2025 (S\$)
		A	B	C	D = B + C	A - D
First tranche of Aug-72	15 August 2022	2,400,000,000	2,400,000,000 ⁴ (Fully allocated)	Not applicable	2,400,000,000 (Fully allocated)	0
Second tranche of Aug-72 (re-opened)	4 September 2023	2,800,000,000	396,961,276	2,403,038,724	2,800,000,000 (Fully allocated)	0
First tranche of Jun-54	3 June 2024	2,500,000,000	Not applicable	404,017,087	404,017,087	2,095,982,913
Third tranche of Aug-72 (re-opened)	1 October 2024	1,500,000,000	Not applicable	0	0	1,500,000,000
Total		9,200,000,000	2,796,961,276	2,807,055,811⁵	5,604,017,087	3,595,982,913

⁴ The tranche was fully allocated as at end-FY2023. Please refer to Singapore Green Bond Report for FY2023 for details.

⁵ PricewaterhouseCoopers LLP has conducted a limited assurance engagement on the allocation of proceeds for the financial year ended 31 March 2025 raised through the issuance of the Green SGS (Infrastructure) bonds. The assurance report can be found in Section 6 of this report.

2.3 Impact Report


Overall, the JRL and CRL will have a combined estimated impact of avoiding between 100,000 and 120,000 tonnes of CO₂-equivalent (i.e. greenhouse gas ("GHG")) project emissions annually.⁶ This represents an 81% reduction in GHG emissions compared to the baseline scenario, and would be equivalent to taking at least 22,000 Internal Combustion Engine (ICE) cars off Singapore's roads.⁷

The green bond proceeds allocated to the JRL and CRL (i.e. S\$5.6 billion as at 31 March 2025) are expected to have a financed impact of between 9,600 and 14,000 tonnes of GHG emissions avoided annually.⁸ Every S\$1 million of allocated Green SGS (Infrastructure) bond proceeds therefore contributes to the avoidance of between 1.7 and 2.6 tonnes of GHG emissions annually (Table 2).

The expansion of Singapore's rail network is expected to bring about economic and social benefits, including a more resilient public transport system, enhanced connectivity and travel time savings for commuters, as well as job creation. While it is not possible to attribute the number of jobs created to specific rail lines, the upcoming expansion of the rail network is expected to create about 1,500 jobs by 2030.

Please refer to the subsequent sections of this report for more information. The Singapore Green Bond Reports on previous Financial Years, and the project descriptions of the JRL and CRL can be found at the respective web-sites.⁹

Table 2: Impact Indicators

Portfolio	Clean Transportation	
Allocated Amount	S\$	5,604,017,087
Project Lifetime	years	99
Project Emissions Avoided	tCO ₂ e/year	99,906 – 122,107
Financed Emissions Avoided	tCO ₂ e/year	9,555 – 14,274
Emissions Avoided per S\$ Million Allocated	tCO ₂ e/year/ S\$'million	1.7 – 2.6
Relative Emissions Avoided	%	81
Project Air Pollutants Reduced	kg/year	SO _x : 20,494 – 25,049 NO _x : 26,132 – 31,939 PM ₁₀ : 1,311 – 1,602 PM _{2.5} : 940 – 1,149
Financed Air Pollutants Reduced	kg/year	SO _x : 1,960 – 2,928 NO _x : 2,499 – 3,733 PM ₁₀ : 125 – 187 PM _{2.5} : 90 – 134
Passenger-kilometers Travelled	million pkm/year	2,207 – 2,697
Length of Rail	km	74
Contribution to SDG	 11 SUSTAINABLE CITIES AND COMMUNITIES	

⁶ Figures rounded to two significant figures. Please refer to Table 2 for the exact impact figures. Project emissions avoided refers to the reduction of GHG emissions between a baseline scenario in which the JRL and CRL do not exist, compared to the project scenario in which the JRL and CRL become fully operational and displace a mix of existing and future transportations along the same travel distance. Please refer to Section 5.1 for elaboration on the methodology for the impact report.

⁷ MOF's estimate based on the United States Environmental Protection Agency (EPA)'s assumption that an average ICE car emits about 4.6 tonnes of CO₂-equivalent per year. EPA's figure is likely to be slightly higher compared to the emission factor in Singapore's context.

⁸ Financed emissions avoided is derived by pro-rating the estimated total project emissions avoided based on the share of green bond financing (i.e. green bond allocated as a proportion of the total project costs). Financed emissions avoided would increase correspondingly in future years as the share of green bonds allocated to the projects increase with construction progress.

⁹ For the Singapore Green Bond Report for FY2022 and FY2023, please refer to <https://go.gov.sg/greenbonds>. For the project descriptions of the JRL and CRL, please refer to https://www.lta.gov.sg/content/ltagov/en/upcoming_projects.html#rail_expansion.



3

INTRODUCTION

3. Introduction

3.1 Singapore's Climate Commitment

Climate change is a real and existential threat for Singapore, as a small, low-lying, highly urbanised island-state. The third National Climate Change Study published in January 2024 projected higher temperatures, more wet and dry extreme weather conditions, and accelerating rise in mean sea levels for Singapore and Southeast Asia by the end of the century.

To strengthen our commitments under the United Nations 2030 Agenda for Sustainable Development and the Paris Agreement, Singapore launched the Singapore Green Plan 2030 ("Green Plan") in February 2021, a whole-of-nation movement to advance Singapore's national agenda on sustainable development, through five key pillars and two key enablers.¹⁰

Although Singapore only accounts for around 0.1% of global emissions, we are deeply committed to contributing to global efforts to address the climate crisis. Singapore aims to achieve net zero emissions by 2050 as part of our updated Long-Term Low-Emissions Development Strategy ("LEDS"). This long-term goal is supported by interim targets, including capping emissions at around 60 MtCO₂e by 2030 and further reducing them to between 45 and 50 MtCO₂e by 2035.¹¹

Despite the challenging circumstances and geographical constraints we face, Singapore is committed to effective climate action and we will find innovative ways to move towards a low-carbon future for industry, economy and society through these key thrusts:

1. Build low-carbon city and promote sustainable living;
2. Catalyse industry and business transformation; and
3. Pursue effective cross-border solutions.

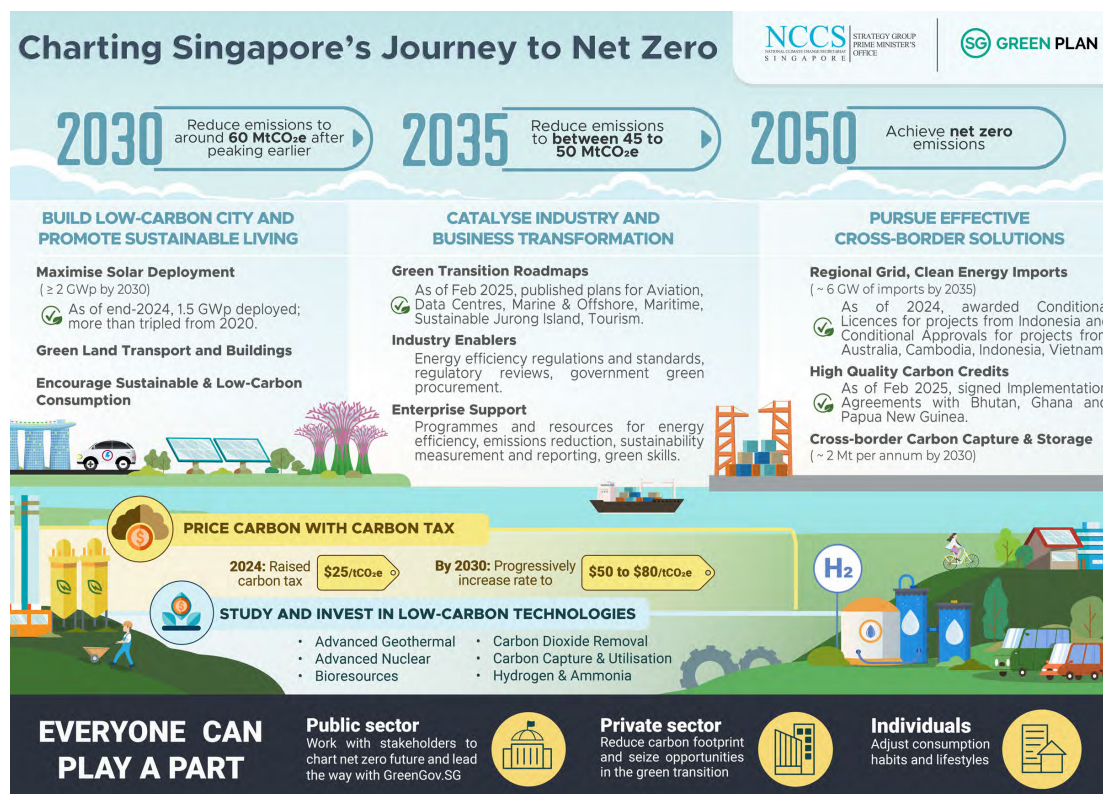
Our low-carbon transition is supported by a carbon tax, which puts a price signal on the externalities of carbon. This encourages businesses and individuals to internalise the cost of carbon and take meaningful action to reduce their carbon footprint. Singapore implemented a carbon tax in 2019 at S\$5/tCO₂e and this is the first carbon pricing scheme in Southeast Asia. The carbon tax was raised to S\$25/tCO₂e in 2024, and will be progressively raised to S\$45/tCO₂e in 2026 and 2027, with a view to reaching S\$50 – 80/tCO₂e by 2030.

Singapore's public sector plays a leadership role in our green transition, and aims to achieve net zero emissions around 2045 under the GreenGov.SG initiative, five years ahead of the national net zero target.¹² MOF's Occasional Paper "Green Budgeting in Singapore: A Progress Update", published in January 2025, explained the Government's green budgeting approach by taking into account sustainability considerations in the management of Singapore's public finances. This helps to ensure that national climate goals are supported through effective fiscal policies.

¹⁰ The five key pillars are City in Nature, Sustainable Living, Energy Reset, Green Economy and Resilient Future. The two key enablers are Green Government and Green Citizenry. More information on the Green Plan can be found at <https://www.greenplan.gov.sg>.

¹¹ The 2030 and 2035 Nationally Determined Contributions (NDCs) were announced in 2022 and 2025 respectively. More information on Singapore's climate targets can be found at <https://www.nccs.gov.sg/singapores-climate-action/singapores-climate-targets/overview/>.

¹² More information on GreenGov.SG can be found at <https://www.greenplan.gov.sg/key-focus-areas/green-government/>.



3.2 Singapore Green Bond Framework

The Singapore Green Bond Framework (“Framework”), first published in June 2022 and subsequently updated in January 2025, together with the Significant Infrastructure Government Loan Act 2021 (“SINGA”), provide the foundation for the issuance of Green SGS (Infrastructure) bonds.¹³

SINGA authorises the Government to borrow to finance qualifying capital expenditures of approved nationally significant infrastructure projects critical to Singapore’s long-term development.¹⁴ Legislative controls are in place to safeguard against the over-accumulation of debt, prevent abuse, and ensure fiscal sustainability.¹⁵ Borrowing to finance such infrastructure spreads the costs across the generations that would benefit from these projects. For any such nationally significant infrastructure that falls within the eight green categories set out in the Framework, the Government can issue Green SGS (Infrastructure) bonds.

The Framework is aligned with internationally recognised market principles, standards, and best practices. Apart from alignment with the core components and key recommendations of the International Capital Market Association (“ICMA”) Green Bond Principles 2021 (with June 2022 Appendix 1) and the ASEAN Green Bond Standards 2018, the updated Framework also features green thresholds for eligible activities that are aligned with those in the Singapore-Asia Taxonomy for Sustainable Finance (December 2023) (“SAT”) where applicable.¹⁶ Second Party Opinions (“SPO”) have been issued by Morningstar Sustainability and DNV, confirming the framework’s alignment with the relevant market principles, standards and best practices.¹⁷

¹³ The updated Framework will apply to all Green SGS (Infrastructure) bonds issued thereafter.

¹⁴ To qualify as nationally significant infrastructure, the infrastructure project should be controlled and legally owned by the Government, cost at least S\$4 billion, have a useful life of at least 50 years, and would support or materially improve national productivity or Singapore’s economic, environmental, or social sustainability.

¹⁵ The SINGA imposes (i) an overall gross borrowing limit of S\$90 billion, and (ii) an annual effective interest cost threshold of S\$5 billion.





¹⁶ Published by the Monetary Authority of Singapore in December 2023, the SAT sets out detailed thresholds and criteria for defining green and transition activities that contribute to climate change mitigation. More information about the SAT can be found at: <https://www.mas.gov.sg/development/sustainable-finance/taxonomy>.

¹⁷ The Singapore Green Bond Framework published in June 2022 and January 2025 and the corresponding SPOs can be found at: <https://go.gov.sg/greenbonds>.

In addition to governing the Singapore sovereign green bonds, the Framework serves as a national benchmark and reference for Statutory Boards.¹⁸ Statutory Boards that issue green bonds are required to align their respective green bond frameworks with the guidelines and standards set out in the national framework.

Singapore has committed to issuing up to S\$35 billion of green bonds by 2030. This will include green bonds issued by the Government as well as Statutory Boards. As at 31 March 2025, the Singapore public sector has issued a total of S\$20.5 billion of green bonds across four green categories (Table 3).

Table 3: Singapore Public Sector Green Bonds as of 31 March 2025

Issuer	Issuance (S\$ ^a billion)	Green Category	
Singapore Government/ Monetary Authority of Singapore ("MAS") ^[a]	9.2	Clean Transportation	
National Environment Agency ("NEA") ^[b]	1.7	Sustainable Waste Management	
Housing & Development Board ("HDB") ^[c]	8.5	Green Buildings	
Public Utilities Board ("PUB") ^[d]	1.1	Sustainable Water and Wastewater Management	
Total	20.5		

^[a] As the agent of the Singapore Government, MAS is empowered by the Government Securities (Debt Market and Investment) Act and the SINGA to undertake the issuance and management of securities on behalf of the Government.

^[b] NEA's Green Bond Framework and relevant materials can be found at: <https://www.nea.gov.sg/corporate-functions/resources/medium-term-note-programme>.

^[c] HDB's Green Finance Framework and relevant materials can be found at: <https://www.hdb.gov.sg/about-us/news-and-publications/green-finance-framework-and-reports>.

^[d] PUB's Green Financing Framework and relevant materials can be found at: <https://www.pub.gov.sg/public/waterloop/sustainability/green-financing-framework>.

These public sector green bond issuances will spur the development of a high-quality green bond market in Singapore by serving as a reference for the corporate green bond market, deepening market liquidity for green bonds, and attracting green issuers, capital, and investors.

For the avoidance of doubt, the allocation and impact reports in the following sections will only include the Green SGS (Infrastructure) bonds issued by the Government, and do not include green bonds issued by the Statutory Boards. The Statutory Boards publish their green bond reports in accordance with their respective frameworks, and relevant details can be found on their websites.

¹⁸ Statutory Boards will issue their own green bond frameworks to demonstrate how their respective frameworks are aligned with international guidelines and market best practices. Refer to the footnotes in Table 3 for the frameworks of the Statutory Boards that have issued green bonds. The Land Transport Authority published its Green Bond Framework in July 2024 and can be found at: https://www.lta.gov.sg/content/ltagov/en/who_we_are/statistics_and_publications/reports.html.

4

ALLOCATION REPORT



4. Allocation Report

In FY2024, the Government issued Singapore's first 30-year Green SGS (Infrastructure) bond ("Jun-54") and the third tranche of 50-year Green SGS (Infrastructure) bond ("Aug-72") (Table 4). Both issuances saw strong market demand, with the respective overall subscription rates at 2.4 times and 1.6 times.

Table 4: Details of Green SGS (Infrastructure) Bonds Issued

Green SGS (Infrastructure) Bonds	ISIN	Original Tenor	Coupon	Issue Date	Principal Amount	Maturity Date
First tranche of Jun-54	SGXPK17B11U8	30 years	3.25%	3 June 2024	S\$2,500,000,000	1 June 2054
Third tranche of Aug-72 (re-opened) ¹⁹	SGXF47639806	50 years	3.00%	1 October 2024	S\$1,500,000,000	1 August 2072

Both tranches were fully earmarked for the JRL and CRL. These projects were approved by the Green Bond Steering Committee ("GBSC") set up by MOF, as Eligible Green Expenditures under the "Clean Transportation" Use of Proceeds category in FY2022.²⁰

The land transport sector today accounts for about 15% of carbon emissions in Singapore. One key strategy to reduce carbon footprint in this sector is encouraging greener commutes, among other initiatives such as vehicle electrification and greening infrastructure and operations. Expanding our public transport infrastructure and electric rail network is a core element of this strategy, and these projects are aligned with the Land Transport Master Plan 2040.

The development of the JRL and CRL will support the "Sustainable Living" pillar of the Green Plan, which targets to expand our rail network to 360km, and achieve 75% mass public transport peak modal share, from 66% in 2024.²¹ This is a key enabler to achieve the Government's ambitious goal of significantly reducing land transport emissions from the peak in 2016 by 2040, and for Singapore to achieve net zero emissions by 2050.

Artist impression of JRL JS9 station



¹⁹ The Aug-72 was first issued in FY2022 and was re-opened for a second tranche in FY2023. These tranches were reported in the Singapore Green Bond Report for FY2022 and FY2023 respectively.

²⁰ The GBSC is chaired by the Second Minister for Finance, to oversee and approve key decisions related to the green bonds issued under the Singapore Green Bond Framework. The GBSC currently comprises of senior government representatives from MOF, MAS, Accountant-General's Department, Ministry of Sustainability and the Environment and Ministry of Transport, and is supported by the Green Bonds Programme Office under MOF.

²¹ The "Sustainable Living" pillar of the Green Plan seeks to make reducing carbon emissions, keeping our environment clean, and saving resources and energy a way of life in Singapore. The expansion of electric rail network comes under the sub-pillar "Green Commutes".

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In FY2024, S\$2.8 billion of green bond proceeds, comprising S\$2.4 billion of the proceeds from the re-opened Aug-72 issued in September 2023 (i.e. second tranche) and S\$0.4 billion of the Jun-54 proceeds, were allocated to current Eligible Green Expenditures (Table 5).²² As a result, 100% of the second tranche of the Aug-72 proceeds (or S\$2.8 billion) and 16% of the Jun-54 proceeds (or S\$0.4 billion) have been allocated as at 31 March 2025.

Table 5: Allocation of Green SGS (Infrastructure) Bonds

Green Category	Environmental Objective	Green Plan Pillar	Eligible Green Expenditures	Green SGS (Infrastructure) Bonds	Issuance Size (\$)	Proceeds allocated up to FY2023 (\$)	Proceeds allocated in FY2024 (\$)	Total allocated proceeds as at 31 March 2025 (\$)	Total unallocated proceeds as at 31 March 2025 (\$)
Clean Transportation	Climate Change Mitigation	Sustainable Living	Passenger Electric Rail		A	B	C	D = B + C	A - D
				First tranche of Aug-72 issued in August 2022	2,400,000,000	2,400,000,000 (Fully allocated)	Not applicable	2,400,000,000 (Fully allocated)	0
				Second tranche of Aug-72 re-opened in September 2023	2,800,000,000	396,961,276	2,403,038,724	2,800,000,000 (Fully allocated)	0
				First tranche of Jun-54 issued in June 2024	2,500,000,000	Not applicable	404,017,087	404,017,087	2,095,982,913
				Third tranche of Aug-72 re-opened in October 2024	1,500,000,000	Not applicable	0	0	1,500,000,000
				Total	9,200,000,000	2,796,961,276	2,807,055,811 ²³	5,604,017,087	3,595,982,913

The unallocated green bond proceeds totalling S\$3.6 billion as at 31 March 2025, were either (i) temporarily held in a separate cash account maintained with MAS which is ring-fenced for Eligible Green Expenditures, or (ii) invested by the Accountant-General's Department in short-term liquidity instruments (i.e. fixed deposits) in accordance with the Framework. These unallocated green bond proceeds are expected to be fully allocated to the JRL and CRL by the end of FY2026.

Artist impression of CRL CR19 station



The Ministry of Transport and the Land Transport Authority are responsible for the implementation and monitoring of the JRL and CRL projects, and informing the GBSC of any potential non-compliance with the eligibility criteria and Environmental, Social, and Governance ("ESG") controversies. There were no non-compliance and ESG controversies noted during FY2024.

²² The green bond proceeds were allocated on a First-in, First-out basis.

²³ PricewaterhouseCoopers LLP has conducted a limited assurance engagement on the allocation of proceeds for the financial year ended 31 March 2025 raised through the issuance of the Green SGS (Infrastructure) bonds. The assurance report can be found in Section 6 of this report.

5

IMPACT REPORT



5. Impact Report


To assess the impact of Eligible Green Expenditures, we have taken reference from ICMA's Harmonised Framework for Impact Reporting (June 2024) handbook. As the construction of the JRL and CRL projects are still ongoing as of the end of FY2024, this report includes the ex-ante (expected) impact figures of these Eligible Green Expenditures on a portfolio basis (Table 6).

In line with previous impact reports, we have focused on the environmental impact (i.e. avoidance of GHG emissions and air pollutants), as well as other performance indicators relating to the JRL and CRL projects. In case of material changes, updates on ex-post (actual) impact figures will be provided when the JRL and CRL become operational in future years.

The expansion of Singapore's rail network is expected to bring about economic and social benefits, including a more resilient public transport system, enhanced connectivity and travel time savings for commuters, as well as job creation. While it is not possible to attribute the number of jobs created to specific rail lines, the upcoming expansion of the rail network is expected to create about 1,500 jobs by 2030.

The JRL will benefit 60,000 additional households within a 10-minute walk from a train station. The JRL is expected to have a daily ridership of 200,000 in the initial years, rising to more than 500,000 a day when the Jurong Innovation District, Tengah Town and Jurong Lake District are fully developed. The CRL will benefit about 180,000 households within a 10-minute walk from a train station. When fully completed, the CRL is expected to have a daily ridership of at least 600,000 in the initial years, growing to one million in the longer term.

Table 6: Impact Indicators

Portfolio	Clean Transportation	
Allocated Amount	S\$	5,604,017,087
Project Lifetime	years	99
Project Emissions Avoided	tCO ₂ e/year	99,906 – 122,107
Financed Emissions Avoided	tCO ₂ e/year	9,555 – 14,274
Emissions Avoided per S\$ Million Allocated	tCO ₂ e/year/ S\$'million	1.7 – 2.6
Relative Emissions Avoided	%	81
Project Air Pollutants Reduced	kg/year	SO _x : 20,494 – 25,049 NO _x : 26,132 – 31,939 PM ₁₀ : 1,311 – 1,602 PM _{2.5} : 940 – 1,149
Financed Air Pollutants Reduced	kg/year	SO _x : 1,960 – 2,928 NO _x : 2,499 – 3,733 PM ₁₀ : 125 – 187 PM _{2.5} : 90 – 134
Passenger-kilometers Travelled	million pkm/year	2,207 – 2,697
Length of Rail	km	74
Contribution to SDG		

5.1 Impact Methodology²⁴

We commissioned Morningstar Sustainalytics, an ESG research, ratings and analytics firm, to independently develop a methodology to quantify the green bond impact relating to the JRL and CRL projects. The methodology was developed by leveraging best-in-class methodologies, protocols, and frameworks.²⁵

A key output of the impact methodology is “emissions avoided”, which refers to the reduction of GHG emissions over the operational lifetime of the JRL and CRL between a baseline (i.e. counterfactual) scenario in which the projects do not exist, compared to the project scenario in which the JRL and CRL become operational and displace a mix of existing and future transportations (including private vehicles, trains, taxis, buses, and active mobility) along the same travel distance. The calculations account for predicted shifts in grid emission factors and local transportation fuel mixes.²⁶

The JRL and CRL projects are estimated to result in total carbon savings of more than 100,000 tonnes of CO₂-equivalent annually, which would be equivalent to taking at least 22,000 ICE cars off Singapore’s roads.²⁷ This represents an estimated emissions reduction of 81% compared to the baseline scenario.

Financed GHG emissions avoided for the green bond portfolio is then calculated to be between 9,600 and 14,000 tonnes of CO₂-equivalent annually. The financed emissions avoided figures are divided by the amount of green bonds allocated (i.e. S\$5.6 billion as at 31 March 2025) to derive the avoided emissions intensity of between 1.7 and 2.6 tonnes of CO₂-equivalent avoided annually, per million Singapore dollar allocated.

MOF will provide annual updates on the estimated impact in our future green bond reports. We will continually refine our impact methodology, in line with international standards and best practices.

²⁴ For more details of the impact methodology, please refer to the Singapore Green Bond Report for FY2022 at <https://go.gov.sg/greenbonds>.

²⁵ These include the GHG Protocol, International Financial Institutions Guideline for a Harmonised Approach to GHG Accounting, Partnership for Carbon Accounting Financials’ Global GHG Accounting Standard, and the United Nation’s Clean Development Mechanism.

²⁶ The calculations for “air pollutants reduced” follow a similar approach.

²⁷ MOF’s estimate based on the EPA’s assumption that an average ICE car emits about 4.6 tonnes of CO₂-equivalent per year. EPA’s figure is likely to be slightly higher compared to the emission factor in Singapore’s context.

6

EXTERNAL REVIEW





Ministry of Finance-Ministry Headquarter
100 High Street, The Treasury
#06-03
Singapore 179434

Attention: Ministry of Finance-Ministry Headquarter

29 September 2025

Our ref: ASR-RS 792914 / LBY / LWK (13)
(When Replying Please Quote Our Reference)

Independent practitioner's limited assurance report on Ministry of Finance-Ministry Headquarter's allocation of proceeds for the financial year ended 31 March 2025 raised through the issuance of the Green Singapore Government Securities (Infrastructure) bonds as set out in the Singapore Green Bond Report

Limited assurance conclusion

We have conducted a limited assurance engagement on the allocation of proceeds of Ministry of Finance-Ministry Headquarter ("MOF" or "you") for the financial year ended 31 March 2025 raised through the issuance of the Green Singapore Government Securities (Infrastructure) bonds amounting to S\$2,807,055,811 in the Singapore Green Bond Report (the "Selected Information").

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Selected Information is not prepared, in all material respects, in accordance with the Singapore Green Bond Framework¹ (the "Framework").

¹ The Singapore Green Bond Framework (June 2022) can be found on the MOF website at:
<https://www.mof.gov.sg/docs/default-source/policies/fiscal/singapore-green-bond-framework.pdf>

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GST No.: M90362193L Reg. No.: T09LL0001D

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Basis for conclusion

We conducted our limited assurance engagement in accordance with Singapore Standard on Assurance Engagements 3000 (Revised), *Assurance engagements other than audits or reviews of historical financial information* ("SSAE 3000 (Revised)").

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion. Our responsibilities under this standard are further described in the Practitioner's responsibilities section of our report.

Our independence and quality management

We have complied with the independence and other ethical requirements of the Accounting and Corporate Regulatory Authority (ACRA) Code of Professional Conduct and Ethics for Public Accountants and Accounting Entities (ACRA Code), which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies Singapore Standard on Quality Management 1, which requires the firm to design, implement and operate a system of quality management including policies or procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Responsibilities for the Selected Information

Management of MOF is responsible for:

- the preparation of the Selected Information in accordance with the Framework, applied as explained in the "Key Updates" section of the Singapore Green Bond Report;
- designing, implementing and maintaining such internal control as management determines is necessary to enable the preparation of the Selected Information, in accordance with the Framework, that is free from material misstatement, whether due to fraud or error; and
- the selection and application of appropriate reporting methods.

Those charged with governance are responsible for overseeing MOF's sustainability reporting process.

Inherent limitations in preparing the Selected Information

The absence of a commonly used generally accepted reporting framework or a significant body of established practice on which to draw to evaluate and measure subject matter allows for different, but acceptable, measurement techniques that can affect comparability between entities and over time.

Practitioner's responsibilities

Our responsibility is to plan and perform the assurance engagement to obtain limited assurance about whether the Selected Information is free from material misstatement, whether due to fraud or error, and to issue a limited assurance report that includes our conclusion. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence decisions of users taken on the basis of the Selected Information.



As part of a limited assurance engagement in accordance with SSAE 3000 (Revised), we exercise professional judgement and maintain professional scepticism throughout the engagement. We also:

- determine the suitability in the circumstances of MOF's use of the Framework as the basis for the preparation of the Selected Information;
- perform risk assessment procedures, including obtaining an understanding of internal control relevant to the engagement, to identify where material misstatements are likely to arise, whether due to fraud or error, but not for the purpose of providing a conclusion on the effectiveness of MOF's internal control; and
- design and perform procedures responsive to where material misstatements are likely to arise in the Selected Information. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

Summary of the work performed

A limited assurance engagement involves performing procedures to obtain evidence about the Selected Information. The procedures in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

The nature, timing and extent of procedures selected depend on professional judgement, including the identification of where material misstatements are likely to arise in the Selected Information, whether due to fraud or error.

In conducting our limited assurance engagement, we:

- Obtained an understanding of MOF's reporting processes relevant to the preparation of its Selected Information by inquiring with management and relevant personnel on the gathering, collation and aggregation of the Selected Information;
- Evaluated whether all information identified by the process to identify the information reported in the Selected Information is included in the Selected Information;
- Performed inquiries of relevant personnel and analytical procedures on selected information in the Selected Information;
- Performed substantive assurance procedures on selected information in the Selected Information;
- Evaluated the appropriateness of quantification methods and reporting policies; and
- Assessed the preparation of the Selected Information against the Framework.



Restriction on distribution and use

Our report has been prepared solely for MOF to assist you in reporting the Selected Information in the Singapore Green Bond Report as required by the Framework ("Purpose") and is not to be used for any other purpose.

Save for the disclosure of our report in the Singapore Green Bond Report and on MOF's website, neither this report nor its contents or any part thereof may be distributed to, discussed with or otherwise disclosed to any third party without our prior written consent. MOF is responsible for all other information, other than our report, in the Singapore Green Bond Report and on MOF's website and our report does not cover this other information, and we do not express any form of assurance conclusion thereon. To the fullest extent permitted by law, we do not accept any liability or assume any responsibility to anyone else other than MOF for our work or this report. Any reliance placed on this report by any third party is entirely at its own risk. MOF is responsible for its website and that we do not accept responsibility for any changes that may have occurred to the Selected Information or the Framework since the publication of our report in the Singapore Green Bond Report.

Yours faithfully

PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP

Public Accountants and Chartered Accountants

Singapore

29 September 2025