

Impact Report for Bonds and Loans

BTSC Green Bond Framework



Impact Summary

Evaluation Date June 3, 2025

Issuer Location Bangkok, Thailand

Sustainalytics has calculated the estimated impact achieved by the green bond issued by Bangkok Mass Transit System Public Company Limited (BTSC) in November 2021. The green bond issuance raised THB 10.2 billion, which has been fully allocated across projects in the Clean Transportation category in Thailand. For a representative year of the bond's term to maturity, Sustainalytics has calculated 9,666 tCO₂e of financed avoided emissions.



THB 10.2B
Allocated funds



9,666
Annual emissions avoided (tCO₂e)



2
Projects



638K
Trees, yearly sequestration

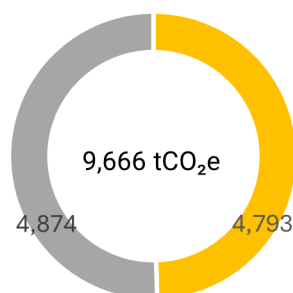


1
Country



Avoided Emissions per Project and Number of Projects by Country

- Green Line North Extension
- Green Line South Extension



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Introduction

BTS Group Holdings PCL (BTSG) is a privately owned, multi-industry conglomerate that operates across three business platforms; MOVE, MIX and MATCH. Listed on the Stock Exchange of Thailand (SET), BTSC is a subsidiary of BTSG and the group's mass transit unit, which accounts for the majority of the group's revenue. BTSC operates and maintains the Sky Train system, an elevated trackwork in Bangkok. In 2021, BTSC issued a green bond and allocated the proceeds according to the BTSG Green Bond Framework. Sustainalytics provided a Second-Party Opinion on the BTSG Green Bond Framework, evaluating it as credible, impactful and aligned with the Green Bond Principles 2021 (GBP).¹

In 2025, BTSC engaged Sustainalytics to quantify the environmental benefits of the projects refinanced with the proceeds from the BTSC Green Bond, specifically, the Mass Rapid Transit Green Line North and South extensions. Using established methodologies, Sustainalytics has estimated avoided emissions from BTSC's Clean Transportation projects. This report presents the details of our findings, including a description of the methodology used to calculate the impacts.

Scope of Work and Limitations

BTSC has engaged Sustainalytics to calculate the environmental impacts of the projects financed with proceeds from the 2021 Green Bond. For this work, Sustainalytics relied on the data provided by BTSC on the amount allocated and the technical data on the projects financed. This report's sole purpose is the transparent reporting of the projects' impact created and emissions avoided and does not provide endorsement of projects nor their eligibility.

Sustainalytics' impact reporting is aligned with ICMA's June 2024 Harmonised Framework for Impact Reporting.² The methodology and assumptions made for the impact calculation are outlined in the methodology chapter.

As part of this engagement, Sustainalytics exchanged information with BTSC's representatives to understand the sustainability impact of its projects. Through these exchanges, BTSC's representatives have confirmed that:

- (1) They understand it is the sole responsibility of BTSC to ensure that the information provided is complete, accurate and up to date;
- (2) They have provided Sustainalytics with all relevant information; and
- (3) Any provided material information has been duly disclosed in a timely manner.

Sustainalytics also reviewed relevant public documents and non-public information.

¹ The Green Bond Principles are administered by the International Capital Market Association and are available at <https://www.icmagroup.org/sustainable-finance/the-principles-guidelines-and-handbooks/green-bond-principles-gbp/>

² ICMA, "Handbook - Harmonised Framework for Impact Reporting", (2024), at: <https://www.icmagroup.org/assets/documents/Sustainable-finance/2024-updates/Handbook-Harmonised-Framework-for-Impact-Reporting-June-2024.pdf>

Impact Findings

For reporting, Sustainalytics follows the ICMA Harmonised Framework for Impact Reporting,³ which synthesizes market expectations and outlines recommendations for impact reporting to create a standardized reporting structure and to enhance the understanding of the impact to all stakeholders, including investors.

Table 1 below provides a summary of the impacts at the portfolio level, which Sustainalytics calculated from the allocation of proceeds from BTSC's 2021 Green Bond. Table 2 provides details for the projects financed per main project. These metrics correspond to a representative year during the financial instruments' term to maturity and are based on the share of project financing. Appendix 1 provides more detailed project-level avoided emissions.

Table 1: Summary of Impact – Portfolio Level

Allocated Amount	Bond Tenor	Financed Passenger-km Travelled	Financed Emissions Avoided	Financed Emissions Avoided/M THB
M THB	Years	pkm/year	tCO ₂ e/year	tCO ₂ e/year/M THB
10,200	10	149,197,305	9,666	0.95

Table 2: Impact of Clean Transportation by Project

Project	Allocated Amount	Financed Passenger-km Travelled	Financed Emissions Avoided	Financed Emissions Avoided/M THB
	M THB	pkm/year	tCO ₂ e/year	tCO ₂ e/year/M THB
Green Line North Extension	5,100	73,976,919	4,793	0.94
Green Line South Extension	5,100	75,220,387	4,874	0.96

³ ICMA, "Handbook - Harmonised Framework for Impact Reporting", (2024), at: <https://www.icmagroup.org/assets/documents/Sustainable-finance/2024-updates/Handbook-Harmonised-Framework-for-Impact-Reporting-June-2024.pdf>

Methodology

Sustainalytics developed its own methodologies for quantifying GHG avoidance and other metrics, including leveraging publicly available best-in-class methodologies, protocols and frameworks that are currently industry best practice. For avoided emissions, our estimation practices and general principles rely on the GHG Protocol.⁴ Our methodologies are based on guidance provided by the International Financial Institutions⁵ on calculation methodology and global emissions. In addition, we rely on the Partnership for Carbon Accounting Financials' Global Accounting Standard⁶ for guidance on estimation, where data is not readily available, and assumptions must be made. Finally, the UN's Clean Development Mechanism⁷ provides guidance and information, serving as the foundation for these and other methodologies, including those implemented in this report.

Clean Transportation

Clean transportation is assumed to displace a mix of existing and future transportation along the same travel distance. The carbon avoidance is calculated using:

- a) The emissions of the clean transportation projects based on the best available data from BTSC. To the extent available, calculations are based on fuel consumption or passenger-kilometre data.
- b) The baseline emissions, which are the emissions associated with a basket of vehicles or modes of transport being replaced currently and in the future lifetime of the project.
- c) Financed project avoided emissions are calculated by using the share of project financing of the total project emissions avoided from the above calculations.

Data Sources and Assumptions

- For the projects included in the report, passenger-kilometre data was provided by BTSC for the period between 1 April 2024 and 31 March 2025. This data is assumed to be representative of a typical year.
- It is assumed that the projects displace a mix of available transportation modes in Bangkok, specifically cars, buses and trains.
- To calculate the emissions avoided, Sustainalytics uses well-to-wheel emission factors that account not only for emissions directly emitted by the project and baseline modes of transport, but also from the production and transportation of the fuels themselves.⁸
- Emissions associated with electricity consumption were calculated using the national grid emission factor sourced from IFL.⁹ To account for emissions from upstream activities, such as electricity transmission losses and the extraction and refining of primary fuels, Sustainalytics applies an additional, indirect emissions factor to the emissions directly emitted by the project and baseline vehicles.¹⁰ For all other fuel types, emissions factors were calculated using data from DEFRA.¹¹

⁴ Greenhouse Gas Protocol, "About Us", (2023), at: <https://ghgprotocol.org/>

⁵ International Financial Institutions (IFI), "Members of the International Financial Institutions on Greenhouse Gas Accounting", at: https://unfccc.int/sites/default/files/resource/IFIs_membership_for_UNFCCC_%27white_pages%27_0.pdf

⁶ Partnership for Carbon Accounting Financials (PCAF), "About", (2023) at: <https://carbonaccountingfinancials.com/>

⁷ UNFCCC, "CDM Methodologies Booklet – Fourteenth edition", (2022), at: <https://cdm.unfccc.int/methodologies/documentation/index.html>

⁸ Government of the UK, Department for Business, Energy & Industrial strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

⁹ UNFCCC, "IFI Default Grid Factors v3.1", (2021), at: <https://unfccc.int/documents/437880>

¹⁰ Government of the UK, Department for Business, Energy & Industrial strategy, "Government conversion factors for company reporting of greenhouse gas emissions", at: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

¹¹ Ibid.

Appendix 1: Impact of Clean Transportation Projects

Project Name	Allocated Amount	Share of Total Project Financing	Financed Passenger-km Travelled	Financed Direct Emissions ¹²	Financed Indirect Emissions ¹³	Financed Emissions Avoided	Financed Emissions Avoided/M THB
	M THB	%	pkm/year	tCO ₂ e/year	tCO ₂ e/year	tCO ₂ e/year	tCO ₂ e/year/M THB
Green Line North Extension	5,100	8.66	73,976,919	3,892	849	4,793	0.94
Green Line South Extension	5,100	20.77	75,220,387	3,957	864	4,874	0.96

¹² Financed direct emissions refer to the financed part of project emissions.

¹³ Financed indirect emissions refer to the financed indirect part of project emissions.

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