

The World's Most Sustainable Transportation Company



TCFD

TCFD Report 2023/24

BTS GROUP HOLDINGS PCL

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(GRI 201-2)

1 | INTRODUCTION

TCFD, or the Task Force on Climate-Related Financial Disclosures, has developed recommendations for businesses to adequately assess and address climate-related impacts, as well as to disclose financial information to investors and other stakeholders so that all parties can understand and avoid potential negative financial impacts from climate change. TCFD disclosure aims to demonstrate how climate change considerations are integrated into businesses' internal processes, systems, and goals, and is structured around the following four pillars: governance, strategy, risk management, and metrics and targets.

As the effects of climate change become evident throughout the global economy, businesses have instinctively sought ways to be resilient to the impacts of climate change. As temperatures rise, so do the level of commitment businesses have to make throughout their operations. With that, BTS Group and companies around the world have been conscious of the imminent threat climate change imposes. We have consistently conducted our business according to our climate strategy, ensuring the sustainability of operations and our future. In addition, climate-related disclosures have been a crucial component for our corporate sustainability. This demonstrates the Company's commitment to our investors and stakeholders in upholding our promise to conduct business with regards to the climate crisis, while adhering to international sustainability reporting frameworks.

BTS Group applies and supports the TCFD framework in the management of climate-related risks and opportunities since June 2021.

2 | GOVERNANCE

Management of climate-related risks and opportunities is integrated into the responsibility of the Board of Directors which includes the approval of BTS Group’s Climate Strategy, overseeing implementation and progress, and the integration of climate-related matters into corporate decision-making process and executive compensation.

2.1 | Climate-Related Responsibilities

BTS Group has aligned internal roles and responsibilities for management of climate-related risks and delivery of climate strategy as follows:

Position	Climate-Related Responsibilities
Board of Directors (BoD)	<ul style="list-style-type: none"> • Approval of BTS Group climate strategy and positions on public policies relating to climate change to ensure alignment with the Paris Agreement. • Oversee implementation and progress of climate strategy. • Incorporate climate-related agendas and matters into corporate decision-making process and executive compensation at least twice per year.
Sustainability Committee	<ul style="list-style-type: none"> • Monitor alignment between our climate position and climate policy positions of trade associations to which we belong. • Oversee climate-related issues. • Report on relevant climate-related developments to the board to ensure climate strategy is in line with international standards. • Review and monitor the Company’s process to assess whether public policy engagement through trade associations aligns with the Paris Agreement. • Monitor implementation of climate strategy.
Risk Management Committee	<ul style="list-style-type: none"> • Oversee assessment, monitoring and management of climate-related risks. • Report on climate-related risks to the BoD on an annual basis. • Monitor new or emerging regulations which may have a long-term impact on the Company.
Chief Executive Officer (CEO)	<ul style="list-style-type: none"> • Examine and approve BTS Group climate strategy, regular monitoring of implementation and progress, delegation of responsibilities. • Incorporate climate-related matters into corporate decision-making process.
Chief Investment Officer (CIO)	<ul style="list-style-type: none"> • Day-to-day implementation of BTS Group climate strategy. • Incorporate climate-related issues into business development and project feasibilities, sustainability priorities and decision-making, investor relations and corporate culture.
Sustainability Department	<ul style="list-style-type: none"> • Coordination body within BTS Group for climate strategy implementation. • Review and update BTS Group’s climate performance and programmes. • Propose to Sustainability Committee for BoD approval of climate-related programmes under climate strategy. • Design and initiate climate-related capacity building activities, including stakeholder engagement and partnerships. • Report on climate policy positions and activities of trade associations.

(GRI 201-2)

Risk Working Team	<ul style="list-style-type: none"> Ownership of BTS Group’s risk taxonomy, including integration of climate-related risks.
Business Development Department	<ul style="list-style-type: none"> Incorporate climate-related risks & opportunities as a factor in analysis of business development, acquisition and partnership.
Investor Relations Department	<ul style="list-style-type: none"> Communicate with investment community regarding climate-related issues, respond to ESG investors’ questionnaires.
Corporate Communication Department / PR team	<ul style="list-style-type: none"> Communicate BTS Group’s climate strategy to relevant stakeholder groups.
Sustainability Department in collaboration with Chief Executive Officers of MOVE, MIX, MATCH Business	<ul style="list-style-type: none"> Develop and implement climate-related programmes under BTS Group’s climate strategy together with internal and external stakeholders. Collect and consolidate climate-related data, prepare periodic reports for the Sustainability Committee.

Table 1: Climate-Related Responsibilities

2.2 | Climate Management System

BTS Group is committed to addressing climate change through public policies aligned with the Paris Agreement. We are also committed to international cooperation and education to raise awareness and action for a sustainable future across all jurisdictions of our own operation through the following management system:

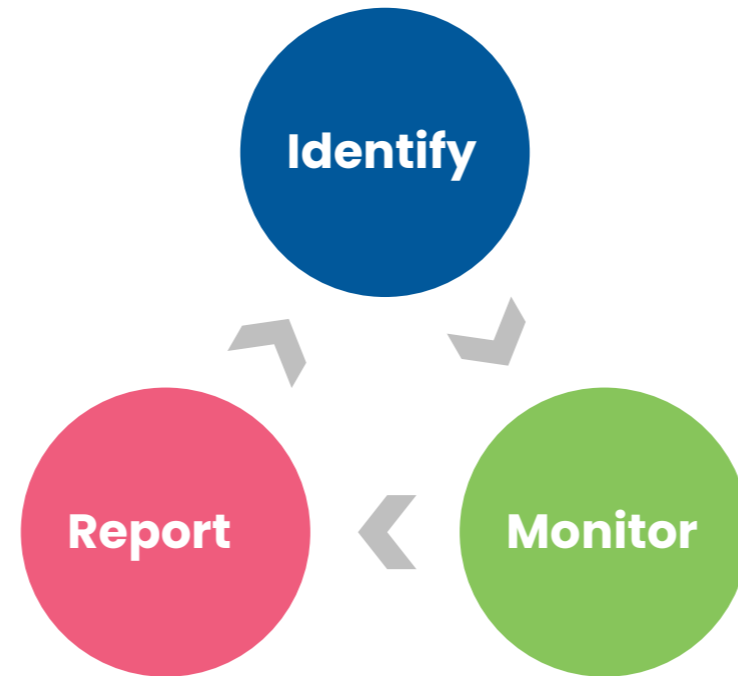


Figure 1: Climate Management System

Identify: impact, influences, and opportunities to engage with policy makers and trade associations.

Monitor: review our climate position and alignment of climate policy positions for all activities and trade associations.

Report: disclose progress on the above actions to investors and other interested stakeholders.

3 | STRATEGY

BTS Group has developed a forward-looking plan to address climate risks and opportunities in line with the Company’s strategic priorities. **Our long-term climate strategy is to achieve Net Zero by 2050.** Guided by four focus areas: Sustainable Operations, Sustainable Energy, Sustainable Collaboration and Sustainable Removal, BTS Group plans to accelerate our role as a provider of low-carbon products and services, to continuously improve our operational energy efficiency and to gradually increase our renewable energy consumption.

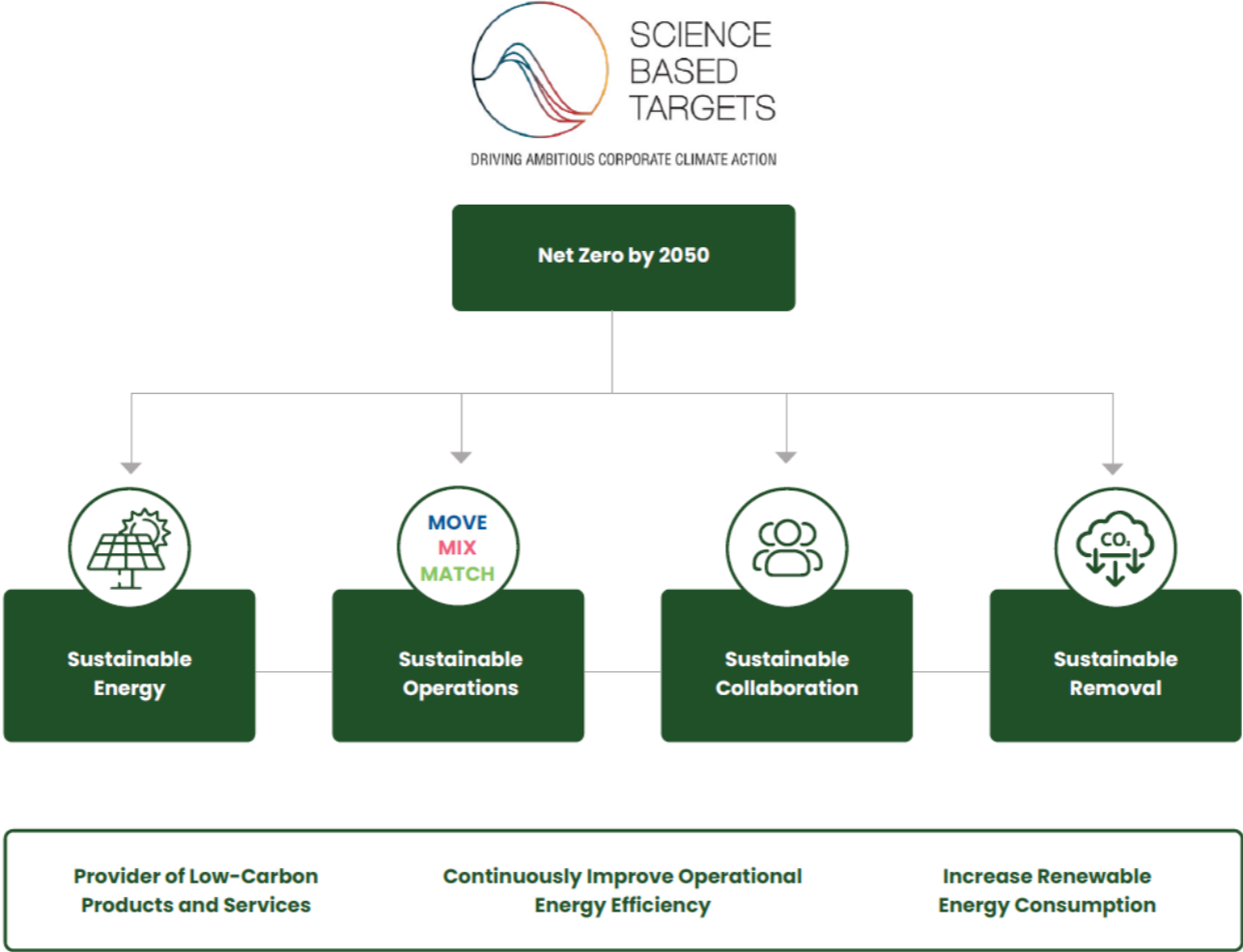


Figure 2: Climate Strategy

(GRI 201-2)

3.1 | LOW-CARBON PRODUCTS

BTS Group provides mass transit electric rail services as an alternative to other carbon-intensive modes of transportation. Passengers who switch to using our services avoid potential greenhouse gas emissions. Avoided emissions are calculated by comparing emissions from car transport with BTS SkyTrain using equivalent passenger-km distance travelled. Since 1999, BTS Group has enabled the avoidance of approximately 2.1mn tCO₂e, averaging to about 87,500 tCO₂e per year. Our BTS SkyTrain makes up for our MOVE business, which constitutes 67% of our total revenue.

BTS Group also provides the Park and Ride service. Commuters can park their private vehicles at the Mo Chit BTS station and take the BTS SkyTrain to work, school and other destinations. This contributes to avoided emissions as travel via private vehicles is lessened and since mass transit has far less overall emissions intensity in comparison with private vehicles. About 2,000 BTS SkyTrain passengers use the Park and Ride per day. Revenue from Park and Ride is estimated with these passengers, at 0.21% of our total revenue. Avoided emissions are calculated using the following assumptions: the average car commute is 24.71 km, the maximum distance that Park and Ride users would travel to park is 10km, emission factors for cars and BTS SkyTrain are taken from Defra and Thailand Greenhouse Gas Management Organisation (TGO). A round trip using Park and Ride avoided 4.4 tCO₂e, amounting to annual avoidance of 1,601 tCO₂e.

3.2 | INTERNAL CARBON PRICING

Thailand is considering implementation of carbon market (tax and/or Cap and Trade). As of 2024, Thailand is undergoing study phase for carbon market as part of the Climate Change Act. We anticipate the regulated carbon market in Thailand take place earliest in 2026. BTS Group has identified green investment and financing to be a climate risk. To manage stakeholder expectations, change internal behaviours and anticipate these climate regulations, BTS Group addresses climate risks through several priority actions, with one of them being the development of the BTS Group Internal Carbon Pricing (ICP) approach. We have calculated internally the implicit carbon price using the price/cost of voluntary carbon credits in Thailand as of 2024. The price is calculated to be THB 4,742. This price covers only Scope 2 emissions. This price is currently being used for all the Company's capital investments related to carbon reduction, energy efficiency, stress testing, low-carbon opportunities, and supplier engagement. This has driven our investment on low-carbon projects such as Solar PV installation. Currently, a feasibility study is underway for the installation of Solar PV on the Yellow and Pink line depots.

4 | RISK MANAGEMENT

BTS Group conducts assessments for climate risks and opportunities for the Company’s whole operations (including upstream and downstream activities) and portfolio. We identify material transition and physical risks and opportunities and potential business impacts over short- (0-1 years), medium- (1-5 years) and long-term (more than 5 years) horizons. In line with our climate risk process, we undertake climate change scenario analysis to explore our vulnerabilities to inform our strategy and become more resilient.

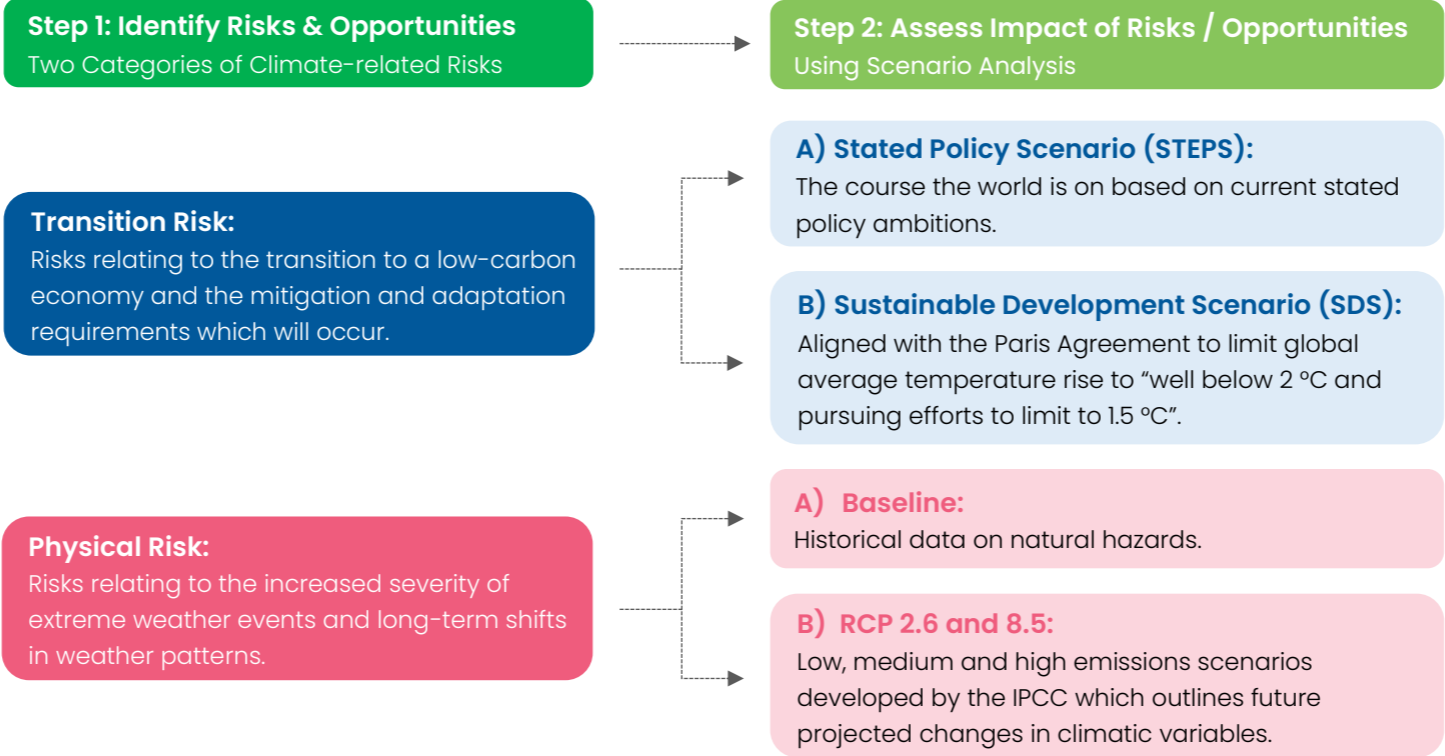






Figure 3: Climate Change Scenario Analysis

4.1 | CLIMATE RISKS

Risk	Description	Type	Impact for BTS Group and Actions
Extreme Weather 	Extreme weather presents a risk to our infrastructure. For example, extreme heat can lead to service disruption due to rail damage such as twisting of tracks. Floods can result in inaccessibility to our services and cause damage to our structural and supporting infrastructure, such as the maintenance depot. Cyclones and high wind can damage our assets and pose a threat to our construction/ maintenance workers.	Physical: Acute & chronic	<p>May result in loss of revenue due to service disruption and higher cost of ensuring the resiliency of assets and infrastructure (repairing), or to repair the damage. Assuming disruption from climate-related physical impacts would be around 1 day per year. As of 31 March 2024, total revenue of MOVE business is THB 12,003,000,000 per year, therefore the risks from delay service and service disruption is estimated to be THB 32,884,932 per day. The estimated cost to repair the damage is estimated to be THB 1,038,525.3.</p> <p>Time horizon: Short, medium and long term</p>
Water Stress 	Sourcing water for our WASH (water, sanitation and hygiene) can become challenging if water becomes scarce.	Physical: Chronic	<p>May reduce customer and employee water access for drinking, sanitation and maintenance. Cost of water sourcing and treatment may be higher.</p> <p>Time horizon: Long term</p>
Technology 	Development of new technologies and reduction in the cost of renewable energy sources continue. Through our assessments, BTS Group anticipates to shift some parts of our operation to green technology, such as shifting NGV buses to EV buses.	Transition: Market	<p>As alternative transportation becomes less carbon intensive, the role of mass transportation may be decreased.</p> <p>Time horizon: long term</p>
Demand for low-carbon transportation services 	Demand for low-carbon transportation services that are more energy efficient and/or use renewable energy.	Transition: Market	<p>Increased operating cost if renewable energy cost in Thailand is still more expensive than using energy from the grid.</p> <p>Time horizon: Medium and long term</p>
Reputation	Increased stakeholder concern and expectation on corporate climate action and negative perceptions towards businesses use of fossil fuels.	Transition: Reputation	<p>Company image and/or reputation damage, leading to reduced trust and revenue.</p>

(GRI 201-2)




			Time horizon: Short, medium and long term
<p>Current and Emerging Regulations</p> 	<ul style="list-style-type: none"> - Change of vehicle excise tax structure based on the amount of greenhouse emissions. - Thailand's Nationally Determined Contribution (NDC) and UNFCCC requirements for transportation sector. - Development of carbon credits, carbon pricing and REC pricing policies in Thailand. - Future implementation of Thailand's Climate Change Act. - New stricter regulations related to current and future extreme weather - Other climate-related legal actions. 	Transition: Policy, regulatory & legal	<p>Changing of BTS Group's Climate Strategy, operations, leading to investment of new infrastructures and sources for supporting new operation systems. Currently, our BRT operates on NGV, with its emissions in 2023/24 at 1,703 tCO₂e. In 2030 we estimate a carbon price of USD 85.5 per tonne. We manage this risk through improving fuel efficiency of our fleet. As of 31 March 2024, USD conversion to THB was at THB 36.528 per 1 USD, therefore financial implications for cost of carbon tax in 2030 is approximately THB 5,318,714. The estimated cost of these actions is estimated to be THB 519,262.65.</p> <p>Time horizon: Medium and long term</p>

Table 2: Climate Risks

4.2 | CLIMATE OPPORTUNITIES

Opportunity	Description	Type	Impact for BTS Group
<p>Market</p> 	<p>Higher demand for low-carbon transport system in Thailand presents new 'white-space' market opportunities.</p>	Transition: Market	<p>The most significant climate opportunities are new BTS lines and extensions, namely the Pink and Yellow line. The government aims to drive low carbon transport through new rail transit lines. BTS Group bases the potential financial impact from forecasted ridership multiplied by average fare for the Pink and Yellow lines. The estimated ridership is 130,000 daily trips and 47.45 million for each line. The average fare is THB 30, so estimated revenue for 2024 from new lines is THB 2.85 billion. The cost incurred for BTS Group is the cost of bidding for the 30 year concession which is estimated from the civil engineering, evaluation and management, and rolling stock costs at THB 9.6 billion, which equates to THB 320 million per year.</p> <p>Time horizon:</p>

(GRI 201-2)




			Short term
<p>New Technology</p> 	<p>Technological advances enabling a reduction in the cost of renewable energy and/or the development of new technologies.</p>	<p>Transition: Technology</p>	<p>May reduce operating costs as price of renewable energy decreases but new technologies requiring new operation patterns or train specification may lead to higher investment.</p> <p>Time horizon: Medium and long term</p>
<p>Reputation</p> 	<ul style="list-style-type: none"> - Improve Company profile amongst key stakeholders and attract investment for climate-related projects. - Set standards for other companies to follow. 	<p>Transition: Reputation</p>	<ul style="list-style-type: none"> - Increased revenues. - Availability of investment (Sustainability-Linked Bonds). <p>Time horizon: Short, medium and long term</p>
<p>Policy, Regulatory & Legal</p> 	<ul style="list-style-type: none"> - Incentives for investment into low emission transportation. - Incentives for reducing carbon emissions. - Incentives for collaboration with the government sector. 	<p>Transition: Policy, regulatory & legal</p>	<ul style="list-style-type: none"> - Increased costs. - Increased investment into greenhouse gas reduction actions and improvement of new infrastructures from transportation sector. <p>Time horizon: Medium and long term</p>

Table 3: Climate Opportunities

For more details, please refer to our Climate Strategy & Disclosure document [here](#).

4.3 | ADDRESSING CLIMATE RISKS

Climate risks are assessed and managed through BTS Group’s annual Risk Assessment, which are then integrated into the company-wide risk management process. The assessment includes our own operations, upstream and downstream activities. BTS Group has established a Group Risk Taxonomy to classify risks according to the following categories: Strategic risk, Operational risk, Financial risk, Compliance risk. Climate is integrated into different categories within this taxonomy, to allow BTS Group to identify different types of climate risk which may impact the business.

BTS Group addresses climate risks through several priority actions. Actions are commissioned to the relevant departments depending on each climate risk.

	Actions
We Provide Low-Carbon Products & Services	<ul style="list-style-type: none"> • MOVE: Clean, safe and connected mobility solutions which decarbonise Thailand’s transportation sector, using innovative low-carbon technologies. • MIX: Data analytics, incentives and public awareness campaigns to encourage consumers’ climate friendly behaviours. • MATCH: Integrating climate awareness and plausible climate-related initiatives into BTS Group’s new partnerships.
We Operate in a Green Way	<ul style="list-style-type: none"> • Energy: Energy efficiency measures in operations, increasing use of renewable energy through procurement of Renewable Energy Certificates (REC) and installing solar panels. • Water: Water efficiency measures in operations. • Waste: Reducing waste from operations and safely managing hazardous waste. • Offsets: Utilisation of offsets to achieve carbon neutrality.
Governance & Risk Management	<ul style="list-style-type: none"> • Climate governance structure, roles, responsibilities and remuneration. • Climate risks assessed through BTS Group’s risk taxonomy. • Asset level physical climate risk assessment and mitigation plans.
Green Investment & Financing	<ul style="list-style-type: none"> • Internal Carbon Price (ICP): Development of BTS Group ICP approach, pilot and roll out across BTS investment decisions. • Climate Smart Investment: Climate-related requirements for assessment, due diligence in new investments. • Green Bonds & Green Finance: Assess and report green impacts of BTS Group green bonds and identify other potential green / sustainability-linked financial instruments applicable for BTS Group for increased share of green financing.
Engagement & Disclosure	<ul style="list-style-type: none"> • Disclosure and reporting in line with the Taskforce for Climate-related Financial Disclosure (TCFD) Framework. • Participation in ESG Ratings, such as DJSI and CDP. • Engagement with stakeholders (investors, policy-makers, customers) on climate change to promote collaborative efforts, such as quantifying avoided emissions in the mass transit network through the engagement with Office of Transport and Traffic Policy and Planning (OTP).

Table 4: BTS Group Priority Actions

5 | METRICS AND TARGETS

BTS Group has set greenhouse emissions reduction targets, energy intensity targets, and energy consumption targets. The targets are set to incentivise the expansion of the Company’s business portfolio while considering climate-related risks and opportunities. Climate metrics and energy efficiency are integrated with our management’s performance evaluation and CEO KPI executive compensation.

We work hard to ensure operational efficiency, and rigorously collect and monitor other material environmental parameters and formulate a defined strategic direction to continuously reduce consumption. Our activities to increase operational efficiency include: conducting train overhaul and improvement programmes, actions related to electricity consumption (e.g., LED lighting replacement, insulation replacement, air condition upgrade etc.), and performing mid-life refurbishments on our original fleet of 35 4-car trains (e.g., traction system and ventilation and air conditioning unit etc.).

The environmental data scope includes both BTSC and VGI unless otherwise stated. The data for FY 2021/22 and before has been recalculated to include VGI. 100% of our MOVE revenue and 100% of emissions are generated from our rail related projects. To ensure validity of data, we employ third-party verifications for all environmental performance.

5.1 | GREENHOUSE GAS EMISSIONS

Indicator	Performance				Target 2023/24
	2020/21	2021/22	2022/23	2023/24	
Total Greenhouse Gas Emissions (Tonnes CO₂ e)	79,475	147,306	153,249	111,106	<175,935
Scope 1 (tCO ₂ e)	3,585	3,500	5,681	4,585	<4,284
Scope 2 (tCO ₂ e)	69,137	68,139	71,876	73,531	<80,821
Scope 3 (tCO ₂ e)	6,753	68,325 ¹	75,692	32,991	<90,830

Table 5: BTS Group Greenhouse Gas Emissions

Remarks:

1. In FY 2020/21, the BTSC data used to calculate Scope 3 emissions covers the water consumption of BTS buildings and stations, including Bus Rapid Transit and the electricity consumption of station tenants. In FY 2021/22, Scope 3 emissions were due to increased coverage of the purchase of Green Line trains, which was deemed significant and material to the Company. For the detailed breakdown of Scope 3 emissions, please refer to BTS Group Sustainability Performance Data FY 2023/24 on BTS Group’s website.
2. BTSC’s GHG emissions are from the BTS Green Line, BTS Gold Line and Bus Rapid Transit. Emissions from BTS Pink and Yellow Lines are excluded from this report, and they will be included in next year’s report. VGI’s GHG emissions are from station media, LCD screens and VGI head office operations.
3. The data used to calculate the carbon dioxide emissions for electricity consumption (emission factor) is 0.4999 tons of carbon dioxide equivalent per megawatt-hour (tCO₂e/MWh), referenced from the Journal of Thailand Greenhouse Gas Management Organisation (TGO) published in April 2022.
4. Scope 1 emissions under BTSC covers the fuel consumption of BTS and VGI buildings and cars, Bus Rapid Transit and refrigerants of the air conditioners in the building and trains.
5. Scope 2 emissions reported here are market-based emissions.

5.2 | ELECTRICITY INTENSITY

Indicator	Performance				Target 2023/24
	2020/21	2021/22	2022/23	2023/24	
Total Green Line electricity consumption per car-km operated (kWh per car-km)	2.24	2.27	2.33	2.47	N/A
Target Green Line electricity consumption per car-km operated (kWh per car-km)	<2.80	<2.31	<2.47	<2.55	N/A
Traction power (kWh/1,000 passengers-km)	71.02	107.04	59.06	52.80	N/A
Total electricity consumption at all train stations (kWh/day)	80,335	85,342	85,694	85,524	N/A
Green Line emissions (Scope 2) per revenue passenger-kilometre (kgCO ₂ e/passenger-km)	0.050	0.081	0.044	0.040	<0.050

Table 6: BTS Group Electricity Intensity

In FY 2023/24, BTSC was able to control the electricity consumption per car-km less than the target of not exceeding 2.55 kWh per car-km operated, resulting in electricity cost saving of THB 25.1mn. With significant expansion of the network in the past 4 years, ridership during and post-COVID-19 pandemic and ongoing ageing of the BTS network, BTS Group continuously monitors our electricity usage to make sure that the increased electricity intensity is not too extreme. Data for electricity intensity covers only BTSC data.

5.3 | ENERGY

Indicator	Performance			
	2020/21	2021/22	2022/23	2023/24
Non-renewable electricity consumed (MWh)	145,198	149,840	164,380	172,641
• Traction electricity (MWh)	91,392	96,769	109,102	115,573
• Non-traction electricity (MWh)	53,806	53,071	55,278	57,068
Non-renewable fuels (MWh)	11,943	10,242	12,024	11,367
Total non-renewable energy consumption (MWh)	157,151	160,082	176,404	184,008
Renewable Energy Certificate (REC) purchased (MWh)	0	15,688	20,600	25,550
Total renewable energy consumption (MWh)	0	15,688	20,600	25,550
Total electricity consumption from renewable energy (percentage)	n/a	10	13	15

Table 7: BTS Group Energy Consumption

In FY 2023/24 we purchased 25,550 renewable energy certificates (REC) equivalent to 25,550 MWh, which cover 14% of our total energy consumption.

The BTSC Maintenance Department conducts an annual energy audit, with the results of this audit are published in the annual Energy Management Report. This practice complies with the Thailand Building Control Act, established by the Department of Alternative Energy Development and Efficiency under the Ministry of Energy. Opportunities identified for improving energy performance include replacing old air conditioners, participating in the annual Earth Hour project, encouraging occupants to turn off lights, and minimizing elevator usage. Training is provided accordingly to raise awareness of reducing energy usage and ensure compliance with the Company's energy management measures. This includes courses for those responsible for energy management and internal energy management auditors.

5.4 | WATER

(Unit: Million cubic meters)	Performance				Target
	2020/21	2021/22	2022/23	2023/24	2023/24
Water consumption	0.2134	0.2111	0.1995	0.2287	<0.2200

Table 8: BTS Group Water Consumption

At BTSC, water is withdrawn from municipal water supplies. Besides water consumption for normal usage, water is also used to wash the BTS Green Line trains at the Mo Chit depot. Water consumed in this manner is taken from 2 sources: fresh water tank that stores the municipal water supply, and reused water that has already been treated from earlier train washing processes, allowing us to use less municipal water to wash our trains. Water that cannot be used further from BTS office and depots are then measured regularly for quality control to comply with ISO 14001, before being safely discharged into natural surface water locations.

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