

# Sustainable Development Report 2020



**Strategic Management  
in The Turbulent World**



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## Message from Managing Director



2020 is a challenging year to the business operations posed by both the environmental impact due to climate crisis and the pandemic of COVID-19 which has affected the health of people around the world, thereby causing slowdown in and disruption to various activities, including travelling, both domestic and international. Then, arrangements to make our businesses survive from such ongoing impacts have provoked a huge challenge for BEM. However, these circumstances provide us an opportunity to demonstrate our commitment to leading transportation network service provider who is ready to deliver the efficient services to our customers to ensure that they can travel conveniently, rapidly and safely, as well as providing value for all stakeholders as our path to sustainable development. To achieve the targets under the mission in pursuit of sustainability, we have therefore reviewed and improved management with an aim of building recognition, decision-making, resilience and integration abilities, in terms of resources and capabilities, in response to rapid business changes. To that effect, we have planned to prepare for the critical situations which can be divided into 2 phases, namely, the short-term plan is to create urgent cooperation with all sectors to cope with the crisis of COVID-19 pandemic by encouraging the social development with maximum safety; and the long-term plan is to make innovative development plans with an aim of minimizing impacts of climate change and response to the Sustainable Development Goals (SDGs) in association with our partners in the supply chain.

### Emergency Response: “Keeping Everyone Safe in Our Home”

During the situation of COVID-19 pandemic, provision of the highest level of hygiene safety for customers, employees, counterparts, along with communities and societies surrounding the MRT and expressway routes is our top priority to ensure that there is zero infected case in our operation and service areas or at lowest number of case as much as possible with zero fatality. There are significant operational procedures as follows:

1. Participation: Raising an awareness with our stakeholders.
2. Protection: Strengthening the approach for safety and hygiene of our customers, such as, measures for cleanliness inside the MRT trains and stations, maintaining the social distance, wearing a mask and rubber gloves of our staff on duty, etc.
3. Response: Preparing for any emergency incidents in the MRT trains and stations, including on the expressways at all times.

### Sustainability for the Future: “For our Green World”

As a result of the climate change affecting the provision of services, whether due to carbon dioxide emissions from fuel oil-burned vehicles or the rising use of air conditioners by which higher greenhouse gas emissions occur, leading to global warming which pose the risk of higher flooding; therefore, we have planned to develop innovations in the operational processes and applied new technologies in order to enhance the performance eco-efficiency less energy consumption and reduction of the negative impacts on the environment as the long-term plan on a continuous basis. All of them are BEM’s commitments, as part of the transportation infrastructure service providers, to alleviate the traffic problems.

We would like to extend our gratitude to all of you for your support to BEM and hope that we can provide you a smile of happiness in every moment of your journey with us.

**Dr. Sombat Kitjalaksana**  
Managing Director



# About This Report

## Resilience in a Fast-Changing World



### About this Report

This Sustainability Report emphasizes information disclosure relating to BEM's resilience and development towards the rapid changes in social and environmental contexts which have a broad impact on lifestyles of both Thai people and people worldwide.

This report covers the operation period from January to December 2020. While the Company's Annual Report focuses on financial performance in business management, BEM's sustainability Report emphasizes on non-financial performance for stakeholders who are interested and aware of changes, impacts, and guidelines for management of social and environmental issues which have an impact on the overall competency in sustainability management, covering the expressway and MRT services.

### Sustainability Context

BEM had resisted a dramatic change in the same situation as many other businesses faced throughout 2020, both due to environmental variability which continued to occur and seemed to intensify until reaching at a crisis level, and especially due to the situation of COVID-19 pandemic which affected people's livelihood, lifestyles, business operations, and the overall economy of the country until the emergence of a New Normal life. BEM, as a business unit of the society affected thereby, therefore needed to adjust the management approaches in order for the Company to stay capable of maintaining the business continuity through provision of cooperation in observing government measures, as well as keeping a balance in delivering value to stakeholders, customers, service users, employees, counterparts, communities and society.

The Company has conducted a review and analysis of the sustainability context in relation to the Company, both internal and external, including its visions, missions, strategies and policies, as well as situations and issues of general interest at national and global levels, contributing to an input factor in formulating response guidelines in terms of maintaining the quality of service, operational process adjustment, and development of the necessary potentials of personnel in the times of such crisis in all sectors.

### Material Issues for Sustainability

According to the analysis of the transportation and logistics business situation, both at national and global levels, at the time of reporting, it is found that sustainability issues which are of critical importance to the Company's performance in economic, social and environmental aspects, and high influence to decision-making of stakeholders, include:



These aforesaid issues have been managed in a mode of focal point of adaptation to complex environments and more difficult-to-control factors in the New Normal life.

### Stakeholders

As stakeholders play a crucial role in survival in the midst of changes, the Company's business management gives priority to stakeholder inclusiveness by listening to, collecting and identifying the interests, expectations and concerns of stakeholders to be used in setting guidelines for creating a shared value balance under the practices in 3 areas, namely :



### Completeness

Any information disclosed in this Report has been reviewed by top management in order to assure stakeholders of the quality, completeness of the information sufficient to create understanding, application, and decision-making for various purposes of stakeholders.



# Materiality for Sustainable Development





# Materiality for Sustainable Development

## Resilience in a Fast-Changing World

**BEM has defined material issues in the business operations which cover the Company's businesses, i.e., expressway and rail businesses. The process for consideration and assessment of the material issues is as follows:**

### Consideration of Factors Affecting the Company

We have taken into consideration both internal factors such as visions, missions, policies, strategies, business direction of the Company, etc., and external factors such as material issues of the transportation industry, issues of general interest or to be expected at national and international levels, rules, regulations, global standards for sustainability indicators, expectations /concerns from stakeholder groups, opportunities and risks, etc.



### Identify Topics Universe

### Prioritization

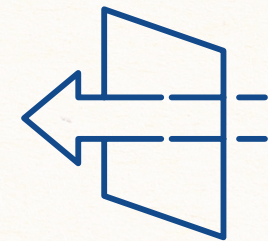
We have prioritized these issues which importance to the Company's business operations in environmental, social and corporate governance dimensions, and importance / influence to stakeholder groups; also calculated and map out the Materiality Matrix in order to identify the priority of each issue.



### Assessment

### Review

All the material issues have been prioritized and then proposed to the Management Team to provide opinions and review the priority of each issue for consideration and approval.



### Materiality Topics

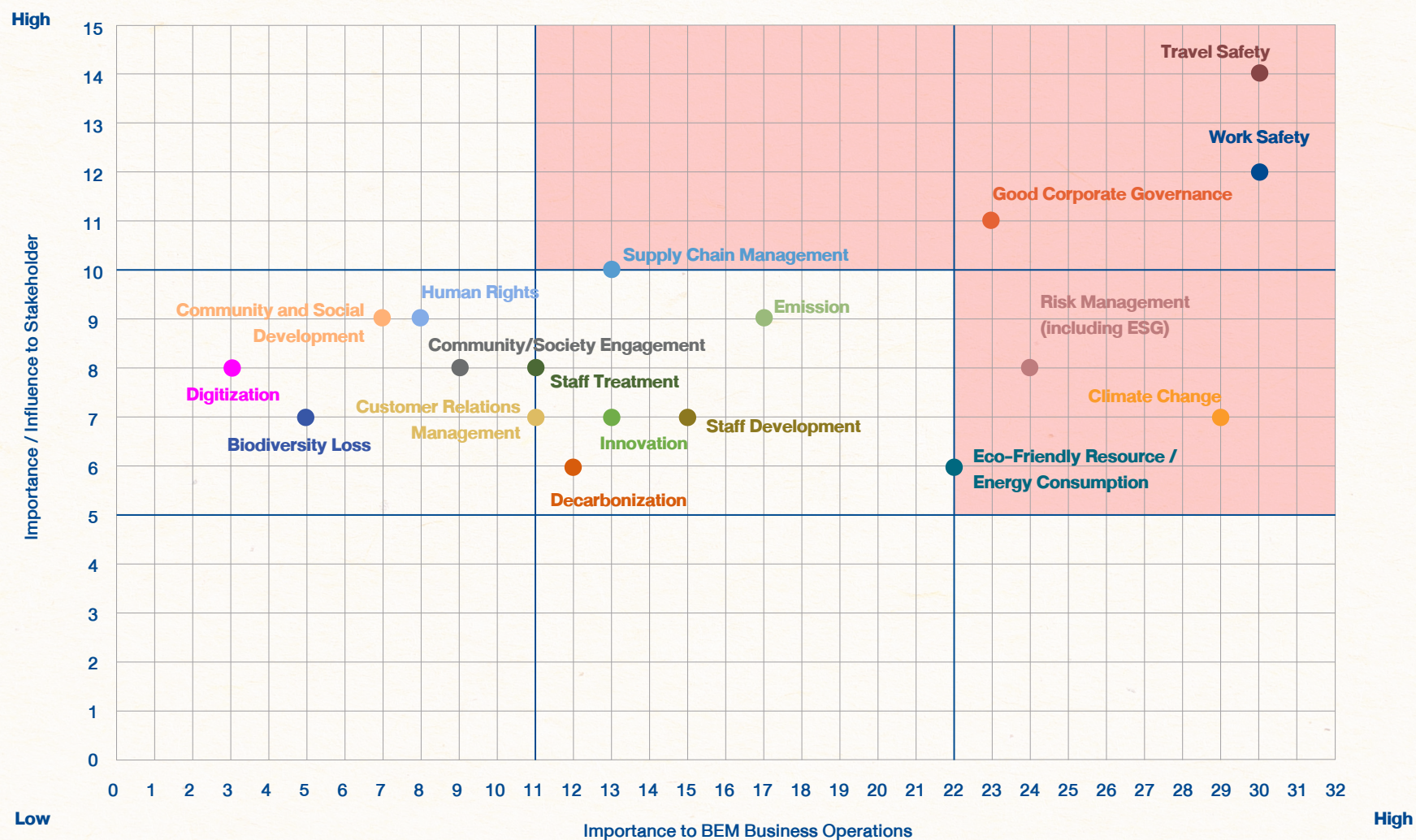


# Materiality for Sustainable Development

## Resilience in a Fast-Changing World

Materialities for BEM's sustainable development have been reviewed from the year 2018 so that relevant key issues are reduced from 6 to 5 issues. To that effect, business ethics issue has been incorporated into good corporate governance issue. Meanwhile customer relationship management and community and stakeholder engagement issues have been assessed to a middle level.

Risk management and climate change issues have been assessed to a high level while travel safety and good corporate governance issues have been assessed and staying at a high level as previously.





# Stakeholder Engagement





# Stakeholder Engagement

## Creating Value and Balancing Needs

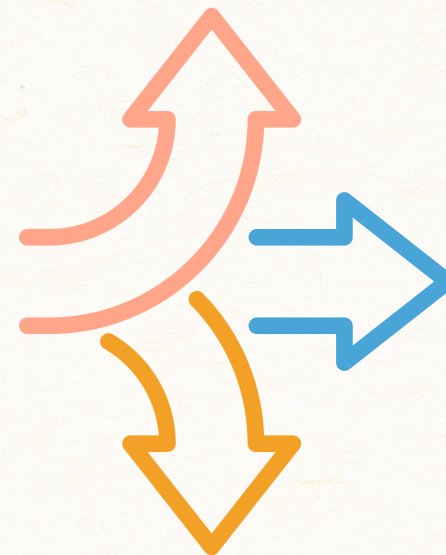
### Balance

Stakeholders play a key role in enabling BEM to progress and grow sustainably. In any such crisis, understanding of the interests, expectations and concerns of stakeholders is the matter of importance. Due to the fact that it will enable the Company to formulate responsive approaches to ensure a balance in creating shared value. To that effect, we have set out the operational guidelines for stakeholder engagement in any such crisis as follows :



### Understanding

Knowledge and understanding of material issues in any such circumstances happened which have combined impacts between stakeholders and the Company.



### Buy-in

Accepting impacts which occurred, having the right attitudes to see the importance, being ready to foster cooperation in improvement, development and change.

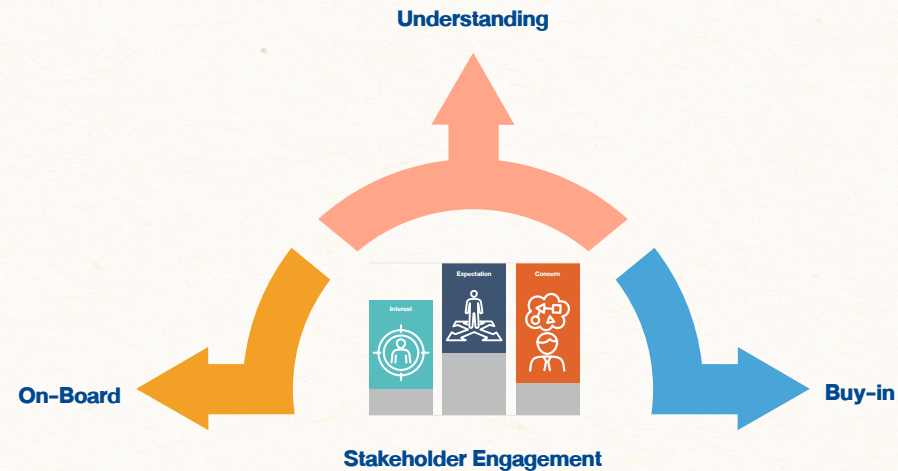
### On-Board

Practices to pursue development which is a change in behavior at an individual level and being part of systems and processes.



# Stakeholder Engagement

## Creating Value and Balancing Needs

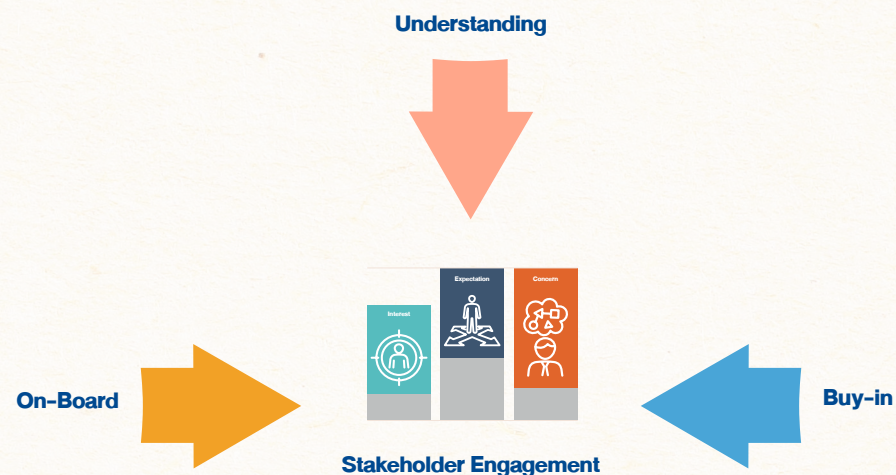


Impacts to BEM	Material Issues	Impacts to Stakeholders
<ul style="list-style-type: none"> <li>- Decrease in revenue</li> <li>- Business disruption</li> <li>- Negative impact on reputation/ Revoked License to Operate</li> </ul>	Operational Results	<ul style="list-style-type: none"> <li>- Creation of Value Added to Business</li> <li>- COVID-19 Infection</li> <li>- Injury and Fatality</li> </ul>
<ul style="list-style-type: none"> <li>- Operation suspension</li> <li>- Negative impact on reputation</li> </ul>	Travel Safety	
	Work Safety	<ul style="list-style-type: none"> <li>- COVID-19 Infection</li> <li>- Illness and Fatality</li> </ul>
<ul style="list-style-type: none"> <li>- Stagnant business growth or possible business bankruptcy</li> <li>- Negative impact on reputation</li> </ul>	Good Corporate Governance	<ul style="list-style-type: none"> <li>- Unethical/Undisciplined Employees</li> <li>- Fraud/Corruption</li> </ul>
<ul style="list-style-type: none"> <li>- Tendency to pay higher tax (Carbon Tax) on use of energy and resources of various kinds</li> </ul>	Severe Climate Change	<ul style="list-style-type: none"> <li>- Impact on Services</li> </ul>
<ul style="list-style-type: none"> <li>- Failure to prevent risks or emergency situations</li> <li>- Business disruption</li> </ul>	Risk Management	<ul style="list-style-type: none"> <li>- Travel/Work-Related Injury / Fatality</li> </ul>



# Stakeholder Engagement

Creating Value and Balancing Needs



Stakeholders	Material Issues	Understanding and Buy-In	On-Board
MRT Passengers / Expressway Users / Communities	Travel Safety	Communication	Use of Services Participation in Activities Complaint and Suggestion Channels
Employees / Counterparts	Work Safety	Policies, Measures, Provision of Knowledge and Training	Safety Awareness-Raising Internal Safety Activities
Executives / Employees	Good Corporate Governance	Policies, Structures and Practices, Governance	Communication / Whistleblowing Channels and Whistleblowing Handling Practices on Ethics and Codes of Conduct
Employees / Communities	Severe Climate Change Environmental Impact	Environmental Practices and Standards	Innovations in Operational Process Environmental Activities
Executives / Employees	Risk Management	Training / Good Practices	Operational Risk Management at All Levels



# Corporate Governance

## Agile Governance



16 PEACE, JUSTICE  
AND STRONG  
INSTITUTIONS





### Benchmarking with global business, upgrading and developing.



**This Sustainability Report reflects our operational approaches in response to severe, continuous and rapid changes in environmental context by integrating the sustainability management concepts into the core strategies, rather than the parallel activity in the operations.**

It is a policy formulation with reporting, monitoring and supervision at the levels of the Executive Board and the Corporate Governance and Risk Management Committee (CG & RM) to rest assured that BEM's business operations can create sustainable value, that is, to be a service provider of convenient and safe transportation infrastructure for society, as a vital part in driving the economy and safely living in both normal and emergency situations, while simultaneously being aware of impacts on the society and environment.

To ensure supervision and monitoring in any such situation where the environment is changing rapidly and severely, it must assure that the business operations are in accordance with significant guidelines, namely:

- Ensuring the sustainable development concept is aligned with the business strategies;
- Ensuring that responsible agencies and persons are given clarity for implementation of policies and action plans in all Business Units (BU);
- Adhering to the missions and goals of creating safety and taking into account environmental impacts.

- Planning to develop the organization's dynamic capabilities in all aspects that importance to business operation and relevant to customers.

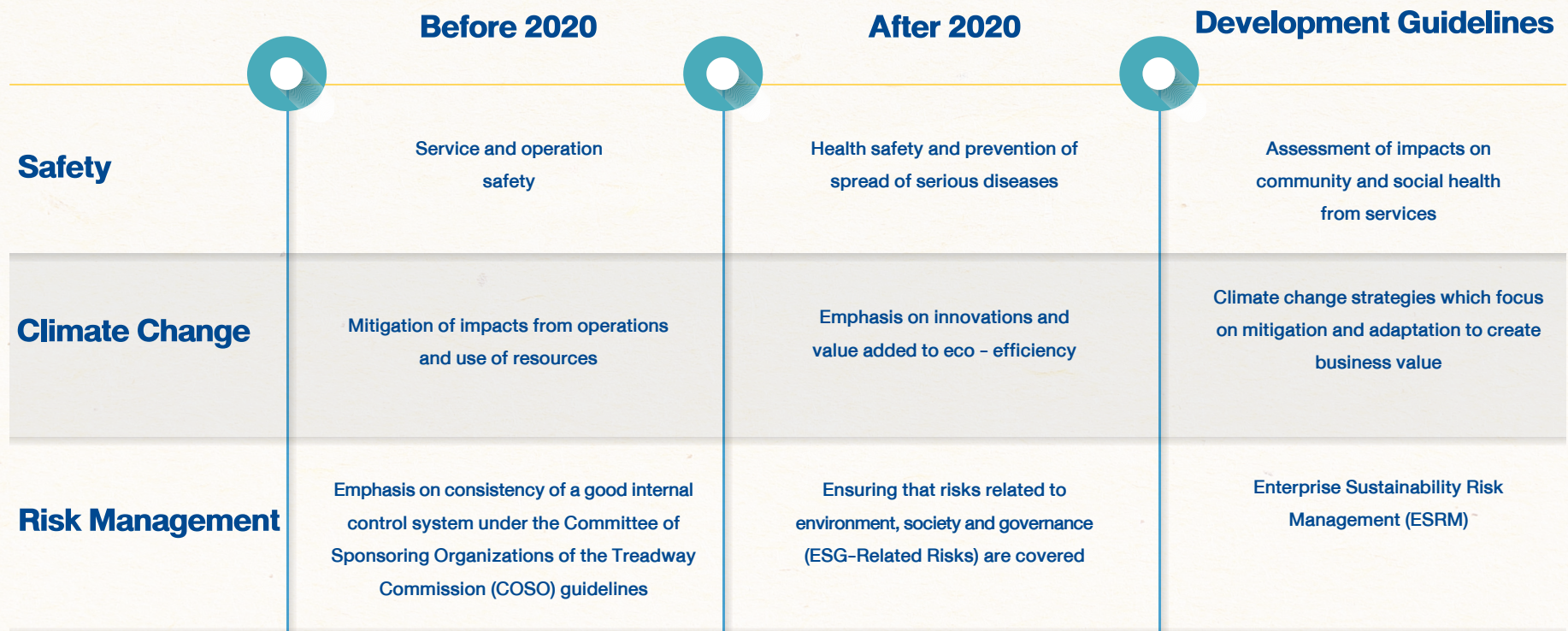
In the future, BEM will review the transformation approaches by way of a benchmark of upgrading and development of management with global business organizations as to transformation, including consider key issues important to customers, business partners, investors, regulators, as well as consistency with BEM's mission in order to enable to maintain its good relationships and engagement with those stakeholders to ensure collaborations in rapidly handling under ever-changing circumstances.

The structure and agility of BEM's governance is therefore essential to ensure consistency in strategic risk management, critical, accurate, timely information management throughout the entire IT Governance system so that BEM can maximize efficiency in management of its resources in response to the ever-changing business environment.

The situation of COVID-19 pandemic in 2020 brought a wealth of experience to BEM for learning and development to stay in the greater business readiness, set targets and metrics reflecting the business capabilities, including shared values outcomes from BEM and stakeholders of all groups for further continuous development in the long run.

Remark: Please see the governance structure in the Annual Report 2020.







# Strategic Management





# Strategic Management in The Turbulent World

## New Challenges

New challenges which are currently emerging rapidly and intensely bring up the question as to whether or not most companies will still be able to live longer to continue its business in the future (future-proofing). A recent report by McKinsey found that the average life-span of companies listed in S&P 500 has changed drastically since 1958, namely, from their average life-span at 61 years in 1980 dropping to 25 years, and less than 15 years in 2019, despite the fact that those companies are in one of the world's environments conducive to development the most.

The Company has reviewed and developed management guidelines with an aim of creating dynamic capabilities responding to changes and uncertainties under the guidelines as follows:

1. Scanning environment to find sustainability factors affecting the business operations.

## Community Health from the Situation of COVID-19 (Public Health)

Since the pandemic of the COVID-19 has occurred, social distancing, is required to refraining from face-to-face contact with others, as a result, all sectors need to make adaptations such as working from home, enforcement of city lockdown, travel restrictions in all modes, including mainly staying at home as much as possible, which result in decrease in the overall travel. Meanwhile, the Company has adjusted the process to increase manpower and equipment ensuring the highest level of safety for our passengers.

## Climate Crisis

Despite the fact that traveling is a necessity, the use of fuel oil-based vehicles is seen as a Carbon Dioxide (CO<sub>2</sub>) emission, therefore, the public transport service is one of the important options, particularly those with electric-powered vehicles which gain more recognition and popularity. In addition, environmental trends affect investment, fundraising aimed at supporting businesses investing in technologies with potential to reduce the environmental impact.

2. Scenario analysis to simulate the urban transport and travelling scenarios in the future under the changing circumstances from those factors as envisioned by BEM that they are caused by sustainability factors.

- New normal life is resulted from the Covid-19 pandemic that has changed the lifestyle of people in society even after the end of the pandemic in respect of travelling, health focus, communication via technologies.
- Extreme weather phenomena requires the services to stay more vigilant and have workable systems in place at all times.
- The trend of global warming becomes more concerned, the public services are therefore essential to mitigate any such impacts.

3. Drivers/Option analysis for sustainable development identifies rapidly and severely changing factors which affect BEM for strategic responses in two key factors:

- Health and safety from the COVID-19 pandemic, as an urgent factor at the critical level; and
- Climate change & CO<sub>2</sub>, as a constantly changing factor, is entering the crisis period.

4. Sustainability strategic responses are what BEM set the organization's strategic responses for bringing the sustainability drivers and capital indicators into the transformation and integration process to ensure the dynamic capabilities, namely:

- Human Capital Development
- Digital Transformation
- Climate strategy
- Enterprise Sustainability Risks Management

The Average Life-spans Of Companies Listed In American S&P 500

61 years OLD in 1958 / 25 years OLD in 1980  
under 15 years OLD in 2019

and 75% in 2027 of companies in S&P 500 will have disappeared.

Source: McKinsey

**Environmental Footprint**

**Lifestyle**

**Climate Crisis**

**Digital Transformation**

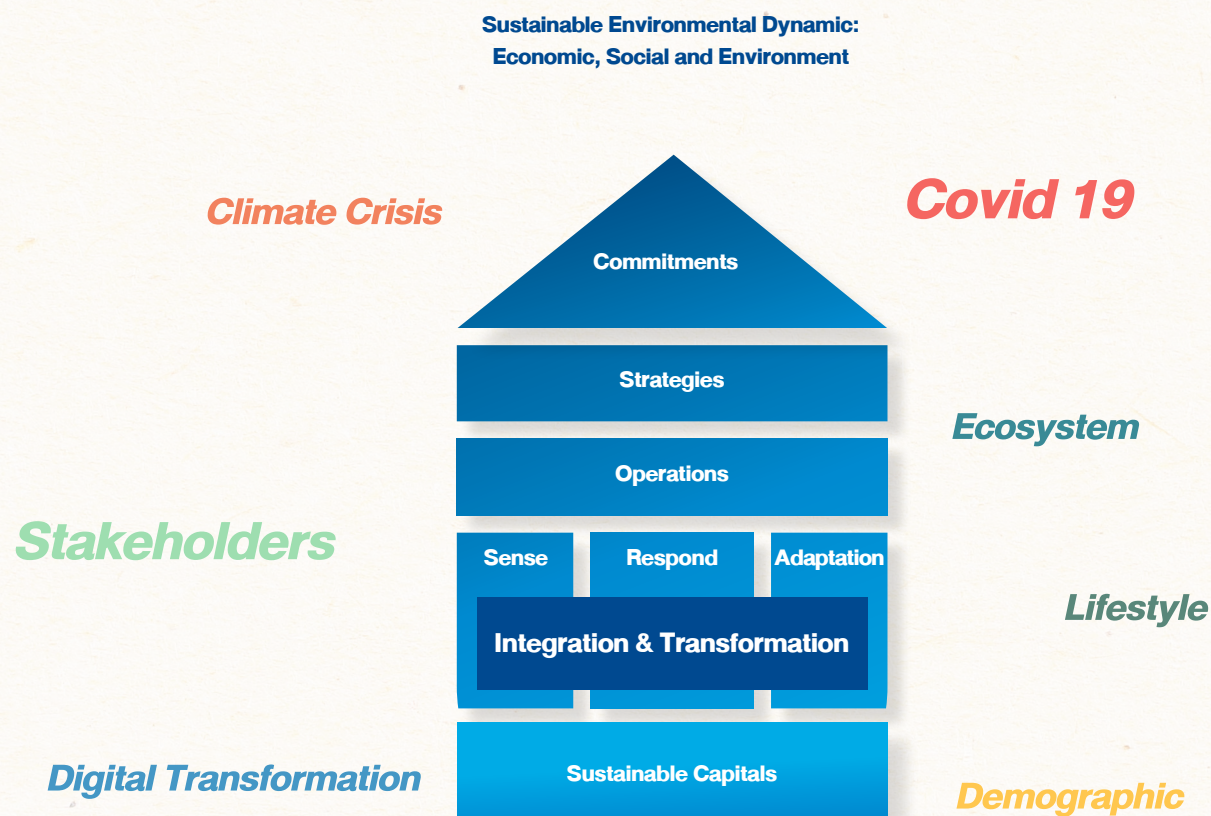
**Stakeholders**

**Covid 19**

**Demographic**



# Strategic Management in The Turbulent World



## Sustainability Commitments

BEM is a provider of transportation infrastructure service in pursuit of ensuring economic growth, good quality of life of people in society, and environmental sustainability.





# Travel Safety



3 GOOD HEALTH  
AND WELL-BEING





## Urban Movement

### Travel Safety

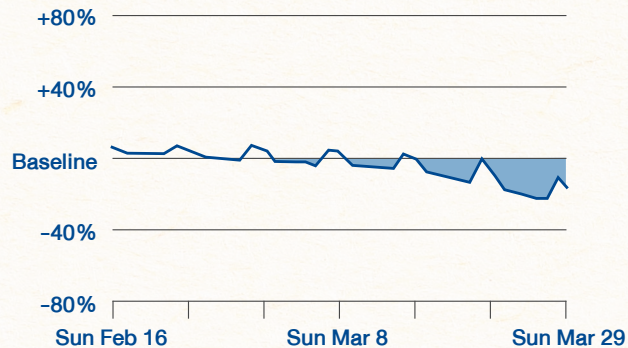


**Another 79% of Thais are unable to work from home, they still have to commute to work.**

Workplaces

**- 21%**

compared to baseline



Reference : Data from Google, April 2020.

**Regardless of severity of the ongoing situation of COVID-19 pandemic in the country, the lives of people in Bangkok still have to move on.**



Over the past years, Bangkok, known as the metropolis that drives the country's economy, has never slept. But due to the COVID-19 situation, this big city must inevitably slow down to contain the spread of COVID-19.

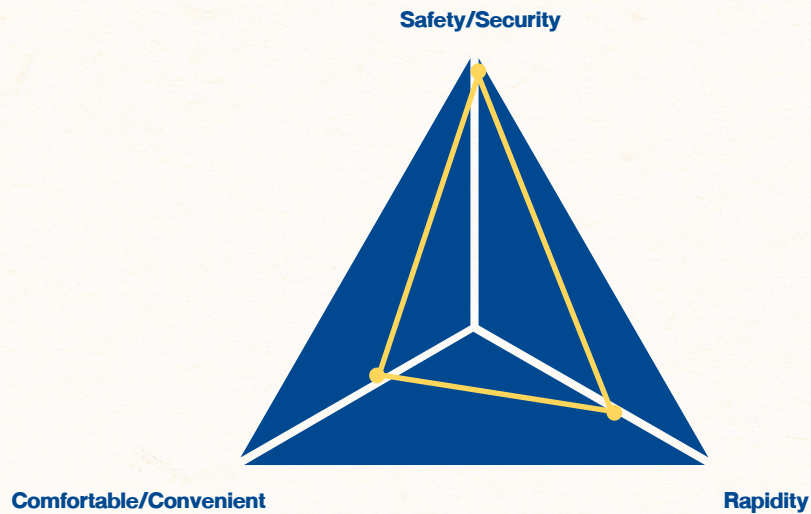
Many activities have been temporarily suspended; a great number of companies and agencies have switched to working from home mode in order to prevent the risk of COVID-19. However, there are still many people who must unavoidably travel for work. According to a Google survey, up to 79% of Thais are unable to work from home and still need to commute to work every day, including some BEM's employees who still have to travel for work in order to fulfil their duty to facilitate travelling for people who still need to travel and use the expressway and MRT services. Both groups of people are making an effort to move the heart of the country forward in times of this tough situation.

#### How can we make these people travel safely?

Traveling by the expressway and metro systems is essential to living in megacities with traffic congestion, especially during peak hours. In addition, travelling in such modes contributes to not only travel-time saving predictions, but also a highly secure system. To this effect, BEM has adhered to the service principles aimed to provide comfortable/convenient services with rapidity and maximum safety/security.



# Service Guidelines for Travel Safety



BEM's service provision, at its best, in facilitating travelling so that passengers can reach their destinations every day, adheres to the service guidelines in 3 dimensions, namely:

1. **Safety/Security:** cooperation with customers of the expressway and metro systems as to the practices for the sake of travel safety;
2. **Comfortable/Convenient:** creation, development of equipment, structures for functional usage and delivery of fully-integrated comfortable/convenient services to customers.
3. **Rapidity:** provision of the expressway and mass rapid transit system services with rapidity, punctuality, and efficiency in order to ensure the improved quality of life of people.

For 2020, we strengthen the highest safety/security to ensure conformity with the situations happened.

## Travelling Taking the Highest Safety into Account

Under the current situation of the COVID-19 pandemic, hygiene safety is deemed of utmost importance. The Company therefore needs to establish measures for operations of its employees and customers in order to ensure the highest safety for everyone's work and travelling. The established measures are to rest assured of travel safety for all customers and conform with the government measures, namely:



## Protection

Providing screening points for checking all customers' body temperatures before entering the station areas; preparing alcohol-based or gel-based hand sanitizers for service users; requesting service users' cooperation in wearing a medical mask at all times while using the service.

## Preparing

- Preparing stations and trains to ensure maximum safety, such as, re-arranging seats in new trains under the social distancing measures.
- Marking the queuing lines at a 1-meter distance apart in a ticketing office area, in a front area of token issuing machine, in a platform area, in a passenger elevator area.
- Increasing trains while increasing service frequencies to ensure the passengers' convenience and relieved congestion.
- Disinfecting inside the metro stations and the frequently touched points or devices every hour, as well as disinfecting inside the trains at the Depots every day before the train service, and spraying disinfectants inside the trains at the terminal stations during the rush hours.

## Responding

In case of an emergency, for example, any patient and/or person at risk is found whether at a station or in a train, we have at all times provided an emergency unit stationed at each station together with preventive equipment, to assist, sort out passengers and coordinate with public health agencies in order to proceed admission of the patient and person at risk to a medical institution as quickly and safely as possible through a coordination system connected with the expressways and metro systems.



# Care of Our People



3 GOOD HEALTH  
AND WELL-BEING



4 QUALITY  
EDUCATION





## Care of Our People

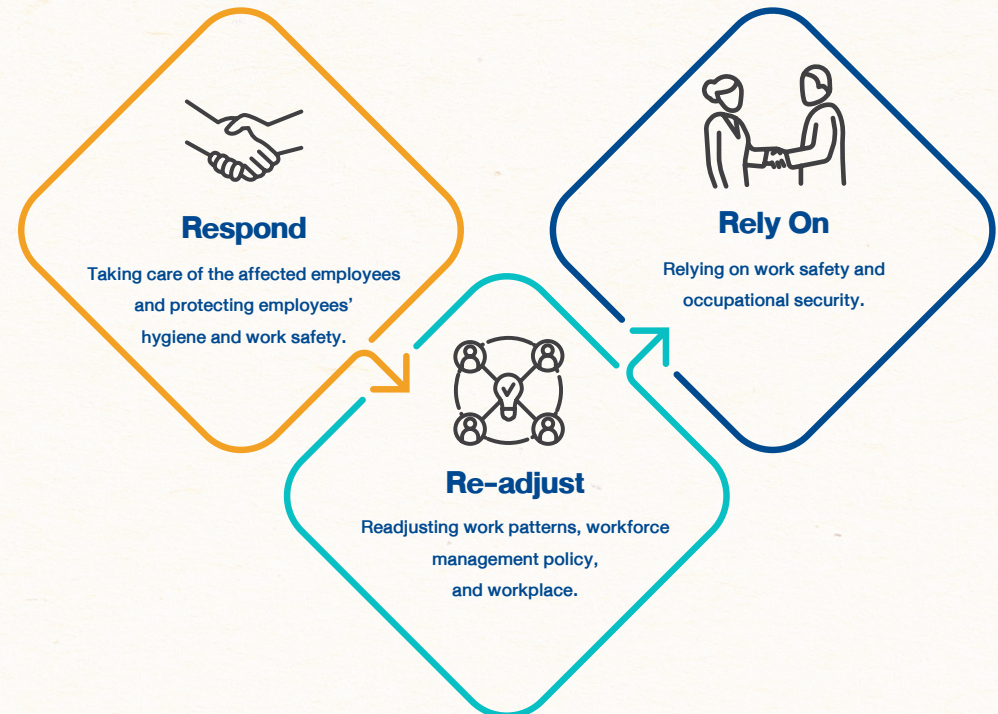
Empathy and Action



Year 2020 had critical events which had an impact on the organizational changes and workforce management, in particular the situation of the COVID-19 pandemic affecting both economic conditions and lifestyles of people around the world, thereby leading to uncertainty in business operations and performance of workers. Such changing lifestyles then cause the organization to take responsive actions through management based on self-operational approaches and new operational approaches, both of virtual work and work from home.

To ensure employees' understanding and acceptance of the new work process while still having confidence in the stability and safety in working life poses a great challenge in determining the direction of the Company's strategic workforce management.

We take actions in response to the situations to improve performance efficiency of the affected employees, manage works and work environment to accommodate the New Normal work life, including development of employees to achieve their stable growth.





## Care of Our People

### Empathy and Action



Listening to employees' voice and supports what they need in order to lessen concerns about impacts from the health crisis situation; maintaining a work-life balance and ensuring safety at workplace by means of clear communication on crisis response, including formulation of policies and measures, especially staff hygiene measures, for example, self-practices for prevention and maintaining a social distancing at the workplace, guidelines for protecting employees from infections, health insurance which covers the pandemic and possible side-effects from vaccinations, along with other assistance relating to living and work. Other than the foregoing responses, we do not have any policy to layoffs or reductions in salary of employees due to the impact of the COVID-19 pandemic.

Readjusting work patterns, by considering the use of automatic systems in works of certain types, such as, processes which require repetitive operations, works related to storage, reception, transmission, and processing of data in order to mitigate the burden and stress in working of employees, and readjusting the workforce management policy to make it appropriate for the situations, for example, adjusting performance evaluation criteria to base on quality of work and work delivery according to schedule rather than on work hours, adjusting work schedules, allocating manpower in offices and workplaces, determining welfare and benefits related to remedies for employees. Also, focusing on workplace-related operations, by considering a combination of working from home, building work flexibility, investing in technologies, both systems and equipment, so as to digitize the work methods at a greater level.

The Company is well aware of its employees' concerns, therefore makes an effort to build confidence in safety at the workplace, by closely monitoring the situations and regularly reviewing risk factors for insecurity, in order to carry out risk management in a timely manner. We also review guidelines for creating occupational security for employees in a new environment, analyze skills which employees need for future employment, both the hard side and the soft side, and develop leadership skill in a crisis situation. Moreover, employees at all levels will be focused on skill development in respect of empathy, complex problem solving, and adaptability.



# Work Safety



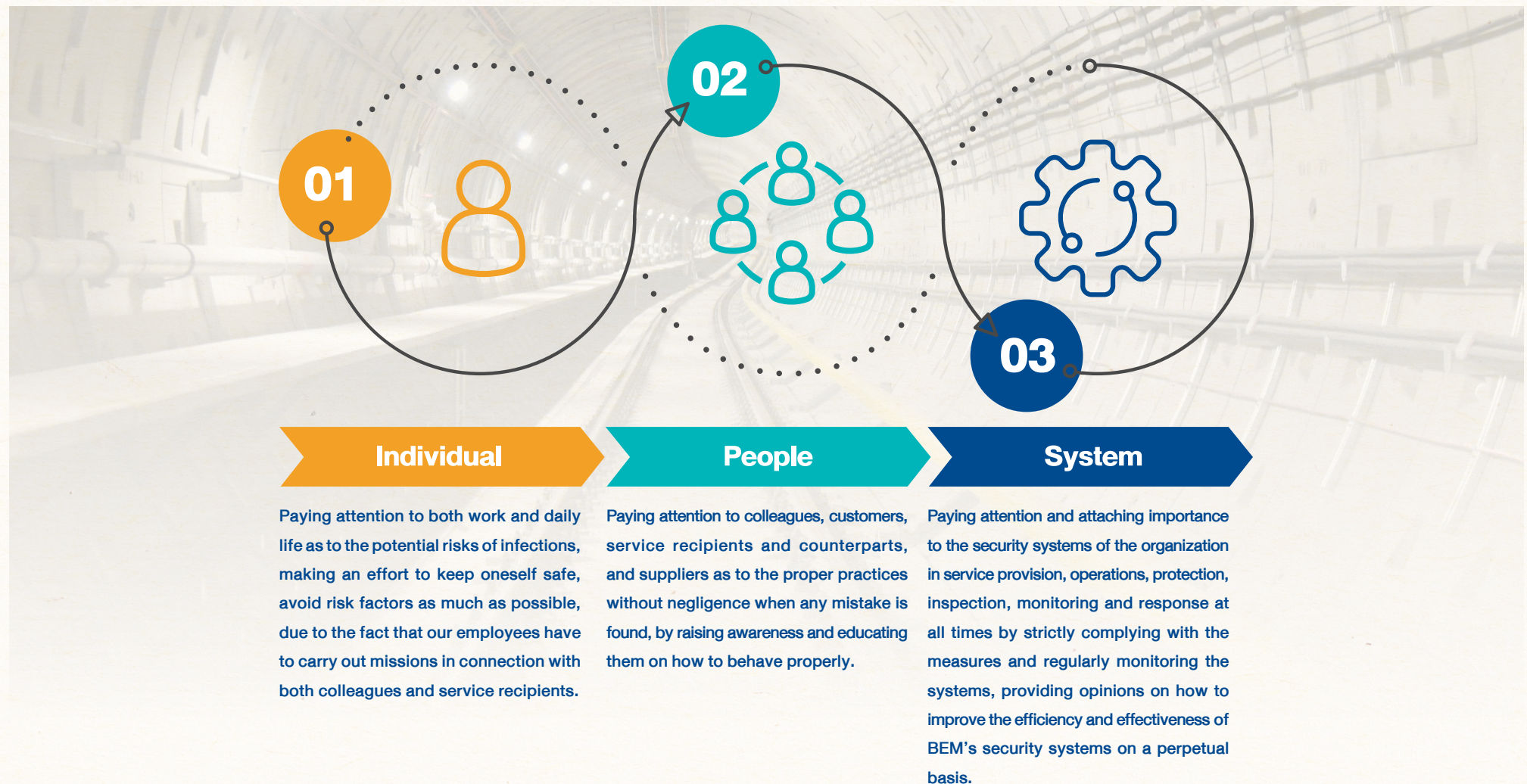
3 GOOD HEALTH  
AND WELL-BEING





## Practices in Crisis (Aware & Alert)

Other than normal safety practices, during the crisis of the COVID-19 pandemic which differentiates hazards and safety from normal ones in some ways, we also have established practical guidelines which emphasize awareness of protecting oneself and others, regarded as the fundamental principle of safety at all levels, by making them aware of risks, likelihood, warning in the case where any concerned persons are found at risk, there must be no negligence in any such situation and must reminding or educating him/her about proper practices, which are divided into three parts:







#### The beginning of safety is our staff (Self-Care)

With BEM's work nature as service provision so even in times of crisis, we still need to have our employees travel to perform their duties. It is then absolutely imperative to establish guidelines for operations during this emergency by taking into account the highest level of safety for this group of employees, starting from the emergence of the pandemic, we have provided our employees with knowledge and information required for self-behavior and self-care through various communication channels of the Company to ensure that our employees have been aware and known how to protect themselves from the COVID-19. We also ask for cooperation from our employees to refrain from traveling to any at-risk provinces, as well as avoiding participating in any crowded events/gatherings, and have provided infection protective equipment for our employees, for instance, alcohol-based or gel-based hand sanitizers, medical masks, gloves, etc.

Before workplace attendance, we provided screening points for those who are entering our office buildings and working areas. We have had our employees work in teams to reduce the risk of exposure to the disease transmission. Moreover, we require that all employees entering the Company's areas must always wear protective face masks and ask them to frequently keep their hands clean.

In the event that any employee is found infected with COVID-19, we will notify the Department of Disease Control and regulatory agencies thereof, and will conduct an assessment of employees of at-risk groups to find if other employees may have infections, if yes, so as to allow such at-risk employees to implement the quarantine measures, together with assessment of areas where may be exposed to spreading the pathogen, along with closure of such areas for cleaning and spraying disinfectants.

In the situation of the spread of COVID-19, BEM has attempted to provide employees with vaccines against the COVID-19 by coordinating with Mass Rapid Transit Authority of Thailand (MRTA), Expressway Authority of Thailand (EXAT), hospitals which are contractual parties with company and Social Security Office (SSO). Currently, there are total of 3,838 employees (97.31%) who are fully vaccinated. (As at 9 August 2021)

As for shareholders, under the situation of COVID-19, the Company has strictly followed the preventive measures under Orders of the Centre for COVID-19 Situation Administration (CCSA), by asking for cooperation from shareholders to authorize the Company's independent directors to attend the meeting instead of their attendance in person; setting up screening checkpoints for shareholders; seating arrangements spaced at least one meter apart, as well as requiring all attendees to wear medical masks at all times during the meeting; requiring them to make check-in and check-out registrations via the application "Thai Chana" before registration for attending the meeting, as well as holding the e-meeting of Shareholders on April 28, 2021; providing for channels for whistleblowers and communication relating to risk management guidelines; and coping with the situation of COVID-19 pandemic in order to bolster shareholders' confidence, etc.



## Work Safety

Aware & Alert



### Care of Counterparts, Suppliers of Products and Services to BEM

In the situation of the current COVID-19 pandemic, we not only give priority to and care about the safety of our employees, but also the safety of our counterparts.

We therefore communicate the safety practices to all of our counterparts for acknowledgement through various communication channels when they need to come to perform duties, attend meetings or carry out any tasks in our office buildings and working areas. We also provide the body temperature measurement at screening points, require them to wear face masks every time and all the times inside the office buildings or working areas throughout the period of task performance. In this regard, our security guards and staff will help monitor to make sure that our counterparts and third parties entering BEM's areas have strictly complied with our guidelines.

In addition, we are well aware that this epidemic situation may prevent our counterparts from delivering goods or services to BEM, not to mention the fact that our counterparts' staff are probably unable to come to work inside BEM's areas or even in the counterparts' office buildings, as a result, goods or services cannot be delivered under the respective contracts executed with BEM. We, after consideration, therefore adopt measures for relaxation of delivery of goods or extension of a period of operation for our counterparts, particularly those who are affected by this crisis situation. We also consider giving our counterparts a fine exemption or reduction as appropriate in order to assure that our counterparts will be able to continue their business while giving the top priority to safety of their own staff.



# Climate Crisis Management

13 CLIMATE  
ACTION







**The world is currently facing with situations and impacts of the climate change arising from various activities carried out by the world's population which is considered the most violent in history. This ongoing climate change is prone to cause more frequent and more severe natural disasters, such as, wildfires, hurricanes, including rising sea levels, let alone deteriorating air quality, or strange features of rains. It is expected that this crisis may pose a risk that 136 megacities worldwide will be struck by flooding, including Bangkok, and it may cause migration or resettlement of approximately 143 million people by 2050.**

As for impacts of the climate crisis on businesses, the Deloitte report states that up to 70 percent of the global economic system may be impacted by this crisis, with every 1 degree Celsius rise in temperature impairing the employee's performance efficiency by 1-3 percent when working outdoors or working in non-air-conditioned workplaces. Moreover, the Intergovernmental Panel on Climate Change (IPCC) report also shows that the transportation industry partially accounts for 23 percent of total greenhouse gas emissions. In respect of impacts of the climate crisis on the transportation industry, for example, rising temperatures may affect the health of the counterparts' staff in monitoring and maintenance of the expressways, or asphalt used for pavement may deteriorate further owing to the warmer climate, or the increased likelihood of flooding in the metro areas, landslides or soil movements which may cause suspension or delay in construction activities. More than that, the rising temperature cause the air conditioners inside the metro stations to work much harder, etc.

Therefore, the World Community has collaborated to find solutions to reduce greenhouse gas emissions with an aim of limiting a global temperature rise not higher than 1.5 degrees Celsius by 2050. We, as a mass rapid transit operator, are well aware of our key role in cooperation to achieve this success, we thus have established the governance structure, business strategies as well as operational plans, metrics and targets to demonstrate our commitment to reducing the amount of greenhouse gas emissions into the atmosphere together with the people worldwide.



# Climate Crisis Management

## Taking an Action



The Company attaches importance to innovations which mitigate impacts of operations on society, environment and stakeholders from the construction, repair until maintenance phases to ensure that the expressway and MRT systems have the potential to be used by customers conveniently and safely in both normal and possible emergency situations in order to maintain the status of the Path of Happiness. The Company emphasizes overseeing of the delivery process and improvement of the services on a regular basis by strictly adhering to the principles of business operations in the supply chain in accordance with the international standards: ISO 9001 Quality Management System, ISO 14001 Environmental Management System and ISO 18000 Occupational Health and Safety Management System, including policy formulation. To rest assured that the Company's operations has been conducted with regard for environmental impacts in pursuit of sustainability in business, by following the principles of good corporate governance and risk management plan of the Company, as well as formulating policies in management of various aspects clearly.



\*Business Policy and Overview is specified in the Annual Report 2020, pages 59–65.

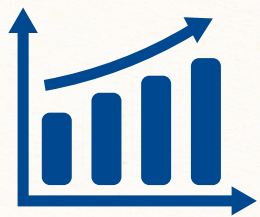




### Governance

The Company regards the good corporate governance as a key business management tool to achieve its targets with efficiency and effectiveness. To that effect, the Board of Directors has appointed the Corporate Governance and Risk Management Committee for policy-level consideration on the adequacy and appropriateness, with the Management having the duty to supervise compliance with the principles of good corporate governance and perform daily routine work on behalf of the Corporate Governance and Risk Management Committee to monitor, evaluate and prepare a report on good corporate governance performance to the Board of Directors for information. In addition, the Company also requires to prepare an annual risk management plan, a risk management handbook as guidelines in the operations, and regularly monitors, evaluates, reviews risks every quarter to be in line with the ever-changing internal and external circumstances, including a backup plan in case of emergency, in order to ensure prompt action in solving problems and coordination with relevant units at all times.





### Strategies

The Company's Business Objectives and Goals for Sustainability

1

Define the business objectives and goals which conform to and promote sustainable value creation for the Company, stakeholders and society.

2

Monitor, oversee the formulation of strategies to ensure compliance with business objectives and goals, by appropriately adopting innovations and technologies.

3

Establishing a two-pronged climate change response strategy, namely:

1. **Mitigation** means striving to find solutions to reduce greenhouse gas emissions from BEM's business operations through eco-friendly operational processes and technologies.
2. **Adaptation** is to enable BEM to further continue its business under the changeable climate and temperature conditions.



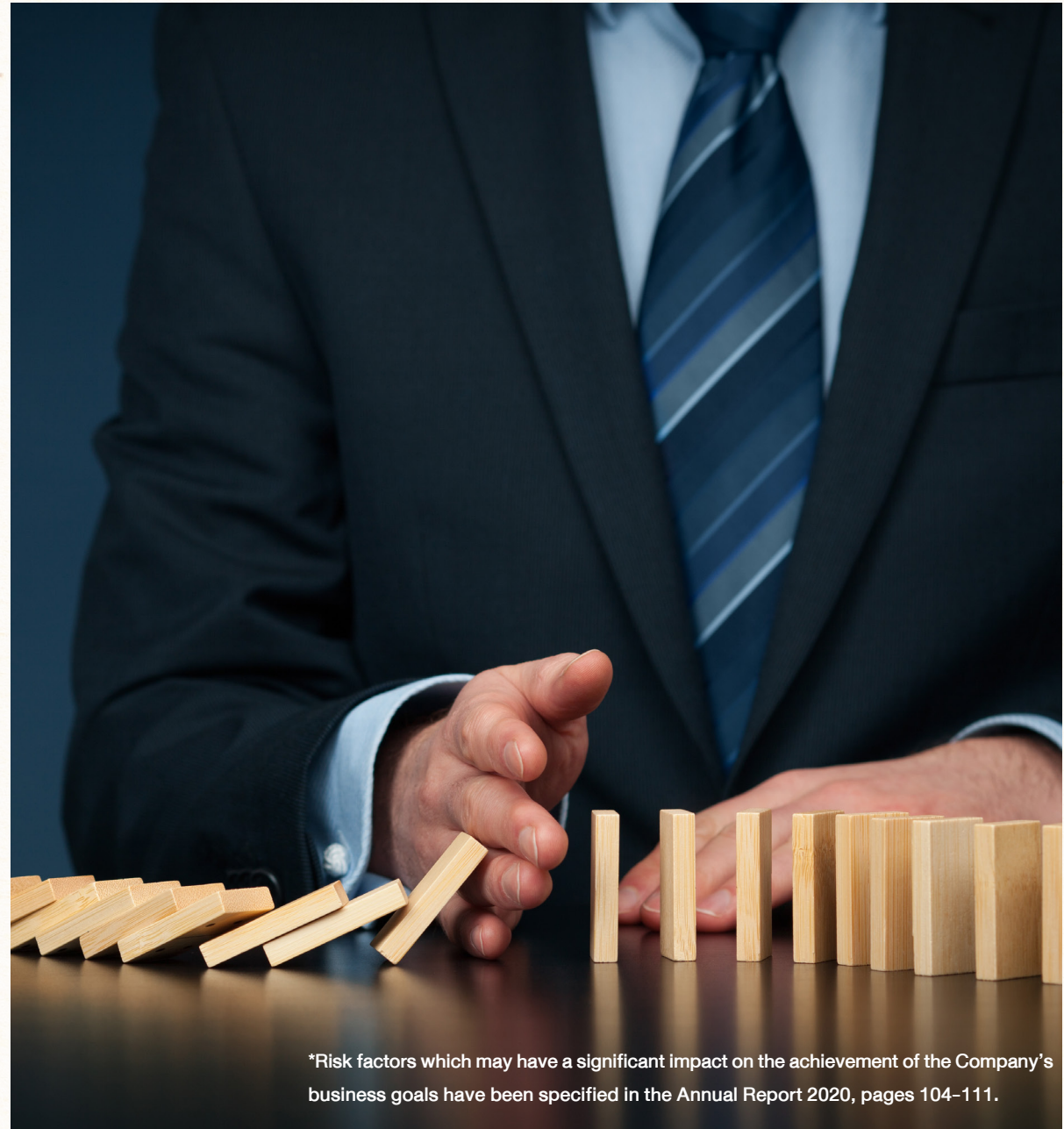


### Risk Management

The Company provides risk assessments\* related to the climate crisis, both transitional risks, such as legal/regulatory risk, technological risks, etc., and physical risks resulting from the climate crisis or natural disaster.

The Company's businesses of both construction and operation of the expressway and metro systems are exposed to an event or external factor which results in an emergency or force majeure, for example, perils, serious accident, earthquake, and the possible causes of terrorism, sabotage, which may force the Company to suspend its services, thereby giving rise to loss of revenue, damaging assets, tarnishing image and destroying reliability of the Company. For this reason, the Company has set forth emergency plans in response to any such events which may suddenly occur, as well as arranging for our staff to ensure that the staff in charge take prompt actions to resolve such emergency, and establishes a unit for monitoring, alerting and coordinating with relevant agencies to prevent the occurrence of any serious accident and to be ready for rescue operations.

The Company has taken out insurance against property all risks, business interruption, public liability, and terrorism in respect to the metro service business.



\*Risk factors which may have a significant impact on the achievement of the Company's business goals have been specified in the Annual Report 2020, pages 104-111.





## Metrics & Targets

The Company has appointed a working group of various aspects to formulate strategies and innovations to ensure the greater efficiency in management in terms of improvement or development of modern and fully-integrated transportation networks, both expressway and metro systems, in order to help alleviate traffic congestion, conserve environment, and develop society. This is to assure that the expressway users are provided with the convenient, fast, safe services, and by which the economic losses caused by fuel burning in the course of traffic congestion can be minimized, not to mention the fact that greenhouse gases occurred from the oil production process and gases emitted from the exhaust pipes can also be reduced, thereby providing more clean and environmentally friendly air in and nearby the expressways.

As for the metro system, in addition to safe, convenient, fast service provided to the metro users, it is also an eco-friendly public transport system which consumes clean energy, helps minimize air pollution, reduce greenhouse gas and Carbon Dioxide (CO<sub>2</sub>) emissions, as well as having a process to prevent and control pollution which may occur from activities of the Company, and takes into account the efficient use of resources, **with a goal of reducing CO<sub>2</sub> emissions in 2020 in the total quantity of ≥ 10,370 tons**, as measured by the total reduced CO<sub>2</sub> from the MRT Blue Line and Purple Line electric energy conservation projects, and environmental activities.





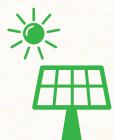
The Company continues to maintain the ISO 14001 Environmental Management System, by monitoring important environmental concerns which may occur, as well as optimizing the use of natural resources through its continuous energy management measures. The Company has also obtained certifications of the ISO 9001: 2015 Quality Management System and ISO 14001: 2015 Environmental Management System from SGS (Thailand) Limited; and the ISO 45001: 2018, OHSAS 18001:2007 and TIS 18001:2001 Occupational Health and Safety Management Systems from TUV NORD (Thailand) Limited.

**In 2020, the Company took environmental actions on a continuous basis as follows :**



### Expressway Business

Change of the air conditioning systems of the Si Rat Expressway Control Center Building, on the 1st and 2nd Floors, from AHU (Air Handling Unit) and Split Type air conditioning systems to VRV (Variable Refrigerant Volume) type air conditioning system, thereby reducing the consumption of electricity from the Metropolitan Electricity Authority by approximately 15 percent from the existing air conditioning systems.



Installation of solar cells at the Si Rat - Outer Ring Road Expressway Control Center (CCB7), at the 75 kWp capacity, generating approximately 109,500 kWh of electricity per year, thereby reducing consumption of electricity from the Metropolitan Electricity Authority by approximately 15 percent, reducing CO<sub>2</sub> greenhouse gas emissions by approximately 54,640.5 kg or 54.64 tons (Rate: CO<sub>2</sub> kg/kWh in Thailand (0.499 kg/kWh)).



Automatic toll collection lanes or Easy Pass, as an automatic toll collection system which was improved as Fast Lane, thereby resulting in expressway users' saving of traveling time and fuel, reducing traffic congestion accumulated in front of the toll plazas while reducing air pollution whereby motorists were not required to stop to pay tolls. That was, a vehicle using the Easy Pass could reduce Carbon Dioxide (CO<sub>2</sub>) emissions of 155 grams/kilometer, thereby promoting the quality of life for officers working on the expressways.



Toll payment service with Contactless EMV at the cash payment tolls: The Company, in association with EXAT and Krungthai Bank, developed the contactless credit or debit card payment system in accordance with an Europay Mastercard Visa (EMV) standard to facilitate the expressway users, whereby the service has been provided on the Si Rat - Outer Ring Road Expressway since June 2020, with the service opening on the Udon Raththaya Expressway and the Si Rat Expressway in 2021. Tapping such credit or debit card to pay tolls would take only 5-6 seconds, less than paying by cash which takes more than 30 seconds or more. This is considered an alternative payment method for motorists, thereby mitigating congestion in front of the toll plazas, helping reduce pollution in front of the toll plazas while reducing fuel consumption, as well as reducing cash exposure during the epidemic of crisis COVID-19.





### Rail Business

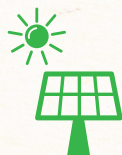
According to the Company's energy conservation policy, each year, the Company will come up with ideas for improvement, including reduction in cost of electricity for the Company. The utilization of electricity by the management business of mass rapid transit system projects accounts for a significant portion of the Company's cost. Therefore, the Company adopted energy-saving measures in 2020 to reduce energy consumption and to protect environment by reducing Carbon Dioxide (CO<sub>2</sub>) emissions. The following activities were undertaken in 2020:



Replacing the existing light bulbs with efficient light bulbs (LED bulbs) in areas of the Phra Ram 9 Depot, the M.R.T. Chaloem Ratchamongkhon Line Project (the original MRT Blue Line); replacing fluorescent bulbs with LED bulbs in the areas of the M.R.T. Chaloem Ratchamongkhon Line Project (the original MRT Blue Line and the MRT Blue Line Extension), and the M.R.T. Chalong Ratchadham Line Project (MRT Purple Line).



Controlling turning on and off the lighting system, and the seasonal air conditioning system so that the use of electric power was according to the actual use and the seasons, to ensure the efficient energy use on the parts of the M.R.T. Chaloem Ratchamongkhon Line Project (the original MRT Blue Line and the MRT Blue Line Extension) and the M.R.T. Chalong Ratchadham Line Project (MRT Purple Line) and to facilitate the services to the rising number of passengers.



Studying on solar power generation project in the areas of the M.R.T. Chaloem Ratchamongkhon Line Project (the original MRT Blue Line), one of the projects on that the Company has conducted a study for a while, not to mention the fact that the global trend has been toward the greater utilization of renewable energy because the production of electricity from natural resources will have no impact on the environment, reducing both Carbon dioxide (CO<sub>2</sub>) emissions and global warming. According to the NOVA's information, the rail service providers in other countries have also started switching to solar power.



Studying on application of highly efficient technologies in the systems including the guidelines for properly improving and changing the working processes of the systems, to control the functions of equipment, so that the study results will be used for reference in operations in the next year for the purpose of energy saving on the parts of the M.R.T. Chaloem Ratchamongkhon Line Project (MRT Blue Line Extension) and the M.R.T. Chalong Ratchadham Line Project (MRT Purple Line).



Conducting air quality measurement in the atmosphere around the projects, the results showed that the total suspended particulate (TSP), particulate matter (PM10) and carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), and the total hydrocarbons (THC) did not exceed normal level.



Participating in the Green Office promotion project with the Faculty of Environment and Resource Studies, Mahidol University, which organized activities to encourage the office to have eco-friendly consumption to be used as a guideline to reduce greenhouse gas emissions, reduce environmental impact, and to be ready to become an international Green Office. BEM was awarded "Green Office" for the year 2020 by the Department of Environment Quality Promotion of the Ministry of Natural Resources and Environment.



## The consumption of electricity, oil, water and the reduction of carbon dioxide (CO<sub>2</sub>) emissions

MRT Blue Line

Item	BL			Emission Calculation
	2020	2019	2018	
Total Passengers	95,332,386	121,939,338	113,711,333	-
Average distance per passengers (km)	8.04	6.43	6.18	-
Total Electricity consumption (traction)	54,493,046	25,101,212	24,292,801	-
Total Electricity consumption (traction) / passenger	0.57	0.21	0.21	-
Total Electricity consumption / passenger	1.59	0.86	0.91	-
Resource consumption				
Total Fuel consumption ( Deisel , Benzene , LPG ) (litre)	125,337	99,259	99,015	-
Total Electricity consumption (kWh)	151,475,477	104,433,789	103,974,518	-
Total Water consumption (m <sup>3</sup> )	540,343	407,650	390,035	-
Amount of waste (kg)	85,557	56,330	41,812	-
<b>Total GHG Emission (Tonnes CO<sub>2</sub> e)</b>	<b>91,587</b>	<b>63,203</b>	<b>62,889</b>	Total GHG Emission form Railway Operation ( Including fuel consumption , purchase electricity , water Consumption and amount of waste )
Fuel consumption ( Deisel , Benzene , LPG ) (Tonnes CO <sub>2</sub> e)	338	268	268	Fuel consumption x Emission Factor
Electricity consumption (Tonnes CO <sub>2</sub> e)	90,673	62,514	62,239	Electricity consumption x Emission Factor
Water consumption (Tonnes CO <sub>2</sub> e)	429	324	310	Water consumption x Emission Factor
Amount of waste (Tonnes CO <sub>2</sub> e)	147	97	72	Amount of waste x Emission Factor
<b>Total GHG Emission Avoided (Tonnes CO<sub>2</sub> e)</b>	<b>27,032</b>	<b>12,127</b>	<b>10,558</b>	Total GHG Emission Avoided ( Including fuel purchase electricity , recycle waste
CO <sub>2</sub> reduction from Electricity (Tonnes CO <sub>2</sub> e)	19,882	7,483	7,758	Reduced Electricity consumption from base year x emission factor
CO <sub>2</sub> reduction from recycle waste (Tonnes CO <sub>2</sub> e)	7,150	4,644	2,800	Amount of recycle waste x emission factor
<b>Comparing to 1 MRT Train (full capacity) (Tonnes CO<sub>2</sub> e)</b>				Emission Avoided from Electricity consumption( Traction) Comparing with Local Bus (Tonnes CO <sub>2</sub> e)
of Bus Equivalent (Tonnes CO <sub>2</sub> e)	8,125	8,327	7,463	Number of Passenger x ( Emission Factor of Average Bus – Emission Factor of MRT ) x Average Distance per Passenger/1,000



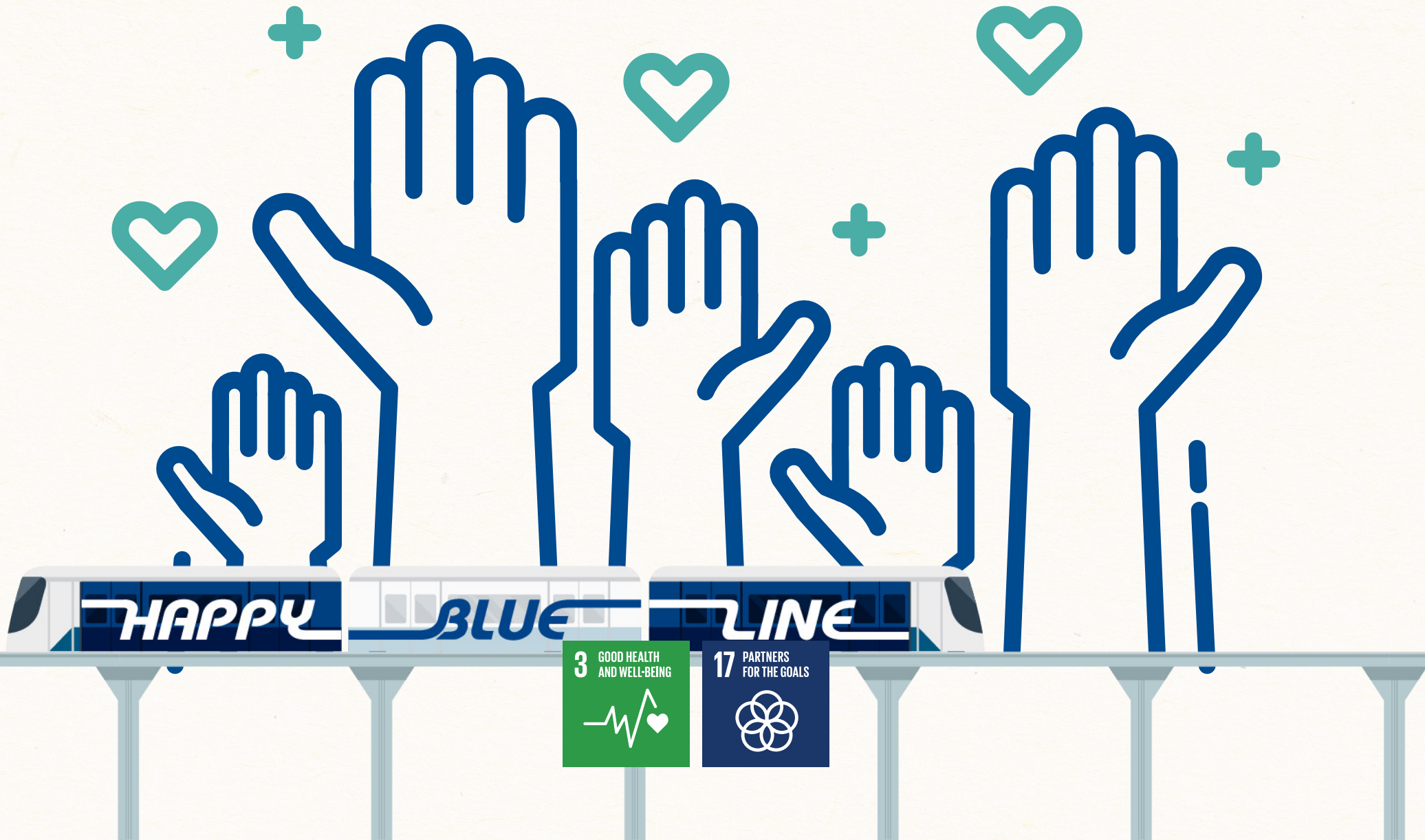
## The consumption of electricity, oil, water and the reduction of carbon dioxide (CO<sub>2</sub>) emissions

### MRT Purple Line

Item	PPL			Emission Calculation
	2020	2019	2018	
Total Passengers	16,836,638	19,726,225	17,644,587	-
Average distance per passengers (km)	10.5	10.16	10.42	-
Total Electricity consumption (traction)	17,710,985	13,503,319	13,276,434	-
Total Electricity consumption (traction) / passenger	1.05	0.68	0.75	-
Total Electricity consumption / passenger	2.50	2.07	2.25	-
Resource consumption				
Total Fuel consumption ( Deisel , Benzene , LPG ) (litre)	49,373	46,100	37,148	-
Total Electricity consumption (kWh)	42,094,570	40,841,001	39,768,701	-
Total Water consumption (m <sup>3</sup> )	65,749	64,080	57,182	-
Amount of waste (kg)	20,976	14,560	11,670	-
<b>Total GHG Emission (Tonnes CO<sub>2</sub> e)</b>	<b>25,416</b>	<b>24,641</b>	<b>23,962</b>	Total GHG Emission form Railway Operation ( Including fuel consumption , purchase electricity , water Consumption and amount of waste )
Fuel consumption ( Deisel , Benzene , LPG ) (Tonnes CO <sub>2</sub> e)	133	123	98	Fuel consumption x Emission Factor
Electricity consumption (Tonnes CO <sub>2</sub> e)	25,198	24,447	23,806	Electricity consumption x Emission Factor
Water consumption (Tonnes CO <sub>2</sub> e)	52	51	45	Water consumption x Emission Factor
Amount of waste (Tonnes CO <sub>2</sub> e)	36	25	20	Amount of waste x Emission Factor
<b>Total GHG Emission Avoided (Tonnes CO<sub>2</sub> e)</b>	<b>-665</b>	<b>79</b>	<b>719</b>	Total GHG Emission Avoided ( Including fuel purchase electricity , recycle waste
CO <sub>2</sub> reduction from Electricity (Tonnes CO <sub>2</sub> e)	-684	66	708	Reduced Electricity consumption from base year x emission factor
CO <sub>2</sub> reduction from recycle waste (Tonnes CO <sub>2</sub> e)	19	13	11	Amount of recycle waste x emission factor
<b>Comparing to 1 MRT Train (full capacity) (Tonnes CO<sub>2</sub> e)</b>				Emission Avoided from Electricity consumption( (Traction) Comparing with Local Bus (Tonnes CO <sub>2</sub> e)
of Bus Equivalent (Tonnes CO <sub>2</sub> e)	1,876	2,301	2,144	Number of Passenger x ( Emission Factor of Average Bus – Emission Factor of MRT ) x Average Distance per Passenger/1,000



# Community Contribution





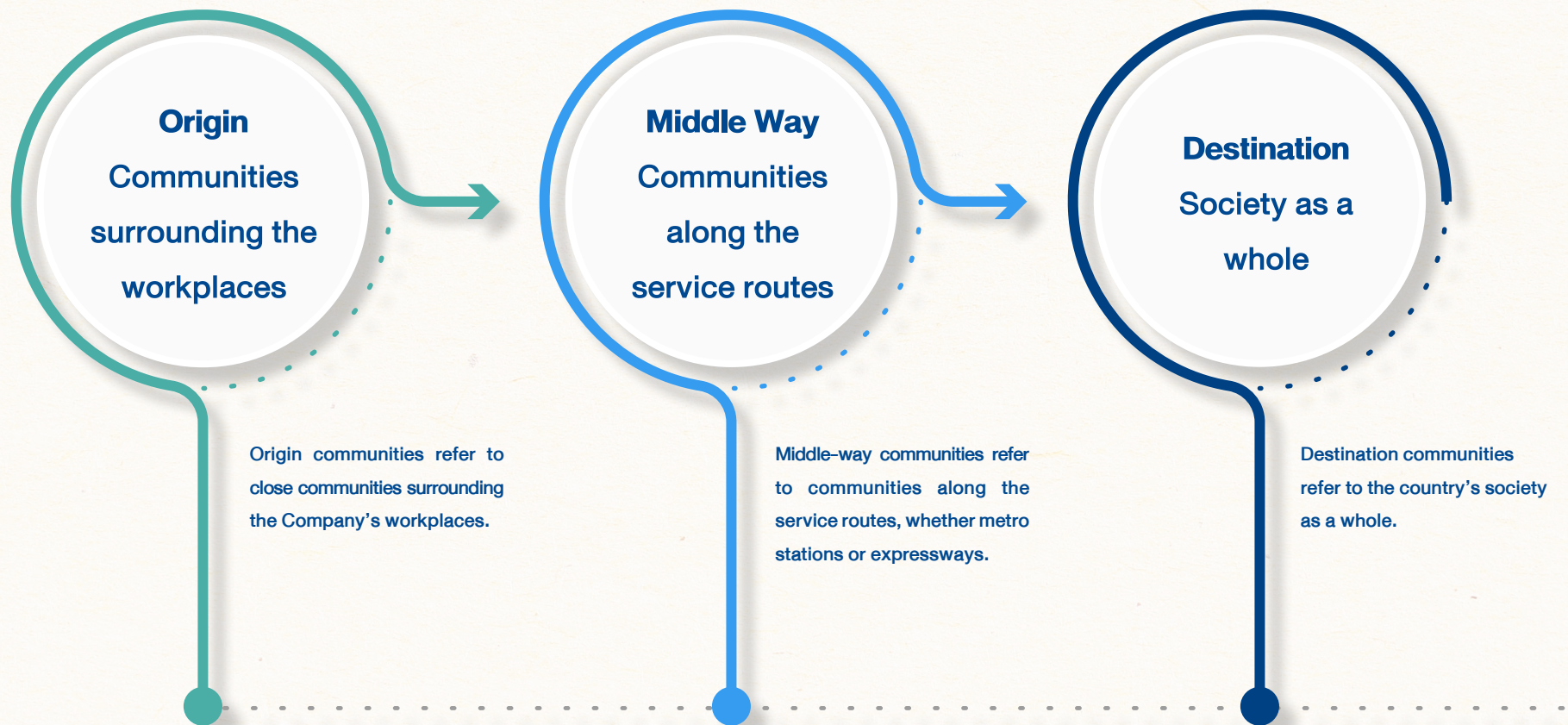
## Community Contribution

### Care and Collaborate



We have strived to operate our businesses with social responsibility throughout the value chain as part of society and Thailand in conformity with the intention and mission of the Company to become the source of happiness and to be by the side of the Thai people, especially we recognize the significance of community and social acceptance and collaboration in the business operations, therefore, we have carried out the business management based on responsibility for impacts created by the Company on communities and society, as well as taking part in development of communities and society committed to their well-being, potential to take care of and develop themselves in the future, to make sure that the communities trust in and peacefully coexist with the Company in good relations between each other.

### The Company's guidelines for operations on Care and Collaborate in community development are divided into 3 target groups as follows:





## Community Contribution

Care and Collaborate



### Origin

Last year, the situation of COVID-19 pandemic had affected the lives of people worldwide. The Company was also affected thereby in terms of the decrease in travel volume of expressway and metro service users. However, the Company did collaborate in complying with the measures imposed by the Centre for COVID-19 Situation Administration (CCSA), through measures to maintain cleanliness inside the metro system and station areas for the sake of the hygiene and safety of all service users while supporting government policies to curb the spread of COVID-19 by organizing the “Healthy Journey with BEM” project as follows :



BEM organized the one million fabric masks giveaway to the MRT passenger activity users under the “Healthy Journey with BEM” project, in association with the Mass Rapid Transit Authority of Thailand (MRTA) organized a campaign against the spread of COVID-19 and gave away fabric masks to the MRT service users.

BEM also delivered fabric masks and protective equipment for COVID-19 to government agencies, district offices, municipal offices, hospitals, Ban Bang Khae Social Welfare Development Center for Older Persons, and schools, communities surrounding the MRT Blue Line and Purple Line, including schools adjacent to the vicinities of the Si Rat Expressway, the Udon Rathaya Expressway, and the Si Rat - Outer Ring Road Expressway, in order to support government policies in campaigning for people to wear fabric or medical masks when in public areas, encourage people to take care of their health and improve the quality of life of people to ensure they have good health and keep away from germs, to be a part in preventing the reoccurrence of the COVID-19 pandemic.



### Origin

Activities under Measures to Maintain Cleanliness in MRT Stations and Trains (Big Cleaning)



• **“Big Cleaning Day” Activity** : BEM’s executives and staff jointly cleaned up the frequently touched points, both inside and outside the MRT station areas, including stair handrails, passenger elevators, doors and various automatic machines at MRT Sanam Chai and Tha Phra Stations under the “Healthy Journey with BEM” project to ensure MRT passengers’ safety and good hygiene in response to the measures to prevent the spread of the COVID-19, and to bolster people’s confidence in the use of MRT services.

• **BEM, in association with the RTA Chemical Department, Royal Thai Army**, sprayed disinfectants against the COVID-19 in all 53 stations of the MRT Blue and Purple Lines after the service closure.

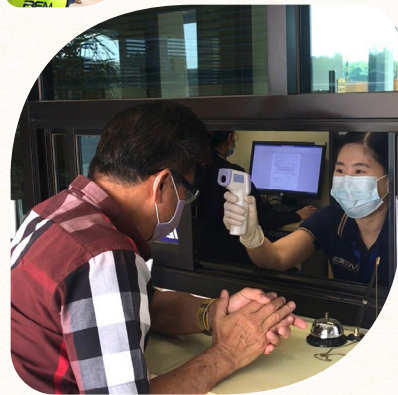
• **Measures to prevent the spread of the COVID-19**, the Company has heightened measures in terms of hygiene and screening for passengers within the metro system areas while taking measures for cleanliness and health care of staff/ contractors as follows :

- Arranging staff to make temperature screening for passengers with a handheld thermometer at the baggage checkpoints of the entrances to the stations; providing health care advice to passengers with a fever higher than 37.5 degrees Celsius.
- Requesting passengers to always wear medical or fabric masks along the journey with the MRT system.
- Ensuring the social distancing by which the MRT has arranged for seats at a one-meter physical distancing and a one-meter standing distance inside the trains.
- Increasing the cleaning frequencies with disinfectants in all MRT stations and inside all MRT trains during, after, and before service every day, especially in the areas frequently touched by passengers.
- Providing more than 800 alcohol-based hand sanitizer service points in all MRT stations thoroughly, such as, at baggage checkpoints, ticket offices, platforms, entries-exits of Metro Mall in all stations.
- Providing health care for staff who provide services in the stations and trains with health check-ups, body temperature measurement before on duty every time; requiring staff to wear medical or fabric masks at all times on duty.
- Cleaning and disinfecting tokens before being circulated in every MRT station.
- Increasing public relations to build knowledge and understanding of self-practices for passengers to avoid the transmission of pathogens, through media, such as, billboards, digital information displays inside the stations and trains, sound public relations inside the MRT stations, and social media of the Company.
- Establishing practical guidelines for staff and contractors to prevent the transmission of pathogens, such as, a policy requiring staff to refrain from travelling to at-risk countries, as well as monitoring the situation and various government measures to ensure the Company’s readiness to adjust various measures to be appropriate, efficient for strict compliance.



## Origin

Measures to Prevent the Spread of the COVID-19 of Expressway



### Toll Collection Operation

- Toll Collection Staff must always wear a face mask and gloves during services for good hygiene of expressway users.
- Providing gel-based hand sanitizers in money-counting rooms and point of sale.
- Cleaning up various touch points with disinfectants at toll booths and toll plazas.
- Setting up infectious waste containers as centralized disposal points for the used medical face masks.
- Before allowing staff to enter the worksite, temperature screening is required and requiring any staff with a fever higher than 37.5 degrees Celsius to seek medical attention immediately and strictly comply with the doctor's instructions, as well as notifying the supervisor for information.
- The body temperatures screenings requirement at the entrance to the toll plaza building, each such relevant person must be given a temperature checked sticker.



### Rescue and Traffic Operations

- Temperature screening requirement at the entrance to the rescue and traffic operation building, any staff and visitor's body temperature must not exceed 37.5 degrees Celsius and they must wear face masks at all times.
- Providing gel-based hand sanitizers for staffs and visitors.
- Rescue staffs operating on rescue and facilitating the expressway users must wear face masks at all time, wash their hands with gel-based hand sanitizers and keep a social distancing from the expressway users during services.
- Encouraging staffs and visitors to strictly comply with the measures to prevent the spread of COVID-19 as required by the Company.



## Middle-way



BEM made pecuniary donations in aid of people affected by the COVID-19 situation, by distributing 1,000 survival bags to communities underneath the expressway vicinities in Ratchathewi District and Phayathai District.

BEM granted scholarships for school development and purchase of the COVID-19 prevention devices under the “Healthy Journey with BEM” project to 24 schools adjacent to the vicinities of the Si Rat Expressway, the Udon Rattaya Expressway, and the Si Rat - Outer Ring Road Expressway.

BEM provided the COVID-19 prevention devices to 56 schools surrounding the MRT routes, including communities surrounding the stations.



## Destination



BEM, in association with CH. Karnchang Public Company Limited (CK) and TTW Public Company Limited (TTW), granted the COVID-19 Coverage Insurance Policies to Medical Personnel all over Thailand BEM jointly encouraged to medical personnel of Thailand by granting a total of 50,000 COVID-19 coverage insurance policies of Muang Thai Insurance Public Company Limited to physicians, nurses, and medical personnel, in the total insured sum of Baht 26,000,000,000.



BEM, in association with CH. Karnchang Public Company Limited (CK) and TTW Public Company Limited (TTW), donated Baht 5,000,000 to the Fund for Education and Procurement of Medical Equipment under the Project to Prevent and Provide Assistance in the Situation of the COVID-19 Epidemic of the Faculty of Medicine Ramathibodi Hospital.



BEM, in association with CH. Karnchang Public Company Limited (CK) and TTW Public Company Limited (TTW), donated Baht 5,000,000 to the Chaipattana Foundation to support the Chaipattana Covid-19 Aid Fund (and Other Pandemics) in aid of hospitals and medical personnel to purchase necessary equipment and supplies for treatment of the COVID-19 patients.



# Impact Report for Sustainability Bond





**BEM is committed to operate its businesses with particular emphasis on the society and environment in pursuit of the Company's sustainable business growth. As such, BEM has developed Sustainable Financing Framework as the guideline to finance and/or refinance projects (or assets) which extend benefit to environment and/or society.**

### Sustainable Financing Framework

The Sustainable Financing Framework ('the Framework') is established in alignment with the Green Bond Principles ("GBP"), Social Bond Principles ("SBP") and Sustainability Bond Guidelines ("SBG"), issued by the International Capital Market Association (ICMA); and the ASEAN Green Bond Standards ("GBS"), ASEAN Social Bond Standards ("SBS") and ASEAN Sustainability Bond Standards ("SUS"), issued by the ASEAN Capital Markets Forum (ACMF); and the Green Loan Principles ("GLP") issued by the Loan Market Association (LMA).





# Impact Report for Sustainability Bond

## Sustainable Finance Portfolio

BEM issued the first Sustainability Debentures of THB 6,000 million to institutional and high-net-worth investors on April 28th, 2021. The details of Sustainability Debentures are as follows;

No.	ThaiBMA Symbol	Issue Date	Maturity Date	Tenor (year)	Coupon (p.a.)	Issue Size (THB mn)
1	BEM244A	28/04/2021	28/04/2024	3	1.56%	2,000
2	BEM264A	28/04/2021	28/04/2026	5	2.24%	2,000
3	BEM284A	28/04/2021	28/04/2028	7	2.91%	1,000
4	BEM314A	28/04/2021	28/04/2031	10	3.33%	1,000
Total						<u>6,000</u>

## Proceeds Allocation

BEM fully allocated the Sustainability Debentures' proceeds since the issuance date to refinance the investment in MRT Blue Line project within the green and social categories regarding clean transportation and affordable basic infrastructure under the company's Sustainability Framework.

Name of Project	Green and Social Categories	Allocation Date	Allocation Amount (THB mn)	% of Refinance Proportion	Look-back Period for Refinance
MRT Blue Line	Clean transportation and Affordable Basic Infrastructure	28 Apr 2021	6,000	100%	Nov 2018 – Dec 2019



# Impact Report for Sustainability Bond

## Impact Report

Sustainability project descriptions and environmental and social benefits

Name of Project	MRT Blue Line
Description of Project	The Company has obtained the concession namely the M.R.T. Chalerm Ratchamongkhon Line Project (MRT Blue Line) from the Mass Rapid Transit Authority of Thailand ("MRTA"), which is comprised of Hua Lamphong – Bang Sue section, Hua Lamphong – Bang Khae section, and Bang Sue – Tha Phra section covering a total distance of 48 kilometers and 38 stations, for the concession period of 30 years from the date of service opening of the entire route on March 30, 2020.
Green and Social Categories	Clean transportation and Affordable Basic Infrastructure
Benefits of Project	Provide clean transportation service, alleviate traffic problems, preserve environments, and improve quality of life of the people in the society.
Passenger Trips	95,332,386 trips <sup>1</sup> in 2020 (121,939,338 trips in 2019)
CO <sub>2</sub> e Offset in tonnes	8,125 tonnes <sup>2</sup> in 2020
Other Benefits	<ul style="list-style-type: none"> <li>Enhance healthy journey such as strengthening measures for cleanliness, spraying disinfectants, campaign for wearing cloth face masks and ensuring social distancing.</li> <li>Measures for energy saving management were implemented to reduce energy consumption such as regenerative braking systems, LED lights, system of recycling train washing water and etc.</li> </ul>

## Note

1 There is a substantial fall in Passenger trips for MRT Blue Line as a result of the pandemic of Coronavirus Disease 2019 (COVID-19) in Thailand.

2 Key approach and assumptions : The estimation on the reduction of Green House Gas (GHG) emission for the Blue Line is based on a comparison of the GHG emissions between railway lines and buses, i.e. assuming that without the railway lines, passengers would have taken buses for their full journeys. This is a conservative estimate as passengers are likely to utilize a mix of minibus, taxis and private cars, totally emitting more GHG than only buses.

$$\text{GHG Emission avoided} = \text{Number of Passenger} * (\text{Emission Factor of Bus} - \text{Emission Factor of MRT}) * \text{Average Distance per Passenger} / 1,000$$



## Impact Report for Sustainability Bond



Transport Mode	Emission Factor kg CO <sub>2</sub> e per Passenger-km	Computed by
Bus	0.0160	using the fuel emission factor (2.7403 kgCO <sub>2</sub> e/litre) divided by the consumption rate (2.85 km/litre) and the bus capacity (60 passengers)
MRT	0.0054	using the electricity emission factor (0.5986 kgCO <sub>2</sub> e/kwh) divided by the consumption rate (0.125 km/kwh) and the carriage capacity (886 passengers)

**Reference :** The emission factor (Bus and MRT), consumption rate (Bus) and capacity (Bus) were obtained from a report published by Thailand Greenhouse Gas Management Organization (Public Organization) ("TGO") (<http://thaicarbonlabel.tgo.or.th/index.php?lang=TH&mod=Y0hKdlpIVmpkSE5mWlcxcGMzTnBiMjQ9>)

### Emission Avoidance Estimation for MRT

The average travelling distance of each passenger was 8.04 km. Based on the number of passengers for the Blue Line in 2020, the corresponding avoidance of GHG emissions are computed as follows:

Project	Annual Passenger Number (‘000)	Annual GHG Emissions Avoided (tonnes CO <sub>2</sub> e)
MRT Blue Line	95,332	8,125



