
Part 1 Business Operations**1. Business Policy and Overview**

Bangkok Expressway and Metro Public Company Limited (the “Company”) was incorporated from the amalgamation, pursuant to the Public Limited Company Act, between Bangkok Expressway Public Company Limited (“BECL”) and Bangkok Metro Public Company Limited (“BMCL”) on December 30, 2015, and the Company has assumed all assets, rights, duties and responsibilities of both companies by operation of law. As of December 31, 2018, the Company’s registered and paid-up capital amounted to Baht 15,285,000,000 divided into a total of 15,285,000,000 ordinary shares, at the par value of Baht 1 per share.

The Company’s main businesses are the provision of the expressway and metro services, including commercial development relating to the expressway and metro systems, which will lay a foundation for business expansion through future extension of the routes and the service network, both in the expressway and metro systems, thereby enabling the Company to be a leading mass rapid transit and transportation service operator in Thailand and in the region. Moreover, the Company may extend its businesses to other fast-growing businesses with good returns, such as other infrastructure projects, commercial development or real estate development, both at home and abroad, etc.

1.1 Vision, Mission, Goals, Business Strategies and Business Overview**Vision**

The Company’s vision is to become a leading, fully-integrated transportation service provider in Thailand and ASEAN.

Mission

The Company is committed to:

1. Providing services of the expressway and metro systems with safety, convenience, rapidity, reliability, punctuality, and efficiency, in order to improve the quality of people’s lives;
2. Improving the quality and efficiency of the modern and full-service transportation network in order to alleviate traffic problems, preserve the environment, and improve society and the country;
3. Creating value-added and utmost benefit to shareholders based on fairness to all stakeholders.

Goals and Business Strategies

To achieve the Company’s objectives and mission, the Company has formulated major strategies in its business operations, as follows:

1. To invest in the transportation system projects, expressway and connecting road projects, metro system projects, and related projects under the government policy for public-private partnership (PPP) in respect of infrastructure, including related business, such as, various commercial development, taking into consideration the projects which are beneficial to society and the country, with reasonable business yields;
2. To strengthen the businesses by generating revenues for continued growth, and managing costs and expenses efficiently, in order to maintain good financial standing;
3. To build relationships with stakeholders through the corporate social responsibility process and communicate with internal and external personnel about it;
4. To develop personnel ready for the provision of quality services of the expressway and metro systems;
5. To build social recognition of the corporate good image.

Business Overview of the Company

The Company is committed to being a leading, fully-integrated transportation service provider, which builds up a good journey for a better living. The Company's businesses comprise the provision of the expressway and metro services, including commercial development directly related to the main businesses. The Company's business overview is as follows:

1.1.1 Expressway Business

The Company and one of its subsidiaries, namely, Northern Bangkok Expressway Company Limited ("NECL"), have been granted concessions for construction and operation of a total of four expressways, comprising:

1) The Si Rat Expressway (Sector A, B, and C)

The Si Rat Expressway (Second Stage Expressway) (**Sector A, B, and C**) under the Second Stage Expressway Agreement with the Expressway Authority of Thailand ("EXAT") for a concession period of 30 years from March 1, 1990, comprising 3 Sectors, namely, Sector A (Rama 9-Ratchadapisek), Sector B (Phayathai-Bangkhlo), and Sector C (Ratchadapisek-Chaeng Watthana), covering a total distance of 29.8 kilometers.

2) The Si Rat Expressway (Sector D)

The Si Rat Expressway (Sector D) is under the Agreement for the Extension of the Second Stage Expressway System (Sector D), with EXAT, for a concession period of 30 years from April 22, 1997. The route from Rama 9 road to Srinagarindra road connects to the Si Rat Expressway Part A, from Rama 9 road east heading to Ramkhamhaeng road and ending at Srinagarindra road, covering a distance of 8.7 kilometers.

3) The Si Rat - Outer Ring Road Expressway

The Si Rat - Outer Ring Road Expressway under the Concession Agreement for Investment, Design, Construction, Operation, Service, and Maintenance of the Si Rat -Outer Ring Road Expressway Project, with EXAT for a concession period of 30 years from December 15, 2012. The route starts from the Outer Ring Road (Kanjapisek Road around Mahasawat Water Treatment Plant) heading eastbound along the right of way of the existing Southern railway, crossing the Chao Phraya River around the Rama VII Bridge, ending around Bang Sue Grand Station (Chatuchak), connecting with the Si Rat Expressway around the Bus Terminal (Mo Chit 2), and running down to at-grade level around Kamphaeng Phet 2 Road, covering a total distance of 17 kilometers. The connection to the north heading to Chaeng Watthana was further opened for service on September 30, 2018.

4) The Udon Rattaya Expressway

The Udon Rattaya Expressway (Bang Pa-in - Pak Kret Expressway), operated by NECL under the Bang Pa-in - Pak Kret Expressway Agreement with EXAT for a period of 30 years from September 27, 1996, comprising 2 Stages, namely, Stage 1, Chaeng Watthana - Chiang Rak, and Stage 2, Chiang Rak - Bang Sai, connecting to the Si Rat Expressway around Chaeng Watthana Road, covering a total distance of 32 kilometers.

1.1.2 Rail Business

The Company has been granted concessions for the operation of two mass rapid transit rail system projects from the Mass Rapid Transit Authority of Thailand (“MRTA”), namely:

- 1) The MRT Blue Line Project, comprising the M.R.T. Chaloem Ratchamongkhon Line Project (Hua Lamphong Station - Bang Sue Station), which is the first underground metro project of Thailand, covering a total distance of 20 kilometers, with 18 underground stations, opened for train operation service on July 3, 2004; and the MRT Blue Line Extension Project (Hua Lamphong - Lak Song and Bang Sue - Tha Phra Sections), covering a total distance of 27 kilometers, comprising 5-kilometer underground track and approximately 22-kilometer elevated track, with 20 stations, 4 of which are underground stations and 16 of which are elevated stations, with a connection to the M.R.T. Chaloem Ratchamongkhon Line Project at Bang Sue Station and Hua Lamphong Station, and a connection to the MRT Purple Line Project at Tao Poon Station.

As for the MRT Blue Line Extension Project, the operations during supply and installation of the M&E Equipment for opening for service are divided into 3 phases, namely, Phase 1: Bang Sue Station - Tao Poon Station, was opened for service on August 11, 2017; Phase 2: Hua Lamphong Station - Lak Song Station, by September 2019; and Phase 3: Tao Poon Station - Tha Phra Station, by March 2020.

The Company is entitled to farebox revenue and undertake activities and commercial development, including advertising, leasing space and telecommunications services in the metro stations and in the trains of the MRT Blue Line Project, for a period of 30 years from the date of opening for service of the whole route; and

- 2) The M.R.T. Chalong Ratchadham Line Project or the MRT Purple Line Project, Bang Yai - Rat Burana, Bang Yai - Bang Sue Section (Khlong Bang Phai Station - Tao Poon Station), Contract 4: Concession for Supply of M&E Systems and O&M Services, on a PPP Gross Cost basis, whereby MRTA invests in all civil works and the Company invests in the M&E Systems and the rolling stocks, as well as provides the operation and maintenance services in accordance with the specified service standards. MRTA is entitled to all fare box revenue and commercial development revenue from the utilization of the civil infrastructure and the railway systems and MRTA shall make a gradual repayment of the M&E Equipment to the Company on a monthly basis for a period of 10 years, and shall engage the Company for the O&M Services throughout the concession period of 30 years from September 4, 2013.

The M.R.T. Chalong Ratchadham Line Project is an elevated metro project, for a distance of 23 kilometers, with 16 stations and a connection to the MRT Blue Line Project at Tao Poon Station of the MRT Purple Line Project, which was opened for service on August 6, 2016.

1.1.3 Commercial Development Business

The Company and one of its subsidiaries, namely, Bangkok Metro Networks Limited (“BMN”), operate the commercial development business of the MRT Blue Line Project, as follows:

- 1) Procurement and/or production of advertising media of various forms in the trains and metro stations;
- 2) Lease of retail spaces in the MRT Blue Line stations and spaces in the basement level of the Lat Phrao park and ride facility;
- 3) Provision of service and maintenance of telecommunications system equipment inside the metro stations.

In addition, as for the expressways, the Company and NECL allowed private entities and individuals to use spaces for commercial operation for installation of Intelligent Traffic Signs and various advertising boards, including retail spaces around toll plazas, and other business activities, such as the use of the expressway areas for installation of 3G signal boosters, etc.

1.2 Significant Changes and Developments

The Company was incorporated from the amalgamation, under the Public Limited Company Act, between BECL and BMCL on December 30, 2015. It operates the businesses of construction and operation of the expressways and operation of the metro system, including commercial development relating to the expressway and metro systems, whereby such businesses were transferred from BECL and BMCL by operation of law.

Significant Changes and Developments prior to the Amalgamation

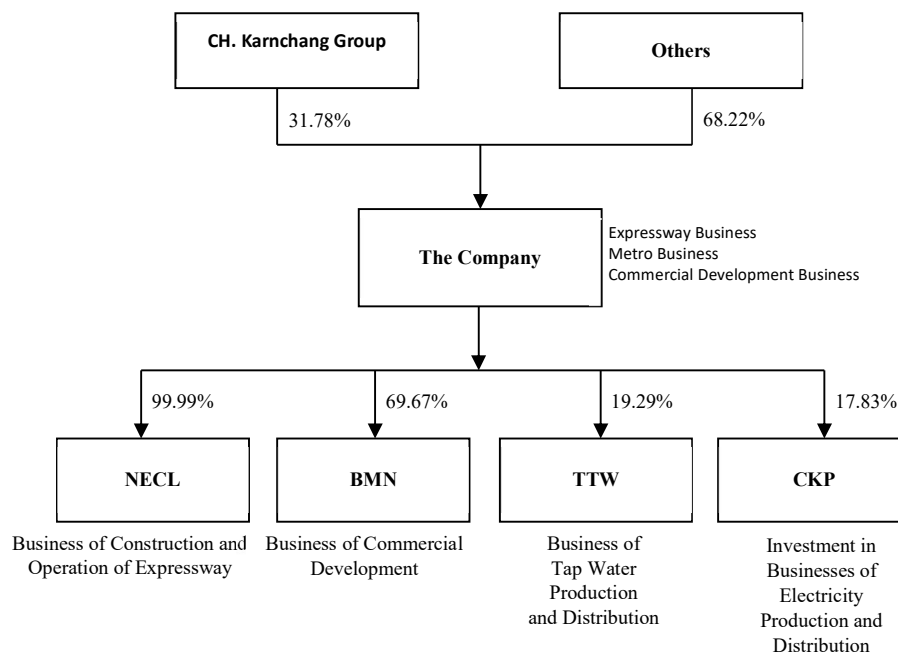
- BECL registered its incorporation on December 23, 1987, and was listed on the Stock Exchange of Thailand (“Stock Exchange”) since August 31, 1995. Prior to the amalgamation, BECL’s registered and paid-up capital amounted to Baht 7,700,000,000, divided into 770,000,000 ordinary shares, at the par value of Baht 10 per share.
- On December 22, 1988, BECL entered into the Second Stage Expressway Agreement with the Expressway Authority of Thailand (EXAT) for construction and operation of the Si Rat Expressway for a concession period of 30 years from the construction commencement date, namely, March 1, 1990.
- On September 25, 1996, BECL established Northern Bangkok Expressway Company Limited (NECL), whereby NECL entered into the agreement with EXAT for construction and operation of the Udon Rattaya Expressway (Bang Pa-in - Pak Kret Expressway) for a period of 30 years from the execution date of the agreement, namely, September 27, 1996.
- On April 17, 1997, BECL entered into the Agreement for the Extension of the Second Stage Expressway System (Sector D), for construction and operation of the Si Rat Expressway (Sector D), with EXAT for a period of 30 years from the construction commencement date, namely, April 22, 1997.
- On September 14, 2012, BECL entered into the Concession Agreement for Investment, Design, Construction, Operation, Service, and Maintenance of the Si Rat - Outer Ring Road Expressway Project with EXAT for a concession period of 30 years from the date of EXAT’s Notice to Proceed, namely, December 15, 2012.
- BMCL registered its incorporation on February 18, 1998, and was listed on the Stock Exchange since September 21, 2006. Prior to the amalgamation, BMCL’s registered and paid-up capital amounted to Baht 7,585,000,000, divided into 20,500,000,000 ordinary shares, at the par value of Baht 0.37 per share.
- BMCL entered into the Agreement for the M.R.T. Chaloem Ratchamongkhon Line Project with MRTA on an AOT (Acquire, Operate and Transfer), PPP Net Cost basis, whereby BMCL was entitled to farebox revenue and undertaking activities and commercial development, including advertising, leasing space and telecommunications services in the metro stations and in the trains for a period of 25 years, from July 2, 2004 to July 1, 2029. Under such Agreement, BMCL was obliged to make payment of remuneration from fares and commercial development to MRTA at the rates as mentioned in the Agreement.
- On February 25, 2009, BMCL established Bangkok Metro Networks Limited (BMN) for operating the commercial development business, by the amalgamation of three companies, namely, BMCL Network Limited, Metro Mall Development Limited, and Triads Networks Co., Ltd. BMN accepted the transfer of all three companies’ businesses, as well as all rights, duties, assets, liabilities and staff.

- On September 4, 2013, BMCL entered into the Agreement for the MRT Purple Line Project with MRTA for a period of 30 years on an ATO (Acquire, Transfer and Operate), PPP Gross Cost basis, namely, MRTA invested in all civil works and BMCL invested in the M&E Systems and the rolling stocks, provided that MRTA shall make a gradual repayment of the M&E Equipment to BMCL, and BMCL shall provide the O&M services in accordance with the service provision standards as specified in the Agreement. In this regard, MRTA is entitled to all farebox revenue and commercial development revenue from the utilization of the civil infrastructure and the railway systems and MRTA shall make payment to BMCL in the form of service fee for the O&M Services from the date of BMCL's operation service until the end of the Concession Agreement.

Significant Changes and Developments of the Company in 2018

April 5, 2018	The Company issued and offered for sale the debentures No. 1/2018, with a maturity of 3-7 years, in the total amount of Baht 10,000 Million, at the fixed interest rate of 2.05 percent to 3.01 percent per annum, for use in replacement of the loan from the financial institutions under the financial restructuring plan of the Si Rat - Outer Ring Road Expressway Project.
June 15, 2018	The Company received a credit rating at "A", with "Stable" outlook from TRIS Rating Co., Ltd. (TRIS Rating).
June 19, 2018	The Company received an "Excellent" rating with 92 scores in the assessment of the quality of the 2018 Annual Ordinary General Meeting of Shareholders from the Thai Investors Association.
June 27, 2018	The Company received the Drive Award 2018 for Finance Excellence as a result of excellent financial management, together with management based on corporate governance, by considering the corporate social and environmental responsibility projects, along with innovations ready to drive the organization into the macro-economy, from Chulalongkorn University.
June 28, 2018	The Company sold all of its shares in Xayaburi Power Public Company Limited (XPCL) representing 7.50 percent to CK Power Public Company Limited (CKP) in consistency with the investment objective of the Company.
July 13, 2018	The Company constructed another three lanes for toll collection at Chim Phli Toll Plaza in order to accommodate an increase in traffic volume of the Si Rat - Outer Ring Road Expressway which opened for service in the late year 2018.
July 16, 2018	The Company sold 111.2 million shares in CK Power Public Company Limited (CKP), as a result, its shareholding percentage in CKP represented 17.83 percent.
September 30, 2018	The Company opened for service the connection between the Si Rat - Outer Ring Road Expressway and the Si Rat Expressway heading to Chaeng Watthana in order to ensure the greater convenience for traveling to Chaeng Watthana and continuing along the Udon Rattaya Expressway.
October 19, 2018	The Thai Institute of Directors Association (IOD) announced the results of corporate governance survey of listed companies for 2018, in which the Company received the "Very Good" score level.
October 31, 2018	The Company was positioned in the Sustainability Index 2018 (SETTHSI INDEX) and the company was selected to enlist in Thailand Sustainability Investment (THSI) 2018 and presented with SET Sustainability Awards 2018 in the capacity as listed company engaging in the sustainable business and serving as role model for other listed companies.
December 20, 2018	The Company additionally purchased 1.14 million shares in Bangkok Metro Networks Limited (BMN), as a result, its shareholding percentage in BMN represented 69.67 percent.

1.3 Shareholding Structure of Company Group
Chart of Shareholding Structure and the Company's Shareholding Percentage as of December 31, 2018



Remark: CH. Karnchang Group comprises

- 1) CH. Karnchang Public Company Limited; and
- 2) CH. Karnchang-Tokyu Construction Company Limited.

1.4 Investment in Subsidiaries and Other Companies

The Company has a policy on investment in businesses of infrastructure or businesses supporting the Company's operations and creating opportunity and long-term yields to the Company including the sources of investment for future projects. The Company's investment as of December 31, 2018, was as follows:

1) Names of Companies invested by the Company and its Shareholding Percentage

Unit: Million Baht

Names of Companies	Nature of Business	Registered Capital	Paid-up Capital	Shareholding Percentage	Investment Value at Cost
Subsidiaries					
Northern Bangkok Expressway Company Limited	Construction and operation of the Udon Ratthaya Expressway	6,000	5,250	99.99%	2,604
Bangkok Metro Networks Limited	Operation of the commercial development business	254	254	69.67%	177
Other Companies					
CK Power Public Company Limited	Investment by holding shares in other companies (Holding Company) operating business of electricity production and distribution	9,240	7,370	17.83%	2,962
TTW Public Company Limited	Tap water production and distribution	3,990	3,990	19.29%	4,242

2) Details of Companies Invested by the Company

Expressway Business

1. Northern Bangkok Expressway Company Limited ("NECL")

NECL's registered capital amounts to Baht 6,000 Million, divided into 294 million ordinary shares and 306 million preferred shares, at the par value of Baht 10 per share, with the paid-up capital of Baht 5,250 Million. As of December 31, 2018, the Company's shareholding was 99.99 percent of its registered capital. NECL entered into the Agreement with EXAT for construction and operation of the Udon Ratthaya Expressway for a period of 30 years from September 27, 1996. The Udon Ratthaya Expressway is northbound and continues from the Si Rat Expressway around Chaeng Watthana Road and passes Bang Phun, Chiang Rak and ends at Bang Sai.

Commercial Development Business

1. Bangkok Metro Networks Limited ("BMN")

BMN has a total registered capital of Baht 254 Million, divided into 25.4 million ordinary shares, at the par value of Baht 10 per share, with the paid-up capital of Baht 254 Million. As of December 31, 2018, the Company's shareholding in BMN was 69.67 percent of its registered capital.

BMN was established by the amalgamation of three companies, namely, BMCL Network Limited, Metro Mall Development Limited, and Triads Networks Co.,Ltd. BMN accepted the transfer of all three companies' businesses, as well as all rights, duties, assets, liabilities, and staff.

The Company currently engages BMN to serve as its sole management representative for commercial development in the MRT Blue Line Project as operated by the Company and also entitles BMN to be its management representative for commercial development, namely, procurement and production of advertising media of various forms in the metro stations and trains, lease of retail spaces in stations of the M.R.T. Chaloem Ratchamongkhon Line Project and at the basement level of the park and ride facility at the Lat Phrao Station, as well as providing service and maintenance of telecommunications system equipment in the stations and tunnels.

Other Infrastructure Businesses

1. CK Power Public Company Limited (“CKP”)

CKP is a listed company on the Stock Exchange, operating its main business by investing in other companies (Holding Company) which operate the business of electricity production and distribution. CKP has a total registered capital of Baht 9,240 Million, divided into 9,240 million ordinary shares, at the par value of Baht 1 per share, with the paid-up capital of Baht 7,370 Million. As of December 31, 2018, the Company's shareholding was 17.83 percent of its registered capital. CKP invests in companies operating the business of electricity production and distribution from three types of energy, namely, hydropower business, by investing in SouthEast Asia Energy Limited and Xayaburi Power Company Limited; thermal power business (cogeneration system), by investing in Bangpa-in Cogeneration Limited; and solar power business, by investing in Bangkhenchai Company Limited, Nakhon Ratchasima Solar Limited, and Chiangrai Solar Limited.

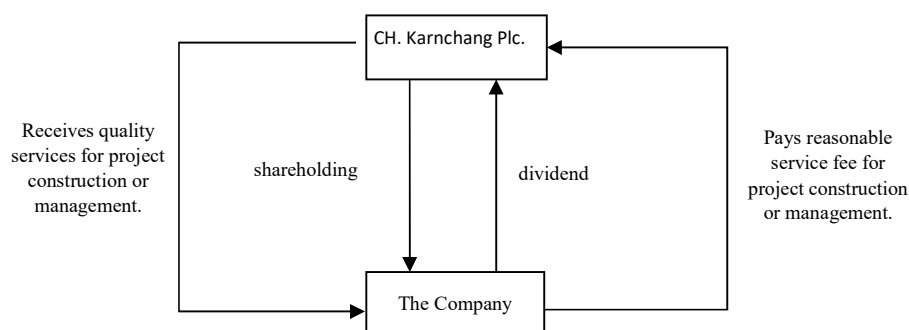
2. TTW Public Company Limited (“TTW”)

TTW is a listed company on the Stock Exchange, having a total registered capital of Baht 3,990 Million, divided into 3,990 million ordinary shares, at the par value of Baht 1 per share, with the paid-up capital of Baht 3,990 Million. As of December 31, 2018, the Company's shareholding was 19.29 percent of its registered capital. TTW operates the business of production and distribution of tap water to the Provincial Waterworks Authority in the areas of Nakhon Pathom Province and Samut Sakhon Province, under the Water Purchase and Sale Agreement with the Provincial Waterworks Authority for a period of 30 years from July 21, 2004. In addition, TTW invests in Pathum Thani Water Co., Ltd., representing 98 percent of its registered capital, which operates the business of tap water production and distribution in the areas of Pathum Thani and Rangsit, under the Water Purchase and Sale Agreement with the Provincial Waterworks Authority for a period of 25 years from October 15, 1998, and also invests in Thai Water Operations Company Limited, which operates the business of management and operation of tap water production and distribution systems and water treatment system, as well as invests in the energy business by holding shares in CKP representing 25 percent of its registered capital.

1.5 Relationship with Business Alliance of Major Shareholder

CH. Karnchang Plc. is the Company's major shareholder. As of December 31, 2018, CH. Karnchang Plc. was holding 4,722,121,829 shares in the Company, representing 30.89 percent of the Company's paid-up capital. From the past until the present, the Company engaged CH. Karnchang Plc. for construction and operation of various projects, as CH. Karnchang Plc. is a large construction company in Thailand, with potential, knowledge, and expertise, and is familiar with the civil infrastructure of the expressway and metro projects, as well as M&E Equipment. In addition, CH. Karnchang Plc. has experience in the operation on a Lump Sum Turnkey basis, which enables it to deliver quality works timely, and is also the Company's strategic investment partner, and as a result, CH. Karnchang Plc. has responsibility and commitment to operating the projects with success. Therefore, in the future, it is possible that the Company will engage CH. Karnchang Plc. for project construction or management. However, in the execution of transactions with CH. Karnchang Plc., which may have a conflict of interests, the Company will comply with its policy on the execution of connected transactions per details as disclosed in Item 12. Connected Transactions.

Chart of Relationship with Business Alliance of Major Shareholder



2. Nature of Business Operations

The Company and its subsidiaries have operated the businesses as concessionaires awarded by the government sector, as follows: 1) concessionaires for the expressway construction and operation, namely, the Si Rat Expressway (Sector A B C), the Si Rat Expressway (Sector D), the Si Rat - Outer Ring Road Expressway and the Udon Raththaya Expressway; 2) concessionaires for operation of the MRT Blue Line Project and the MRT Purple Line Project. Other than serving as the concessionaire, the Company has also operated the commercial development business pursuant to the relevant Concession Agreements. Currently, the revenue structure of the Company and its subsidiaries is set forth below.

(Unit: Million Baht)

Total Revenue Structure	Operated by	Shareholding Percentage of the Company	Consolidated Financial Information					
			For Year Ended December 31, 2018		For Year Ended December 31, 2017		For Year Ended December 31, 2016	
			Million Baht	%	Million Baht	%	Million Baht	%
Revenue from expressway business			10,174	53.3%	9,957	64.7%	9,301	70.3%
Toll revenue	Company		8,718	45.7%	8,573	55.7%	7,978	60.3%
Toll revenue	Subsidiary (NECL)	99.99	1,456	7.6%	1,384	9.0%	1,323	10.0%
Revenue from rail business			4,736	24.8%	4,521	29.3%	3,230	24.4%
Fare box revenue and metro operation service charges	Company		4,736	24.8%	4,521	29.3%	3,230	24.4%
Commercial development revenue			705	3.7%	675	4.4%	573	4.3%
Commercial development revenue	Company		240	1.3%	75	0.5%	78	0.6%
Commercial development revenue	Subsidiary (BMN)	69.67	465	2.4%	600	3.9%	495	3.7%
Gain on change in investment category			2,496	13.1%	-	-	-	-
Gain on investments ⁽¹⁾			499	2.6 %	12	0.1%	12	0.1%
Other income ⁽²⁾			477	2.5%	228	1.5%	117	0.9%
Total revenues			19,087	100%	15,393	100%	13,233	100%

Remarks: (1) Gain on investments includes gain on sales of investments in CKP, XPCL, TTW, and other temporary investments.

(2) Other income comprises interest income, gain on fair value adjustment of investment.

2.1 Nature of Business Operations of the Company

The Company is committed to being a leading, fully-integrated transportation service provider, which builds up a good journey for a better living. The Company's businesses are composed of the expressway and metro system services, including commercial development business directly related to the main businesses. The Company's overall businesses are divided into three main sectors, as follows:

2.1.1 Expressway Business

1) Nature of Services

The Company and one of its subsidiaries, i.e., Northern Bangkok Expressway Company Limited ("NECL"), have been granted concessions for construction and operation of a total of four expressways, namely, the Si Rat Expressway (Sector A B C), the Si Rat Expressway (Sector D), the Si Rat - Outer Ring Road Expressway, and the Udon Raththaya Expressway, as per the following details:

(1) The Si Rat Expressway (Sector A B C)

The Si Rat Expressway (Second Stage Expressway) under the Second Stage Expressway Agreement with the Expressway Authority of Thailand (“EXAT”) for a concession period of 30 years from March 1, 1990.

The Si Rat Expressway is the first large-scale construction project in Thailand on the basis of public private partnership. This project is implemented on a BTO (Build Transfer Operate) basis, namely, the Company (formerly BECL) invested in the design, construction and operation of the Si Rat Expressway. In this regard, the title to various permanent constructions pertaining to or use of the Si Rat Expressway shall be vested in EXAT. This expressway comprises 3 Sectors, namely, Sector A (Rama 9 - Ratchadapisek), Sector B (Phayathai - Bangkhlo), Sector C (Ratchadapisek - Chaeng Watthana), covering a total distance of 29.8 kilometers. EXAT invested in the construction and operation of the Chalerm Mahanakorn Expressway (First Stage Expressway), covering a total distance of 27.1 kilometers. The Company has the right to receive toll revenue sharing in respect of the Chalerm Mahanakorn Expressway and the Si Rat Expressway in such proportions as specified in the Second Stage Expressway Agreement.

As for toll collection, expressway users shall pay tolls at the booths around the on-ramps of the Expressway. EXAT is responsible for the collection of all tolls and shares such toll revenue with the Company as specified in the Second Stage Expressway Agreement with effect from the Priority Component Opening Date. The toll revenue from the Chalerm Mahanakorn Expressway and the Si Rat Expressway shall be encompassed and shared as per rules of area zoning. This is to say that in the urban network, for the first nine years, the Company and EXAT shall receive the revenue sharing at 60 percent and 40 percent, respectively. For the last nine years, the Company and EXAT shall receive revenue sharing at 40 percent and 60 percent, respectively. As for the period between the first nine years and the last nine years, the Company and EXAT shall receive the revenue sharing at 50 percent each. For the suburban network, namely, the Si Rat Expressway (Sector C) all toll revenue shall belong to the Company throughout the period of the Agreement.

(2) The Si Rat Expressway (Sector D)

The Si Rat Expressway (Sector D) (Rama 9 - Srinagarindra) is under the Agreement for the Extension of the Second Stage Expressway System, Sector D, with EXAT, for a concession period of 30 years from April 22, 1997.

The Si Rat Expressway (Sector D) is implemented on a BTO (Build Transfer and Operate) basis, namely, the Company invested in design, construction and operation of the expressway system; however, the title to permanent constructions pertaining thereto shall be vested in EXAT, covering a distance of 8.7 kilometers. In this regard, the Company has the right to receive consideration from toll revenue as specified in the Agreement, which shall be revised from time to time under the same criteria as that of the Second Stage Expressway Agreement.

(3) The Si Rat - Outer Ring Road Expressway Project

The Si Rat - Outer Ring Road Expressway under the Concession Agreement for Investment, Design, Construction, Operation, Service, and Maintenance of the Si Rat - Outer Ring Road Expressway Project, with EXAT for a concession period of 30 years from December 15, 2012.

The Company has the duties to carry out design and construction, supply and installation of various equipment and systems, together with operation and maintenance of the expressway, including toll collection, in consideration of the right to receive toll revenue and other revenues (if any). The project is an elevated six-traffic lane expressway, for a distance of 17 kilometers, with 10 toll plazas. The project's route starts from the Outer Ring Road (Kanjanaipisek Road around Mahasawat Water Treatment Plant)

heading eastbound along the right of way of the existing Southern railway, crossing the Chao Phraya River around the Rama VII Bridge, ending around Bang Sue Grand Station (Chatuchak), connecting with the Si Rat Expressway to the north of the Mo Chit 2 Bus Terminal, and running down to at-grade level around Kamphaeng Phet 2 Road. Moreover, the Company opened the connection of the Si Rat - Outer Ring Road Expressway with the northern part of the Si Rat Expressway (heading to Chaeng Watthana) for service on September 30, 2018, in order to ensure the greater convenience in travelling to Chaeng Watthana and continuing along the Udon Ratthaya Expressway. In this regard, the Company is responsible for investment and all operating expenses, as well as sharing returns with or providing benefits to EXAT as specified in the Agreement.

In management of this project, the Company is responsible to collect tolls and shall have the right to receive all toll revenue and other revenues (if any) throughout the concession period, whereby the toll rates and revisions shall be agreed upon in the Agreement.

(4) The Udon Ratthaya Expressway

The Udon Ratthaya Expressway (Bang Pa-in - Pak Kret Expressway) is operated by the subsidiary (“NECL”) under the Bang Pa-in - Pak Kret Expressway Agreement with EXAT for a concession period of 30 years from September 27, 1996.

The Udon Ratthaya Expressway is implemented on a BTO (Build Transfer Operate) basis like the Si Rat Expressway, namely, NECL invested in the design, construction, and operation of the Udon Ratthaya Expressway, whereby the title to various permanent constructions pertaining to or use of the expressway shall be vested in EXAT, and EXAT is responsible to collect and deliver all tolls to NECL as specified in the Agreement. The Udon Ratthaya Expressway comprises 2 Stages, namely, Stage 1, Chaeng Watthana - Chiang Rak, and Stage 2, Chiang Rak - Bang Sai, connecting to the Si Rat Expressway around Chaeng Watthana Road, covering a total distance of 32 kilometers. As for the inbound route, expressway users shall pay tolls at the booths around the on-ramps of the expressway while in respect of the outbound route, expressway users shall pay tolls at the off-ramps of the expressway. EXAT is responsible to collect and deliver all tolls to NECL. All toll revenue in respect of the Udon Ratthaya Expressway shall belong to NECL.

2) The details of the expressway network connections are as follows:

Expressway Systems	Length (kilometers)	Constructed and Operated by
1. Chalm Mahanakorn Expressway (First Stage Expressway) (Bang Na - Din Daeng - Dao Khanong)	27.1	EXAT
2. Si Rat Expressway (Second Stage Expressway) 2.1 Urban Network (Sector A B) (Prachachuen - Phayathai - Bangkhlo - Asoke) 2.2 Suburban Network (Sector C) (Prachachuen - Chaeng Watthana)	29.8	Company
3. Si Rat Expressway (Sector D) (Rama 9 – Srinagarindra)	8.7	Company
4. Udon Ratthaya Expressway (Bang Pa-in - Pak Kret)	32.0	NECL
5. Uttaraphimuk Elevated Way (Don Muang Tollway)	28.0	Don Muang Tollway Public Company Limited
6. Chalong Rat Expressway including its Extension (Ramindra - At Narong and Ramindra - Outer Ring Road)	42.4	EXAT
7. Burapha Withi Expressway (Bang Na - Chonburi)	56.7	EXAT

Expressway Systems	Length (kilometers)	Constructed and Operated by
8. Kanjanapisek Expressway (Bang Pli - Suksawad) and Highway No. 37 (Suksawad - Bang Khun Thien Section) including a connecting road to Bhumibol Bridge 1 and Bhumibol Bridge 2	42.3	EXAT
9. Si Rat - Outer Ring Road Expressway and Connection of the Si Rat - Outer Ring Road Expressway with the northern part of the Si Rat Expressway (heading to Chaeng Watthana)	17.0	Company
Total Length	284.0	

3) Toll Revenue Sharing

Effective from March 1, 2011, the Company and EXAT have received the toll revenue sharing in respect of the urban network at 40 percent and 60 percent, respectively, while the Company has received all toll revenues for the suburban network, in accordance with the terms of the Agreements.

Expressway	Network	Length (km.)	Opening Date	Revenue	Revenue Sharing Company : EXAT
Chalerm Mahanakorn					
Din Daeng - Port	Urban	8.9	January 4, 1981	Company and EXAT	- 60:40 for the first nine years
Bang Na - Port	Urban	7.9	January 17, 1983		- 50:50 for the period between the first nine years and the last nine years
Port - Dao Khanong	Urban	10.3	August 8, 1987		- 40:60 for the last nine years
Si Rat					
Sector A: Rama 9-Ratchadapisek	Urban	12.4	September 2, 1993	Company and EXAT	- 60:40 for the first nine years
Sector B: Phayathai-Bangkhlo	Urban	9.4	October 6, 1996		- 50:50 for the period between for the first nine years and the last nine years
Sector C: Ratchadapisek - Chaeng Watthana	Suburban	8.0	September 2, 1993	Company	- 40:60 for the last nine years
Si Rat, Sector D					
Rama 9 - Srinagarindra	Suburban	8.7	Section 1 December 2, 1998 Section 2 March 1, 2000	Company	- 100:0
Si Rat-Outer Ring Road	Suburban	17.0	August 22, 2016	Company	- 100:0
Udon Ratthaya					
Chaeng Watthana-Chiang Rak	Suburban	22.0	December 2, 1998	Subsidiary (NECL)	- 100:0
Chiang Rak - Bang Sai	Suburban	10.0	November 1, 1999		

4)

Toll Rates

Expressway/Toll Plaza	Toll Rates (Baht/Trip)		
	4 wheels	6-10 wheels	More than 10 wheels
Chalerm Mahanakorn Expressway (First Stage Expressway)	50	75	110
Except:			
At Narong 1 Toll Plaza (to Bang Na)	40*	65*	100*
Si Rat Expressway (Sector A B C) (Second Stage Expressway)	50	75	110
Except:			
Prachachuen Toll Plaza (inbound)	60	90	140
Prachachuen Toll Plaza (outbound)	10	15	30
Prachachuen 1 Toll Plaza (from Prachachuen Road)	15	20	35
Prachachuen 2 Toll Plaza (to Prachachuen Road)			
Ngam Wong Wan 1 Toll Plaza (outbound)			
Ngam Wong Wan 2 Toll Plaza (inbound)			
Si Rat Expressway, Sector D	25	55	75
Si Rat - Outer Ring Road Expressway	50	80	115
Udon Ratthaya Expressway	45	100	150
Except:			
Muang Thong Thani Toll Plaza	35**	90**	140**
Bang Pa-in Toll Plaza	55	120	180

Remarks: * This is the rate after Baht 10 discount for all types of vehicles.

** This rate is the rate after Baht 10 discount for all types of vehicles.

The revision of the toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway is in accordance with the Second Stage Expressway Agreement, which shall be made every five years, and the calculation and revision shall be based on the most recent increase of the Consumer Price Index of Bangkok as issued by the Ministry of Commerce. Each increase shall be rounded up to the nearest whole multiple of Baht 5, provided that such revision shall not increase by more than Baht 10 during the first 15 years of the Contract Period. If there is an unusually high rate of inflation or an occurrence of Force Majeure or Exceptional Event, the Company and EXAT shall consider the toll revision as appropriate. The most recent toll revision was made on September 1, 2013. For the revision of the toll rates on 2018, EXAT hasn't revised and still use the same rates as the year 2013.

The revision of the toll rates of the Si Rat - Outer Ring Road Expressway is in accordance with the Concession Agreement for Investment, Design, Construction, Management, Operation and Maintenance of the Si Rat - Outer Ring Road Expressway Project, which shall be made every five years from the date of service operation of the project for five years, at the rates of Baht 15, Baht 25 and Baht 35 for four-wheeled vehicles, six-wheeled to ten-wheeled vehicles; and more than ten-wheeled vehicles, respectively, as specified therein.

With respect to the Udon Ratthaya Expressway, the revision of toll rates every five years shall be based on the most recent increase of the Consumer Price Index of Bangkok as issued by the Ministry of Commerce. Each increase shall be rounded up to the nearest whole multiple of Baht 5, provided that such revision shall not increase by more than Baht 15 during the first 15 years of the Contract Period. The first toll revision was made on November 1, 2003, and the latest toll revision was made on November 1, 2013.

Despite EXAT's issuance of the Notifications of the Ministry of Transport with approval of the Deputy Minister of Transport in charge, namely, the toll rates for the Chalerm Mahanakorn Expressway and the Si Rat Expressway were enforced on September 1, 2018 and the toll rates for the Udon Ratthaya Expressway were enforced on November 1, 2018, the Company and one of its subsidiaries (NECL) were of the view that the revised toll rates under the said Notifications did not comply with the provisions of the relevant Agreements since the toll rates is still the same rates as the year 2013 which the Company and subsidiary are opposing to EXAT about such subject.

5) Marketing and Competition of Expressway Business

• Customer Characteristics and Target Customers of Expressway Business

Target customers of the Chalerms Mahanakorn Expressway, the Si Rat Expressway, the Si Rat - Outer Ring Road Expressway and the Udon Rathaya Expressway refer to those motorists who desire a convenient and rapid transportation or who desire to shorten the traveling distance to their destinations as well as to avoid the traffic congestion along the normal roads in Bangkok and its vicinity. The customers by the types of vehicles using the expressways may be divided into four-wheeled vehicles; six-wheeled to ten-wheeled vehicles; and more than ten-wheeled vehicles, which in 2018, accounted for 98.04 percent, 1.72 percent, and 0.24 percent, respectively. The traffic volume from January 1 to December 31, 2018, using the expressways may be described by areas as follows:

Expressway Systems	Average Traffic Volume (trips/day)	%
1. Chalerms Mahanakorn Expressway (First Stage Expressway) (Bang Na - Din Daeng - Dao Khanong)	372,759	30.30
2. Si Rat Expressway (Second Stage Expressway)		
2.1 Urban Network (Sector A and B) (Prachachuen - Phayathai - Bangkhlo - Asoke)	322,050	26.18
2.2 Suburban Network (Sector C) (Prachachuen - Chaeng Watthana)	186,911	15.20
3. Si Rat Expressway (Sector D) (Asoke - Srinagarindra)	201,248	16.36
4. Udon Rathaya Expressway (Bang Pa-in - Pak Kret)	91,077	7.40
5. Si Rat - Outer Ring Road Expressway	56,090	4.56
Total Traffic Volume	1,230,135	100

Given the fact that the provision of the expressway services is considered a form of public service for motorists requiring convenient, rapid and safe traveling, as target customers of the expressway systems, customers are broad depending on their destinations, residences, and workplaces. In this respect, the revenue of the expressway systems will not depend on any particular group of customers.

6) Marketing Policy and Strategies of Expressway Business

• Marketing Strategies of Expressway Business

The marketing highlight is that the Si Rat Expressway is designed to respond to the transportation needs through the expressway network which connects to and covers major areas in Bangkok, whether from the Chalerms Mahanakorn Expressway and the Si Rat Expressway, as well as the Chalong Rat Expressway (Ramindra-At Narong) which cover the areas from the North to the South and from the West to the East of Bangkok. Motorists may use the expressway to connect to the Burapha Withi Expressway (Bang Na-Chonburi), and the Chalerms Mahanakorn Expressway and the Chalong Rat Expressway, thereby rendering the service of the expressway systems to become more complete for users to reach their destinations more conveniently and rapidly than using at-grade roads.

On August 22, 2016, the Company opened for service the Si Rat - Outer Ring Road Expressway, a route connecting between Bangkok - Thonburi sides, starting at the off-ramp from the Second Stage Expressway at Mo Chit (Chatuchak) and across the Chao Phraya River at the Rama VII Bridge, and continuing along in parallel to the Southern railway via the districts of Bang Phlat, Bang Bamru, Taling Chan, connecting to the Boromarajonani Elevated Road passing Ratchaphruek Road, and ending at the Outer Ring Road (the West). As such, such route enables motorists to conveniently and rapidly commute from and to Bangkok-Thonburi sides. Moreover, on September 30, 2018, the connection of the Si Rat - Outer Ring Road Expressway with the northern

part of the Si Rat Expressway, Sector A, was opened for service to ensure the greater convenience in expressway users' travelling to Ratchadaphisek, Prachachuen, Chaeng Watthana, and Bang Pa-in.

The marketing disadvantage is the physical limitation which prevents the release of traffic around the expressway exits during rush hour, which depends on the traffic on at-grade roads, representing an uncertain factor beyond the Company's control. However, the Company continuously coordinates with traffic police in police stations of such areas, including linking video signal from CCTVs on the expressways to police stations of such areas, to provide assistance in releasing and facilitating traffic flow in the expressway systems by improving various on- and off-ramps for motorists to save time and facilitate motorists with more convenience and better quality of living in their commute in the downtown. Motorists should then appreciate these benefits over the price factor.

In view of various marketing strategies, the Company has proceeded as follows:

○ **Service and Product Strategies of Expressway Business**

- The prime location and connections to major roads in the city allow the expressway network to respond to the transportation needs of motorists to reach their desired destinations. In this regard, the Company has improved the quality of the routes and its services and given priority to the customers' needs, which will be integrated as key strategies to efficiently accommodate the traffic volume flowing in the system.
- The feasibility study on improvement of the on- and off-ramps of the expressways serves as another measure to facilitate the traveling and to continually maintain the quality of the expressways in terms of engineering safety to meet international standards.
- The Company has continuously monitored the traffic volume statistics to enhance the efficiency of its Easy Pass service as appropriate in order to improve the service provision and accommodate the increased volume of expressway users. The Company has added Easy Pass lanes at various Toll Plazas on the Si Rat Expressway and the Si Rat - Outer Ring Road Expressway to accommodate the increased volume of Easy Pass users. In addition, the Company has moved the Easy Pass lanes for more convenience and safety of the Easy Pass service users and to minimize the cross traffic between the cash lanes and the Easy Pass lanes, which will mitigate the traffic congestion at the front of the toll plazas.
- The study on new routes in response to the urbanization in the future, particularly in Bangkok, as well as the study on traveling behavior of motorists, are conducted to prepare for the expansion of the scope of the expressway services, and serve well as additional channels of services in response to needs of the motorists in the future.
- The Company has added communication channels on traffic information via Smart Traffic and Variable Message Signs (VMS) to keep motorists informed of the traffic conditions on expressways, as well as suggesting routes on expressways for more convenience and rapidity.
- The Company has also improved signboards regarding the expressway usage on the at-grade main road and various alleys in Bangkok and its vicinity so as to facilitate motorists and boost confidence to access and use the expressways. To this effect, the Company focuses on introducing such landmarks adjacent to the on- and off-ramps of the expressways on the website, various public relations media, and social media to ensure that customers, as the expressway users, would travel more conveniently and rapidly.

- The company has organized the Roadshow activity to advertise and introduce the connecting route of the Si Rat - Outer Round Road Expressway and the Si Rat Expressway heading to Chaeng Watthana by exploring the places along the Si Rat - Outer Round Road Expressway and Chaeng Watthana. Furthermore, the Company also received the suggestions and feedbacks from the expressway users.
- The company has also conducted a survey on the satisfaction of the toll collection of the Si Rat - Outer Round Road Expressway with a result at the “Very Good” level.
- **Price Strategies of Expressway Business**
 - Toll rates are agreed upon and specified in the Agreements, including the calculation for revisions of toll rates ahead of time. It is mutually agreed that the rates are considered reasonable and based on the feasibility study for the investment of each project. Under the Second Stage Expressway Agreement, the Agreement for the Extension of Second Stage Expressway (Sector D), and the Bang Pa-in - Pak Kret Agreement, toll rates shall be revised at every five years interval in accordance with changes in Consumer Price Index of Bangkok as announced by the Ministry of Commerce, which serves as the basis of calculation for the intrinsic value of the toll rates during the given periods under the Agreements. Furthermore, the revision of the toll rates of the Si Rat - Outer Ring Road Expressway is in accordance with the Concession Agreement, which shall be made every five years from the date of service operation of the project at the rates specified therein.
 - The Company continues to provide discount on tolls on certain routes for a limited period of time to attract motorists to increasingly use the expressway services, especially such routes with connections between the expressway systems, e.g., At Narong 1 Toll Plaza (from the Chalong Rat Expressway to enter the Chalerm Mahanakorn Expressway around Bang Na), and Muang Thong Thani Toll Plaza of the Udon Ratthaya Expressway, which the Company, together with EXAT, continued to provide discount.
- **Distribution and Distribution Channel Strategies of Expressway Business**
 - **Payment of Tolls**
 - Users of the Chalerm Mahanakorn Expressway and the Si Rat Expressway may choose to use the expressway services from various on- and off-ramps covering major areas in Bangkok throughout the total distance of 65.6 kilometers. Expressway users shall pay tolls at the on-ramps of toll plazas, totaling 52 locations, 20 toll plazas of the Chalerm Mahanakorn Expressway (e.g., Din Daeng, Bang Na, Dao Khanong, Sukhumvit, Rama 4 Toll Plazas, etc.) and 32 toll plazas of the Si Rat Expressway (e.g., Asoke, Rama 9, Srinagarindra, Yommaraj, Surawong, Hua Lamphong, Khlong Prapa, Yan Phahon Yothin, Prachachuen, Rama 3, etc.). Users may pay tolls in two channels, in cash, or via Easy Pass.
 - Users of the Udon Ratthaya Expressway which connects to the expressway system towards the North of Bangkok has a total distance of 32 kilometers, with 10 toll plazas, shall pay tolls at the on-ramps for the inbound direction and at the off-ramps for the outbound direction. There are five on-ramps and five off-ramps. Users may pay tolls in cash or via Easy Pass.
 - Users of the Si Rat - Outer Ring Road Expressway which connects to the Si Rat Expressway System towards the West of Bangkok has a total distance of 16.7 kilometers, with 9 toll plazas, shall pay tolls at the on-ramps in cash or via Easy Pass.

- **Electronic Toll Collection System**

The Company, in association with EXAT, introduces the Electronic Toll Collection system in the toll collection, in order to serve as an alternative channel for motorists and facilitate and speed up the toll payment at the front of the Toll Plazas during rush hour, as well as accommodating the increasing traffic volume in the future. Currently, there are Easy Pass users representing approximately 39.51 percent.

In the interest of convenience to the Easy Pass users, the Company has arranged for the Easy Pass Fast Service, including film cutting service for Easy Pass installation and testing, whereby the expressway users are able to bring their cars to use the services at the Easy Pass Fast Service, free of charge, at the Si Rat Expressway Control Center, Asoke - Dindaeng Road, every day during the office hours from 9:00 - 17:00 hours.

To ensure more benefits of the Easy Pass users, the Company, in association with EXAT and the Department of Highways, improved the efficiency of the toll collection via the Electronic Toll Collection System by way of integration between the Easy Pass system and the M-Pass system to enable the service users to pay tolls with only one pass for seven expressway routes and two of the Intercity Motorway Projects (Motorways) of the Department of Highways from November 1, 2016.

- **Marketing Promotion and Communication Strategies of Expressway Business**

The Company provides a discount on tolls on certain routes within a limited period of time, aimed at attracting target customers to continue to use the expressway services and eventually become regular customers. In 2018, the Company continued to provide a discount on the Udon Rathaya Expressway of one of its subsidiaries (NECL), to motorists at Muang Thong Thani Toll Plaza.

Furthermore, during the remarkable festivals, such as, Songkran Festival and New Year's Festival, the Company also holds activities promoting the use of the expressways for motorists by cooperating with EXAT to distribute souvenirs to motorists, including arranging for motorist service points, demonstrating our positive image and good relationship with motorists under the theme that we provide the best services to customers throughout the routes, as well as educating them about applicable traffic laws during Songkran Festival. In addition, to celebrate on the occasion of the previous New Year's Eve, the Company jointly supported EXAT in public relations of offering a discount on application fee for Easy Pass. EXAT also organized a pilot project to give a discount of Baht 5/trip to the Easy Pass users at Asoke Toll Plaza 4 or representing a 10-percent discount from Baht 50, remaining Baht 45, only on business days during off-peak hours (6.00 - 9.00 hrs.) from November 1, 2018 to December 28, 2018, in order to encourage the expressway users to use more Easy Pass, thereby reducing accumulated traffic congestion at the front of the toll plaza.

The Company, as a private company that provides the expressway services, implemented in response to the government policy by participating in the drive safety campaign known as "Driving Slowly, Daytime Headlight Switching on, Seat Belt Fastening", for the motorists' facility and safety during the Songkran and New Year Festivals, and the Company promoted the drive safety campaign via social media on the expressways and traffic radio station to the target customers to raise awareness of safe journey among them, as well as resting assured of the quality service on the expressways, and activities supporting use of the services of the Company.

The activities on the occasion of the National Mother and Father Days were held for the lucky motorists, offering toll discounts, dissemination of the expressway network maps, including connections of the expressways with various routes in order to facilitate the expressway users' travelling. This year, the Company organized the Lady Safety Driving activity to promote safe driving and reduce accidents, as well as giving tips on basic car care for women, including how to handle emergencies on the expressways.

The channels of public relations used by the Company to disseminate information comprise documentary programs on radio and television, radio spot, leaflets, Variable Message Signs (VMS), and our website: www.bemplc.co.th, as well as social media (www.facebook.com/bangkokexpresswayandmetro), including BEM Magazine bimonthly newsletters as a medium for sharing information and news between the Company and motorists, and to educate, satisfy and attract new customers to use the services more, as well as organizing various social activities throughout the year to ensure the positive attitude of our services towards customers and society.

7) Industrial Outlook and Competition of Business Expressway

In 2018, the economy continued to grow from the previous year so the income of consumers was high accordingly. In November 2018, the Manufacturing Production Index (MPI) increased by 0.98 percent from the previous year, which had a positive effect on the automobile industry in a way which it expanded accordingly, partially resulting from the distribution of new vehicles to the market, sale promotion and economic situation which was improved as a whole. Thus, the volume of car sales in the 36th Thailand International Motor Expo was more than 40,000 cars, partially due to the end of the 5-year first new car scheme, consumers then had purchasing power for new cars instead, together with a supporting factor from automobile companies' sale promotion, including steady oil prices. As a result, the volume of car sales continued to rise (*The Office of Industrial Economics, December 25, 2018*).

Such factors contributed to the worsening traffic problems in Bangkok and its surrounding provinces which had been encountering the traffic congestion problems. Moreover, there was the growing development of the mass rapid transit systems, together with infrastructure construction, e.g., electricity system, tap water system, along with the problem of on-street parking as a hindrance to the traffic and violation of traffic rules, as such, the traffic congestion problems continued endlessly and inevitably.

Furthermore, in 2018, the statistics showed that there were a total of 10,217,694 registered vehicles in Bangkok and there were 905,593 new registered vehicles, with a daily average of approximately 1,517 registered vehicles. It could be seen that in 2018, the daily number of registered vehicles increased by two times from the previous year while the road distance in Bangkok was only 5,500 kilometers in length. Consequently, there remained the traffic congestion problems throughout Bangkok where the number of vehicles exceeded the capacity that its roads could accommodate. As a result, the average speeds of vehicles in Bangkok were 23.69 kilometers per hour during off-peak hours in the morning and 16.12 kilometers per hour during off-peak hours in the evening (*Daily News, January 1, 2019 Issue*), thereby having an impact on the growth the traffic volume on the expressways as a whole.

8) Procurement of Products and Services of Expressway Business

• Nature of Procurement of Products of Expressway Business

EXAT is an authority responsible for the construction of expressways to provide service for convenient, rapid and safe traffic, as well as to mitigate traffic problems. EXAT invited interested parties to submit investment proposals; the Company then conducted a feasibility study and submitted its proposals for investment in projects with appropriate returns and conditions.

The expressway projects under the Second Stage Expressway Agreement, the Bang Pa-in - Pak Kret Expressway Agreement, the Agreement for Extension of the Second Stage Expressway (Sector D), and the Concession Agreement for the Si Rat - Outer Ring Road Expressway Project are implemented on a BTO

basis. According to the essence of the Agreements, EXAT shall have the duty to determine the characteristics of the expressways, expressway routes and areas to be used for construction and arrange for land expropriation for delivery to the Company for construction within the time specified in the Agreements. Thereafter, the Company would carry out construction in accordance with the designs approved by EXAT, subject to the supervision of the quality of construction work by EXAT's Consulting Engineer, Independent Certification Engineer, and Independent Design Checker. Upon completion of the construction, the Independent Certification Engineer shall inspect the work and issue Certificate of Completion to evidence that the construction work is completed in accordance with the specified standards and is ready for service, at which time, the Company shall be entitled to obtain toll revenue under the conditions of the Agreements. In the previous constructions, the Company engaged project managers to carry out construction and operate the Expressway Projects on a lump sum turnkey basis. This was due to the fact that the expressway projects are large-scale projects, which may sustain cost overrun issues and delayed completion of the construction. The lump sum turnkey engagement is intended to prevent such risk. In the engagement of project managers, the Company will select specialists with experience to act as project managers and construction contractor to ensure the accomplishment of quality work on time.

With respect to the Si Rat - Outer Ring Road Expressway Project, the Company and EXAT executed the Concession Agreement for Investment, Design, Construction, Operation, Service and Maintenance of the Project on September 14, 2012, for a concession period of 30 years from December 15, 2012 to December 15, 2042, and with a construction period of not exceeding 48 months. EXAT shall determine the expressway route and areas to be used for construction and arrange for land expropriation for delivery to the Company within the specified time. The Company shall have the duty to carry out the design and construction in accordance with the designs approved by EXAT, subject to the supervision of the quality of construction work by EXAT's Engineer and Independent Certification Engineer. Upon completion of the construction, the Independent Certification Engineer shall inspect the work and issue Certificate of Completion to evidence that the construction work is completed in accordance with the specified standards and is ready for service. The Company engaged CH. Karnchang Public Company Limited, which specializes and has extensive experience in construction and management of all expressway projects under the concessions of the Company, to act as project manager and construction contractor as well as the operator of the project on a lump sum turnkey basis.

Under this Concession Agreement, the Company shall have the right to manage and provide service, e.g., toll collection, rescue operation, and maintenance, whereby the Company shall be entitled to receive all tolls throughout the concession period.

9) Environmental Impact (Expressway Business)

The Company and its subsidiaries have always operated the construction and expressway business with environmental responsibility, by adhering to the business guidelines which can be summarized as follows:

In the construction of the expressways, the Company and its subsidiaries complied with the measures to prevent pollution in accordance with the regulations of the National Environment Committee and other relevant laws, which form an integral part of the Agreements. The Company and the subsidiaries implemented the measures and procedures as appropriate for the construction carried out in the urban areas with high populations. In so doing, the Company employed the Segmental Box Girder construction technique, which allowed it to complete the construction faster than other techniques in those days, so as to prevent any impact to nearby communities and affect the at-grade traffic at the least possible extent during the construction. Furthermore, the Company had no records of committing any environment-related offenses.

Even during the course of the operation of the expressway systems, the Company remained concerned about the eco-friendly business operations affecting the quality of life of staff, motorists and communities surrounding the expressways, including all groups of stakeholders. The Company improved and reviewed its internal procedures to conform to the environmental requirements for applying for the Certificate of ISO 14001 Environmental Management System. The Company has its commitment to ensuring environmental management in line with the following guidelines:

- To give priority to pollution prevention and control by managing and maintaining the expressways to meet international standards and keeping in mind the environmental impact on motorists, staff, and communities;
- To instill and encourage our staff with an awareness of efficient use of energy and natural resources;
- To comply with the environment-related laws and regulations;
- To review the purposes and goals for continued improvement of the environmental management system;
- To communicate our environmental policy to the public and all parties concerned.

Besides, the Company obtained certification from SGS (Thailand) Limited as follows:

- ISO 9001: 2015 Quality Management System; and
- ISO 14001: 2015 Environmental Management System.

In 2018, the Company continued to maintain the ISO 14001 Environmental Management System, by monitoring possible environmental issues, as well as optimizing the use of natural resources through its continued energy management measures. In so doing, the Company did change to use more efficient lamps on the expressways and around toll plazas, as follows:

1. The lamps in the Si Rat - Outer Ring Road Expressway were replaced by LED lamps as follows:
 - Replacement of the existing lamps in the Si Rat - Outer Ring Road Expressway Control Center Building with LED lamps, thereby saving up to 45 percent of energy.
 - Replacement of the existing lamps in the toll plazas with LED lamps, thereby saving up to 45 percent of energy.
2. The existing high pressure floodlight lamps were replaced by LED lamps in the merged area on the Udon Ratthaya Expressway, thereby saving up to 59 percent of energy by providing the brightness greater than the existing lamps, as well as minimizing the dispersed light.
3. The project to install solar cells on Rama VII Bridge Toll Plaza on the Si Rat Expressway - Outer Ring Road Expressway, thereby saving up to 20 percent of energy from the Metropolitan Electricity Authority.

With respect to safety management, the Company had an engineering analysis agency comprising knowledgeable and skilled personnel in traffic engineering and safety on the expressways to conduct studies on impacts from various factors. A traffic simulation was made for study of the suitability in the improvement of physical characteristics at the front areas of toll plazas, as well as inspection of road safety; analysis of risk areas on expressways; study of features and patterns in the installation of safety equipment, in order to improve the expressways to ensure the maximum safety for motorists, as well as to minimize environmental impact. The Company then put such study results into practice as follows:

- The safety on expressways was improved by inspecting and assessing the safety of the gore areas and installing safety equipment, e.g., crash cushions, cushion tanks, flexible guide posts, red-colored cold plastic road paint to alert for high accident risk areas.
- More Easy Pass lanes were added in response to the increased traffic volume in the Easy Pass lanes. After EXAT's policy on cancellation of the Easy Pass card deposit, the use of Easy Pass service has increased, which necessitates more

Easy Pass lanes to accommodate the increased traffic volume, and as a result, motorists can save their commute time and fuels.

- Easy Pass lanes at Asoke Toll Plaza 4, Prachachuen Toll Plazas (inbound) and (outbound), were relocated to the farthest right lane for motorists to have more efficient and rapid access to the Easy Pass lanes.
- Easy Pass signboards were improved for expressway motorists' convenient and rapid passage through the Easy Pass lanes.
- All Easy Pass lanes on the Si Rat Expressway were improved as fast lanes to accommodate more rapid passage and minimize slow traffic in front of the Easy Pass lanes.
- As for the project to enhance the efficiency of Easy Pass lanes, the Company installed the second antennas in Easy Pass lanes to suit the convenience of the Easy Pass users in the event that a barrier gate is not opened despite their remaining credit adequate for passing through, in that case, the system will have the barrier gate opened without waiting staff to open it. Such system helps expedite the motorists' travelling, save time waiting in a queue and reduce traffic congestion in front of the toll booths, as well as minimizing air pollution.
- Cash toll collection lanes were improved to accommodate the Easy Pass users, namely, in 2018, the Company developed the toll collection system to ensure that one toll collection lane would be capable of facilitating the service users' payment for tolls both in cash and by Easy Pass (dual mode system) for the greater convenience of the Easy Pass users. Such system would be in service at Rama 9-1 Toll Plaza (Si Rat) by early 2019.

The Company continued to provide training for staff and executives on know-how and techniques for environmental management in accordance with the ISO 14001 : 2015 Environmental Management System, as well as various activities to raise awareness of environmental protection in the organization and social contributions in association with the communities nearby.

Moreover, the Company sets a policy to improve the toll collection system for control centers to ensure compliance with the standard of information security management system of the ISO/IEC 27001:2013 in order to tighten the information security of the toll collection system for the control centers, and to lay down a standard for management of significant information to ensure the continued business operations, enhancing the organization's worldwide reputation for reliability. For that reason, the Company did apply for accredited certification of the ISO/IEC 27001:2013 for development of process and information security management system (ISMS) in accordance with the ISO/IEC 27001:2013 for the toll collection system of the Si Rat Expressway Control Center (CCB2) and the Si Rat - Outer Ring Road Expressway Control Center (CCB7) as well as developing its personnel in line of information security management so that they were able to fulfill work under the process/system so developed.

2.1.2 Rail Business

1) Nature of Services

The Company has been granted concessions for two mass rapid transit rail system projects by the Mass Rapid Transit Authority of Thailand ("MRTA"), as per the following details:

- (1) **The MRT Blue Line Project**, comprising the M.R.T. Chaloem Ratchamongkhon Line (Hua Lamphong - Bang Sue Section) and the MRT Blue Line Extension Project (Hua Lamphong - Lak Song Section and Bang Sue - Tha Phra Section), under the Concession Agreement executed by the Company with MRTA on March 31, 2017, for a period of 33 years from MRTA's Notice to Proceed. The Company is entitled to fare box revenue as well as undertaking activities and commercial development, including advertising, leasing space and telecommunications services in the metro stations and in the trains of the MRT Blue Line Project, for a period of 30 years from the date the entire route is opened for service.

- **The M.R.T. Chaloem Ratchamongkhon Line Project** (Hua Lamphong - Bang Sue Section) is the first underground metro system of Thailand, covering the distance of 20 kilometers, with 18 stations, which was in service on July 3, 2004. The Company is entitled to fare box revenue as well as undertaking activities and commercial development, including advertising, leasing space and telecommunications services in the metro stations and in the trains. Currently, there are 19 a total of 19 trains in service every day without holiday from 6.00 hours - 24.00 hours.
 - **The MRT Blue Line Extension Project** (Hua Lamphong - Lak Song Section and Bang Sue - Tha Phra Section), covering the distance of 27 kilometers, comprises 5 kilometers underground railway and 22 kilometers elevated railway, with a total of 20 stations, divided into 4 underground stations and 16 elevated stations, having a connection with the M.R.T. Chaloem Ratchamongkhon Line at Hua Lamphong Station and Bang Sue Station, as well as connecting with the MRT Purple Line Project at Tao Poon Station. The Company is responsible for investment, supply, installation, testing and commissioning of the M&E Equipment, whereby the supply and installation of the M&E Equipment for opening for service are divided into three sections, namely, Section 1: Bang Sue Station - Tao Poon Station, in service on August 11, 2017; Section 2: Hua Lamphong Station - Lak Song Station, to be in service by September 2019; Section 3: Tao Poon Station - Tha Phra Station, to be in service by March 2020, and provision of the service for the M.R.T. Chaloem Ratchamongkhon Line Project and the MRT Blue Line Extension Project to ensure the Through Operation. The Company is entitled to farebox revenue and commercial development throughout the concession period. On August 11, 2017, the MRT Blue Line Extension Project, Tao Poon - Bang Sue Section, covering a distance of 1.2 kilometers, was opened for service, to ensure the Through Operation among the M.R.T. Chaloem Ratchamongkhon Line (the existing MRT Blue Line), the MRT Blue Line Extension, and the M.R.T. Chalong Ratchadham Line (MRT Purple Line).
- (2) **The M.R.T. Chalong Ratchadham Line** (“MRT Purple Line Project”) Khlong Bang Phai Station - Tao Poon Station, covering a distance of 23 kilometers, with a total of 16 stations, starts from Khlong Bang Phai, where the Depot is located, Outer Ring Road (West), Kanchanaphisek Road, turning left to Rattana Thibet Road, crossing over the Chao Phraya River in parallel with Phra Nangklao Bridge and turning right to Tiwanon Road before reaching Khae Rai Intersection, and then turning left to Krung Thep - Nonthaburi Bridge and terminating at Tao Poon Intersection, where Tao Poon Station is located as an interchange station with Bang Sue Station of the M.R.T. Chaloem Ratchamongkhon Line Project, making it possible for passengers’ interchange from the MRT Purple Line to the MRT Blue Line at Tao Poon Station, which in the future, would be connected with the MRT Blue Line (Bang Sue - Tha Phra Section) and the MRT Purple Line (Tao Poon - Rat Burana Section).

The Company has been granted the concession for investment, the supply of M&E Systems and O&M Services, on a PPP Gross Cost basis. That is, MRTA invests in all civil works and the Company invests in the M&E Systems and the rolling stocks, as well as provides the operation and maintenance services in accordance with the specified service standards. MRTA is entitled to all fare box revenue and commercial development revenue from the utilization of the civil infrastructure and the railway systems and MRTA shall make gradual repayment for the M&E Systems to the Company on a monthly basis for a period of 10 years, and engage the Company to conduct the operation and maintenance throughout the concession period of 30 years from September 4, 2013.

There are a total of 21 trains available every day without holiday, from 5.30 - 24.00 hours on Mondays - Fridays, and from 6.00 - 24.00 hours on Saturdays - Sundays and public holidays.

Projects	M.R.T. Chaloem Ratchamongkhon Line Project (Hua Lamphong Station - Bang Sue Station)	MRT Blue Line Extension Project (Hua Lamphong Station - Lak Song Station and Bang Sue Station - Tha Phra Station)	MRT Purple Line Project (Klong Bang Phai Station - Tao Poon Station)
Concession Type	PPP Net Cost		PPP Gross Cost
Concession Period	33 years (from MRTA's Notice to Proceed)		30 years (2013-2043)
Number of Stations	18 stations	20 stations	16 stations
Distance	20 kilometers	27 kilometers	23 kilometers

2) Revenue

The Company's revenues from the rail business can be divided into two categories, comprising farebox revenue and revenue from O&M services.

- Fare box revenue**

Pursuant to the Concession Agreement for the MRT Blue Line Project between the Company and MRTA, the Company has the right to operate the train and collect farebox revenue and undertake commercial development throughout the concession period. The Company is obliged to make payment of remuneration from fares and commercial development to MRTA at the rates as mentioned in the Concession Agreement.

The fare rates of the metro as of the commencement date would be in accordance with the basic reference fare rates in force at the time of the revenue service commencement date. Under the Concession Agreement, the reference fare rates would be adjusted every 24 months based on the actual changes of the Bangkok Non-Food Consumer Price Index compared to the basic reference fare rates.

The Company adjusted the fare rates under the terms of the Concession Agreement accordingly. The current fare rates in force were adjusted on July 3, 2018, which will remain in force until July 2, 2020.

- Revenue from O&M Services**

The Company receives service fees for train operation and maintenance from the MRT Purple Line Project Concession Agreement, Contract 4, Concession for Supply of M&E Systems and O&M Services (Klong Bang Yai Station – Tao Poon Station), Phase 2 (for a period of approximately 27 years). The service opening commenced on August 6, 2016.

3) Marketing and Competition of Rail Business

- Customer Characteristics and Target Customers**

The Company's target customers can be divided into two groups, namely, residents nearby the metro routes and those who need to pass or head for other destinations along the metro routes, and categorized by purposes of journeys as follows:

1. Commute for work;
2. Commute to schools/educational institutes;
3. Commute by tourists/for leisure;
4. Commute for special activities, e.g., seminars or conferences; and
5. Commute for other purposes, e.g., business dealings.

4) Marketing Policy and Strategies of Rail Business

- **Service and Product Strategies of Rail Business**

- Creativity and Development of Convenient Services for MRT Passengers

At present, the MRT route starts from Hua Lamphong Station and ends at Tao Poon Station, covering a total distance of 21 kilometers, passing through central business districts (CBD), residential areas and connecting with other mass rapid transit systems which may increase the number of passengers, e.g., connection with the Green Line (BTS) at Silom Station, Sukhumvit Station and Chatuchak Park Station, with the Red Line (Airport Rail Link) at Phetchaburi Station heading for Suvarnabhumi Airport, and connection with the MRT Purple Line Project at Tao Poon Station, and connections with Hua Lamphong and Bang Sue Railway Stations. Other connections between the metro stations and four buildings currently include 1) Chamchuri Square (residential, office and edutainment complex) at Sam Yan Station; 2) Union Mall at Phahon Yothin Station; 3) Interchange 21 Tower (office building) and Terminal 21 Tower (shopping center, hotel, office, and residential building) at Sukhumvit Station; and 4) Central Plaza Grand Rama 9, G Tower with Phra Rama 9 Station; and in the future, there would be a connection with One Bangkok Project at Lumpini Station.

Traveling behavior of service users mostly accounts for work, followed by schools, and they usually travel during rush hour, while other purposes account for off-peak journeys with potential higher number of trips. The Company thus strategically increases the number of off-peak journeys, which can be handled by the currently available capacity, to ease the passenger density on off-peak trains, with its effort to encourage passengers to adjust their travelling behavior to leave early to work through the “MRT Lucky Hour for Early Birds” activity, and promotes more journeys by passengers using the metro cards in order to increase revenues and the number of cardholder passengers. This strategy has been continuously implemented since 2013 in alliance with its partners along the routes by way of provision of discounts or special benefits for metro card issuance or top-up and information services on highlighted events and destinations for the MRT passengers. In the past, there were activities and information services in collaboration with its subsidiary (BMN) and partners, for instance, Metro Mall, Central Plaza Grand Rama 9, Queen Sirikit National Convention Center, Lumpini Park, etc.

- Quality Services

The Company focuses on quality services on the motto “Service above all else” so that the MRT service becomes “lifestyle of Bangkok residents” under the Company’s professional operations. Various activities have been undertaken to promote the image of the current MRT services and create value added to Bangkok residents’ lifestyle. Based on this policy, the Company sets out the following signs for quality services:

- **Safety:** The MRT passengers’ life and property safety is the Company’s top priority. All staff must be well aware of and expected to strictly follow the Company’s safety requirements. In the past, the Company conducted regular training on safety and supervised to ensure that the Company’s services meet Thailand’s safety standard requirements and comparable to those of the world’s leading mass rapid transit operators.
- **Convenience:** The Company takes care of all equipment and facilities in the MRT system to function properly, and proactively facilitates the passengers’ convenient commute during high seasons, such as festival events and activities or exhibitions along the routes, by arranging for more ticketing points to best serve the passengers.
- **Fast:** The Company keeps the average train speed aligned with the timetable in response to passengers’ needs during different periods.

- Reliability: The Company maintains the trains and signaling systems in good conditions without any impact on its services.
- Punctuality: The Company keeps the timetable and stops time at every station punctual with the least possible deviations.

- Metro Cards for Everyone

The Company analyzes the customer characteristics and target customers, both regular and non-regular passengers, and then plans for and produces various styles of metro cards to suit every group of customers and to attract non-regular passengers to increasingly use the MRT cards in travelling. These arrangements comprise keeping styles of metro cards modern to ensure conformity with technology and increase in efficiency of metro cards to ensure that metro cards can be commonly used with the MRT Blue Line and the MRT Purple Line, as well as drawing up a plan to cover the MRT Blue Line Extension to be partially opened for service in 2019 and to be entirely opened for service in 2020; cooperation with financial institutions in issuing co-branded cards for financial transactions and MRT services, namely, in alliance with KASIKORNBANK Public Company Limited and Siam Commercial Bank Public Company Limited, including Chulalongkorn University, Chulalongkorn Hospital, and other institutions or agencies. Moreover, top up vouchers were issued to Ananda Development Public Company Limited to distribute as welfare for its staff to top up their metro cards.

- **Price Strategy of Rail Business**

The Company collects distance-related fares in fairness to passengers according to different distance of their journeys and provides discounts to school/college students, and children/elderly, by taking into account the fare rate collection of other mass rapid transit systems. The fare rates are adjusted in accordance with the relevant Concession Agreements.

- **Marketing Promotion Strategies of Rail Business**

The Company's classification of target customers is intended to draw up a strategy on sales promotion to effectively cover all target customer groups. As such, the Company's sales promotion and marketing plans based on target customers' lifestyle and settings are described as follows:

- To promote the park and ride facilities to encourage more passengers to park their personal cars at the service locations and use the MRT service to commute to such business districts as Sukhumvit Road, Silom Road, Ratchadaphisek Road, in order to help alleviate traffic congestion and minimize global warming.
- To accept credit card payments for passengers' convenience, collaborate with leading companies and banks, namely, AIS, KTC, Citibank, UOB, Bank of Ayudhya, Muang Thai Life Assurance, FWD Life Insurance, for providing discounts and cash back, including credit card reward points, in order to create value added to the MRT service, and offer special benefits to metro card holders with an aim to change passengers' behavior from using token to using metro cards for the sake of convenience and special benefits.
- To increase the number of passengers or trips in the system through information services on highlighted events along the MRT routes, and offer various types of customized metro cards bearing specific logos or signs of agencies, organizations, office buildings or hotels both along and beyond the routes, for public relations and sales promotion, in order to distribute the metro cards to both current and new target customers.
- To create the Customer Relations Management (CRM) and build a network compatible with the CRM process, which will serve as a central mechanism for loyalty marketing, focusing on efficient and effective response to ensure customers' satisfaction and creation of the MRT Club community for relationship building by using social

network and communication channels within the MRT stations to organize activities in alliance with partners on the win-win strategy through MRT Club memberships, for instance, offering gala movies in association with Major Cineplex Group, registering for a chance to win free concert tickets from BEC-TERO, offering the MRT cardholders discounts on SF Cinema movie tickets, etc.

- To create brand loyalty and awareness through various activities to promote marketing campaigns, rewards to customers and society, and corporate image towards young customers and passengers by creating value added collaboration on a regular basis, namely, building relationships with alliances to seek privileges for the cardholder passengers in a form of discounts on shops, restaurants, movie theaters or events surrounding the MRT route.
- To develop the electronic payment system for online top-up and mobile payment with TrueMoney Wallet, and draw up a plan to develop the electronic payment system for retail shops within Metro Mall to make it more convenient and rapid for the MRT passengers.
- To encourage the people to use government welfare smart cards in travelling with the MRT system, by improving the automatic fare collection systems (AFC) of the M.R.T. Chaloem Ratchamongkhon Line (MRT Blue Line Project) and the M.R.T. Chalong Ratchadham Line Project (MRT Purple Line Project) to accommodate usage of their government welfare smart cards.

• **Marketing Communication Strategies of Rail Business**

- To select effective channels of communication and public relations which are accessible to target groups of different marketing events through management of space and flows in the MRT system, e.g., standees within the stations, visual display on the token machines, event calendar media on monitors, digital media, social network media, including external public relations media from the alliances to provide service users with journey information in the MRT system. The Company also has emphasized development of the Mobile Application titled Bangkok MRT Application to accommodate travelling plans of the passengers.
- To focus on publicizing news and information to new customers via exhibition booths, encourage customers to apply for MRT Club membership as well as introducing privileges, MRT lucky hour activity and various activities, benefits, including Trove games activity, giveaways of souvenirs, by emphasizing the punctuality, convenience, fast journey, family time-saving, and definite timetable, in order to stimulate provision of information on services and privileges to the service users.
- To create destinations via regular communication, public relations and journey information along the MRT routes, prepare event calendar, route maps with attractive destinations, e.g., office buildings, schools, hotels, shopping centers, tourist attractions and other landmarks, convenient and rapid links to other mass rapid transit systems via the website and Mobile Application.
- To assure the passengers and people of the safety in travelling and service provision through public relations via television, radio and other media, and organize activities for public relations of service provision and safety-related activities at various venues, e.g., schools, office buildings, to present the safety of the MRT system to the passengers and people for their understanding and confidence in the services.

- **Development Strategy of Rail Business**

The Company adopts a strategy for regular development of quality and its services to ensure service users' utmost satisfaction with convenience, rapidity, and safety, which would attract more users of the MRT service. At present, the Company collaborates with financial institutions to hold single co-branded cards for multi-transactions.

- **Distribution Strategies and Channels of Rail Business**

The Company provides more sales outlets in addition to the ticket vending machines and ticket offices in the stations, by means of direct sales to various agencies, organizations, banks, schools, hotels, and private sectors, etc., with customized cards on various occasions, such as, gifts for staff, customers or for brand promotion and public relations materials, as a result, the metro cards become even more flexible for various uses than just for the MRT service.

5) **Industrial Outlook and Competition of Rail Business**

Mass Rapid Transit Systems in Bangkok and its Vicinity

Bangkok is a large capital city, with a dense population and various modes of transportation systems, for example, personal cars, public buses, passenger vans, metro, micro buses, taxis. The traffic problem in Bangkok has extremely intensified due to the increase in population in urban areas and the rising travel demand of people, as a result, the traffic area capacity was not enough to accommodate such increase, which is considered a major problem which is not different from the problem in other highly populated capital cities around the world. Thus, the government adopts a policy focusing on the development of various public transport networks to resolve the traffic problem to accommodate an increase in population and the economic growth of the country.

In this regard, traveling by residents in Bangkok can be divided into two modes of transport systems, namely, personal transport system and public transport system.

- **Personal Transport System**

People's residences in Bangkok and its vicinity are spread all over, traveling by personal cars thus is popular. The growing number of highly-paid or middle-class people and the inadequacy of the existing transport systems, and travelling expenses as compared with that of travelling by personal cars, as well as the service quality and safety, have also caused personal cars to become essential and convenient for traveling. In this connection, the expansion of traffic area in Bangkok remained limited and inadequate to accommodate the volume of vehicles.

- **Public Transport System**

As a result of the traffic congestion problem, particularly in peak hours, and the growth of the real estate projects surrounding the route, consumers' demand for the public transportation system of certain types was considerably high, especially for the metro system which was significantly expanding by reason of change in the urban people's behaviors of selection of residences and travelling by mainly focusing attention to convenience and rapidity in travelling.

- **Public Bus Service**

At present, there are various types of public buses for service at different service rates, but the number of public buses in service in Bangkok and its vicinity remained inadequate, owing to the fact that a certain number of buses were undergoing improvement and rearrangement of bus routes was made, and let alone the fact that there are more than 16,000 passenger vans, as another popular alternative for commuters because of the convenience and rapidity in travelling. In January 2018, the Department of Land Transport launched new model buses with developments in technologies to make it compatible with the GPS system and the E-Ticket system for service on certain routes. Nevertheless, as a result of the ongoing traffic congestion

on roads, especially during rush hours in the morning from 6:30 to 8:30 hours, and in the evening from 16:30 to 18:30 hours, traveling is inefficient and time-consuming, not to mention the impact from the safety issues and the pollution produced by the vehicle exhaust system.

- **Trains**

In the past, the government sector formulated a policy to satisfy the low-income earners' requirements to use the government welfare smart cards for their spending, in a manner which the government welfare smart cardholders were able to use such card for travelling by buses, passenger vehicles served by The Transport Co., Ltd. and trains for free in the amount not exceeding Baht 500 per travelling mode per month. Unfortunately, there remained a lack of convenience and safety owing to unpleasant train condition and non-air conditioning of trains, let alone the limited routes not covering the entire city, as a result, the State Railway of Thailand (SRT) expedited additional dual track rail system construction projects on many routes, together with the new depot construction project in order to accommodate old and new locomotives and for the purpose of development of the Thai railway system in accordance with Thailand's transportation infrastructure development strategy. In this regard, the SRT's train service is not considered the Company's direct competitor due to different service routes, namely, the SRT aims to provide the service to suburban areas.

- **BTS**

BTS Skytrain was Thailand's first mass rapid transit rail system on the elevated dual tracks and directions. BTS opened for service on December 5, 1999, on 2 lines, namely, Sukhumvit Line and Silom Line, and currently, extended 49.05 kilometers, with 43 stations. In 2018, BTS Skytrain had the number of daily average passengers amounting to approximately 660,000 trips. As such, traveling by BTS Skytrain was a convenient alternative for commuters. Moreover, BTS Skytrain is intended to provide service to the heart of the city, not to mention the real estate development around the routes and connection with the MRT system, which makes it enormously popular, and thus, such factors have caused an increase in service user volume.

- **ARL**

The Suvarnabhumi Airport Rail Link or Airport Rail Link or Airport Link is a special mass rapid transit rail system project, as part of the project for construction of suburban and commuter rail systems, carried out and operated by the State Railway of Thailand (SRT). The structure of the Suvarnabhumi Airport Rail Link is both underground and elevated, with the alignment accommodating journeys from the eastern and northern outskirts, and passengers from the Suvarnabhumi Airport, to the center of Bangkok at Phaya Thai Station, covering a total of 8 stations, with a distance of 28.6 kilometers. Airport Link was opened for service on August 23, 2010. For the current service provision, a plan was set up to develop, improve and increase the train capacity, including purchase of new trains, together with a plan to reduce passengers' waiting time for the next incoming train from 12 minutes per train to 10 minutes per train in order to boost efficiency in the service provision. In 2018, the daily average passenger volume was approximately 80,000 persons per day, resulting from an ongoing increase in a number of the public transport system service users, reflecting the change in travel behavior of residents in Bangkok and its surrounding provinces from using personal car to use the public transport system. This indicated the development in terms of convenience, rapidity, safety and the extended coverage areas of travelling to ensure transit in the through operation system at present. However, owing to the traffic congestion, air and noise pollution, and potential accidents, the transit rail system is then regarded as a significant milestone for change and development of the mass rapid transit systems in Bangkok and its vicinity, which will help alleviate traffic problems, ensure safe, convenient and rapid journeys of service users, and result in a positive effect on the economy and environment.

Therefore, the mass rapid transit system represented a traveling mode, which helped improve the quality of life of urban people and reduce the usage of national resources.

6) Industrial Outlook and Government Policy of Rail Business

Thailand's economic outlook in 2018 was expected to grow at approximately 4.1 percent, which was improved from 3.9 percent in the previous year, and in 2019, it was expected to grow by 3.5 - 4.5 percent, significantly resulting from an expansion of consumption and investment of the private sector and the continued expansion of spending and investment of the government sector (*Source: Office of the National Economic and Social Development Board*).

The government prioritizes its strategic plans for transportation development, particularly investment projects in the metro system, to resolve traffic problems in Bangkok and its vicinity, and as such, speeds up the bidding process for these projects by establishing the Public Private Partnership (PPP) Policy Committee and setting up a PPP Fast Track team by focusing on infrastructure investments in accordance with Thailand's PPP Strategic Plan 2017-2021. There were 10 megaprojects for transportation infrastructure in the initial phase, which were invested, worth Baht 4.4 Billion. The metro projects expected to be launched for bids in 2019 include the MRT Purple Line Project (Tao Poon - Kanchanaphisek Outer Ring Road) and the MRT Orange Line Project (West and East). Moreover, the PPP Committee followed up on progress of five PPP Fast Track projects of the Ministry of Transport, with an estimated investment value of Baht 240,126 Million, namely, 1) Rest Area Project of Bang Pa-In - Nakhon Ratchasima Motorway; 2) Rest Area Project of Bang Yai - Kanchanaburi Motorway; 3) Phuket Mass Transit System Project; 4) Chiang Mai Mass Transit System Project; and 5) Nakhon Ratchasima Mass Transit System Project, and also accelerated the development of the mass transit systems in principal cities in other provinces, such as, Khon Kaen Province and Songkhla Province, etc., in order to ensure diversification of investment and development of infrastructure in the region and alleviate the congested traffic problems of the principal cities. From the success of the PPP Fast Track, the Ministry of Transport then continued to expedite the projects into the PPP Fast Track for the next phase.

In this regard, the government sector's role in stimulating the economy through its expenditure and investment was considered the most crucial factor which would have an influence on the future economic situation. Giving priority to investment in infrastructure projects, particularly in the transportation system, would help make travelling and transport of goods convenient, which would attract Thai and foreign investments from the private sector and strengthen the economy conducive to the sustainable growth in the future.

Real estate development around the metro routes

As a result of the continued economic growth in 2018, the real estate market continued to grow, especially the real estate market surrounding the metro routes which became more hugely popular. It was evidenced by a diverse selection of new condominium launches, particularly those which were around the MRT Blue Line Extension Project (Hua Lamphong - Bang Khae Section and Bang Sue - Tha Phra Section), which would be in service in 2019 and are currently attractive to investors. The development of the public transport system to cover the wide-areas of Bangkok and its surrounding provinces became a key factor in accelerating the real estate development in various forms, such as, condominiums, building offices, shopping centers, markets, most-visited tourist attractions, hotels, apartments, restaurants and supermarkets, to ensure that they were growing rapidly accordingly.

7) **Progress of Development of the Mass Rapid Transit Systems under the Government Policy**

Project	Current Status of Project
SRT Dark Red Line (North - South) Suburban railway system, divided into 4 phases, covering a total distance of 80.5 km.: <u>Phase 1:</u> Bang Sue - Thammasat (Rangsit campus) <u>Phase 2:</u> Bang Sue - Hua Lamphong <u>Phase 3:</u> Hua Lamphong - Bang Bon <u>Phase 4:</u> Bang Bon - Mahachai	Bang Sue - Rang Sit, with a distance of 26 km. <ul style="list-style-type: none"> - SRT is proceeding with the following: <u>Contract 1:</u> Civil Work for Bang Sue Station and Depot, SRT executed the agreement for engagement of SU Joint Venture (Sino-Thai Engineering & Construction Public Company Limited and Unique Engineering and Construction Public Company Limited) on January 18, 2013. <u>Contract 2:</u> Civil Work for Bang Sue - Rang Sit Section, SRT executed the agreement for engagement of Italian-Thai Development Public Company Limited on January 31, 2013. <u>Contract 3:</u> M&E System, including the supply of carriages - On December 20, 2018, the SRT Board approved an expansion of the construction term from 36 months to 54 months. It was expected to complete and be in service in January 2021.
SRT Light Red Line (West - East) SRT's suburban railway system, Bang Sue - Taling Chan, Taling Chan - Salaya, and Bang Sue - Makkasan - Hua Mak, covering a total distance of approximately 48 km.	Bang Sue - Taling Chan, with a distance of 15 km. <ul style="list-style-type: none"> - SRT engaged Unique - Chun Wo Joint Venture to carry out the construction. The construction was 100% completed. - The project was opened for a trial run during September 8 to November 30, 2012, for four trips per day (round trip) by diesel railcars in order to inspect the rail condition and systems relating to train operation. - It was opened for temporary service from December 5, 2012. Bang Sue - Phaya Thai - Makkasan - Hua Mak, with a distance of 19 km. <ul style="list-style-type: none"> - The project was in the process of design revision to make it compatible with the hi-speed rail linked 3 airport project, whereby both projects would use the foundation together in the area of Chitralada Royal Villa. Taling Chan - Salaya, with a distance of 14.8 km. <ul style="list-style-type: none"> - The project was approved by the Office of the National Economics and Social Development Board (NESDB). It was expected to propose the project to the Council of Ministers for approval by 2019.
MRT Blue Line Extension	Bang Sue - Tha Phra and Hua Lamphong - Bang Khae, with a distance of 27 km. <ul style="list-style-type: none"> - On March 28, 2017, the Council of Ministers resolved to approve the results of the selection of the private entity. The Company entered into the Concession Agreement for the MRT Blue Line Project with MRTA, under which the Company shall invest in the M&E Systems and O&M Services. - On August 11, 2017, the MRT Blue Line Extension Project, Tao Poon - Bang Sue Section, covering a distance of 1.2 km., was opened for service. <p>Currently, it was in the process of supply, installation of the M&E Equipment. Hua Lamphong Station - Lak Song Station Section would be opened for service by September 2019 and Tao Poon Station - Tha Phra Station Section would be opened for service by March 2020. In this regard, the Company was accelerating the operations to ensure the early service opening.</p> Bang Khae - Phutthamonthon Sai 4 (with a distance of 8 km.) <p>It was in the process of consideration and review of passenger volume and justification of the project by the Ministry of Transport.</p>

<p>MRT Green Line</p>	<p>Mo Chit - Saphan Mai - Khu Kot, with a distance of 18.4 km.</p> <ul style="list-style-type: none"> - MRTA executed the civil work contracts, Contracts 1-4, on April 3, 2015, as follows: <p><u>Contract 1:</u> (Civil Works), Mo Chit - Saphan Mai, with a distance of 12 kilometers, operated by Italian-Thai Development Public Company Limited;</p> <p><u>Contract 2:</u> (Civil Work), Saphan Mai - Khu Kot, with a distance of 7.5 kilometers, operated by UN-SH-CH Joint Venture (Unique Engineering and Construction Public Company Limited, Sinothyro Corporation Limited, and China Harbour Engineering Company Limited);</p> <p><u>Contract 3:</u> (Depot and Park & Ride Facilities) operated by STEC-AS-3 Joint Venture (SINO-Thai Engineering and Construction Public Company Limited, A.S. Associated Engineering (1964) Co., Ltd.);</p> <p><u>Contract 4:</u> (Design and Construction of Trackwork) operated by STEC-AS-3 Joint Venture (SINO-Thai Engineering and Construction Public Company Limited, A.S. Associated Engineering (1964) Co., Ltd.).</p> <p>Bearing - Samut Prakan, with a distance of 12.8 km.</p> <ul style="list-style-type: none"> - On April 1, 2017, one station, namely, Samrong Station, was opened for service. - On December 6, 2018, the MRT Green Line, Bearing - Samut Prakan Section, was opened for a free trial for a period of 4 months
<p>MRT Orange Line</p>	<p>Thailand Cultural Centre - Min Buri, with a distance of 20 km.</p> <ul style="list-style-type: none"> - On December 9, 2017, the contract signing ceremony was held for the civil work construction of the MRT Orange Line Project between MRTA and contractors as winning bidders in Contracts 1, 2, 3, 4, 5 and 6, as follows: <p><u>Contract 1:</u> (Civil Work), Thailand Cultural Centre - Soi Ramkhamhaeng 12, operated by CKST Joint Venture (CH. Karnchang Public Company Limited and Sino-Thai Engineering & Construction Public Company Limited);</p> <p><u>Contract 2:</u> (Civil Work), Soi Ramkhamhaeng 12 - Hua Mak, operated by CKST Joint Venture (CH. Karnchang Public Company Limited and Sino-Thai Engineering & Construction Public Company Limited);</p> <p><u>Contract 3:</u> (Civil Work), Hua Mak - Khlong Banma, operated by Italian-Thai Development Public Company Limited;</p> <p><u>Contract 4:</u> (Civil Work), Si Yaek Banma - Suwinthawong, operated by Unique Engineering and Construction Public Company Limited;</p> <p><u>Contract 5:</u> (Civil Work), Depot and Park & Ride Facilities, in the area of MRTA's office, Phra Ram 9 Road, operated by CKST Joint Venture (CH. Karnchang Public Company Limited and Sino-Thai Engineering & Construction Public Company Limited);</p> <p><u>Contract 6:</u> Design and Construction of Trackwork, operated by Unique Engineering and Construction Public Company Limited.</p> <p>Taling Chan - Thailand Cultural Centre, with a distance of 17.5 km.</p> <ul style="list-style-type: none"> - It was in the process of consideration of the Public Private Partnership Policy Committee (PPP Committee). It was expected to issue an announcement for the invitation to the private entities for bidding (TOR) by early 2019.

<p>MRT Yellow Line</p>	<p>Lat Phrao - Samrong, with a distance of 30.4 km.</p> <ul style="list-style-type: none"> - On May 30, 2017, the Council of Ministers resolved to approve the results of selection of the private entity and draft Concession Agreement for the MRT Yellow Line Project, in collaboration with BSR Joint Venture (comprising BTS Group Holdings Public Company Limited, Ratchaburi Electricity Generating Public Company Limited and Sino-Thai Engineering & Construction Public Company Limited). - On June 16, 2017, MRTA signed the Concession Agreement with BSR Joint Venture. - On August 27, 2018, the construction of the project officially commenced, for a construction period of 39 months (3 years and 3 months). It was expected to complete and open for service in late 2021.
<p>MRT Pink Line</p>	<p>Khae Rai - Min Buri, with a distance of 34.5 km.</p> <ul style="list-style-type: none"> - On May 30, 2017, the Council of Ministers resolved to approve the results of selection of the private entity and draft Concession Agreement for the MRT Pink Line Project, in collaboration with BSR Joint Venture (comprising BTS Group Holdings Public Company Limited, Ratchaburi Electricity Generating Public Company Limited and Sino-Thai Engineering & Construction Public Company Limited). - On June 16, 2017, MRTA signed the Concession Agreement with BSR Joint Venture. - On August 27, 2018, the construction of the project official commenced, for a construction period of 39 months (3 years and 3 months). It was expected to complete and open for service in late 2021.
<p>Red Line (Airport Link)</p>	<p>Suvarnabhumi Airport Rail Link Extension Project, Don Mueang - Bang Sue - Phaya Thai Section, with a distance of 21.8 km.</p> <ul style="list-style-type: none"> - SRT is pending review of the appropriateness of the drawings and construction method to ensure that it is suitable to seamlessly combine with the hi-speed rail linked 3 airport project (Don Mueang - Suvarnabhumi - U-Tapao). - On March 27, 2018, the Council of Ministers resolved to approve the incorporation of the Suvarnabhumi Airport Rail Link Extension Project, Don Mueang - Bang Sue - Phaya Thai Section, into part of the hi-speed rail linked 3 airport project. SRT was assigned to implement the project. - On June 18, 2018, SRT opened for the sale of private sector selection document envelopes. It was expected to conclude the results of the private sector selection by early 2019.

Sources: www.railway.co.th, www.mrta-purpleline.com, www.bts.co.th, www.bkkmrt.com, and information collected by the Company.

8) Procurement of Products or Services of Rail Business

• Nature of Procurement of Products

The mass rapid transit system projects are awarded to the Company by way of concessions from MRTA, a state agency established and existing under the “Mass Rapid Transit Authority of Thailand Act B.E. 2543 (2000)” to operate the mass rapid transit systems in Bangkok and its vicinity, including other designated provinces, with safety and efficiency. MRTA is a state enterprise under the supervision of the Minister of Transport. The Company specializes in the metro business, conducts the project feasibility studies, and submits its investment proposals for such projects with appropriate returns and conditions. The existing concession projects were awarded for investment, supply of rolling stocks, operation and maintenance, whereby the government sector invests in all civil infrastructure, namely, stations and facilities, tunnels,

ventilation systems and trackwork, etc., while the Company invests in the railway systems, namely, rolling stocks, signaling and operation systems, communications and SCADA systems, power supply, automatic fare collection, platform screen door, and depot workshop systems, etc.

The M.R.T. Chaloei Ratchamongkhon Line (Blue Line) (Hua Lamphong Station - Bang Sue Station)

The Company engaged Joint Venture CKET as the project manager for the MRT project (Project Manager) (from August 2000 to July 2009) to manage technical operations, such as procurement of the M&E Equipment as ordered from manufacturers and liaison with contractors and relevant authorities regarding the installation of the M&E Equipment. Upon expiration of the engagement agreement of CKET for project management, the Company was able to efficiently administer and manage the MRT Project, as well as improve and develop the efficient service provision on its own. In regard to the supply and maintenance of the M&E Equipment, the Company engaged Lincas and Siemens to manufacture the M&E Equipment. Lincas and Siemens are responsible for the design, manufacture, supply, installation, testing, and commissioning of the M&E Equipment. The Company also engaged Siemens as a contractor for maintaining the M&E Equipment for a period of 10 years (July 2004 to July 2014), which was extended for another 10 years (to end in July 2024).

The M.R.T. Chaloei Ratchadham Line (MRT Purple Line), Bang Yai - Rat Burana, Bang Yai - Bang Sue Section, (Klong Bang Phai Station - Tao Poon Station)

The Company executed the Concession Agreement for the MRT Purple Line Project, Bang Yai - Rat Burana, Bang Yai - Bang Sue Section, (Klong Bang Phai Station - Tao Poon Station), with MRTA, on a PPP Gross Cost basis, namely, the government sector invests in all civil works and the Company invests in the M&E Systems and the rolling stocks. The government sector shall make repayment in installments to the Company for the costs of the M&E Systems after the delivery of the ownership. In this regard, the Company will provide the operation and maintenance services according to standards as specified in the Agreement. In addition, the government sector is entitled to all fare box revenue and commercial development revenue from the utilization of the civil infrastructure and the railway systems and the government sector shall make repayment to the Company in the form of service fee for the O&M Services, for a contractual period of 30 years, divided into two phases, namely, Works under Phase 1: Design, supply, installation, testing of the M&E Systems and other related systems, including trial run to ensure its readiness for public service until the commencement of the Operation Service, by means of engagement of CH. Karnchang Public Company Limited as Project Manager. As for the implementation of Works under Phase 1 of the Concession Agreement, the Company, and CH. Karnchang Public Company Limited engaged MTJV (Marubeni-Toshiba Joint Venture) for the supply of rolling stocks, power supply equipment, signaling system, control, and communications systems, as well as maintenance service for a period of 10 years.

9) Environmental Impact of Rail Business

In respect of the metro business, the Company is committed to continuing its environment-related activities in accordance with ISO 14000 standards, by implementing pollution prevention and control measures, mitigation environmental impact and sustainable use of resources on the basis of three aspects of sustainable development, namely, society, economy, and environment. In addition, the Company reported its operational results in line with the index on the operational results regarding energy conservation and environmental preservation in accordance with the Energy Conservation Promotion Act (No. 2) B.E. 2550 (2007), the ministerial regulations on standards, criteria and procedures for energy management in designated factories and buildings B.E. 2552 (2009), as well as the energy management manual for sustainable development.

Regarding the energy conservation and environmental preservation in the metro business, the Company has strictly complied with the relevant laws governing energy conservation and the environment, and also adopted the Energy Management System (ISO 50001) and the International Environmental Management System (ISO 14001) since the opening of its MRT service, as well as simultaneously organizing activities for participation by and listening to related parties' opinions to ensure proper understanding which leads to sustainable development. It was for this reason that the Company received the standard management certifications as follows:

- ISO 9001:2015 Quality Management System;
- ISO 14001:2015 Environmental Management System;
- OHSAS 18001:2007 and TIS 18001:2001 Occupational Health and Safety Management Systems;
- Safety Management System from Ricardo Rail Limited.

In addition, the Company has been paying attention to the potential environmental impact from the MRT services on the environment, quality of life, and lives of people and nearby communities, by strictly monitoring, preventing and mitigating the environmental impact that may arise during the implementation of the MRT projects (Environmental Impact Mitigation Measures and Monitoring Program - EMP) in service, namely, the M.R.T. Chaloem Ratchamongkhon Line, the M.R.T. Chalong Ratchadham Line and the MRT Blue Line Extension, Bang Sue - Tao Poon Section, as well as submitting reports on its compliance with such measures to the Office of Natural Resources and Environmental Policy and Planning (ONEP) for consideration twice a year. The environmental quality was followed up and monitored in key environmental issues as follows:

(1) Air Quality

The results of air quality measurement in the atmosphere around the projects showed that the total suspended particulate (TSP), particulate matter (PM10) and carbon monoxide (CO), nitrogen dioxide (NO₂), and the total hydrocarbons (THC) did not exceed normal level.

(2) Air Quality in MRT Stations and Trains

The results of air quality measurement in the MRT stations and trains, during both peak and off-peak hours, showed that the total bacterial and fungal volume, ventilation rate, temperature, and relative humidity did not exceed normal level.

(3) General Noise Level

The results of general noise level measurement showed that the average noise did not exceed 70 dB(A), with the maximum level not exceeding 115 dB(A), which met the standard requirements.

(4) Vibration Level

The results of vibration level measurement did not exceed normal levels.

(5) Effluent Quality

The results of effluent quality measurement in stations, depot and administration building did not exceed normal levels. The wastewater treatment system could work efficiently according to its design.

(6) Waste Management

The results of waste management were found that segregation, collection and transport of waste for disposal were made efficiently in accordance with the management plan and applicable laws.

In addition to the environmental quality measurements, maintenance vehicles used in the depot area meet the EURO IV Standard, an emission standard for vehicles, which provides assurance that the use of such maintenance vehicles and the maintenance operations will in no way give rise to pollution at a hazardous level.

2.1.3 Commercial Development Business

The Company and its subsidiary, namely, Northern Bangkok Expressway Company Limited (“NECL”), have carried out commercial development in relation to the expressway system by allowing the private entities and individuals to use the space for commercial operations in the vicinity of the expressway system for installing Intelligent Traffic Signs and advertising boards in various forms and for installing shops in the areas of toll plazas and engaging in other business, such as, use of the areas in the expressway system for installing 3G signal boosters, etc. Moreover, the Company has operated and granted the rights to its subsidiary, namely, Bangkok Metro Networks Limited (“BMN”), to serve as the management representative in the commercial development of the M.R.T. Blue Line Project, per the following details:

1) Nature of Services

• Commercial Development Relating to Expressway Systems

As for the commercial development in the area of the expressway system, the Company and one of its subsidiaries, namely, NECL, allowed private entities and individuals to take on the lease of spaces for commercial operation, as follows:

○ Installation of Intelligent Traffic Signs and Advertising Boards

Private entities were allowed to install Intelligent Traffic Signs on the main routes and in front of toll plazas, and install advertising boards in various areas, such as, in front of toll plazas, toll booths, expressway columns, and expressway barriers, etc.

○ Retail Areas around Toll Plazas

Private entities and individuals were allowed to take on the lease of retail areas for providing service to expressway service users around Prachachuen, Srinagarindra, and Bang Pa-in Toll Plazas.

○ Other Business Operations

Private entities were allowed to use the expressway areas for installation of 3G signal boosters, etc.

• Commercial Development Relating to Metro System

In regard to commercial development revenue from the M.R.T. Blue Line Project, the Company has operated and granted the following rights to its subsidiary, namely, BMN, as the management representative in the commercial development of such project:

○ Procurement and/or Production of Advertising Boards

Procurement and/or production of advertising boards or media in all 18 stations, 19 trains (MRT metro), and the Tao Poon Extension connecting with the MRT Purple Line, as developed from the former style into modern style to make it attractive to the service users by making use of the media of the advertisers which do intend to build brand awareness of goods and services, e.g., media in a form of special-sized light boxes on a spot where they are visible from the further distance, change in the media in the prime location from stickers to be light boxes or digital media, etc., as well as enhancing creative thinking, in order to suit the change in passengers’ commuting behaviors, while brightening up the journeys and surroundings within the MRT stations.

○ Lease of Retail Areas in MRT Stations

Lease of retail areas in 11 MRT stations, comprising Khlong Toei Station, Queen Sirikit National Convention Centre Station, Sukhumvit Station, Phetchaburi Station, Phra Ram 9 Station, Thailand Cultural Centre Station, Ratchadaphisek Station, Lat Phrao Station, Phahon Yothin Station, Chatuchak Park Station and Kamphaeng Phet Station, and spaces in the basement level of the Lat Phrao park and ride facility, covering the total commercial lease spaces of approximately 19,490 square meters (spaces for retail shops and sale promotions). To date, the retail shops are opened in nine stations, namely, Khlong Toei Station, Sukhumvit Station, Phetchaburi Station, Phra Ram 9 Station, Thailand Cultural Centre Station, Phahon Yothin Station, Kamphaeng Phet Station, and spaces in the basement level of the Lat Phrao park and ride facility. In early 2018, Chatuchak Park Station was closed for renovation to make the space of the retail shops beautiful and modern,

create a new lifestyle of the space for retail shops within the MRT station to serve as a rest area or meeting point of the service users or the general public.

- **Provision of Service and Maintenance of Telecommunications System Equipment**

Provision of service and maintenance of telecommunications system equipment, particularly mobile phone network, inside the metro stations and tunnels, as well as Hi-speed Internet, the Wi-Fi services, and the telecommunications signal systems in the metro stations and tunnels. Currently, the telecommunications network service is also available covering the 850, 900, 1800, 2100 and 2300 MHz frequency bands.

2) **Marketing and Competition of Commercial Development Business**

- **Customer Characteristics and Target Customers**

The commercial development in the M.R.T. Blue Line Project is comprised of procurement and/or production of advertising media of various forms in the metro stations and trains, lease of retail areas, as well as providing service and maintenance of telecommunications system equipment, with different customer characteristics and target customers varying on service types, therefore, customer characteristics and target customers for commercial development can be classified, as follows:

- **Procurement and/or Production of Advertising Media of Various Forms**

The advertising media customer groups in the MRT system consists of advertising media purchasers via agencies and owners of goods and services. Currently, the percentage of advertising media purchasers via agencies is higher than that of advertising media purchase by owners of goods and services. However, the percentage of advertising media purchase by owners of goods and services increased from 30 percent to 40 percent in 2018.

The top five groups of goods and services using the MRT advertising media are comprised of group of communications equipment (mobile phone), followed by groups of financial institutions, food and beverage, entertainment business and real estate from various projects surrounding the MRT stations, which corresponds with the main groups of the MRT service users in the age range of 20-39 years old representing more than 60 percent, accounting for more than 30 percent of school and university students and more than 30 percent of workers.

- **Lease of Retail Areas in MRT Stations**

In 2018, the group of lessees of retail areas in MRT stations was significantly changed whereby there was an increase in group of area leasing customers whose brands were well known and popular, by having an interest in expanding its branches in areas within more than two MRT stations and having an intention to be an alliance in branch expansion, if any, in the future. Moreover, the Company supported and promoted the expansion of provision of the government sector's services in the MRT system to the public, by way of support of opening the Legalization Office, Department of Consular Affairs, at Khlong Toei Station.

Other than the retail areas, the service expansion of the temporary event spaces to be in outside spaces of the retail areas was higher as compared with that in the previous year, in particular the event spaces outside the retail areas at Chatuchak Park Station, including the service provision of the event spaces in front of the retail areas at Phra Ram 9 Station and Phetchaburi Station.

- **Provision of Service and Maintenance of Telecommunications System Equipment**

The provision of telecommunications system service relies on those who have obtained licenses to operate the telecommunications business from the Office of the National Broadcasting and Telecommunications Commission (the Office of the NBTC); therefore, the Company's customer group included AIS, DTAC, TRUE MOVE, TOT, and CAT.

3) Marketing Policy and Strategies of Commercial Development Business**• Service and Product Strategies of Commercial Development Business****Commercial Development Relating to Expressway Systems**

- Intelligent Traffic Signs in the form of maps and text messages are provided to give traffic updates to expressway users, including advertising boards in front of toll plazas, barriers, expressway columns, and in front of toll booths.
- Shops and public restrooms are provided to expressway users in 4 toll plazas of the Si Rat Expressway and the Udon Rathaya Expressway, namely, Srinagarindra Toll Plaza, Prachachuen Toll Plaza (inbound), Bang Pa-in Toll Plaza (inbound), and Bang Pa-in Toll Plaza (outbound).

Commercial Development Relating to Metro System

The commercial development service is provided for facilitating and ensuring pleasant journeys for MRT service users, including people living in the areas adjacent to the MRT stations, and such commercial development service generates more revenue, as follows:

- As for the policy and strategy to develop retail areas, the strategy to improve the image of the stations was adopted to make it modern, attractive to both the area lessees and the service users; the selection of the retail shops in response to the commuting behaviors of the service users played a key factor in developing the service business of retail shops in MRT stations to achieve growth; and moreover, entering into an alliance with popular brands of goods and services in branch expansion in the retail shops within other stations also was a part of supporting and promoting the image. It was then evident that the service provision of the retail areas in 2018 was changed.
- The marketing strategies in 2018 of static media and dynamic media were to give priority to collaboration with advertising media agencies and designers to ensure the integration of advertising media and to meet the requirements of the customers by allowing advertising media to serve as a communication channel with the MRT service users to achieve the utmost efficiency. Moreover, change in advertising media from static media to dynamic media or enhancement of creative thinking enabled MRT advertising media to build brand awareness because of its distinguishing form different from general static media, or development of dynamic media to make it more attractive and interesting by means of using software to help add dimensions to the dynamic media, for instance, Octagon and Digital Media Set, at Phetchaburi Station and Sukhumvit Station.
- As for communication service in 2018, the Company conducted a study to improve efficiency in the MRT system service provision and drew up a plan to enhance efficiency in the communication service in 2019 to make it in line with the service provision development of the licensees for telecommunications business which has the increasing competition among them.

The development of commercial services in other aspects than advertising media service, retail area service and telecommunication service, also included use of other spaces than the retail areas for providing the service of temporary event activities, which started changing evidently from use of the spaces outside the retail areas for benefiting the service users and generating more income as well as expanding service of other automatic vending machines.

• Corporate Image Promotion Strategies

- In addition to the objectives in commercial development, giving back to the community, support of the government policies, are also treated as our required main mission, for example, by collaborations with alliances and the commercial development licensee (BMN) in organizing GAT/TCAS Guideline Program by Khun Kru Somsri, under the “Getting Fit Beat GAT/TCAS by MRT” Project since 2009, supporting the use of spaces and retail shops within shopping malls, launching the blue flag store

with MRT project, validating the government welfare smart cards with the MRT trains. Moreover, there was the “Naiin × BMN Read Around” project to allow the people to read books for free via scanning QR code at Sam Yan Station, Phetchaburi Station, Thailand Cultural Centre Station, Phahon Yothin Station, and Chatuchak Park Station, etc.

- **Distribution Strategies and Channels of Commercial Development Business**
 - Distribution channels vary by the forms of commercial development services, mainly by mixed presentation via the Company’s strategic partners together with a direct presentation to owners of goods and services.

4) **Industrial Outlook and Competition of Business Development Business**

- **Advertising Media**

Spending budget for buying the advertising media in 2018, as compared with that in the previous year, was found high by 3.91 percent. The top five media which had the highest growth included in-store, followed by TV, radio, cinema, out of home, which was growing at a similar rate, and the Internet, respectively. In this regard, the MRT advertising media as classified in transit media had the growth by 3.25 percent, as compared with that in the same period of the previous year.

Despite the fact that the growth of the transit media was not very high, as compared with the growth of the top five media, it could reflect that the everyday outdoor lifestyle was increasing, especially spending so much time commuting. The people’s lifestyle change was a crucial factor in causing the business operators to change advertising media in line with consumers’ everyday life. Nevertheless, there were differences in the transit media in terms of target group, route, and a number of service users, for instance, in forms of MRT, BTS, airports and public buses, etc. Therefore, the budget for the purchase of media in each category varied according to the objectives of owners of goods and services. Currently, the growth rate of the passengers of the rapid transit system was continuously high, including the MRT passengers, together with the government sector’s policy to promote and support travelling by the electric train system, which would have a positive effect on the advertising media service in the future.

- **Space for Lease and Service**

As a result of the change in the service provision of goods and services of the operators with their efforts to find out the locations where are accessible to consumer groups the most, together with an increase in rental rates of spaces in large-scale shopping malls, therefore, in 2018, various brands of goods and services were found to expand the service platforms into different locations from that specified in the existing strategies of service location selection. Then, the retail areas within the MRT stations became more popular and attractive to the well-known operators because they foresaw the opportunity which would come up and the potential for the growth of the passengers in the future resulting from the expansion of the service provision of the mass rapid transit system of the government sector. Moreover, the service provision is able to be made easily and rapidly available to target groups to suit their lifestyles in spending more time commuting, in spite of the fact that consumer behavior towards online shopping was increasing.

5) **Procurement of Products and Services of Business Development Business**

- **Nature of Procurement of Products**

The Company which has obtained the concession from the Mass Rapid Transit Authority of Thailand (MRTA) for operation and commercial development in the MRT Blue Line Project, has authorized its subsidiary (BMN) to conduct the commercial development in respect of 1) procurement and/or production of advertising media of various forms; 2) lease of retail areas in the MRT stations; 3) provision of service and maintenance of telecommunications system equipment; and 4) other commercial activities.

With respect to the expressways, the Company and one of its subsidiaries (NECL) allowed private entities and individuals to take on lease of expressway areas for installation of Intelligent Traffic Signs and various advertising boards, including retail areas around toll plazas, and other business activities, such as, the use of the expressway areas for installation of 3G signal boosters, etc.

6) Environmental Impact of Commercial Development Business

The Company also cares for and takes into account the environmental impact on the retail shop floors in the MRT system in order to prevent any impact on the environment, quality of life, and livelihood of people and communities, per details in the caption of Environmental Impact of Rail Business, on pages 2-26 to 2-27.

2.2 Work Pending Delivery

1. The MRT Blue Line Extension Project

The Company entered into the Concession Agreement for the MRT Blue Line Extension Project (Hua Lamphong Station - Lak Song Station and Bang Sue Station - Tha Phra Station) with MRTA on March 31, 2017, for the period of 33 years, with the project value of Baht 22,036 Million, on a PPP Net Cost basis. The sections for the supply and installation of the M&E Systems for opening for service were divided into three phases, namely, Phase 1: Bang Sue Station - Tao Poon Station, in service on August 11, 2017; Phase 2: Hua Lamphong Station - Lak Song Station Section, to be in service by September 2019; and Phase 3: Tao Poon Station - Tha Phra Station, to be in service by March 2020, extending a total of 27 kilometers, with 20 stations. The Company shall be entitled to fare box revenue and commercial development throughout the concession period.

3. Risk Factors

The Company realizes the significance of the management of risks from business operations under the changes of internal and external factors affecting its operational results. Risk management is considered a key instrument for business administration to ensure efficient and effective achievements and promote its competitiveness, as well as a key factor of the Good Governance. The Company thus arranges for the systematic risk management, monitoring, and measures to minimize risks continuously. 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 to supervise the overall risk management process of the organization and perform daily routine work on behalf of the Corporate Governance and Risk Management Committee to monitor, evaluate and prepare a report on risk management to the Board of Directors for information.

In addition, the Company has also prepared 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. The risk management policy of the Company is as follows:

1. To adopt a risk management process in accordance with international standards or practices to ensure the efficiency of risk management, implementation and development in the same direction on an enterprise level in line with the business operation policy of the Company.
2. To treat the risk management as part of work, significant decision-making regarding management, and strategic planning to achieve the specified objectives, goals, missions and vision of the Company.
3. To carry out proactive risk management to manage risks which may result in the Company's loss of interests and opportunities.
4. To delegate risk management as the staff's responsibility at all levels and manage risks within their work units and the organization to contain risks at an adequate and appropriate level.
5. To determine guidelines for prevention or reduction of risks at a level acceptable to the Company in order to formulate plans to manage and control risks to at an acceptable level. All work units must consider the justification of expenses or costs to implement risk management measures in comparison with expected benefits.
6. To efficiently communicate the risk management within the Company for staff's effective learning, development, and compliance.
7. To prepare an annual risk management plan subject to consideration and approval of the Corporate Governance and Risk Management Committee in respect of sufficiency and appropriateness to the current business circumstances.
8. To regularly follow up and assess the results of risk management to make sure that risk management is duly and properly conducted.

Risk factors which may materially affect the Company's business operations are as follows:

3.1 Systematic Risk

3.1.1 Risk from Business Operations under Agreements with Government Sector and Government Policy

The Company operates its businesses under the relevant Concession Agreements subject to the supervision of the government agencies, differences in the contractual parties' interpretations on terms and conditions of the Concession Agreement may arise in various matters, such as, revisions of toll or fare rates, consideration to extend the concession periods under the Concession Agreements and responsibility for costs under the Agreements, which may require a certain period of time to come to a solution, and may impact the Company's business operations.

Moreover, the political uncertainty and changes in government administration from the political party in charge may result in changes in policies, relevant laws or regulations, that possibly affect consideration to extend the concession periods under the Concession Agreements or terms and conditions stated, thereby rendering EXAT or MRTA unable to perform its obligations under the relevant Agreements or may require the Company to proceed beyond those specified in the relevant Agreements or undertakings.

The Company's core revenue is partial from the expressway business under the Second Stage Expressway Agreement, which its concession term of 30 years will end in February 2020. Despite the conditions of the Agreement specifying that prior to the termination of the contract term of 30 years, the Agreement may be renewed twice of 10 years each, subject to

the conditions to be agreed upon between EXAT and the Company, the political uncertainty or changes in government policies may affect the consideration to renew the Agreement. In such case, if the Company is not granted approval for renewal of the Agreement, the Company will lose such toll revenue. To minimize such risk, the Company has submitted an application for renewal of the Second Stage Expressway Agreement, which is pending the consideration and negotiation with EXAT. In addition, the Company will establish a joint operating system with the government agencies both at the administrative and operation levels, by sharing sufficient information to ensure good understanding towards each other, as well as closely and regularly monitoring the political situations and changes in policies. The Company will review the strategies and operational plans to be reasonably suitable for the situations and for their mutual interest in the long run.

3.1.2 Risk Relating to Revenues less than Projections

As the Company provides both expressway and metro services, therefore, the Company's core revenues are tolls and fares, which may be affected by several external factors beyond the Company's control, such as metro network expansion, improved feeder systems, fare rates of other available alternative transit systems, road traffic congestion, oil prices, and growth of real estate and condominium projects as well as other businesses surrounding the metro routes, which would serve as people's destinations, etc., all of which will affect the volume of service users. Moreover, the Company generates commercial development revenue, which may vary depending upon the local and overseas economic conditions, competition in advertising media and retail space lease business, as well as the progress in opening of retail shops in the stations, several factors of which are beyond the Company's control. Therefore, should the Company's revenues differ from study results or projections, it may affect the liquidity and serviceability management with respect to the existing obligations owed to the lending financial institutions or creditors according to the mutually agreed schedule, such as, interest expenses, scheduled repayment of loans, operating expenses under the Agreements, as well as compensation for expressway site acquisition cost or remuneration payable to MRTA, etc.

To minimize such risk, the Company will establish a unit to closely monitor any impact which may affect various factors, and formulate appropriate strategies. In addition, the Company can limit potential impacts from risk factors, such as oil prices, road traffic congestion, and fare rates of other available alternative transit systems, due to the Company's full services of expressways and metro, both of which are considered substitute products. With respect to the commercial development, the Company will develop new advertisement media to increase its commercial development revenue, such as advertisement media management via the Passenger Information Display System (PIDs), platform billboards, and digital media, including its plans to develop more retail space.

3.1.3 Risk from Interest Rate and Foreign Exchange Rate Fluctuations

Given that the Company remains obliged to service interest-bearing liabilities to lenders, and the Company plans for future investment in many projects, therefore, it may require a large amount of long-term loans. Thus, interest expenses may be considered the significant expenditures for the Company. The increased interest rates on loans may affect the Company's operational results due to the floating interest cost in respect of the certain credit facility, thereby putting the Company at risk by bearing an increase in expenses from interest rate fluctuation or increase in the money market. However, the Company will manage such risk from interest rate fluctuation, by arranging for the loan structure, divided into loans at floating interest rates and loans at fixed interest rates including plans to issue debt instruments or debentures as suitable to the economic conditions and the Company's view of the future interest rates.

In 2018, the Company issued the debentures, with the maturity of 3-7 years, in the total amount of Baht 10,000 Million, at the fixed interest rates of 2.05-3.01 percent, respectively, proceeds of which were used for prepayment of the long-term credit facility of the Si Rat - Outer Ring Road Expressway Project at the floating interest rate in order to manage the risks and minimize the financial cost of the Company.

In addition, the Company incurred expenses in foreign currencies, for example, the maintenance cost of the M&E Equipment, and insurance premiums, part of which had to be paid in foreign currencies. Thus, should the Baht value depreciate, the Company's expenses will increase accordingly. However, the proportion of the expenses in foreign currencies is low. Moreover, the Company will set up a policy to minimize risk from the exchange rate, such as negotiations for reduction of foreign currency expenses and buying forward, etc.

3.1.4 Risk from Serious Accidents, Public Unrest, or Natural Perils

The Company's businesses of both construction and management of the expressways and metro are exposed to an event or external factor which results in an emergency, namely, perils, serious accident, earthquake and such events which may be caused by terrorism, sabotage as bombing, riot, including gathering of insurgent groups, 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 events which may suddenly occur, for example, removing various significant and essential M&E equipment in the management of the expressways for storage at the safe place, and arranges for staff training to ensure that the staff in charge will be able to immediately take actions to resolve such emergency, for instance, emergency drills of all relevant units inside and outside the Company by way of simulation of such various situations as emergency in the metro stations from bomb threat and bomb blast in the metro stations, train breakdown and stop inside the tunnel, fire in the rolling stock, metro stations or tunnel, etc., as well as 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; installation of metal detectors, CCTVs, and provision of security staff in all areas.

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

3.1.5 Risk in respect of Personnel

As the government realizes the significance for solving problems on traveling and traffic in Bangkok by using the mass rapid transit system, it is thus expedited to expand the metro network and the connecting system to other transportation systems. Therefore, it is highly possible that there will be governmental organizations or private agencies operating the mass rapid transit system business which requires additional personnel with knowledge, expertise, and skills in the technical field in the rail business. As a result, it is likely that the Company's main personnel will be enticed away from the Company.

The risk from a shortage of competent personnel is considered as one of the Company's main risks, as they are a key factor to drive our organization to success. The Company gives priority to the personnel risk management, starting from the nomination and selection of good and qualified personnel suitable for the Company; continuous staff training courses to improve knowledge, skills, and abilities in various fields necessary for the performance of work based on each staff's position and designated duties; encouragement of the staff morale; consideration of appropriate and fair remuneration and welfare; organizing outing activities to encourage staff to love, unite, feel connected with the organization; review and revisions of the operation process and work system to ensure readiness at all times, as well as preparation of the succession plan, whereby the Company has prepared the succession plan and appointment of a working group comprising high-level executives to set up guidelines in the selection of staff to ensure the availability of personnel, both in the executive and supervisor levels, in order to prevent the risk from a shortage of personnel having knowledge, expertise and technical skills for specific work. The Company has arranged for collection of the body of knowledge for specific work and extended the results to the knowledge management program, in order to continuously improve the work process.

3.1.6 Risk in respect of Information Technology

With the Company's commitment to providing the services of the expressway system and the mass rapid transit system with safety, convenience, rapidity, reliability, punctuality and efficiency, the Company then needs to employ the cutting-edge technology to support its operations, including the provision of the services with the highest efficiency in a constant manner, which there may be a risk from disruption of main work systems, such as the collection control system, traffic control system, electricity system, and equipment (electrical power system, signaling system, communications system, SCADA system, platform screen door system, automatic fare collection system, signage system) and the Company's internal computer system (Back Office). If there is an attempt to have unauthorized or unapproved access to the information technology system of the Company, from both internal and external persons, including computer virus attacks, there is a risk which the fare collection system may break down; the fare management system may be disrupted and out of service.

The Company makes an emergency plan to deal with possible incidents which may have an impact on system equipment, comprising preventive and corrective plans for system equipment, on a regular basis, for prevention and arranging for staff in charge to ensure their access to tackling problems immediately if an emergency occurs in the work systems; there is a process of replaceable cards management in the case where the fare management system is not able to record entry-exit to and from the gates. The system is designed to enable all fare collection equipment to collect information in a stand-alone manner in the case where the server is not able to collect information on traveling of passengers. Manuals are prepared to specify procedures and methods for the safety of the information technology system. Furthermore, the inspection and monitoring of work operations are required to be done by the internal auditor and the external auditor certifying the systems. In this respect, the Company has passed the inspection and has obtained certification of the information security management system (ISO/IEC 27001:2013) as for the basic structure of the toll collection system at the toll collection computer center on July 5, 2018.

3.2 Corporate Specific Risk

3.2.1 Risk from Legal Disputes

The Company and NECL have a total of 17 disputes with EXAT on a different interpretation of several matters, such as adjustment of toll rates and responsibility for costs under the Agreements. The disputes were referred to the Arbitral Tribunal in accordance with the dispute settlement procedures under the Agreements and in the Administrative Court, divided into the disputes that the Company and NECL referred to the dispute settlement proceedings under the Agreements and demanded for damages with the total amount until the date of submission of the disputes of approximately Baht 54,503.70 Million; and the disputes that EXAT submitted claims for damages with the total amount until the date of submission of the disputes of approximately Baht 1,589.2 Million.

In 2018, there were material changes in the disputes as follows:

As for the dispute of NECL regarding the competing road with the Udon Ratthaya Expressway, on September 21, 2018, the Supreme Administrative Court affirmed the judgment of the Administrative Court of First Instance enforcing compliance with the arbitral award requiring EXAT to compensate the subsidiary for the revenue which decreased from the estimate under the Bang Pa-in - Pak Kret Expressway Agreement in the amount of Baht 1,790 Million, together with interest until the payment would be made by EXAT in full, provided that EXAT shall completely comply with the judgment within 90 days from the date of the Supreme Administrative Court's judgment, which would expire on December 20, 2018.

Currently, EXAT and the subsidiary are in the process of negotiation to provide guidelines for compliance with such judgment of the Supreme Administrative Court.

As for the dispute regarding revision of toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for the year 2008, on October 24, 2018, the Arbitral Tribunal unanimously rendered the final award requiring EXAT to compensate the Company for damages caused by the revision of toll rates for the year 2008, which was not in accordance with the Agreement, in the total amount of Baht 9,091.8 Million, together with interest under the Agreement of the principal of the damages of Baht 7,909.6 Million until EXAT would make such payment in full; and to compensate for the damages in a form of difference between the toll rates under the Notification of the Ministry of Transportation dated August 15, 2008, and the sharing to which the Company is entitled under the Agreement by calculating the number of vehicles of each category actually using the expressways on a daily basis from June 1, 2013 onwards, including payment for interest of default under the Agreement from June 1, 2013 onwards until the damages would be paid together with interest to the Company. In this regard, most of the major claims for high value damages are made by the Company from EXAT. Therefore, the decision should not materially have any negative risk towards the Company's operational results.

However, in 2018 the Company and EXAT have been negotiated and agreed to compromise and settle the disputes, wherewith, EXAT will submit the dispute settlement guidelines to the relevant authorities and the council of ministry for further approval.

3.2.2 Risk from Return on Investments in Companies less than Projections

The Company may be exposed to a risk from return on investments in companies less than projections should the operational results of such companies whose shares were held by the Company not meet the projections. To minimize such risk, the Company will take into account the proportion of investments in companies in line with the Company's investment policy which those investments could turn into cash when there are business opportunities and timely manner.

In 2018, the Company sold 111.2 million shares in CK Power Public Company Limited, by having gain from sales in the amount of Baht 222 million, as a result, its shareholding percentage in CK Power Public Company Limited decreased from 19.34 percent to 17.83 percent, and there was change in category of accounting record from investments in associates recognizing share of profit or loss according to the shareholding percentage to be investments in available-for-sale securities, which a change in market capitalization would be recorded on the end date of the accounting period. The price difference is treated as unrealized gain or loss indicated in the shareholders' equity.

Moreover, the Company sold its shares in Xayaburi Power Company Limited representing 7.5 percent of the registered capital, by having gain from sales in the amount of Baht 244 Million. While investments in other companies continued to be held for reserve investment source of the future project which still receives returns in a form of dividend.

3.2.3 Risk Relating to Fluctuation of Cost of Rail Business

Costs of rail business comprise the cost of fare and cost of train service, which are deemed the main expenditure of the Company's business operations, comprising repair and maintenance costs for the metro and civil infrastructure, public utility cost, personnel cost, and payment of remuneration from fare revenue.

As for the maintenance costs under the M&E contract, the Company's contract is in foreign and Baht currencies, subject to adjustment based on the Consumer Price Index as specified in the contract. Given the long-term contract, the Company will be then exposed to risk due to changes in such indices.

The public utility cost mainly comprises the cost of electricity used at the metro stations and for train operations. The cost of electricity may be adjusted according to the electricity rates of the Metropolitan Electricity Authority, which may result in the Company's increased cost.

Therefore, the Company's costs of rail business in respect of the cost of farebox vary according to the aforesaid costs. However, in the past, the Company was able to effectively control its cost of the farebox. Besides, the cost of farebox is mostly fixed cost, not varying directly according to the increased volume of passengers, provided that there is no material change in the volume of passengers to the extent that the Company is required to add the number of trains for service to enhance the capacity to accommodate the passengers.

In the MRT Purple Line Concession Agreement, the service fees for the O&M Services payable by MRTA to the Company are calculated and based on the projections of operating expenses estimated by the Company, whereby such service fees may be adjusted only based on the actual inflation rate and electricity charge rate under the method specified in the Concession Agreement. Therefore, profits from the Operation Service will vary according to the Company's ability to manage the actual costs and expenses to mirror the specified projections. Should the actual costs and expenses be different from the projections, the Company's operational results may be affected since the Company is not able to request compensation or increase the service fees from MRTA.

However, with the expertise and experience in the management of the MRT Blue Line Project, the Company is confident in its ability to efficiently manage costs and expenses for operations to be close to the projections.

3.2.4 Risk from Engagement of Outsourced Experts as Main Contractors for Supply and Maintenance of the M&E Equipment

The Company has accepted the transfer of the agreement for the procurement of the M&E Equipment and an agreement for maintenance of the M&E Equipment with main contractors, namely, Siemens Limited, Thailand, and Japan Transportation Technology (Thailand). Thus, in the event that such outsourced expert group, as such main contractors, is unable to provide services under the agreements to the Company or there is any change in the maintenance agreement, the Company's business operation may be affected and if the trains cannot be opened for service, the Company's image may be affected.

In this regard, the Company managed the risk by studying information from members of the international federations of public transport operators, e.g., UITP, APTA, NOVA Group of Metros, including the advice from Lloyd's Register Rail, the highly experienced consultant, it is then the company is possible to select and procure other manufacturers' M&E Equipment which is compatible with its existing system. The Company also formulates the strategic plan in developing the quality of its personnel to have sufficient capabilities for working with local and overseas equipment manufacturers and contractors in the maintenance and repair of the M&E Equipment and the rail system to ensure its efficiency without reliance on the sole existing manufacturer.

3.2.5 Risk from Work Operations of Expressway Construction and Management Business

The Company takes into account the risk from operations of expressway construction and management business which may be resulted from primary factors, i.e., personnel, work system, operation system and external factors, which cause error or insufficiency of work procedures, employees, work system or information technology system, including employees' fraud and events or external factors, which may give rise to monetary and non-monetary damage, namely, damage to reputation or security of the Company. Therefore, it is greatly necessary to have a thorough supervision system with due care. The Company has then arranged for a specific unit having duties to monitor and maintain the routes and toll collection system in accordance with the operation standards, which can be assured by the experience and expertise of staffs in charge from all divisions, thereby leading to the quality and availability of efficient, complete and continued service.

In addition, the Company has also established the preventive measure for the significant structures of the expressway systems so as to be available for full-time service by way of drawing up a plan for inspection of the structures of both the Si Rat Expressway, the Udon Rathaya Expressway, and the Si Rat - Outer Ring Road Expressway to be in line with the inspection by JMI Pacific Co., Ltd., a designing company with expertise in structural inspection. The monitoring, surveillance, and maintenance were conducted to ensure that there would be no impact on the use of the expressways. As for the toll collection, communication and traffic control systems, which are important to its operations, the Company has provided the preventive maintenance as well as the data backup system, the standby power system and the management of purchase of spare materials.

Moreover, the Company may be exposed to the risk from non-functional toll collection system equipment which may arise by various causes, such as non-functional electrical system due to a power outage from the Metropolitan Electricity Authority, error processing by the operating system, etc. In this regard, the Company gives high priority to such risk management by arranging for power backup system, a security system for access to significant systems by third parties, determination of authorization levels of access to information and equipment, and installation of virus scan software and data backup in the operating system to ensure instant substitution.

3.2.6 Risk from Delayed Construction and Operation of the Projects

The Company executed the Concession Agreement for the MRT Blue Line Extension Project with the Mass Rapid Transit Authority of Thailand (MRTA) on March 31, 2017, whereby the Company shall have duties in supply, installation, and test run and commissioning of the M&E Systems for the MRT Blue Line Extension Project, provided that such M&E Systems shall be connected with those of the M.R.T. Chaloem Ratchamongkhon Line Project in order to provide the train operation service in phases as planned, namely:

- Phase 1: Bang Sue Station - Tao Poon Station, opened for service by August 15, 2017, (opened for service on August 11, 2017);
- Phase 2: Hua Lamphong Station - Lak Song Station, to be opened for service within 30 months (September 2019); and
- Phase 3: Tao Poon Station - Tha Phra Station, to be opened for service within 36 months (March 2020).

The Company then managed such risk by entering into an agreement engaging CH. Karnchang Public Company Limited as Project Manager, as well as for supply, installation, and test run and commissioning of the M&E Systems for the Project. At present, there remained the risk from the operation of Phases 2 and 3 of the Project. Nevertheless, the overall progress of the MRT Blue Line Extension Project was currently as planned.

4. Property Used in Business Operations

4.1 Main Assets

As of December 31, 2018, the Company and its subsidiaries had main assets used in business operations, as follows:

(Unit: Million Baht)

Class of Assets	Net Book Value
1. Building and equipment	325
2. Rights to operate completed expressway sectors	35,146
3. Rights to use sites for expressway construction	390
4. Intangible assets under the Concession Agreement for the MRT Blue Line Project	35,427
Total	71,288

The main assets of the Company and its subsidiaries as indicated above can be classified into class of assets and companies, as follows:

4.1.1 Building and Equipment

As of December 31, 2018, the book value of the building and equipment as per the consolidated financial statements of the Company and its subsidiaries was as follows:

(Unit: Million Baht)

Company	Net Book Value	Ownership	Encumbrance
The Company	283	Owner*	None
NECL	26	Owner**	None
BMN	16	Owner	None
Total	325		

Remarks: * This refers to the building, construction improvement, and certain structures of the Second Stage Expressway System. Despite the fact that the title to such building is owned by EXAT, the Company is granted the right to use such building to operate the Second Stage Expressway Project under the conditions as specified in the Agreement. The Company takes on the lease of a building for use as its head office located at No. 587 Sutthisarn Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400, at the rental rate of Baht 10,000 per month.

** NECL does not own any property, plant, and equipment but takes on the lease of a building for use as its head office located at No. 587 Sutthisarn Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400, at the rental rate of Baht 10,000 per month. NECL uses the Bang Pa-in - Pak Kret Expressway Control Center Building, which is part of the Bang Pa-in - Pak Kret Expressway Project, to supervise the operations. Despite the fact that the title to such building is owned by EXAT, NECL is granted the right to use such building to operate the Bang Pa-in - Pak Kret Expressway Project under the conditions as specified in the Agreement.

4.1.2 Rights to Operate Completed Expressway Sectors

As of December 31, 2018, the book value of the rights to operate completed expressway sectors as per the consolidated financial statements of the Company and its subsidiary was as follows:

(Unit: Million Baht)

Company	Net Book Value
The Company	29,542
NECL	5,604
Total	35,146

The rights to operate completed expressway sectors are considered the costs of construction of the Si Rat Expressway, the Si Rat - Outer Ring Road Expressway, and the Udon Ratthaya Expressway, with the details as of December 31, 2018, comprising:

(Unit: Million Baht)

Class of Assets	Net Book Value	Ownership	Encumbrance
Si Rat Expressway (Sectors A, B and C)	2,536	EXAT	None
Si Rat Expressway (Sector D)	3,348	EXAT	None
Si Rat - Outer Ring Road Expressway	23,648	EXAT	None
Udon Ratthaya Expressway	5,604	EXAT	*
Project costs during construction	10		
Total Net Book Value	35,146		

Remark: * NECL provided the rights to operate completed expressway sectors under the Concession Agreement for the Udon Ratthaya Expressway Project as security to the Company to secure the loan repayment.

Given that the Expressway Agreements above are on a BTO (Build, Transfer and Operate) basis, the title to all expressways, including various permanent constructions in relation to or used in connection with the expressway systems, shall be vested in EXAT immediately upon construction by the Company and NECL. Upon opening for service, the Company and NECL are entitled to utilize such property and shall have the duty to keep such property maintained throughout the term of the Agreements. The Second Stage Expressway Agreement (Si Rat Expressway) has a term of 30 years from March 1, 1990, and may be renewed twice of 10 years each, subject to the conditions to be further agreed upon. The Agreement for the Extension of the Second Stage Expressway(Sector D), has a term of 30 years from April 22, 1997. The Si Rat - Outer Ring Road Expressway has a term of 30 years from December 15, 2012. The Bang Pa-in - Pak Kret Expressway Project Agreement (Udon Ratthaya Expressway) has a term of 30 years from September 27, 1996, and may be renewed twice of 10 years each. These Agreements require the Company and NECL to be responsible for expenses relating to toll collection, traffic management and rescue operation on the expressways, including the costs of maintenance of the expressways under the relevant Agreements throughout the term of the Agreements.

4.1.3 Rights to Use Sites for Expressway Construction

As of December 31, 2018, the book value of the rights to use sites for expressway construction as per the consolidated financial statements of the Company was as follows:

(Unit: Million Baht)

Company	Net Book Value
The Company	390

The rights to use sites for expressway construction are considered as a part of the rights to operate completed expressway sectors. The Company recorded the initial costs of the rights to use sites for expressway construction at the costs equivalent to the present value of the encumbrance in payment of compensation for site acquisition cost to EXAT under the Second Stage Expressway Agreement after initial recognition of the rights to use sites for expressway construction which showed the value at costs, less accumulated amortization. The Company amortized the rights to use sites for expressway construction as expenses in the income statement based on the volume of vehicles using service.

4.1.4 Intangible Assets under the Concession Agreement for the MRT Blue Line Project

As of December 31, 2018, the book value of intangible assets under the Concession Agreement for the MRT Blue Line Project as per the consolidated financial statements of the Company and its subsidiary were as follows:

(Unit: Million Baht)

Company	Net Book Value
The Company	35,089
BMN	338
Total	35,427

The intangible assets under the Concession Agreement for the MRT Blue Line Project are considered the costs of construction of the MRT Blue Line Project, with the details as of December 31, 2018, comprising:

(Unit: Million Baht)

Company	Class of Assets	Net Book Value	Ownership	Encumbrance
The Company	M&E Equipment	17,021	Owner	None
The Company	M&E Equipment and leasehold improvements, telecommunications system equipment, and advertising system equipment in metro stations	506	Owner	None
BMN	M&E Equipment and leasehold improvements, telecommunications system equipment, and advertising system equipment in metro stations	321	Owner	None
The Company	Project costs during construction	17,562	Owner	None
BMN	Project costs during construction	17	Owner	None
	Total Net Book Value	35,427		

4.2 Investments in Other Companies

4.2.1 Summary of Investments as per the Financial Statements

As of December 31, 2018, the book value of investments in other companies as per the Company's separate financial statements was as follows:

(Unit: Million Baht)

Company	Book Value under Cost Method	Portion of Investment in each Company (percent)	Paid-up Capital	Type of Investments	Nature of Business Operations
1. Northern Bangkok Expressway Company Limited <u>Less:</u> Provision for impairment of investments Net investments	2,604 (2,450) 154	99.99	5,250	Subsidiary	- Construction and operation of the Bang Pa-in - Pak Kret Expressway Project
2. Bangkok Metro Networks Limited <u>Less:</u> Provision for impairment of investments Net investments	226 (16) 210	69.67	254	Subsidiary	- Development of lease retail spaces in the metro stations and the basement level of the park and ride facility - Procurement of advertising boards or media in the metro stations and inside the trains - Provision of service and maintenance of telecommunications system equipment in the metro stations
3. TTW Public Company Limited	4,242	19.29	3,990	Associated Company	- Production and distribution of tap water
4. CK Power Public Company Limited	2,962	17.83	7,370	Other Company	- Investment in other companies (Holding Company) operating the energy business

4.2.2 Policy on Investment and Management in the Subsidiaries

The Company has the policy to invest in businesses which are related, similar, or beneficial, and support the Company's business operations, in order to provide opportunities and long-term yields, and strengthen the Company's stability and operational results. The investment policy shall be as follows:

1. To invest in projects or acquire ordinary shares in project operators, in a manner of long-term investments;
2. To invest up to the minimum proportion to allow the Company to participate in setting out policies, monitoring and reviewing operations of such companies so invested;
3. Not to invest in any project giving rise to environmental impact or contrary to the good moral of the society.

As of December 31, 2018, the Company invested in the subsidiaries and other company, as follows:

1) Northern Bangkok Expressway Company Limited (“NECL”)

The Company established NECL in 1996, by holding 99.99 percent of its shares. The benefits to be derived shall be in the form of a dividend from investment in shares of NECL. Due to the impact on NECL from the government policy for construction of the competing road, NECL’s revenue did not meet its projection. In this regard, NECL’s operational results continued to sustain a loss to the extent that the accumulated loss exceeded its equity, resulting in shareholders’ deficit. In 2003, NECL, therefore, increased its registered capital by Baht 3,000 Million to become the registered capital of Baht 6,000 Million. At present, NECL called for share payment of 75 percent of the increased registered capital of Baht 3,000 Million. However, NECL’s operational results have started to generate profits since 2013 until present. The Company provided a large amount of loans for NECL and also is the major creditor of NECL, the Company has therefore assigned its five executives to be members of NECL’s board of directors, from a total of six directors of NECL. In case NECL would take any actions which may significantly affect the Company, NECL would be required to seek prior approval from the Company’s Board of Directors’ Meeting. Furthermore, the Company is also the service provider for all operations of NECL.

As of December 31, 2018, NECL’s registered and paid-up capital was Baht 5,250 Million. The Company’s shareholding in NECL was 99.99 percent of its registered capital.

2) Bangkok Metro Networks Limited (“BMN”)

The Company established BMN on February 25, 2009, to operate the businesses of procurement and production of advertising media in various forms inside the metro stations and inside the trains, lease of retail spaces in the MRT Blue Line stations and spaces in the basement level of the Lat Phrao park and ride facility. To date, the retail shops are opened in nine stations, namely, Sukhumvit Station, Phahon Yothin Station, Chatuchak Park Station, Kamphaeng Phet Station, Phra Ram 9 Station, Thailand Cultural Centre Station, Khlong Toei Station, Lat Phrao Station, and Phetchaburi Station. In addition, BMN also provides service and maintains telecommunications system equipment inside the metro stations. Subsequently, in October 2018, the Company, who shall be exclusively entitled to commercial development in the M.R.T. Chaloem Ratchamongkhon Line Project and the MRT Blue Line Extension Project in accordance with the Concession Agreement for the MRT Blue Line Project dated March 31, 2017, entered into an agreement engaging BMN as a management representative for all commercial development in lieu of granting of the commercial development right. As of December 31, 2018, BMN’s registered and paid-up capital was Baht 254 Million, whereby the Company holds shares in BMN representing 69.67 percent of all BMN’s shares sold, together with 30.33 percent of shares held by other investors having experience and expertise in the businesses of advertising media, marketing, real estate, and telecommunications technology.

As for the policy on future investment in BMN, the Company continues to maintain its shareholding in BMN of not less than 50 percent of all shares in BMN. The Company will receive the return on investment in the form of revenue sharing and dividend income from investment in BMN. The Company has a control policy or participates in setting out the significant policies on the business operations by assigning its four representatives to be members of BMN’s board of directors, from a total of eight directors of BMN.

3) TTW Public Company Limited (“TTW”)

The Company invested in TTW which operates the business of production and distribution of tap water to the Provincial Waterworks Authority in the vicinity of Nakhon Pathom Province and Samut Sakhon Province, under the Water Purchase and Sale Agreement with the Provincial Waterworks Authority with a 30-year contract term from July 21, 2004. TTW invested in Pathum Thani Water Co., Ltd., representing 98 percent of its registered capital, whereby such company operates the business of production and distribution of tap water in the vicinity of Pathum Thani and Rangsit, under the Water Purchase and Sale Agreement with the Provincial Waterworks Authority with a 25-year contract term from October 15, 1998. TTW also invested in Thai Water Operations Company Limited which operates the business of operation and management of tap water production and distribution systems and wastewater treatment service provision, whereby TTW holds shares representing 68.50 percent of its registered capital. In addition, TTW invested in the energy business by holding 25.31 percent of shares in CK Power Public Company Limited, a company investing in other companies operating the energy business. The benefits to be derived by the Company from investment in TTW shall be in the form of dividend income.

The Company, as a shareholder, assigned its representative to be a member of the board of directors of TTW. As of December 31, 2018, the Company held shares in TTW representing 19.29 percent of its registered capital.

4) CK Power Public Company Limited (“CKP”)

The Company invested in CKP, which operates core business by investing in other companies (Holding Company) operating the business of production and distribution of electricity from various types of energy. As of December 31, 2018, CKP invested by holding shares representing 56 percent in SouthEast Asia Energy Limited; 30 percent in Nakhon Ratchasima Solar Limited; 37.50 percent in Chiangrai Solar Limited; 100 percent in Bangkhenchai Company Limited; 65 percent in Bangpa-in Cogeneration Limited; and 30 percent in Xayaburi Power Company Limited. The benefits to be derived by the Company shall be in the form of a dividend from the investment.

The Company, as a shareholder, assigned its representative to be a member of the board of directors of CKP. As of December 31, 2018, the Company held shares in CKP representing 17.83 percent of its registered capital.

5. Legal Disputes

5.1 Disputes with the Expressway Authority of Thailand (“EXAT”)

The Company and the subsidiary had a total of 17 disputes with EXAT, which were referred to the Panel and Arbitral Tribunal in accordance with the dispute settlement procedures under the Agreements and in the Administrative Court. The essence of each dispute was as follows:

5.1.1 Disputes submitted by the Company and the subsidiary claiming damages in 11 disputes, with the total amount until the date of submission of the disputes of approximately Baht 54,503.77 Million

1. Priority Component Opening Date under the Second Stage Expressway Agreement

The Company submitted a statement of claim requiring EXAT to compensate for the deficient revenue with interest in the amount of Baht 3,831.4 Million, due to different opinions as to which date was the Priority Component Opening Date, which affected the commencement of the toll revenue sharing with the Company under the Agreement.

The Arbitral Tribunal rendered its arbitral award on the dispute requiring EXAT to pay the toll revenue sharing including interest under the Agreement as required by the Company. EXAT subsequently issued a letter refusing to comply with the arbitral award.

On April 20, 2009, EXAT submitted a petition to the Central Administrative Court requesting the Court to revoke the arbitral award or order refusing to enforce compliance with the arbitral award, and on October 19, 2011, the Company submitted a petition to the Central Administrative Court requesting a judgment to enforce compliance with the arbitral award. The interest was calculated up to the date on which the Company submitted the petition to the Court, amounting to Baht 1,189.7 Million, with the total disputed amount of Baht 5,021.1 Million.

On September 13, 2013, the Central Administrative Court adjudged to dismiss EXAT’s petition requesting the Court to revoke the arbitral award and adjudged to enforce the Company’s petition.

On October 11, 2013, EXAT lodged an appeal against the Central Administrative Court’s judgment with the Supreme Administrative Court.

At present, it is pending the Supreme Administrative Court’s consideration.

2. Issuance of variation orders by EXAT

The Company submitted a statement of claim requiring EXAT to compensate the Company for damages caused by EXAT’s issuance of additional variation orders for certain construction work of the Si Rat Expressway in the total amount of Baht 209.1 Million (excluding interest).

The Arbitral Tribunal unanimously rendered its arbitral award requiring EXAT to pay the construction costs and expenses as per the Notice of Variation in the total amount of Baht 382.5 Million, including interest under the Agreement.

EXAT refused to comply with the arbitral award and also submitted a petition to the Central Administrative Court requesting the Court to revoke the arbitral award. The Company submitted a petition for enforcement of the arbitral award to the Central Administrative Court.

At present, it is pending the Central Administrative Court’s consideration.

3. Revision of toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for the year 2003

The Company submitted a statement of claim requiring EXAT to compensate the Company for damages caused by the revision of toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for 2003, which was not in accordance with the Agreement, thereby causing the damages, including interest, in the total amount of Baht 4,368 Million.

The Arbitral Tribunal, by the majority of votes, rendered its arbitral award requiring EXAT to compensate the Company for damages in the amount of Baht 4,368 Million, including interest under the Agreement.

EXAT refused to comply with such arbitral award and also submitted a petition to the Central Administrative Court requesting the Court to revoke the arbitral award.

On November 4, 2016, the Company submitted its answer to the petition to the Central Administrative Court. The Court presided over the case for the first time on January 10, 2019.

On February 12, 2019, the Company submitted a petition to the Central Administrative Court requesting a judgment to enforce compliance with the arbitral award.

At present, it is in the process of the Court's scheduling of the hearing date for the reading of the judgment and it is pending the Central Administrative Court proceedings.

4. Revision of toll rates of Sector D of the Si Rat Expressway for the year 2003

The Company submitted a statement of claim requiring EXAT to compensate the Company for damages caused by the revision of toll rates of Sector D of the Si Rat Expressway for the year 2003, which was not in accordance with the Agreement, in the total amount of Baht 1,048.2 Million.

At present, it is pending the arbitration proceedings.

5. Revision of toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for the year 2008

The Company submitted a statement of claim requiring EXAT to compensate the Company for damages caused by the revision of toll rates (of the Chalerm Mahanakorn Expressway and the Si Rat Expressway) for the year 2008, which was not in accordance with the Agreement, in the total amount of Baht 9,091.8 Million, together with interest under the Agreement.

On October 24, 2018, the Arbitral Tribunal unanimously rendered the final award requiring EXAT to compensate the Company for damages caused by the revision of toll rates (of the Chalerm Mahanakorn Expressway and the Si Rat Expressway) for the year 2008, which was not in accordance with the Agreement, in the total amount of Baht 9,091.8 Million, together with interest under the Agreement of the principal of the damages of Baht 7,909.6 Million until EXAT would make such payment in full.

At present, it is waiting for EXAT's compliance with the arbitral award rendered by the Arbitral Tribunal and waiting for the result of negotiation and dispute settlements.

6. Revision of toll rates of Sector D of the Si Rat Expressway for the year 2008

The Company submitted a statement of claim requiring EXAT to compensate the Company for damages caused by the revision of toll rates of Sector D of the Si Rat Expressway for the year 2008, which was not in accordance with the Agreement, together with interest calculated up to May 31, 2013, in the total amount of Baht 4,062.8 Million, including interest under the Agreement.

At present, it is pending the arbitration proceedings.

7. Increase in toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for the year 2013

On August 16, 2018, the Company submitted a statement of claim to the Arbitral Tribunal requiring EXAT to compensate the Company for damages caused by the revision of toll rates (of the Chalerm Mahanakorn Expressway and the Si Rat Expressway) for the year 2013, which was not in accordance with the Agreement, in the total amount of Baht 14,662.7 Million, together with interest under the Agreement.

At present, it is pending the arbitration proceedings.

8. Increase in toll rates of Sector D of the Si Rat Expressway for the year 2013

On August 21, 2018, the Company submitted a statement of claim to the Arbitral Tribunal requiring EXAT to compensate the Company for damages caused by the revision of toll rates of Sector D of the Si Rat Expressway for the year 2013, which was not in accordance with the Agreement, in the total amount of Baht 6,936.4 Million, together with interest under the Agreement.

At present, it is pending the arbitration proceedings.

9. Revision of toll rates of the Udon Raththaya Expressway for the year 2003

The subsidiary submitted a statement of claim requiring EXAT to compensate the subsidiary for damages, together with interest, caused by the revision of toll rates of the Udon Raththaya Expressway for the year 2003, which was not in accordance with the Agreement, in the amount of Baht 908.7 Million, together with interest under the Agreement.

At present, it is pending the arbitration proceedings.

10. Revision of toll rates of the Udon Raththaya Expressway for the years 2008 and 2013

On August 21, 2018, the subsidiary submitted a statement of claim requiring EXAT to compensate the Company for damages caused by the revision of toll rates of the Udon Raththaya Expressway for the years 2008 and 2013, which was not in accordance with the Agreement, in the amount of Baht 4,724.8 Million, together with interest under the Agreement.

At present, it is pending the arbitration proceedings.

11. Competing road with the Udon Raththaya Expressway

The subsidiary submitted a statement of claim requiring EXAT to compensate for the deficient revenue, based on the ground that the Government granted permission for construction of the Extension of the Don Muang Tollway Project, from the National Memorial to Rangsit Section, which constituted a competing road under the Agreement, and affected the financial position of the subsidiary, thereby rendering such damages until the date of submission of the dispute (excluding interest) to Baht 1,790 Million.

The Arbitral Tribunal rendered its arbitral award on the dispute requiring EXAT to compensate for the deficient revenue with interest under the Agreement as required by the subsidiary. EXAT then issued a letter to the subsidiary refusing to comply with such arbitral award. Then, on March 3, 2009, EXAT submitted a petition to the Central Administrative Court requesting the Court to revoke the arbitral award.

On May 31, 2013, EXAT lodged an appeal against the Central Administrative Court's judgment with the Supreme Administrative Court.

On September 21, 2018, the Supreme Administrative Court affirmed the judgment of the Administrative Court of First Instance enforcing compliance with the arbitral award requiring EXAT to compensate for the revenue which decreased from the estimate to the subsidiary under the Bang Pa-in - Pak Kret Expressway Agreement in the amount of Baht 1,790 Million, together with interest at the rate specified under the Agreement until the payment would be made in full, provided that EXAT shall completely comply with the judgment within 90 days from the date of the Supreme Administrative Court's judgment, which expired on December 20, 2018.

On December 19, 2018, EXAT and the subsidiary issued a letter to the Administrative Case Execution Bureau regarding compliance with the judgment of the Supreme Administrative Court that it was in the process of negotiation to reach a settlement in complying with the judgment of the Supreme Administrative Court.

During December 2018, subcommittee to consider determining the guidelines for compliance with the judgment of the Supreme Administrative Court of the dispute in the case of the competing road attended the meetings for negotiation with the Company and the subsidiary several times for the dispute settlement of all cases between EXAT and the Company /the subsidiary under the Second Stage Expressway Agreement (Sector A, B and C), the Agreement for the Extension of the Second Stage Expressway System (Sector D), and the Bang Pa-in - Pak Kret Expressway Agreement. On 21 December 2018, the Company / the subsidiary have reached the agreement with EXAT for the dispute settlement for all disputes as mentioned on Notes 42. This includes the dispute regarding Competing road with the Udon Raththaya Expressway, in which the Notice of claim has been issued to require EXAT to comply with the Agreement in an amount of Baht 74,590 million. The agreement can be summarized as follows;

- A) EXAT and the Company/ the subsidiary have agreed to settle all disputes which already took place or would take place in the future in the same issues in relation with the Concession Agreements.

- B) EXAT and the Company /the subsidiary have mutually agreed to review and amend the Concession Agreements as follows;
- B1. The respective periods of time of the Second Stage Expressway Agreement (Sector A, B and C), the Agreement for the Extension of the Second Stage Expressway System (Sector D), and the Bang Pa-in - Pak Kret Expressway Agreement, shall be extended from which would formerly end in 2020, 2027, and 2026 respectively, to end on April 2057;
 - B2. The Company shall provide the O&M Services of the Second Stage Expressway and the subsidiary shall provide the O&M Services of the Bang Pa-in - Pak Kret Expressway, provided that the Company/the subsidiary are entitled to receive toll revenue sharing throughout the respective agreement periods at the rates ranging from 40 to 100 percent according to the rates specified in the Agreements;
 - B3. The revision of toll rates shall be revised to constantly increase every 10 years;
 - B4. The Company shall have duty to invest, construct and improve the Second Stage Expressway in the total investment amount of approximately Baht 31,500 million to solve the traffic congestion problem.

At present, the results of the negotiation and disputes settlement are pending for the relevant government agency to propose to the Cabinet for an approval in conformity with the Private Investment in State Undertaking Act B.E. 2556, in which there might be the possibilities to be altered from which summarized in A) and B).

5.1.2 Disputes submitted by EXAT claiming damages in 3 disputes, with the total amount until the date of submission of the disputes of approximately Baht 1,589.2 Million

1. Cost of arrangements of the entrance - exit and resolution of complaints

EXAT submitted a statement of claim requiring the Company to be responsible for the cost of arrangements of the entrance - exit claimed by complainants, and the cost of free flow drains, in the total amount of Baht 0.4 Million, which the Arbitral Tribunal rendered its arbitral award ruling that EXAT had no right to claim such costs.

On May 7, 2014, EXAT submitted a petition for revocation of the arbitral award.

On August 30, 2017, the Central Administrative Court rendered the judgment revoking the arbitral award, only in respect of the Arbitral Tribunal's acceptance for consideration of the second dispute in case of free flow drains, as EXAT submitted the statement of claim after the statute of limitations of such dispute had expired.

On September 29, 2017, the Company lodged an appeal against the Central Administrative Court's judgment with the Supreme Administrative Court.

At present, it is pending the Supreme Administrative Court's consideration.

2. Construction of the Udon Rattaya Expressway, Phase 2

EXAT submitted a statement of claim requiring the subsidiary to complete the construction of the Udon Rattaya Expressway, Phase 2, in accordance with Clause 8.5 a. of the conditions of the Bang Pa-in - Pak Kret Expressway Agreement, and to compensate in the amount of Baht 1,587.7 Million, together with interest under the Agreement. The Agreement specifies that although the conditions under the Agreement have been completed for construction commencement, should EXAT breach the Agreement that gives rise to the subsidiary's serious financial impact, and as a result, the subsidiary is not yet required to commence the construction. In this regard, EXAT breached the Agreement on the competing road and the revision of toll rates, the subsidiary then shall have the right not to commence the construction yet, and EXAT shall not have the right to claim any fines.

At present, it is pending the arbitration proceedings.

3. Cost of utilization of the Control Center Building (Bang Phun)

EXAT submitted a statement of claim requiring the subsidiary to be responsible for the cost of utilization of the Control Center Building (Bang Phun) in the amount of Baht 1.1 Million, which the subsidiary was of the view that such cost claimed by EXAT was not within its scope of responsibility under the Agreement.

At present, it is pending the arbitration proceedings.

Given that the disputes are pending the consideration and negotiation to reach a settlement, the Company and the subsidiary, therefore, have not yet recorded such entries in the financial statements.

5.1.3 Disputes submitted to Panel where the Company/the subsidiary pending to submit to the Thai Arbitration Institute claiming for damages in 3 disputes, with the total amount to date of submission of the disputes of approximately Baht 907.12 million.

1. Revision of toll rates of the Chalerm Mahanakorn Expressway and the Si Rat Expressway for the year 2018

On November 16, 2018, the Company requested EXAT to compensate for the damages from September 1, 2018 to October 31, 2018, together with the interest, in an amount of Baht 592.9 million, and the interest of the principle damage in an amount of Baht 590.8 million on a daily basis from November 1, 2018 onwards, and compensate for the differences of toll revenue according to the Notification of the Ministry of Transport dated August 2, 2013, from November 1, 2018, onwards together with the default interest under the Agreement.

At present, the dispute is pending to submit to the Thai Arbitration Institute.

2. Revision of toll rates of the Si Rat Expressway Sector D for the year 2018

On November 16, 2018, the Company requested EXAT to compensate for the damages from September 1, 2018, to October 31, 2018, together with the interest, in an amount of Baht 289.3 million, and the interest of the principle damage in an amount of Baht 288.3 million on a daily basis from November 1, 2018, onwards, and compensate for the differences of toll revenue according to the Notification of the Ministry of Transport dated August 2, 2013, from November 1, 2018, onwards together with the default interest under the Agreement.

At present, the dispute is pending to submit to the Thai Arbitration Institute.

3. Revision of toll rates of Udon Ratthaya Expressway for the year 2018

On November 16, 2018, the subsidiary requested EXAT to compensate for the damages from November 1, 2018 to November 11, 2018, together with the interest, in an amount of Baht 24.92 million, and the interest of the principle damage in an amount of Baht 24.90 million on a daily basis from November 12, 2018, onwards, and compensate for the differences of toll revenue according to the Notification of the Ministry of Transport dated August 2, 2013, from November 12, 2018, onwards together with the default interest under the Agreement.

At present, the dispute is pending to submit to the Thai Arbitration Institute.

Since the disputes are pending consideration, the Company and the subsidiary therefore did not record such entries in the financial statements.

6. General Information and Other Significant Information

6.1 General Information

(1) General information of the Company

Company Issuing Securities	: Bangkok Expressway and Metro Public Company Limited (“BEM”)
Business Operation	: Construction and management of the expressways and the rail mass rapid transit system projects, including other related businesses
Company Registration No.	: 0107558000491
Registered Capital	: Baht 15,285 Million, which is fully paid up.
Head Office	: 587 Sutthisarn Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400
Telephone	: 0 2641 4611 and 0 2354 2000
Fax	: 0 2641 4610 and 0 2354 2040
Website	: www.bemplc.co.th
Branch Office (1)	: 238/7 Asoke-Dindaeng Road, Bangkapi Subdistrict, Huai Khwang District, Bangkok 10310
Telephone	: 0 2641 4611
Fax	: 0 2641 4610
Branch Office (2)	: 189 Rama IX Road, Huai Khwang Subdistrict, Huai Khwang District, Bangkok 10310
Branch Office (3)	: 189/1 Rama IX Road, Huai Khwang Subdistrict, Huai Khwang District, Bangkok 10310
Branch Office (4)	: 189/2 Rama IX Road, Huai Khwang Subdistrict, Huai Khwang District, Bangkok 10310
Telephone	: 0 2354 2000
Fax	: 0 2354 2040

(2) Legal entities in which the Company holds 10 percent of shares or more

Company Issuing Securities	: Northern Bangkok Expressway Company Limited (“NECL”)
Business Operation	: Construction and management of the Udon Ratthaya Expressway
Head Office	: 587 Sutthisarn Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400
Registered Capital	: Baht 6,000 Million, Baht 5,250 Million of which is paid up.
Shareholding Percentage	: 99.99 percent
Telephone	: 0 2641 4647
Fax	: 0 2641 4646

Company Issuing Securities : **Bangkok Metro Networks Limited (“BMN”)**

Business Operation : 1. Acting as a representative for the lease of retail spaces in the MRT stations and the basement level of the Lat Phrao park and ride facility

2. Acting as a representative for procurement and/or production of advertising media in the MRT stations and inside the MRT trains

3. Acting as a representative for the provision of service and maintenance of telecommunications system equipment in the MRT stations

Head Office : 832 Sutthisarn Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400

Registered Capital : Baht 254 Million, which is fully paid up.

Shareholding Percentage : 69.67 percent

Telephone : 0 2690 8200

Fax : 0 2690 8212

Website : www.bmn-mrt.com

Company Issuing Securities : **TTW Public Company Limited (“TTW”)**

Business Operation : Production and distribution of water supply to the Provincial Waterworks Authority and investment in companies operating the business of other public utilities

Head Office : 30/130 Moo 12, Buddhamonthon 5 Road, Tambon Rai Khing, Amphoe Samphran, Nakhon Pathom Province 73210

Registered Capital : Baht 3,990 Million, which is fully paid up.

Shareholding Percentage : 19.29 percent

Telephone : 0 2811 7526

Fax : 0 2420 6064

Website : www.ttwplc.com

Company Issuing Securities : **CK Power Public Company Limited (“CKP”)**

Business Operation : Investment by holding shares in other companies (Holding Company) operating the business of production and distribution of electricity from various types of energy

Head Office : 587 Viriyathavorn Building, 19th Floor, Sutthisan Winitchai Road, Ratchadaphisek Subdistrict, Dindaeng District, Bangkok 10400

Registered Capital : Baht 9,240 Million, Baht 7,370 Million of which is paid up.

Shareholding Percentage : 17.83 percent

Telephone : 0 2691 9720

Fax : 0 2691 9723

Website : www.ckpower.co.th

(3) Reference**Securities Registrar : Thailand Securities Depository Company Limited**

The Stock Exchange of Thailand
93 Rachadapisek Road, Dindaeng Subdistrict,
Dindaeng District, Bangkok 10400
Telephone : 0 2009 9382
Fax : 0 2009 9476

Auditor : EY Office Limited

193/136-137 Lake Rajada Office Complex, 33rd Floor,
New Rajadapisek Road
Klongtoey District, Bangkok 10110
Telephone : 0 2264 0777
Fax : 0 2264 0789

Legal Advisor : The Legists Group

Abdulrahim Place, 9th Floor
No. 990 Rama IV Road, Silom Subdistrict
Bangrak District, Bangkok 10500
Telephone : 0 2636 1111
Fax : 0 2636 0000

Financial Advisor : Advisory Plus Company Limited

1550 Thanapoom Tower, 10th Floor
New Petchburi Road, Makkasan Subdistrict
Ratchathewi District, Bangkok 10400
Telephone : 0 2652 7858-64
Fax : 0 2652 7867

Debenture Registrars : Siam Commercial Bank Public Company Limited

1060 New Phetchaburi Road, Makkasan Subdistrict
Ratchathewi District, Bangkok 10400
Telephone : 0 2544 3924
Fax : 0 2937 7783

: Krung Thai Bank Public Company Limited

977/2 Phaholyothin Road, Samsen Nai Subdistrict
Phayathai District, Bangkok 10400
Telephone : 0 2298 0831
Fax : 0 2298 0835

**Regularly Contacted
Financial Institutions****: Krung Thai Bank Public Company Limited**

35 Sukhumvit Road, Khlong Toei Nuea Subdistrict
Wattana District, Bangkok 10110

Telephone : 0 2208 4631-9

Fax : 0 2256 8619

: Siam Commercial Bank Public Company Limited

9 Ratchadaphisek Road, Chatuchak Subdistrict
Chatuchak District, Bangkok 10900

Telephone : 0 2256 2323

: TMB Bank Public Company Limited

3000 Phaholyothin Road, Chom Thong Subdistrict
Chatuchak District, Bangkok 10900

Telephone : 0 2299 2511-2

Fax : 0 2299 2752

: Bangkok Bank Public Company Limited

333 Silom Road, Silom Subdistrict
Bang Rak District, Bangkok 10500

Telephone : 0 2230 1036

Fax : 0 2230 2722

6.2 Other Significant Information

- None -