

SUSTAINABLE FINANCE REPORT 2020



Combating
Climate
Change

Biodiversity

Energy
Reduction and
Efficiency

Introduction

MTR established a Green Bond Framework in 2016 to guide its green bond issuances and a Green Finance Framework in 2018 to add green loans and other credit facilities as its green financing instruments. In 2020 a Sustainable Finance Framework was established to cover a wider range of financing transactions where the proceeds are used for furthering the development of sustainable urban infrastructure in support of the United Nations Sustainable Development Goals.

Sustainalytics is of the opinion that the Sustainable Finance Framework aligns with the Green Bond Principles 2018, Social Bond Principles 2020, Sustainability Bond Guidelines 2018 and Green Loan Principles 2020.

In 2020, a total of seven green bonds and two bilateral green loans were arranged.

Sustainable Finance Portfolio

At the end of 2020, MTR's sustainable finance portfolio consisted of fifteen bonds in four different currencies and three HKD green loans. The bonds were issued by MTR or its issuance vehicle MTR Corporation (C.I.) Limited ("MTR CI") with the guarantee of MTR.

Year 2020 saw the maturity of a 2-year green bond (MTRCIGB_HKD_200629 - HK0000427812) issued in 2018 and a 1-year green loan (MTRGL_HKD_200617) arranged in 2019, as well as partial cancellation of the 5-year green loan (MTRGL_HKD_230626) arranged in 2018.

The following tables list out the sustainable financings that were outstanding as of 31 December 2020.

Green Bonds						
Year Issued	Identifier/ISIN	Issuer	Currency	Coupon (p.a.)	Maturity Date	Principal Amount
2016	MTRCIGB_USD_261102XS1509084775	MTR CI	USD	2.500%	2 Nov 2026	USD 600,000,000
2017	MTRCIGB_AUD_270628XS1637858546	MTR CI	AUD	3.300%	28 Jun 2027	AUD 171,000,000
2017	MTRCIGB_HKD_320920HK0000365228	MTR CI	HKD	2.460%	20 Sep 2032	HKD 722,000,000
2017	MTRGB_HKD_470717HK0000352432	MTR	HKD	2.980%	17 Jul 2047	HKD 338,000,000
2017	MTRCIGB_HKD_470906HK0000362761	MTR CI	HKD	2.830%	06 Sep 2047	HKD 315,000,000
2017	MTRGB_USD_470927XS1690683211	MTR	USD	3.375%	27 Sep 2047	USD 100,000,000
2018	MTRCIGB_HKD_210502HK0000416609	MTR CI	HKD	2.560%	2 May 2021	HKD 413,000,000
2018	MTRCIGB_HKD_480328HK0000409455	MTR CI	HKD	3.150%	28 Mar 2048	HKD 230,000,000
2020	MTRGB_HKD_210304HK0000579323	MTR	HKD	1.835%	4 Mar 2021	HKD 300,000,000
2020	+MTRGB_HKD_210507HK0000603180	MTR	HKD	1.020%	7 May 2021	HKD 250,000,000
2020	+MTRGB_USD_210603XS2174507058	MTR	USD	0.700%	3 Jun 2021	USD 60,000,000
2020	MTRGB_CNY_210607HK0000611290	MTR	CNY	2.150%	7 Jun 2021	CNY 220,000,000
2020	MTRGB_CNY_210610HK0000611381	MTR	CNY	2.350%	10 Jun 2021	CNY 500,000,000
2020	MTRGB_USD_300819XS2213668085	MTR	USD	1.625%	19 Aug 2030	USD 1,200,000,000
2020	MTRGB_HKD_550624HK0000612025	MTR	HKD	2.550%	24 Jun 2055	HKD 500,000,000

Green Loans/Credit Facilities				
Year Executed	Identifier	Currency	Maturity Date	Loan Amount
2018	*MTRGL_HKD_230626	HKD	26 Jun 2023	HKD 1,200,000,000
2020	MTRGL_HKD_230626B	HKD	26 Jun 2023	HKD 700,000,000
2020	MTRGL_HKD_250618	HKD	18 Jun 2025	HKD 1,500,000,000

+ The proceeds of these two bonds were to be used in 'Green Projects or COVID related expenses'. See Annex I for description.

* There was a reduction in the amount of the facility due to partial cancellation.

Project Portfolio

The majority of financing raised in 2020 were used in refinancing of completed rail projects (which have long asset lifespan of usually 20-30 years). There were also some allocation to several new green projects, with their names bolded in the table below for easier reference. New projects in Low Carbon Transportation normally take several years to construct/implement and the relevant investment amount will increase gradually following the projects' progress.

Details of the projects are available in later part of this report. Note the numbering of the projects have been re-arranged (from last year's) based on classification of the projects.

#	Name of Project	Classification	Total Project Amount	Cost Incurred up to Dec 2020	Amount Financed by Sustainable Finance Proceeds
Train Lines and Infrastructure					
A	Kwun Tong Line Extension	Low Carbon Transportation	HK\$ 6,900 million	HK\$ 6,900 million	HK\$ 5,293 million
B	South Island Line (East)	Low Carbon Transportation	HK\$ 17,200 million	HK\$ 17,200 million	HK\$ 14,742 million
C	Replacement of 1st Generation M-Trains	Low Carbon Transportation	HK\$ 7,100 million	HK\$ 110 million	HK\$ 110 million
D	Replacement of Rail Power Line	Low Carbon Transportation	HK\$ 4,900 million	HK\$ 117 million	HK\$ 117 million
E	Battery Locomotives Acquisition	Low Carbon Transportation	HK\$ 265 million	HK\$ 5 million	HK\$ 5 million
Energy Efficiency Improvement					
F	Replacement of Chillers at Stations/Depot Facilities	Energy Efficiency	HK\$ 1,100 million	HK\$ 546 million	HK\$ 546 million
G	Trackside Energy Storage (pilot)	Energy Efficiency	HK\$ 20 million	HK\$ 19 million	HK\$ 19 million
H	Smart Intelligent Power Module (R-IPM)	Energy Efficiency	HK\$ 98 million	HK\$ 65 million	HK\$ 65 million
I	Regenerative Station Energy Saving Inverter System	Energy Efficiency	HK\$ 8 million	HK\$ 1 million	HK\$ 1 million
Sustainable Stations and Buildings					
J	Maritime Square Extension	Sustainable Real Estate	HK\$ 2,600 million	HK\$ 2,500 million	HK\$ 2,500 million
K	Carbon Neutral Station Design	Sustainable Transit Station	HK\$ 5 million	HK\$ 5 million	HK\$ 4 million
Biodiversity Preservation					
L	Lok Ma Chau Wetland	Biodiversity and Conservation	HK\$ 4~5 million per year	HK\$ 18 million (from 2017)	HK\$ 18 million
Total:			HK\$ 40,214 million	HK\$ 27,486 million	HK\$ 23,420 million

Use of Proceeds

The following table lists out how the financing proceeds were allocated to different projects, and the corresponding aggregate greenhouse gas (GHG) emission avoidance for 2020.

Year Raised	Description/ Identifier/ISIN	Principal Amount (HKD million equivalent)	Current Allocation in Projects (HKD million)													Total CO ₂ e avoidance (tonnes)	
			A	B	C	D	E	F	G	H	I	J	K	L	MM [^]		
2016-2019	Eight green bonds and one green loan*	9,677	2,903	6,579					172	19					4		11,218
2020	MTRGB_HKD_210304 HK0000579323	300	100	200													315
2020	MTRGB_HKD_210507 HK0000603180	250 ⁺	73	150												27	233
2020	MTRGB_USD_210603 XS2174507058	465 ⁺	152	285												28	466
2020	MTRGB_CNY_210607 HK0000611290	238	88	150													259
2020	MTRGB_CNY_210610 HK0000611381	545	195	350													586
2020	MTRGB_USD_300819 XS2213668085	9,300	1,756	6,978	70	67		374		50	1		4				12,926
2020	MTRGB_HKD_550624 HK0000612025	500	26	50	40	50	5			15		300		14			768
2020	MTRGL_HKD_230626B	700										700					133
2020	MTRGL_HKD_250618	1,500										1,500					285
	Total:	23,475	5,293	14,742	110	117	5	546	19	65	1	2,500	4	18	55		
	GHG emission avoidance in 2020 per HKD million investment		1.75	0.70	2.72	2.71	3.82	8.91	-	24.49	39.13	0.20	-	-	-		

* Please refer to the 2016-2019 reports for the allocation of the financing proceeds raised in previous years.

⁺ A total of HK\$ 55 million from these 2 bonds have been allocated to COVID-19 related expenditures. See Annex I for description.

[^] Allocation to COVID-19 related expenditures.

MTR Green Bond, Green Finance and Sustainable Finance Frameworks

MTR set up a [Green Bond Framework \("GBF"\)](#) in October 2016. [Sustainalytics opined](#) that the Framework was in alignment with the four pillars of the Green Bond Principles (2016) of the International Capital Market Association. Expanding upon the foundation of the GBF, MTR established a [Green Finance Framework](#) in 2018 to include the coverage of green loan financing, taking into account the recommendation of the Green Loan Principles issued by the Asia Pacific Loan Market Association.

In August 2020, a [Sustainable Finance Framework \("SFF"\)](#) was established so that the scope of eligible investments was further broadened to include projects in the development of sustainable urban infrastructure in support of the United Nations Sustainable Development Goals. A second-party [opinion](#) was provided by Sustainalytics on the SFF.

The Frameworks set out how the Corporation uses sustainable finance proceeds to fund or refinance eligible projects and initiatives that enhance long-term service levels and propel ESG (Environmental, Social and Governance) targets, as well as the reporting thereon, thereby integrating ESG elements into its financing and corporate decision-making process.

A summary of the Frameworks is as follows:



MTR Frameworks:

- MTR Green Bond Framework established in October 2016
- MTR Green Finance Framework established in June 2018
- MTR Sustainable Finance Framework established in August 2020
- Proceeds of sustainable financings will be used to fund or refinance, in whole or in part, Eligible Investments
- Proceeds of sustainable financings may be used to repay borrowings under MTR's general credit facilities pending allocation to Eligible Investments
- Eligible Green Investments include projects in the following sectors:
 - Renewable Energy
 - Low Carbon Transportation
 - Energy Efficiency
 - Sustainable Transit Stations and Real Estate Properties
 - Adaptation to Climate Change
 - Biodiversity and Conservation
 - Water Management
 - Waste Management
 - Pollution Prevention
- Eligible Social Investments include projects in the following sectors:
 - Relief measures and programmes for employment generation and unemployment prevention for populations adversely affected by unexpected economic and financial disruptions caused by natural disasters and pandemics. Relief measures may include, but are not limited to, rent moratorium for tenants.
 - Affordable basic infrastructure, including initiatives, subsidy or investments in:
 - Projects that support passengers affected by socioeconomic situation including but not limited to relief measures such as fare discount
 - Sanitation and infection preventative services and equipment at transit stations, trains, buildings, real estates properties, facilities and infrastructure
 - Projects for the design, construction, maintenance and upgrade of station facilities, services and train environment including but not limited to baby care and breast-feeding rooms for women, accessibility and barrier-free infrastructure and facilities for elderly and special need groups, among others

Sustainable Investment Descriptions and Environmental Benefits

As there has not been any material changes in Project #G and Project #L, descriptions of the projects are not repeated here but available at earlier [reports](#).

Name of Investment	(#A) Kwun Tong Line Extension
Total Investment Amount	HK\$ 6,900 million
Investment Amount Funded by Sustainable Finance	HK\$ 5,293 million
Category of Eligible Investment	Low Carbon Transportation
Description of Investment	<p>In May 2011, the Company entered into project agreements with the Hong Kong SAR Government to design, construct and operate the Kwun Tong Line Extension ("KTL") and the South Island Line (East) ("SIL").</p> <p>KTL extends the existing Kwun Tong Line from Yau Ma Tei station by 2.6km, with two new stations at Ho Man Tin and Whampoa. KTL commenced operation in October 2016.</p>
Benefits of Project	The project provides low carbon transportation services to densely populated areas and helps reduce road traffic congestions experienced by the residents.
Passenger Trips for 2020	33,087,000* (43,828,000 in 2019)
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	12,100 tonnes CO₂ equivalent ^ (19,700 tonnes CO ₂ equivalent in 2019)
Carbon Avoided per Million Investment (HK\$) for 2020	1.75 tonnes (2.86 tonnes in 2019)
Other Benefits	<ul style="list-style-type: none"> Reduction of road traffic and congestion around the new stations as fewer cars are needed to transport passengers from the area. Energy conservation measures such as regenerative braking systems, full platform screen doors and efficient chiller equipment were implemented.

* Passenger trips for Kwun Tong Line Extension fell substantially in 2020 as the COVID-19 pandemic affected daily activities of Hong Kong residents.

^ Please see Appendix I for the method of estimating the GHG emission avoided for projects #A, #B, #C and #D.

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#B) South Island Line (East)
Total Investment Amount	HK\$ 17,200 million
Investment Amount Funded by Sustainable Finance	HK\$ 14,742 million
Category of Eligible Investment	Low Carbon Transportation
Description of Investment	<p>In May 2011, the Company entered into project agreements with the Hong Kong SAR Government to design, construct and operate the Kwun Tong Line Extension ("KTL") and the South Island Line (East) ("SIL").</p> <p>SIL is a 7km medium capacity metro line connecting the existing Admiralty station to the Southern District of Hong Kong, with four new stations at Ocean Park, Wong Chuk Hang, Lei Tung and South Horizons. SIL commenced operation in December 2016.</p>
Benefits of Project	The project provides low carbon transportation services to densely populated areas and helps reduce road traffic congestions experienced by the residents. SIL was also designed with environmentally friendly features like regenerative braking and trackside energy storage systems, extended noise barriers and green roofs.
Passenger Trips for 2020	33,070,000* (45,384,000 in 2019)
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	12,100 tonnes CO₂ equivalent ^ (20,400 tonnes CO ₂ equivalent in 2019)
Carbon Avoided per Million Investment (HK\$) for 2020	0.70 tonnes (1.19 tonnes in 2019)
Other Benefits	<ul style="list-style-type: none"> • Estimated 600 kWh of electricity saved annually with the regenerative braking and trackside energy storage systems. • Reduction of road traffic and congestion especially at the Aberdeen Tunnel.

* Passenger trips for South Island Line (East) fell substantially in 2020 as the COVID-19 pandemic affected daily activities of Hong Kong residents.

^ Please see Appendix I for the method of estimating the GHG emission avoided for projects #A, #B, #C and #D.

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#C) Replacement of First-Generation Metro Cammell EMU Trains ("M-Trains")
Total Investment Amount	HK\$ 7,100 million
Investment Amount Funded by Sustainable Finance	HK\$ 110 million
Category of Eligible Investment	Low Carbon Transportation
Description of Investment	<p>As part of MTR's long-term asset renewal strategy, ninety-three 8-car trains were procured to replace some of the first-generation M-trains, which have been in service for decades on Tsuen Wan Line, Kwun Tong Line, Island Line and Tseung Kwan O Line.</p> <p>Eleven out of ninety-three trains have been received and they are undergoing stringent testing and commissioning procedures before being put into service.</p>
Benefit of Project	Some of the first-generation M-trains have reached an age where asset replacement must be carried out to ensure continuity of reliable services and smooth operations.
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	<p>19,300 tonnes of CO₂ equivalent (upon completion of project)^</p> <p>299 tonnes of CO₂ equivalent at current investment level</p>
Carbon Avoided per Million Investment (HK\$) for 2020	2.72 tonnes

^ Please see Appendix I for the method of estimating the GHG emission avoided for projects #A, #B, #C and #D.



Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#D) Replacement of Rail Power Line
Total Investment Amount	HK\$ 4,900 million
Investment Amount Funded by Sustainable Finance	HK\$ 117 million
Category of Eligible Investment	Low Carbon Transportation
Description of Investment	<p>Replacement of High Voltage and Low Voltage rail power line systems for Kwun Tong Line, Tsuen Wan Line and Island Line to maintain the reliability of the power supply system.</p> <p>The replacement also improves energy efficiency by adding Power Convertors to recycle traction power back into the network.</p>
Benefit of Project	<p>The replacement is to ensure the reliability of the transport infrastructure over the long term, avoiding break down due to aging of the systems.</p> <p>Enhancements to the existing power system have been added in conjunction with the asset replacement programme, including:</p> <ul style="list-style-type: none"> • Installation of five power converters for power recycling • Higher efficiency transformers to reduce power losses
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	<p>13,300 tonnes of CO₂ equivalent (upon completion of project)[^] 318 tonnes of CO₂ equivalent at current investment level</p>
Carbon Avoided per Million Investment (HK\$) for 2020	2.71 tonnes
Other Benefits	<p>The new power converters and higher efficiency transformers provide the following expected benefits.</p> <p>Power Converter savings: 1.7GWh / year Transformer savings: 1.6GWh / year</p> <p>Applying average emission factors of 0.54kgCO₂e/kWh for CLP¹ and HK Electric², works out to be around 1,800 tonnes of CO₂e when completed. This would further improve the carbon avoided but was not included in the calculation of the carbon avoided numbers above.</p>

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh

2. HKE emission factors for 2020: 0.71kgCO₂e/kWh

[^] Please see Appendix I for the method of estimating the GHG emission avoided for projects #A, #B, #C and #D.

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#E) Battery Locomotives Acquisition
Total Investment Amount	HK\$ 265 million
Investment Amount Funded by Sustainable Finance	HK\$ 5 million
Category of Eligible Investment	Low Carbon Transportation
Description of Investment	Procurement of 13 battery operated locomotives to replace eight diesel and five old battery locomotives.
Beneficial Environmental Impact Estimate	<p>The operating efficiency and performance of the new electric-battery locomotives will be an improvement over the existing diesel and battery locomotives. On average, each locomotive is active 8 hours / day</p> <p>For diesel locomotive, approximately 51 litres of diesel is consumed each hour. Diesel consumption per day: 8 x 51L = 408L Total CO₂e emission per year⁺ = 2.61 * 365 * 408 = 388.7 tonnes</p> <p>For electric-battery locomotive, CO₂e emission is calculated based on average emission factor of the power companies^{1,2}. Electric-Battery locomotive (old) electricity consumption = 1,408 kWh / day Total CO₂e emission per year = 365 * 1,408 * 0.54 = 277.5 tonnes</p> <p>Electric-Battery locomotive (new) electricity consumption = 1,360 kWh / day Total CO₂e emission per year = 365 * 1,360 * 0.54 = 268.1 tonnes</p> <p>Total CO₂e emission reduction per year for 13 locomotive replacements = 8 * (388.7 – 268.1) + 5 * (277.5 – 268.1) = 1,012 tonnes</p>
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	1,012 tonnes of CO ₂ equivalent based on the average CO ₂ e emission factors of 0.54kg CO ₂ e/kWh for CLP ¹ and HK Electric ² .
Carbon Avoided per Million Investment (HK\$) for 2020	3.82 tonnes

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh

2. HKE emission factors for 2020: 0.71kgCO₂e/kWh

⁺ Emission of CO₂e for usage of diesel can be obtained [here](#) (report by the Environmental Protection Department and the Electrical and Mechanical Services Department).

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#F) Replacement of Chillers at Stations/Depot Facilities						
Total Investment Amount	HK\$ 1,100 million						
Investment Amount Funded by Sustainable Finance	HK\$ 546 million						
Category of Eligible Investment	Energy Efficiency						
Description of Investment	<p>A total of 154 chillers at 38 MTR stations and four railway depots will be replaced with more advanced and environmentally friendly systems by 2023.</p> <p>The new station chillers will provide a more comfortable station environment for passengers, with enhanced energy efficiency using variable-frequency drive inverter technology that could adjust the power output based on the actual temperature detected.</p>						
Beneficial Environmental Impact Estimate	<p>The operating efficiency and performance of the new chillers will be an improvement over the existing chillers. Total number of chillers needed is reduced to 133 chillers. Total energy consumption is expected to be reduced by 30.4 GWh when completed:</p> <p><u>Estimation of benefit</u></p> <table border="0"> <tr> <td>Old chillers total energy consumption per annum:</td> <td>92.1 GWh</td> </tr> <tr> <td>New chillers total energy consumption per annum:</td> <td>61.7 GWh</td> </tr> <tr> <td>Estimated energy conserved per annum:</td> <td>30.4 GWh</td> </tr> </table>	Old chillers total energy consumption per annum:	92.1 GWh	New chillers total energy consumption per annum:	61.7 GWh	Estimated energy conserved per annum:	30.4 GWh
Old chillers total energy consumption per annum:	92.1 GWh						
New chillers total energy consumption per annum:	61.7 GWh						
Estimated energy conserved per annum:	30.4 GWh						
Progress of Investment and Estimated Benefits	<p>As of December 2020, a total of 92 chillers have been replaced.</p> <p>Computation of savings in energy based on specification numbers is at approximately 18.1 GWh per year (92/154 * 30.4GWh)</p>						
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	9,800 tonnes of CO ₂ equivalent based on the average CO ₂ e emission factors of 0.54kgCO ₂ e/kWh for CLP ¹ and HK Electric ² .						
Carbon Avoided per Million Investment (HK\$) for 2020	8.91 tonnes						

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh

2. HKE emission factors for 2020: 0.71kgCO₂e/kWh

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#H) Smart Intelligent Power Module (R-IPM)
Total Investment Amount	HK\$ 98 million
Investment Amount Funded by Sustainable Finance	HK\$ 65 million
Category of Eligible Investment	Energy Efficiency
Description of Investment	Replacement of Intelligent Power Modules in 48 SP trains with more advanced R-series Smart Intelligent Power Modules ("R-IPM") that improves usage rate of regenerative energy from braking.
Beneficial Environmental Impact Estimate	<p>R-IPM installed in trains allow a train to increase the regenerative energy (electricity generated from the braking system) ratio from 36% to 41%. The regenerative energy is fed back into the power supply network for usage by the train or other trains that run on the network.</p> <p>The energy recycled back to the network that are utilised will increase to 35.7 GWh from 31.4 GWh per annum with a net savings of 4.36 GWh.</p> <p>In addition, the higher regenerative energy ratio also provides for better braking traction to assist trains to stop at the destination points.</p>
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	2,400 tonnes of CO ₂ equivalent based on the average CO ₂ e emission factors of 0.54kgCO ₂ e/kWh for CLP ¹ and HK Electric ² .
Carbon Avoided per Million Investment (HK\$) for 2020	24.49 tonnes

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh

2. HKE emission factors for 2020: 0.71kgCO₂e/kWh



Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#1) Regenerative Station Energy Saving Inverter System
Total Investment Amount	HK\$ 8 million
Investment Amount Funded by Sustainable Finance	HK\$ 1 million
Category of Eligible Investment	Energy Efficiency
Description of Investment	<p>Installation of Station Energy Saving Inverter (S-EIV) at Hong Kong University Station (HKU) and Lai King Traction Substation (LKT).</p> <p>The S-EIV converts the regenerative energy produced by the train braking system into 415V low-voltage alternative current electricity that can be consumed by the station facilities, thereby increasing the utilisation of regenerative energy and reducing external electricity consumption.</p> <p>At Hong Kong University Station, the installation of the S-EIV also helps to decelerate trains more effectively and improve stopping accuracy at the West Island Line stations.</p>
Beneficial Environmental Impact Estimate	<p>Annual savings estimated in HKU station: 170MWh</p> <p>Annual savings estimated in LKT substation: 409MWh</p> <p>Total electricity saved per annum: 579MWh</p>
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	313 tonnes of CO ₂ equivalent based on the average CO ₂ e emission factors of 0.54kgCO ₂ e/kWh for CLP ¹ and HK Electric ² .
Carbon Avoided per Million Investment (HK\$) for 2020	39.13 tonnes

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh
2. HKE emission factors for 2020: 0.71kgCO₂e/kWh



Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#J) Maritime Square Extension												
Total Investment Amount	HK\$ 2,600 million												
Investment Amount Funded by Sustainable Finance	HK\$ 2,500 million												
Category of Eligible Investment	Sustainable Real Estate Properties												
Description of Investment	<p>It is a shopping mall building with the design of a "Floating Garden" with multi-level accessible green terraces, seamlessly integrated with the interior spaces and a water covered skylight at the roof garden which brings in dynamic natural lighting to the core atrium of the mall interior.</p> <p>Implementation of energy-saving initiatives includes an energy management system, water-cooled air conditioning system with a combination of conventional and oil-free chillers, air lock lobbies and energy efficient lighting.</p>												
Benefit of Investment	The project has attained the Beam Plus Silver accreditation, a strong achievement for a non-office commercial building (shopping mall). The energy savings is estimated at 25.9% for the commercial portion and 21.6% for the car park respectively (average 23.8%).												
Beneficial Environmental Impact Estimate	<p>The annual electricity consumption for the Maritime Square extension for 2020 was 4,267 MWh.</p> <p>As most of energy consumption is at the commercial portion of the mall (versus carpark), conservatively we use the average of the 2 saving rates listed above to compute the total energy saved.</p> <p>Savings of 23.8% amounted to about 1,333 MWh (for 2020), equivalent to CO₂e emission avoidance of 760 tonnes based on CLP's¹ (provider of electricity in Tsing Yi area) CO₂e emission factor.</p> <p>The following was the recorded energy consumption for 2018-2020.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Electricity Consumption (MWh)</th> <th>Energy savings based on average 23.8% rate (MWh)</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>4,564</td> <td>1,425</td> </tr> <tr> <td>2019</td> <td>4,458</td> <td>1,392</td> </tr> <tr> <td>2020</td> <td>4,267</td> <td>1,333</td> </tr> </tbody> </table> <p>Energy Savings = Consumption/(1-Saving Rate) - Consumption</p>	Year	Electricity Consumption (MWh)	Energy savings based on average 23.8% rate (MWh)	2018	4,564	1,425	2019	4,458	1,392	2020	4,267	1,333
Year	Electricity Consumption (MWh)	Energy savings based on average 23.8% rate (MWh)											
2018	4,564	1,425											
2019	4,458	1,392											
2020	4,267	1,333											
Equivalent Carbon Avoided for 2020 (GHG Emission Avoided in tonnes CO ₂ e)	493 tonnes of CO ₂ equivalent												
Carbon Avoided per Million Investment (HK\$) for 2020	0.20 tonnes												

1. CLP emission factors for 2020: 0.37kgCO₂e/kWh

Sustainable Investment Descriptions and Environmental Benefits

Name of Investment	(#K) Carbon Neutral Station Design
Total Investment Amount	HK\$ 5 million
Investment Amount Funded by Sustainable Finance	HK\$ 4 million
Category of Eligible Investment	Sustainable Transit Station
Description of Investment	<p>Tuen Mun South (“TMS”) Station</p> <p>TMS Station is a proposed new railway station located along Wu King Road near the sea front of Tuen Mun. It will be the new terminal station for West Rail Line and the future Tuen Ma Line. TMS Station will be surrounded on both sides by existing buildings.</p> <p>The station platforms will be sheltered with a light-weight metal canopy which also supports photo voltaic panels, generating electricity for station use and further shading the station. TMS Station is designed as a natural side ventilated station without the need of air-conditioning. High volume low speed (HVLS) fans together with air amplifiers will be used to maintain a constant breeze for passenger comfort. Rainwater harvesting will be integrated with the roof design to irrigate planters around the station structure.</p> <p>Hung Shui Kiu (“HSK”) Station</p> <p>HSK Station is a proposed new railway station located between Tin Shui Wai Station and Siu Hong Station along West Rail Line on the north-western side of the New Territories in Hong Kong. It will be located in the center of the future Hung Shui Kiu New Town Development Area as designed by the Government.</p> <p>The station platforms will be sheltered with a light-weight metal canopy which also supports photo voltaic panels, generating electricity for station use and further shading the station. The Concourse will be sheltered by the platforms and an existing viaduct. HSK Station is designed as a natural side ventilated station without the need of air-conditioning. Mesh wall panels will form the external walls, sheltering the station from heavy rain and wind. HVLS fans together with air amplifiers will be used to maintain a constant breeze for passenger comfort. Design for Manufacture and Assembly (DfMA) methods will be extensively used for the construction of the station, further reducing the embodied carbon content and construction waste.</p>
Benefit of Investment	This project is an initial design of the two carbon neutral stations to be built. It will likely lead to full scale development of the stations at a later stage.
Beneficial Environmental Impact Estimate	The design features of TMS reduce the energy requirements of the station by 75% compared to a typical air-conditioned station. At HSK, the large array of photo voltaic cells enables the station design to generate all the required energy to power the station systems (excluding retail and traction power) effectively making the station ‘Zero Carbon’.

Annex 1

The global economic and social disruption caused by the COVID-19 pandemic is significant. As a leader in railway transport in Hong Kong and other parts of the world, we continue to deliver high operational standards while safeguarding the well-being of our customers and colleagues, striving, as always, to keep cities moving.

To help slow the COVID-19 transmission while keeping the trains running and ensuring the safety and availability of our facilities, the Company has implemented various measures as recommended by the relevant authorities and specialists.

Some of the mitigation and precaution measures the Company has taken include:

- Introduction of a face mask production line at Siu Ho Wan Depot with an estimated production capacity of over 300,000 masks per month, ensuring stable supply to frontline staff and avoiding future potential shortages.
- Deployment of “Vaporised Hydrogen Peroxide Robots” to automatically spray atomised hydrogen peroxide for deep cleaning and decontamination of train compartments and stations, enhancing hygiene and health protection for passengers and staff.

- Application of Nano-Photocatalyst Coating on train compartments to help prevent microbial contamination.
- Installation of contactless sensors for lift button panels at more than 100 lifts in stations across different lines to enhance anti-pandemic measures.
- Provision of laundry allowance for frontline staff to subsidize their increased cost of hygiene maintenance during the pandemic.

The total cost of such measures come to around HK\$ 55 million for 2020 and was funded / refinanced with the proceeds of two of the bonds the Company issued in 2020, namely MTRGB_USD_210603 (XS2174507058, USD 60 million) and MTRGB_HKD_210507 (HK0000603180, HKD 250 million). The proceeds of these two bonds are set to be used for “funding or refinancing of activities that can help to combat the socio-economic impacts of the COVID-19 disease, in addition to sustainable projects”.

Appendix I - Methodology for Estimating Environmental Benefits of Low Carbon Transportation

Key Approach and Assumptions:

The GHG emission avoidance for MTR is calculated with

- The total passenger-km number for the asset of the project.
- The GHG emission reduction versus the next best alternative (local public bus), which is a conservative assumption as passengers are also likely to use alternative means like mini-bus, private cars and taxis, all of which emit more GHG than a local bus.
- GHG Emission avoided = Number of Passenger-km * (Emission Factor of Average Bus – Emission Factor of MTR)

The emission factor for MTR trains is computed using the total GHG emission divided by the total number of passenger-km.

The total passenger-km travelled on MTR Heavy Rail system in 2020 was 12,124,774,100 (18,171,762,200 in 2019).

Total GHG emission from railway operation (including fuel consumption, refrigerants, purchased electricity and water consumption) in 2020 was 828,954,000 kg CO₂e (1,129,223,000 kg CO₂e in 2019).

The GHG emission MTR rounds to **0.068 kg CO₂e/passenger-km** (0.062 kg CO₂e/passenger-km in 2019).

The emission factor for buses was obtained from a report published by UK Department of Business Energy & Industrial Strategy (DEFRA).

<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020>

Transport Mode	Emission Factor kgCO ₂ e per Passenger-km	Reference
Buses (average local bus)	0.10312	Defra conversion factor (2019: 0.10471)
MTR Railway	0.068	As computed above (2019: 0.0620)

Hence total GHG Emission avoidance for the MTR heavy rail transport (excluding Airport Express) rounds out to be:

$$12,045,527,005 * (0.10312 - 0.068) = 423,000 \text{ tonnes CO}_2\text{e}$$

Where 12,045,527,005 is the total passenger-km travelled on MTR heavy rail network excluding Airport Express.

For Projects #A and #B

Projects #A and #B are newly constructed extensions to the MTR network with an ending node. For estimation of the GHG emission avoidance, we assume any usage of the lines (i.e. passengers that used any one of the stations along the lines) as an incremental usage as the train trips would not have happened without the lines. i.e. passengers would have taken additional trip on a bus/car from end station, or passengers would have taken outright the full trip on bus/car.

The average travelling distance of each passenger was 10.5km in 2020 (10.8km for 2019). Based on the number of passengers for Kwun Tong Line Extension and South Island Line in 2020, the corresponding avoidance of GHG emissions are computed as follows:

$$\text{Annual GHG Emissions Avoided} = (\text{Emission Factor for MTR} - \text{Emission Factor for Average Bus}) * \text{Annual Passenger number} * \text{Average Passenger Distance}$$

Projects	Annual Passenger Number ('000)	Annual GHG Emissions Avoided (tonnes CO ₂ e)
#A	33,087 (43,828 in 2019)	12,100 (19,700 in 2019)
#B	33,070 (45,384 in 2019)	12,100 (20,400 in 2019)

For Projects #C and #D

Projects #C and #D are mid-life asset replacement projects that are crucial to upkeep the operation of the network.

The GHG emission avoidance number is estimated based on the amount of expenditure divided by the Total Asset Value of the MTR rail system (inclusive of KCRC rail system), multiplied by the total GHG emission avoided by the whole system.

• Total Asset Value of the heavy rail system: HKD 100.7 billion¹ + HKD 54.8 billion²

• GHG Emission avoided for project =

$$\text{Project Investment Amount} / \text{Total Asset Value} *$$

GHG Emission Avoidance for MTR Heavy Rail Network

Projects	Current Investment Amount (Total Investment Amount)	Annual GHG Emissions Avoided (tonnes CO ₂ e)
#C	HK\$ 110 million (HK\$ 7,100 million)	299 (19,300 for complete project)
#D	HK\$ 117 million (HK\$ 4,900 million)	318 (13,300 for complete project)

1. Carry value of railway assets for MTR as of end 2019 (page 260, 2019 MTRC [annual report](#))

2. Carry value of railway assets for KCRC as of end 2019 (page 54, 2019 KCRC [annual report](#))





VERIFICATION STATEMENT

Scope of Verification

Hong Kong Quality Assurance Agency (HKQAA) has been engaged by MTR Corporation Limited ("MTR", Hong Kong stock code: 66) to undertake an independent verification for providing limited assurance on the compliance of the projects included in the green and social project portfolio and financed through the proceeds of 15 MTR Green and/or Social Bonds issued by MTR Corporation (C.I.) Limited (a subsidiary of MTR) and MTR Corporation Limited, and 3 green credit facilities (refer to annex 1 for details) under MTR Sustainable Finance Framework ("Framework"). The scope of HKQAA's verification covers the data and information for the period 1st January 2020 to 31st December 2020.

Level of Assurance and Methodology

The process applied in this verification was based on the International Standard on Assurance Engagements 3000 (Revised) – "Assurance Engagement Other Than Audits or Reviews of Historical Financial Information" issued by the International Auditing and Assurance Standards Board (ISAE 3000). Our evidence gathering process was designed to obtain a limited level of assurance as set out in ISAE 3000 for the purpose of devising the verification.

Our verification procedure performed covered reviewing of relevant documentation, interviewing responsible personnel with accountability for preparing the reporting contents and verifying the selected representative sample of project, data and information. Raw data and supporting evidence of the selected samples were also thoroughly examined during the verification process.

Independence

MTR is responsible for the collection and presentation of the information presented. HKQAA does not involve in calculating, compiling, or development of the Report. Our verification activities are independent from MTR.

Limitations

There are inherent limitations in performing assurance. Assurance engagements are based on selective testing of the information and data being examined. It is possible that fraud, error or non-compliance may occur and not be detected. The assurance did not provide assurance on information outside the defined reporting boundary and period. There are additional inherent risks associated with assurance over non-financial information including reporting against standards which require information to be assured against source data compiled using definitions and estimation methods that are developed by the reporting entity. Finally, adherence to ISAE 3000 is subjective and will be interpreted differently by different stakeholder groups.

Our assurance was limited to the MTR Sustainable Finance Framework post-issuance, and did not include statutory financial statements, financial statements and economic performance. Our assurance is limited to policies and procedures in place as of 31st December 2020.

Conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the selected information as at 31st December 2020 has not been prepared, in all material respects, in accordance with the reporting criteria.

Signed on behalf of Hong Kong Quality Assurance Agency



Jorine Tam
Director, Corporate Business
24 May 2021

Annex 1: List of Bonds and Credit Facilities

BONDS	
<u>Issuer name</u>	<u>Name of Bond</u>
MTR Corporation (C.I.) Limited	MTRCIGB_USD_261102XS1509084775
MTR Corporation (C.I.) Limited	MTRCIGB_AUD_270628XS1637858546
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_320920HK0000365228
MTR Corporation Limited	MTRGB_HKD_470717HK0000352432
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_470906HK0000362761
MTR Corporation Limited	MTRGB_USD_470927XS1690683211
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_210502HK0000416609
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_480328HK0000409455
MTR Corporation Limited	MTRGB_HKD_210304HK0000579323
MTR Corporation Limited	MTRGB_HKD_210507HK0000603180
MTR Corporation Limited	MTRGB_USD_210603XS2174507058
MTR Corporation Limited	MTRGB_CNY_210607HK0000611290
MTR Corporation Limited	MTRGB_CNY_210610HK0000611381
MTR Corporation Limited	MTRGB_USD_300819XS2213668085
MTR Corporation Limited	MTRGB_HKD_500624HK0000612025
CREDIT FACILITIES	
<u>Year Executed</u>	<u>Identifier</u>
2018	MTRGL_HKD_230626
2020	MTRGL_HKD_230626B
2020	MTRGL_HKD_250618