

GREEN FINANCE REPORT 2019



Introduction

MTR established a Green Bond Framework in 2016 and subsequently a Green Finance Framework in 2018. The Green Bond Framework took guidance from the core components and recommendations of the Green Bond Principles (issued by the International Capital Market Association ICMA) and the Green Finance Framework expanded from this foundation to also factor in the recommendations of the Green Loan Principles (issued by Asia Pacific Loan Market Association APLMA). By providing guidance on the execution, use of proceeds and reporting of the green financings, these frameworks further integrate MTR's environmental, social and corporate governance into its financing and decision-making processes.

In 2019, a 1-year HK\$ 1 billion bilateral green loan was arranged.

Green Finance Portfolio

At the end of 2019, MTR's green finance portfolio consisted of nine bonds in three different currencies and two 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. The following tables list out all the green financings.

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%	6 Sep 2047	HKD 315,000,000
2017	MTRGB_USD_470927XS1690683211	MTR	USD	3.375%	27 Sep 2047	USD 100,000,000
2018	MTRCIGB_HKD_200629HK0000427812	MTR CI	HKD	2.520%	29 Jun 2020	HKD 348,000,000
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

Green Loans/Credit Facilities				
Year Executed	Identifier/ISIN	Currency	Maturity Date	Principal Amount
2018	MTRGL_HKD_230626	HKD	26 Jun 2023	HKD 2,500,000,000
2019	MTRGL_HKD_200617	HKD	17 Jun 2020	HKD 1,000,000,000

Project Portfolio

The projects funded by our green finance proceeds remained unchanged from the previous year, but the cost incurred in some of the projects increased as these projects progressed further. Details of the projects are available in Appendix I.

#	Name of Project	Classification	Total Project Amount	Cost Incurred up to Dec 2019	Amount Financed by Green Finance Proceeds
A	Kwun Tong Line Extension	Low carbon transport	HK\$ 6.9 billion	HK\$ 6.1 billion	HK\$ 3,703 million
B	South Island Line	Low carbon transport	HK\$ 17.2 billion	HK\$ 16.8 billion	HK\$ 8,234 million
C	Air Cooled Chiller Replacement	Energy efficiency	HK\$ 1.1 billion	HK\$ 356 million	HK\$ 356 million
D	Trackside Energy Storage (pilot)	Energy efficiency	HK\$ 20 million	HK\$ 19 million	HK\$ 19 million
E	Lok Ma Chau Wetland	Biodiversity preservation	HK\$ 4~5 million per year	HK\$ 13 million (from 2017)	HK\$ 13 million
Total:					HK\$ 12,325 million

Use of Proceeds

The following table lists out how the green finance proceeds were allocated to the different projects.

Year Raised	* Description/ Identifier/ISIN	Principal Amount (HKD million)	Current Allocation in Projects (HKD million)				
			A	B	C	D	E
2016	One green bond	4,654	1,305	3,349			
2017	Five green bonds	3,180	968	2,157	32	19	4
2018	Three green bonds and one green loan	3,491	1,130	2,217	140		4
2019	MTRGL_HKD_200617	1,000	300	511	184		5
Total		12,325	3,703	8,234	356	19	13

* Please refer to the 2016-2018 reports for the allocation of the green finance proceeds raised in previous years.

MTR Green Bond and Green Finance Frameworks

MTR set up a [Green Bond Framework \("GBF"\)](#) in October 2016. Sustainalytics provided a [second opinion](#) that the Framework is aligned with the four pillars of the Green Bond Principles (2016) of the International Capital Market Association.

In June 2018, MTR expanded upon the foundation of the GBF and established a [Green Finance Framework](#) to cover other forms of green financing, taking into account the recommendation of the Green Loan Principles issued by the Asia Pacific Loan Market Association.

The Frameworks set out how the Corporation uses green finance proceeds to fund initiatives to enhance long-term service levels and environmental performances, as well as the reporting thereon, thereby integrating environmental, social and corporate governance into its financing and decision-making process.

Summary of the Frameworks are as follows:

MTR Frameworks:

- MTR Green Bond Framework established in October 2016
- MTR Green Finance Framework established in June 2018
- Proceeds of green financings will be used to fund or refinance, in whole or in part, Eligible Investments.
- Proceeds of green financings may be used to repay borrowings under MTR's general credit facilities pending allocation to Eligible Investments.
- Eligible Investments include projects in the following sectors:
 - 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



Green project descriptions and environmental benefits

Name of Investment	(#A) Kwun Tong Line Extension
Total Investment Amount	HK\$6.9 billion
Investment Amount Funded by Green Finance	HK\$3.7 billion
Category of Eligible Investment	Low Carbon Transportation
Description of Investments	<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 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 Projects	The project provides low carbon transportation services to densely populated areas and helps to reduce road traffic congestions experienced by the residents.
Passenger Trips for 2019	43,828,000 ¹ (45,365,000 in 2018)
Equivalent Carbon Offset (GHG Emission Avoided in tonnes CO ₂ e)	19,700 tonnes CO ₂ equivalent ² (22,900 tonnes CO ₂ equivalent in 2018)
Carbon Offset per Million Investment (HK\$)	2.86 tonnes (3.32 tonnes in 2018)
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.

Note¹ : Passenger trips for Kwun Tong Line Extension saw a substantial fall due to public order events in Hong Kong, affecting the operation of the system.

Note² : Please see Appendix I for the method of estimating the CO₂ avoided for projects #A and #B.

Green project descriptions and environmental benefits

Name of Investment	(#B) South Island Line (East)
Total Investment Amount	HK\$17.2 billion
Investment Amount Funded by Green Finance	HK\$ 8.2 billion
Category of Eligible Investment	Low Carbon Transportation
Description of Investments	<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 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 Projects	The project provides low carbon transportation services to densely populated areas and helps reduced 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 2019	45,384,000 ¹ (45,288,000 in 2018)
Equivalent Carbon Offset (GHG Emission Avoided in tonnes CO ₂ e)	20,400 tonnes CO ₂ equivalent ² (22,800 tonnes CO ₂ equivalent in 2018)
Carbon Offset per Million Investment (HK\$)	1.19 tonnes (1.33 tonnes in 2018)
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.

Note¹: The impact of public order events in Hong Kong to the operation of the South Island Line was less severe as it was not in the main areas of the events.

Note²: Please see Appendix I for the method of estimating the CO₂ avoided for projects #A and #B.

Green project descriptions and environmental benefits

Name of Investment	(#C) Replacement of Air-Cooled Chillers
Total Investment Amount	HK\$1.1 billion
Investment Amount Funded by Green Finance	HK\$356 million
Category of Eligible Investment	Energy Efficiency
Description of Investments	<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, the energy consumption is expected to be reduced by 30.4 GWh when completed:</p> <p><u>Estimation of benefit</u> Old chiller total energy consumption: 92.1 GWh New chiller total energy consumption: 61.7 GWh Estimated energy conserved per annum: 30.4 GWh</p> <p><u>Energy conservation estimates based on planned schedule</u> 12,300MWh per year by April 2020 16,300MWh per year by April 2021 19,300MWh per year by April 2022 25,400MWh per year by April 2023 30,400MWh per year by April 2024</p>
Progress of Project and Benefits	<p>A total of 60 chillers have been replaced.</p> <p>Computation of savings in energy based on specification numbers is at approximately 11,400 MWh.</p>

Green project descriptions and environmental benefits

Name of Investment	(#D) Pilot Installation of Trackside Energy Storage Devices												
Total Investment Amount	HK\$20 million												
Investment Amount Funded by Green Finance	HK\$19 million												
Category of Eligible Investment	Energy Efficiency												
Description of Investments	The energy storage devices were installed at two locations – Tsuen Wan Depot (TWD) and Kowloon Ventilation Building (KVB) for energy saving. The regenerative energy obtained from the braking of Electric Multiple Units (EMU) is stored in the storage devices and then back-fed to the power line to be used by EMUs during acceleration.												
Beneficial Environmental Impact Estimate	The energy consumption is estimated to be reduced by approximately 600MWh per year.												
Measured Benefit for 2017/2018	The following were recorded energy saving data for 2017/2018 during the initial installation phase of the projects. <table border="1" data-bbox="568 1167 1481 1406"> <thead> <tr> <th colspan="3" data-bbox="568 1167 1481 1227">Total measured conserved energy during installation period (MWh)</th> </tr> <tr> <th data-bbox="568 1227 874 1285">Year</th> <th data-bbox="874 1227 1177 1285">TWD</th> <th data-bbox="1177 1227 1481 1285">KVB</th> </tr> </thead> <tbody> <tr> <td data-bbox="568 1285 874 1346">2017</td> <td data-bbox="874 1285 1177 1346">248</td> <td data-bbox="1177 1285 1481 1346">335</td> </tr> <tr> <td data-bbox="568 1346 874 1406">2018</td> <td data-bbox="874 1346 1177 1406">299</td> <td data-bbox="1177 1346 1481 1406">358</td> </tr> </tbody> </table> Detailed measurement was discontinued after 2018 as the system has proven to be operational and effective, and measurement is no longer needed operationally.	Total measured conserved energy during installation period (MWh)			Year	TWD	KVB	2017	248	335	2018	299	358
Total measured conserved energy during installation period (MWh)													
Year	TWD	KVB											
2017	248	335											
2018	299	358											
Operational Impact	The system is operational and effectively serving the objective of providing energy efficient solution to the railway network. Total energy saved is as estimated (600MWh per annum)												

Green project descriptions and environmental benefits

Name of Investment	(#E) Lok Ma Chau (LMC) Wetland Management
Total Investment Amount	HK\$4~5 million per year
Investment Amount Funded by Green Finance	Total of HK\$13 million for 2017~2019
Category of Eligible Investment	Biodiversity Preservation
Background/ Description of Investment	<p>In 2007, Kowloon Canton Railway/MTR started operating the 32-hectare Ecological Enhancement Area (EEA) to mitigate the ecological impact from the construction and operation of the Lok Ma Chau extension.</p> <p>The Environmental Impact Assessment report by Environment Protection Department is available at the following link. http://www.epd.gov.hk/eia/register/report/eiareport/eia_0442000/C13/C13.htm</p>
Achievements of Investment	<p>The LMC wetland provides a variety of habitats for a wide range of birds, mammals and reptiles, playing a pivotal role in regional biodiversity and helping to maintain the sustainability of local migratory birds.</p> <ul style="list-style-type: none"> • Over 270 bird species have been observed, including the endangered Black-face Spoonbill. During the 2019 breeding season, more than 150 pairs of birds representing 6 different species were spotted. • Seven globally threatened bird species, as classified by the International Union for Conservation of Nature's (ICUN) Red List of Threatened Species, were recorded during regular bird surveys in the LMC wetland in 2017: <ul style="list-style-type: none"> • Yellow-breasted Bunting – critically endangered • Oriental Stork – endangered • Black-faced Spoonbill – endangered • Lesser White-fronted Goose – vulnerable • Greater Spotted Eagle – vulnerable • Eastern Imperial Eagle – vulnerable • Collared Crow – vulnerable • Since 2010, around 120 nest boxes designed for the White-Shouldered Starling have been installed in the LMC wetland and more than 100 pairs of White-Shouldered Starling bred in the nest boxes in 2016. Measures are being implemented to attract Pheasant-tailed Jacana to breed in the wetland. • The wetland also hosts dragonflies, reptiles, mammals and amphibians including those classified as endangered, vulnerable and near-threatened. There had been regular sightings of the Chinese soft-shelled turtle (threatened species), and the Eurasian Otter (near-threatened species). <p>The 2019 Habitat Creation and Management Plan report is published at the following link. http://www.mtr.com.hk/archive/corporate/en/env_report/hcmp201910.pdf</p>

Appendix I - Methodology for estimating environmental benefits of Railway Lines

Key approach and assumptions:

- The estimation on the reduction of Green House Gas (GHG) emission for the Kwun Tong Line Extension and South Island Line is based on a comparison of the GHG emissions between MTR's railway lines with that of local buses, i.e. assuming that without the railway lines, passengers would have taken buses for their full journeys. This is a conservative estimate as passengers would likely have also utilized a mix of minibus, taxis and private cars, all emitting more GHG than a local bus.

$$\text{GHG Emission avoided} = \text{Number of Passenger} * (\text{Emission Factor of Average Bus} - \text{Emission Factor of MTR}) * \text{Average Distance per Passenger}$$

- 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 2019 was #18,171,762,200 (19,725,532,782 in 2018).

Total GHG emission from railway operation (including fuel consumption, refrigerants, purchased electricity and water consumption) in 2019 was 1,129,223,000 kg CO₂e (1,059,503,000 kg CO₂e in 2018).

The GHG emission MTR works out to be 0.062kg CO₂e/passenger-km (0.054 kgCO₂e/passenger-km in 2018).

#The passenger trips for Hong Kong heavy rail experienced a substantial fall due to public order events affecting the operation of the system.

- 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-2019>)

Transport Mode	Emission Factor kgCO ₂ e per Passenger-km	Reference
Buses (average local bus)	0.10471	Defra conversion factor, link as above (2018: 0.10097)
MTR Railway	0.06200	As computed above (2018: 0.0540)

Emission Avoidance Estimation for MTR

The average travelling distance of each passenger was 10.8km. Based on the number of passengers for the Kwun Tong Line Extension and South Island Line in 2019, the corresponding avoidance of CO₂ emissions are computed as follows:

New Lines	Annual Passenger Number ('000)	Annual GHG Emissions Avoided (tonnes CO ₂ e)
KTL	43,828 (45,365 in 2018)	19,700 (22,900 in 2018)
SIL	45,384 (45,288 in 2018)	20,400 (22,800 in 2018)



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 project portfolio and financed through the proceeds of 9 MTR Green Bonds issued by MTR Corporation (C.I.) Limited (a subsidiary of MTR) and MTR Corporation Limited, and 2 green revolving credit facilities (refer to annex 1 for details) under MTR Green Finance Framework ("Framework"). The scope of HKQAA's verification covers the data and information for the period 1st January 2019 to 31st December 2019.

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 Green 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 2019.

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 2019 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
28 April 2020



Annex 1: List of Bonds and Credit Facilities

BONDS	
Issuer name	Name of Bond
MTR Corporation (C.I.) Limited	MTRCIGB_USD_261102 XS1509084775
MTR Corporation (C.I.) Limited	MTRCIGB_AUD_270628 XS1637858546
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_320920 HK0000365228
MTR Corporation Limited	MTRCIGB_HKD_470717 HK0000352432
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_470906 HK0000362761
MTR Corporation Limited	MTRGB_USD_470927 XS1690683211
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_200629 HK0000427812
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_210502 HK0000416609
MTR Corporation (C.I.) Limited	MTRCIGB_HKD_480328 HK0000409455
CREDIT FACILITIES	
Year Executed	Identifier
2018	MTRGL_HKD_230626
2019	MTRGL_HKD_200617