

ASSESSMENT

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Wuhan Metro Group Co., Ltd.

Green Bond Assessment - senior unsecured perpetual securities

Summary analysis



Summary opinion

A GB1 (Excellent) Green Bond Assessment (GBA) assigned to [Wuhan Metro Group's](#) (A3 stable) \$400 million senior unsecured perpetual securities issued in December 2018 primarily reflects the following considerations:

- » Dedicated green bond working group that reviews potential projects to ensure alignment with the eligibility criteria codified in the issuer's green bond framework
- » Green bond proceeds to finance or refinance investments in the expansion of the issuer's metro system, including the construction of additional metro lines and associated renewable energy, energy efficiency and pollution prevention projects
- » Good disclosure in the issuer's green bond framework, including clear green project eligibility criteria and descriptions of the environmental benefits anticipated for each eligible project type (excluding greenhouse gas emissions reduced or avoided)
- » Proceeds management underpinned by the creation of a register to track the use of green bond proceeds over time despite the lack of a segregated green bond account
- » Anticipated publication of annual green bond reports, containing both allocation and impact reporting, although only until proceeds are fully allocated

| Factor | Factor Weights | Score | Weighted Score |
|-----------------------------------|----------------|-------|----------------|
| Organization | 15% | 1 | 0.15 |
| Use of Proceeds | 40% | 1 | 0.40 |
| Disclosure on the Use of Proceeds | 10% | 2 | 0.20 |
| Management of Proceeds | 15% | 2 | 0.30 |
| Ongoing Reporting and Disclosure | 20% | 2 | 0.40 |
| Weighted Score | | | 1.45 |

The transaction's weighted score, using the green bond scorecard, is 1.45. This, in turn, corresponds to a GB1 grade.

Profile

Wuhan Metro Group Co., Ltd. (Wuhan Metro) is mandated by the Wuhan City Government as the sole platform to own and operate the metro system in Wuhan, the capital city of Hubei Province. The company also engages in primary land development, property development and investment, advertising and retail.

Wuhan Metro was established in 2000. As of end-June 2018, the company is approximately 88% owned by the Wuhan State-owned Assets Supervision and Administration Commission and approximately 12% owned by the China Development Bank Development Funds, which is ultimately 100% owned by the [China Development Bank](#) (A1 stable).

At present, Wuhan Metro runs nine metro lines with a total length of approximately 318 kilometers (km). The company has another 10 metro lines with a total mileage of approximately 276 km under construction.

Transaction summary

Wuhan Metro issued \$400 million of green senior unsecured perpetual securities in December 2018. The securities were registered with the National Development and Reform Commission (NDRC) and listed on The Stock Exchange of Hong Kong Limited (SEHK).

The senior unsecured perpetual securities represent Wuhan Metro's first offshore green bond offering and fourth overall green bond issuance.

Strengths and weaknesses

| Strengths | Weaknesses |
|--|--|
| Dedicated green bond working group that reviews potential projects to ensure alignment with the eligibility criteria codified in the issuer's green bond framework | Impact reporting is not expected to contain information on greenhouse gas emissions reduced or avoided or the reduction of air pollutants, as recommended by the Green Bond Principles |
| Green bond proceeds to finance or refinance investments in the expansion of the issuer's metro system, including the construction of additional metro lines and associated renewable energy, energy efficiency and pollution prevention projects | No formal segregated green bond account or sub-account, though this is somewhat mitigated by the presence of a green bond register |
| Good disclosure in the issuer's green bond framework, including clear green project eligibility criteria and descriptions of the environmental benefits anticipated for each eligible project type | Annual post-issuance reporting will continue only for as long as there are unallocated green bond proceeds |
| Proceeds management underpinned by the creation of a register to track the use of green bond proceeds over time | |
| Anticipated publication of an annual green bond report containing both allocation and impact reporting | |

Organization



Wuhan Metro's approach to issuing green bonds is codified in a detailed green bond framework, published on a standalone basis and as a component of the offering memo. The green bond framework discusses the rationale for issuing the green bond, background of the metro system, as well as details on the use of green bond proceeds, project evaluation and selection, management of proceeds and reporting.

A dedicated green bond working group provides oversight of the green bond issuance process. The working group, which is comprised of senior members of the finance, treasury, investment management, operations, engineering and enterprise management teams, is responsible for reviewing potential green bond projects to ensure alignment with the detailed eligibility criteria codified in the green

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bond framework. The green bond working group also reviews allocation of proceeds annually to ensure maximum allocation of green bond proceeds and to facilitate ongoing green bond reporting.

Wuhan Metro mitigates environmental and social risks through a series of internal policies, as well as compliance with national policies and regulations that enforce sustainability considerations. For example, Wuhan Metro complies with the Energy Saving Regulation of the People's Republic of China, the Energy Efficiency Standards for Public Buildings, the Regulation for Green Construction, as well as other policies and regulations.

Wuhan Metro's green bond issuance advances its overall sustainability strategy and aligns with the country's environmental goals, such as [those under the Paris Agreement](#). As part of its mandate, Wuhan Metro promotes a green integrated rail transit system and green urban metro network, increasing the availability of low-carbon transportation. The green bond issuance also supports the environmental protection and low-carbon economy development goals under China's 13th Five Year Plan by facilitating energy savings in transportation, managing indicators of total energy consumption, reducing air pollution, more effectively controlling carbon emissions and promoting low-carbon development in transportation.

| Factor 1: Organization (15%) | Yes | No |
|---|-----|----|
| Environmental governance and organization structure appears to be effective | • | |
| Policies and procedures enable rigorous review and decision making processes | • | |
| Qualified and experienced personnel and/or reliance on qualified third parties | • | |
| Explicit and comprehensive criteria for investment selection, including measurable impact results | • | |
| External evaluations for decision making in line with project characteristics | • | |
| Factor Score | 1 | |

Use of proceeds



Wuhan Metro will allocate proceeds from the green senior perpetual securities to a series of eligible projects consistent with the [International Capital Market Association's \(ICMA\) Green Bond Principles](#) and the 2018 Green Bond Guidance of the National Development and Reform Commission (NDRC). As seen in Exhibit 1, eligible project categories include low carbon transportation, pollution prevention, energy efficiency and renewable energy. For each eligible project category, Wuhan Metro lists descriptions of eligible projects and the intended environmental benefits. In the case of rolling stock and carriages, investment in projects or assets that advance the use or generation of fossil fuel, diesel or nuclear energy are explicitly excluded.

Exhibit 1

Wuhan Metro eligible green bond projects cover four broad categories

| Eligible Green Project Category | Examples of Eligible Green Projects |
|---------------------------------|--|
| Low Carbon Transportation | Technology Research & Development and Preliminary Planning: <ul style="list-style-type: none"> • Research costs associated with but not limited to surveying, planning and assessing site suitability • Technological upgrades and enhancements |
| | Rail Transit Stations: <ul style="list-style-type: none"> • Construction of station buildings, including internal modernization and investment into ventilation, lighting, fire, water and waste management • Establishment and refurbishment of existing ticketing equipment to allow for automation • Upgrade of escalators and safety doors to save energy and ensure safety |
| | Associated rail infrastructure: <ul style="list-style-type: none"> • Construction of the related infrastructure (including tunnels), including but not limited to track construction |
| | Rolling Stock / Carriages: <ul style="list-style-type: none"> • Purchase and maintenance of electric rolling stock (excluding projects or assets which advance the use or generation of fossil fuel, diesel or nuclear energy) and carriages |
| | Modern Communication System: <ul style="list-style-type: none"> • Construction and modernization of signalling system, train control and propulsion system |
| | Pipeline Relocation and Related Relocation: <ul style="list-style-type: none"> • Pipeline relocation • Temporary relocation which is for the purpose of expanding and/or increasing the capacity of the rail transit network |
| Pollution Prevention | Technologies related to: <ul style="list-style-type: none"> • Enhancing air quality such as to increase air circulation and air filtration • Noise reduction technologies such as noise barriers, modification of turnouts, rail dampers and insulation booths • Modernization and maintenance of ventilation and drainage system |
| Energy Efficiency | Design, manufacture and installation of systems, products and technology associated with low-carbon transportation systems that: <ul style="list-style-type: none"> • Reduce energy consumption or improve efficiency • Mitigate greenhouse gas emissions in railway construction and operations • Modernize lighting systems, such as with upgrades to LED |
| Renewable Energy | Design, manufacture and installation of renewable energy systems, products and technology, such as solar panels |

Source: Wuhan Metro green bond framework

Wuhan Metro will use the green bond proceeds to finance or refinance investments toward the expansion of the metro system, including the construction of additional metro lines, as well as upgrades to the existing lines it operates. At present, Wuhan Metro runs nine metro lines with a total length of approximately 318 kilometers (km). Please see Exhibit 2 for a detailed breakdown of the existing metro lines.

Exhibit 2

Wuhan Metro's existing lines total 318 km in length

| Line | Route Length (km) | Number of Stations | Commencement of Operations |
|--|-------------------|--------------------|----------------------------|
| Line 1 Phase I | 10 | 10 | July 2004 |
| Line 1 Phase II | 19 | 16 | July 2010 |
| Line 1 Hankou northward extension | 6 | 3 | May 2014 |
| Line 1 Jinghe northward extension | 4 | 3 | December 2017 |
| Line 2 Phase I | 28 | 21 | December 2012 |
| Line 3 Phase I | 28 | 24 | December 2015 |
| Line 4 Phase I | 17 | 15 | December 2013 |
| Line 4 Phase II | 17 | 13 | December 2014 |
| Line 6 Phase I | 36 | 27 | December 2016 |
| Line 7 Phase I | 31 | 19 | October 2018 |
| Line 7 southward extension (Paper Square Line) | 17 | 7 | December 2018 |
| Line 2 northward extension (Airport Line) | 20 | 7 | December 2016 |
| Line 2 southward extension | 13 | 5 | February 2019 |
| Line 8 Phase I | 17 | 12 | December 2017 |
| Line 11 Eastern Segment (Phase I) | 20 | 13 | October 2018 |
| Yangluo Line | 35 | 16 | December 2017 |
| Total | 318 | 211 | |

Source: Wuhan Metro

The company has another ten metro lines under construction with a total length of approximately 276 km. These lines will become operational by the end of 2024. Please see Exhibit 3 for a detailed breakdown of the issuer's metro lines currently under construction.

Exhibit 3

Wuhan Metro has approximately 276 km of track under development through 2024

| Line/Project | Expected Total Investment (CNY billions) | Route length (km) | Progress |
|---|--|-------------------|--------------------|
| Line 5 | 25.0 | 31.9 | Under construction |
| Line 8 Phase II | 13.8 | 16.7 | Under construction |
| Line 11 Eastern Segment Phase II (Wuchang Segment) | 10.2 | 12.6 | Under construction |
| Caidian Line | 9.2 | 16.1 | Under construction |
| Line 8 Phase III | 2.6 | 4.9 | Under construction |
| Line 12 (Loop Line) | 58.4 | 59.9 | Under construction |
| Line 6 Phase II | 4.6 | 7.0 | Under construction |
| Hannan Line | 15.4 | 32.3 | Under construction |
| Qianchuan Line | 17.6 | 33.6 | Under construction |
| Line 11 Phase III (Wuchang Shoukai Segment) | 8.0 | 4.0 | Under construction |
| Line 11 Phase III (New Hanyang Railway Station Segment) | 3.9 | 2.2 | Under construction |
| Line 11 Phase III (Gedian Segment) | 1.6 | 3.7 | Under construction |
| Line 19 | 17.2 | 20.6 | Under construction |
| Xingang Line | 17.7 | 30.2 | Under construction |
| Total | 205.0 | 275.7 | |

Source: Wuhan Metro

| Factor 2: Use of Proceeds | Yes | No |
|--|-----|----|
| >95% - 100% of proceeds allocated to eligible project categories that are determined based on the issuer's adopted policies and the categories established under the Green Bond Principles that will be further informed by one or more robust and widely recognized green bond frameworks or taxonomies that qualify eligible projects, including any applicable regulatory guidelines. | • | |
| Factor Score | 1 | |

Disclosure on the use of proceeds

Wuhan Metro's disclosure on the expected use of green bond proceeds is robust, with the green bond framework containing clear green project eligibility criteria, including descriptions of the environmental benefits anticipated for each of the project types. In addition, the issuer has provided detail on the various metro lines deemed eligible for green bond funding, including information on the existing lines in operation as well as the expected date of operation and total investment expected per line for those lines currently under construction or approved for construction.

Although Wuhan Metro provides general information on the environmental benefits of low-carbon transportation, impact reporting is not expected to contain information on greenhouse gas emissions reduced or avoided, or the reduction of air pollutants, as recommended by the Green Bond Principles. We reflect this slight weakness in our scoring around the methods and criteria for calculating the quantitative and qualitative environmental benefits of the projects.

Wuhan Metro's green bond framework received a second party opinion, which will be published on the issuer's website alongside its green bond framework.

| Factor 3: Disclosure on the Use of Proceeds | Yes | No |
|---|-----|----|
| Description of green projects, including portfolio level descriptions, actual and/or intended | • | |
| Adequacy of funding and/or strategies to complete projects | • | |
| Quantitative and/or qualitative descriptions for targeted environmental results | • | |
| Methods and criteria, both qualitative and quantitative, for calculating performance against targeted environmental results | | • |
| Issuer relies on external assurances: Second Party reviews, audits and/or third party certifications | • | |
| Factor Score | 2 | |

Management of proceeds



Wuhan Metro will deposit proceeds from each green bond it issues into its general funding account and earmark the proceeds pending allocation. Although Wuhan Metro does not have a formal separate green bond account, it will maintain a green bond register to track the use of proceeds. The green bond register will contain detailed information for each green bond issued including the ISIN, pricing date, maturity date and other information. The register will also include an eligible green project allocation list, including:

- » Confirmation that investments are made to eligible green projects
- » Description of the investments
- » Investment amounts
- » Other necessary information so that the aggregate of issuance proceeds allocated to eligible projects is recorded at all times

Wuhan Metro has committed to allocate green bond proceeds within a short timeframe, given that many of the eligible green investments have already been identified, as outlined above. Any unallocated funds will be held in accordance with the issuer's normal liquidity management policy, such as in Notice Deposits. Wuhan Metro has confirmed that the deployment of funds to eligible green projects will be reviewed by an external auditor or independent internal audit unit, but the specifics of this process have not yet been confirmed.

| Factor 4: Management of Proceeds | Yes | No |
|--|-----|----|
| Bond proceeds are segregated and separately tracked on an accounting basis or via a method by which proceeds are earmarked | | • |
| Application of proceeds is tracked by environmental category and project type | • | |
| Robust process for reconciling planned investments against actual allocations | • | |
| Clear eligibility rules for investment of cash balances | • | |
| Audit by external organization or independent internal audit unit | • | |
| Factor Score | 2 | |

Ongoing reporting and disclosure



Wuhan Metro will publish an annual green bond report for as long as bond proceeds remain unallocated. The green bond report will be made public and contain information on the use of green bond proceeds, including:

- » Aggregate amount allocated to the various eligible green bond project categories
- » Remaining balance of funds which have not yet been allocated
- » Examples of green projects from each eligible green bond category

To support disclosure on the environmental benefits of the financed green projects, Wuhan Metro has committed to include a series of impact indicators based on the eligible green project category. These include kilometers of tracks built and the number of passengers for low-carbon transportation, number of noise barriers installed for pollution prevention projects, and the amount of energy saved and installed renewable energy production capacity for energy efficiency and renewable energy projects. As discussed above, impact reporting is not expected to contain information on greenhouse gas emissions reduced or avoided, or the reduction of air pollutants, [as recommended by the Green Bond Principles](#).

| Factor 5: Ongoing Reporting and Disclosure | Yes | No |
|--|-----|----|
| Reporting and disclosure post issuance provides/to be provided detailed and timely status updates on projects | ● | |
| Ongoing annual reporting is expected over the life of the bond | | ● |
| Disclosures provide granular detail on the nature of the investments and their expected environmental impacts | ● | |
| Reporting provides/to be provided a quantitative and/or qualitative assessment of the environmental impacts actually realized to-date | ● | |
| Reporting includes/to include quantitative and/or qualitative explanation of how the realized environmental impacts compare to projections at the time the bonds were sold | ● | |
| Factor Score | 2 | |

Moody's Green Bond Assessment (GBA)

Moody's GBA represents a forward-looking, transaction-oriented opinion on the relative effectiveness of the issuer's approach to managing, administering, allocating proceeds to and reporting on environmental projects financed with green bond proceeds. GBAs are expressed using a five-point relative scale, ranging from GB1 (Excellent) to GB5 (Poor). A GBA does not constitute a credit rating.

Moody's related publications

Methodology:

- » [Green Bonds Assessment \(GBA\)](#), 30 March 2016

Issuer research:

- » [Moody's assigns A3 rating to Wuhan Metro's proposed USD perpetual securities](#), 21 November 2018
- » [Moody's assigns Green Bond Assessment \(GBA\) of GB1 to Wuhan Metro's proposed green senior perpetual securities](#), 20 November 2018
- » [Wuhan Metro Group Co., Ltd.: Update following ratings affirmation](#), 14 September 2018

Green bond research:

- » [Green Bonds - Global: Global green bond issuance to hit \\$200 billion in 2019](#), 31 January 2019
- » [Green Bonds – Global: Environmental impact and reporting vary by jurisdiction and asset class](#), 4 December 2018
- » [Structured finance – Global: Green finance sprouts across structured finance sectors](#), 13 November 2018
- » [Green bonds – Global: Repeat issuers drive volume as green bond market matures](#), 12 November 2018
- » [Green Bonds – Global: Adoption of UN Sustainable Development Goals to drive demand](#), 12 November 2018
- » [Green Bonds – Global: Issuance in the first three quarters of 2018 flat compared with 2017](#), 6 November 2018
- » [Green Bonds – Global: Second-quarter issuance rebounds but full-year 2018 growth likely to moderate](#), 31 July 2018
- » [Green Bonds – Sovereign: Sovereign green bond market on course for critical mass, but challenges remain](#), 9 July 2018
- » [Green Bonds – Global: Modest Q1 2018 issuance a speed bump on the road to market growth](#), 30 April 2018
- » [Green Bonds – Global: Global municipal green bond issuance will continue to rise](#), 19 March 2018
- » [Cross-sector – Global: FAQ: The green bond market and Moody's Green Bonds Assessment](#), 29 November 2017
- » [Green Bond Assessments – Global: Issuers exhibit strong organizational frameworks but differ on disclosure](#), 19 September 2017

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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