STRUCTURED FINANCE

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CREDIT OPINION
30 May 2023

New Issue

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Bauhinia ILBS 1 Limited

New Issue – A project finance and infrastructure loan-backed transaction

Capital structure

Exhibit 1
Definitive ratings

Class	Ratings	Amount ($ millions)	Share of Capital Structure (%)	Effective Subordination (%)(a)	Coupon(b)
Class A1-SU Notes	Aaa (sf)	100.00	74.0	26.0	6m Term SOFR + 1.60%
Class A1 Notes	Aaa (sf)	199.60			6m Term SOFR + 1.70%
Class B Notes	Aa1 (sf)	36.50	9.0	17.0	6m Term SOFR + 2.50%
Class C Notes	A2 (sf)	18.25	4.5	12.5	6m Term SOFR + 3.95%
Class D Notes	Baa3 (sf)	10.00	2.5	10.0	6m Term SOFR + 5.95%
Subordinated Notes	Not rated	40.43	10.0	n/a	6m Term SOFR + 6.00%
Total		404.78	100.00		

(a) Effective subordination is based on the $404.78 million target par amount of the portfolio. Class A1-SU notes and Class A1 notes rank pari passu with each other in the issuer's priority of payments.
(b) Upon a change in notes' payment frequency from semiannual to quarterly, the benchmark rate would change to three-month Term Secured Overnight Financing Rate (SOFR).
Sources: Joint Global Coordinators and Moody's Investors Service

Summary

Bauhinia ILBS 1 Limited (the issuer) is a pilot project finance and corporate infrastructure collateralized loan obligation (the CLO or the transaction) cash flow securitization transaction, sponsored by The Hong Kong Mortgage Corporation Limited (HKMC, the collateral manager, Aa3/P-1, stable).

The notes issued by the issuer were backed by a $404.78 million portfolio of bank-syndicated project finance loans and corporate infrastructure loans predominantly in Asia-Pacific, the Middle East and South America at closing. All the loans were acquired directly from or by way of funded participation with HKMC or rated bank(s) around the closing date. Of the $404.78 million portfolio, $6.17 million relates to undrawn commitments, which was deposited in the issuer's bank account at closing, pending to be drawn by the borrowers.

In our credit analysis, we considered the attributes of the underlying assets, including the assets' default probability, recovery rate, asset correlation, loan participation exposure, loan term, spread, industry sectors and subsectors, and geographic concentration.

HKMC was established in Hong Kong in 1997 and is wholly owned by the Hong Kong Government through the Exchange Fund, with reported total assets of HKD173.2 billion as of the end of December 2021. This CLO transaction will be managed by the Infrastructure Financing and Securitization Division (IFS) of HKMC. Based on our knowledge of HKMC's organizational structure, staffing of the IFS division and its experience in the infrastructure and project finance sectors, systems and controls, we believe that HKMC is capable of managing this transaction. For further discussion about the collateral manager, see the “Asset description” section of this report.

The issuer issued five classes of rated notes: Class A1, A1-SU, B, C and D notes. The Class A1 notes and Class A1-SU notes rank pari passu with each other and rank senior to the Class B, C, D and the unrated subordinated notes.

In addition, the issuer issued unrated subordinated notes to HKMC that will receive residual interest and principal payments. HKMC provided a sponsor loan to the issuer at closing to support the liquidity of the issuer in meeting interest payments on the rated notes on the first payment date.

We measured the credit risk of the notes using our CDOROM™ and CDOEdge™ models, which incorporate the transaction's structural features and asset characteristics noted above.

Credit strengths

» ***High credit quality portfolio:*** The weighted average rating factor (WARF) of the identified portfolio, based on credit estimates, is 772 before applying the credit estimate notching adjustments, and 936 after applying the credit estimate notching adjustment. (See “Asset description”)

» ***High asset recovery prospects:*** The portfolio consists of predominantly bank-syndicated senior secured project finance loans (80.8% of the pool), which historically have had high recovery rates. The remaining portion of the pool consists of telecommunication and utilities corporate infrastructure loans (15.5%) and corporates guaranteed project finance loans (3.7%). About 3.8% of the portfolio also benefit from external credit support, which will improve loan recovery prospects. (See “Asset analysis - Additional asset analysis”)

» ***Short transaction life :***The weighted average life of the identified portfolio is about five to six years, and the transaction has a three-year replenishment period. (See “Asset description - Assets as of the closing date”)

» ***No currency mismatch :*** Both the loans and the notes are denominated in US dollars. (See “Asset description”)

» ***No long-dated assets:*** All the loans in the identified portfolio have maturities before the legal maturity date of the transaction. The collateral manager has no right to consent to asset maturity amendments that result in the asset's maturity extending beyond the transaction's legal maturity date. (See “Asset analysis - Additional asset analysis”)

» ***Remote likelihood of an OC-based event of default:*** An over-collateralization (OC)-based event of default and the associated liquidation of the portfolio are unlikely because the event of default par ratio trigger of 102.5% is well below the initial OC level of about 135%. (See “Securitization structure analysis - Additional structural analysis”)

Credit challenges

» ***Unrated loan portfolio:*** None of the underlying project and infrastructure loans are rated by us. We assigned a credit estimate to each of the loans in the portfolio. (See “Asset description” and “Asset analysis - Additional asset analysis”)

» ***High project and sector concentration risk:*** The identified portfolio only includes loans relating to 25 projects, with high exposure to a few projects concentrated in energy-related sectors such as power generation renewables and non-renewables, schools and education, and LNG. The exposure to the largest obligor group in the power generation renewables sector, comprises about 11.8% of the portfolio, greater than the subordination of the Class D notes. Certain projects also involve common off-takers, operators or sponsors. A significant credit deterioration of any of these projects would have a negative rating impact on the Rated notes. In our analysis, we considered several stress scenarios assuming default of the largest obligor group or higher asset correlation. (See “Asset analysis - Additional asset analysis”)

» ***High country risk:*** Of the identified portfolio, about 30% portfolio exposure is to projects that are exposed to countries with single-A or below foreign-currency country ceilings (FCC). The geographical distribution of the portfolio is widely diversified across 12 countries in different regions. Exposure to top three countries which have non-Aaa FCC are China (about 14%, Aa1 FCC), India (about 12%, A3 FCC), and Brazil (about 12%, Baa2 FCC) (See “Asset analysis - Additional asset analysis”)

» ***High participation loan risk:*** The issuer invested in about 18% of the portfolio via funded participation with HKMC (Aa3/P-1) or rated bank(s). The issuer will rely on HKMC or the rated bank(s) to enforce its rights against the borrower and take credit performance risk of HKMC and the rated bank(s). We considered this in our analysis. (See “Asset analysis - Additional asset analysis”)

» ***Undrawn commitment amount:*** Of the identified portfolio, about 1.5% of the portfolio is pending to be drawn before the first notes' payment date. The issuer set aside cash in its bank account to ensure it has sufficient liquidity to fullfil its lending obligation. (See “Asset description”)

» ***Recovery period may be long:*** The recovery after a loan default may take several years because liquidity for defaulted loans predominantly in Asia-Pacific, the Middle East and South America is uncertain and any workout may take a long time. (See “Asset analysis - Additional asset analysis”)

» ***Construction risk:*** About 12.5% of the portfolio relates to two projects that are in advanced stage of construction. The credit estimate of these two projects' loans factors in the construction risk. (See “Asset analysis - Additional asset analysis”)

» ***Floating rate basis mismatch risk:*** The issuer is exposed to basis mismatch as all the rated notes are linked to SOFR, while 32% of the initial target portfolio is linked to USD-Libor, and the remaining 68% is linked to SOFR. As USD-Libor will cease on 30 June 2023, the benchmark rate of loans that are currently USD-Libor may transition to other floating rate indices such as term SOFR or daily non-cumulative compounded SOFR or costs of funds of the lenders. In our analysis, we considered zero credit adjustment spread except for loans that have executed terms for USD-Libor transition. (See “Asset description”)

ESG considerations

In general, our fundamental credit analysis of each underlying issuer takes into consideration environmental, social and governance (ESG) risks at the asset level. Additionally, the diversified nature of the portfolio helps mitigate environmental risks to the transaction. Furthermore, the transaction structure and characteristics of the transaction parties largely mitigate governance risks. Our General Principles for Assessing Environmental, Social and Governance Risks Methodology explains our general principles for assessing ESG risks in our credit analysis for all sectors globally.

The ESG considerations included in this report are based on the identified portfolio, draft transaction documents, and the structure and characteristics of the transaction provided to us. Accordingly, the ESG considerations are current as of the date of this report. However, the ESG information may not reflect the future composition of the transaction's portfolio.

» **Environmental**: The underlying assets in the identified portfolio are categorized within sectors that have been assigned an environmental score of either "high risk", "moderate risk" or "low risk." None of the assets are in sectors that have "very high risk" environmental score. (See "Asset description – ESG - Environmental considerations")

» **Social**: Most of the underlying assets in the transaction's identified portfolio are categorized within sectors that have been assigned a social score of "moderate risk" (See Asset description – ESG - Social considerations).

» **Governance**: This transaction's governance risk is low and is typical of other CLOs in the market. For this transaction, we considered additional governance factors, as described in the "ESG - Governance considerations" section. (See "Additional structural analysis – ESG - Governance considerations")

In addition to the ESG considerations mentioned above, we also note the following ESG-related details:

» In 2022, HKMC established its Social, Green and Sustainability Financing Framework (SGS Framework). The SGS Framework is developed in alignment with the following sustainable finance principles and guidelines to ensure that E&S risks associated with HKMC-sponsored transactions are effectively identified, assessed and managed:

  – International Capital Market Association Green Bond Principles 2021

  – International Capital Market Association Social Bond Principles 2021

  – International Capital Market Association Sustainability Bond Guidelines 2021

» All the loans in the portfolio have been screened by HKMC before their acquisition for compliance with HKMC's SGS framework. HKMC will apply this framework on an ongoing basis to its assessment and monitoring of the portfolio.

Key characteristics

Exhibit 2
Asset characteristics

Portfolio Metrics	Identified Pool*	Project loans sub-pool	Corporate infrastructure loans sub-pool**
Portfolio Par Amount	$404,781,966	$327,231,966	$77,550,000
Weighted Average Rating Factor (WARF) before notching adjustment***	772	582	1,571
Weighted Average Rating Factor (WARF) after notching adjustment***	936	785	1,571
Weighted Average Recovery Rate (WARR)	64%	70%	39%
Weighted Average Spread (WAS)****	2.33%		
Weighted Average Life (WAL)	About 6 years		
Moody's Asset Correlation	21.5%		
Key Asset Types			
Participation Loan	18.0%		
Long-Dated Assets	Nil		
Key Party			
Collateral Manager	The Hong Kong Mortgage Corporation Limited		
Sponsor	The Hong Kong Mortgage Corporation Limited		

*The identified portfolio represents the assets in the portfolio at closing, including projects loans sub-pool and corporate infrastructure loans sub-pool.
**This includes $15 million of corporate guaranteed project loans.
***A two-notch haircut to the largest CE on material pool exposures that collectively represent up to 30% of the total portfolio was applied in accordance with the Moody's Approach to Using Credit Estimates in Its Rating Analysis cross-sector rating methodology. Credit estimate rating factors reflect credit estimates without consideration of the higher recovery rate assumed for covered exposures.
****The WAS over the applicable benchmark rate of each respective loan is around 2.33% as of the expected closing date. About 32% of the portfolio are currently linked to USD-Libor, and the remaining are linked to either term SOFR or daily SOFR compounding in arrear.
Source: Moody's Investors Service

Exhibit 3
Securitization structure characteristics

Key Dates	
Closing Date	30 May 2023
Latest Effective Date	Closing date
Payment Date and Payment Frequency	21 April and 19 October of each year
End of Non-Call Period	19 October 2026
End of Replenishment Period	19 October 2026
Legal Final Maturity	19 October 2044
Key Parties	
Issuer	Bauhinia ILBS 1 Limited
Collateral Manager	The Hong Kong Mortgage Corporation Limited
Trustee	DB Trustees (Hong Kong) Limited
Transaction Administrator	Deutsche Bank AG, Hong Kong Branch
Account Bank	Deutsche Bank AG, Hong Kong Branch
Joint Global Coordinators	ING Bank N.V., Singapore Branch, MUFG Securities Asia Limited, Standard Chartered Bank
Class	**Effective Subordination(%)**
A1 Notes	26.0
A1-SU Notes	26.0
B Notes	17.0
C Notes	12.5
D Notes	10.0

Source: Joint Global Coordinators

Asset description

The transaction is backed by a portfolio of 35 bank-syndicated senior secured project finance and corporate infrastructure loans to 25 projects in various countries in Asia-Pacific, the Middle East, and South America at closing.

The collateral manager selected the identified portfolio for an amount equal to $404.78 million, the target initial par amount of the portfolio. Of the $404.78 million portfolio, about $6.17 million relate to undrawn commitment amount, which is deposited in the issuer's bank account at closing, pending to be drawn by the borrowers in a few months.

Assets as of the closing date

Target initial par amount

The transaction's target initial par amount represents the aggregate par amount of assets in the initial portfolio.

Asset acquisition guidelines

Identified portfolio

The exhibits below provide information about the identified portfolio. All the loans in the identified portfolio are denominated in US dollars. About 32% of the initial target portfolio is interest linked to USD-Libor, and the remaining 68% is linked to either term SOFR or daily SOFR with compounding in arrear. All the loans in the portfolio pay interest either quarterly or semiannually.

None of the loans in the identified portfolio are rated by us. We have undertaken credit estimates for each of them, assessing some of them at the investment-grade level (our credit estimate rating factor of 610 or lower) and some of them at the non-investment-grade level (our credit estimate rating factor of 940 or higher).

Exhibit 4

Credit estimate rating factor distribution of the identified portfolio

Percentage relative to the identified portfolio's par amount

Credit Estimate Rating Factor	% of pool (after notching adjustment)* **	% of pool (before notching adjustment)**
10-40	2.5%	2.5%
70-180	25.9%	33.8%
260-610	24.6%	20.0%
940-1766	29.7%	38.1%
2220-3490	17.4%	5.6%
Total	**100.0%**	**100.0%**

*A two-notch downward adjustment was applied to the largest credit estimates representing up to 30% of the total portfolio in accordance with the Moody's Approach to Using Credit Estimates in Its Rating Analysis cross-sector rating methodology.
** Credit Estimate Rating Factors reported in this report reflect credit estimates without consideration of the higher recovery rate assumed for covered exposures.
Percentages quoted in the table are rounded numbers, hence not adding to 100%.
Source: Moody's Investors Service

Exhibit 5
Sector and subsector distribution of the identified portfolio
Percentage relative to the identified portfolio's par amount

Sectors and Sub-sectors	% of Identified Pool	Project loans sub-pool	Corporate infrastructure loans sub-pool
Oil/Gas and Commodities			
LNG	17.2%	13.5%	3.7%***
Oil	14.7%	14.7%	
Power Generation Non-Renewables			
Power- Electricity Contracted (Coal/Gas)*	20.7%	20.7%	
Power Generation Renewables			
Power-Renewables: Solar**	11.8%	11.8%	
Power-Renewables: Wind	3.0%	3.0%	
Power-Renewables: Hydro	1.3%	1.3%	
PPP/PFI			
Schools/Education	15.8%	15.8%	
Regulated Assets/Utilities			
Telecommunications	11.7%		11.7%
Gas distribution or transmission	3.7%		3.7%
Total	**100.0%**	**80.8%**	**19.2%**

*There is no coal-fired power generation project in the Power-Electricity Contracted (Coal/Gas) category of the identified portfolio.
**There is a project within the Power-Renewables: Solar category that includes both solar- and wind-based power generation capacity.
***This represents corporate guaranteed project loans.
Percentages quoted in the table are rounded numbers, hence not adding to 100%.
Source: Moody's Investors Service

Exhibit 6
Distribution of the identified portfolio by country of risk
Percentage relative to the identified portfolio's par amount

Country of Project	Foreign Currency Country Ceiling	Foreign Currency Country Rating	% of Identified Pool
Australia	Aaa	Aaa	5.63%
New Zealand	Aaa	Aaa	7.36%
United Arab Emirates	Aaa	Aa2	20.46%
United Kingdom	Aaa	Aa3	3.37%
Qatar	Aa1	Aa3	10.84%
China	Aa1	A1	14.35%
Saudi Arabia	Aa2	A1	7.66%
India	A3	Baa3	11.75%
Indonesia	A3	Baa2	2.06%
Brazil	Baa2	Ba2	11.56%
Vietnam	Ba1	Ba2	3.01%
Bangladesh	Ba3	Ba3	1.24%
Guyana	Unrated	Unrated	0.72%
Total			100.00%

Country of risk in this table has not factored in credit enhancement or cover policy.
Percentages quoted in the table are rounded numbers, and may not add to 100%.
Source: Moody's Investors Service

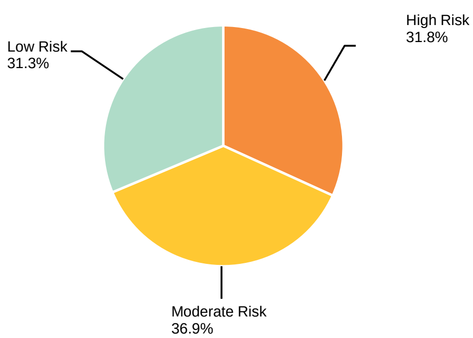
ESG - Environmental considerations

None of the underlying assets in the transaction's identified portfolio are in sectors that have been assigned an environmental score of "very high risk." [1] The exhibits below show the exposure of the underlying issuers to each environmental sector risk level (1) in the identified portfolio of this deal; and (2) of all outstanding US CLOs rated by us.

Exhibit 7

Environmental risk scores and high risk industries

Identified portfolio level



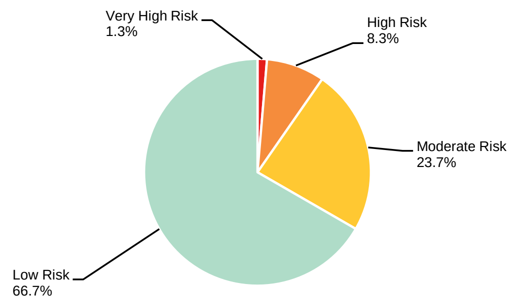
"High risk" industry exposures: Oil and Gas - Midstream Energy.

Source: Moody's Investors Service

Exhibit 8

Environmental risk scores

All US CLOs rated by us



"Very high risk" industry exposures (five largest): Chemicals - Commodity; Oil and Gas - Refining and Marketing; Oil and Gas - Independent Exploration and Production; Mining - Metals and Other Materials, excluding Coal; Coal Mining and Coal Terminals.

"High risk" industry exposures (five largest): Chemicals - Specialty; Oil and Gas - Midstream Energy; Airlines; Surface Transportation and Logistics; Unregulated Utilities and Power Companies.

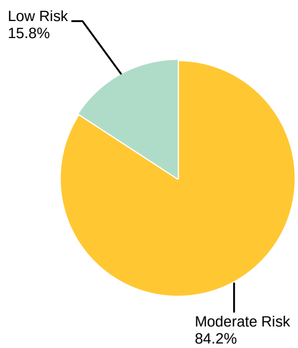
Source: Moody's Investors Service

As explained in our environmental credit risk heat map, our environmental sector classifications are broadly based on our rating methodologies. In addition, our overall sector environmental risk scoring scale includes scores of "very high risk", "high risk", "moderate risk" and "low risk."

ESG - Social considerations

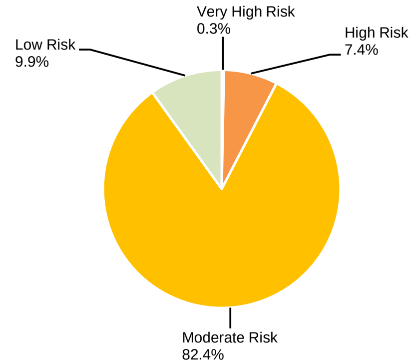
In terms of pandemic-related risks, a large majority of the underlying assets in the transaction's identified portfolio are categorized within sectors that have been assigned a social score of moderate risk.[2] The exhibits below show the exposure of the underlying issuers to each social sector risk level (1) in the CLO's identified portfolio; and (2) of all outstanding US CLOs rated by us.

Exhibit 9
Social risk scores and moderate risk industries
Identified portfolio level



"Moderate risk" industry exposures: Power Generation Projects, Oil & Gas - Midstream Energy, Telecommunications, Telecommunications.
Source: Moody's Investors Service

Exhibit 10
Social risk scores
All US CLOs rated by us



"Very high risk" industry exposures (four largest): Oil and Gas - Refining and Marketing; Oil and Gas - Independent Exploration and Production; Coal Mining and Coal Terminals; Tobacco.
"High risk" industry exposures (five largest): Chemicals - Commodity; Pharmaceuticals; Gaming and Gambling; Unregulated Utilities and Unregulated Power Companies; Construction.
Source: Moody's Investors Service

As explained in our publication ESG – Global: Heat map: Social considerations, our social sector classifications are broadly based on our rating methodologies and reflect only entities we rate within a given sector. In addition, our overall sector social risk scoring scale includes scores of "very high risk", "high risk", "moderate risk" and "low risk".

Collateral manager and sponsor

The Hong Kong Mortgage Corporation Limited (HKMC or the collateral manager) (rated Aa3/P-1) is the collateral manager of this transaction. This transaction is HKMC's pilot sponsored transaction. HKMC invested in the subordinated notes issued by the issuer and provided a sponsor loan to the issuer at closing to support the liquidity of the issuer in meeting interest payments on the rated notes on the first payment date.

HKMC was established in March 1997 and is wholly owned by the Government of the Hong Kong Special Administrative Region of the People's Republic of China through the Exchange Fund, a fund under the control of the Financial Secretary of the Hong Kong Government as provided under the Exchange Fund Ordinance.

HKMC, as the collateral manager for the transaction, selected the initial portfolio of loans, carried out credit review and approval process, including financial, industry, technical, insurance, environmental and social and legal due diligence to understand the technical, legal, commercial and financial considerations for each of the loan, as well as the current operating or construction status of each project.

During the transaction period, HKMC will be responsible for identifying new assets for the issuer to purchase following the receipt of unscheduled principal collections, on cancellation or expiry of the availability period in connection with undrawn loan commitments and proceeds from the sale of assets during the replenishment period; monitoring the credit performance of each loan, including credit reviews, covenant monitoring, processing of waivers and other notices, maintenance of credit estimates; identifying credit-risk assets, and deciding whether to sell credit-risk, defaulted assets, or non-eligible sustainability assets during the transaction life; and ensuring that the transaction is in compliance with its contractual obligations and periodic reporting, along with the transaction's trustee and transaction administrator.

The exhibit below details the key attributes of the collateral manager.

Exhibit 11
Collateral manager details

Attribute	Collateral Manager
Management Entity	The Hong Kong Mortgage Corporation Limited
Infrastructure projects under management	Over 45 infrastructure projects with commitments amounting to approximately US$1.51 billion
CLO Team	Five management members of the IFS division team will be dedicated to CLO transaction
Number of investment professionals	Six IFS Collateral Manager Committee voting members
Average Number of Years of Experience	Over 20 years
Number of CLOs Currently Managed	Nil
Number of Obligors Covered by Credit Analysts	10-15
Size of operation team	Not disclosed

Source: HKMC

Assets after the closing date

The portfolio is not likely to be actively traded during the entire transaction life.

The collateral manager may direct the issuer to sell defaulted assets, certain credit-risk assets, non-eligible sustainability assets or assets that are subject to tax event.

The sale of credit-risk assets and non-eligible sustainability assets are subject to the satisfaction of all OC and interest coverage (IC) tests (the coverage tests).

The aggregate principal amount of credit-risk assets that are sold within 12 months cannot exceed 30% of the initial portfolio par amount. Any further sale of credit-risk assets would be subject to it not resulting in a reduction or withdrawal of the then outstanding rating of each class of the rated notes.

The sale of non-eligible sustainability assets is only allowed during the reinvestment period and is subject to the ability of the collateral manager to identify eligible sustainability assets that pass the reinvestment criteria.

The trading of assets at the collateral manager's discretion is not allowed.

Undrawn loan commitments

In the identified portfolio, project loans relating to two projects currently stand to be partially disbursed. The undrawn loan amount aggregates to about $6.17 million or 1.5% of the portfolio size. The drawdowns are scheduled to take place across different months by September 2023. An amount equal to the aggregate of all undrawn loan amount was held in an account in the name of the issuer to ensure it has sufficient liquidity to fullfil its lending obligation to these loans.

Before the loans being fully drawn, the issuer will earn less interest on the portfolio. For the first notes payment period, the issuer will make whole any shortfall from meeting rated notes' interest payments by drawing on a $3.5 million cash reserve which is fully funded by the sponsor loan at closing. The issuer will repay the sponsor loan from the first notes payment date onward.

Upon cancellation or expiry of the availability period for each undrawn loan amount, the collateral manager has the option to either replenish the portfolio, during the replenishment period in accordance with the replenishment criteria, or repay the senior-most outstanding class of notes.

Replenishment period

There is a three-year replenishment period in this transaction, which begins on the closing date. During the replenishment period, the collateral manager may direct the issuer to use unscheduled principal collections, on cancellation or expiry of the availability period in connection with undrawn loan amount and proceeds from the sale of assets to purchase new assets, provided no event of default is happening, all coverage tests are satisfied and the proposed asset purchase does not result in a reduction or withdrawal of the then outstanding rating of each class of rated notes. The collateral manager would have a period of 45 business days to identify eligible investment. All new purchased assets must have a public rating or a credit estimate assigned by us.

During the replenishment period, all scheduled asset collections, and if no eligible investment can be found, all unscheduled collections, upon cancellation or expiry of the availability period for each undrawn loan amount and sale proceeds, will be used to amortize the rated notes sequentially according to the principal priority of payment.

Amortization period

The transaction does not permit any reinvestment or asset purchase after the replenishment period. Scheduled and unscheduled principal collections and proceeds from the sale of assets will be used to amortize the rated notes sequentially during the amortization period.

Asset analysis

Primary asset analysis

Modeling

Our CDOROM™ and CDOEdge™ models are the principal models that we use to rate this transaction. We used a loan-by-loan Monte Carlo simulation framework in Moody's CDOROM™ to model the portfolio default distribution and asset type specific recovery assumptions for this project finance CLO transaction.

We assumed three years of recovery delay for the project finance loans and 1.5 year of recovery delay for the corporate loans. In the cash flow model, for each tranche, Moody’s used a separate fixed recovery rate assumption for each sub-pool (project finance loans and corporate loans) together with the default distribution generated by CDOROM. For the project finance loan sub-pool, we determined the certainty equivalent fixed recovery rate for each tranche.

The country ceiling event risk is modeled in two steps in CDOROM™. In the first step, we simulate whether a country ceiling event occurs. All loans with projects domiciled in countries where country ceiling events are simulated to occur would be simulated to default in the model.

In the second step, for loans with projects in countries where country ceiling events are simulated not to occur in the first step, we simulate whether the loans default.

For loans under participation agreements, the loans would default if either the loan or the counterparty to the participation agreement is simulated to default in CDOROM™.

The identified portfolio is used in our initial rating analysis because the portfolio is likely to be fully acquired at closing and is not likely to be actively traded by the collateral manager, with no discretionary trading. Furthermore, the credit characteristics of the portfolio will be reassessed by us at the time we receive each new asset purchase proposal from the collateral manager.

We note the following portfolio characteristics of the identified portfolio.

Exhibit 12

Base-case modeling assumptions

Attribute	Metric
Portfolio Par Amount	404,781,966
WARF (after credit estimate adjustment)	936
Asset correlation of the portfolio	21.5%
WAS*	2.33%
Weighted average mean recovery rate of project loans sub-pool	70%
Weighted average recovery rate of corproate infrastructure loans sub-pool	39%

*The WAS over the applicable benchmark rate of each respective loan is around 2.33% as of the expected closing date. About 32% of the portfolio are currently linked to USD-Libor and the remaining are linked to either term SOFR or daily SOFR with compounding.
**Corporate guaranteed project loans are included in the corporate infrastructure loan sub-pool.
Source: Moody’s Investors Service

Additional asset analysis

Notch-down adjustment on credit estimates

None of the loans in the identified portfolio are rated by us. We will assign a credit estimate to all assets before such assets can be included in the portfolio.

The loans related to the largest credit estimates, representing up to 30% of the pool, will be subject to a two-notch haircut. This two-notch haircut adjustment is primarily to account for the unmonitored nature of credit estimates (hence, credit estimates are subject to potentially higher volatility than ratings) and also the fact that credit estimates are typically assigned based on more limited information than for ratings.

We expect to review the credit estimates as the collateral manager requests and provides updated information to us at least once every 12 months from each of the last assignment date.

Adjustment on default probability on project finance and infrastructure loans

We apply a default probability adjustment on the loans so that along with applying high recovery assumptions of the loans, the modeled expected loss would be equal to the idealized expected loss commensurate with the credit estimate of the loans.

For instance, for project finance and infrastructure loans with a mean recovery rate assumption of 75%, the default probability stress is 120%, and for project finance and infrastructure loans with a mean recovery rate assumption of 65%, the default probability stress is around 57%.

Our ratings or credit estimates of the loans address the expected loss of the loans, which quantitatively is the product of default probability and loss severity of the loan. The adjustment on the modeled default probability is to counterbalance our high mean recovery rate assumptions (that is, low severity) on the project finance and infrastructure loans such that the expected loss of the loans represented by the ratings or credit estimates will be maintained.

High project concentration

The portfolio is high concentrated in a few sectors with 35 loans across 25 projects only. The exposure to the largest obligor group, in the power generation renewables sector, comprises about 11.8% of the portfolio, greater than the subordination of the Class D notes. There are six other projects which each of them comprises between 6% and 8% of the portfolio. More than 70% of the portfolio comprises projects of which each constitutes more than 3% of the portfolio at closing.

We correlate loans at 100% for those loans that relate to the same project or same sponsor so that when one of them defaults, all of them would default in the same simulation.

In our analysis, we considered several stress scenarios assuming default of the largest obligor group or higher asset correlation.

High sector concentration

The identified portfolio of loans is concentrated in certain sectors such as power generation non-renewables (20.7%) and renewables (16.1%), and oil, gas and commodities (32.0%). Credit quality deterioration in a single sector may have an outsized negative impact on the transaction. External credit support and notes' subordination are key mitigants to this risk.

We considered other stress scenarios assuming generally higher asset correlation across the entire pool or lower recovery rate assumptions for a few projects. We determined that the potential rating volatility in the notes under these stress scenarios was acceptable.

High country risk

The underlying projects are exposed to risk in various countries in the Asia-Pacific, the Middle East, and South America. Most of these countries have a non-Aaa FCC assigned by us (see Exhibit 6). Of total portfolio exposure, 4% is to projects located in countries with FCC at non-investment grade and 0.7% of the portfolio is to a project located in a country not rated by us. A further 25% of the portfolio is to projects located in countries with foreign-currency country ceilings in the single-A and Baa range.

We take the country risk into account in our quantitative analysis. Geographical diversification, external credit support and notes' subordination are key mitigants to this risk. Each rated notes have sufficient subordination to protect them from risk to any single country, which has country ceiling below the rating of the respective class of notes.

High loan participation exposure
The issuer has acquired indirect exposures for about 18% of identified portfolio by entering into participation agreements with HKMC or the lenders of record of those loans, instead of purchasing them directly.

Therefore, the transaction is exposed to the counterparty risk of the lenders and HKMC, the risk that they do not comply with its covenants under the participation agreements and the operational risk of relying on them to pass on the cash flow of the loans to the transaction.

We take this counterparty risk into account in our quantitative analysis.

Long recovery period for defaulted loans
The recovery period following the default of project finance and infrastructure loans may span several years because the liquidity of the trading market in Asia and the Middle East may be low and the workout may take a long time. The collateral manager is not obliged to direct the issuer to sell the defaulted loans by a certain date.

In our default study research (Default and recovery rates for project finance bank loans, 1983-2021), we observed a longer recovery period for defaulted bank project finance and infrastructure loans in Asia and the Middle East, compared with that in North America and Western Europe. Default history in the Middle East has been limited, with only 10 defaults in the study data set; however, we do observe long recovery periods in those instances.

In our analysis, we have assumed three years of recovery delay for the project finance loans and 1.5 year of recovery delay for the corporate loans.

Some projects are under construction
About 12.5% of the portfolio relates to two projects that are in advanced stage of construction. The credit estimate of these two project loans has considered the construction risk.

Common off-takers or guarantors' risks
Certain underlying projects involve common off-takers or guarantors, thus increasing the asset correlation of the portfolio. We take into account this additional asset correlation in our quantitative analysis.

Withholding tax on some assets
Withholding tax applies to about 4% of the identified portfolio of the loans either because of the incorporation of the issuer or the lender of record of loans under a participation agreement. We model the net interest earnings on the identified portfolio in our quantitative analysis.

External credit support
About 3.8% of the identified portfolio benefits from external credit support such as commercial risk insurance (covered loans) provided by export credit agencies or insurers such that the issuer (or lender of record in the case of a loan under a participation agreement) will be able to recover losses from the cover providers.

In our analysis of credit estimates for covered loans, we take into account the terms and coverage of the credit support arrangements. We use a higher mean and lower standard deviation as the recovery assumptions of the covered portion, to reflect our view that these exposures generally have a higher recovery prospect.

No long-dated asset and restriction of asset maturity amendment
There is no long-dated asset in the identified portfolio. The collateral manager may not consent to amendments that extend the maturity of any asset beyond the legal maturity date of the notes. In addition, the collateral manager may not consent to an asset maturity amendment for a total principal par amount of assets exceeding 10% of the initial portfolio par amount during the transaction life. These factors reduce the risk that the collateral manager would need to liquidate assets remaining at the transaction's maturity date (long-dated assets).

Collateral manager and sponsor assessment
The CLO transaction will be managed by the Infrastructure Financing and Securitisation Division (IFS) of HKMC. We had an operations review meeting with HKMC in March 2023. The IFS division is supported by other business functions of HKMC, including corporate

risk management, legal and compliance, treasury, financial control and treasury functions. We view its staffing, experience in the infrastructure loan market, operational systems and controls as adequate to support its CLO platform.

Securitization structure description

The issuer issued several classes of notes that receive semiannual interest payments and certain principal payments following asset scheduled payments, prepayments and sale of certain assets, in order of seniority. The transaction structure allows for the collateral manager to consider a change in payment frequency of the notes from semiannual to quarterly if the aggregate principal balance of the portfolio that constitutes quarterly or less frequently paying obligations is greater than or equal to 85% of the portfolio.

In addition, the issuer also issued one unrated class of subordinated notes to HKMC that receives only residual interest and principal payments.

We measure the credit risk of the notes using our CDOROM™ and CDOEdge™ models; the latter model incorporates both the transaction's structural features and asset characteristics.

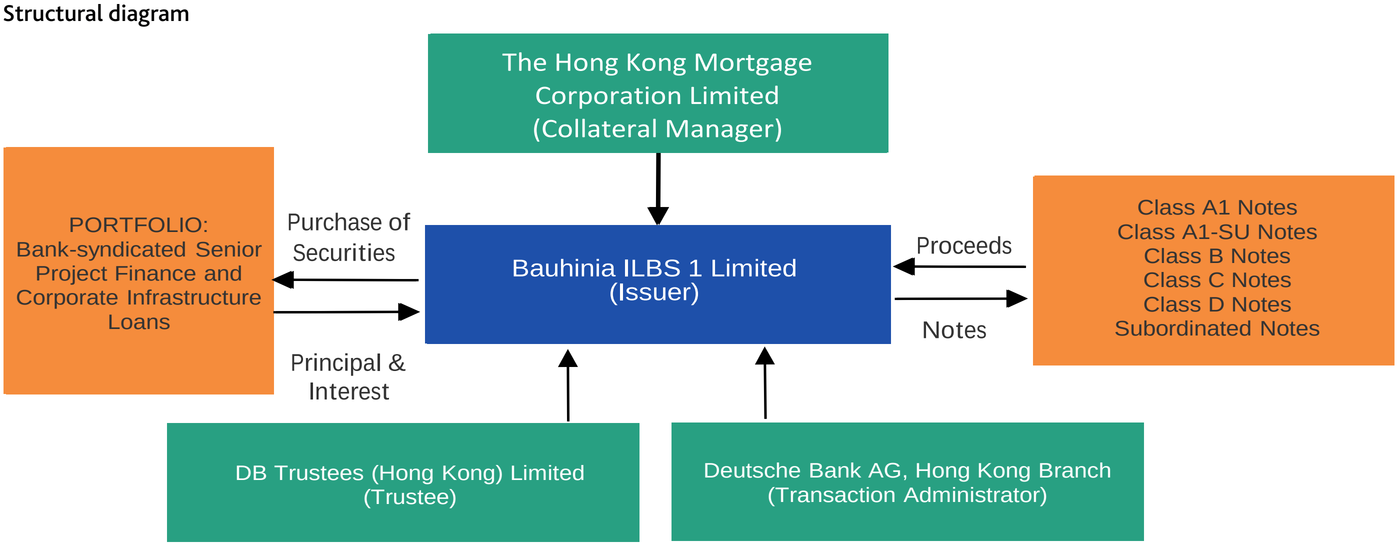
This transaction is structured using a bankruptcy-remote special-purpose entity incorporated in Hong Kong that issues liabilities as listed in Exhibit 1.

The proceeds from the issuance were invested in loans that generate cash flow from interest and principal, as we described in the "Asset description" section above. The cash flow is distributed in accordance with the transaction's priority of payments, subject to the coverage tests.

Structural diagram

The exhibit below shows the transaction's key parties and cash flow.

Exhibit 13
Structural diagram



Source: Moody's Investors Service

Detailed description of the structure

Priority of payments

This transaction's payment waterfall is consistent with that of a typical CLO. This transaction pays the notes sequentially in both the interest and principal waterfalls, although pro rata among Class A1 and A1-SU notes. Both waterfalls include coverage tests (see the "Appendices - Priority of payments" for interest and principal waterfall details).

Coverage tests

Exhibit 14
OC and IC tests

Coverage Tests	Trigger Level	Initial level
Class A/B OC Test	115.5%	120.4%
Class C OC Test	110.3%	114.2%
Class D OC Test	108.1%	111.1%
Class A/B IC Test	110.0%	n/a
Class C IC Test	107.5%	n/a
Class D IC Test	102.5%	n/a

IC tests are applicable starting from the second notes' payment date.
Source: Joint Global Coordinators

OC test: OC tests, present in all CLOs, provide protection for the CLO's notes. If the OC level for a particular class or several classes of notes falls below the OC trigger for that class, the deal diverts cash flow to repay the senior-most outstanding class of notes until the breached OC ratio meets the trigger level.

Common to most CLOs, excess Caa assets are carried at the lower of their market values and our mean recovery rate assumption in the calculation of the OC ratios. Excess Caa assets are those Caa securities whose aggregate principal balance exceeds 10% of the portfolio's principal balance.

IC test: IC tests, which measure a CLO's excess interest cash flow, also provide protection for the CLO's notes. If the IC level for a particular class or several classes of notes falls below the IC trigger for that class, the deal diverts cash flow to repay the senior-most outstanding class of notes until the breached IC ratio meets the trigger level.

Security interest, bankruptcy remoteness and safeguards against involuntary bankruptcy
Security interest: With minor exceptions, the assets of the transaction are pledged to the trustee for the benefit of the noteholders. The security interest granted can provide noteholders with additional protection and a greater degree of control in cases where difficulties have developed with the transaction's structure.

Bankruptcy remoteness: The issuer is a special-purpose entity, has no prior operating history, and is established for the limited purposes of acquiring the assets, issuing the notes and performing certain related activities. Given this typical legal structure, we are able to analyze this transaction as bankruptcy remote.

Safeguards against the transaction's involuntary bankruptcy: The transaction incorporates certain safeguards against the issuer's involuntary bankruptcy.

Note redemption
The issuer can effect an optional redemption of all rated notes in whole if the collateral manager confirms with the trustee in writing before selling the portfolio that there will be sufficient proceeds to fully redeem all of the notes, and if sufficient sales proceeds to redeem the notes are received by the issuer at least one business day before the optional redemption date. If any of these conditions are not met, the issuer will cancel the optional redemption, and such a cancellation is not an event of default of the notes.

Securitization structure analysis

Primary structural analysis

Expected loss and modeling analysis

We expect the losses on the rated notes to be consistent with our benchmark rating targets. This expectation is based on our analysis using our CDOROM™ and CDOEdge™ models.

We apply the Monte Carlo simulation framework in CDOROM™ to model the portfolio loss distribution for this transaction. The simulated defaults and recoveries for each of the Monte Carlo scenarios define the pool's loss distribution.

CDOEdge™ is a cash flow model. In this cash flow model, we modeled portfolio amortization, interest collections, portfolio default and recoveries to estimate the expected losses of each class of notes.

For each tranche, we used a separate fixed recovery rate assumption for each sub-pool (project finance loans and corporate infrastructure loans) together with the default distribution generated by CDOROM. For the project finance loan sub-pool, we determined the certainty equivalent fixed recovery rate for each tranche. For corporate loans, we determined the loans fixed recovery rates for each tranche using our corporate loans recovery assumptions. We have assumed three years of recovery delay for the project finance loans and 1.5 year of recovery delay for the corporate loans and recoveries will increase at an accretion rate equal to the benchmark rate of the loan plus 1.5% per annum. This accretion rate has taken into consideration the weighted average interest margin of the identified portfolio during the transaction term, and the benchmark rate of the loans could be transitioned to SOFR from USD-Libor as USD-Libor ceases to be published after June 2023.

The CDOEdge™ model incorporates various scenarios for default timing and interest rate paths, and allocates the cash flow arising from the portfolio in accordance with the transaction's documentation.

We fully describe our approach to modeling and rating this transaction in Moody's Global Approach to Rating Collateralized Loan Obligations and Project Finance and Infrastructure Asset CLOs Methodology.

Additional structural analysis

OC analysis

Remote likelihood of an OC-based event of default: We view the occurrence of an OC-based event of default and the associated liquidation of the portfolio as unlikely. The event of default par ratio trigger is set at 102.5%, below the initial level of 120.5%. The calculation, which is based on the ratio of the portfolio's par amount to the outstanding principal amount of the Class A1 and A1-SU notes, incorporates haircuts for defaulted assets, but not for Caa or deep-discount assets. The portfolio's par amount includes without duplications, amounts on deposit in the issuer's principal account and principal fixed deposit account. Portfolio liquidation following an event of default based on breach of the trigger requires consent from either a supermajority of the controlling class or a supermajority of each class of notes, voting separately.

No currency mismatch risk

No currency mismatch: As the target closing portfolio and the notes are denominated in US dollars, there is no currency mismatch risk in this transaction at closing.

Floating rate basis mismatch risk

Floating rate basis mismatch risk: The issuer is exposed to floating rate basis mismatch as all the rated notes interest payments are linked to SOFR, while about 32% of the initial target portfolio are still linked to USD-Libor, and the remaining about 68% are linked to SOFR. As USD-Libor will cease on 30 June 2023, the benchmark rate of loans that are currently USD-Libor may transition to other floating rate indices such as term SOFR or daily non-cumulative compounded SOFR or costs of funds of the lenders. In our analysis, we considered zero credit adjustment spread except for loans that have executed terms for USD-Libor transition.

Note redemption and cancellation analysis

Note redemption: The issuer can effect an optional redemption of the notes, which relies on the collateral manager's certification that there will be sufficient proceeds to fully redeem all of the notes.

Although many other CLOs apply haircuts to the assets' market values when determining the sufficiency of such proceeds, thereby providing a buffer against market value declines, this transaction does not incorporate such haircuts. Therefore, the transaction could face a situation in which there are insufficient liquidation proceeds to redeem the notes in full if a large decline in asset prices occurs during the redemption process.

A mitigant to these risks is the fact that the issuer can cancel the optional redemption, and such a cancellation does not constitute an event of default under the terms of the transaction.

Note cancellation: No notes may be surrendered in this transaction.

ESG - Governance considerations

This transaction's governance risk is low and is typical of other CLOs in the market. As described in our publication Governance considerations are a key determinant of credit quality for all issuers, we examine five governance considerations in our analysis: financial strategy and risk management; management credibility and track record; organizational structure; board structure, policies and procedures; and compliance and reporting. The transaction's structure, documentation and characteristics of the transaction parties, as described below, mitigate governance risks.

1. Financial strategy and risk management – The transaction limits the issuer's permitted activities as described in the "Securitization structure description - Detailed description of the structure - Bankruptcy remoteness" section above.

2. Collateral manager's credibility and track record – Collateral manager characteristics are described in the "Asset analysis - Additional asset analysis - Collateral manager and sponsor assessment" section above.

3. Organizational/transaction structure – The issuer is structured as a bankruptcy-remote special-purpose entity and includes an alignment of interests among the transaction parties, as detailed in the "Securitization structure description - Detailed description of the structure - Security interest, bankruptcy remoteness and safeguards against involuntary bankruptcy" section above.

4. Board structure – The issuer has an independent director. In addition, the transaction has an independent trustee and transaction administrator, as outlined in the first paragraph of the "Securitization structure description" section above.

5. Compliance and reporting – The transaction's consistency and quality of financial reporting in the form of quarterly investor reports is described in the "Asset description - Asset acquisition guidelines - Collateral manager and sponsor" section above.

Legal structure analysis

Safeguards against the issuer's bankruptcy: The transaction includes provisions that we view as helpful to protect it against bankruptcy.

Methodology and monitoring

Rating methodologies

Project Finance and Infrastructure Asset CLOs Methodology

To access this report, click on the link above. Note that this reference is current as of the date of publication of this report and that a more recent report may be available. All research may not be available to all clients.

Monitoring

We will monitor the ratings on an ongoing basis. We will announce and disseminate any subsequent changes in the ratings on www.moodys.com.

Appendices

Modeling scenarios

Apart from considering the characteristics of the identified portfolio in determining our base-case modeling assumptions, we considered additional sensitivity analysis, including the following:

1. Change the credit estimate of the most significant loan exposures that relate to the same group of companies or projects to Caa2.
2. Change the credit estimate of the second most significant loan exposures that relate to the same group of companies or projects to Caa2.
3. Apply two notches of downward adjustment to the rating of HKMC as the participation agent.
4. Increase correlations for all power-electricity projects to 60% and all oil and LNG projects to 60%.
5. Adjust the credit estimates of the loans in the power generation (non-renewables), and oil and gas sectors down by one notch.

Priority of payments

Application of interest proceeds and sponsor loan

1. Taxes and fees
2. Trustee fees and expenses, subject to a cap
3. Administrative expenses, subject to a cap
4. Top-up fee reserve account, subject to a cap
5. Senior collateral management fees
6. Pari passu and ratably:
    a. Class A1 notes interest
    b. Class A1-SU notes interest
7. Interest on Class B notes
8. Class A/B coverage tests
9. Interest on Class C notes
10. Class C coverage tests
11. Deferred interest on Class C notes
12. Interest on Class D notes
13. Class D coverage tests
14. Deferred interest on Class D notes
15. Remaining trustee fees and expenses
16. Remaining administrative expenses
17. Interest on the sponsor loan
18. Principal payment to the sponsor loan on and from the first notes payment date
19. Junior collateral management fees

20. Deferred collateral manager fees
21. Interest to the subordinated notes

Application of principal proceeds

1. Steps 1 through 7 of the interest waterfall if not fully paid
2. Class A/B coverage tests
3. Interest on Class C notes if Class C notes are the controlling class of notes
4. Class C coverage tests
5. Deferred interest on Class C notes if Class C notes are the controlling class of notes
6. Interest on Class D notes if Class D notes are the controlling class of notes
7. Class D coverage tests
8. Deferred interest on Class D notes if Class D notes are the controlling class of notes
9. On a redemption date or a special redemption date, make payments on the notes in accordance with the notes' principal payment sequence
10. During the reinvestment period, to reinvest in additional assets, subject to the satisfaction of replenishment criteria, or to the principal account of the issuer pending for reinvestment at the discretion of the collateral manager
11. Make payments on the notes in accordance with the principal payment sequence
12. Deferred collateral manager fees
13. Residual to the subordinated notes

*See Moody's Clarifies Policy for the issuance of RACs (January 2012), which makes clear that the provision of a rating agency confirmation (RAC) remains entirely within our discretion, and it may be that we will not provide a RAC even if the transaction documents, to which we are not a party, require it.

Sources used in this report

The sources we used in preparation of this report include:

» Moody's Investors Service

» Information from the Joint Global Coordinators

» Information from the collateral manager

» CLO's legal documents

Endnotes

1 See ESG – Global: Environmental risk heat map: Updates to risk assessments for certain sectors, 10 June 2022, which describes our overall sector environmental risk scoring of "very high risk", "high risk", "moderate risk" and "low risk."

2 See ESG – Global: Social risk heat map: Updates to risk assessments for certain sectors, 10 June 2022, which describes our overall sector social risk scoring of "very high risk", "high risk", "moderate risk" and "low risk."

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