



Bauhinia ILBS 4

Pre-issuance Impact Report

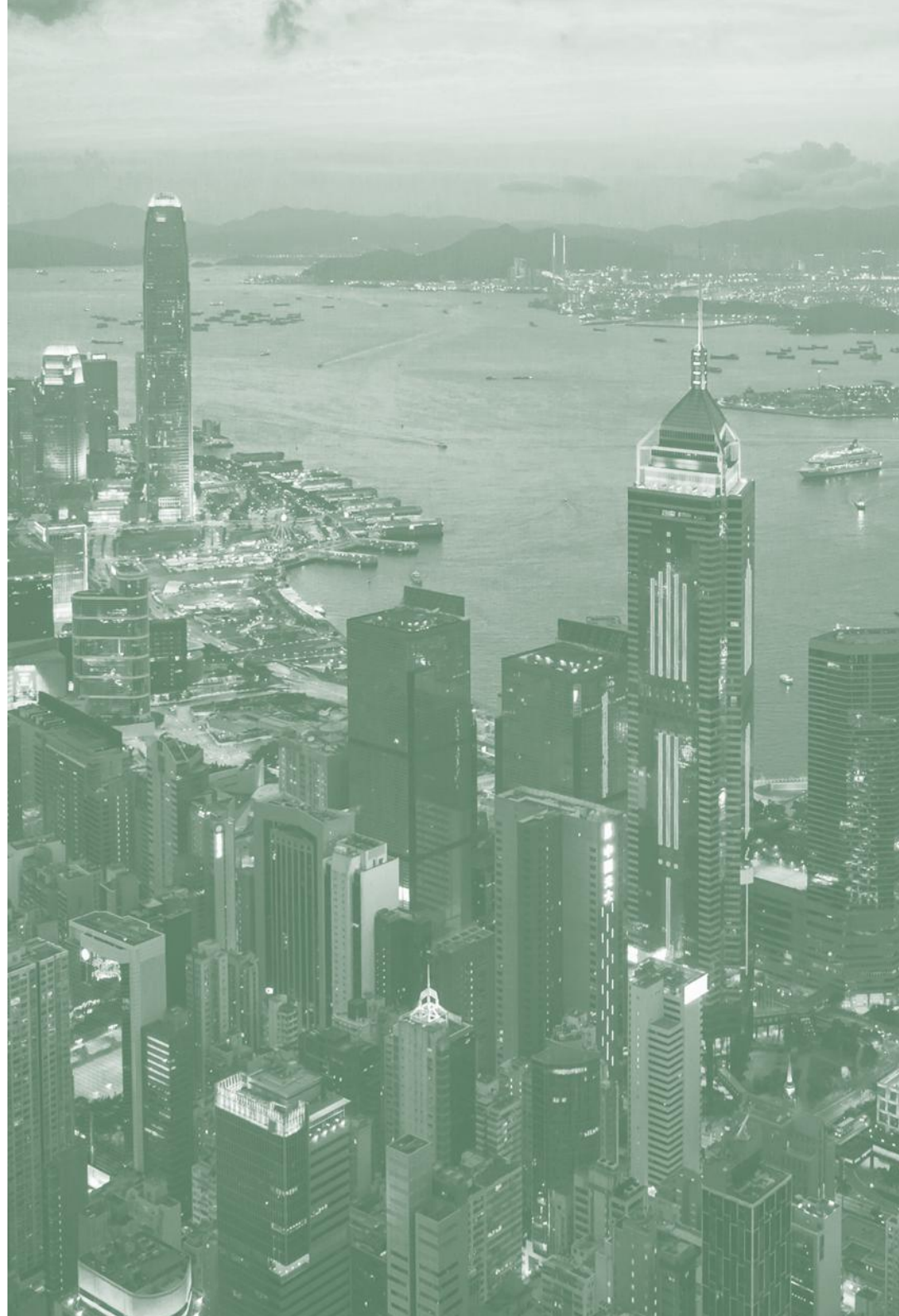
For the sustainable assets included in the Sustainability Tranche
of the Bauhinia ILBS 4 issuance

Final Impact Assessment Dated 30 October 2026

Elaborated for



香港按揭證券有限公司
The Hong Kong Mortgage Corporation Limited





ERM – Project Consultant

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Abbreviations

ADB	Asian Development Bank
CAIDI	Customer Average Interruption Duration Index
CM	Combined Margin
CO₂e	Carbon Dioxide Equivalent
EHS	Environmental, Health and Safety
ESG	Environmental, Social and Governance
FWA	Fixed Wired Access
GEF	Grid Emission Factor
GHG	Greenhouse Gas
HKMC	The Hong Kong Mortgage Corporation Limited
ICMA	International Capital Market Association
ICT	Information and Communication Technology
IFI	International Financial Institutions
IFC	International Finance Corporation
ILBS	Infrastructure Loan-Backed Securities
MW	Megawatt
MWh	Megawatt-hour
OECD	Organisation for Economic Co-operation and Development
OM	Operating Margin

PCAF	Partnership for Carbon Accounting Financials
PUE	Power Usage Effectiveness
PV	Photovoltaic
SDG	Sustainable Development Goals
SEHK	The Stock Exchange of Hong Kong Limited
SPO	Second Party Opinion
SPV	Special Purpose Vehicle
TRAI	Telecom Regulatory Authority of India
UAE	United Arab Emirates
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1 About this Report

This report was prepared by Environmental Resources Management (S) Pte Ltd (“ERM”) to provide details of the Bauhinia ILBS 4 issuance and the composition of its Sustainable Asset Portfolio as of the date of issuance, which comprises companies and projects from several countries that are eligible and in line with The Hong Kong Mortgage Corporation Limited’s (“HKMC”) Social, Green and Sustainability Financing Framework (“Framework”), which was first published by HKMC in September 2022 and further updated in August 2025, available [here](#).

The Bauhinia ILBS 4 issuance and its sustainability tranche are managed in accordance with the Framework, which is a structured approach that outlines how HKMC can raise funds through financial instruments like bonds or loans to support projects and initiatives that deliver social, environmental, and sustainability benefits. The Framework includes criteria for selecting eligible projects, guidelines for managing the proceeds, and methods for reporting on the impact and outcomes of these projects. Its purpose is to ensure that the proceeds raised are used in a transparent and accountable manner to achieve positive social and environmental impacts.

All asset-backed securities via public issuance and private placement issued under the Framework are referred to as Sustainable Financing Instruments. Both the Framework and the infrastructure loan-backed securities (ILBS) issuance have been externally reviewed by reputable ESG consultancy firms, that have issued a Second Party Opinion (SPO) to attest credibility and impact.

1.2 About The Hong Kong Mortgage Corporation Limited

The Hong Kong Mortgage Corporation Limited (“HKMC” or “The Group”), incorporated since March 1997, is wholly owned by the Government of the Hong Kong Special Administrative Region of the People’s Republic of China (the “HKSAR Government”) through the Exchange Fund. The Group has three wholly owned subsidiaries: HKMC Insurance Limited, HKMC Annuity Limited and HKMC Mortgage Management Limited. HKMC’s mission is to promote stability of the banking sector, wider home ownership, development of the local debt market and development of retirement planning market in Hong Kong.

The Group is committed to operating and carrying on business in a responsible and sustainable manner while applying high standards of corporate governance. This commitment is embedded in the way it operates, serves its customers, accounts for its stakeholders, cares for its staff, manages its impact on the environment and contributes to its community. To formulate and implement its ESG strategy, the Group has established the ESG Committee (ESGC) to lead the Group’s sustainability efforts and oversee ESG management as part of the Group’s overall business strategy. The ESGC is responsible for reviewing, approving, and updating the Group’s ESG strategy, policies, and plans, monitoring the ESG trends and issues that are material to the Group and overseeing the implementation of the Group’s ESG strategy. It will also evaluate the performance of the Group in achieving its ESG-related goals and targets.

2. Bauhinia ILBS 4 Issuance Structure

2.1 The HKMC's Social, Green and Sustainability Financing Framework

As a public sector entity and one of the major debt issuers in Hong Kong, the HKMC launched the Framework in September 2022 (updated in August 2025), as an extended effort for the HKMC to expand and implement its sustainability strategy as an integral part of its business strategy. HKMC uses the Framework as the basis to structure and issue green, social and/or sustainability bond(s) and asset-backed securities via public issuance and private placement, to support the growth of assets or projects with environmental and/or social benefits.

HKMC structured its Framework following the four components of the ICMA Principles, a set of guidelines developed by ICMA to promote the integrity and efficiency of the international capital markets. They include the following key guidelines:

- **Green Bond Principles (GBP)¹:** Guidelines for the issuance of green bonds, which are financial instruments intended to fund projects with clear environmental benefits.
- **Social Bond Principles (SBP)²:** Guidelines for the issuance of social bonds, which aim to finance projects with positive social outcomes, such as poverty reduction or public infrastructure improvements.
- **Sustainability Bond Guidelines (SBG)³:** Guidelines for the issuance of sustainability bonds, which combine both environmental and social benefits in their project funding.

These guidelines aim to provide transparency, disclosure, and reporting standards to support the credibility and comparability of green, social, and sustainability bonds. The key principles are:

- **Use of Proceeds:** This refers to how the funds raised from the bond issuance will be allocated. For green, social, or sustainability bonds, the proceeds must be dedicated to projects that provide clear environmental or social benefits, such as renewable energy projects, affordable housing, or healthcare facilities, or to corporate financing, pure players which derive at least 90% of revenue from eligible sustainable activities under the Framework.
- **Process for Project Evaluation and Selection:** This involves the criteria and methods used to identify and select eligible projects for funding.
- **Management of Proceeds:** This pertains to how the raised funds are tracked and managed to ensure they are used exclusively for their intended purposes.
- **Reporting:** This involves providing regular updates on the use of proceeds and the status of funded projects.

¹ [Green Bond Principles June 2025.](#)

² [Social Bond Principles June 2025.](#)

³ [Sustainability Bond Guidelines June 2021.](#)

Exclusionary Criteria

In any case, the following assets shall not be eligible for the Use of Proceeds of HKMC's Sustainable Financing Instruments:

- Nuclear energy generation related assets and projects
- Weapons, gambling, and casinos
- Business activities which are prohibited by laws and regulations in HKSAR
- In addition, projects under the Infrastructure Financing and Securitisation Division will be further subject to IFS Division Environmental and Social Exclusion List, available at the website of the [HKMC – IFS Division](#).

2.2 The Issuance

The portfolio of Bauhinia ILBS 4 issuance comprises loans, bonds, and/or notes from Bauhinia ILBS 1, The Hong Kong Mortgage Corporation Limited and/or commercial banks and its notes will be listed on The Stock Exchange of Hong Kong Limited (SEHK).

As the sponsor of this transaction, HKMC sourced and constituted a loan portfolio comprising infrastructure projects across geographies and sectors, including renewable power generation, power distribution, energy efficiency, telecommunications, data centre portfolios, and education infrastructure, primarily denominated in USD. As part of the issuance, the SPV is expecting to create a sustainability tranche backed by 14 sustainable assets and aligned to the sponsor's Framework.

In addition, HKMC successfully completed three ILBS issuances in May 2023, September 2024, and October 2025. Each issuance included a sustainability tranche backed by sustainable, green, and social assets based on the Framework. Second-Party Opinions and Impact Reports have been issued by reputable ESG consultancy firms to attest to the credibility and positive impact of the sustainability tranches.

To provide information regarding the potential impact of the sustainable assets and enable investors to incorporate this impact data into their decision-making alongside other customary considerations, HKMC has commissioned ERM to assist with the Pre-Issuance Impact Report for the Bauhinia ILBS 4 sustainability tranche. This will cover:

- **Impact metrics:** Selection and preparation of relevant impact metrics, establishing the baseline and methodology.
- **Standards:** Alignment with the market practices (as recommended by International Capital Market Association and/or any other standards widely adopted by sustainable bond investors).
- Provide **calculation methodologies** to the Issuer to compute the environmental impact of its green assets and the social impact of its social assets.

An overview of the selected green and social impact metrics is also provided in Table 1 and their geographical distribution on Figure 1.

Table 1: Overview of the Sustainable Asset Portfolio and Key Impact Indicators, as of the Date of Issuance

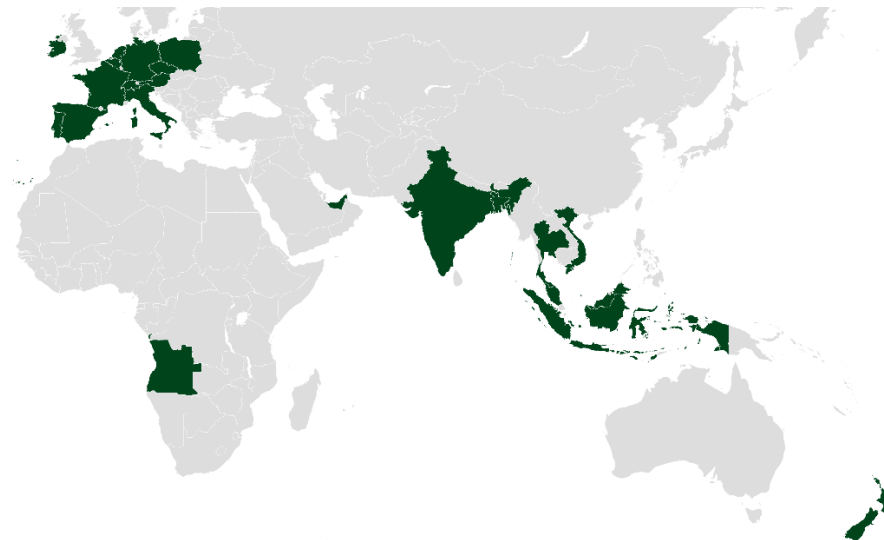
Asset Type	Eligible Category	Borrower	Eligibility Portion	Asset (Sector)	% of Bauhinia 4 Sustainability Tranche	Location	Key Impact Indicators	Performance Results	UN SDG Alignment
Green	Renewable Energy	Renewable A	100%	Solar PV	8.92%	UAE	(a) Installed renewable energy capacity (b) Estimated annual avoided emissions	(a) Confidential (b) 268,016 tCO ₂ e	 
		Renewable B	100%			Bangladesh		(a) 50 MW (b) 50,955 tCO ₂ e	
		BIM Wind Power Joint Stock Company	100%	Onshore Wind	5.71%	Vietnam		(a) 88 MW (b) 260,663 tCO ₂ e	
		Renewable C	100%	Run-of-River Hydro	8.22%	Indonesia		(a) 180 MW (b) 1,039,012 tCO ₂ e	
		Renewable D	100%			Angola		(a) 30 MW (b) 178,965 tCO ₂ e	
		Renewable E	100%	Power Distribution Utilities	3.00%	New Zealand	(a) Share of renewable energy in the national grid (b) New generation capacity below carbon threshold (c) Electricity supply reliability	(a) 88.5% (b) 95% (c) ≥99.95%	
	Green Buildings	Data Centre A	97.1% ⁴	Data Centre Portfolio	37.18%	Europe	Power usage effectiveness (PUE)	1.32	
		Data Centre B	100%			Malaysia		1.38	
		Data Centre C	100%			Malaysia		1.36	
		Thai DC 1 Co., Ltd	100%			Thailand		1.35	

⁴ Prorated by MW (IT Capacity) – the portfolio comprises data centres that are fully operational, ramping, up, under construction and under planning. Certain data centres in the portfolio were not included in the eligible portion of the loan.

	Energy Efficiency	Energy Efficiency A	100%	Combined Cycle Retrofitting (Waste Heat Recovery)	5.53%	Indonesia	(a) Power generation efficiency improvement (b) Estimated annual mitigated emissions	(a) 31.7% (b) 482,875 tCO ₂ e	<div>7 AFFORDABLE AND CLEAN ENERGY</div> <div></div>
Social	Access to Essential Services	University A	100%	University (Education)	29.73%	UAE	(a) Number of female students enrolled (b) Ratio of female students enrolled	(a) ~4,400 (b) 68.8%	<div>4 QUALITY EDUCATION</div> <div></div>
		University B	100%	University (Education)		UAE	(a) ~1,000 (b) 72.7%	<div>5 GENDER EQUALITY</div> <div></div>	
	Access to Affordable Basic Infrastructure and Services	GIP EM Ascend 2 PTE. Ltd.	100%	Telecommunication Towers (ICT)	1.71%	India	(a) Tower density in underserved regions (b) Network uptime	(a) 1.37 towers/100,000 inhabitants (b) >99.9%	<div>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</div> <div></div>

While the aforementioned assets are expected to yield positive outcomes, our review of the sustainability reports – alongside due diligence documentation, risk assessments, ESG monitoring reports, and independent assurance statements – has not revealed any evidence indicating that these projects would cause significant harm to the environment or surrounding communities. Each project presents mitigation measures addressing environmental and social risks.

Figure 1: Location of the Projects



3. Use of Proceeds

The following sections showcase examples of the projects financed by the issuance, provide details on the methodology used to estimate the impact of the Issuer's underlying green and social assets, and present the respective performance results.

3.1 Renewable Energy Assets

The Issuer committed around **USD 44.8 million** on financing renewable energy projects. These comprise five renewable energy generation projects and one power distribution utilities asset. They are assessed against distinct impact metrics and are therefore presented in separate sections below.

a. Renewable Energy Generation

Note on the selected impact metric, according to ERM methodology: Avoided GHG Emissions

Renewable energy generation is a low-GHG emissions energy source and has an environmental benefit in replacing energy generated from fossil fuel-based power generation. Energy generated from renewable sources increases clean-source electricity supply, which will displace fossil fuel sources and reduce the emissions intensity of the electricity grid. Therefore, avoided GHG emissions are the most material environmental impact of renewable energy projects.

For an operational renewable energy generation project, the annual avoided GHG emissions are estimated using the total electricity generated multiplied by an operating margin (OM) electricity emission factor (EF) specific to each project's geographical location⁵. These estimates assume that the energy generated by the projects replaces an equivalent amount of electricity by the existing local power plants (most of which are fossil fuel-powered), thus offsetting the associated GHG emissions. For the calculation of the indicator, the power grid's energy mix of the country of each project was considered.

As the Issuer is not the sole lender in these assets, an attribution factor was applied to the total avoided emissions to determine the Issuer's share of avoided emissions. The attribution factor is measured in terms of the Issuer's percentage share of total debt and equity financing. The major data inputs needed to calculate the avoided GHG emissions are summarised in the Appendix document.

Table 2 below details the main characteristics and information of the renewable generation energy assets.

⁵ Grid emission factors were sourced from local authorities where available. In the absence of those, factors were obtained from the Harmonized IFI Default Grid Factors dataset (IFI TWG). [Latest version v3.2 \(2022\)](#).

Table 2: Main Characteristics and Performance Results of the Renewable Energy Generation Assets

Borrower	Type	Country	Status	Installed Capacity (MW)	Annual Production (MWh)	Grid Emission Factor (tCO ₂ e/MWh) ⁶	Estimated Annual Avoided Emissions (tCO ₂ e)	Attribution Factor (%)	Annual Avoided Emissions Attributed to the Issuer (tCO ₂ e)
Renewable A	Solar PV	UAE	Operational	Confidential	Confidential	Confidential	268,016	4.41%	11,820
Renewable B	Solar PV	Bangladesh	Operational	50	86,365	0.590	50,955	3.69%	1,880
BIM Wind Power Joint Stock Company	Onshore Wind	Vietnam	Operational	88 ⁷	283,299	0.920	260,663	7.63%	19,889
Renewable C	Run-of-River Hydro	Indonesia	Operational	180	1,326,963	0.783	1,039,012	2.29%	23,793
Renewable D	Run-of-River Hydro	Angola	Operational	30 ⁸	121,250 ⁹	1.476 ¹⁰	178,965	6.29%	11,257
TOTAL				—	—	—	1,797,612	—	68,639

Figure 2 below shows the projected cumulative avoided emissions of the renewable energy assets in the sustainability tranche attributed to the Issuer, estimated until loan maturity, and Figure 3 presents the distribution of these avoided emissions by generation technology.

⁶ In line with the approach recommended by the Partnership for Carbon Accounting Financials (PCAF), the operating margin grid emission factor has been adopted in this impact report.

⁷ The plant's power export capacity is capped at the feeder level, while the total installed capacity of wind turbine generators is significantly higher to provide an ample redundancy buffer.

⁸ An incremental capacity of 30 MW (34 MW installed capacity less the historical 8.8 MW facility, of which only 4 MW had been operational prior to the redevelopment) was used for the calculations.

⁹ Annual electricity generation is a proxy estimate derived from local hydropower projects of similar scale and nature, used in the absence of project-specific operational generation data.

¹⁰ The OM GEF (1.476 tCO₂e/MWh) was adopted instead of the Firm Energy GEF (0.748 tCO₂e/MWh), as it better reflects the thermal generation displaced during periods of reduced hydropower availability caused by drought.

Figure 2: Projected Cumulative Avoided Emissions Attributed to the Issuer¹¹

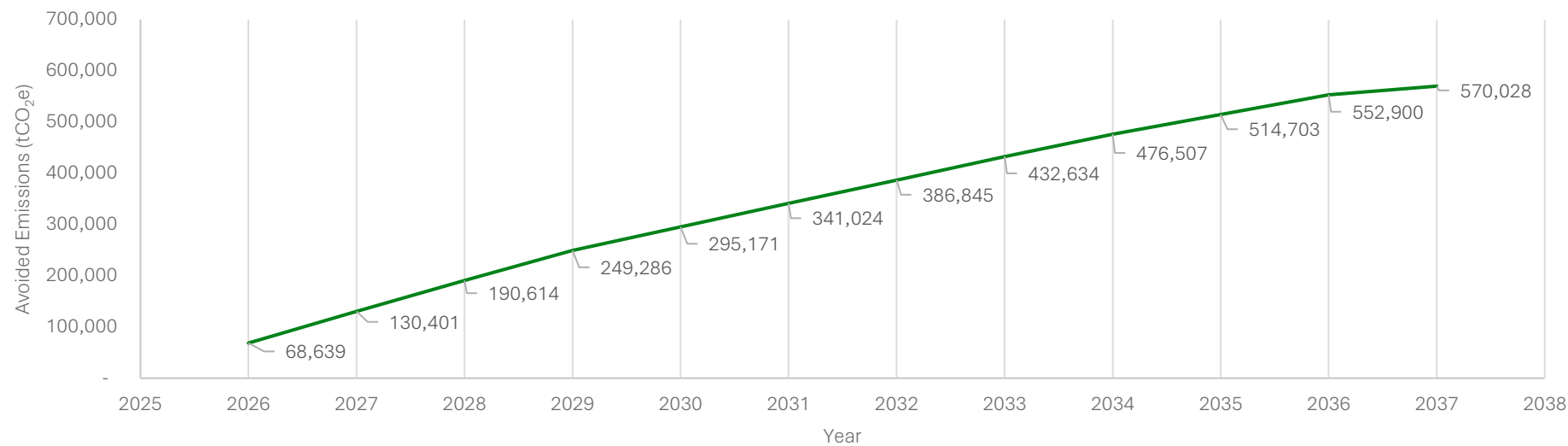
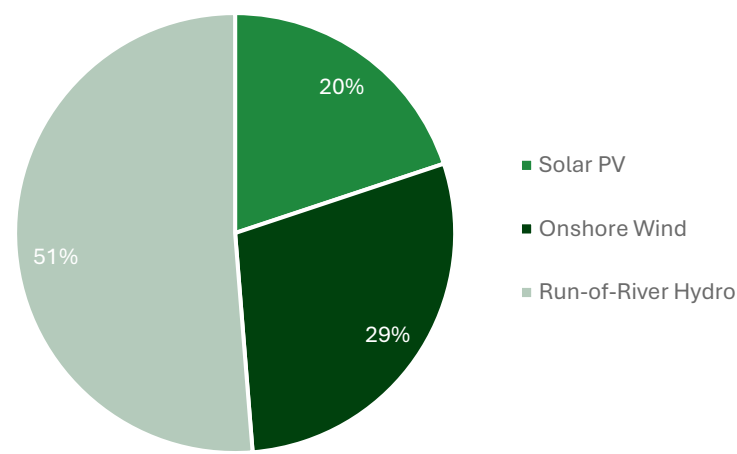


Figure 3: Avoided Emissions Attributed to the Issuer by Generation Type



¹¹ A constant attribution factor has been adopted in calculating the cumulative avoided emissions. When the debt amortises, assuming that the equity value remains constant, the attribution factor might decrease, leading to a lower avoided emission value. Nevertheless, due to the lack of data in estimating future equity values, a constant attribution factor is used in the calculations.

CASE STUDY 1 – RENEWABLE ENERGY GENERATION PROJECT

Onshore Wind Farm – BIM-ACEV Wind Power Plant, Vietnam

The Project involves the refinancing of a fully operating 88 MW onshore wind farm located in Ninh Thuan Province, Vietnam. The plant comprises 22 GE wind turbine generators. It supplies renewable electricity to the national grid with Vietnam Electricity (EVN).

The plant has been in commercial operation since September 2021 and has since delivered clean energy to Vietnam's national grid. Generation has consistently outperformed the base case, supported by favourable wind resources and low curtailment levels.

The Project supports Vietnam's long-term energy transition strategy. The country has pledged to reduce emissions by up to 43.5% with international support by 2030, with a vision to achieve net-zero emissions by 2050. As a low-emission generation asset, the wind farm contributes directly to this decarbonisation pathway.



BIM-ACEV Wind Power Plant.

Source: [BIM Group | Renewable Energy](#)

Environmental and Social Mitigation Programmes:

- Noise management through monthly internal and quarterly third-party monitoring, with additional sampling points introduced in response to community feedback.
- Waste management including source segregation of recyclable and non-recyclable waste, and collection, transport, and treatment of hazardous waste by a licensed contractor.
- Soil and water protection through secondary containment of hazardous materials, on-site spill kits, and periodic surface water and wastewater monitoring against national (QCVN) and IFC standards.
- Biodiversity protection through bird and bat monitoring, smart curtailment of turbines during high bat-activity periods, and post-construction fatality monitoring.
- Shadow flicker mitigation via an automated management system linked to turbine shutdown, supported by periodic receptor surveys.
- Community engagement through annual consultations and a multi-channel grievance redress mechanism.
- Worker welfare through labour audits of the operator and contractors, occupational health, and safety training.
- Implementation of an Environmental and Social Management Plan (ESMP), monitored by an independent Lender's Technical Advisor, aligned with ADB Safeguard Policy (2009) and World Bank Group EHS Guidelines.

Key metrics:

- Installed renewable energy capacity: **88 MW**.
- Commercial operation started: **September 2021**
- Estimated annual GHG emissions avoided by the project: **260,663 tCO₂e**.
- Annual avoided emissions attributed to the Issuer: **19,889 tCO₂e**.

b. Power Distribution Utilities

Note on the selected impact metrics, according to ERM methodology: New Generation Capacity Below Carbon Threshold (%) and Share of Renewable Energy in the National Grid (%)

Power distribution utilities’ sustainable impact lies in enabling the connection of new generation and in delivering the electricity mix to end users. A distribution network is the infrastructure through which new low-carbon generation reaches demand, and through which an increasingly renewable grid is made available to consumers. The most material environmental impact of investment in a distribution utility therefore lies in the extent to which the network facilitates the integration of low-carbon generation and mirrors the decarbonisation of the electricity it delivers.

The share of new generation capacity below the carbon threshold measures the proportion of newly connected generation capacity, over a rolling five-year period, that falls below 100 gCO₂e/kWh on a lifecycle (Product Carbon Footprint) basis. It indicates the extent to which the network is enabling the connection of genuinely low-carbon generation, and therefore how far investment in the asset supports the decarbonisation of the electricity it delivers.

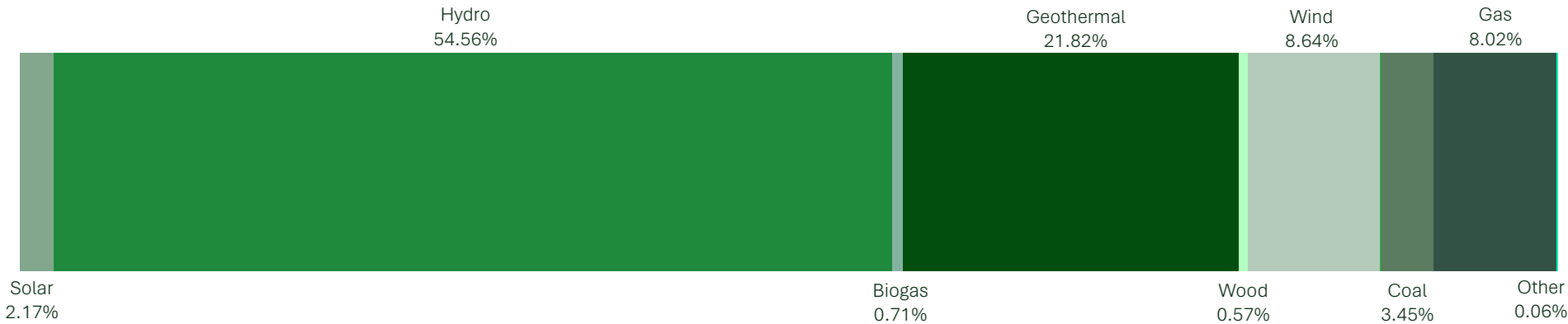
The share of renewable energy in the national grid situates the asset within the decarbonisation profile of the wider electricity system it serves: the more renewable the grid, the greater the impact of investment that strengthens and extends the network delivering that clean electricity to end users.

Table 3 below details the main characteristics and performance results of the power distribution asset, and Figure 4 gives details of New Zealand’s grid composition.

Table 3: Main Characteristics and Performance Results of the Power Distribution Utilities Asset

Borrower	Location	Share of Renewable Energy in the National Grid (%)	New Generation Capacity Below Carbon Threshold (%)	Climate Change Adaptation – Electricity Supply Reliability (%)	Climate Change Adaptation – CAIDI ¹² (minutes)	GRESB Infrastructure Asset Rating ¹³
Renewable E	New Zealand	88.5%	95%	≥99.95%	77.05	5-Star

Figure 4: Electricity Generation Sources, New Zealand, 2025



Source: Ministry of Business, Innovation and Employment 2026

¹² CAIDI (Customer Average Interruption Duration Index) measures the average duration of individual outage events experienced by affected customers. It complements the 99.95% reliability metric by indicating how effectively the system responds to and recovers from service interruptions.

¹³ The [GRESB Infrastructure Asset Assessment](#) evaluates and scores the ESG (Environmental, Social, and Governance) performance of individual infrastructure assets and portfolios. It uses a relative 1-to-5-star rating system based on an entity's quintile ranking against global peers.

CASE STUDY 2 – POWER DISTRIBUTION UTILITIES

Electricity Distribution Network – Renewable E, New Zealand

Renewable E involves a green term loan to a major electricity distributor in New Zealand, operating an extensive electricity distribution network.

As an electricity distributor, the borrower plays a central role in New Zealand's decarbonisation. The national grid is among the world's most renewable, with 88.5% of electricity generated from renewable sources in 2025. As sectors decarbonise in line with the country's net-zero 2050 goal, the borrower is enabling the electrification of transport, industry, and process heat, connecting distributed renewable generation to its network, and adapting its infrastructure to accommodate new demand profiles and bidirectional energy flows. The borrower has committed to a significant reduction in scope 1 and 2 emissions by 2030 against a recent base year, underpinned by an Emissions Reduction Plan.

Environmental and Social Mitigation Programmes:

- Climate adaptation & resilience plan, incorporating regional hazard vulnerability mapping and a programme of resilience repair projects (including sub transmission pole relocations and community energy hubs) to strengthen network resilience to acute and chronic climate risks.
- Health and safety through a critical-risk programme (including a company-wide safety stand-down initiative and a new learning management system), aligned with the NZS7901 Public Safety Management System.
- Emissions reduction plan covering all scope 1 and 2 emission sources, developed using Science Based Targets initiative (SBTi) methodology.
- Community engagement through an online community investment map, a community fund, and coordination with lifelines groups on infrastructure resilience.
- Governance through an ISO 55001 certified Asset Management System and ISO 27001 certified information security management, under the regulatory oversight of the New Zealand Commerce Commission.

**Key metrics (FY26):**

- Electricity supply reliability: ≥99.95%
- Customer Average Interruption Duration Index (CAIDI): **77.05 minutes**
- GRESB Infrastructure Asset Rating: 5-Star

3.2 Data Centre Assets

The Issuer committed around **USD 64.5 million** on financing four data centre projects.

Note on the selected impact metric, according to ERM methodology: PUE (Power Usage Effectiveness)

PUE measures data centre energy efficiency by comparing total facility energy use to IT equipment energy consumption. A lower PUE signifies higher efficiency, indicating more energy is used for computing rather than supporting systems. The equation for calculating the PUE of a data centre is summarised below, with 1.0 representing a theoretically perfect score in which 100% of energy is directed to IT equipment:

$$\text{PUE} = \text{Total Facility Energy Consumption} / \text{IT Equipment Energy Consumption}$$

The inputs necessary to calculate the Impact Indicators for the Data Centre’s assets are reflected in the Appendix. Table 4 details the main characteristics and information of the assets.

Table 4: Main Characteristics and Performance Results of the Green Building (Data Centre) Assets

Borrower	Location	IT Capacity (MW)	Power Usage Effectiveness (PUE)	Renewable Energy Usage (%)
Data Centre A	Europe	261.1 (operational)	1.32 (operational - annualised weighted average as of March 2026)	98% ¹⁴
		35.7 (initial operation)		
		291.6 (planning / construction)		
Data Centre B	Malaysia	45 (under construction)	1.38 (design)	
Data Centre C	Malaysia	319.2 (operational)	1.36 (operational - annualised weighted average as of June 2026)	-
		253.9 (initial operation)		
		1,141.0 (planning / construction)		
Thai DC 1 Co., Ltd	Thailand	82.6 ¹⁵ (under construction)	1.35 (design)	-

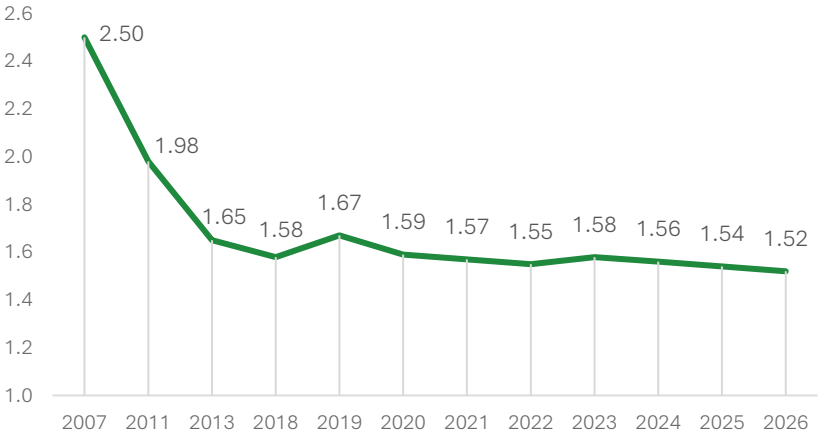
¹⁴ The numbers presented in the 2024 Independent Assurance cover the full portfolio of the loan, while the investment portfolio covers 97.1% of the projects analysed in the document.

¹⁵ The project has a total IT capacity of 102.6 MW, and the additional capacity is not funded in the securitisation portfolio.

Given the anticipated growth in demand in the global data centre market, it is essential to assess and promote low-emission solutions. Global data centre energy consumption reached around 485 TWh in 2025, with base projections expecting this demand to nearly double by 2030, reaching approximately 945 TWh (roughly 3% of world electricity)¹⁶. Key performance indicators such as PUE and the percentage of renewable energy utilised, which can significantly reduce emissions associated with this sector, are particularly noteworthy. Regulatory frameworks are being established on a global scale to mandate minimum efficiency standards, thereby establishing maximum acceptable PUE values on a regional basis.

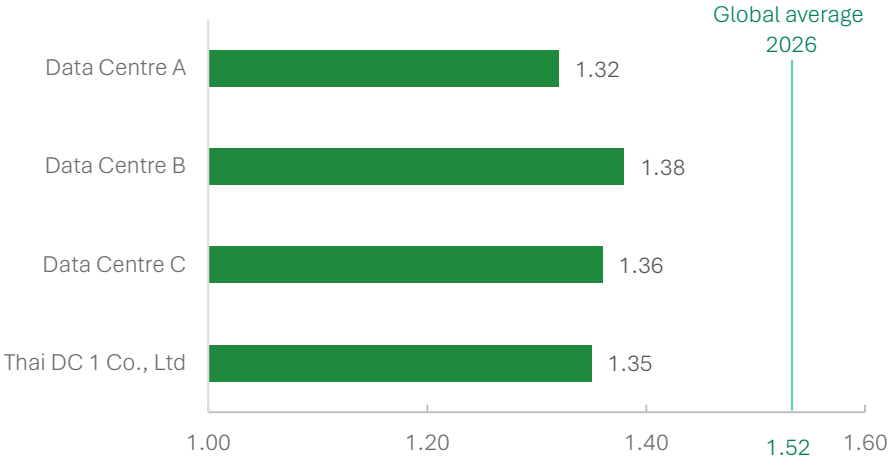
As a reference, Figure 5 shows the evolution of the annual average PUE value of data centres worldwide from 2007 to 2026. The reduction over the years is due to a combination of factors, including improved cooling systems (such as cold plate cooling, rear door heat exchangers, immersion cooling, direct-to-chip liquid cooling, free cooling and AI-driven cooling optimisation), more efficient building services installations, advanced power distribution, and waste heat recovery. Figure 6 presents the operational and design PUE of the data centre assets in the portfolio compared against the 2026 global average benchmark of 1.52. As shown, all evaluated assets demonstrate performance below the global average, reflecting higher energy efficiency across these individual operations.

Figure 5: Data Centre Average Annual Power Usage Effectiveness (PUE) Worldwide from 2007 to 2026



Sources:
[Uptime Institute Global Data Centre Survey 2025](#)
[The growing PUE advantage of larger data centers 2026](#)

Figure 6: Operational and Design PUE by Data Centre Asset vs. Benchmark



Source:
[The growing PUE advantage of larger data centers 2026](#)

¹⁶ [Key Questions on Energy and AI](#)

3.3 Energy Efficiency Asset

The Issuer committed around **USD 9.6 million** on financing a combined cycle retrofitting (waste heat recovery) infrastructure project.

Note on the selected impact metric, according to ERM methodology: Power Generation Efficiency (%) and Estimated Annual Mitigated Emissions (tCO₂e)

In a combined-cycle conversion, waste heat that would otherwise be released from the gas turbines is captured through heat recovery steam generators (HRSGs) and used to drive additional steam turbines, generating incremental electricity without additional fuel combustion. This incremental generation displaces electricity that would otherwise be supplied by the grid – most of which is produced from fossil fuel-based sources – thereby reducing the emissions intensity of the electricity supplied. Therefore, the two key indicators of the asset's environmental performance are the power generation efficiency improvement, which measures the gain in energy performance delivered by the conversion, and the mitigated GHG emissions resulting from the incremental generation displacing grid electricity.

The power generation efficiency figure presented is a design value, derived from the additional generation capacity enabled by the combined-cycle configuration relative to the pre-conversion simple-cycle operation. Efficiency improvements are expected to be realised over time, after ramping up and once operation reaches the optimum design load.

The annual mitigated GHG emissions are estimated using the incremental electricity generation multiplied by a grid emission factor (EF) specific to the project's geographical location. For this asset class, the factor applied is the Combined Margin (CM) factor for energy efficiency projects, as defined by the International Financial Institutions Technical Working Group on Greenhouse Gas Accounting.¹⁷

As the Issuer is not the sole lender in this asset, an attribution factor was applied to the total mitigated emissions to determine the Issuer's share. The attribution factor is measured in terms of the Issuer's percentage share of total debt and equity financing. The major data inputs needed to calculate the mitigated GHG emissions are summarised in the Appendix document. Table 5 below details the main characteristics and information of the energy efficiency asset, and Figures 7 and 8 illustrate, respectively, the added capacity to the plant and the incremental energy generation attributed to the waste heat recovery.

¹⁷ Harmonized IFI Default Grid Factors dataset (IFI TWG). [Latest version v3.2 \(2022\)](#).

Table 5: Main Characteristics and Performance Results of the Energy Efficiency Asset

Borrower	Type	Location	Added Capacity (MW)	Power Generation Efficiency Improvement (%)	Annual Incremental Energy Generation (MWh)	Grid Emission Factor (tCO ₂ e/MWh)	Estimated Annual Mitigated Emissions (tCO ₂ e)	Attribution Factor (%)	Annual Mitigated Emissions Attributed to the Issuer (tCO ₂ e)
Energy Efficiency A	Combined Cycle Retrofitting (Waste Heat Recovery)	Indonesia	650 (operational)	31.7%	715,370	0.675	482,875	0.01%	48.29

Figure 7: Capacity Upgrade Breakdown

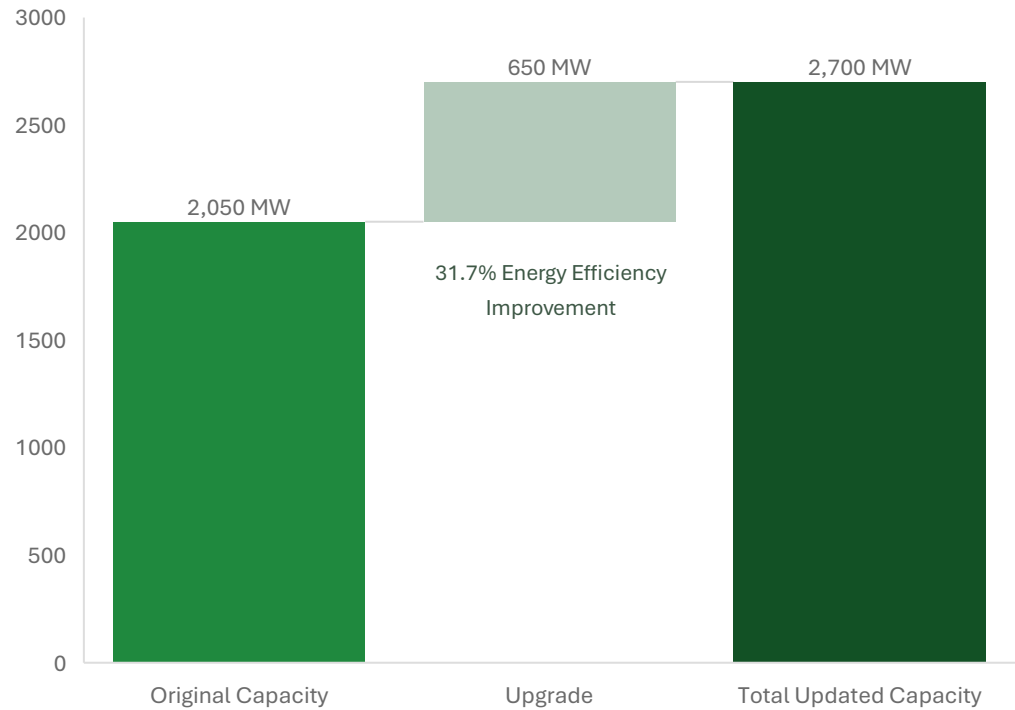
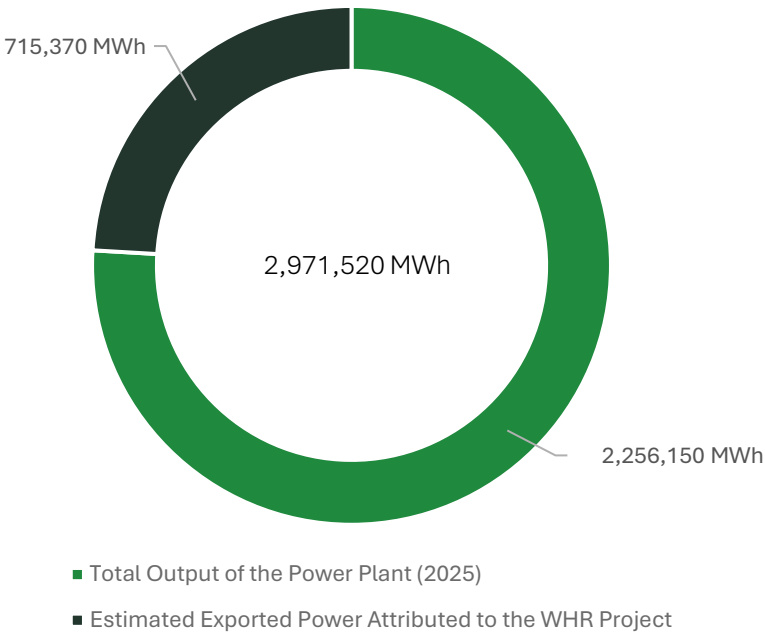


Figure 8: Waste Heat Recovery (WHR) Contribution to Total Power Generation



Source: Borrower’s Annual Report 2025

3.4 Education Assets

The Issuer committed around **USD 51.6 million** on financing two education projects.

Note on the selected impact metrics, according to ERM methodology: Number and Ratio of Female Students Enrolled

Diversity and inclusion are key impact drivers for education assets. Hence, the number and percentage of female students enrolled were selected as key social impact metrics as unequal access to higher education is recognised as leading to fewer resources and opportunities available to women. Higher education institutions are also seen as incubators where improved norms for gender equality can be practised, serving as an influential tool for society in accelerating the progress towards gender equality and women’s empowerment. This is significant in the United Arab Emirates (UAE), where gaps related to women’s economic mobility remain. The inputs used to calculate these impact indicators are reflected in Table 6 and illustrated in Figures 9 and 10.¹⁸

Table 6: Main Characteristics and Performance Results of the Education Assets

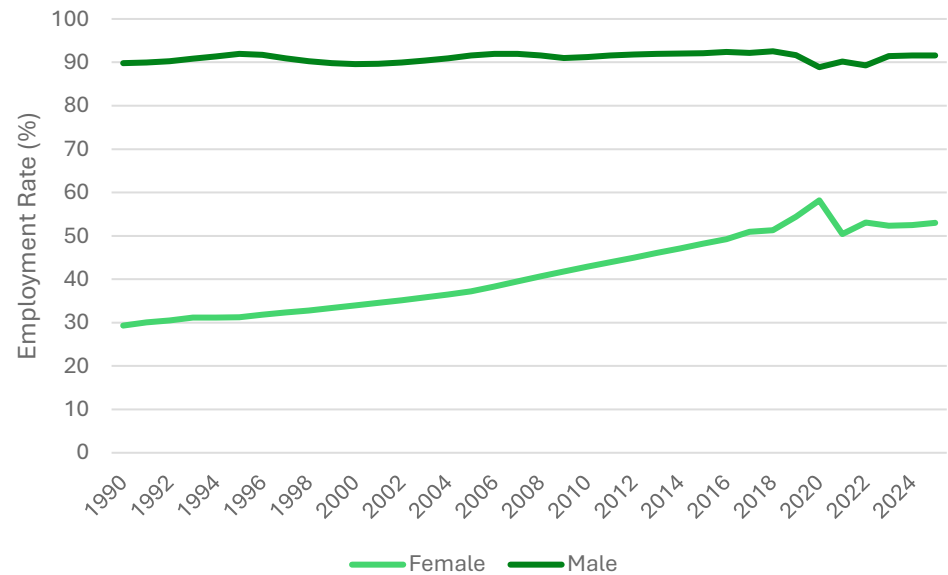
Borrower	University	Country	Campus Location	Measures to Promote Affordability	Total No. of Students	No. of Female Students	Ratio of Female Students
University A	Confidential	UAE	Abu Dhabi	Full government scholarship for Emirati students	~6,400	~4,400	68.8%
University B	Confidential	UAE	Abu Dhabi	Full government scholarship for Emirati students	~1,400	~1,000	72.7%

¹⁸ Recognising the projects’ importance in sustaining access to higher education by women, the education projects shall remain eligible under this category regardless of any potential changes in female student enrolment statistics over the loan tenor.

Figure 9 illustrates labour force participation rates in the UAE by gender between 1990 and 2025. Male participation has remained consistently high throughout the period, at around 90%. Female participation, while rising steadily from approximately 30% in 1990 to just over 50% in recent years, continues to sit well below that of men. This persistent gap underscores the extent to which women remain underrepresented in the UAE's workforce, despite the progress achieved over the past three decades.

Against this backdrop, expanding women's access to higher education carries particular significance. Educational attainment is a key enabler of economic participation¹⁹, and the high female enrolment rates recorded at both financed institutions (Figure 10)²⁰ reflect a meaningful contribution towards narrowing this gap. By supporting universities where women make up the majority of the student body, the assets help strengthen the human capital base needed to advance women's economic mobility and, over time, reduce the disparity in labour force participation shown in Figure 9.

Figure 9: Labour Force Participation Rate by Gender in the United Arab Emirates (1990-2025)

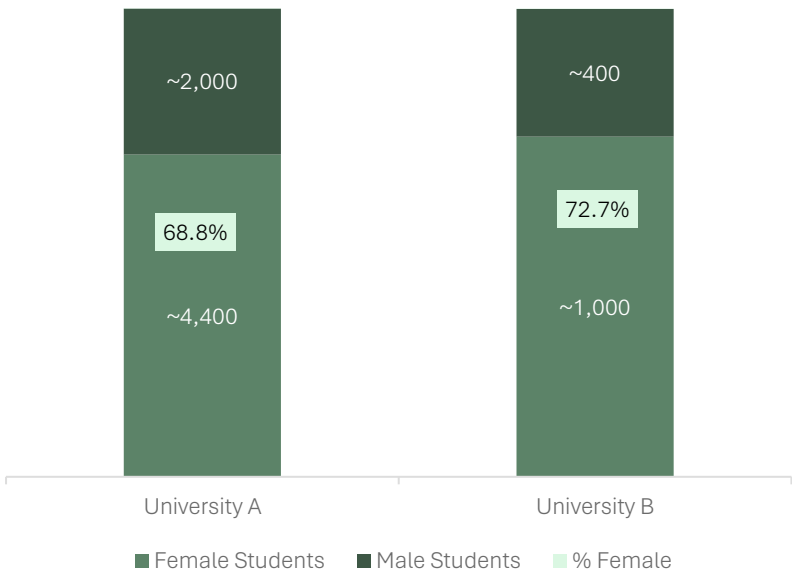


Source: World Bank Group | Gender Data Portal 2026

¹⁹ Education at a Glance 2025 | OECD

²⁰ Student numbers are approximate and rounded to the nearest hundred. Ratios of female students are calculated from the exact enrolment figures and may therefore differ slightly from ratios computed from the rounded figures shown.

Figure 10: Number and Ratio of Female Students Enrolled



Sources: University Fact Book 2024-2025 and University Data Portal

3.5 Information and Communications Technology Assets

The Issuer committed around **USD 3 million** on financing one Information and Communications Technology (ICT) project.

Notes on the selected impact metrics, according to ERM methodology: Tower Density in Underserved Regions, Network Uptime

Tower density, defined as the number of telecom towers per 100,000 inhabitants, is a key indicator of mobile network accessibility. In India, where fixed broadband remains limited, tower density plays a vital role in promoting digital inclusion. Higher density generally leads to better coverage and connectivity, enabling access to essential services like education, finance, healthcare, and employment. Equally important is **network uptime**, which measures the reliability and availability of the telecom infrastructure. High uptime ensures consistent service delivery, especially in underserved regions, reinforcing the social and economic benefits of expanded mobile infrastructure.

Table 7 details the main characteristics and information of the ICT asset.²¹

Table 7: Main Characteristics and Performance Results of the ICT Asset

Borrower	Country	Telecom Region	Towers ²²	Tower Distribution	Network Uptime (%)	Total Population (2026 estimate)	Total Area (km ²)	Population Density (Pop. / km ²)	Tower Density (Towers/100,000 inhabitants)
GIP EM Ascend 2 PTE. Ltd.	India	Circle A	7,055	36.0%	>99.9% ²³	419,425,000	1,096,324	382.6	1.68
		Circle B	5,957	30.4%		607,440,000	1,265,180	480.1	0.98
		Circle C	5,518	28.2%		327,633,000	972,188	337.0	1.68
		Metros	1,057	5.4%		71,409,000	9,678	7,378.7	1.48

²¹ Recognising the projects’ importance in sustaining digital inclusion for communities, the telecommunication project shall remain eligible under this category regardless of any potential increase of the background internet connection speed over the loan tenor.

²² FY2024-25 figures are presented.

²³ [Ascend Sustainability Report 2025](#)

Telecom Circles and Regional Disparities

India's telecom sector is organised into 22 Telecom Circles, or Licensed Service Areas (LSAs), categorised based on revenue potential and state boundaries. These are grouped into four categories:

- **Metro Circles:** Include major cities like Delhi, Mumbai, and Kolkata, with high population density and economic activity.
- **Circle A:** Covers economically prosperous states with large populations.
- **Circle B:** Represents regions with moderate economic activity.
- **Circle C:** Includes less economically developed areas.

Tower density remains low and relatively uniform across all Telecom Circle categories, indicating that the physical infrastructure enabling fixed broadband is limited nationwide rather than confined to specific regions.

Growth in Broadband Speeds: Mobile vs. Fixed

India has witnessed a rapid expansion in broadband connectivity in recent years, though this progress has been markedly uneven across mobile and fixed networks. According to the Indian Ministry of Communications²⁴ and Ookla's Speedtest Global Index (July 2026)²⁵, mobile broadband download speeds surged from 10.71 Mbps in 2019 to 129.30 Mbps, placing India 37th globally and broadly in line with global levels. Fixed broadband, by contrast, has not kept pace: at a median download speed of 63.48 Mbps, India ranks just 100th out of 151 countries, and sits at roughly half the global fixed median of 127.70 Mbps.

India's internet ecosystem is predominantly mobile driven²⁶, and the gap between mobile and wired access is stark. As of July 2026, mobile broadband accounted for approximately 1,027.5 million subscriptions – around 93.9% of all broadband subscriptions in the country – while fixed wired broadband accounted for only about 48.1 million, or roughly 4.4% of the total. The remaining subscriptions were served by Fixed Wireless Access (FWA) – its utilisation remains very low, accounting for under 2% of total broadband subscriptions²⁷. Wired connections are therefore outnumbered by mobile broadband subscriptions by more than twenty to one, underscoring the limited reach of wired infrastructure. Fixed wired broadband is delivered primarily through fibre-to-the-home (FTTH) and legacy DSL (copper telephone lines), with some cable availability in urban centres, and remains concentrated in urban and semi-urban areas. This gap is significant because fixed broadband remains the essential medium for data-intensive daily applications, such as video conferencing, remote work, online education, and e-health, where a stable, high-capacity wired connection matters most. For reference, fixed broadband penetration is highest in Europe (37.2 subscriptions per 100 inhabitants), followed by the Americas (27.7) and the Commonwealth of Independent States (CIS) region (26.7)²⁸.

²⁴ [2025 Year End Review for Department of Telecommunications | DoT](#)

²⁵ [India Median Country Speeds Updated July 2026](#).

²⁶ [IBEF Presentation](#)

²⁷ [Highlights of Telecom Subscription Data at end of July 2026](#) (Posted on August)

²⁸ [Fixed broadband internet penetration by region 2005-2025 | Statista / Fixed broadband subscriptions \(per 100 people\) | Data](#)

Government Initiatives and Strategic Goals

To address connectivity gaps, the Indian Government launched the National Broadband Mission 2.0 ²⁹, aiming to provide high-speed and meaningful broadband access for all. Reliable fixed broadband underpins productivity and economic growth and extending it beyond urban centres is central to the Government's digital inclusion agenda. The annual implementation plan for fixed broadband is presented in Table 8:

Table 8: Indian Annual Implementation Plan for Fixed Broadband Speed

KPI	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30
Availability of Fixed Broadband download Speeds – National Average as per Ookla’s Global Index (in Mbps)	70	75	80	90	100

As of July 2026, the most recent measurement provided by Ookla was a national median of 63.48 Mbps³⁰, below the FY2025-26 target of 70 Mbps, and well short of the 75 Mbps envisaged for FY2026-27. The average fixed broadband download speed data by Telecom Circle is presented by Opensignal 2025 Report³¹ and summarised in Table 9 by category. These two sources are complementary rather than directly comparable – Ookla reflects the sustained peak speeds a connection can achieve via Ookla’s dedicated test servers (used here as the national benchmark), while Opensignal reflects users' typical real-world experience (used for the circle-level breakdown).³²

Fixed Broadband Performance and Access Gap

Against the national targets set out above, two indicators reveal how far India's fixed broadband landscape falls short: download speed, which measures the performance of existing connections, and tele-density, which measures how widely those connections are available. Table 9 presents both by Telecom Circle category, alongside mobile tele-density and tower density. Read together, they show that inadequate fixed access is a nationwide condition rather than one confined to specific regions. The steps followed and all assumptions and premises considered are detailed in the Appendix.

The weighted wireline download speed of each circle category remains below the 75 Mbps target without exception, ranging from 31.25 Mbps in Category B to 45.67 Mbps in the Metros. Even the best-performing category falls short of the national target, establishing that no part of the country meets the benchmark for adequate fixed broadband speed.

²⁹ [National Broadband Mission 2.0](#)
³⁰ [India's Mobile and Broadband Internet Speeds - Speedtest Global Index](#) (accessed on September 2, 2026)
³¹ [India, August 2025, Fixed Broadband Experience Report | Opensignal](#)
³² [OECD Closing Broadband Connectivity Divides for All](#)

Table 9: Fixed Broadband Performance and Access by Telecom Circle

Circle Category	National Broadband Mission's target for fixed broadband download speed	Weighted Average Wireline Download Speed (Mbps) ³³	Weighted Average Wireline Tele-Density ³⁴	Weighted Average Wireless Mobile Tele-Density	Tower Density (towers/100,000 inhabitants)
A	75 Mbps (for FY 2026-2027)	38.44	5.78%	103.45%	1.68
B		31.25	1.81%	76.09%	0.98
C		31.91	1.70%	75.20%	1.68
Metros		45.67	10.38%	171.48%	1.48
India		63.48 (Ookla median sustained peak)	3.38%	88.71%	1.37

Nationally, wireline tele-density stands at just 3.38%, against a mobile tele-density of 88.71% – more than twenty-five times higher³⁵. This contrast holds across every circle: fixed connectivity is marginal everywhere, while mobile networks are close to saturation. Within this uniformly low baseline, the more developed circles (Metro at 10.38% and Category A at 5.78%) show modestly higher wireline penetration than Categories B and C (1.81% and 1.70%), though the difference is small set against the scale of the national deficit.

This performance gap is underpinned by limited physical infrastructure: tower density remains low and relatively uniform across all categories (0.98-1.68 towers per 100,000 inhabitants), indicating that the fixed-capable network enabling broadband is constrained nationwide rather than in isolated areas.

Taken together, low download speeds, negligible wireline tele-density and limited tower density across every circle category demonstrate that the need to expand fixed-capable infrastructure applies at national scale.

³³ Obtained by weighting provider speeds by wireline market share within each circle and then aggregating to circle category by population. Full methodology in the Appendix.

³⁴ Obtained from [TRAI](#) for each Telecom Circle and aggregated to circle category by population weighting.

³⁵ [The Indian Telecom Services Performance Indicators January-March, 2026](#)



Bauhinia ILBS 4

Pre-issuance Impact Report - Appendix

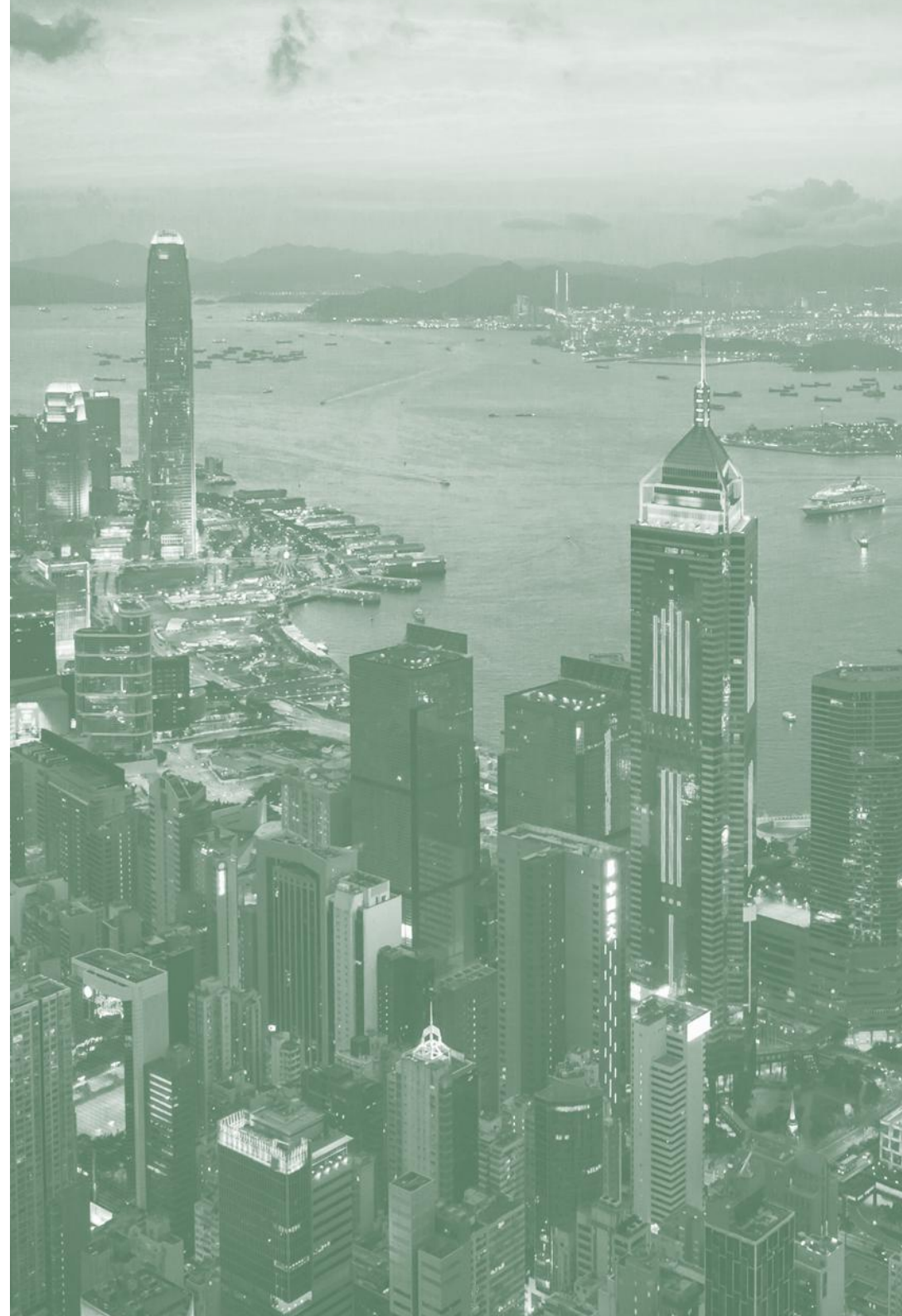
For the sustainable assets included in the Sustainability Tranche
of the Bauhinia ILBS 4 issuance

Final Impact Assessment Dated 30 October 2026

Elaborated for



香港按揭證券有限公司
The Hong Kong Mortgage Corporation Limited



4. Appendix

4.1 Details on Methodology – Renewable Energy Assets

Table 10: Input Factors for Calculating Avoided Emissions for Renewable Energy Assets

Input	Description	Source
Annual Production (MWh)	Quantity of electricity generated by renewable energy assets.	Borrowers' Operational Record
Grid Emission Factor (tCO₂e/MWh)	<p>The CO₂e emissions associated with each unit of electricity supplied by the grid in the country where the asset is located (tCO₂e/MWh), covering CO₂, CH₄ and N₂O expressed as CO₂ equivalent. In line with the approach recommended by the Partnership for Carbon Accounting Financials (PCAF), the operating margin (OM) grid emission factor is applied to all renewable energy assets, as it reflects the grid generation displaced by the asset. OM factors are sourced from the IFI Harmonized Grid Factors dataset (v3.2, 2022) as the portfolio-wide default. Where the host country publishes its own official OM factor, the country-specific value is applied, as it more accurately represents the marginal grid generation displaced in that market.</p> <ul style="list-style-type: none"> IFI Harmonized Grid Factors (v3.2, 2022) – Operating Margin: applied to Renewable C (Indonesia) and Renewable D (Angola). Bangladesh First Biennial Update Report to the UNFCCC (2023), Table 67 – weighted-average Simple Operating Margin: applied to Renewable B (Bangladesh). MoNRE, Climate Change Department – <i>Research and Development of Emission Factors of the Vietnam Power Grid in 2023</i> (October 2024), Table 8 – Operating Margin: applied to BIM Wind Power Joint Stock Company (Vietnam). 	<p>UNFCCC - IFI Harmonized Grid Factors</p> <p>Bangladesh First Biennial Update Report to the UNFCCC (2023)</p> <p>Research and Development of Emission Factors of the Vietnam Power Grid in 2023</p>
Attribution Factor (%)	The loan outstanding due to the Issuer over total debt and equity of a borrower (or enterprise value if the borrower is a public company).	Data provided by HKMC

The equation for calculating the financed avoided emissions of the renewable energy assets (p) is summarised below:

$$FAEp = EGp \times GEFc \times AFp$$

Where:

FAEp is the financed avoided emissions by the Issuer for the renewable energy asset *p* (tCO₂e)

EGp is the annual electricity generated by the renewable energy asset *p* (MWh)

GEFc is the grid emission factor of country *c* where the renewable energy asset *p* is located (tCO₂e/MWh)

AFp is the attribution factor for the renewable energy asset *p* (%)

4.2 Details on Methodology – Power Distribution Utilities Asset

Table 11: Details on Impact Metrics

Input	Description	Source
Share of Renewable Energy in the National Grid (%)	The proportion of electricity generated from renewable sources across the national grid the network serves, expressed as a share of total generation. It situates the asset within the decarbonisation profile of the wider electricity system whose clean power the network delivers to end users.	New Zealand: Ministry of Business, Innovation & Employment (MBIE)
New Generation Capacity Below Carbon Threshold (%)	The share of generation capacity newly connected to the network over a rolling five-year period with a Product Carbon Footprint below 100 gCO ₂ e/kWh, assessed on a lifecycle basis by generation technology. It reflects the extent to which the network enables the connection of genuinely low-carbon generation.	Borrower’s Green Finance Report 2025

4.3 Details on Methodology – Data Centre Assets

Table 12: Input Factors to Calculate PUE and Renewable Energy Usage

Input	Description	Source
PUE (Power Usage Effectiveness)	PUE measures data centre energy efficiency by comparing total facility energy use to IT equipment energy consumption. A lower PUE signifies higher efficiency, indicating more energy is used for computing rather than supporting systems.	Data Centre A: HKMC information Data Centre B: Due Diligence Report Thai DC 1 Co., Ltd: Information Memorandum Data Centre C: HKMC information
Renewable Energy Usage (%)	The amount of renewable energy used is directly tied to the facility's level of pollution, with data centres contributing significantly to emissions due to their substantial energy consumption.	Data Centre A: Independent Assurance Statement

4.4 Details on Methodology – Energy Efficiency Asset

Table 13: Factors for Calculating Mitigated Emissions for Energy Efficiency Asset

Input	Description	Source
Incremental Energy Generation (MWh)	Quantifies the additional electricity generation enabled by the HRSG conversion – energy previously lost as exhaust heat, now captured through steam turbines.	Estimation based on Borrowers' Operational Record
Grid Emission Factor (tCO₂e/MWh)	In line with the approach recommended by the Partnership for Carbon Accounting Financials (PCAF), the combined margin (CM) grid emission factor for energy efficiency is applied, as it reflects the grid generation displaced by the asset. CM factor is sourced from the IFI Harmonized Grid Factors dataset (v3.2, 2021)	UNFCCC - IFI Harmonized Grid Factors
Attribution Factor (%)	The loan outstanding due to the Issuer over total debt and equity of a borrower (or enterprise value if the borrower is a public company).	Data provided by HKMC

4.5 Details on Methodology – Education Asset

Table 14: Input Factors to Calculate Number and Percentage of Female Students Enrolled

Input	Description	Source
Number of Female Students	Refers to the number of female students enrolled in academic year 2024-2025	University Fact Book 2024-2025 University Data Portal
Total Number of Students	Refers to the total number of students enrolled (male and female) in academic year 2024-2025.	

4.6 Details on Methodology – ICT Assets

To assess fixed broadband performance and access across India's Telecom Circles, two complementary families of indicators were used: fixed broadband download speed, which reflects the performance of existing connections, and tele-density which reflects the availability of those connections (wireline and wireless mobile). These were complemented by tower density, describing the physical infrastructure that underpins connectivity. Each indicator was determined for the individual Telecom Circles and then consolidated by circle category (A, B, C and Metros).

The primary data sources were the Telecom Regulatory Authority of India (TRAI), for tele-density³⁶ and wireline subscriber market share³⁷; the Opensignal Fixed Broadband Experience Report (August 2025)³⁸, for download speed by service provider, Ookla's Speedtest Global Index for India median country speeds³⁹; and India's official population projections and census data⁴⁰, used for the population weighting.

³⁶ [The Indian Telecom Services Performance Indicators January-March, 2026](#)

³⁷ [Highlights of Telecom Subscription Data at end of July 2026](#)

³⁸ [India, August 2025, Fixed Broadband Experience Report | Opensignal](#)

³⁹ [India's Mobile and Broadband Internet Speeds - Speedtest Global Index](#) (accessed in September 2026)

⁴⁰ Overall population projection primarily followed the July 2020 Report of the 2011 census-based Population Projections for India and States 2011-2036, with Metro areas (such as Kolkata and Mumbai) adjusted based on localised projections.

Table 15: Regional Data by Telecom Circle

Telecom Circle	Circle Category	Population (2026 Estimate)	# of Towers	Wireline Average Download Speed (Mbps)	Wireline Tele-Density (March 2026)	Wireless Mobile Tele-Density (March 2026)
Andhra Pradesh	A	92,345,000	871	37.80	5.58%	94.41%
Gujarāt	A	75,627,000	674	34.48	3.51%	94.33%
Karnātaka	A	68,962,000	1,844	45.02	8.90%	119.94%
Mahārāshtra	A	103,188,000	762	35.34	6.14%	108.70%
Tamil Nādu	A	79,303,000	2,904	41.25	5.00%	101.51%
Haryāna	B	31,299,000	675	31.89	3.05%	85.60%
Kerala	B	36,277,000	1,158	34.93	5.17%	117.03%
Madhya Pradesh	B	120,884,000	1,327	32.10	1.88%	70.79%
Rājasthān	B	83,642,000	430	32.96	1.64%	80.98%
Uttar Pradesh (East)	B	242,859,000	1,326	30.38	1.09%	68.93%
Uttar Pradesh (West)	B	11,993,000	482	34.48	1.09%	68.93%
West Bengal	B	80,486,000	559	28.39	2.13%	79.48%
Assam	C	36,717,000	328	33.27	1.17%	79.50%
Bihār	C	173,223,000	2,258	30.90	0.83%	62.01%
Himāchal Pradesh	C	7,579,000	177	32.90	2.64%	123.89%
Jammu & Kashmīr	C	14,201,000	492	28.86	3.48%	94.65%
North-East	C	16,181,000	118	32.50	2.06%	81.98%
Odisha (Orissa)	C	47,147,000	706	33.05	1.64%	80.90%
Punjab	C	32,585,000	1,439	34.86	5.83%	109.08%
Delhi	Metros	22,540,000	557	47.85	23.35%	335.01%
Kolkata	Metros	21,150,000	220	37.16	2.13%	79.48%
Mumbai	Metros	27,719,000	280	50.40	6.14%	108.70%
Total (India)	-	1,425,907,000	19,587		3.38%	88.71%

Opensignal reports fixed broadband download speed by individual service provider within each Telecom Circle, rather than as a single regional value. To obtain one representative speed per circle, the speed of each of the four providers with the largest market share – Jio, Airtel, Tata Tele. and BSNL – was weighted by its share of wireline subscribers in India, as presented in the market share table below. The market share figures reflect wireline (fixed line) subscribers as reported by TRAI. All remaining providers appearing in the Opensignal data, being those outside the four largest by market share, were grouped into a single "Others" category, weighted by the residual wireline subscriber share (4.97%); the speed assigned to this category is the average of those providers' speeds within the circle. The weights of the providers present in each circle were renormalised to sum to 100%. The resulting value represents the download speed weighted towards the providers serving the largest share of wireline subscribers.

Table 16: India’s Wireline Market Share

Service provider	Market Share (%)
Jio	32.89%
Airtel	25.32%
Tata Tele	22.98%
BSNL	13.85%
Others	4.97%

To determine the value for each circle category, the circle-level speeds were then aggregated through a second weighting, based on the population of each circle. This two-stage approach ensures that the circle-level figure reflects the connection of the average subscriber, while the category-level figure reflects the experience of the average inhabitant.

Wireline and wireless mobile tele-density were obtained from TRAI for each Telecom Circle and aggregated to circle category using the same population weighting applied to download speed.

Tower density measures the number of telecom towers per 100,000 inhabitants. The number of towers owned by Ascend, aggregated by India's main Telecom Circles was sourced from Ascend Sustainability Report 2025⁴¹.

⁴¹ [Ascend Sustainability Report 2025](#)

Table 17: Consolidated Data by Telecom Circle Category

Telecom Region	Total Area (km ²)	Total Population (2026 estimate)	Population Density (Pop. / km ²)	Towers ⁴²	Tower Density (Towers/100,000 inhabitants)	Tower Distribution	Weighted Avg. Wireline Download Speed (Mbps)	Weighted Avg. Wireline Tele-Density	Weighted Avg. Wireless Mobile Tele-Density
Circle A	1,096,324	419,425,000	382.6	7,055	1.68	36.0%	38.44	5.78%	103.45%
Circle B	1,265,180	607,440,000	480.1	5,957	0.98	30.4%	31.25	1.81%	76.09%
Circle C	972,188	327,633,000	337.0	5,518	1.68	28.2%	31.91	1.70%	75.20%
Metros	9,678	71,409,000	7,378.7	1,057	1.48	5.4%	45.67	10.38%	171.48%
India	3,343,370	1,425,907,000	-	19,587	-	-	63.48*	3.38%	88.71%

**Note on download speed measures*

Two complementary third-party sources are used to characterise fixed broadband speeds. Ookla's Speedtest Global Index compiles results from user-initiated tests directed at dedicated test servers, capturing the peak sustained throughput achievable on the access network across all providers and reported as a national median (63.48 Mbps); it is used here as the national reference benchmark against the National Broadband Mission target. Opensignal collects automated, end-to-end measurements from real-world users across the full connectivity chain (from the device to content delivery networks), capturing typical everyday experience; combined with provider market share, it is used to derive the circle-category wireline download speeds. Because the two are constructed on different bases, the national Ookla figure is higher than, and not an arithmetic aggregation of, the circle-category values. This complementary use of both sources follows the approach taken by the OECD in its 2025 broadband connectivity report.

⁴² FY2024-25 figures are presented.