

Industrial Bank Co., Ltd
Hong Kong Branch

Climate-related Disclosure

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1. Governance

1.1. Senior Management’s Oversight¹

At the Industrial Bank Co., Ltd. Hong Kong Branch (“the Branch”), the Risk Management Committee and Chief Executive oversee all climate-related risks for the Branch. It has the following responsibilities related to climate change:

- Understand global, regional and local development on climate change and comprehensively assess climate-related opportunities and risks;
- Cultivate a risk culture from the top that embeds climate-related considerations into the business activities and decision-making process;
- Ensure proper functioning of the risk management framework;
- Define the roles and responsibilities of each department in managing climate-related issues;
- Follow Head Office’s climate-related strategies and goals; and
- Regularly report climate-related issues and climate-related management information to Head Office.

The Senior Management of the Branch follows the climate strategy set out in Head Office and is responsible for overseeing and managing climate-related risks, including reviewing, approving the Risk Appetite Statement (RAS), and implementing climate-related metrics.

1.2. Management’s Role

On a regular basis, climate-related matters are reported to the Branch-level Senior Management and Head Office on a quarterly basis and on ad hoc basis should circumstances require an urgent decision.

The Branch adopts three lines of defense (“LoD”) risk governance structure. The responsibilities of managing climate-related risks are allocated among three LoD as following:

- First line of defense includes Corporate Banking, Commercial Banking, Trade Finance and Financial Markets, which are identified as business units where risks are taken. When conducting lending and investment

¹ TCFD recommendation requires disclosure on board’s oversights of climate-related risks and opportunities, adopted as senior management’s oversight given the circumstances of the Branch.

- assessment, relevant staffs should possess sufficient awareness and understanding to identify and assess potential climate-related risks.
- Second line of defense is responsible for overseeing climate-related risks in business activities, keeping abreast of the latest development of climate-related risks, on-going risks monitoring and reviewing relevant policies and procedures, which include Corporate Business Management, Credit Approval, Risk Management, Legal & Compliance, and Administration.
 - Internal Audit (“IA”) acts as third line of defense and is independent from first and second LoD. IA is responsible for providing assurance and periodic audit evaluation on the effectiveness of the Branch’s climate-related risk management (including the first and second LoD).

2. Strategy

2.1. Climate-related Risks and Opportunities – Overview

The Branch followed the TCFD recommendations to identify climate risks and opportunities:

Transition Risks

The climate risk assessment begins with an identification of the 4 transition risk factors including:

- Policy and regulation
- Technology development
- Market
- Reputation

In general, high-carbon emission industries are usually affected by policies and regulations over short to medium term. While considering the variety of sectoral characteristics, each industry's attribution of transition risk factors would be different. For example, the profitability of the transportation sector is mainly driven by market behaviours and policy changes.

Physical Risks

Acute climate-related events (e.g., heatwaves, floods, hurricanes, wildfires, etc.) can impair or destroy asset values, and increase underwriting risks for insurers, higher capital expenditure and operational costs, and a decrease in the liquidity and asset value.

On the other hand, chronic impacts may particularly come from increased temperatures, sea levels rise and precipitation, possibly leading to heatwaves, floods, and hurricanes. The impacts may affect labour, capital, and agriculture productivity in certain areas that experience longer-term, incremental shifts in climate patterns.

Opportunities

Major climate-related opportunities are also identified and analyzed to supplement a comprehensive understanding of the climate-related impacts on high-carbon industry. Climate-related opportunities we identified include:

- Resource efficiency

- Energy source
- Products and services
- Market opportunity
- Resilience

Each industry's attribution of opportunity factors would be different given the variety of sectoral characteristics. For example, energy source is an opportunity to property development sector, because new advances in photovoltaic technology and developing urban wind resources can reduce external energy needs and reduce reliance on fossil fuel-generated power over medium to long term.

2.2. Climate-related Risks and Opportunities – Impacts

For comparison and assessment within and across industries, a heat map analysis on both loan and bond portfolio is conducted with a materiality categorization based on publicly available information and qualitative judgement.

Business activities involved in high-carbon sectors result in financial exposures around high greenhouse gas (“GHG”) emissions and high energy consumption. It may lead to policy, legal and litigation risk, shared across these sectors. New climate-related disclosure requirements and compliance measures and public policies, such as carbon taxes and stricter energy efficiency standards and low carbon materials etc., will lead to higher operating and investment cost.

Furthermore, this group of sectors is vulnerable to the effects of acute physical risks from extreme weather events as it requires high investments in plants, equipment, and buildings that are relatively fixed in terms of location. For example, increased frequency of tropical cyclones will lead to damage to property and disruption to operations, resulting in higher insurance premium, higher workplace risk and lower revenue.

It is also identified that some climate related risks and opportunities are unique to specific sector due to its distinct business nature.

Property Development

Flooding is recognized as a major physical risk for property development sector. Increased heavy precipitation events cause larger damage to properties from localized flash flooding and higher storm surges linked to rising sea levels or typhoons increase damage to coastal properties.

In term of opportunity, lengthening the typical lifespan of buildings will reduce the emission and the operating cost associated with demolition and

redevelopment while shifting to greener building materials can reduce the embodied carbon emission.

Manufacturing

Manufacturing sector-specific opportunities include energy source and product/service. New advances in decarbonized energy sources and technologies that reduce carbon emissions from production can reduce the degree of reliance on fossil fuel-generated power in manufacturing, resulting in lower carbon intensity for the business' operation.

Increased demand for sustainable products as a result of climate change can promote innovation in low-carbon materials, technologies and production processes.

Utility

Utility sector generally has financial exposure around transition issues related to GHG emissions, which may cause reputational damage and reduced revenue from decreased demand for coal-powered generation products/services.

As wind, solar, and other renewable energy sources grow incrementally, the renewable energy is considered to be a significant opportunity to utility sector. Incorporating renewable energy and new technologies in utility generation can reduce carbon emission and compliance cost to new regulation.

Construction

Similar to Property Development, increased heavy precipitation events cause larger damage to buildings and infrastructure from localized flash flooding and higher storm surges linked to rising sea levels.

For opportunities, lengthening the typical lifespan of buildings will reduce the emission and the operating cost associated with demolition and refurbishment while greener building materials can reduce the embodied carbon emissions.

Transportation

The market shift to more sustainable transportation means and reduced financing support from banks to transportation companies with high carbon intensity may lead to reduced revenue.

On the other hand, adopting sustainable fuels may reduce carbon emission and reduce operating costs. Moreover, the demand for fuel-efficient transportation

tools and sustainable fuels will increase as companies move away from fossil fuel and transit to low-carbon energy sources and operations.

Energy

In addition to the common transition risk mentioned above, market risk is also identified to be significant to energy sector. The market shift to lower-priced renewables and reduced financing support from banks may lead to financial losses and affect energy companies' valuation.

Decarbonized energy sources are deemed to be the opportunity for energy sector. Using decarbonized energy sources can reduce carbon emission as well as its risk exposure to new regulation. New technology (e.g., carbon capture technology) can be used to increase oil recovery rates.

Metal & Mining

Heat stress is identified to be another material physical risk in addition to tropical cyclone. Increased costs and reduced labour productivity due to additional cooling required overheated equipment and heat illness on underground mine workers.

Climate technology supports the sustainable extraction and processing of minerals and metals, and provides economic opportunities. Alternative reductant of fuels and recycling of heat and wastes may improve resource efficiency and reduce emissions in the production process.

2.3. High-carbon sector Exposures

The Branch's exposure to high-carbon sectors is moderate. Based on the latest data, the total exposures to the 7 high-carbon sectors account for 27.5% of loan portfolio, and 25.9% of bond portfolio.

2.4. Financial Resilience to Climate Changes

In order to assess the Branch's resilience to potential shocks brought about by climate change, scenario analysis and stress testing have been performed to assess the climate-related impacts on the Branch's portfolio and operation. The Branch's climate risk stress test ("CRST") comprises four scenarios, namely two physical risk scenarios representing different climate situations (i.e., RCP 8.5 and RCP 2.6) and two transition risk scenarios representing different pathways (i.e., disorderly and orderly) to a low-emission economy. Physical risk and transition

risk are assessed separately under these scenarios, allowing the Branch for a better understanding of the impact on each risk.

For transition risk assessment, two scenarios (i.e., disorderly and orderly) published by the Network of Central Banks and Supervisors for Greening the Financial System (“NGFS”) are selected. The orderly transition pathway (i.e., represented by the NGFS “Below 2°C” scenario) is applied as the Business-as-Usual (“BAU”) scenario to assess climate-related impacts in short to medium-term horizons (i.e., in 2025 & 2030), while the disorderly transition pathway (i.e., represented by the NGFS “Delayed Transition” scenario) is used as the worst-case scenario to analyse impacts in the longer term (i.e., in 2035).

For physical risk assessment, two Representative Concentration Pathway (“RCP”) scenarios from the Intergovernmental Panel on Climate Change (“IPCC”), i.e., RCP 8.5 and RCP 2.6, are selected. The RCP 2.6 scenario is applied as the BAU scenario to assess climate-related impacts in short to medium-term horizons (i.e., in 2025 & 2030), while the RCP 8.5 scenario (i.e., a high GHG concentration climate change pathway) is used as the worst-case scenario to analyse impacts in the longer term (i.e., in 2050).

Based on the results of transition and physical risk assessments, a summary of climate-related impacts on the Branch’s loans and bonds portfolio as of 30th June 2022, as well as operational income as of 31st December 2021 are shown below.

Transition Risk Assessment

Loan Portfolio

According to the assessment performed, the results have indicated that transition risk will primarily be reflected in an increase in the probability of default (“PD”) for obligors of high-carbon industries under stress scenarios.

Under the disorderly transition scenario, the average PD for high-carbon industries will rise by around 40 bps in 2035 as compared to the level in 2022. Among the high-carbon industries, the Utilities industry is affected severely in 2025 under transition risk scenarios.

Based on the change in PD, it is estimated that the Branch’s total loan portfolio ECL (“Expected Credit Loss”) will rise by 5.44% in 2035.

Bond Portfolio

According to the assessment performed, the results have indicated that transition risk will mainly be reflected in the decreased market value. Under the disorderly transition scenario, the market value of bond portfolio under high-carbon industries will decrease by only 0.10% in 2035 as compared to the level in 2022. Based on the assessment results, it is observed the transition risk impact to the Branch's bond portfolio could be considered as minimal.

Physical Risk Assessment

Loan Portfolio

1.27% of the Branch's loan portfolio exposures are pledged with property-related collaterals, which include locations in Hong Kong, and Mainland China. According to the assessment performed, the results have indicated that physical risk will primarily be reflected in an increase in LGD ("Loss Given Default") for loans with property-related collaterals under stress scenarios. Under the RCP 8.5 scenario, the average LGD for loans with property-related collaterals will rise by approximately 10 percentage points in 2050 as compared to the level in 2022. As the result, total loan portfolio ECL will rise by 4.00%.

Operational Loss

Operational losses are considered from three perspectives: 1) Decrease in the market value of owned properties; 2) Additional operational losses due to physical damage, such as repair costs; and 3) Additional operational losses due to business interruption. All the Branch's operating locations are of continuous operation nature with backup workplaces to safeguard business operations. The current BCP is sufficient to ensure business continuity, and the business will not be interrupted. Therefore, losses due to business interruptions will not be assessed. In addition, property insurance covers the repair costs, therefore the additional operational losses due to physical damage will not be assessed. Hence, only decrease in the market value of owned properties will be considered. According to the assessment performed, the results have indicated that physical risk impact to the Branch's operations will primarily be reflected in the decreased market value of the Branch's owned property under stress scenarios.

Under the RCP 8.5 scenario, the market value of the owned property will be decreased by 16.84% in 2050 as compared to the current. Based on the assessment results, the physical risk impact on the Branch's operation is considered to be less significant comparing to climate-related impact on the Branch's loans and bond investment in terms of financial benefit.

3. Risk Management

3.1. Identifying and Assessing Climate-related Risks

Transmission to Traditional Risk Types

The Branch evaluated transmission to traditional risk types to understand the impact of climate risk. The climate risk impact may be evaluated quantitatively or qualitatively, depending on the traditional risk types and the maturity of the development. Below illustrates climate risks transmission to traditional risk types.

Traditional Risk Types	Climate Risks Transmission to Traditional Risk Types
Credit Risk	Climate risk may decrease the ability of loan borrower’s repayment or bond issuer’s coupon payment/notional redemption and may impact the Branch’s recovery of the loan/bond outstanding in the event of default. Climate risk may also decrease the values of collaterals, which are posted by the borrowers as a measure originally adopted by the Branch to mitigate credit risk arising from loans, through physical risk drivers.
Market Risk	Market risk may increase when there is a large, sudden, and negative price adjustment triggered by climate risk drivers, resulting in reduction in values of financial assets. Climate risk could also lead to a breakdown in correlations between assets or a change in market liquidity for assets, undermining risk management assumptions.
Liquidity Risk	The Branch’s counterparties may withdraw deposits and draw down credit lines in the event driven by climate risk drivers. As such, the Branch may need sufficient funding sources to ensure the Branch can fulfill all obligations as a result of sharply increased cash-out flows.
Operational and Legal Risk	<p>The Branch’s operational risk may increase during extreme weather events and the business continuity may be challenged during such time.</p> <p>Increasing legal and regulatory compliance risk may also rise when the Branch deals with climate-sensitive</p>

	investments and businesses.
Reputational Risk	Reputational risk may increase based on changing market or consumer sentiment. Consumer may be in favor of more climate or environmentally friendly products, services, and business practices. Inaction of addressing climate issues may adversely impact market and consumer perception to the Branch and subsequently impacting the Branch's abilities to maintain or establish business relationships.
Strategic Risk	The Branch may face strategic risk if failing to respond and address climate issues in a changing market environment. Competitiveness and market standing may be lost during such time when the Branch misses to adopt climate or environmentally friendly solutions and responsible practices.

Identifying and Assessing Climate Risks on Portfolio and Counterparty Level

Portfolio Level Assessment

At portfolio level, the Branch has assessed the impacts of climate risks on its loan and bond portfolios through the assessments on portfolio exposure to transition and physical risks.

1) Transition Risk

With reference to HKMA's pilot CRST exercise, the Branch has focused its transition risk assessment on corporate loans and bond investments. To determine the scope of assessment, the Branch has mapped the industry classifications of its loan obligors and bond issuers currently in system to high-carbon industries, i.e., (1) Energy; (2) Utility; (3) Metals and Mining; (4) Manufacturing; (5) Property Development; (6) Construction; (7) Transportation. After the identification of loan obligors and bond issuers in scope for assessment, based on the materiality threshold and sector exposure amounts, the Branch proceeded to perform qualitative analysis at sector level for immaterial industries (i.e., with exposure less than 1% of total portfolio), while detailed quantitative assessment at counterparty level is performed for sectors with material exposures.

2) Physical Risk

Different from transition risk assessment, since physical risk arises from weather-related events and progressive shifts in climate patterns, the impact of physical risk is less differentiated among industries. Instead, geographical locations are used as an important factor to identify physical risk. Hence, to determine the scope of the Branch's physical risk assessment, all types of property-related collateral loans are identified and included for counterparty level assessment with details in below section. After identifying locations of collaterals in the Branch's portfolio that are impacted by physical risks, the Branch proceeded to perform detailed quantitative assessment at regional level.

Counterparty Level Assessment

Once determined the scopes for climate risk assessment on the Branch's loan and bond portfolio, counterparty level assessment is carried out to analyze transition and physical risk impacts.

1) Transition risk

Loan portfolio

The transition risk assessment on the Branch's loan portfolio is performed under 2 NGFS scenarios (i.e., disorderly and orderly scenarios) over 3 time horizons, including 2025, 2030 and 2035. The assessment begins with an identification of key transition risk factors/scenario dimensions in NGFS scenarios, followed by a comprehensive economic response assessment from designed transmission channels at the sectoral level. The transition risk effects would transmit to potential financial impacts through 4 categories (i.e., Revenues, Expenditures, Assets and Investment) in the financial statements of obligors for each selected high-carbon emission industries.

Subsequently, the Branch has applied the obligors' stressed financials to the existing PD model to assess the transition risk impacts on the repayment ability of the obligors. Based on the assessment of PD, the Branch would further estimate the change in ECL on the portfolio level with reference to the change in PD results.

Bond portfolio

For the Branch's bond portfolio, under climate risk scenarios, assuming the interest rate and liquidity environments remain unchanged, the climate risk impact would therefore simply be reflected on the increase in credit risk. Hence, the Branch has leveraged the credit spread change of the bonds to estimate the fair value change of bond due to transition risk impacts.

The stressed PDs of high-carbon industries (“industry-level stressed PD”) under loan portfolio have been leveraged for generating the credit spread change. The log-odd of relative change in industry-level stressed PD has been taken as the change in credit spread under climate scenarios for bonds. Subsequently, the Branch has used the credit spread change to derive the stressed market value and assess the transition risk impact to the bond portfolio.

2) Physical risk

The Branch evaluates the exposure of individual clients in the loan portfolios for which property-related collaterals are identified. The geographical location of collateral is used to determine counterparties with higher physical risk impact.

The physical risk assessment on the Branch’s loan portfolio is performed under 2 IPCC scenarios (i.e., RCP 2.6 and RCP 8.5) over 3 timestamps (i.e., 2025, 2030 and 2050). By observing the climate events in Hong Kong and key locations of property-related collaterals identified in the Branch’s loan portfolio, along with the consideration of data availability, the Branch has focused its assessment on physical risk due to tropical cyclone and flooding.

The Branch has assessed the physical risk impacts on the collateral values of property-related loans through 3 physical damage indicators, namely, annual expected damage rate from tropical cyclones, floods, and the consolidated expected damage rate from tropical cyclones and floods. The annual expected damage rates are calculated through relative change in annual damage rates and baseline damage rates, which are obtained from external data sources, such as World Resources Institute’s (“WRI”), NGFS CA Climate Impact Explorer (CIE), and Hong Kong Observatory (“HKO”).

Once obtained the projected stressed damage rates from tropical cyclone and flooding, the Branch has quantified physical risk impacts by calculating stressed collateral values. Subsequently, the stressed collateral values are used as inputs to compute stressed LGD, which is further used to estimate the change in ECL on the Branch’s loan portfolio level.

Identifying and Assessing Climate Risks on Operation Level

Besides climate risk implication to the Branch’s loan and bond investment portfolios, with the consideration that physical assets of the Branch may be impaired and business operation may be impacted during extreme weather event, the physical risk impact on operation is also assessed.

Given the Branch's current BCP is sufficient to ensure business continuity and insurance will cover the damage caused by the natural disasters or accidents, climate-related impacts on the Branch's operational risk are mainly contributed by the risk of decreasing market value of owned properties under stress scenarios.

3.2. Processes for Managing Climate-related Risks

To manage climate risk in a holistic manner, the Branch has established a climate risk management framework, consisting of risk identification, assessment, monitoring, and control and mitigation. Risk identification and assessment aim to collect climate-related data and information to understand the potential climate risks for the Branch and to qualitatively and quantitatively assess the climate risks the Branch is exposed to. Monitoring is to ensure the exposures to climate-related risks is consistent with the Branch's risk appetite using a set of climate-related risk metrics. Control and mitigation are in place for the Branch to apply climate-related mitigation measures to manage the exposure to the associated risks.

Monitoring Climate Risks

To facilitate the processes to monitor exposures to climate-related risks, the Branch regularly evaluates its portfolio and own operation against a set of climate-related metrics. The list of climate risk impact indicators consists of both qualitative and quantitative metrics and is organized into portfolio, counterparty, and operation levels. For both portfolio and counterparty levels, the Branch has set up metrics for evaluating exposures to physical and transition risks respectively.

Regarding portfolio level, the Branch has focused its monitoring over its loans and bond investments portfolios, identifying sectors which are more vulnerable to transition risks and locations of collaterals in the Branch's portfolio that are more likely to be impacted by physical risks.

Controlling and Mitigating Climate Risks

The Branch has set up a number of measures to manage its exposures to climate-related risks, having regard to the policy and procedures of Head Office, its climate risk management strategy, and its risk appetite. The Branch mitigates such risks by adopting sector-level, counterparty-level and operation-level measures.

At the sector perspective, the Branch has enhanced monitoring of high-risk sectors with material exposures. The Branch has also applied counterparty-level

measures such as strengthening data and information collection to manage exposures to climate-related risks. Apart from considering measures to mitigate the climate risks posed to the Branch's portfolio, the Branch has incorporated climate-related considerations in its Business Continuity Planning (BCP) procedures to prevent climate-related disruptions to its operation.

3.3. Integration to Overall Risk Management

The Branch has taken climate change into consideration and formulates processes for climate risk management as one of the key actions in the overall risk management.

Given the business risks posed by climate change, the Branch embeds climate change and its related risks into its current risk management framework, strengthens its climate risk governance and identifies climate change's potential risks and opportunities in a comprehensive manner. The Branch has incorporated climate risk into the three lines of defense and enhanced its current policies and procedures from various perspectives, including risk policies, risk appetite statements, and business policies, to ensure climate-related considerations have been incorporated into the existing risk management processes.

Enhancing Risk Management Capability

To address information and data challenges, the Branch has formulated questionnaire to collect climate-related data and information from customers. The questionnaire would enable the Branch to strengthen the engagement with clients to develop a better understanding of climate-related impact on clients' business. It would also enable the Branch to obtain more climate-related information from clients and thereby applying the appropriate control and mitigation measures. For example, the Branch would be able to identify whether the counterparty has incorporated climate-related considerations in their risk management and whether the counterparty has any carbon emission targets.

4. Metrics and Targets

The Branch has developed a template to monitor its exposures to climate-related risks (both physical and transition risks) on portfolio level, counterparty level and operation level. The template assists the Branch to monitor and report on certain climate-related metrics, and hence better manage climate-related risks, for example, the exposure percentage of high carbon industries to total portfolio.

Apart from monitoring metrics, below summarizes metrics used when conducting scenario analysis and stress testing.

Transition Risk

Metrics for the Branch's loan portfolio:

- Exposure to high-carbon sectors
- Probability of default
- Expected credit loss

Metrics for the Branch's bond portfolio:

- Exposure to high-carbon sectors
- Market value

Physical Risk

Metrics for the Branch's loan portfolio and operations:

- Exposure of loan with property-related collateral
- Annual and accumulative damage rates from extreme weather events
- Collateral values
- Loss given default
- Expected credit loss

Metrics for the Branch's operation:

- Market value of owned properties