Annex

Good practices on climate risk management

This annex summarises the key observations from the thematic examinations and consultative sessions recently conducted by the HKMA, highlighting good practices identified among the participating AIs[1] to strengthen climate risk management frameworks and develop effective risk control processes and measures.

The good practices span the risk management cycle, intertwined and complementary to one another. These good practices demonstrate the following trends observed among participating AIs when managing their climate risks: (i) advancing toward a more quantitative-oriented risk management framework; (ii) bridging data gaps to further incorporate climate risks into credit decisions; and (iii) deepening and broadening the embedment of climate considerations in the management of other traditional risk types.

As international practices and regulatory standards on climate risk management evolve, AIs are encouraged to draw upon these good practices, considering their individual circumstances, to further enhance their work in this area.

(I) Advancing toward a more quantitative-oriented climate risk management framework

Key observations

All participating AIs have established and enhanced their climate risk management frameworks. These frameworks align with the AIs' climate strategies and reflect the scale, nature, and complexity of their business and operations in Hong Kong. They typically include dedicated policies for climate risk management, which are integrated into their existing risk management frameworks and policies. Climate risks are incorporated into the AIs' risk appetite framework at the local, regional, and/or group level, at least qualitatively. Furthermore, the AIs have clearly allocated the roles and responsibilities for managing climate-related risks across the three lines of defence.

Good practices

1. Establishing a robust climate risk limit structure governed by a quantitative climate risk appetite statement (RAS)

Most participating AIs have built upon their qualitative climate RAS to establish quantitative metrics and limits within their climate RAS. These metrics and limits are

[1] A total of 21 AIs participated in these supervisory exercises, including 11 locally incorporated AIs and 10 overseas-incorporated AIs with head offices across the Asia-Pacific, Europe and North America.

designed to govern their bank-wide climate risk limit structure effectively. Common metrics and limits include the concentration of credit exposures to high-emitting sectors in the lending and investment portfolios, the amount of credit exposures with property collateral vulnerable to physical risks, and the size and growth of the green and sustainable finance portfolio. More advanced AIs have introduced sectoral metrics and limits for credit exposure and Scope 3 financed emissions to monitor and control their transition risks at a more granular level.

Using RAS limits and metrics as a guide, many participating AIs also establish appropriate key risk indicators (KRIs) and key performance indicators (KPIs) to inform their business-as-usual (BAU) risk monitoring and management processes. For example, some AIs have implemented KRIs to track emissions trends of their top high-emitting clients, thereby enhancing counterparty-level monitoring. In addition, some AIs have employed KRIs to monitor the impacts of climate risk on their operations, such as the proportion of their operating sites, facilities, and major outsourced activities located in areas of high physical risk.

2. Underpinning the understanding of climate risk impacts with regular and quantified assessments

Some participating AIs conduct regular assessments to refresh their understanding of how climate risks may affect traditional risk types. These assessments evaluate the transmission channels, materiality, and time horizons of potential impacts on each traditional risk type. They consider risk drivers, including physical risk, transition risk, and other nature-related risks such as biodiversity risk, as well as factors like pollution, and changes in land use. In addition, some AIs incorporate their risk mitigation measures to evaluate the residual climate risks, assess their impacts, and identify potential gaps in their policies and controls. Examples of the types of assessments conducted by AIs are as follows:

- *Multi-dimensional concentration analysis broken down by sector and geography* is conducted by some AIs in order to gain a deeper understanding of how climate risks may impact their credit portfolio.

- *Scenario analysis and stress testing* are used by many participating AIs to quantify and assess the materiality of climate risk impacts. For transition risk, AIs evaluate the changes in the repayment ability of counterparties in high-emitting sectors under climate-focused stressed scenarios. Some AIs also analyse second-order impacts on and from the counterparties' upstream and downstream business sectors. For physical risk, AIs assess the impact of physical risk events on their property-related lending and investments, property collateral, exposures to other obligors whose credit quality may be significantly affected by extreme weather events, and their own business operations.[2]

[2] The HKMA set out the good practices identified during its second round of climate risk stress test in the "Climate Risk Stress Test 2.0 Report" published in February 2025. Please refer to https://brdr.hkma.gov.hk/eng/doc-ldg/docId/getPdf/20250306-2-EN/20250306-2-EN.pdf.

Some participating AIs and/or their banking groups have developed integrated climate risk stress tests as a BAU tool, and introduced climate shocks into the stress testing programmes for traditional risk types. For instance, to estimate the impact on liquidity risk, some AIs assume increased deposit runoff and usage of committed undrawn credit facilities during climate events. A few AIs have also integrated climate shocks into their market risk stress testing to assess and monitor the potential losses across various asset classes, including equities and commodities.

- *Climate risk materiality assessments focused on local operations in Hong Kong* are performed by some participating AIs in addition to those conducted by their banking groups. Furthermore, some participating AIs actively contribute to group-level climate risk materiality assessments by participating in discussion, providing local inputs, and conducting evaluations to ensure that the group-level assessment adequately addresses the climate risk impacts on their local operations.

3. Exploring suitable Fintech solutions with the objective of enhancing the effectiveness and efficiency of climate risk management

Some participating AIs have been actively exploring Fintech solutions to improve the effectiveness and efficiency of climate risk management. Examples of such solutions include:

- *Using Generative Artificial Intelligence (A.I.) to complete climate or ESG questionnaires.* Some participating AIs have deployed Generative A.I. to assist staff in completing the climate or ESG questionnaires used to inform counterparty-level climate risk assessments. The Generative A.I. tool analyses input documents, such as a client's annual report and sustainability report, provides summarised information, and suggests responses to the questions in the climate or ESG questionnaire.

- *Using HKSAR Government APIs to assess the physical risk of collateral*. One participating AI assesses the physical risk associated with property collateral by leveraging the HKSAR Government's APIs (e.g. the Land Parcel and Public Utility Number Search API, the Coordinates Transformation API). These APIs are used to locate and translate property collateral addresses into standardised coordinates, which are then applied to the AI's stress testing model to measure and monitor physical risk exposures.

- *Leveraging climate risk modelling tools, such as the HKMA's Physical Risk Assessment Platform*[3]*, to assess and manage the physical risks associated with*

[3] In May 2024, the HKMA launched the beta version of the Physical Risk Assessment Platform, a cloud-based platform which enables AIs to assess the impact of physical hazards on real estate under different climate scenarios. The HKMA further enhanced the Platform and released the formal version in July 2025. Please refer to https://brdr.hkma.gov.hk/eng/doc-ldg/docId/20240529-1-EN and https://brdr.hkma.gov.hk/eng/doc-ldg/docId/20250710-2-EN respectively.

credit exposures. These tools are integrated into processes such as loan origination and portfolio management.

(II) Bridging data gaps to further incorporate climate risks into credit decisions

Key observations

Participating AIs have established mechanisms and processes to incorporate climate-related considerations into their credit decisions. They employ a variety of methodologies and tools to assess the climate risks of their counterparties. Many participating AIs have developed in-house questionnaires in a bid to build up internal data capabilities.

Good practices

4. Establishing a structured approach to guide the selection of suitable methodologies and tools for assessing climate risk across diverse counterparties

A few participating AIs have implemented a tier-based system to categorise their clients, enabling the application of proportionate approaches and tools for counterparty-level climate risk assessments. Clients are typically categorised based on factors such as their industry sector, the size of the credit line, the AI's exposure to the client, and/or the significance of their contribution to the AI's financed emissions.

By categorising clients in this manner, AIs can apply proportionate approaches and tools to perform climate risk assessments in a risk-based manner. AIs utilise customised climate/ESG questionnaires that require clients with higher climate risk implications to provide more detailed information to assess their climate risk profile. Clients from selected high-emitting industries are also subject to sector-specific question lists or questionnaires, which provide a more tailored approach to assessing their climate risk. Additionally, some AIs assess the transition plans of clients classified as having high climate risk implications, enabling a more comprehensive understanding of their climate risk profile.

As the availability of data and climate risk management capabilities continue to improve, AIs refine their approaches and tools for each tier of counterparties. This refinement enhances their overall climate risk management assessments and better addresses the unique needs of each client tier.

5. Developing questionnaires to facilitate a comprehensive climate risk assessment

Many participating AIs have developed their own climate/ESG questionnaires to collect granular climate-related data for evaluating the vulnerability and resilience of their

counterparties to climate risks. These questionnaires were informed by publicly available questionnaire templates[4], and cover information including:

- *The level and trend of climate risks inherent to the counterparty's business and operations*, encompassing factors such as industry sector, operating location, realised or forecasted carbon footprints (measured by scope 1, 2, and 3 greenhouse gas emissions and emissions intensity), and energy consumption;

- *The counterparty's practices for managing climate-related risks and opportunities*, involving considerations of the counterparty's governance, strategy (e.g. net zero/carbon neutrality goals and targets), risk identification, assessment, and management, as well as its climate disclosure practices (including alignment with international climate disclosure standards and external assurance conducted on the disclosures);

- *The adaptation and mitigation measures taken by the counterparty to increase its resilience against climate risks*. These measures include business contingency planning, insurance coverage for chronic and acute physical risk events, and the use of carbon credits. The effectiveness of these measures is prudently reviewed;

- *The credibility of the counterparty's transition or sustainability plan*. Some participating AIs assess the plan's quality and reliability against established criteria, such as alignment with the Paris Agreement or national/jurisdictional climate commitments, and the transparency of the counterparty's decarbonisation targets over different time horizons;

- *The counterparty's implementation of its transition plan*. Progress in implementing the transition plan is measured against relevant ambitions and targets (e.g. greenhouse gas emissions reduction, energy saving and improvement in energy usage efficiency); and

- *Additional ESG/climate-related information.* Such information includes negative news and litigations, which may pose reputational impacts to the counterparty and the AI.

Some AIs also apply the double materiality concept, which also assesses the environmental impact of clients' operations.

Some participating AIs have developed detailed guidance on the conditions and caveats for incorporating group-level information in climate risk assessments of borrowing entities. For instance, one AI outlines the key assessment aspects where group-level information can be

[4] Including the questionnaire templates jointly developed by the Green and Sustainable Finance Cross-Agency Steering Group (CASG) and CDP. Please refer to https://www.sustainablefinance.org.hk/en/data-technology/casg-non-listed-company-questionnaire-on-climate-and-environmental-risk.

used[5], while stipulating that a borrowing entity's climate risk sensitivity should not be rated better than that of its group. However, the borrower's climate risk resilience can be rated better with proper justification, such as lower carbon intensity, more efficient energy use, a better-defined transition plan, and a clear strategy.

6. Leveraging alternative methods and resources where relevant climate-related information is not available

In addition to engaging bilaterally with counterparties, some participating AIs use alternative methods to address the remaining data gaps. These methods include:

- *Developing proxy methodologies and data.* For example, one AI created an internal sovereign heat map ranking to estimate the physical risk level of counterparties' operating locations.

- *Leveraging data and solutions from external providers*. This involves the use of vendor models and data to estimate clients' probabilities of default (PD) under climate-triggered stress scenarios, evaluate temperature alignment scores, and assess the physical risk level of property collateral. Some AIs also use vendor reports to capture ESG-related incidents and conduct reputational risk assessments.

- *Referencing reliable public information*, such as clients' published climate-related disclosure reports and media news.

To ensure the relevance and accuracy of the data, some AIs have also implemented quality assurance measures across the first and second lines of defence.

7. Adopting a systematic approach to integrate climate risk assessments into credit risk management processes

A standardised template can be used to develop a structured climate risk assessment, to facilitate the understanding and processing of credit reviewers, and to enable consistent integration into the credit evaluation process. Many participating AIs have also established rating or grading systems to further enhance the assessment process. Notably, one participating AI has introduced a mechanism that explicitly links the climate risk rating to its internal credit rating by applying a credit override.

Annual credit reviews also provide an opportunity for some AIs to conduct additional analyses to quantify the impact of climate risks on clients' repayment ability. For example, some AIs perform forward-looking cash-flow analyses that incorporate climate risk considerations, while one participating AI assesses clients' projected probabilities of default under prescribed climate risk stress scenarios. The results of these quantitative analyses are then integrated into the AIs' credit decisions, ensuring a comprehensive evaluation of climate-related risks.

[5] For example, committees at the board and senior management level that oversee climate-related issues, sustainability targets, calculation and reporting of greenhouse gas emissions, external ESG-related ratings, etc.

(III) Deepening and broadening the embedment of climate considerations in the management of other traditional risk types

Key observations

Based on the understanding of transmission channels and potential impacts of climate risks on other traditional risk types, participating AIs have developed and implemented risk control and mitigation measures to effectively monitor and address these impacts.

Good practices

8. Establishing metrics and limits for monitoring and reporting operational, liquidity, and market risks arising from climate-related risk drivers

Most participating AIs conducted scenario analysis and stress testing to evaluate the impact of physical risk events on their own business operations. Some participating AIs maintain a comprehensive inventory of climate-related events that have affected the AI's operations. Corresponding RAS metrics/limits and KRIs are established to govern the relevant risk monitoring and reporting process. Some AIs also conduct climate risk assessments that cover both transition and physical risks when selecting third-party service providers.

Some participating AIs have established a liquidity concentration metric or limit to monitor the proportion of deposits from clients vulnerable to climate risks. This metric measures and controls the risk of deposit withdrawals triggered by climate-related risk drivers. Furthermore, some participating AIs assess the impacts of physical climate risk events on the stability of their wholesale deposits during their internal liquidity adequacy assessment process (ILAAP).

In addition, some participating AIs have established climate-related market risk limits to mitigate the risk of sudden and significant fluctuations in the value of financial assets and their correlations upon the materialisation of climate risk-related triggers. Examples of such limits include exposures to equities from high-emitting sectors, and climate-sensitive FX exposures to countries with high transition risk.

9. Developing a holistic framework for managing reputational risks arising from climate-related risk drivers

Some participating AIs have developed a holistic framework and dedicated policies to address reputational risks arising from climate-related risk drivers at the institutional, product, and counterparty levels. These policies outline the control processes and measures to mitigate such risks, and clearly define the roles and responsibilities of the parties involved to ensure the effective performance of their duties. Any issues related to these reputational

risks are reported and discussed by the responsible board-level committees and senior management. Examples of the control measures include:

- *Establishing a proper mechanism to closely monitor and actively manage progress toward meeting their climate commitments*. These commitments include operational emissions, financed emissions, and green and sustainable finance (GSF). Where targets are set and centrally managed by the banking group, some participating AIs have established protocols for coordinating with the group to track and manage progress toward the relevant targets at the local level. For example, one AI regularly obtains data from its head office regarding the share of financed emissions arising from its local lending and investment portfolios. In addition, some participating AIs regularly track their local GSF transaction data, which in turn enables consolidation at the group level.

- *Embedding greenwashing risk considerations in the product governance process, referencing the relevant good practices previously shared by the HKMA*[6]. Many participating AIs have established controls on green and sustainable products throughout the product lifecycle, spanning from new product approval to transaction due diligence, and post-offering monitoring and reporting.

- *Critically reviewing and assessing the reputational risk associated with the AI's counterparties, taking into account their sustainability commitments, transition plans, and relevant actions and progress accomplished*. One participating AI monitors the decarbonisation progress of high-emitting clients against their respective sectoral trajectories, thereby enabling an assessment of the credibility of the clients' sustainability commitments.

Some participating AIs have established policies and guidelines to govern the use of carbon credits. These carbon credit policies outline the usage of carbon credits, as well as the principles and due diligence process for selecting credible carbon credits. Examples of these policies and guidelines include the following:

- *Stipulating that carbon credits will only be used to offset their residual, unabated operational emissions after all possible measures to reduce emissions have been exhausted;*

- *Permitting the use of carbon credits only if they have been recently generated and have undergone robust independent third-party validation and verification; and*

- *Conducting a critical review of the relevant carbon crediting programme to ensure that it is subject to effective governance and registered at reputable registries.*

[6] In December 2022, the HKMA published good practices on the development and ongoing management of green and sustainable products. Please refer to https://brdr.hkma.gov.hk/eng/doc-ldg/docId/20221209-3-EN.

To ensure that the information communicated to external parties accurately reflects their climate commitments and progress, some participating AIs have established policies and protocols for the prudent formulation, rigorous review, and approval of messages to be deployed.