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White Paper on Green and Sustainable Banking



HONG KONG MONETARY AUTHORITY
香港金融管理局

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Objective

Climate change is one of the major risks threatening the well-being of mankind, and the financial sector is no exception. Authorized institutions (AIs) should gear up to meet the possible challenges arising from climate change, including the physical and transition impacts on their own operations and their clients.

The objective of this white paper is to present the initial thinking of the Hong Kong Monetary Authority (HKMA) about its supervisory approach to addressing climate-related issues, and to a lesser extent, broader sustainability issues. The HKMA also hopes that this white paper can enable AIs to have a grasp of the issue and help shape a greener, better and more climate-resilient banking system.

The HKMA appreciates further discussion about our thinking presented in this white paper.

Structure

Part I gives an introduction of sustainability issues, including climate change.

Part II discusses how climate-related risks can be transmitted to the banking sector in general, and how banks in Hong Kong may be affected in particular. It also covers how climate change brings opportunities to banks.

Part III describes the HKMA's regulatory development and its three-phased approach to promoting green and sustainable banking in Hong Kong.

Part IV presents our initial thoughts on supervisory expectations and requirements.

I. Introduction

1.1 Background

- 1.1.1 Sustainability issues have been receiving increasing attention and have become a core part of the agenda of public and private sectors around the globe. Topics such as climate, energy and the circular economy¹ are discussed at the World Economic Forum (WEF)². At the United Nations (UN), sustainable development goals (SDGs) are advocated and progress is reported and discussed regularly. Business leaders have joined the UN's efforts in mobilising resources for long-term sustainable investments³.
- 1.1.2 Globally, central banks and banking supervisors are demonstrating growing awareness of climate change and a commitment to tackling the challenge. For instance, in December 2015, the Task Force on Climate-related Financial Disclosures (TCFD) was established by the Financial Stability Board. The TCFD developed a set of voluntary, consistent disclosure recommendations for use by companies in providing information to investors, lenders and insurance underwriters about their climate-related financial risks⁴. In December 2017, eight central banks and supervisors established the Central Banks and Supervisors Network for Greening the Financial System (NGFS) with the aim of contributing to the development of environment and climate risk management in the financial sector, and mobilising mainstream finance to support the transition toward a sustainable economy. Since then, the NGFS had grown to 66 members and 12 observers as of May 2020⁵.

1.2 Sustainability and ESG

- 1.2.1 The concept of sustainable development is commonly defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”⁶.
- 1.2.2 Sustainability is multifaceted. There is no definite or exhaustive list detailing the boundary or scope of the issues concerned. It is common to link sustainability with

¹ A circular economy is an industrial system that is restorative or regenerative by intention and design. It promotes the elimination of waste and the continual safe use of natural resources. (Source: WEF)

² Source: WEF, *World Economic Forum Annual Meeting*, January 2020.

³ Source: UN, *Global Investors for Sustainable Development Alliance*.

⁴ Source: TCFD, *2019 Status Report*, June 2019.

⁵ Source: NGFS website.

⁶ Source: World Commission on Environment and Development, *Our Common Future (also known as the Brundtland Report)*, 1987.

environment, social and governance (ESG) issues. Examples⁷ of these issues include biodiversity loss, climate change and modern slavery, although it is generally held that a definitive list of ESG issues does not exist. In 2015, the UN announced, in its 2030 Agenda for Sustainable Development, 17 SDGs for addressing the global challenges. These SDGs relate to poverty, inequality, climate change, environmental degradation, peace and justice, etc.⁸. In its Guide to Banking and Sustainability, the United Nations Environment Programme Finance Initiative (UNEPFI) considers that sustainability encompasses the business role in balancing environmental and social issues and, to a lesser degree, economic issues⁹.

- 1.2.3 Sustainability is relevant to banks. While sustainability could bring business opportunities, depletion of resources and tighter sustainability regulations would affect the banks themselves and their clients. Stakeholders and the public would also have certain expectations of AIs' approach to sustainability.

1.3 Climate change

- 1.3.1 Among the sustainability issues, climate change is of particular importance. According to the Global Risks Report 2020¹⁰, climate action failure and extreme weather events are ranked the top two global risks in terms of likelihood, and the former also tops the rankings in terms of impact. The report highlights the implications of climate change as catastrophic, wide-ranging and intersecting, and cautions that some impacts are still unknown. The known risks include loss of life, stress on ecosystems, food and water crises, exacerbation of geopolitical tensions, economic losses, capital market risks and supply chain disruptions.
- 1.3.2 Some characteristics of climate change, as shown below, are distinct from broader sustainability issues and more importantly, demand our imminent action. In line with what the NGFS has suggested, it is on this basis that climate change is the initial focus of our actions¹¹.

⁷ Source: UN Principles for Responsible Investment (PRI), *PRI Reporting Framework – Main Definitions 2018*, November 2017.

⁸ Source: UN, *Transforming our World: The 2030 Agenda for Sustainable Development*, 2015.

⁹ Source: UNEPFI, *Guide to Banking and Sustainability – Edition 2*.

¹⁰ Source: WEF, *Global Risks Report 2020*, January 2020.

¹¹ Source: NGFS, *A call for action: Climate change as a source of financial risk*, April 2019.

Table 1: Distinctive characteristics of climate change

Far-reaching impacts in breadth and magnitude	Foreseeable nature	Irreversibility	Dependency on short-term actions
Climate change will affect all agents in the economy, across all sectors and geographies. The impacts could be much larger, more widespread and more diverse than those of other structural changes.	There is a high degree of certainty that some combination of physical and transition risk will materialise in the future.	There is a high degree of confidence that, above a certain threshold for the concentration of greenhouse gas emissions in the atmosphere, climate change will have irreversible consequences on our planet.	The magnitude and nature of future impacts will be determined by the actions taken today.

Source: NGFS

1.4 Green and sustainable banking

- 1.4.1 Given the breadth of climate change impacts across all sectors and geographies, banks in Hong Kong will inevitably be affected, and the HKMA is committed to exploring ways to address this challenge.
- 1.4.2 Our consideration in addressing climate-related issues is two-fold, covering the financial impacts and the environmental/social impacts.¹² Financial impacts refer to the effects, which can be positive or negative, of climate change on the value and financial health of banks. On one hand, climate change would pose risks to the operations and business of banks, for example, by causing disruption to banks and their clients. On the other hand, climate change would bring business opportunities to banks arising from the reallocation of capital in transitioning to a low-carbon economy. Environmental/social impacts refer to the effects of banking activities on the environment. Bank operations and, more importantly, the activities they finance, may accelerate or mitigate climate change.
- 1.4.3 Given the HKMA's role as a banking regulator, our primary focus is on the risks posed by climate change to banks. We will also explore initiatives facilitating the development of businesses and promoting corporate social responsibility (CSR) in relation to climate change mitigation and adaption. We understand that different

¹² Under the EU's *Non-Financial Reporting Directive (Directive 2014/95/EU)* and the *Guidelines on non-financial reporting: Supplement on reporting climate-related information (2019/C 209/01)*, information related to these impacts are required to be disclosed if they are assessed to be material.

banks are at varying stages of development in addressing climate-related issues. While our ultimate goal is to get all banks on board to go green, we are mindful not to create excessive hardship to banks which are less ready, particularly those of smaller size with simpler operations.

II. Impact of climate change on Hong Kong banking industry

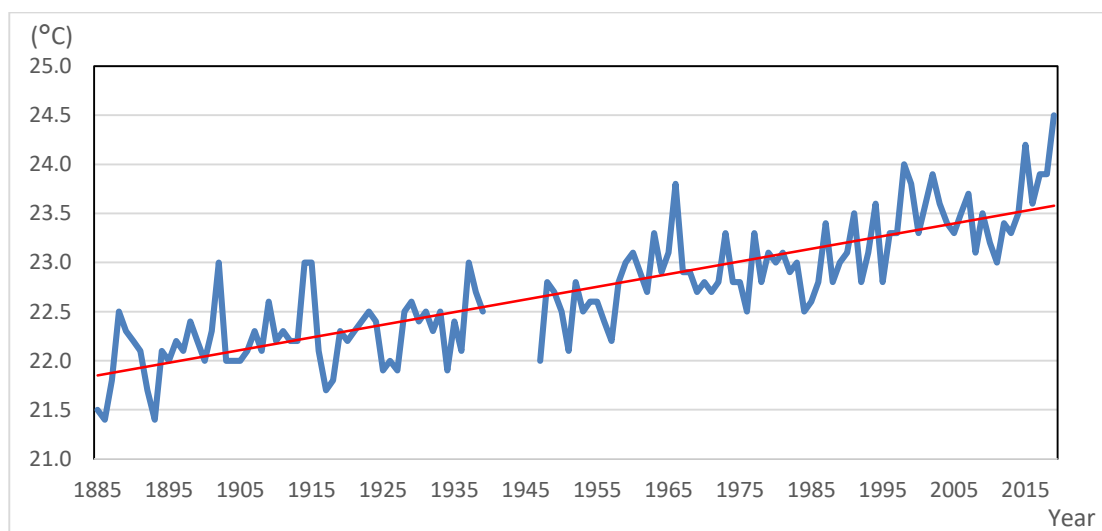
2.1 Signs of climate change

2.1.1 Climate change can be observed globally. According to the Intergovernmental Panel on Climate Change (IPCC), warming in the decade of 2006-2015 reached 0.87°C ($\pm 0.12^{\circ}\text{C}$) from 1850-1900, predominantly due to human activity generating more greenhouse gases (GHG) in the atmosphere. If the global temperature keeps rising at the current pace of 0.2°C ($\pm 0.1^{\circ}\text{C}$) per decade, human-induced warming would reach 1.5°C above pre-industrial levels around 2040¹³.

2.1.2 Hong Kong is not immune to the impacts of climate change. Some of the findings by the Hong Kong Observatory (HKO) are excerpted and set out below:

(a) Increase in average temperature: Chart 1 below shows that, from 1885 to 2019, the average temperature in Hong Kong increased at a rate of 0.13°C per decade. Similar to the global trend, the increase appeared to have accelerated in recent decades, reaching a rate of 0.21°C per decade during the three decades in 1990-2019. Table 2 shows the projections of the HKO, that by the end of this century, the mean increase in annual temperature, under different scenarios, could be between 1.3 and 4.2°C .

Chart 1: Annual mean temperatures recorded at the HKO headquarters (1885-2019)



Source: HKO

¹³ Source: IPCC, *Special Report on Global Warming of 1.5 °C*.

Table 2: Projected changes in the annual temperature (°C) and mean sea level of Hong Kong and its adjacent waters (incorporating the effect of local vertical land displacement) of Hong Kong relative to the average of 1986-2005 under different GHG concentration scenarios¹⁴

	GHG concentration scenario	2031- 2040		2051 - 2060		2091 - 2100	
		Mean	Likely range	Mean	Likely range	Mean	Likely range
Annual temperature change (°C)	Low	1.0	0.6 - 1.6	1.3	0.8 - 1.9	1.3	0.7 - 2.2
	Medium-low	1.1	0.6 - 1.6	1.7	1.0 - 2.4	2.2	1.4 - 3.2
	Medium-high	0.9	0.6 - 1.2	1.4	0.9 - 2.0	2.6	1.8 - 3.6
	High	1.3	0.8 - 1.9	2.2	1.6 - 3.0	4.2	3.1 - 5.5
	GHG concentration scenario	Mean	Likely range	Mean	Likely range	Mean	Likely range
Mean sea level change (m)	Low	0.22	0.16 - 0.29	0.36	0.26 - 0.46	0.60	0.44 - 0.79
	Medium-low	0.22	0.16 - 0.29	0.37	0.27 - 0.48	0.71	0.53 - 0.92
	Medium-high	0.23	0.16 - 0.28	0.38	0.27 - 0.46	0.73	0.54 - 0.93
	High	0.24	0.17 - 0.32	0.43	0.32 - 0.55	0.98	0.73 - 1.28

Source: HKO

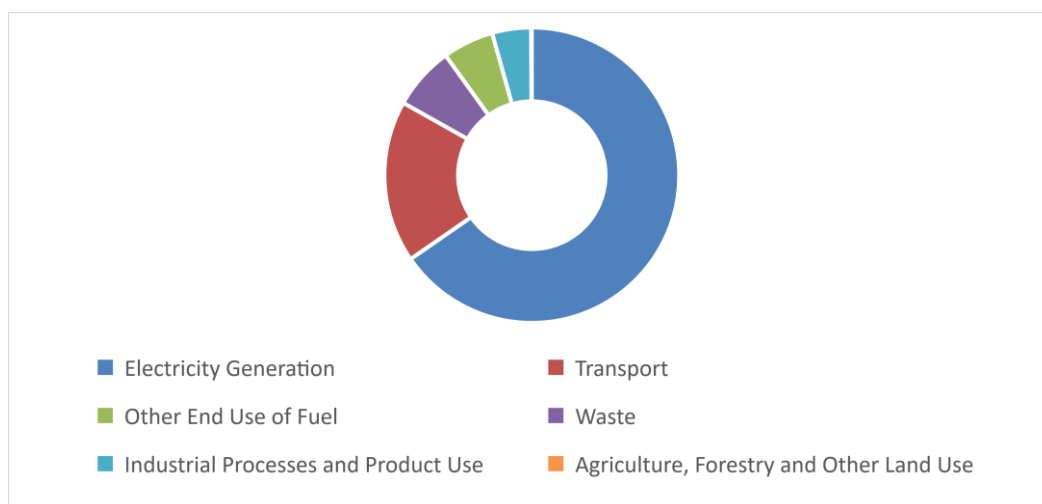
- (b) **More frequent extreme precipitation:** Extreme precipitation events have become more often. The hourly rainfall record at the HKO headquarters was broken several times in the last few decades, when in the past it used to take several decades to break the record.
- (c) **Rising sea level:** The mean sea level in the Victoria Harbour rose 0.12m during the past 50 years since 1954. The rising sea level, coupled with the passage of tropical cyclones, resulted in storm surges (sudden and rapid increases in water level due to a storm) that inundated low-lying and coastal areas. As Table 2 shows, the average increase in sea level under different scenarios is projected by the HKO to be between 0.6m and 0.98m by the end of this century. This will amplify the threat of storm surge during the passage of tropical cyclones.

¹⁴ These GHG concentration scenarios corresponds to certain Representative Concentration Pathways (RCPs) adopted by the IPCC. Different RCPs describe different 21st century pathways of GHG emissions and atmospheric concentrations, air pollutant emissions and land use, and serve as common grounds for making projections. In ascending order of GHG concentration, "RCP2.6" is a stringent mitigation scenario, "RCP4.5" and "RCP6.0" are two intermediate scenarios and "RCP8.5" is a scenario with very high GHG emissions. (Source: IPCC, *Climate Change 2014 Synthesis Report*)

2.2 The Paris Agreement and Hong Kong

- 2.2.1 In an effort to address climate change, the international community has, under the 2015 Paris Agreement, committed to limiting the increase in the global average temperature to below 2°C above pre-industrial levels, and to pursuing efforts to further limit the temperature increase to 1.5°C. The IPCC has projected that, to reach the target of limiting global temperature increase to 1.5°C, net human-caused carbon dioxide (CO₂) emissions must fall by 45% by 2030 and reach net zero by 2050. Even the lower target, of limiting the temperature rise to 2°C, would require CO₂ emissions to fall by 25% by 2030^{15,16}.
- 2.2.2 China is a signatory to the Paris Agreement, which also applies to Hong Kong. To fulfil the obligations under the agreement, the Hong Kong Government has formulated a carbon reduction target by 2030 so as to reduce Hong Kong's carbon emissions¹⁷. According to the plan, local emissions are expected to peak by 2020, while carbon intensity will reduce by the range of 65% to 70% by 2030. As local electricity generation is the biggest contributor to carbon emissions in Hong Kong making up about 70% as shown in Chart 2, the carbon reduction plan includes phasing down the use of coal for electricity generation and replacing it with natural gas.

Chart 2: GHG Emissions in Hong Kong by sector in 2017 (in kilotonnes CO₂-e)



Source: Environmental Protection Department

¹⁵ Source: WEF, *The Net-Zero Challenge: Fast-Forward to Decisive Climate Action*, January 2020.

¹⁶ Source: IPCC, *Special Report on Global Warming of 1.5 °C*.

¹⁷ Source: Environmental Bureau, *Hong Kong's Climate Action Plan 2030+*, January 2017.

2.3 How does climate change pose risks to banks?

2.3.1 Climate-related risks are risks posed by climate change, such as damage caused by extreme weather events or a decline of asset value in carbon-intensive sectors. They are broadly classified into physical risk, transition risk and liability risk^{18,19}:

- (a) **Physical risk** is categorised as acute when it arises from climate and weather-related events, such as droughts, floods, storms and sea-level rises, and as chronic when it arises from progressive shifts in climate and weather patterns, such as increasing temperatures. It comprises impacts resulting directly from such events and shifts, such as damage to property or reduced productivity, and also those that may arise indirectly through subsequent events, such as the disruption of global supply chains.
- (b) **Transition risk** is financial risk which can result from the process of adjustment towards a lower-carbon economy prompted by, for example, changes in climate policy, technological changes (such as energy-saving technologies and a sharp decline in renewable energy costs) or a change in market sentiment.
- (c) **Liability risk** is associated with emerging legal cases related to climate change, including those seeking compensation from financial institutions which are held responsible for loss and damages resulting from the effects of climate change, or which finance companies with activities having negative environmental impacts²⁰.

2.3.2 Assessing the risks posed by climate change to the banking industry would require an understanding of the various transmission channels. Below are some examples which outline how climate-related risks can develop into traditional risks faced by banks²¹:

- (a) **Credit risk** - Banks may be affected if the value of properties taken as collateral is hit by extreme weather events. Credit risk may also increase if banks are lending to customers whose businesses are adversely affected by drivers of climate change, climate policy, technology or market sentiment.

¹⁸ Source: NGFS, *First Comprehensive Report - A Call for Action*, April 2019.

¹⁹ Source: NGFS, *Guide for Supervisors: Integrating climate-related and environmental risks into prudential supervision*, May 2020.

²⁰ Following the approach adopted in the NGFS' recent work, liability risk will be considered as a subset of either physical or transition risk.

²¹ These examples are derived through the HKMA's discussion with AIs, and other banking regulators and its participation in international fora (such as the NGFS).

- (b) **Operational risk** - Severe weather events such as floods and typhoons could compromise a bank's property and operation. Heatwaves may also disrupt power generation or transportation, which will in turn upset banking services, affect business continuity, reduce revenue and increase repair costs. A bank's profitability may also be affected due to insurance costs being pushed up by higher risks stemming from extreme weather events.

Box 1

Extreme weather events in Hong Kong

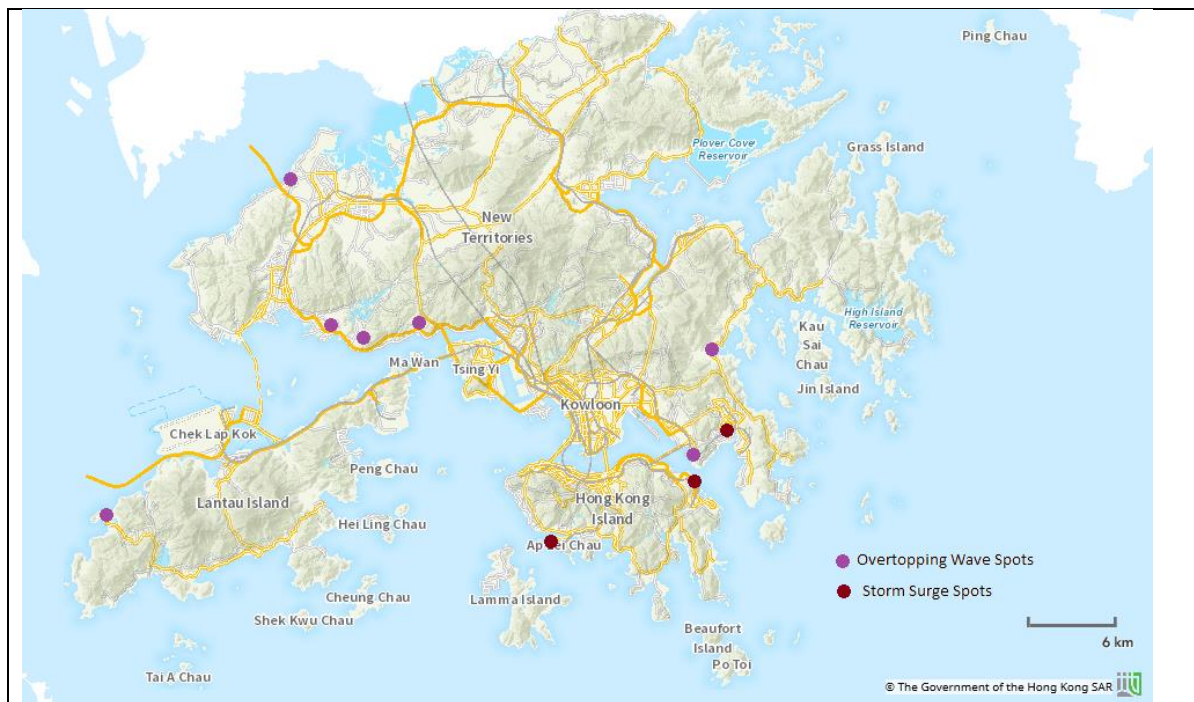
Super Typhoon Mangkhut struck Hong Kong on 16 September 2018. According to the HKO, the storm surge induced by Mangkhut generally raised water levels in Hong Kong by more than 2m. The Hong Kong Federation of Insurers reported²² that total claims incurred by Mangkhut amounted to **HK\$3.1 billion**, and that around 74% of the total claims, or **HK\$2.3 billion**, were related to property damage. While no official information was available on the extent of losses related specifically to storm surge induced by Mangkhut, the overall data could give an indication of the potential losses resulting from an extreme weather event.

In fact, Hong Kong's coastal areas will be under increasing stress and become more and more vulnerable to rises in the sea level. While the risk of coastal inundation caused solely by higher sea levels is generally not high, flooding may become more frequent because of the greater incidence of storm surges²³ or extreme precipitation, potentially causing physical damage to properties. Certain areas are more vulnerable to the physical risks. According to the Drainage Services Department, the passage of severe/super typhoons in recent years has revealed coastal areas that are considered vulnerable to serious seawater inundation due to overtopping waves²⁴ or storm surges in Hong Kong Island, Kowloon, the New Territories and Lantau Island. With rising sea levels, more coastal areas could become vulnerable to serious seawater inundation.

²² The statistics were collected from 54 insurance companies accounting for around 80% of market share.

²³ Source: Environmental Bureau, *Hong Kong's Climate Action Plan 2030+*, January 2017.

²⁴ Overtopping waves are formed when incoming waves rise above the seawall. During the passage of a tropical cyclone, the rise in sea level induced by a storm surge may cause coastal areas to be more easily inundated by seawater due to overtopping waves. (Source: Drainage Services Department)



Source: Drainage Services Department

Physical damage caused by extreme weather events is more likely to be transmitted to the banking sector if banks' properties or operations are located in these coastal areas, or their lending exposures whose clients' properties or operations are located and affected. Given the significant exposure²⁵ of the Hong Kong banking sector to the property market, physical risks arising from extreme weather events cannot be neglected.

- (c) **Market risk** - Climate events may trigger extreme market movements such as volatility in commodity prices. Sudden policy changes, such as the imposition of a carbon tax or technological changes may cause the equity prices of companies in carbon-intensive sectors to fluctuate.
- (d) **Liquidity risk** - Market sentiment towards carbon-intensive assets could change suddenly due to policy changes or technological breakthroughs, which may lead to a sudden decline in the value of assets held by banks, making it difficult to liquidate these assets. Furthermore, as credit rating agencies focus increasingly on ESG risks, poor management of climate-related risks could

²⁵ As of March 2020, among Als' loans and advances for use in Hong Kong, 45% are used for property development and investment and the purchase of residential properties. While not all properties are subject to the same level of physical risk, their significant size in Als' lending portfolios indicates that the impact of severe weather events on Als could be substantial.

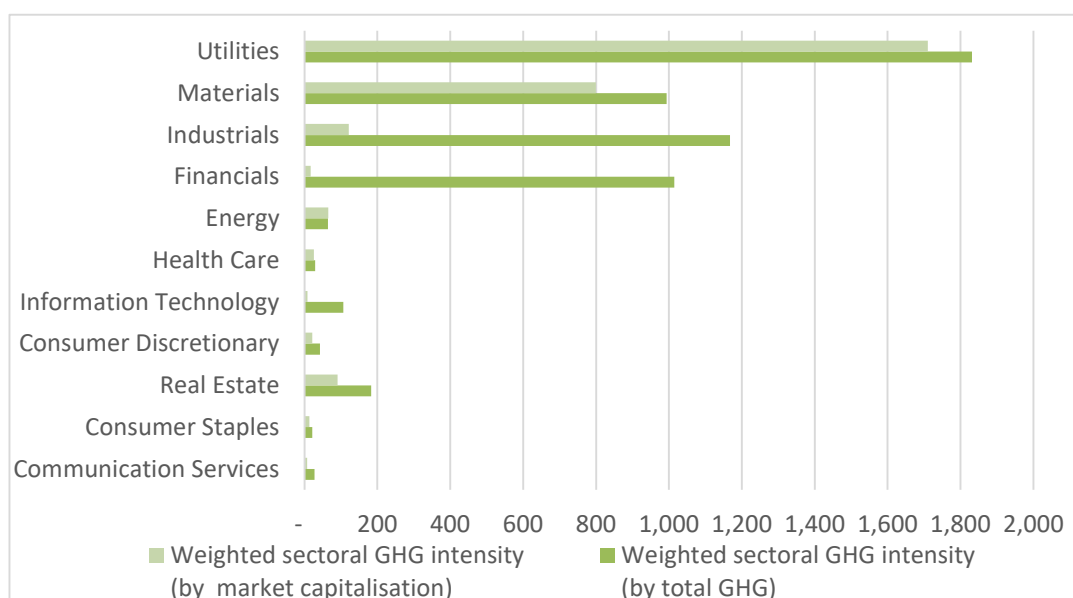
adversely impact the bank's credit rating and consequently affect its ability to obtain liquidity from the market.

- (e) **Reputation risk** - Market expectations of how adequately a bank responds to climate change are growing. A bank's association with projects viewed as socially or environmentally damaging may create negative publicity that may hit the customer base or even revenue.

Box 2

Sectors sensitive to climate-related risks

Policy changes are taking place around the world to cut carbon emissions and more are expected to be carried out to meet pledges made in the Paris Agreement. In assessing their exposure to climate risks, banks may first identify sectors that are more likely to be affected by transition risks. The most straight-forward approach would be to look into sectors that account for larger proportions of GHG emissions. Based on Bloomberg's GHG intensity data of Hong Kong-listed companies, the utilities and materials sectors are of the highest GHG intensities weighted by market capitalisation:



Source: Bloomberg

Apart from the above, other factors which identify sectors that are subject to higher transition risk can be extended to those related to the extraction or processing of fossil fuel or the manufacturing of petroleum or chemical products, and those under transformation due to technological advancement, such as the transportation and agricultural sectors. Banks can use such factors to assess whether they have substantial lending or investment in these sectors, or conduct further granular analysis on individual companies or transactions²⁶.

²⁶ Loans and advances to these sectors, namely (1) electricity and gas, (2) transports and transport equipment and (3) manufacturing of rubber, plastics & chemicals, roughly account for 8% of AIs' loans and advances for use

2.4 How does climate change bring opportunities to banks?

- 2.4.1 Apart from risks, it is held that climate change would also bring opportunities. The TCFD identified several areas of opportunity including improvement in resource efficiency, adoption of low-emission energy sources, development of new low-emission products and services, access to new markets, and resilience building along the supply chain²⁷. The opportunities create demand for green funding. The Organisation for Economic Co-operation and Development (OECD) estimated that on average, US\$ 6.9 trillion a year would be required for green infrastructure investment from 2016 to 2030²⁸.
- 2.4.2 The HKMA conducted a survey in April 2019 to understand Als' awareness of and progress in developing green and sustainable banking (please refer to *Part III* of this paper for more details of the survey). On a question about the potential benefit of developing green and sustainable banking business, "*corporate image and reputation benefits*" was considered by the most Als as significant (68%), followed by "*more business opportunities and new income sources*" (66%), "*meeting customers' demand*" (62%) and "*portfolio diversification*" (52%). In fact, some surveyed Als indicated that the development of green and sustainable banking had provided them opportunities to create positive environmental impacts and fulfil their duties to society and shareholders, and that they had observed increasing demand across different customer segments, from corporate clients requesting green banking solutions, to high-net-worth clients asking for relevant investment solutions.
- 2.4.3 Apart from green bonds, we have also observed innovations in green and sustainable products. For example, in April 2019, a sustainability-linked loan was granted in Hong Kong, and the interest rate of which would be partially based on a third-party assessment of the borrower's ESG performance²⁹. In November 2019, a sustainable deposit was launched for corporate and institutional clients, with funds raised being used to help finance activities that supported the UN SDGs³⁰. In December 2019, green retail certificates of deposit were issued in Hong Kong. The

in Hong Kong as of March 2020. While individual companies and projects within these economic sectors that contribute to this percentage figure may not necessarily be exposed to high climate-related risk (as some of the projects may even be considered as green), the figure provides an indication about the materiality of the impact of climate change on the banking sector.

²⁷ Source: TCFD, *Recommendations of the TCFD*, June 2017.

²⁸ Source: OECD, *Investing in Climate, Investing in Growth*, June 2017.

²⁹ Source: S&P Global, *Whelock lands Hong Kong's 1st sustainability-linked loan*, April 2019.

³⁰ Source: Standard Chartered, *Press release - Standard Chartered launches Hong Kong's first sustainable deposit*, November 2019.

proceeds will go towards financing eligible businesses and projects that promote the transition to a low-carbon, climate-resilient and sustainable economy³¹.

³¹ Source: HSBC, *News release - HSBC issues Asia's first green retail certificates of deposit in Hong Kong*, December 2019.

III. HKMA's approach to promoting green and sustainable banking

3.1 *The first stocktake on green and sustainable banking*

3.1.1 In April 2019, the HKMA conducted the first stocktake exercise on selected AIs to understand local developments in green and sustainable banking, including their practices on governance, management and disclosure of environmental and climate-related risks. A total of 50 AIs participated in the survey, representing a total market share of about 90% in terms of asset size. Overall, the survey results indicated that, while the AIs had different degrees of readiness for the development of green and sustainable banking, the bigger and more international AIs were in general more advanced. Other major observations are as follows:

- (a) In terms of awareness level, 74% of the surveyed AIs identified certain impacts of environmental and climate-related risks that were potentially significant, such as greater transactional losses, increased credit risk and hence higher risk-weighted assets.
- (b) In terms of progress, 72% of the surveyed AIs indicated they had engaged, to different extents, in green and sustainable banking and financial activities, such as issuing green bonds and granting green loans.
- (c) In terms of risk management, around half of the surveyed AIs addressed climate and environmental risks in their corporate governance and/or risk management frameworks.
- (d) 46% of the surveyed AIs have disclosed information about their green and sustainable banking activities and the associated risk management approaches.

3.1.2 As observed from these findings, there is certainly room for the AIs to strengthen their awareness of and progress in the management of environmental and climate-related risks, and to accelerate the development of green and sustainable banking business. The HKMA is committed to working with the industry in these areas.

3.2 *The three-phased approach*

3.2.1 Following the survey, as part of our measures to support Hong Kong's green finance development, the HKMA announced a three-phased approach in May 2019 to promoting green and sustainable banking:

- Phase I – developing a common framework to assess the “Greenness Baseline” of individual banks and providing technical support to banks;
- Phase II – engaging the industry and other relevant stakeholders in a consultation on the supervisory expectations or requirements; and
- Phase III – implement, monitor and evaluate banks’ progress in this regard.

3.2.2 The objective of the three-phased approach is to build climate resilience within the banking system, to raise banks’ awareness of climate change. The adoption of a three-phased approach allows the HKMA to understand AIs’ readiness in the development of green and sustainable banking so that we may provide the necessary guidance and support. A comprehensive understanding of AIs’ development progress would allow us to formulate supervisory requirements which are suitable for our local circumstances. Most importantly, the process of self-assessment helps an AI review its readiness and preparedness in this area, and serves as an effective tool in formulating its climate-risk strategies.

3.3 *Development of an assessment framework*

- 3.3.1 The major focus of the work in Phase I was the development of a common assessment framework which could assesses the “greenness” baseline of AIs. In July 2019, we formed a Working Group on Green and Sustainable Banking consisting of representatives from 22 AIs to develop the framework. As the degree of readiness for green and sustainable banking varies among banks, a mix of banks, comprising first movers, beginners, small and big banks, were brought together to maximise the effectiveness of sharing knowledge, experiences and good practices.
- 3.3.2 Rounds of discussions were held within the Working Group, with members providing very useful input to the development of the framework. We came up with a draft assessment framework and consulted the industry on it in December 2019. Taking into account the comments received from the industry, the HKMA finalised the framework and launched the first round of assessment in May this year.
- 3.3.3 The framework aims to collect information about an AI’s stage of development in preparing for climate-related risks and environmental risks in six areas, namely (i) governance, (ii) corporate planning and tools, (iii) risk management process, (iv) business policies, products and services, (v) performance and resources, and (vi) disclosure and communication. In the first round of assessment, we engaged around 50 banks to participate, having considered predominantly their asset sizes and business activities. After we receive the assessment results in August 2020, we may approach individual banks to seek further information or clarification,

which will assist us in learning about common practices and inform our work in setting supervisory expectations and requirements.

- 3.3.4 As we have emphasised in our previous communication with the industry, this assessment is not a pass or fail test as the aim is to facilitate AIs' preparation in developing green and sustainable banking and to inform our policy formulation. In fact, the three-phased approach is an iterative and evolving process, so the assessment will be ongoing. The exercise would initially be conducted on an annual basis, although a longer time frame would also be considered if the circumstances justified it.

3.4 Guiding principles for building climate resilience

- 3.4.1 Following the commencement of the self-assessment, we have entered Phase II, in which the major focus is the development of supervisory expectations and requirements. The assessment results will inform the design of supervisory expectations and requirements. In the meantime, we acknowledge the importance of communicating our supervisory expectations to AIs regarding the development of green and sustainable banking, so that AIs can formulate their plans accordingly. For this reason, this white paper aims to outline our initial thinking on supervisory expectations.
- 3.4.2 In this paper, we have outlined some initial thinking and possible actions that AIs may take to address climate-related issues, including principles and recommendations on the areas of governance, strategy, risk management and disclosure. We have also provided in the paper a summary of our observations from AIs, including some of the good practices.³² For details of such practices, AIs may refer to a separate circular to be issued by the HKMA.

3.5 Policy direction

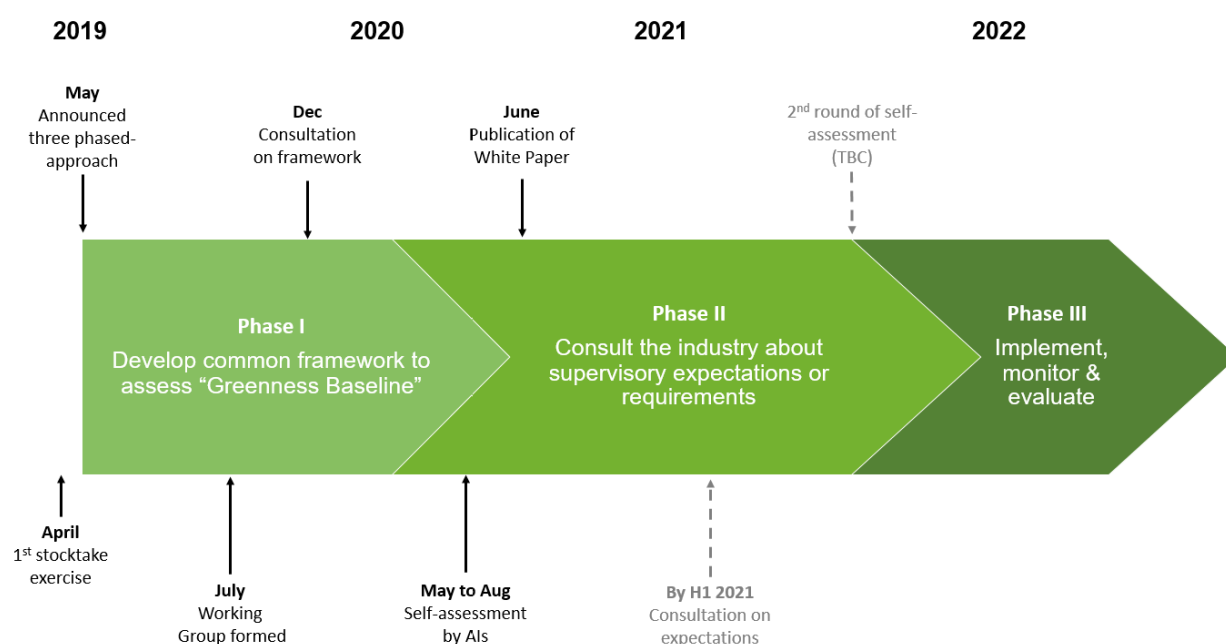
- 3.5.1 Both the assessment results and the industry feedback on our guiding principles will inform our development of supervisory expectations. We will continue our engagement with individual AIs and discussions within the Working Group to collect feedback from the industry. Currently, it is our plan to consult the industry in H1 2021 on our supervisory expectations. In formulating supervisory requirements, we will be mindful to adopt a proportionate approach such that the requirements are appropriate to AIs of different sizes. In addition to setting supervisory expectations and requirements, we are also exploring ways to facilitate AIs'

³² For details, please refer to *Part IV* of this paper.

development in the management of climate-related risks and business. We will conduct studies on potential obstacles to the development of green and sustainable banking in Hong Kong.

- 3.5.2 In terms of capacity building, in October 2019, the HKMA’s Centre for Green Finance (CGF) and the International Finance Corporation (IFC), a member of the World Bank Group, co-organised a seminar titled “Greening Financial Institutions”. The seminar highlighted how financial institutions were increasingly factoring in climate-related risks in various aspects such as their governance, lending policies, risk management frameworks, investment portfolios, business models and disclosure. Going forward, the CGF will continue to serve as a platform for technical support and experience sharing for the green development of the Hong Kong banking and finance industry.

Chart 3 - HKMA’s regulatory road map



3.6 Collaboration with other authorities and regulators

- 3.6.1 Given the large presence of international banks in Hong Kong, it is important to consider initiatives carried out by overseas banking regulators, as well as coordination among regulators, in developing our road map to build climate resilience for the sector.

International collaboration

- 3.6.2 The HKMA takes a proactive role in international regulatory development. For instance, we have participated in certain international fora, including the NGFS, where the HKMA is a member of the plenary and four workstreams³³. Regular exchange with other regulators also allows us to incorporate some overseas best practices in developing our supervisory approach.
- 3.6.3 The Basel Committee on Banking Supervision recently set up a high-level Task Force on Climate-related Financial Risks and the HKMA is one of the members. We are also the champion of the Interest Group on Sustainable Finance of the Working Group on Banking Supervision of the Executives' Meeting of East Asia-Pacific Central Banks. We are working with fellow banking regulators through these fora to conduct studies on climate-related risk management and share our experiences in this area.

Local collaboration

- 3.6.4 In May 2020, the HKMA and the Securities and Futures Commission initiated the establishment of the Green and Sustainable Finance Cross-Agency Steering Group (Steering Group). The Steering Group aims to co-ordinate the management of climate and environmental risks to the financial sector, accelerate the growth of green and sustainable finance in Hong Kong and support the Government's climate strategies.
- 3.6.5 It is the first time that the financial regulators in Hong Kong have joined hands for a common cause, showing Hong Kong's commitment to tackling climate and environmental risks and targeting a common goal on sustainability. The financial regulators will make use of this platform to keep each other updated on the relevant local and international developments, so that we may co-ordinate on the policy considerations, address potential challenges and explore possible ways to overcome the challenges collectively.

³³ The HKMA is a member of the Microprudential/supervisory workstream (WS1), Macrofinancial workstream (WS2), Scaling up green finance workstream (WS3) and the Bridging the data gaps workstream.

IV. Guiding principles for building climate resilience

4.1 Overview

- 4.1.1 Our initial thoughts on the supervisory expectations of AIs to build climate resilience are summarised in the following nine guiding principles. These guiding principles are designed to help AIs develop a governance framework and strategy for managing the risk and opportunities brought by climate change, and to provide guidance for taking into account of climate considerations in their risk management framework and the formulation of an approach in climate-related information disclosure.
- 4.1.2 These principles are intended to be relevant to all AIs. We recognise that there is a wide spectrum among AIs in terms of size, nature of business, complexity of operations and stage of development in their capability in addressing climate-related issues. As such, we expect that these principles will be applied to AIs on a proportionate basis, and will initially focus on larger AIs which have a greater impact on the Hong Kong economy and the financial system as a whole.
- 4.1.3 For AIs which are local subsidiaries or branches of foreign banks, it is not uncommon that the management of the risks and opportunities of climate change is led by the group or head office. If the relevant policy/setup/practice at the parent bank or head office is also applicable to, and adopted in, the operation in Hong Kong, the AI may consider relying on such policy/setup/practice when meeting the supervisory expectations based on the principles. In that case, the AI should assess whether such policy/setup/practice is relevant in the context of its Hong Kong operation, and ensure that any local specialities are addressed in a way that is commensurate with the size, nature of business, and complexity of operation of the Hong Kong office.
- 4.1.4 These guiding principles are formulated on the basis of our understanding of the practices of selected AIs obtained through our discussion with them, our first stocktake exercise and approaches of overseas regulators. Both risk and opportunity aspects of climate change are covered. Under each principle, a brief summary of the range of practices observed in our discussion with AIs is provided. AIs can refer to the circular *“Range of practices for management of climate risks”* issued separately by the HKMA for details on the range of practices of more advanced AIs specifically on the risk management aspect, which is the focus of our supervisory approach.

GOVERNANCE	
Principle 1 Board's accountability in climate resilience	The board has primary responsibility for an AI's climate resilience. It should have sufficient understanding of the climate-related issues in determining the AI's approach to address them.
Principle 2 Board's oversight of climate strategy development and implementation	The board should exercise oversight of the development and implementation of the AI's climate strategy, including embedding climate-related risks into the AI's risk appetite framework.
STRATEGY	
Principle 3 Formulation	Climate considerations should be embedded throughout the strategy formulation process, from strategic assessment to action plan development.
Principle 4 Implementation	Organisational structures, business policies, processes and resources availability should be reviewed and enhanced to ensure effective integration of climate strategy into the operation and corporate development of an AI.
RISK MANAGEMENT	
Principle 5 Identification	Als should identify the transmission channels and assess the impacts of physical and transition risks arising from climate change on their business. Concrete plans should be devised to address any information and data gaps.
Principle 6 Measurement	Als should build capability over time to measure climate-related risks using various methodologies and tools, among which scenario analysis should be actively explored.
Principle 7 Monitoring and reporting	Als should implement processes to monitor and report exposures to climate-related risks to ensure that such exposures are consistent with their risk appetite, and that timely and regular updates are provided to the board and senior management.
Principle 8 Control and mitigation	Als should carry out measures to control and mitigate exposures to climate-related risks to ensure effective management of these risks.
DISCLOSURE	
Principle 9 Disclosure	Als should develop an appropriate approach to disclosing climate-related information to enhance transparency. When considering the information to be disclosed, Als should take the TCFD recommendations as the core reference.

4.2 Governance

Principle 1 – Board’s accountability in climate resilience

The board has primary responsibility for an AI’s climate resilience. It should have sufficient understanding of the climate-related issues in determining the AI’s approach to address them.

- 4.2.1 The board has primary responsibility for the long-term development and financial soundness of an AI. To better deal with the challenges and opportunities posed by climate change, we consider that the board and senior management should have sufficient knowledge to consider the impact on the AI, and define clear roles and responsibilities for the AI’s approach to addressing climate-related issues.

Allocation of responsibility

- 4.2.2 While the board remains ultimately responsible for the AI’s climate resilience, it may delegate authority to board-level committees. Key personnel or management-level committees may also be allocated with responsibilities in managing the risks and opportunities posed by climate change to the AI. Such delegation should be made formally with the relevant roles and responsibilities, governance structure, and escalation/reporting procedures clearly outlined and documented in the mandate/charter/terms of reference/job duties. However, such delegation should not absolve the board from its responsibilities with regard to the AI’s climate resilience.

Approaches to addressing climate-related issues

- 4.2.3 It is acknowledged that AIs’ approaches to addressing climate-related issues would be multi-faceted, possibly covering climate risk management, CSR issues, and/or sustainability-related business development. While the HKMA encourages AIs to incorporate sustainability issues, in particular climate change considerations, into their CSR initiatives and development of sustainability-related business, our supervisory expectations will remain focused on AIs’ management of climate-related risks at this stage.

Range of practices

- 4.2.4 Some more advanced AIs have integrated climate-related considerations into their governance structure. The boards have expanded their mandates and set up specialised committees/expanded the roles of existing committees to address climate-related issues. Senior management are responsible for developing and implementing the strategy and plans for dealing with the risks and opportunities arising from climate change. In some cases, designated individuals (e.g. Chief

Sustainable Officer or Chief Risk Officer) are tasked to help senior management to execute the plans.

Principle 2 – Board’s oversight of climate strategy development and implementation

The board should exercise oversight of the development and implementation of the AI’s climate strategy, including embedding climate-related risks into the AI’s risk appetite framework.

- 4.2.5 To ensure effective development and implementation of climate strategy, involvement from the top would be crucial. Therefore, it is considered that the board should have specific roles for overseeing the development and implementation of the AI’s climate strategy, including ensuring that the AI’s strategic climate goals are in line with its vision, approving the climate strategy recommended by senior management, and ensuring that there are appropriate resources, processes, systems and controls to support the implementation of the strategy by the senior management.
- 4.2.6 To facilitate effective oversight, it is important for the board to be provided regularly with management information reports, and updates on international developments and project progress.

Embedding climate-related risks into the risk appetite framework

- 4.2.7 The board is responsible for setting the AI’s overall risk appetite and approving the risk appetite statement (RAS) recommended by senior management.
- 4.2.8 Having developed an understanding on the risks posed by climate change, and taking into account the AIs’ specific circumstances such as the strategic climate goals, risk-taking capacity and results of any materiality assessment, the board should review and consider whether and how climate risks should be integrated into the existing risk appetite framework. If assessed to be appropriate, climate risks should be properly reflected in the RAS in a proportionate manner, whether explicitly or implicitly (i.e. as a part of general risk management).
- 4.2.9 It is acknowledged that most AIs are at the stage of formulating their approaches to measuring exposures to climate risks. As such, the consideration of climate risks in the RAS may be qualitative in the initial stage. The RAS should however be regularly reviewed and enhanced, in the light of the evolving impacts arising from, and the data availability and capability in assessing, climate change.

Possible tools to support effective oversight of climate strategy implementation

- 4.2.10 While it is not currently our intention to draw up mandatory requirements related to the setting of business targets on sustainable finance, incentives or remuneration, we encourage AIs to consider setting targets in developing their CSR initiatives and sustainability-related businesses in addressing climate-related issues. Such targets would visualise the AI's potential contribution in global efforts to mitigate climate change (e.g. reduction in GHG emission) or to adapt to it (e.g. through the extent of green finance that the AI engages in), thereby attesting to the AI's commitment to this issue. Climate risk considerations could also be integrated into the performance scorecard of board members and senior management by linking their remuneration with the AI's sustainability objectives.

Range of practices

- 4.2.11 The boards of some AIs have approved a specific climate risk management framework or a broader ESG framework with climate considerations embedded. Specifically for risk appetite framework, some AIs have attempted to incorporate climate-related risks in their risk appetite statement to demonstrate their commitment. Following the incorporation, some of them are developing quantitative metrics (e.g. exposures which are most vulnerable to impacts of climate-related risks) to facilitate tracking and reporting.
- 4.2.12 While it is not our intention to require AIs to set targets or goals in growing their sustainable finance business, it is observed that the more advanced AIs have set business targets at the group level, broadly covering sustainable financing, facilitation/advisory services or investment. They are using an array of tools for performance tracking and monitoring against the targets.

4.3 Strategy

Principle 3 - Formulation

Climate considerations should be embedded throughout the strategy formulation process, from strategic assessment to action plan development.
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- 4.3.1 In view of the long-term and potentially very significant impacts of climate change on the economic, financial and business environment, it is important to embed relevant considerations in its strategic planning process to set the tone from the top for the AI to achieve its strategic goals in dealing with climate change. Therefore, the formulation of climate strategy should be based on a long time horizon, and underpinned by a proper strategic assessment process which could include an

assessment of relevant internal and external factors, engagement with relevant stakeholders of the AI, and scenario analysis.

Assessment of internal and external factors

- 4.3.2 As in the usual strategic assessment process, consideration could be given to relevant internal and external factors in evaluating the AI's strategic position and formulating the climate strategy. Internal factors include the AI's strengths and weaknesses. In the context of climate change, this may involve an evaluation of the AI's risk management structures and data systems to support its management of climate-related risks, the knowledge and expertise of staff and management on climate-related risk, and the AI's competitive position and market standing in exploring business opportunities during the transition. External factors generally refer to the environment that poses threats and opportunities to an AI. For instance, climate change may impact the business environment in which the AI operates, through government policies and regulations, technological advancement and stakeholder sentiments. All these external factors may increase demand for a more climate-resilient economy and in turn affect the AI and its customers and counterparties.

Stakeholders engagement

- 4.3.3 With increasing awareness of climate-related issues across the community, a comprehensive strategic assessment could benefit from involving relevant stakeholders to gather their views and insights. The stakeholders that an AI should engage may include the regulators, investors, depositors, clients, creditors, counterparties, suppliers, employees and the general public, subject to the specific situations facing the AI. Engagement efforts should aim at enabling the AI to better understand the key concerns and expectations of the stakeholders, and conversely inform them about how the AI is positioning itself in the light of climate-related risks and opportunities.
- 4.3.4 Methods of stakeholder engagement are flexible and can be tailored according to different objectives. They may include surveys, meetings, written communication or any other channels, depending on the types of stakeholders. Given the areas of concerns and expectations may change over time, engagement should be an iterative process.

Scenario planning

- 4.3.5 The use of scenario analysis is particularly relevant to the formulation of a climate strategy and plan. The purpose of a scenario analysis is to explore alternatives that may significantly alter the basis of "business-as-usual" assumptions. Such analysis would enable the AI to evaluate its potential resiliency to a range of

scenario outcomes and plan its strategy and responses accordingly. Please refer to Principle 6 for more details about the role of scenario analysis in measuring the impact of climate-related risks.

Time horizon

- 4.3.6 The business plan of AIs normally covers a time horizon of one to three years, which is considered relatively short in the context of climate change. For example, the physical impacts of climate change (e.g. the rises in temperature and sea level) are more relevant over a longer horizon of more than five years. It thus follows that, in formulating climate strategy, a longer time horizon should be adopted to cater to the unique nature of climate risks.

Action plan

- 4.3.7 Following the strategic assessment process, the AI may then devise an action plan that will target climate resilience and set out its response to climate change in line with its strategic goals. If there are any competing priorities or resource constraints within the AI, it would need to explore all available options and decide on the best way to deal with the potential conflicts or gaps as appropriate, such as issues with the time horizon. In addition, the AI needs to regularly review the action plan for any deficiency or need for refinement.

Group strategy

- 4.3.8 An AI which is a locally incorporated subsidiary or operates in Hong Kong as a branch may adopt its group or parent strategy in addressing climate-related issues. In that case, the AI should assess whether such a strategy fits the local circumstances. Should there be any local special conditions that are not sufficiently addressed by the group or parent strategy, the AI should either raise them with the group or parent for a possible solution or address them locally. In this regard, communication channels should be in place to facilitate the process.

Range of practices

- 4.3.9 Regarding the strategy and approach to addressing climate-related issues, it is observed that many AIs have already addressed the CSR aspect, for example, by managing the carbon footprint of their own operations. In respect of the risk management aspect, more advanced AIs have already identified the channel of impact of climate risks, and have plans to collect data and further explore sophisticated quantitative techniques to measure the risks. As for the business development aspect, it is observed that some AIs' strategic focuses are on green/sustainable project loans and issuance of green bonds, while other areas such as advisory on clients' investment are in early stage.

- 4.3.10 In strategy formulation process, some AIs reached out to internal and external stakeholders to gather their expectations regarding a selection of sustainable development topics (including climate change) to identify the most relevant and material issues, which in turn inform the setting of strategic priorities. They have also published in relevant reports to disclose details on their engagement with these stakeholders.

Principle 4 – Implementation

Organisational structures, business policies, processes and resources availability should be reviewed and enhanced to ensure effective integration of climate strategy into the operation and corporate development of an AI.

- 4.3.11 After the climate strategy and action plan is developed by top management, it is essential for AIs to review and enhance its internal settings to ensure effective strategy implementation. This may include defining the climate-related functions of different units and processes, modifying business policies to reflect strategic climate goals, and allocating sufficient resources to ensure proper alignment with the climate strategy.

Structure and process

- 4.3.12 It is important for each business and functional unit taking part in climate strategy implementation to have their roles and responsibilities clearly defined. An inter-departmental working groups may be established to facilitate communication and co-ordination. Certain roles and functions in the climate strategy such as those relating to the management of climate-related risks, should also contain built-in mechanisms for checks and balances (please refer to the next sub-section on Risk Management for details of the three lines of defence model). Organisational re-structuring and business process re-engineering may be needed if existing settings are not adequate for effective implementation.

Business policy

- 4.3.13 AIs' strategic climate goals should be properly reflected in their business policies. For instance, AIs may focus on the client's transition plan if their goal is driven by business opportunities arising from the transition to a low-carbon economy. On the other hand, AIs may develop an exclusion, negative screening or tilting mechanism if they target to contain the negative effects of climate change. They may also engage with stakeholders to gather views on pursuing CSR to contribute to the transition to a low-carbon economy.

Resources

- 4.3.14 Als should ensure that sufficient internal resources, whether financial or non-financial, are allocated to climate strategy implementation. Enhancements could be made in, for example, capacity building, talent recruitment and the strengthening of the data management system and framework. In case of need, Als may approach external consultants or vendors to assist in the process.

Range of practices

- 4.3.15 It is observed in some Als that climate-related considerations have been incorporated into the operation and corporate development of the AI, with various initiatives carried out to ensure effective implementation of the climate strategy. For instance, climate-related risk assessment (as part of the ESG or sustainability assessment) is required in certain transactions and clients, with built-in mechanisms for check and balance (e.g. the three lines of defence model). Dedicated unit or cross-functional working groups consisting of senior representatives from different functions (e.g. frontline, risk department or strategy department) are set up to co-ordinate the work relevant to climate change. Moreover, efforts to ensure adequate resources and sufficient expertise of staff are also observed, including measures to build capacity and awareness across the institution.

4.4 Risk management

- 4.4.1 Climate change has wide-ranging impacts on the various traditional risk areas faced by Als. Thus, Als are expected to incorporate climate risk considerations into their existing risk management framework, with effective risk management processes to identify, measure, monitor, report, control and mitigate climate-related risks.
- 4.4.2 To begin with, Als should assess how and to what extent climate change would affect their assets (including lending portfolios and proprietary investments) and operations (including any outsourcing arrangements). If needed, Als should then develop concrete plans to enhance the existing risk management function in areas such as the decision-making authority and resources allocation, expertise, and the management information system, with a view to facilitating the management of climate-related risks. It is noted that many Als are still in the early stage of developing their approach to dealing with climate-related risks, and that time is needed to establish the process and build the relevant capabilities. In light of this, this section focuses on the initial steps that an AI may take in enhancing the risk management function for managing climate-related financial risks.
- 4.4.3 Day-to-day climate-related risk management activities should be carried out by the AI's existing risk management function, independent of the risk-taking activities and

operational units it reviews. In line with the usual risk governance arrangement, the responsibilities of managing climate-related risks could be allocated among three lines of defence as follows:

- The frontline forms the **first line of defence**. For instance, climate-related risk assessments may be undertaken during the client on-boarding, credit application and credit review process. Frontline staff should have sufficient awareness and understanding to identify potential climate-related risks.
- The **second line of defence** covers the oversight of climate risks in business activities, the monitoring of risks and the review of the relevant policies and procedures. For instance, the risk function is primarily responsible for undertaking independent climate risk assessment and monitoring, including challenging the initial assessment conducted by the frontline.
- The **third line of defence** should be provided by an independent and effective internal audit function, which includes periodic audit evaluation of the effectiveness of the climate risk functions performed by the first and second lines of defence.

Principle 5 - Identification

Als should identify the transmission channels and assess the impacts of physical and transition risks arising from climate change on their business. Concrete plans should be devised to address any information and data gaps.

- 4.4.4 A prerequisite for embedding climate considerations into the risk management process is to have a sufficient understanding of how climate risks could be transmitted to the traditional risks faced by Als (such as the eight major types of inherent risks defined in the HKMA's supervisory process). Based on this understanding, the AI could then, by analysing the likelihood and potential impact, or through tools such as heat maps, identify the key risk areas of their business that may be affected by climate change. Initial identification may focus on geographical locations and industry sectors which are more vulnerable to physical or transition risks respectively.

Identification of physical risks

- 4.4.5 Als should consider the impact of physical risks on both their own operations (as part of the business contingency planning process) and their clients. Specifically for client-level assessment, initial analysis could focus on the physical location of the client's business operations and assets (e.g. clients with operations in coastal

areas may be more prone to flood risks and rising sea levels) and the potential physical disruption to the client's supply chain. At the portfolio level, the AIs may start with an assessment on their residential mortgages portfolio and commercial real estate portfolio (including property development and investment) by evaluating how climate hazards may affect the value of collaterals, how borrowers' repayment abilities may be affected and the AI's ability to withstand these risks.

Identification of transition risks

- 4.4.6 In identifying transition risks, the AI may start with a review of its own business portfolio in specific sectors which are more vulnerable to climate change (e.g. through an analysis of the relevant factors highlighted in Box 2). With sufficient information, such a review can be extended to borrower-level by considering borrowers' financial and other relevant data, such as carbon intensity, pattern of energy use, transition strategy and business supply chain.

Concrete plans to address information and data gaps

- 4.4.7 In identifying and assessing the impacts of climate risks, data gaps may be revealed as information such as a client's energy use pattern and transition strategy are not usually collected under the current risk assessment framework of an AI. Concrete plans should be devised to address such gaps by, for instance, engaging with clients to develop a better understanding of the impact of climate-related risks on the clients' business, collecting more climate or environmental information from clients during the on-boarding and credit application process, and hiring consultants or data vendors.

Range of practices

- 4.4.8 A good understanding of the transmission of climate risks is observed among the more advanced AIs. Some have conducted holistic reviews to identify the impacts of both physical and transitional risks at the portfolio, client and operational levels. For example, in a pilot assessment of the impact of physical risks on the residential mortgage portfolio, the impact of extreme weather events (e.g. flood, storm surge) on properties was evaluated. In another analysis focusing on clients vulnerable to transition risks, a survey was conducted to gather clients' emission data, to understand their ability to manage climate-related risk and transition strategies. These pilot analyses serve as a good starting point for AIs to further engage clients to collect data and measure their progress in transition.

Principle 6 - Measurement

AIs should build capability over time to measure climate-related risks using various methodologies and tools, among which scenario analysis should be actively explored.

- 4.4.9 We acknowledge that most AIs are still building capabilities and collecting necessary data to measure exposures to climate-related risks. As in the management of other traditional risks, we would expect AIs to establish methodologies and acquire tools for measuring climate-related risks in the long run. In the meantime, we consider it necessary for AIs to formulate plans to build these capabilities and in particular, explore the use of scenario analysis.

Development of measurement tools and methodologies

- 4.4.10 At the initial stage, AIs may start with simple metrics (e.g. GHG emissions and carbon intensity of projects financed by the AI) as a basis for tracking. AIs may explore how well these metrics could indicate the potential impacts of climate change on the business and financial performance of clients, and on the risks faced by them in turn. For example, the earnings of clients in high transition risk sectors are potentially susceptible to any changes in carbon price or technology, which may subsequently affect their repayment ability, and eventually increase the credit risks faced by AIs. As AIs enhance data collection and accumulate more experience, they could build their capabilities in risk measurement.

Scenario analysis

- 4.4.11 Scenario analysis could be considered as a technique for testing resilience to climate stress. The purpose of conducting a scenario analysis is to assess how physical and transition risks may impact an AI's business under different future states over time, so as to facilitate the AI's planning of responses to these different states, and hence the building of climate resilience. In conducting such analysis, AIs should explore using both short and long time horizons. Short-term assessments, as emphasised under traditional stress testing methodology, are useful in measuring and assessing the risks within an ordinary business planning horizon. However, climate change occurs over a longer period of time with high complexity and uncertainty. Conducting analyses for both short-term and longer term would help the AI measure existing and potential vulnerabilities, and eventually facilitate the planning of mitigating actions accordingly. Apart from measuring the potential financial impact on the AI's business portfolios, scenario analysis is also useful for assessing the possibility and materiality of business disruption that may be caused by climate events, so as to inform the AI's management of operational risk.
- 4.4.12 In setting scenarios, a spectrum of events and severity levels for all relevant risks, as well as the interactions among these risk factors, could be considered. For assessing physical risk impact, assumptions could be made based on average global temperature increase, and the rising frequency and severity of extreme weather

events. For transition risk, the assumptions may focus on the impact of policy change, technological advancements, changes in market sentiment or a combination of these factors. Certain scenarios have been explored internationally to form the basis for evaluation. For instance, the TCFD has recommended firms to consider a 2°C scenario³⁴ as the minimum and consider using other scenarios most relevant to the firm's circumstances. The NGFS is also developing some reference scenarios.

4.4.13 Scenario analysis is crucial for Als' management of climate-related risks and would help Als formulate early responses to risks that might materialise in the future. While we acknowledge that scenario analysis is an evolving area and further guidance may be needed, Als should start to build the relevant capabilities and collect data. Als are also encouraged to conduct pilot analysis on sectors of higher risks, referencing the scenarios developed by relevant international organisations (e.g. the IPCC, the TCFD, and the NGFS).

4.4.14 At the same time, Als should also be cautious about the limitations of scenario analysis. For instance, scenario assumptions and stylised model parameters may not be able to capture the complex interaction of the various climate risk factors, and hence difficulty in using the analysis to predict the evolution of these factors. Als should be mindful that scenario analysis is used primarily for facilitating internal discussion and decision-making, and is not meant to be a forecasting or projection tool.

Range of practices

4.4.15 For quantifying the risk exposures, some Als started with simple metrics such as number of customers, or amount of loans to sectors, which were more vulnerable to climate-related risks. Some Als have partnered with external consultants to conduct pilot scenario analyses on selected portfolios. For example, in a scenario analysis conducted at the group level, the impact of physical risks on a selected group of utilities companies were analysed in terms of the impact of (1) chronic climate change (e.g. increased temperatures) on power plant production, and (2) extreme weather events resulting in downtime.

4.4.16 While practices of Als vary and the methodology is still evolving, the more advanced Als have attempted to adopt an integrated approach for conducting scenario

³⁴ A 2°C scenario lays out a pathway and an emissions trajectory consistent with limiting the average global temperature increase to a temperature range around 2°C above pre-industrial levels with a certain probability. For details, please refer the technical supplement "*The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities*" issued by the TCFD in June 2017.

assessments, covering (1) climate change scenario development, (2) top-down, sector level assessment, and/or (3) bottom-up, customer level assessment.

Principle 7 - Monitoring and reporting

Als should implement processes to monitor and report exposures to climate-related risks to ensure that such exposures are consistent with their risk appetite, and that timely and regular updates are provided to the board and senior management.

- 4.4.17 In monitoring climate-related risks, Als are suggested to conduct regular screening of their portfolios to keep track of the overall exposure to physical risks and transition risks by focusing on high-risk factors such as certain sectors and geographical locations. In view of the evolving nature of climate-related risks, it is also important to ensure that the risk monitoring process keeps pace with the latest developments on climate change (e.g. in respect of emission path and environmental policies). It is also crucial to carry out timely and regular reporting to the board to facilitate oversight.

Monitoring at portfolio level

- 4.4.18 As an initial step, Als may focus on certain risk factors and monitor to what extent their portfolios may be affected. Such monitoring may cover the AI's exposures to certain sectors which are more vulnerable to transition risks, and collaterals which are more likely to be impacted by physical risks. Limits may be set based on simple metrics (e.g. percentage of exposures to high-risk sectors) to facilitate monitoring.
- 4.4.19 For those high risk sectors where the AI has significant exposure, it is advisable for the AI to take further steps in the monitoring process. For example, the AI may conduct internal research, collaborate with external consultants and data providers, and engage with clients to monitor industry developments which would affect the AI's vulnerability to climate-related risks. This would enable the AI to identify any warning signal and to work with the clients to control or mitigate the risks at an early stage.

Monitoring of clients' transition progress

- 4.4.20 As the transition progress of clients to low-carbon activities would affect an AI's exposure to transition risks, Als should take into account such progress in monitoring climate-related risks. For example, Als may engage with clients in high-risk sectors on an on-going basis and conduct regular reviews to monitor their transition progress.

Monitoring of the evolution of climate-related risks

- 4.4.21 Both the likelihood and impacts of climate-related risks are evolving, dependent upon whether global emissions could be reduced on a pathway consistent with a 2°C warming, and there could be rapid and abrupt changes in the climate system and policy responses. For example, a continuous high emissions pathway may lead to an even more substantial global temperature increase and hence potentially more drastic policy responses. In the meantime, the readiness of a country to switch to a low-carbon economy and its economic composition will affect its vulnerabilities to climate change. In the risk monitoring process, AIs should therefore keep track of such developments and evaluate the potential impacts on their exposures.

Reporting to board and senior management

- 4.4.22 Timely and regular reports on climate-related risk exposure should be provided to the board and senior management to better inform decision-making. Simple quantitative metrics as mentioned above may also be piloted in the reporting process. In the meantime, AIs should keep in view any need to enhance their risk reporting framework to enable it to capture, aggregate and report climate-related exposures better.

Range of practices

- 4.4.23 The more advanced AIs have adopted a range of qualitative or quantitative tools to monitor the risk exposures, including some sector and portfolio metrics, and client level indicators. Other observed practices include active engagement with customers to maintain ongoing dialogue and engagement with external intelligence provider on ESG risks to facilitate ongoing monitoring.
- 4.4.24 The more advanced AIs have also included climate-related risks in the various management information reports to the board and senior management.

Principle 8 - Control and mitigation

AIs should carry out measures to control and mitigate exposures to climate-related risks to ensure effective management of these risks.

- 4.4.25 For effective risk management, it is important to carry out measures to control and mitigate exposures to climate-related risks, and be reflected in the AI's business policies. It is acknowledged that the formulation of such measures shall have regard to the circumstances of certain sectors and individual clients/transactions.

Sector-level measures

- 4.4.26 Als may implement measures to impose limitations or a tilting policy on their exposures to sectors which do not align with their climate strategy or risk appetite. Such measures, together with any climate considerations or assessment criteria, could be set out in relevant sector policies to facilitate consistent implementation and risk assessment. Apart from sectoral exposure policy, Als may also consider applying more stringent lending terms such as a shorter tenor and a lower loan-to-value limit. In the event that an exclusion policy has to be implemented by ceasing financing to certain sectors, Als may consider adopting a gradual approach, for example, by ceasing the financing of new projects.

Client/transaction-level measures

- 4.4.27 At client level, Als may review, in their client selection, credit assessment, annual review and ongoing monitoring processes, whether the business activities of their clients are in line with their own climate strategy or risk appetite, taking into account the client's climate strategies. Als may then determine the appropriate mitigation measures. Depending on their approach to climate change, Als may help build their clients' climate resilience by supporting them in transitioning to low-carbon activities. A possible way is to establish certain targets with the client such as improvements in energy efficiency and GHG emissions.
- 4.4.28 In fact, such climate considerations could be incorporated more effectively at a transactional level. For instance, it would be more practicable to track the use of loan proceeds for a specific project loan than for a general working capital loan. Moreover, some voluntary process guidelines are already in place for promoting the development and integrity of certain green products³⁵.

Consideration of location

- 4.4.29 In addition to transition risks, Als should also consider taking control or mitigation measures with regard to physical risks. Als may take into account the location factor in formulating such measures, by assessing whether clients' operations or properties are located in areas which are prone to physical risk, such as coastal areas with a higher flooding risk. As the same risk factor will affect Als' operation in a similar manner, Als should also consider relocating critical functions to areas less vulnerable to climate risks.

³⁵ For example, the Green Bond Principles issued by the International Capital Market Association, and the Green Loan Principles and the Sustainability Linked Loan Principles issued by the Loan Market Association.

Range of practices

- 4.4.30 At portfolio and sector level, the more advanced AIs have developed and implemented policies related to certain business activities or industry sectors. These sector-specific policies are usually developed by the AI taking into account relevant industry certification schemes, international practices, its strategy, level of exposure to the particular sector, and even its engagement with customers, industry experts, shareholders and the community.
- 4.4.31 At client level, some AIs will conduct more in-depth due diligence to assess climate-related and the broader sustainability risks, and adopt corresponding measures such as providing support to clients' transition.

4.5 Disclosure

Principle 9 - Disclosure

AIs should develop an appropriate approach to disclosing climate-related information to enhance transparency. When considering the information to be disclosed, AIs should take the TCFD recommendations as the core reference.

- 4.5.1 Climate-related disclosure could facilitate the understanding of an AI's approach to addressing climate-related issues by different stakeholders, such as the government, regulators, investors, depositors, customers, creditors, counterparties and the public. As the disclosure landscape evolves with increasing expectations for greater transparency, we recognise the importance for AIs to take active steps to formulate and enhance their approach to climate disclosure, taking the TCFD recommendations as the core reference³⁶.
- 4.5.2 The TCFD's 11 recommendations surrounding the four thematic areas (governance, strategy, risk management, and metrics and targets) address financial risks and

³⁶ AIs should not feel constrained in enhancing their sustainability reporting and may take into account a number of international initiatives and frameworks developed for voluntary adoption, for example:

- (a) Global Reporting Initiative Standards – the standards outline how (e.g. by stakeholder engagement) and what to report regarding the material economic, social and environmental impacts of an organisation on sustainable development;
- (b) Climate Disclosure Project – it issues a questionnaire-based framework that collects information on climate change, water security and forest commodities;
- (a) Climate Disclosure Standards Board Framework – it provides guidance on how and what to report on climate, natural capital and other environmental issues in a mainstream annual report; and
- (b) Sustainability Accounting Standards Board's Standards – the standards guide reporting on financially material environmental, social and governance issues by means of indicators and disclosures for 77 industries.

opportunities posed by climate change. These recommendations also informed the HKMA in the development of the framework for assessing the “greenness” of AIs. In view of the wide recognition and coverage of the TCFD recommendations, having different AIs adopting such a framework would also facilitate consistency and comparison.

Approach to climate disclosure

- 4.5.3 The preparation of climate-related disclosure involves considerations on the scope and reporting areas. In general, the scope of disclosure could include both risks and opportunities posed by climate change. As regards reporting areas, they may include how the AI responds to climate change in its business model, policies and processes, risk management, and targets. They may also include information about the impact of the AI’s business on the climate, as well as the potential vulnerability to climate change. It thus follows that an informative disclosure would consist of both quantitative data and qualitative narratives.
- 4.5.4 We consider that certain aspects of climate-related information are more appropriate to be the starting point of disclosure, such as the AI’s governance and oversight regarding climate-related risks, and the relevant risk management process (these correspond to “governance” and “risk management” under the TCFD recommendations). AIs are highly recommended to prioritise their disclosure along these two aspects at the initial stage. In the event that the AI decides not to make such disclosure, it should stand ready to explain to its stakeholders, including regulators, the rationale and key considerations for such a decision.

Continuous enhancement in an evolving reporting landscape

- 4.5.5 AIs are expected to have a plan to enhance their climate disclosure progressively. For instance, while most institutions may be less ready at this stage to report on Scope 3 emissions³⁷ (as compared with Scope 1 and Scope 2 emissions), they should start working out a plan to obtain such information from the relevant parties, such as collecting emission data from their clients through additional client engagement.

Preparing for the evolving disclosure landscape

- 4.5.6 Apart from TCFD recommendations, AIs should keep abreast of evolving disclosure requirements, both globally or locally, in the light of increasing attention on climate-related issues. Recent examples include the development of non-financial

³⁷ This refers to the GHG Protocol methodology. Scope 1 emissions are direct emissions from owned or controlled sources. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. (Source: Greenhouse Gas Protocol website)

information reporting guidelines in the EU³⁸, the Hong Kong Exchanges and Clearing Limited's proposed changes to the ESG Reporting Guide, and the relevant amendments to the Listing Rules. The HKMA will also keep in view any need for issuing additional guidance and requirements on Als' climate disclosures.

Disclosure at entity level

- 4.5.7 For Als which are the local subsidiaries or branches of foreign banks, climate disclosure may be centralised in the group or head office level, with the information of the subsidiary or branch integrated into the relevant report. To promote transparency, and in view of climate risk factors specific to Hong Kong, we consider that there are merits for Als that are local subsidiaries to make specific disclosures concerning their approach to climate-related risks and mitigating actions expressly for the Hong Kong operations. For local branches, however, the need for such specific disclosures about the Hong Kong operations appears less compelling as there may not be a standalone governance framework and strategy for the Hong Kong operations.

Range of practices

- 4.5.8 Recognising the benefits of enhanced transparency achieved through risk disclosures, the more advanced Als have made some progresses in their disclosure of approaches in managing climate-related issues to support the recommendations of the TCFD, alongside other ESG / sustainability issues. Some Als have published standalone TCFD reports in which governance, strategies and risk management processes related to climate issue were disclosed. Some also revealed their pilot exercises in conducting scenario analysis in measuring the financial impacts arising from climate change.

³⁸ This refers to the *Guidelines on non-financial reporting: Supplement on reporting climate-related information (2019/C 209/01)* issued by the European Commission in June 2019.