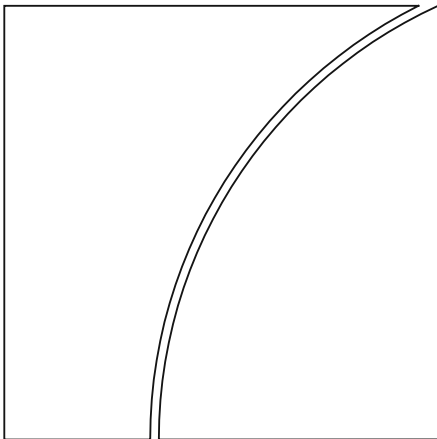


Basel Committee on Banking Supervision



Principles for the effective management and supervision of climate-related financial risks

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Principles for the effective management and supervision of climate-related financial risks

I. Introduction

1. Climate change may result in physical and transition risks that could affect the safety and soundness of individual banking institutions and have broader financial stability implications for the banking system. To address climate-related financial risks within the banking sector, the Basel Committee on Banking Supervision (BCBS) established a high-level Task Force on Climate-related Financial Risks in 2020 to contribute to the Committee's mandate to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability.

2. The Committee began its work on climate-related financial risks by conducting a stocktake of member jurisdictions' existing regulatory and supervisory initiatives on climate-related financial risks. The results of the stocktake were published in April 2020.¹ The Committee then conducted analytical work to better understand the risk features of climate change and its potential implications for individual banks and the broader banking system. This culminated in the publication of analytical reports on *Climate-related risk drivers and their transmission channels*² and *Climate-related financial risks – measurement methodologies*.³ The Committee is now examining the extent to which climate-related financial risks can be addressed within the Basel Framework, identifying potential gaps in the current framework and considering possible measures to address any identified gaps. Current work in this area is comprehensive in nature, spanning the regulatory, supervisory and disclosure dimensions.

3. With regard to supervision, a review of the existing Basel Framework concluded that, while the *Core principles for effective banking supervision* (BCPs) and the supervisory review process (SRP) are sufficiently broad and flexible to accommodate additional supervisory responses to climate-related financial risks, supervisors and banks could benefit from the Committee's guidance to foster alignment in terms of supervisory expectations for addressing these risks.

4. Through the publication of the Principles for the effective management and supervision of climate-related financial risks, the Committee seeks to promote a principles-based approach to improving risk management and supervisory practices related to climate-related financial risks. The approach builds on the review of the current Basel Framework, particularly the BCPs and SRP, and draws from existing supervisory initiatives undertaken by individual prudential authorities and other international bodies.

5. The document includes 18 high-level principles. Principles 1 through 12 provide banks with guidance on effective management of climate-related financial risks, while principles 13 through 18 provide guidance for prudential supervisors. The principles seek to achieve a balance in improving practices related to the management of climate-related financial risks and providing a common baseline for internationally active banks and supervisors, while maintaining sufficient flexibility given the degree of heterogeneity and evolving practices in this area.

¹ Basel Committee on Banking Supervision, *Climate-related financial risks: a survey on current initiatives*, 30 April 2020, www.bis.org/bcbs/publ/d502.pdf.

² Basel Committee on Banking Supervision, *Climate-related risk drivers and their transmission channels*, 14 April 2021, www.bis.org/bcbs/publ/d517.pdf.

³ Basel Committee on Banking Supervision, *Climate-related financial risks – measurement methodologies*, 14 April 2021, www.bis.org/bcbs/publ/d518.pdf.

6. The principles seek to accommodate a diverse range of banking systems and are intended to be applied on a proportionate basis depending on the size, complexity and risk profile of the bank or banking sector for which the authority is responsible. Specifically, with regard to scenario analysis and stress testing, the principles are formulated with a view towards application to large internationally active banks and to supervisory and other relevant financial authorities in Basel Committee member jurisdictions. However, smaller banks and authorities in all jurisdictions can benefit from a structured consideration of the potential impact of climate-related financial risks.

II. Principles for the management of climate-related financial risks

7. Banks are potentially exposed to climate-related financial risks regardless of their size, complexity or business model. Climate-related financial risk drivers can translate into traditional financial risk categories⁴. Banks should therefore consider the potential impacts of climate-related risk drivers on their individual business models and assess the financial materiality of these risks. Banks should manage climate-related financial risks in a manner that is proportionate to the nature, scale and complexity of their activities and the overall level of risk that each bank is willing to accept.⁵

8. Climate-related risk can have wide-ranging impacts in terms of the sectors and geographies it affects. Banks should take into account the unique characteristics of such risks, including but not limited to potential transmission channels, the complexity of the impact on the economy and financial sector, uncertainty related to climate change and potential interactions between physical and transition risks.

9. While some physical and transition risks are already evident, the impacts of climate change could materialise over varying time horizons and are likely to worsen over time. The Committee's report on transmission channels noted that some climate-related risks may also materialise beyond a bank's traditional two- to three-year capital planning horizon but within the maturities of longer-dated positions. Other climate risks may materialise over a much longer time horizon. The high degree of uncertainty around the timing of these risks suggests that banks should take a prudent and dynamic approach to developing their risk management capacities. Different time horizons should be considered in the process of risk identification and assessment as well as in scenario analysis. The board of directors and senior management are also expected to take a long-term consideration of climate-related financial risks.

10. It is recognised that the management of climate-related financial risks, and the methodologies and data used to analyse these risks, are currently evolving and are expected to mature over time. Banks should therefore continuously develop their capabilities and expertise on climate-related financial risks commensurate with the risks they face and ensure they have appropriate resources allocated to managing these risks.

11. The reference to the board and senior management throughout these principles should be understood in accordance with their respective roles and responsibilities. In line with the existing Basel Framework, these principles do not advocate a specific board structure.

Corporate governance

Principle 1: Banks should develop and implement a sound process for understanding and assessing the potential impacts of climate-related risk drivers on their businesses and on the environments in which they operate. Banks should consider material climate-related financial risks that could materialise over various

⁴ See BCBS, *Climate-related risk drivers and their transmission channels*, April 2021.

⁵ See BCPs 8, 9, 14 and 15, and SRP 30.4, 31.5 and 31.30.

time horizons and incorporate these risks into their overall business strategies and risk management frameworks. [Reference principles: BCP 14, SRP 30, Corporate governance principles for banks]

12. Banks should take material physical and transition risk drivers into consideration when developing and implementing their business strategies. This includes understanding and evaluating how these risks could impact the resilience of a bank's business model over the short, medium and longer terms and considering how these drivers may affect a bank's ability to achieve its business objectives. This also includes understanding and assessing a bank's exposure to structural changes in the economy, financial system and competitive landscape in which the bank operates as a result of climate-related risk drivers. The board and senior management should be involved in relevant stages of the process, and the approach established by the board should be clearly communicated to the bank's managers and employees.

13. The board and senior management should consider whether the incorporation of material climate-related financial risks into the bank's overall business strategy and risk management frameworks may warrant changes to its compensation policies, taking into account that these should be in line with the business and risk strategy, objectives, values and long-term interests of the bank.

14. Banks' risk management frameworks should be consistent with their stated goals and objectives. Hence, the board and senior management should ensure that their internal strategies and risk appetite statements are consistent with any publicly communicated climate-related strategies and commitments.

Principle 2: The board and senior management should clearly assign climate-related responsibilities to members and/or committees and exercise effective oversight of climate-related financial risks. Further, the board and senior management should identify responsibilities for climate-related risk management throughout the organisational structure. [Reference principles: BCP 14, SRP 30, Corporate governance principles for banks]

15. Responsibilities for managing climate-related financial risks should be clearly assigned to board members and/or committees to ensure material climate-related financial risks are appropriately considered as part of the bank's business strategy and risk management framework.

16. Banks should ensure that the board and senior management have an adequate understanding of climate-related financial risks and that senior management is equipped with the appropriate skills and experience to manage these risks. Where necessary, banks should build capacity and train the board and senior management on climate-related topics, such as through internal workshops or external collaboration with expert organisations.

17. Banks should clearly define and explicitly assign roles and responsibilities associated with identifying and managing climate-related financial risks throughout the bank's organisational structure and ensure relevant functions and business units have adequate resources and expertise to effectively fulfil responsibilities regarding climate-related financial risk management. Where dedicated climate units are set up, their responsibilities and interaction with existing governance structures should be clearly defined.

Principle 3: Banks should adopt appropriate policies, procedures and controls that are implemented across the entire organisation to ensure effective management of climate-related financial risks. [Reference principles: BCP 14, SRP 30, Corporate governance principles for banks]

18. Management of material climate-related financial risks should be embedded in policies, processes and controls across all relevant functions and business units, including, for example, in client onboarding and transaction assessment.

Internal control framework

Principle 4: Banks should incorporate climate-related financial risks into their internal control frameworks across the three lines of defence to ensure sound, comprehensive and effective identification, measurement and mitigation of material climate-related financial risks. [Reference principles: BCP 26, SRP 20, SRP 30, Corporate governance principles for banks]

19. The internal control framework should include a clear definition and assignment of climate-related responsibilities and reporting lines across the three lines of defence. .

20. In the first line of defence, climate-related risk assessments may be undertaken during the client onboarding, credit application and credit review processes, and in ongoing monitoring and engagement with clients as well as in new product or business approval processes. Staff in the first line of defence should have adequate awareness and understanding to identify potential climate-related financial risks.

21. The second line of defence, the risk function, should be responsible for undertaking climate-related risk assessment and monitoring independently from the first line of defence. This includes challenging the initial assessment conducted by the first line of defence, while the compliance function should ensure adherence to applicable rules and regulations.

22. The third line of defence, the internal audit function, should provide an independent review and objective assurance of the quality and effectiveness of the overall internal control framework and systems, the first and second lines of defence and the risk governance framework in the light of changes in methodology, business and risk profile, as well as in the quality of underlying data.

Capital and liquidity adequacy

Principle 5: Banks should identify and quantify climate-related financial risks and incorporate those assessed as material over relevant time horizons into their internal capital and liquidity adequacy assessment processes, including their stress testing programmes⁶ where appropriate. [Reference principles: BCP 15, BCP 24, SRP 20, SRP 30]

23. Banks should develop processes to evaluate the solvency impact of climate-related financial risks that may materialise within their capital planning horizons. Banks should include climate-related financial risks assessed as material over relevant time horizons that may negatively affect their capital position (ie through their impact on traditional risk categories) in their internal capital adequacy assessment process.

24. Banks should assess whether climate-related financial risks could cause net cash outflows or depletion of liquidity buffers, assuming both business-as-usual and stressed conditions (considering severe yet plausible scenarios). Banks should include climate-related financial risks assessed as material over relevant time horizons that may impair their liquidity position in their internal liquidity adequacy assessment process.

25. Incorporating climate-related financial risks assessed as material over relevant time horizons into banks' internal capital and liquidity adequacy assessment processes includes, where appropriate, incorporating physical and transition risks that are relevant to a bank's business model, exposure profile and business strategy, and are assessed as material over relevant time horizons, into their stress testing programmes in order to evaluate the bank's financial position under severe but plausible scenarios.

26. It is recognised that climate-related financial risks will probably be incorporated into banks' internal capital and liquidity adequacy assessments iteratively and progressively, as the methodologies and data used to analyse these risks continue to mature over time and analytical gaps are addressed. To

⁶ As defined in the BCBS report *Climate-related financial risks - measurement methodologies*, the term stress test is understood as an evaluation of a financial institution's financial position under a severe but plausible scenario.

this end, banks should start building risk analysis capabilities by identifying relevant climate-related risk drivers that may materially impair their financial condition, developing key risk indicators and metrics to quantify exposures to these risks, and assessing the links between climate-related financial risks and traditional financial risk types such as credit and liquidity risks.

Risk management process

Principle 6: Banks should identify, monitor and manage all climate-related financial risks that could materially impair their financial condition, including their capital resources and liquidity positions. Banks should ensure that their risk appetite and risk management frameworks consider all material climate-related financial risks to which they are exposed and establish a reliable approach to identifying, measuring, monitoring and managing those risks. [Reference principles: BCP 15, SRP 30]

27. The board and senior management should ensure that climate-related financial risks, where material, are clearly defined and addressed in the bank's risk appetite framework.

28. Banks should regularly carry out a comprehensive assessment of climate-related financial risks and set clear definitions and thresholds for materiality, bearing in mind that a bank's risk management framework should enable it to recognise all material risks with an integrated firm-wide perspective on risk. These risks may include those posed by concentrations,⁷ in particular those related to industry, economic sectors and geographic regions. As with other material risks, banks should develop appropriate key risk indicators for effective management of material climate-related financial risks that align with their regular monitoring and escalation arrangements.

29. Where appropriate, banks should consider risk mitigation measures such as, but not limited to, establishing internal limits for the various types of material climate-related financial risks to which they are exposed, eg in their credit, market, liquidity and operational risk profiles.

30. Given the evolving nature of climate-related risks, additional channels for transmitting these risks to traditional financial risk categories may yet be undiscovered. As such, banks should monitor future developments and seek to understand and, where possible, manage the impacts of climate-related risk drivers on other material risks should additional transmission channels be identified.

Management monitoring and reporting

Principle 7: Risk data aggregation capabilities and internal risk reporting practices should account for climate-related financial risks. Banks should seek to ensure that their internal reporting systems are capable of monitoring material climate-related financial risks and producing timely information to ensure effective board and senior management decision-making. [Reference principles: BCP 15, SRP 30, Principles for effective risk data aggregation and risk reporting]

31. A bank's risk data aggregation capabilities should include climate-related financial risks to facilitate the identification and reporting of risk exposures, concentrations and emerging risks. Banks should have systems in place to collect and aggregate climate-related financial risk data across the banking group as part of their overall data governance and IT infrastructure. Banks should also put in place processes to ensure that the aggregated data is accurate and reliable. Banks may consider investing in

⁷ As stated in SRP 30, a risk concentration is any single exposure or group of similar exposures with the potential to produce (i) losses large enough to threaten a bank's creditworthiness or ability to maintain its core operations or (ii) a material change in a bank's risk profile. In the context of climate-related financial risks, concentrations could be within and between risk types associated with climate-related financial risks (eg between physical risk and transition risk, or between traditional financial risk types) and they could include, but not limited to, geographies, sectors and counterparties.

data infrastructure and enhancing existing systems where appropriate to make it possible to identify, collect, cleanse and centralise the data necessary to assess material climate-related financial risks.

32. Banks should consider actively engaging clients and counterparties and collecting additional data in order to develop a better understanding of their transition strategies and risk profiles. Where reliable or comparable climate-related data are not available, banks may consider using reasonable proxies and assumptions as alternatives in their internal reporting as an intermediate step.

33. The reporting should be timely and updated regularly. Banks may consider an appropriate interval for updating internal risk reports, taking into account the evolving nature of climate-related financial risks.

34. Banks should develop qualitative and/or quantitative metrics or indicators to assess, monitor, and report climate-related financial risks. Limitations that prevent full climate risk data assessment should be made explicit to stakeholders where relevant.

Comprehensive management of credit risk

Principle 8: Banks should understand the impact of climate-related risk drivers on their credit risk profiles and ensure that credit risk management systems and processes consider material climate-related financial risks. [Reference principles: BCP 17, BCP 19, SRP 20, Principles for the management of credit risk]

35. Banks should have clearly articulated credit policies and processes to address material climate-related credit risks. This includes prudent policies and processes to identify, measure, evaluate, monitor, report and control or mitigate the impacts of material climate-related risk drivers on their credit risk exposures (including counterparty credit risk) on a timely basis. Banks should incorporate consideration of material climate-related financial risks into the entire credit life cycle, including client due diligence as part of the onboarding process and ongoing monitoring of clients' risk profiles.

36. Banks should also identify, measure, evaluate, monitor, report and manage the concentrations within and between risk types associated with climate-related financial risks. For example, banks could use metrics or heatmaps to assess and monitor concentration of exposure to geographies and sectors with higher climate-related risk.

37. Banks should consider a range of risk mitigation options to control or minimise material climate-related credit risks. These options may include adjusting credit underwriting criteria, deploying targeted client engagement, or imposing loan limitations or restrictions such as shorter-tenor lending, lower loan-to-value limits or discounted asset valuations. Banks could also consider setting limits on or applying appropriate alternative risk mitigation techniques to their exposures to companies, economic sectors, geographical regions, or segments of products and services that do not align with their business strategy or risk appetite.

Comprehensive management of market, liquidity, operational and other risks

Principle 9: Banks should understand the impact of climate-related risk drivers on their market risk positions and ensure that market risk management systems and processes consider material climate-related financial risks. [Reference principles: BCP 22]

38. Banks should identify and understand how climate-related risk drivers could affect the value of the financial instruments in their portfolios, evaluate the potential risk of losses on and increased volatility of their portfolio, and establish effective processes to control or mitigate the associated impacts.

39. Given the specific characteristics of market risk, analysis of a sudden shock scenario could serve as a useful tool for better understanding and assessing the relevance of climate-related financial risks to a bank's trading book. Such a scenario could, for example, feature variation in liquidity across assets

exposed to climate-related risk and assume variation in the speed at which exposures could reasonably be closed out.

40. In evaluating mark-to-market exposure to climate-related risks, banks may consider how the pricing and availability of hedges could change given different climate and transition pathways, including in the event of a disorderly transition.

Principle 10: Banks should understand the impact of climate-related risk drivers on their liquidity risk profiles and ensure that liquidity risk management systems and processes consider material climate-related financial risks. [Reference principles: BCP 24, Principles for sound liquidity risk management and supervision]

41. Banks should assess the impacts of climate-related financial risks on net cash outflows (eg increased drawdowns of credit lines, accelerated deposit withdrawals) or the value of assets comprising their liquidity buffers. Where material and appropriate, banks should incorporate these impacts into their calibration of liquidity buffers and into their liquidity risk management frameworks.

Principle 11: Banks should understand the impact of climate-related risk drivers on their operational risk⁸ and ensure that risk management systems and processes consider material climate-related risks. Banks should also understand the impact of climate-related risk drivers on other risks⁹ and put in place adequate measures to account for these risks where material. This includes climate-related risk drivers that might lead to increasing strategic, reputational, and regulatory compliance risk, as well as liability costs associated with climate-sensitive investments and businesses. [Reference principles: BCP 25, Principles for the sound management of operational risk, Principles for operational resilience, SRP 20, SRP 30]

42. Banks should assess the impact of climate-related risk drivers on their operations in general and their ability to continue providing critical operations. Banks are expected to analyse how physical risk drivers can impact their business continuity and to take material climate-related risks into account when developing business continuity plans.

43. Banks should assess the impact of climate-related risk drivers on other risks, such as strategic, reputational, regulatory compliance and liability risk, and take such risks, where material, into account as part of their risk management and strategy-setting processes.

Scenario analysis

Principle 12: Where appropriate, banks should make use of scenario analysis¹⁰ to assess the resilience of their business models and strategies to a range of plausible climate-related pathways and determine the impact of climate-related risk drivers on their overall risk profile. These analyses should consider physical and transition risks as drivers of credit, market, operational and liquidity risks over a range of relevant time horizons. [Reference principles: BCP 15, Stress testing principles]

44. The objective(s) of climate scenario analysis should reflect the bank's overall climate risk management objectives as set out by its board and senior management. These objectives could include, for example: (i) exploring the impacts of climate change and the transition to a low-carbon economy on the bank's strategy and the resiliency of its business model; (ii) identifying relevant climate-related risk

⁸ Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. The definition includes legal risk but excludes strategic and reputational risk.

⁹ Examples include strategic, reputational, regulatory, and litigation or liability risk.

¹⁰ As stated in the BCBS report *Climate-related financial risks - measurement methodologies*, scenario analysis is a tool that challenges assumptions made for the purposes of risk analysis. A key feature of the scenarios analysed is to explore alternatives that may significantly alter the basis for "business-as-usual" assumptions. Accordingly, they need to consider extreme but plausible scenarios.

factors; (iii) measuring vulnerability to climate-related risks and estimating exposures and potential losses; (iv) diagnosing data and methodological limitations in climate risk management; and (v) informing the adequacy of the bank's risk management framework, including risk mitigation options.

45. Scenario analysis should reflect relevant climate-related financial risks for banks. This should include the physical and/or transition risks that are relevant to a bank's business model, exposure profile and business strategy. Scenarios should cover a range of plausible pathways, as appropriate. Banks should consider the potential benefits and limitations of selected scenarios and assumptions (eg balance sheet assumption).

46. Banks should build sufficient capacity and expertise to conduct climate scenario analysis that are proportionate to their size, business model and complexity. Larger and more complex banks should be expected to have more advanced analytical capability.

47. Scenario analysis should employ a range of time horizons, from short- to long-term, in order to address different risk management objectives. For instance, shorter time frames may be used to analyse the crystallisation of risk within a bank's typical business planning horizon at a lower level of uncertainty. Longer time frames, which carry higher levels of uncertainty, may be used to evaluate the resiliency of existing strategies and business models to structural changes in the economy, financial system or distribution of risks.

48. The field of climate scenario analysis is highly dynamic, and practices are expected to evolve rapidly, especially as climate science advances. Climate scenario models, frameworks and results should be subject to challenge and regular review by a range of internal and/or external experts and independent functions.

III. Principles for the supervision of climate-related financial risks

Prudential regulatory and supervisory requirements for banks

Principle 13: Supervisors should determine that banks' incorporation of material climate-related financial risks into their business strategies, corporate governance and internal control frameworks is sound and comprehensive. [Reference principles: BCP 9, BCP 14, BCP 26, SRP 20]

49. Supervisors should determine that roles and responsibilities for climate-related financial risks, including for the board and senior management, are clearly assigned, adequate and properly documented in relevant policies, procedures and controls.

50. Supervisors should assess the effectiveness of board and senior management oversight of climate-related financial risks and should verify that board and senior management receive accurate and appropriate internal reporting on material climate-related financial risks in order to conduct this oversight.

51. Supervisors should maintain sufficiently frequent contact, as appropriate, with board and senior management to develop an understanding of, and assess the bank's long-term approach to, addressing climate-related financial risks in a forward-looking manner. Where necessary, supervisors should challenge the bank on the assumptions made in setting strategies and business models.

52. Supervisors should determine that banks consider the potential impacts of climate-related risk drivers when developing and implementing their business strategies, including addressing the resiliency of their business models to any material climate-related financial risks over various time horizons and considering how these risks may impact their ability to achieve their business objectives.

53. Supervisors should determine that banks adequately incorporate climate-related financial risks into their corporate governance and internal controls, including adopting appropriate policies, procedures

and controls across the three lines of defence, equipping relevant functions with adequate resources and expertise for implementing business strategy and risk management frameworks, and performing regular reviews of the overall internal control framework and system.

Principle 14: Supervisors should determine that banks can adequately identify, monitor and manage all material climate-related financial risks as part of their assessments of banks' risk appetite and risk management frameworks. [Reference principles: BCP 15, SRP 20, SRP 30]

54. Supervisors should review the extent to which banks regularly assess the materiality of climate-related financial risks, supported by appropriate key risk indicators and, where applicable, risk mitigating measures to effectively manage these risks.

55. Supervisors should assess the extent to which material climate-related financial risks are included in banks' risk management frameworks and risk appetite along with appropriate processes and procedures to identify, monitor and manage such risks. This may include ensuring that banks' risk management frameworks take into account all material climate-related financial risks to which they are exposed and assessing whether banks' data aggregation capabilities and internal reporting practices can facilitate identification and reporting of climate-related risk exposures, concentrations and emerging risks as well as banks' ability to deploy a range of risk management approaches.

Principle 15: Supervisors should determine the extent to which banks regularly identify and assess the impact of climate-related risk drivers on their risk profile and ensure that material climate-related financial risks are adequately considered in their management of credit, market, liquidity, operational, and other types of risk. Supervisors should determine that, where appropriate, banks apply climate scenario analysis. [Reference principles: BCP 17–25, Principles for sound liquidity risk management and supervision, Principles for the sound management of operational risk, Principles for operational resilience]

56. Supervisors should ensure that banks consider a range of mitigation options to manage and control material climate-related risks. Supervisors should also determine that banks consider climate-related financial risks assessed as material over relevant horizons within their internal capital and liquidity adequacy assessments.

57. Where appropriate, supervisors should determine that banks have in place a scenario analysis programme that is proportionate to their size, business model and complexity, in order to assess the resilience of their business models and strategies to a range of plausible climate-related outcomes. As part of the assessment, supervisors should review and, where necessary, challenge model assumptions, methodologies and results.

Responsibilities, powers and functions of supervisors

Principle 16: In conducting supervisory assessments of banks' management of climate-related financial risks, supervisors should utilise an appropriate range of techniques and tools and adopt adequate follow-up measures in case of material misalignment with supervisory expectations. [Reference principles: BCP 8, BCP 9, SRP 10, SRP 20]

58. Supervisors should set expectations in a manner proportionate to the nature, scale and complexity of relevant banks' activities.

59. To foster cross-border collaboration, home and host supervisors of cross-border banking groups should share information related to the climate risk resilience of banks and banking groups, leveraging existing frameworks for sharing information and undertaking collaborative work.

Principle 17: Supervisors should ensure that they have adequate resources and capacity to effectively assess banks' management of climate-related financial risks. [Reference principles: BCP 9]

60. Supervisors should take regular stock of existing skills and projected requirements, taking into account relevant evolving market practices and supervisory practices in this landscape, and take timely measures to build adequate expertise in identified skill sets. Where aspects of climate-related risk assessments are outsourced, supervisors should maintain appropriate knowledge to ensure that the results of the outsourced analysis are credible and realistic.

61. Supervisors should engage a broad and diverse range of stakeholders to facilitate a collective understanding and measurement of climate-related financial risks and allow for optimisation of climate-dedicated resources.

62. Supervisors could use existing regulatory reports to assess the materiality of climate-related financial risks to banks. In case of data gaps, supervisors may collect additional information from banks such as sector exposures and banks' internal reports.

Principle 18: Supervisors should consider using climate-related risk scenario analysis to identify relevant risk factors, size portfolio exposures, identify data gaps and inform the adequacy of risk management approaches. Supervisors may also consider the use of climate-related stress testing to evaluate a firm's financial position under severe but plausible scenarios.¹¹ Where appropriate, supervisors should consider disclosing the findings of these exercises. [Reference principles: Stress testing principles]

63. Supervisors should clearly articulate their specific objectives for supervisory climate scenario analysis, which could include, for example: (i) exploring the impact of climate change and the transition to a low-carbon economy on banks' strategies and the resiliency of their business models; (ii) identifying and assessing relevant climate-related risk drivers affecting individual banks or the banking system; (iii) facilitating information-sharing and identifying common data and methodological gaps and limitations in climate-related risk management; and (iv) assessing the adequacy of banks' risk management frameworks, including their risk mitigation options.

64. Supervisors may also consider the use of climate-related stress testing to test the adequacy of banks' financial positions under severe yet plausible scenarios. It is recognised that these capabilities are expected to mature progressively over time as data and methodologies further develop.

65. In designing these supervisory exercises, supervisors should consider material climate-related financial risks, including physical and transition risks, that take into account the nature, scale and complexity of the banks within their jurisdiction. The scenarios used should incorporate a range of plausible climate pathways. Supervisors should consider a range of time horizons, from short- to long-term, depending on the objectives of the exercise. For instance, shorter time horizons may be useful to analyse the types of climate-related financial risks that could crystallise within traditional capital planning horizons and to assess their potential impact on regulatory capital, while longer horizons, which carry higher levels of uncertainty, may be useful to gauge exposure to structural changes in the economy or financial system or the distribution of risks.

66. Supervisors should build sufficient capacity and expertise to conduct these exercises. Supervisors are encouraged to collaborate with a broad and diverse set of stakeholders, including the climate science community, to develop scenarios that can inform comprehensive assessments of climate-related financial risks, and should keep abreast of emerging practices in scenario design and implementation.

67. As approaches continue to evolve, supervisors should recognise the limitations of their analyses when communicating their results or using them in supervisory assessments. Ongoing dialogue among

¹¹ See Footnotes 6 and 10 for definitions of stress testing and scenario analysis.

supervisors and between supervisors and banks will contribute to the development of deeper insights on banks' climate-related vulnerabilities and their strategies to mitigate climate-related financial risks.

68. Supervisors should take into account the level of uncertainty associated with scenarios when determining whether to disclose results. Supervisors may consider disclosing the results of these supervisory exercises at an appropriate level of aggregation and should include the appropriate level of detail on methodologies, assumptions, the level of uncertainty and key sensitivities when disclosing results.

69. To foster information-sharing, cross-border collaboration and efficient resource utilisation, home and host supervisors are encouraged to leverage existing frameworks for cross-border banking groups, where possible, and to establish frameworks for communicating and coordinating these supervisory exercises with other relevant domestic and cross-jurisdictional authorities where this is likely to yield useful synergies. They are also encouraged to share best practices, the outcome of these supervisory exercises, subject to applicable legal constraints, and to use common scenarios where appropriate.