



## Climate and Capital: Views from the Institute of International Finance

July 28, 2022

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## Executive Summary

The debate over the role of prudential regulators and supervisors in addressing climate-related risks – and whether and how different prudential tools should be applied to respond to such risks – continues to evolve. Recently, some prudential authorities have begun, or announced intentions, to examine aspects of the relationship between climate risks and the regulatory capital framework. However, perspectives regarding the feasibility, appropriateness, and desirability of using the regulatory capital framework to address climate-related risks vary significantly across jurisdictions. This is due at least in part to a number of important factors, including the lack of evidence of risk differentials between green and non-green assets/activities. Debate is also evolving at the global level, through the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS), and the Financial Stability Board (FSB); however, common views and approaches to using the capital framework to address climate-related risks may not be achieved in the near term given current significant divergence of views on this topic.

There are many important open questions regarding the feasibility, costs, benefits, and potential unintended consequences of using the regulatory capital framework to address climate-related risks, which need to be resolved before actions are taken. Due to varying mandates and divergent jurisdictional perspectives, a risk of fragmentation could emerge if certain jurisdictions were to take action to address climate risks through the current capital framework (or through modifications to it) before global standard setters develop consensus approaches. The IIF and its members have therefore worked together to assess key questions and contribute industry perspectives on the theoretical basis, methodological approaches, and potential implications of using the regulatory capital framework to address climate-related risks.

### **Context: The potential role of regulatory capital frameworks in addressing climate-related risks**

In a 2021 paper, the IIF proposed that prudential authorities should consider **both** the microprudential objective of resilience **and** the macroprudential objective of examining the alignment of the financial system with future climate pathways, with a view to reducing risks for financial stability stemming from climate-related and/or environmental risks. Importantly, this paper concluded that going beyond resilience and system-wide alignment to pursue an **“active transition” objective**, which could involve the use of prudential tools for extraordinary purposes (i.e., to encourage or discourage the financing of certain sectors and activities), is unlikely to be effective and could result in significant unintended consequences. “Active transition” objectives should primarily be driven not by financial regulatory policy, but by government environmental and industrial policies consistent with the transition to a low carbon economy.

**To date, this perspective has been broadly consistent with the views of prudential authorities and standard-setting entities; however, a range of societal and political factors could drive a shift in thinking in some jurisdictions.** Three potential shifts that could influence regulatory approaches to climate-related risks include: i) lengthening of the time horizons over which long-term risks would be considered in regulation and supervision (and the use of near-term actions to account for such risks); ii) the application of a double materiality approach in supervision to consider risks and impacts to and from the financial system, and iii) the supervision of financial institutions' strategies and commitments for alignment with Net Zero goals (e.g. 'transition plans').

**Globally, the banking and insurance sectors have in recent years taken significant steps and made progress in developing a more systematic understanding of, and response to, climate-related risks and opportunities.** Banks and insurers are increasingly accounting for climate-related risks as drivers of traditional financial risks stripes they manage, including credit, market, operational, legal, and other risks. Progress towards developing a climate risk management framework and program can depend on a range of factors, including the institution's business model, portfolio allocation, jurisdictional policy framework and supervisory environment, as well as broader market context and competitive position.

**Banks and insurers have begun to consider whether and how to include climate-related risks as part of their internal capital adequacy and solvency assessment,** including by accounting for climate risk factors in the context of existing risk drivers. Currently, reflecting the current state of methodologies and available data, banks do not generally consider risk factors, including climate-related factors, looking beyond five years into the future to be relevant for capital adequacy. However, there is no industry consensus or established practice regarding the appropriate time horizon to capture climate in internal analysis of capital adequacy. The potential impacts of climate-related risks on solvency and the time horizons over which such risks may materialize are even more idiosyncratic in the insurance industry, given the diversity of insurance business models.

**These insights raise questions regarding the potential use of capital in the context of supervisory responses to banks' and insurers' internal capital adequacy or solvency assessments.** Looking forward, prudential authorities should explore opportunities to engage with industry stakeholders to ensure that firms have clarity regarding technical approaches for the reflection of climate-related risks in the context of supervisory guidance relevant to the Internal Capital Adequacy Assessment Process (ICAAP), Internal Liquidity Adequacy Assessment Process (ILAAP), and Own Risk and Solvency Assessment (ORSA).

**Examining key questions: perspectives on the relationships of climate risks to the capital framework**

*How material are climate-related risks for safety, soundness, policyholder protection, robust and well-functioning financial services markets and financial stability, and what evidence is there to assess how climate-related risks may affect capital adequacy?*

Supervisory climate scenario analyses and stress tests completed to date suggest that the impacts of climate-related risks on financial stability and institution safety and soundness are likely to be generally moderate and manageable over the short- to medium-term, with the potential for more significant risks arising over the longer term under different scenarios. The results of these scenario-based climate risk measurement (SCRM) exercises appear to indicate that financial institutions would be able to absorb climate-related risks with current capital levels. The potential impacts of climate change on the financial system are comparable to, and in certain cases may be smaller, than other financial stability risks which are considered in the context of macrofinancial stress testing – and importantly, such risks and impacts are projected over a much longer horizon than prudential tools are calibrated for. As such, on a purely quantitative basis, the levels of potential exposure and stability risks posed by climate change – as indicated by the results of SCRM exercises to date – **do not appear to currently indicate levels of risk over the near to medium term which would justify the use of the capital framework.** However, due to the high levels of uncertainty inherent in these estimates, the rate at which climate risks are increasing, and the methodological and data gaps which remain, these results should not be considered conclusive from a capital perspective – but rather should call attention to the importance of further collaboration between supervisors and industry to assess the dynamics of near-term climate risks. Differences in design choices (e.g., scope of institutions and portfolios, modelling assumptions, metrics, and other factors) complicate efforts to compare the results of exercises across jurisdictions and create challenges for evaluating the robustness of supervisory SCRM exercise results from the perspective of informing prudential interventions. Therefore, while such results would not provide the basis for regulatory capital decisions, the uncertainty around their evaluation requires that climate risk assessment be complemented by qualitative factors and practices such as the ones described in the recent Basel Committee on Banking Supervision (BCBS) Principles for the Effective Management and Supervision of Climate-related Financial Risks.<sup>1</sup>

**SCRM exercises can yield important insights on the extent to which climate risk poses a threat to financial institutions and the dynamics of physical and transition risks on their balance sheets.** Financial institutions' own scenario analyses, and supervisory oversight of these analyses, could play an increasingly important role in informing firm-specific interventions and broader policy decision-making with respect to climate-related risks.

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<sup>1</sup> Basel Committee on Banking Supervision, "[Principles for the Effective Management and Supervision of Climate-related Financial Risks](#)," June 2022.

According to the recent research of the Network for Greening the Financial System (NGFS)<sup>2</sup> and the European Banking Authority (EBA),<sup>3</sup> there is little evidence of risk differentials between green and non-green assets/activities. Considering limitations of this research, including its backward-looking analysis, this does not prove that risk differentials do not exist. However, the conclusions do call into question the potential to implement capital surcharges to respond to climate-related risks, such as the modification of risk weights through a brown penalizing factor (BPF) or green supporting factor (GSF), in a risk-based and data-driven manner.

***What is the appropriate time horizon over which climate risks could be considered in capital frameworks?***

**Time lags between actions that may exacerbate or mitigate climate risks and those risks manifesting raise important questions about the appropriate prudential response.** Specifically, there is debate on whether all potential climate-related risk drivers, regardless of the time horizon over which they are likely to generate material risks and losses for financial institutions, are relevant to prudential supervisors and should therefore be considered within the prudential framework. Through the lens of the current time horizon of the global banking and insurance capital frameworks, material climate-related risk drivers of credit and operational risks over a one-year and, in the case of prudential stress testing, over a three- to five-year horizon could be relevant from a prudential capital perspective. While having higher financial system capital today could increase resilience, such an approach would involve “front-loading” future risks, rather than enabling them to be reflected when they are likely to crystallize by virtue of the “moving time window” of the current capital framework. **It is not clear that “front-loading” the potential impacts would necessarily deliver a tangible difference in resilience, at the point at which such resilience to crystallized risks is likely to be required.** Furthermore, it is possible that requirements to set aside significant capital could constrain capacity to extend credit and investment to key sectors in need of transition finance. This could potentially exacerbate transition-related disruptions to the economy, and negatively impact actual climate outcomes – in addition to the risk of potential mis-calibration of capital charges more broadly.

***What are supervisory perspectives on the applicability of the capital framework for climate-related risks, and the relevance of other types of prudential tools?***

There are divergent views across the supervisory community on the feasibility and desirability of efforts to reflect climate risks within the capital framework. Among regulators which have begun to assess the costs and benefits of different options, **there is growing consensus that Pillar 1 adjustments, such as the modification of risk weights (e.g., BPF/GSF) or adjustments to standard regulatory capital models may not be warranted as the costs are likely to exceed the benefits.** Some supervisors are of the view that, in the instance that there is evidence that

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<sup>2</sup> NGFS 2022, “[Capturing risk differentials from climate-related risks: A Progress Report](#)” (May), hereafter referred to as “NGFS 2022 (May)”.

<sup>3</sup> EBA 2022, “[The Role of Environmental Risks in the Prudential Framework](#)”(May), hereafter referred to as “EBA 2022 (May)”.

the Pillar 1 framework does not appropriately reflecting climate-related risks, Pillar 2 approaches could be considered. In this regard, while the general application of Pillar 2 in the context of the adequacy of risk management capabilities and governance of an individual bank or insurer remains valid, significant methodological challenges exist in order to make this tool broadly applicable in the context of climate-related risks.

***What are the potential costs, benefits, and challenges associated with using different capital tools to address climate-related risks?***

**The IIF and its members support the emerging consensus among certain supervisors that adjustments to the Pillar 1 framework are not warranted and should not be pursued at present, considering that:**

- The design of the Pillar 1 framework may already enable climate risks to be appropriately accounted for, and therefore there should be no amendments/modifications to key design pillars to account for climate risks, nor should there be efforts undertaken to utilize the existing framework (without modifications) to target climate-related risks in the absence of the necessary risk signals.
- Furthermore, given gaps in the evidence base, necessary data, and methodology, efforts to modify Pillar 1 measures to account for climate related risks would face major challenges and lead to potential unintended consequences.

**The IIF and its members consider there to be significant methodological challenges associated with amending the overarching design of Pillar 1 measures, including challenges of considering the impacts of climate-related risk drivers over a long time horizon, and the backward-looking nature of most calibration methodologies.**

**The IIF and its members have a number of concerns regarding the potential use of Pillar 2 measures, including the significant degree of fragmentation that would result from individual jurisdictions developing their own approaches to Pillar 2 application with the resulting negative implications for a level playing field.** More significantly, the current methodological and data hurdles that exist with respect to climate risk measurement (including those related to current climate scenario analysis) affect the ability of supervisors to make adequate judgements on the impact of such risks on solvency (beyond the general application of Pillar 2 as currently conceived). This is without prejudice to potential use of such tools in the future, under certain circumstances and on the basis of necessary preconditions in terms of data, methodology, and clarity regarding scope of application.

**The IIF and its members do not support the use of macroprudential buffers, such as so-called “Climate System-wide Buffers”, to address climate-related risks.** Introducing a buffer from a precautionary perspective would not only be unnecessary given the results SCRM exercises, but also potentially point toward the setting of buffers in a non-risk-based manner given the inadequacy of existing methodologies. Such buffers would also likely significantly

constrain financial institutions' capacity to support the real economy, including through the provision of transition finance.

**Concentration limits could potentially be useful to prevent a small number of financial institutions from continuing to finance firms and sectors which may be particularly exposed to physical or transition risks associated with climate change and thereby accumulating risks in those institutions.** However, in addition to the issue of a lack of a common exposure classification methodology, the introduction of new concentration limits could harm specific regions or sectors, impeding efforts to scale up transition finance where it is most needed. Furthermore, in the instance that such limits constrained financing from the banking and insurance sectors, capital from other sources could be sought by vulnerable firms or sectors, including from unregulated or unsupervised entities.

**Intervention on the basis of results of SCRM exercises could, over time, be the right tool to incorporate longer time horizons and forward-looking elements of climate-related risks but, as most regulators acknowledge, the exercises are premature in terms of data, scenarios, and methodologies.** Additionally, although some regulators regard capital add-ons based on the Supervisory Review and Evaluation Process (SREP) as an already available tool, they should publish clear criteria to clarify the circumstances under which they would apply the add-on in relation to climate-related risks (e.g., absence of climate risk strategy, absence of risk identification, monitoring, and assessment procedures) to ensure transparency. Before considering capital add-ons, regulators should focus on dialogue with institutions for the time being to avoid the risk of steering whole industries in the wrong direction due to lack of understanding of climate-related risks. Furthermore, clear guidelines are required to ensure supervisors do not take divergent approaches that would result in further regulatory fragmentation.

**Figure ES1: Assessment of Policy Options**

	Policy option	How banks are already incorporating	Potential readiness in a climate risk context	Future outlook
Pillar 1	<b>Amendments to Overarching Design of Pillar 1 Measures</b>	[[IRB] Adjust internal ratings based on exposures' climate risks. Reevaluate collateral values. [SA] External ratings already reflect climate risks to some extent.		<b>Should not be used.</b> Pillar 1 may already enable climate risks to be accounted for, and there would be significant methodological challenges in core design changes.
	<b>Adjustment to Risk Weights</b>	Same as above.		<b>Should not be used.</b> Active transition is not the goal of prudential capital. Potentially undermine credibility.
Pillar 2	<b>Pillar 2 Concentration Limits (Pillar 1)</b>	Current framework implicitly captures the risks. Some banks have exclusion or phasing-out		<b>Could be used in the Medium to Long Term.</b> Careful design and phased approach are critical not to hamper transition finance.

	<b>Large Exposure Limits)</b>	criteria to limit carbon-intensive finance.		
	<b>Enhanced Supervision</b>	Banks are voluntarily implementing climate risk management, incl. scenario analysis, transition plans.		<b>Supervisory dialogue could be started in the Short Term</b> with FIs to incentivize better risk management.
	<b>Capital add-ons based on qualitative supervisory judgement</b>	Banks are voluntarily implementing climate risk management, incl. scenario analysis, transition plans.		<b>Capital add-ons should be avoided in the Short Term.</b> Several issues need to be solved before implementing capital add-ons.
	<b>Capital Add-ons based on scenario analysis/stress test</b>	Banks are piloting those analyses voluntarily or with supervisors.		<b>Currently premature, but could be used in the Medium to Long Term</b> when conditions are met, such as data, common scenario, and proper methodologies (e.g., dynamic balance sheet approaches).
<b>Comb ined Buffer</b>	<b>Climate Systemic Buffer</b>	Existing buffers already capture the climate risks, because the sizes of buffers are calculated from RWA.		<b>Unlikely to be usable in the Short to Medium Term.</b> No basis to add climate elements on top of the current buffers.
	<b>System-wide Buffer</b>	Existing buffers already capture the climate risks, because the sizes of buffers are calculated from RWA.		<b>Should not be used.</b> No basis to add climate elements on top of the current buffers. Significantly limit banks' financing capacity regardless of their climate efforts.

Source: IIF

**Key Considerations**

**There are four important challenges associated with using the capital framework to account for climate-related risks which warrant consideration in advance of action being taken.**

- **The rationale** for taking action to address climate risks may vary significantly depending on a particular prudential authority’s objectives. As such, different interventions through the prudential framework could potentially have countervailing effects, and in certain cases could potentially lead to negative outcomes.
- **Unintended consequences** could arise from the use of the capital framework due to the uncertainty of climate-related risks and complex nature of financial institutions’ regulatory capital requirements. Using the capital framework could negatively affect climate outcomes (e.g., constraining transition finance), the broader economy (e.g., exacerbating inequality due to high energy prices, biodiversity losses<sup>4</sup>), and even financial stability itself (e.g., undermining capital framework credibility).

<sup>4</sup> IPBES/IPCC (2021) “[Scientific Outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change](#)”.

- **Comparative effectiveness** of policy tools for climate must be a primary focus. Other supervisory and regulatory tools than capital, such as supervisory engagement, could be more effective in incentivizing constant development and improvement of climate risk measurement and management methodologies and rapid alignment of portfolios with climate goals.
- **Dynamic impacts of cross-sectorial policies** are hard to predict. The use of the capital framework will always be influenced by an array of exogenous factors beyond the remit of prudential supervisors, such as climate policies and other economic policies; as such, it may be difficult to calibrate how well a given financial regulatory tool may align – or potentially be misaligned – with broader transition goals. Ambiguity regarding the real or perceived role of prudential regulators with respect to climate change could potentially send conflicting signals to governments about what is needed in terms of ambitious real economy policies to achieve net-zero – and potentially misrepresent the role of the financial sector.

Looking forward in 2022 and beyond, several key policy development processes, including official-sector efforts (e.g., NGFS) and market-based initiatives (e.g., GFANZ), may influence the feasibility and desirability of using the capital framework to address climate-related risks. These policy developments will help to clarify broader dimensions of the climate risk and alignment agenda for financial institutions, regulators, and policymakers, which will in turn influence thinking regarding the costs and benefits of the use of the capital framework to address climate-related risks. It will be critical for prudential authorities to consider this evolving agenda in deliberations regarding the costs and benefits of the use of prudential tools, including capital, to respond to climate-related risks and broader transition priorities.

### **Conclusions and Recommendations**

**The global financial sector recognizes the critical threats that climate risks, if unaddressed, will pose for the stability of the economy, livelihoods, social stability, risk of conflict, ecosystem health, and biodiversity, which could ultimately threaten human survival** – as illustrated by the conclusions of the IPCC 6<sup>th</sup> Assessment Report. These risks cannot be underestimated. The global financial industry is responding rapidly by enhancing risk management capacities, changing their strategies, developing new products, and showing leadership on the climate agenda – including through setting Net Zero commitments.

**The paucity of data and methodological development should not lead to policy or supervisory paralysis. The global financial sector recognizes this risk and the dilemma it proposes for policy development.** We believe, however, that the focus should remain on adequate risk management and creating a policy environment that does not create disincentives to transition finance. While it is understandably tempting to move forward with “precautionary measures” such as capital buffers, this would inevitably require a departure from the core risk-

based foundations of the prudential framework, and introduce subjective choices pertaining to broader policy objectives. While achievement of these objectives is critical, challenging choices are presented when considering the implications of these actions, and their potential unintended consequences.

**The IIF and its members consider it critically important that policy frameworks respond to the realities and challenges associated with time horizons, data, and methodologies** – while also ensuring that supervisory and regulatory mandates and objectives are adhered to. There is a need for ongoing dialogue, technical work, and scientific analysis, which the industry and regulators are well placed to pursue collaboratively.

**Climate goals are truly jointly shared goals.** The financial industry has a strong desire to demonstrate commitment and provide evidence of ongoing progress on risk measurement and management, including climate risk management. Supervisors do have currently the tools to respond in case the industry is not living up to such commitments.

Looking forward, the IIF would propose the following recommendations for consideration:

- **Prudential authorities should take a nimble approach to the supervision and regulation of climate-related risks, including the potential use of the capital framework, which can be adapted to dynamic climate science, policy, and market conditions.** At the same time, prudential authorities should not apply pressure for firms to independently adopt capital or other responses to climate risks that are not necessarily supported by the available evidence or are oriented towards broader policy objectives rather than evidence-based analytical outcomes about risk, resilience and solvency.
- **Prudential authorities should collaborate, through global standard setters such as the BCBS and the IAIS, to develop common approaches regarding the use of prudential tools to respond to dynamic conditions at the international level – and critically, avoid contributing to fragmentation by preempting the development of formal standards at the local level. In particular, any decisions regarding changes to current Pillar 1 approaches should be thoroughly debated and agreed by the BCBS.** Although naturally a more jurisdiction-specific and flexible tool, similar considerations would apply to Pillar 2, particularly given the already fragmented landscape of its application across jurisdictions.
- **Prudential authorities should publish clear criteria based on which they would apply their discretion within the Pillar 2 framework,** such as capital add-ons, including for instance, the absence of climate risk strategy, the absence of or inadequacy of risk identification, monitoring and assessment procedures, or a lack of progress towards defined supervisory objectives and expectations.
- **Prudential authorities, working together through the global standard-setting bodies or voluntary coalitions, should identify a set of standardized metrics that should be used to quantify the impacts of different scenarios.** The set of metrics would enable

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supervisors and financial institutions to assess potential future climate risks in the context of other financial stability risks, and could also be helpful in the context of a global financial system vulnerabilities assessment. Importantly, it would not be appropriate to apply the same impacts metrics for macro-financial stress testing to climate scenario analysis exercises in which the objective is not to assess near-term capital adequacy. Public-private dialogue is necessary to ensure that SCRMs exercises generate meaningful results, which firms can then use to help inform future climate strategies.

- **Prudential capital arguments should remain data-driven and risk-based.** Industry stakeholders would welcome opportunities to engage with prudential authorities and other regulators (e.g., securities regulators) to implement innovative structures and platforms to enable greater consistency and completeness of data, including the provision of open-source data repositories.

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## 1. Introduction

**The debate over the role of prudential regulators and supervisors in addressing climate-related risks – and how different prudential tools should be applied to respond to such risks – continues to evolve.** Over the past twelve months, there have been a number of statements from official sector stakeholders focusing on whether the use of the prudential capital framework to account for climate-related risks may be warranted and under what circumstances, and views on the challenges, costs, and benefits of interventions under different pillars of the global capital regimes for banks and insurers.<sup>5</sup> Civil society stakeholders, including NGOs, have called for regulators to apply the capital framework to account for climate-related risks, generally with the aim of steering capital allocation from the financial system to the economy in support of decarbonization.

**Recently, some authorities have begun to (or have announced their intention to) examine aspects of the relationship between climate risks and the regulatory capital framework in more detail,** including the BoE (2021/22),<sup>6</sup> the EBA (2022),<sup>7</sup> and the NGFS (2022).<sup>8</sup> Debate on the potential interactions between climate risks and dimensions of the prudential framework, including capital frameworks for banks and insurers, is evolving at the global level, including through the BCBS, the IAIS, and the FSB.

**There are many important open questions at present regarding whether, and under what circumstances, it would be possible or desirable for regulators to use the regulatory capital framework to account for climate-related risks and the desired outcomes of regulatory intervention** (e.g., whether to strengthen balance sheets against unexpected losses derived from climate risks or steer capital allocation in favor of decarbonization). Similarly, there is ongoing debate over the ways that such interventions could potentially be designed, considering the inherent challenges associated with addressing uncertain, long-term risks through near-term measures, and the potential risks and unintended consequences of different approaches – both from a financial stability and climate outcome perspective. Some critical questions include:

- What is the time horizon over which prudential authorities should evaluate and take action in support of microprudential and macroprudential objectives?

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<sup>5</sup> These include the Basel III International Regulatory Framework for Banks of the Basel committee on Banking Supervision (BCBS), and the standard method of calculating the group capital requirement under the Insurance Capital Standard (ICS) of the International Association of Insurance Supervisors (IAIS). We recognize that there are a number of jurisdictional insurance capital standards but for purposes of this paper focus on the ICS.

<sup>6</sup> Bank of England Prudential Regulation Authority (UK PRA) 2021, "[Climate-related financial risk management and the role of capital requirements](#)" (October), hereafter referred to as "PRA 2021 (October)".

<sup>7</sup> EBA 2022 (May)

<sup>8</sup> NGFS 2022 (May).

- Do specific features of climate-related and environmental risks – such as data and methodological challenges, or inherently greater uncertainty – warrant a specific approach, which may deviate from or not be reflected in the core prudential framework, in order to meet microprudential and macroprudential objectives?
- Are there gaps in the prudential framework that may arise with respect to the consideration of climate-related risks, considering the time lags between actions that may reduce or exacerbate risks (e.g., changes in GHG emission levels), and the manifestation of impacts on the economy and financial institutions?
- What are the potential costs and benefits of different tools that could be applied to address climate-related risks? What types of unintended consequences could potentially arise?

**The IIF and its members have worked together to examine these questions, with the aim of contributing an industry perspective on the theoretical basis, methodological approaches, and potential implications of using the capital framework to respond to climate-related risks.** This paper focuses on relationships between climate-related risks and the banking and insurance prudential frameworks, making references to Basel III and the ICS where appropriate. It is intended to convey the views of the global financial sector to key platforms for dialogue in 2022, including the Bank of England Climate and Capital Conference,<sup>9</sup> as well as consultations by key authorities and standard-setting bodies. By exploring new dimensions of the debate regarding the intersection of climate-related risks with prudential objectives, this paper aims to contribute insights on the potential costs and benefits of different potential interventions, and recommendations for the way forward.

**The remainder of this paper is structured as follows:**

- **Section two** examines the context through which debate on the role of regulatory capital frameworks in addressing climate-related risks is advancing, and reviews current industry practices in the areas of climate risk identification, management, and assessment of impacts on capital adequacy.
- **Section three** explores a set of four questions regarding the use of the capital framework to address climate-related risks, including evidence regarding the materiality of climate-related risks, time horizons, supervisory views on P1/P2/ICS options, and industry perspectives on the costs and benefits of different measures.
- **Section four** sets out key considerations that should guide thinking on the use of the capital framework to address climate-related risks, including theories of change, unintended consequences, and relationships to other policy instruments.
- **Section five** sets out conclusions and recommendations for the way forward.

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<sup>9</sup> The conference information can be found [here](#).

## 2. Context: The potential role of regulatory capital frameworks in addressing climate-related risks

### 2.1 The relevance of climate-related risks to prudential objectives: An evolving debate

In a January 2021 report,<sup>10</sup> the IIF discussed three theoretical objectives that prudential authorities could pursue with respect to climate-related and environmental risks, listed below in ascending level of intervention. In a climate context, these can be described as:

- **“Resilience”** – Ensure safety and soundness of individual financial institutions in light of transition and physical climate-related financial risks; a microprudential lens.
- **“System-wide Alignment”** – Examine the alignment of the financial system with various possible future climate pathways to assess transmission channels between the economy, climate, and financial system, with a view to reducing or mitigating potential vulnerabilities for financial stability; a macroprudential lens.
- **“Active Transition”** – Use prudential tools to regulate and incentivize the financial system to actively steer the low-carbon transition of key sectors in the real economy, via the provision and pricing of financial products and services.

The IIF proposed that **prudential authorities should consider both the microprudential objective of resilience and the macroprudential objective of examining the alignment of the financial system with future climate pathways**, with a view to reducing the potential for financial instability stemming from climate-related or environmental risks. **However, going beyond resilience and system-wide alignment to pursue an “active transition” objective, which could involve the use of prudential tools for extraordinary purposes (e.g., directing capital allocation by the financial sector), is unlikely to be highly effective and could result in significant unintended consequences.** “Active transition” objectives should primarily be driven not by financial regulatory policy but by government environmental and industrial policies consistent with the transition to a low carbon economy. Using prudential tools to attempt to achieve transition goals in the absence of economy-wide policy frameworks could potentially undermine the credibility and efficiency of prudential tools, and hinder the ability of prudential authorities to meet their primary objectives of ensuring safety, soundness, and financial stability.

**In the 18 months since the release of this report, this view seems, so far, consistent with many prudential authorities’ views.** For example, in the PRA’s *Climate Change Adaptation Report 2021*,<sup>11</sup> it stated, “the PRA’s primary objectives are to promote the safety and soundness

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<sup>10</sup> IIF 2021, “[Prudential Pathways: Industry Perspectives on Supervisory and Regulatory Approaches to Climate-Related and Environmental Risks](#)”(January), hereafter referred to as “IIF Prudential Pathways 2021”

<sup>11</sup> PRA 2021 (October)

of the firms it regulates and to contribute to securing an appropriate degree of protection for insurance policyholders. Climate change is relevant to these objectives as the firms the PRA regulates are exposed to climate related financial risks.” In its May 2022 discussion paper on the role of environmental risks in the prudential framework, the EBA<sup>12</sup> indicated that “Its starting point is that prudential requirements should reflect the risk profiles of exposures and should not be used for other policy purposes.”

**At the global level, there is a growing consensus that an active transition approach may create a number of challenges.** In a recent speech, Fernando Restoy, Chairman of the BIS Financial Stability Institute, noted that “it would not be appropriate to assign prudential authorities a prominent role in the direct public policy response to the climate emergency. ...Moreover, in delivering on their core mandate to preserve financial stability, prudential authorities need to consider trade-offs and adopt decisions that may not always be fully aligned with climate-related policy actions taken in other areas.”<sup>13</sup> A recent BIS article warned against over-expectations on the bank sector’s ability to lead the green transition by saying, “it is unrealistic to expect that (the financial sector) can drive the required reallocation of resources in the absence of adequate environmental policymaking in the real economy. Such unrealistic expectations could undermine financial stability and may derail the green transition itself.”<sup>14</sup>

**Global standard setting bodies, including the BCBS and the IAIS, alongside the FSB, have begun to deepen their work on supervisory and regulatory approaches to climate-related risks; however, to date, no consensus has emerged on the use of the prudential framework to address such risks.** The BCBS recently set out a set of principles for a holistic approach to assessing, measuring and mitigating climate-related financial risks that considers potential supervisory, regulatory and disclosure-related measures for the banking system.<sup>15</sup> The BCBS Task Force on Climate-related Financial Risks (TCFR) has indicated that it may in the future seek to undertake an assessment of gaps in the Basel Framework that may create issues in enabling climate-related risks to be addressed; however, no timeline for the release of this assessment publicly has been put forward. The current focus of the IAIS is on monitoring and assessing global insurance market trends and developments, including climate change, and determining their potential impact on insurance markets and global financial stability. The IAIS is also undertaking a review of its supervisory material, including the Insurance Core Principles (ICPs) and the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame), to assess whether there is a need for changes to the standards or the development of new

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<sup>12</sup> EBA 2022 (May).

<sup>13</sup> BIS FSI 2021, “[The role of prudential policy in addressing climate change](#)” (October).

<sup>14</sup> BIS 2022, “[Finance and climate change risk: managing expectations](#)” (June), hereafter referred to as “BIS 2022 (June).”

<sup>15</sup> BCBS 2022, “[Principles for the effective management and supervision of climate-related financial risks](#)”

supporting materials to address the risks from climate change.<sup>16</sup> The FSB has also undertaken a consultation on supervisory and regulatory approaches to climate-related risks,<sup>17</sup> to which the IIF has responded.<sup>18</sup>

**While responding climate change is not a primary objective for prudential authorities, there are an array of social and political pressures that may push authorities towards pursuing measures that would be considered an “active transition” approach.** For instance, HM Treasury’s March 2021 recommendations letter for the Prudential Regulation Committee (PRC) stated, “*the PRC should have regard to the government’s commitment to achieve a net-zero economy by 2050 under the Climate Change Act 2008 (Order 2019) when considering how to advance its objectives and discharge its functions.*”<sup>19</sup> In Europe, the ECB and the EBA repeatedly emphasizes their mandates and their will to continue risk-based approaches in response to political debate regarding the use of financial policy and regulation to address climate-related issues.

**Authorities that support a risk-based approach to climate-related risks have identified a number of situations which could potentially warrant a shift in thinking and practice.** For instance, a risk of “missing materiality” – where financial institutions and authorities potentially do not appropriately account for risks that are present today due to inappropriate risk pricing — could leave financial institutions vulnerable if those risks were to crystallize rapidly (e.g., transition risks in a climate “Minsky moment”). Linked to this, a risk of “policy myopia” due to the time horizons of policy options not being aligned with the time horizon over which future climate risks will crystallize, could lead to a build-up of financial risks requiring more aggressive policy responses in the future.<sup>20</sup> To overcome policymaking paralysis stemming from incomplete data or immature methodologies, leading to a “tragedy of the horizon” whereby the market signals necessary to appropriately price in climate-related risks only manifest at a point after which climate impacts are already unavoidable, supervisors could theoretically take action in the absence of full evidence regarding the materiality of future risks.

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<sup>16</sup> Notably, the ICS will form part of ComFrame once it is finalized.

<sup>17</sup> FSB 2022 “[Supervisory and Regulatory Approaches to Climate-related Risks: Interim Report](#)”

<sup>18</sup> IIF/ISDA/GFMA 2022 “[Response to Financial Stability Board “Supervisory and Regulatory Approaches to Climate-related Risks: Interim Report”](#)”

<sup>19</sup> HM Treasury 2021, “[Recommendations for the Prudential Regulation Committee](#)”(March).

<sup>20</sup> Speech by Frank Elderson (ECB) 2022, “[Towards an immersive supervisory approach to the management of climate-related and environmental risks in the banking sector](#)” (February).

Blog post by Frank Elderson (ECB) 2022, “[Mind the gap, close the gap – the ECB’s views on the banking package reforms](#)” (April).

Speech by Steven Maijoor (DNB) 2022, “[On how climate-related and environmental risks affect banking and its prudential supervision](#)” (May).

## 2.2 New concerns and priorities: Potential shifts in prudential responses

Looking across recent statements by regulators, consultation reports, and publications, we perceive three inter-related shifts that may potentially influence supervisory and regulatory approaches to climate risks: i) extension of supervisory time horizons to address long-term risks through near-term actions, ii) applying a double materiality approach to consider risks to and from the financial system, and iii) increasing supervisory engagement on financial institutions' strategic actions on net zero alignment, including supervision of transition plans.

### i) Addressing long-term risks through near-term supervisory actions

**Some prudential authorities have indicated that they may seek to take a longer-term perspective on potential risks as a guide for decisions today**, including through the use of forward-looking analysis such as climate-related scenario analysis and stress testing. However, there is arguably a fine line between an active transition objective and a precautionary macroprudential objective. If authorities consider that financial system risks may arise in the future because of action (or inaction) by the financial system today, they could seek to use prudential tools today to reduce the likelihood of those risks developing. A similar logic is applied by some authorities that use the countercyclical capital buffer (CCyB) to “lean against the credit cycle” by increasing the cost of credit provision in an upswing.

### ii) Double materiality - a changing view of risk, impact, and alignment

**Most supervisors have not formally expressed that they may seek to apply a double materiality approach to climate-related risks in the context the prudential framework; however, debate in this area continues.** For instance, the EBA holds a double materiality perspective for the European bank prudential framework, stating that, “a risk-sensitive prudential framework should thus take both of these perspectives (the outside-in perspective and the inside-out perspective) into account.”<sup>21</sup> An ECB working paper argues that the knowledge gap to assess the double materiality of climate-related financial risks could have a direct impact on the feasibility of climate scenarios themselves and that considering the role of the finance-economy-climate feedback is necessary to design appropriate macro-prudential policies.<sup>22</sup> Considering the fact that there is still no formal international agreement on a standard approach to assess the materiality perspective through which climate risks should be considered, (e.g., in the context of disclosure standards) a risk of fragmentation could emerge if double materiality were explicitly reflected within prudential frameworks in select jurisdictions.

**From a double materiality perspective, some prudential authorities seek to assess how financial institutions' business strategies and capital allocation may have implications for the exacerbation or mitigation of future climate-related risks – particularly by examining Scope**

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<sup>21</sup> EBA 2022 (May)

<sup>22</sup> ECB 2022, “[The double materiality of climate physical and transition risks in the euro area](#)” (May).

**3 financed emissions as a proxy.** Forward-looking analysis of financed emissions pathways is beginning to be reflected in the disclosures of some banks and insurers; however, there is not necessarily a linear relationship between levels of financed emissions and climate risks facing financial institutions. The linkage between financed emissions and risk needs further investigation, including how the risk profile of a counterparty may be affected by its potential to align with the low-carbon transition, and the strength of a counterparty's transition planning measures. For example, some entities (e.g., oil companies with very low breakeven oil prices) may be highly carbon-intensive but resilient to transition scenarios due to the low costs associated with their business, with high profit margins acting as a buffer to future carbon taxes or falling demand. For the institutions that lend to them, they may therefore see high financed emissions but relatively low impact on expected credit losses from climate-related risks. Other counterparties may be carbon intense today but have credible plans, aligned with science-based pathways, toward net zero by 2050 – similarly, there is building concern that decarbonization of portfolios on a climate risk reduction basis at the financial institution level may have negligible impacts on real economy climate outcomes.<sup>23</sup> Prudential authorities have recognized this complexity. In a recent speech, Sarah Breeden, Executive Director of Financial Stability Strategy and Risk at the Bank of England, noted that *“while balance sheet-greening – or paper decarbonisation – may reduce the direct risks firms face from transition, it will not reduce the system-wide risks we will all face, unless those actions mean that emissions are actually reduced.”*<sup>24</sup>

### iii) Supervision of transition plans

**A further issue pertains to the question of how supervisors may seek to engage with firms on Net Zero alignment, particularly on targets set in line with voluntary commitment frameworks.** Recent statements and publications from prudential authorities and voluntary coalitions indicate that many authorities do consider transition plans to be relevant from a microprudential perspective, in the context of supervisory reviews. At the global level, the NGFS intends to examine the role of supervisors in assessing financial institutions' transition plans, including potential ways to assess transition plans' resilience to environmental risks, good practices among supervisors on overseeing financial institutions' transition plans, and how financial institutions should consider their counterparties' transition plans.<sup>25</sup> At the jurisdictional level, several authorities – including the ECB – have announced intentions to release expectations regarding transition plans by financial institutions, and incorporate financial institutions' transition plans in the Supervisory Review and Evaluation Process (SREP).<sup>26</sup> François Villeroy de Galhau, Governor of the Banque de France, said *“banks should be required to publish*

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<sup>23</sup> Caldecott 2020, [“Climate risk management \(CRM\) and how it relates to achieving alignment with climate outcomes \(ACO\)”](#), Journal of Sustainable Finance and Investment (December)

<sup>24</sup> BOE speech by Sarah Breeden 2022, [“Balancing on the net-zero tightrope”](#) (April), hereafter referred to as “BOE Speech 2022 (April)”.

<sup>25</sup> MAS speech by Ravi Menon 2022, [“Gearing Up for Climate Action – The Road Ahead for the NGFS”](#) (May).

<sup>26</sup> Speech by Frank Elderson (ECB) 2022, [“Towards an immersive supervisory approach to the management of climate-related and environmental risks in the banking sector”](#) (February).

transitions plans to be assessed by supervisors: a misalignment with the climate policy target could be seen as an indication of material transition risk – leading potentially to a capital add-on.”<sup>27</sup> The PRA is also considering how to assess financial institutions' transition plans in the supervisory process.<sup>28</sup> Tomoko Amaya, Vice Minister for International Affairs at the Japan Financial Services Agency (JFSA), said helping clients proactively to deal with climate change is the core of financial institutions' actions in response to climate change.<sup>29</sup> The JFSA gives examples of effective dialogues and interactions with financial institutions' clients and argues that supporting clients' decarbonization through finance would contribute to their growth and competence, and in turn, reduce financial institutions' credit risks as well.<sup>30</sup>

### 2.3 Insights on current industry practices: Assessing the impacts of climate risks on credit risk, insurance risk, capital adequacy and solvency

**Globally, the banking and insurance sectors have in recent years taken steps to develop a more systematic understanding of, and response to, climate-related risks and opportunities.** Progress towards developing a climate risk management framework and program can depend on a range of factors, including the institution's business model, portfolio allocation, jurisdictional policy framework and supervisory environment, and broader market context and competitive position.

**As recognized by the BCBS and IAIS, banks and insurers are increasingly accounting for climate-related risks as drivers of traditional financial risks stripes they manage, including credit, market, operational, legal, and other risks.** Banks have generally focused on climate risk drivers of credit, market, operational, reputational, and strategic risk to date (see Figure 1); insurers are considering insurance risks alongside risk stripes relevant for banks.

**Physical and transition factors may impact financial risks in different ways, and over different timeframes.** Climate-related risks may manifest through exposure, asset liquidation and legal liability transmission channels, with physical risk generally location-dependent and transition risk reflecting counterparties' need for additional funding, credit downgrades or defaults, or the creation of stranded assets. The exposure channel reflects primarily increases in risk premia and counterparty exposures and interconnections; the asset liquidation channel refers to the sudden sale of assets on a large scale that can trigger rapid decreases in asset prices that disrupt trading or funding in key markets; and the legal liability channel reflects counterparty risk from companies with exposure to climate-related legal liabilities. Banks consider credit, operational, reputational and legal risks as the most likely to be impacted by climate-related risks in the next 1-2 years and consider credit risks to be the most likely to be impacted in the medium-term (to

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<sup>27</sup> Banque de France 2022, “[Europe in motion for climate transition: snapshot, video and scenario of the risks](#)” (March).

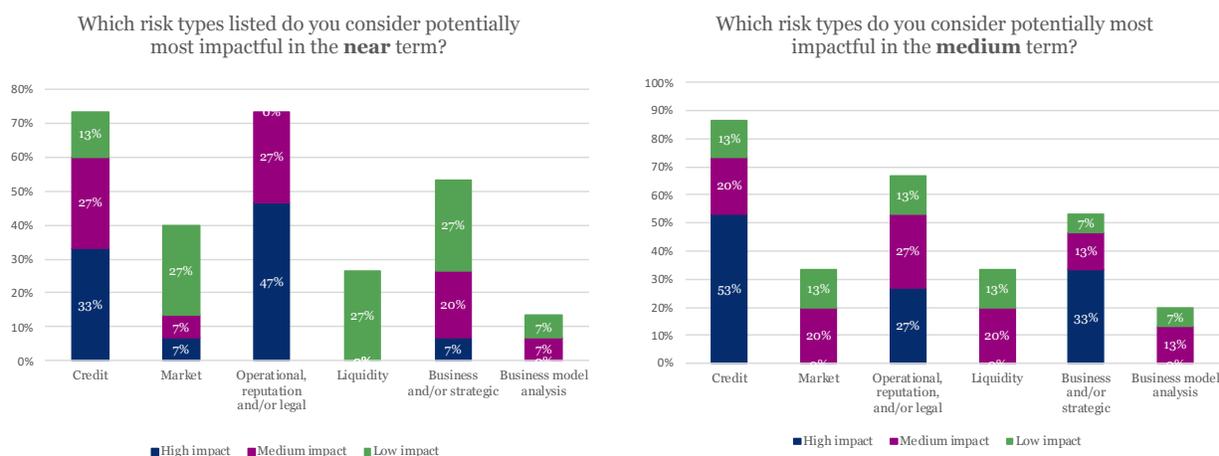
<sup>28</sup> PRA 2021 (October).

<sup>29</sup> [Closing remark in the JFSA symposium 2022 “Transition to Net-Zero: The Role of Finance and Pathway toward Sustainable Future”](#) (May).

<sup>30</sup> The JFSA news release on April 25, 2022, can be found [here](#).

2025 and beyond). Most insurers that the IIF has surveyed note that transition risk is more material than physical risk at the present time even for insurers with significant catastrophe risk exposures. The impact on P&C (re)insurance books is relatively limited given the annual repricing conventions and the availability of risk mitigation and risk transfer via reinsurance and retrocession. One risk that is receiving more attention of late is the liability risk of insurers through direct exposure or exposure via the underwriting of directors' and officers' liability policies.

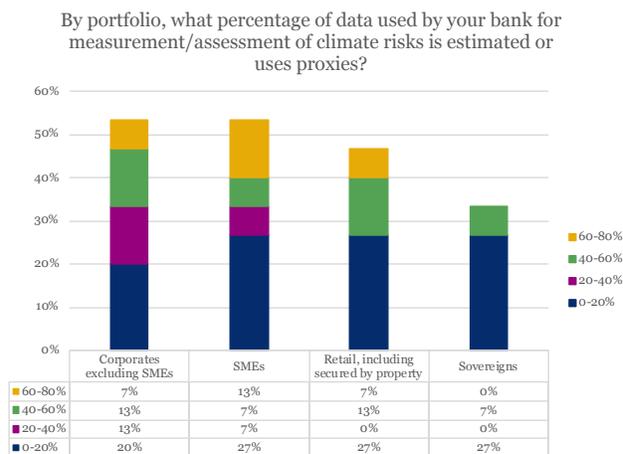
**Figure 1: Degree of impact of different risk divers over near and medium terms for banks**



Source: IIF H1 2022 Survey of Large Banking Institutions

**Some banks measure the carbon-related assets they hold, which is used as an approximation to size transition risk.** This approach aims to identify potential “pockets of risk” in the portfolio. Another observed practice is to calculate the carbon footprint of banks’ assets as a proxy for transition risk (see Figure 2). While going in the same general direction as the identification of carbon-related assets, carbon footprints involve measuring at a more granular level the financed emissions associated with lending and investment activities by combining information on sectoral or firm exposures with information on carbon emissions. Similar to banks, insurers often measure the carbon footprint of their investment portfolios and determine the level of financed emissions using a weighted average of carbon intensity metric. A number of insurers are actively involved in an industry effort to develop a methodology for assessing the carbon impact of underwriting activities.

**Figure 2: Use of proxies in climate risk assessment**

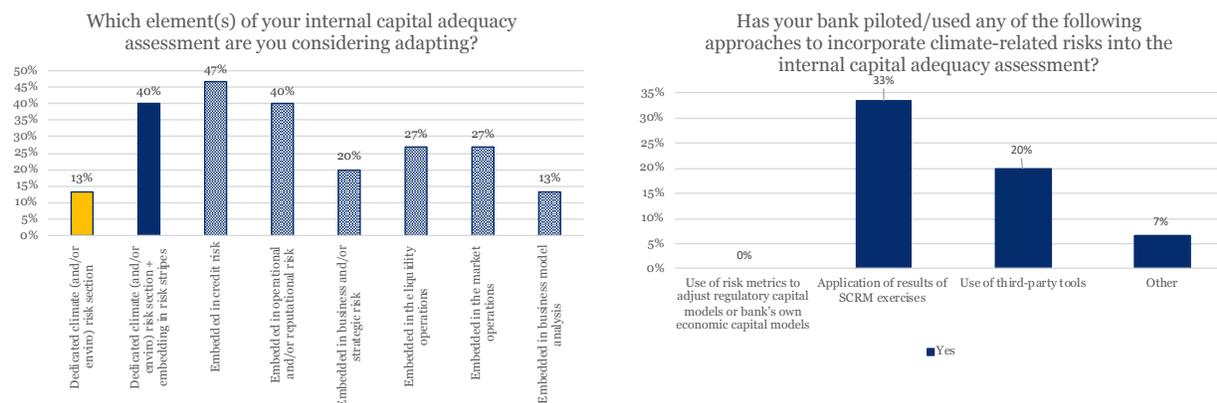


Source: IIF H1 2022 Survey of Large Banking Institutions

**Banks and insurers have begun to consider whether and how to include climate-related risks as part of their internal capital adequacy and solvency assessments, either by embedding climate risk factors into existing risk drivers or through dedicated climate/environmental risk sections.** Tools for doing so include application of scenario-based risk measurement approaches, third-party tools and expert judgement based on qualitative assessment. Where quantitative information is lacking, some financial institutions have launched an internal process to evaluate climate related financial risks qualitatively and estimate their potential financial impacts. In addition, financial institutions leverage heatmaps to visualize the materiality of their portfolios to such indicators and to monitor concentration risks over time.

**While data paucity and the need to develop more robust methodologies have resulted in the initial outputs of these analyses being more qualitative in nature, the development of more quantitative outputs is increasing.** These outputs, both qualitative and quantitative, are used for strategic planning and the management of a wide range of risks that may be impacted by climate change. Insurers are increasingly considering these risks when deciding whether to underwrite a risk and on what terms and conditions and at what price. On the asset side of the balance sheet, the outputs of stress testing, reverse stress testing, and scenario analysis impact investment decisions. However, financial institutions note that the availability of data on investees generally is poor, particularly in the case of private assets.

**Figure 3: Consideration of climate risks in internal capital adequacy assessment by banks**



Source: IIF H1 2022 Survey of Large Banking Institutions

**Currently, most banks do not generally consider climate-related risk factors beyond five years to be relevant from a capital adequacy perspective.** There are a range of reasons for this, including: i) longer-dated risk drivers are usually considered as part of strategic/business planning, which is done over a much longer time frame than capital planning; ii) the degree of uncertainty about longer-dated risks is extremely high (their nature and magnitude is often scenario-dependent); and, iii) for those firms which have performed initial empirical analysis of the impact of certain longer-dated risks on their balance sheets, they are usually assessed as not posing a capital adequacy risk over the generally shorter capital planning horizon. These challenges have been recognized by the BIS FSI in its recent comparison of practices for stress testing banks for climate change.<sup>31</sup> As of yet, there is no industry consensus or established practice regarding the appropriate time horizon to capture climate in internal analysis of capital adequacy.

**The potential impacts of climate-related risks on solvency are more idiosyncratic in the insurance industry given the diversity of insurance business models but, generally, insurers consider climate risks in a five- to ten-year horizon.** Insurance business models also influence the relevant time horizon for the consideration of climate risks. For most P&C (re)insurers, policies renew annually and a one-year horizon is particularly relevant; however, as recognized by insurance regulators and supervisors, a one-year horizon may not be adequate for a robust consideration of climate risks. For life insurers, climate risk generally is more attenuated and a

<sup>31</sup> See BIS FSI (2021) "[Stress-testing banks for climate change – a comparison of practices](#)" (July). "With the exception of newly originated long-dated real estate and project finance exposures, banks' exposures to sovereigns, other financials, corporates and households rarely exceed a few years, thus making it necessary to introduce ad hoc assumptions about the evolution of bank portfolios over a very long period of time. Furthermore, such long horizons can give banks a way to reduce the impacts of climate-related risks, as they can minimise them by introducing assumptions about technological innovation, divestment or other management actions"

longer time horizon generally is appropriate, but challenges exist in quantifying risks over a longer time horizon given the non-linear path dependency of climate risk.

**It is inherently challenging to model the future impact of climate-related risk drivers on capital adequacy and liquidity for several reasons,** including the highly scenario-dependent and complex nature of the effects which create modelling complexities, the need for novel modelling tools and techniques, and challenges associated with adaptation of existing techniques to account for climate risk.<sup>32</sup> Calibration is an important issue; a lack of relevant historical data also makes robust model back-testing challenging.

**Prudential authorities in certain jurisdictions are beginning to set new expectations for banks and insurers to incorporate climate risks into supervisory expectations on internal capital adequacy assessment, such as ICAAP and ORSA filings.** For instance, in the UK, banks have been required to conduct initial calculations of the potential impacts of climate on capital adequacy within the 2021 ICAAP process. Some firms are also voluntarily undertaking such analysis without supervisory expectations in place in their jurisdiction. The fact that not all jurisdictions have taken steps to formalize expectations on the consideration of climate risk in internal capital adequacy assessment (e.g., ICAAP or ORSA filings) is indicative of a broader divergence of views regarding the use of different prudential tools to address climate-related risks – and raises question on the likelihood that supervisors will work to fully utilize existing prudential tools in a consistent manner, before certain jurisdictions seek to make targeted amendments on a climate risk basis.

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<sup>32</sup> IIF (2021) Prudential Pathways

### 3. Examining key questions: perspectives on the relationships of climate risks to the capital framework

There are many important open questions supervisors, industry, and stakeholders should examine before action is taken to use the capital framework to address climate-related risks. A key overarching issue at hand is the degree to which current bank and insurance prudential frameworks may enable climate-related risks to be appropriately accounted for, and if there are any gaps that may need to be addressed, including the capital framework. This section examines the following questions in an effort to provide insight on this issue:

- How material are climate-related risks for safety, soundness, policyholder protection, robust and well-functioning financial services markets and financial stability, and what evidence is there to assess how climate-related risks may affect capital adequacy?
- What is the appropriate time horizon over which climate risks could be considered in capital frameworks?
- What are supervisory perspectives on the degree to which the capital framework can enable climate-related risks to be addressed?
- What are the potential costs, benefits, and challenges associated with using different capital tools to address climate-related risks?

#### 3.1 How material are climate-related risks for safety, soundness, policyholder protection, robust and well-functioning financial services markets and financial stability, and what evidence is there to assess how climate-related risks may affect capital adequacy?

The starting point for an assessment of the degree to which the current prudential frameworks may be able to appropriately account for future climate risks is an examination of the evidence on the levels of these risks, their dynamics, levels of uncertainty inherent in these estimates, and the methodological and data paucity which could complicate efforts by regulators to apply insights in the context of prudential responses. There are two main sources of information that public authorities are using to support their assessments: **i) supervisory scenario-based climate risk measurement (SCRM) exercises**, including climate scenario analysis and stress tests, and **ii) assessments of the degree of riskiness of different types of assets in relationship to their climate sensitivity**, including analysis of the potential for risk differentials between green and high-carbon assets, and scientific literature assessing how climate-related risks may affect various sectors and asset classes. This section focuses on the former, drawing on IIF analysis of supervisory exercises where public results have released, and reviews literature on the latter, including recent reports from prudential authorities.

### 3.1.1 Supervisory SCRMs Exercises: What are we learning?

SCRMs is a rapidly evolving field of practice for financial institutions and supervisors. According to a high-level progress report by the NGFS in October 2021, 29 jurisdictions have completed, initiated, or announced SCRMs exercises in their jurisdictions.<sup>33</sup> As described in the IIF's 2021 report "Navigating Climate Headwinds: Reference Approaches for Scenario-based Climate Risk Measurement by Banks and Supervisors,"<sup>34</sup> supervisory exercises to date have varied across a number of key dimensions, including scenarios applied, sectoral transition pathways, the scope of risks, institutions and portfolios considered, exercise format and degree of specification, key modelling assumptions, and organization of exercise outputs and results, including metrics chosen to quantify impacts.

Different design choices taken by supervisors have significant implications for exercise feasibility, comparability of exercise results, and ultimately the value of these exercises for supervisors and firms in terms of supporting progress towards an orderly transition to Net Zero with minimal risks to financial stability. One emerging issue of particular importance noted in the IIF's 2021 report is whether, and under what circumstances, the results of different types of SCRMs exercises could be considered relevant for supervisory and regulatory practices, particularly where such actions would be intended to address long-term risks through near-term interventions. While no supervisory SCRMs exercises to date have led to prudential interventions (such as the recalibration of prudential tools such as capital requirements),<sup>35</sup> there have been notable statements by senior regulators in key jurisdictions that allude to the need to explore potential links between climate risks and the prudential regime, including through the use of forward-looking scenario analysis and stress testing.<sup>36</sup>

In order to provide a global picture of the latest evidence on the likely severity of the impacts of climate change from a financial stability perspective, and to assess the degree to which the results of recent SCRMs exercises create a sound evidence basis for near-term action to address future risks, the IIF has undertaken a comparative analysis of the results of **the ten recent supervisory SCRMs exercises** for which publicly available information has been released as of end-June 2022. These include:

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<sup>33</sup> NGFS 2021, "[Scenarios in Action: A progress report on global supervisory and central bank climate scenario exercises](#)" (October), hereafter referred to as "NGFS 2021".

<sup>34</sup> IIF 2021, "[Navigating Climate Headwinds: Reference Approaches for Scenario-based Climate Risk Measurement by Banks and Supervisors](#)" (July).

<sup>35</sup> NGFS 2021 (May).

<sup>36</sup> The IIF has counted at least 22 statements or references to climate and regulatory capital by policymakers or regulators within the past year, often in relation to climate scenario analysis. For example, remarks by Fernando Restoy (Chairman of the BIS Financial Stability Institute) in [October 2021](#); ECB Macroprudential Bulletin article ([October 2021](#)); PRA 2021; remarks by Frank Elderson ([November 2021](#)); and remarks by Peter Routledge (Superintendent of OSFI) in [January 2022](#).

- [Bank of Canada \(BoC\)/Office of the Superintendent of Financial Institutions \(OSFI\)](#), “Using Scenario Analysis to Assess Climate Transition Risk” (2022)
- [Bank of England \(BoE\)](#), “Results of the 2021 Climate Biennial Exploratory Scenario” (May 2022)
- [European Banking Authority \(EBA\)](#), “Mapping climate risk: main findings from the EU-wide pilot exercise” (May 2021)
- [European Central Bank \(ECB\)](#), “ECB economy-wide climate stress test” (September 2021)
- [European Central Bank \(ECB\)](#), “2022 climate risk stress test” (July 2022)
- [Hong Kong Monetary Authority \(HKMA\)](#), “Pilot Banking Sector Climate Risk Stress Test” (December 2021)
- [International Association of Insurance Supervisors \(IAIS\)](#), “The Impact of Climate Change on the Financial Stability of the Insurance Sector” (September 2021)
- [L’Autorité de Contrôle Prudentiel et de Résolution \(ACPR\)](#), “A first assessment of financial risks stemming from climate change: The main results of the 2020 climate pilot exercise” (June 2021)
- [Monetary Authority of Singapore \(MAS\)](#), “Financial Stability Review December 2021” (December 2021)
- [Reserve Bank of Australia \(RBA\)](#), “Climate Change Risks to Australian Banks” (September 2021)

**Figure 4. Overview of Supervisory SCR exercise – Features and key conclusions**

	Scenarios	Institution Scope	Modelling assumptions	Key Conclusions: Assessment of financial stability impacts
<a href="#">ACPR</a>	Transition scenarios included an orderly transition, late transition, and sudden transition, developed based on NGFS scenarios. Physical risk was assessed using the IPCC RCP 8.5 scenario. Time horizon is through 2050.	Banks and insurers including 9 banking groups (the 6 main French groups as well as 3 public sector financial institutions) and 15 insurance groups (or 22 undertakings).	Static balance sheet through 2025, and then a dynamic balance sheet from 2025-2050.	“The pilot exercise revealed an overall ‘moderate’ exposure of French banks and insurers to climate risks.”
<a href="#">EBA</a>	Two adverse NGFS scenarios – disorderly transition and hot house world. 30-year time horizon.	29 banks from 10 countries representing 50% of the EU banking sector’s total assets and 47% of total EU RWA. Includes 7 G-SIIs and 15 O-SIIs.	Static balance sheet; 30-year time horizon.	“...for the 29 banks in the sample, more than half of their exposures to non-SME corporates (58% of total) are allocated to sectors that might be sensitive to transition risk. A parallel analysis, based on GHG emissions, reveals that 35% of banks’ total submitted exposures are towards EU obligors with GHG emissions above the median of the distribution.”

	Scenarios	Institution Scope	Modelling assumptions	Key Conclusions: Assessment of financial stability impacts
<a href="#">ECB 2021</a>	Used three of the NGFS Phase I scenarios: orderly transition, disorderly transition, and hot house world. Intend to update the framework to account for the NGFS Phase II scenarios. 30-year time horizon.	Approximately 1,600 banking groups across the EU.	Static balance sheet; 30-year time horizon.	“The results of the ECB’s economy-wide climate stress test first show that there are clear benefits in acting early... The results also show that for corporates and banks most exposed to climate risks, the impact is potentially very significant, especially in the absence of further mitigating policies... Climate change thus represents a major source of systemic risk, particularly for banks with portfolios concentrated in certain economic sectors and, more importantly, in specific geographical areas.”
<a href="#">ECB 2022</a>	Three long-term transition risk scenarios based on NGFS Phase II scenarios: orderly, disorderly, hot house world. Two physical risk scenarios including a drought and heat scenario and a flood risk scenario.	41 banks	Dynamic balance sheets for long term (30-year) transition scenarios, static for short-term (3-year) transition scenarios.	“Climate risks are relevant for the large majority of significant institutions directly supervised by the ECB... The extent to which this could give rise to climate risk will depend on the transition plans of the counterparties in these high-emitting sectors... The significant institutions are, to varying degrees, exposed to the materialisation of acute physical risks in Europe, namely drought and heat events and flood risk. The risks banks are facing in this regard are closely linked to the geographical location of their lending activities and could in some cases lead to non-negligible losses.”
<a href="#">RBA</a>	NGFS hot house world scenario. Time horizon through 2100.	Australian banks; further details not provided.	Not provided	“This approach suggests that a small share of housing in regions most exposed to extreme weather could experience price falls that might subsequently result in credit losses, but the overall losses for the financial system are likely manageable. Banks are also exposed to transition risks from their lending to emissions-intensive industries, but their portfolios appear to be less emissions-intensive than the economy as a whole.”
<a href="#">IAIS</a>	NGFS scenarios: orderly transition, disorderly transition, hot house world, and too little too late. Time horizon through 2100.	32 IAIS members, representing about 75% of the global insurance market.	Static balance sheet.	“Despite the significant losses shown in the four scenarios analysed, the insurance sector as a whole appears to be able to absorb these investments losses, in light of the high pre-stress capital levels.”

	Scenarios	Institution Scope	Modelling assumptions	Key Conclusions: Assessment of financial stability impacts
<a href="#">HKMA</a>	One physical risk scenario and orderly and disorderly transitions. All banks assessed the impact between 2031 and 2035 under the disorderly transition scenario while D-SIBs also conducted an assessment between 2021 and 2050 for the orderly transition scenario.	27 banks including 20 major retail banks and 7 branches of international banking group (accounting for 80% of the sector's total lending)	Static balance sheet.	"Climate risks can give rise to significant adverse impacts on the banks' profitability, capital positions and operations. Notwithstanding the significant potential impacts of climate change, the Hong Kong banking sector remains resilient to climate-related shocks given the strong capital buffers built up over the years."
<a href="#">MAS</a>	Not applicable	Intended to be representative of Singapore banks' and insurers' loans and investments based on MAS statistical reporting data.	Not provided	"The bulk of CPRS loan exposures in the Singapore banking sector are to CPRS with lower EML (Table S2.1), suggesting less susceptibility to impairments from changes in climate policy."
<a href="#">BoC-OSFI</a>	i) Baseline (as at end-2019), ii) immediate policy action towards limiting warming to 2°C, iii) delayed policy action towards limiting warming to 2°C, and iv) immediate policy action to limit warming to 1.5°C. All over a 30-year horizon.	Six Canadian federally regulated financial institutions – both banks and insurers.	Static balance sheet as of end 2019.	"...the analysis suggested that delayed or sudden climate policy action could pose greater risks of financial market dislocation."
<a href="#">BoE</a>	Early action, late action, and no additional action scenarios, all with different degrees of physical and transition risk. 30-year time horizon.	UK Banks and insurers	Static balance sheet as of end-2020.	"Loss projections vary across participants and scenarios, but are equivalent to an annual drag on profits of around 10-15% on average. Losses of this magnitude could make individual firms, and the financial system overall, more vulnerable to other future shocks. Due to the relative immaturity of firms' approaches and the complexity of modelling the impact of these risks, the uncertainty bands around projected losses are very large (...) Based on banks' and insurers' projections in this exercise, the overall costs to these firms from the transition to net zero should be bearable without substantial impacts on firms' capital positions."

**a) Comparing SCR exercise results: How severe are the impacts?**

The results of recent SCRM exercises have delivered directionally-similar conclusions: the impacts of climate-related risks on financial stability and institution safety and soundness are **generally moderate and manageable over the short- to medium-term even with a static balance sheet assumption**, with the potential for more significant risks arising over the longer term under different scenarios. While results do range significantly across exercises, **portfolio exposures were found to be generally moderate and currently do not pose major threats to financial stability**. A detailed overview of the quantitative results of exercises, looking across portfolio exposures, credit risk impacts, market risk impacts, additional findings, and capital impacts (where available)<sup>37</sup> is provided in Figure 5.

**Figure 5: Detailed Results of SCRM Exercises**

	Portfolio exposures	Credit risk impacts	Additional physical and transition risk findings and market risk impacts	Capital impacts
<a href="#">ACPR</a>	<p>The pilot exercise reveals an overall "moderate" exposure of French banks and insurance companies to the risks associated with climate change.</p> <p>Insurers' <b>exposure</b> to sectors that are potentially at risk in the event of transition risk shocks remains limited to about 17% of their total assets.</p>	<p><b>Cost of risk:</b><sup>38</sup> 15.8 bps in 2050 for the top 6 banks participating in the exercise. Sudden transition: 17.2 bps (+8.9%) Late transition: 16.4 bps (+3.9%)</p>	<p>French banks and insurers have "moderate" exposure to transition risk. Insurers found that the <b>cost of claims</b> could rise by a factor of 5 to 6 between 2020 and 2050. In a natural disaster scenario, <b>insurance premiums</b> would increase by between 130% and 200% over 30 years.</p> <p>Instantaneous impact of the transition scenarios on the fair value revaluation in the trading book of the top six banking institutions reaches €160 million in case of a sudden transition and €69.6 million in case of a delayed transition. In the counterparty risk analysis, the total impact on the six largest banks is €190 million in the sudden transition scenario and €145 million in the delayed transition scenario.</p>	Not provided
<a href="#">EBA</a>	<p>More than half of banks' exposures (58% of total non-SME corporate exposures to EU obligors) are allocated to sectors that might be sensitive to transition risk and are concentrated in some specific sectors. 35% of the total non-SME corporate exposures submitted in the exercise are to EU obligors with GHG emissions above the median of the distribution. The green asset ratio is 7.9%.</p>	<p>At EU level, the additional <b>expected loss</b> (the product of regulatory PD, LGD and the exposure value) in the two adverse scenarios, disorderly and hot house world, is 160 and 175 bps respectively. The distribution across banks ranges from 58 bps to 321 bps in the disorderly scenario and from 65 bps to 343 bps in the hot house scenario.</p>	Not provided	Not provided

<sup>37</sup> HKMA is one of the few banking exercises that includes capital impacts in the results. While the estimated impacts are quite significant (-3pp drop in capital ratios over five years), note that they accrue from 2031 not today. In this sense, they are still aligned with the takeaway that medium- to longer-term impacts could be more significant under certain scenarios.

<sup>38</sup> ACPR states that the annual cost of credit risk "is calculated by dividing the total annualised flows of provisions for each time interval by the average of the exposures over that time interval."

	Portfolio exposures	Credit risk impacts	Additional physical and transition risk findings and market risk impacts	Capital impacts
<a href="#">ECB 2021</a>	Approx. 8% of non-SIs and 10% of SIs' bank loans are exposed to high transition and high physical risk. Approx. 32% of non-SIs' and 35% of SIs' bank loans are exposed to high transition and low physical risk. Approx. 8% of non-SIs' and 12% of SIs' bank loans are exposed to low transition and high physical risk. Approx. 51% of non-SIs' and 41% of SIs' bank loans are exposed to low transition and low physical risk.	The average <b>bank-level probability of default</b> for corporate loan portfolios under the orderly transition scenario would be approximately 2.1% by 2050, and 2.3% under the hot house world scenario. Average expected losses would be approximately 3.5% higher by 2050 under a disorderly transition and just over 8% higher under a hot house world scenario as compared to an orderly transition baseline.	The impact of market risk is limited compared with the credit-risk channel, however it follows similar dynamics in terms of scenario comparison and country differences.  <b>Fair value losses</b> on banks' corporate bond portfolios are <0.6% in 2050 under either an orderly transition or a hot house world scenario for most banks assessed, rising to approx. 1.2% (orderly transition) or 2% (hot house world) for the most exposed banks.	Not provided
<a href="#">ECB 2022</a>	On average, more than 60% of interest income is derived from business with corporates belonging to carbon-intensive sectors. The combined weight of the seven most GHG-emitting sectors represents 28.8% of corporate exposures related to the 22 NACE sectors considered.	By 2050, <b>projected loan losses</b> are expected to rise to 0.192% of performing exposures in a hot house world, 0.187% in a disorderly scenario, and 0.171% in an orderly scenario.	Banks report a drop of 0.9% in the <b>net fair value</b> of their trading portfolios from a one-year materialization of an instantaneous transition risk shock. Under a short term, three-year disorderly transition risk scenario and the two physical risk scenarios (flood risk and drought and heat risk), the <b>combined credit and market risk losses</b> for the 41 banks providing projections would amount to around €70 billion.	Not provided
<a href="#">RBA</a>	A small share of housing in regions most exposed to extreme weather could experience price falls that might subsequently result in credit losses, but the overall losses for the financial system are likely manageable. Around 20% of banks' business loans are found to be to industries with (scope 1) carbon emissions per dollar of output that are in the top quartile of all industries by emissions.	400,000 more loans with a <b>loan-to-value ratio</b> greater than 80%.	By 2050, around 1.5% of properties are expected to experience a rise in <b>insurance premiums</b> that could reduce home values by around 10%; the rises to 9% of properties by 2100 with a 20% reduction in prices. Banks are also exposed to transition risks from their lending to emissions-intensive industries, but their portfolios appear to be less emissions-intensive than the economy as a whole.	Not provided
<a href="#">IAIS</a>	More than 35% of insurers' investment assets are exposed to climate risks. (range of 10-76%.) The sector is able to absorb losses given currently high capital levels. Under the scenarios, losses range between 3-18% for equities, 0.5-2% for corporate debt, and 0.25-4% for loans and mortgages. Loss of total assets ranges from 0.5-3%.	Not provided	Not provided	Orderly transition: drop in insurers' <b>available capital</b> of around 7% to 8% of required capital. Disorderly transition: 14% "Too little, too late": c. 50%
<a href="#">HKMA</a>	Aggregate exposures to the property development sector and six high-emitting industries stands at HK\$3.2 trillion, or 31% of banks' total lending.	Under the disorderly transition scenario, the <b>annualized credit cost of lending</b> (average annual change in ECLs/average loan amount) to the high-emitting industries increases by 3x compared to 2019 to reach 0.3%. Under orderly transition scenario, <b>annualized credit cost of</b>	Not provided	Starting from 2031 and under a disorderly transition scenario, average D-SIBs' <b>capital adequacy ratios</b> fall by 3 percentage points over a 5-year

	Portfolio exposures	Credit risk impacts	Additional physical and transition risk findings and market risk impacts	Capital impacts
		<b>lending</b> to high-emitting sectors rises steadily over 30-yr horizon. <b>Expected credit losses (ECLs)</b> will rise sharply under physical risk scenario – 1-year ECLs on residential mortgages will rise x25 from HK\$0.7 billion to HK\$17.3 billion.		assessment horizon.
<a href="#">MAS</a>	The proportion of bank loans exposed to sectors (excluding residential mortgages) that could be negatively affected in a disorderly transition has been stable in recent years: 29-31% from 2015-20. The insurance sector’s exposure has been stable in recent years: 32-33% from 2015-20.	Not provided	Not provided	Not provided
<a href="#">BoC-OSFI</a>	Total credit exposures to the 10 most emissions-intensive sectors within scope of the exercise were Can\$239.3 billion. Banks accounted for 54.8% of those exposures, while insurers accounted for 45.2%. The exposures represented 5% of the banks’ combined total balance sheet assets and 15% of the insurers’ combined total balance sheet assets.	<b>Change in PDs for corporates</b> (not FIs) across the transition scenarios: percentage change versus baseline for PDs ranged from -15 to 600, with the highest results for refined oil products and the lowest results for renewable energy. Most sectors saw % change in PDs of 50 to 150.	Analysis showed the largest decreases in <b>equity valuations</b> in the fossil-fuel sectors (falling close to zero by 2050), while the electricity sector experienced the largest gains (increasing 20-60% by 2050). Suggests that delayed or sudden climate policy action poses risks of financial market dislocation.	Not provided
<a href="#">BoE</a>	Not provided	Banks’ <b>projected climate-related credit losses</b> were 30% higher in the Late Action scenario (225 billion pounds) than Early Action. UK and international general insurers, respectively, projected a <b>rise in average annualized losses</b> of around 50% and 70% by the end of the No Additional Action scenario.	The sectors most affected by transition risks account for around a third of banks’ total provisions in the transition scenarios, despite these sectors only accounting for around 14% of banks’ total corporate exposures.	Not provided

There are a number of design considerations across these scenario analysis exercises which may complicate efforts to compare and evaluate the degree to which results could be considered relevant from a prudential perspective. Key differences include choices of scenarios, scope, format and specification, modelling assumptions, outputs, and application of results, which are all described further below.<sup>39</sup> One area of particular importance from a prudential perspective are differences in metrics used to quantify impacts, and the segmentation of results.

- **Scenarios:** Across the exercises examined, most supervisors used scenarios based on those developed by the NGFS, though adjustments were often made. Key factors such as GDP changes, GHG emissions changes, and carbon pricing often slightly varied among exercises.
- **Scope:** Differences in scope across exercises include variations in types of participating institutions (e.g., all insurers vs. all banks vs. a combination), number of participating

<sup>39</sup> These were identified in the IIF’s *Climate Headwinds* report as the primary design choices across SCRM exercises.

institutions, geographical regions covered, risk type examined, and exposures examined.

- **Format and specification:** The exercises examined included differences in model choice/specification, execution by supervisor or participating institution, reporting intervals, and variable/choice specification.
- **Modelling assumptions:** The exercises examined include differences in modelling assumptions, pertaining to balance sheet structure (e.g., dynamic vs. static), counterparties, and management actions.
- **Outputs, metrics, and segmentation:** A combination of qualitative and quantitative outputs were used in these exercises, and an array of different metrics have been employed, raising challenges for cross-jurisdictional comparisons of results.
- **Intended outcomes and use cases for results:** The intended outcomes and use cases for SCRM results vary, including informing supervisory engagement, supporting capacity building, supporting high-level horizon scanning, and other uses. To date, no prudential authority has specifically indicated that it intends to use the results of an analysis published to date to inform prudential interventions or the use of the capital framework.

### **Box 1: Challenges in comparing SCRM results: Metrics and Segmentation**

Prudential authorities have applied a variety of metrics, such as percent of loans to industries with high carbon emissions (e.g., RBA); fall in available financial institution capital (e.g., IAIS); change in capital adequacy ratio (e.g., HKMA); increase in leverage (e.g., ECB 2021); decrease in profitability (e.g., ECB); increase in probability of default (e.g., ECB 2021); rise in insurance claims (e.g., ACPR); projected climate-related credit losses (e.g., BoE); and percent of properties with rise in insurance premiums (e.g., RBA). While the high-level results of various exercises may tell a somewhat consistent story, the lack of a common lens for assessing potential impacts, and absence of a set of consistent reference points for comparison of financial stability impacts (e.g., with disruptions experienced in past financial stability events, such as the global financial crisis), makes it difficult to evaluate how severe the potential future impacts of climate may be in the context of other risks to financial stability.

**Credit risk measurement serves as an example of inconsistent use of metrics.** Of the nine exercises, six examine credit risk though each with different metrics and parameters. ACPR measures “cost of risk” in bps, while the EBA measures additional expected lost (the product of regulatory PD, LGD, and the exposure value). ECB 2021 looks at average bank-level probability of default for corporate loan portfolios; the BoC-OSFI estimate changes in PD for corporate sectors but do not translate this to the impact on FIs’ PDs. RBA presents the number of loans with a loan-to-value ratio greater than 80% and HKMA examines the annualized credit cost of lending to high-emitting industries, which they define as the average annual change in expected credit losses/average loan amount. Finally, the BoE presents projected credit losses in pounds. (IAIS and MAS did not provide credit risk metrics). These differing methods of measurement and metrics complicate direct credit risk comparison across jurisdictions.

**Other challenges pertain to differences in how supervisors segment analysis and present results.** Results are often subdivided differently across physical risk, transition risk, credit risk, insurance risk, market risk, and/or sector type, further complicating comparisons. Exposure metrics is the only category (compared to market risk, credit risk, and capital impacts) for which all regulators produced results.

**Reviewing exposure metrics allows for the most direct comparison across the exercises, yet there are small differences that impede comparisons across jurisdictions.** The EBA, for example, finds that of institutions in their sample, 58% of exposures are to sectors that may be sensitive to transition risk. The ECB (2021) presents exposures differently, by indicating the share of bank loans exposed to climate risk in high transition/high physical risk, high transition/low physical risk, low transition/high physical risk, and low transition/low transition risk scenarios. Results in these four areas are further divided by systemic institutions and non-systemic institutions. For instance, the RBA finds that “around 20% of banks” business loans are found to be to industries with (scope 1) carbon emissions per dollar of output that are in the top quartile of all industries by emissions,” which again presents an exposure metric, but of a different classification of firms than the ECB or EBA uses. The ACPR and IAIS find that exposures to climate risk of the insurers’ scope of their respective exercises stand at 17% and 35% of their assets respectively, though ACPR specifies that that figure is specifically the exposure to transition risk, while IAIS does not differentiate between exposure to physical and transition risk. HKMA, MAS, and BoC/OSFI all measure portfolio exposures similarly though they consider exposures to different numbers and combinations of sectors.

## **b) Putting SCRM results in context: How do the impacts of climate change compare to other financial stability risks?**

**Credit Risk Impacts: SCRM vs. Macro-financial stress tests.** The ECB’s 2021 top-down scenario analysis exercise found that bank expected losses increased by about 3.5% by 2050 under a disorderly transition scenario and by 8% by 2050 under a hot house world scenario. This credit risk increase can be approximately compared with findings from the ECB’s 2021 prudential stress test.<sup>40</sup> This mainstream stress test showed that loan loss provisions increased by 3% on average over a 2-year period in an adverse scenario. Loan loss provisions and expected losses (ELs) can be compared as banks increase provisioning when ELs rise. The ECB’s 2021 prudential stress test found that banks remain resilient despite credit risk and capital impacts under the adverse scenario – a signal that perhaps a 3.5% increase in ELs under a disorderly transition scenario will remain manageable. An 8% increase in ELs under a hot house world scenario is significantly higher. Nevertheless, it is unclear what an 8% increase in ELs would imply in terms of impacts on the capital ratios, when considering the 30-year timeframe over which these impacts may manifest.

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<sup>40</sup> ECB 2021 “[SSM-wide Stress Test 2021 – Final Results](#)” (July)

**Credit risk impacts: SCRM vs. the Global Financial Crisis.** Since comparing SCRM results to those of stress tests relies on hypothetical impacts, it is also helpful to compare SCRM results to known impacts of a financial stress event, such as the 2008 financial crisis. There are challenges with comparing ‘ex ante’ predictions of changes in bank probability of default (PD) from a scenario analysis exercises with ‘ex post’ realizations in real-world stress scenarios. However, the IMF<sup>41</sup> has released data that can be roughly compared with SCRM results. The IMF has estimated that PDs of the largest banks globally rose from <1% to about 3% in the summer of 2007, and then up to 12% in H1 2008 at the height of the crisis. In comparison, the ECB’s 2021 top-down climate scenario analysis exercise finds that bank-level PDs would be about 2.1% under an orderly transition scenario by 2050, and 2.3% under a hot house world scenario by 2050.

**Capital impacts: SCRM vs. Macro-financial stress tests.** HKMA’s SCRM exercise is the only one of the nine analyzed for this paper which measured impact on bank capital ratios, thereby enabling comparison to results of macro-financial stress tests which regularly include capital impacts.. HKMA found that D-SIBs’ capital adequacy ratios fall by 3pp over a horizon of five years starting in 2031 under a disorderly transition scenario. This is roughly aligned with findings from recent prudential stress tests under severe but plausible macrofinancial downturn scenarios; the EBA, RBA, Federal Reserve, and BoE find drops in capital of 4.8pp, 3pp, 2.1pp, and 5.5pp respectively. Figure 6 contains further information on time horizons, scenarios, and institution types in these exercises. In these macrofinancial stress tests, the banks remained resilient despite the falls in capital given adequate buffers.

**Figure 6. Details of prudential stress tests vs. SCRM exercise**

Exercise	Drop in capital	Scenario	Time horizon	Institution type
<a href="#">HKMA</a> climate scenario analysis	3pp	Disorderly transition	2031-2036	D-SIBs
<a href="#">EBA</a> 2021 prudential stress test	4.8pp (fully loaded CET1)	Adverse	2020-2023	50 EU banks
<a href="#">RBA</a> 2021 Financial Stability Review	Approx. 3pp CET1	Downside COVID risk	n/a (very short-term)	Large and mid-sized banks
<a href="#">Fed</a> 2020 CCAR	Peak fall of 2.1pp CET1	Severely adverse	Q4 2019-Q1 2022	Largest U.S. Bank Holding Companies
<a href="#">BoE</a> 2021 prudential stress test	5.5pp CET1 (transitional IFRS9 basis)	Adverse	2021-2025	Major UK banks (G-SIBs. D-SIBs)

Source: IIF analysis

**On a purely quantitative basis, the levels of potential exposure and stability risks posed by climate change – as indicated by the results of SCRM exercises to date – currently do not**

<sup>41</sup> IMF 2008 “[A Crisis of Confidence... and a Lot More.](#)” (June)

appear to currently indicate levels of risk over the near to medium term which would justify the use of the capital framework. However, due to the high levels of uncertainty inherent in these estimates, the rate at which climate risks are increasing, and the methodological and data gaps which remain, these results should not be considered as conclusive from a capital perspective – but rather should call attention to the importance of further collaboration between supervisors and industry to assess the dynamics of near-term climate risks. Differences in design choices (e.g., scope of institutions and portfolios, modelling, assumptions, metrics, and other factors) complicate efforts to compare the results of exercises across jurisdictions and create challenges for evaluating the robustness of supervisory SCRMs exercise results from the perspective of informing prudential interventions. Therefore, while such results would not provide the basis for regulatory capital decisions, the uncertainty around their evaluation require that climate risk assessment be complemented by qualitative factors and practices such as the ones described in the recent BCBS Principles for the Effective Management and Supervision of Climate-related Financial Risks.<sup>42</sup>

**SCRMs exercises can yield important insights on the extent to which climate risk poses a threat to financial institutions and the dynamics of physical and transition risks on their balance sheets.** Given the urgency of the climate crisis, it is vital that firms and supervisors can leverage insights from SCRMs analysis to catalyze strategic near-term actions that can reduce risk and enhance resilience. Given the potential role that scenario analysis may play in informing future supervisory engagement with firms and potentially firm-specific or broader policy decision-making with respect to climate and environment-related risks, it is important to have comparable assessments across jurisdictions. This can enable insights on the degree to which a given supervisor’s response to the analysis and available results reflects the severity of potential risks facing firms, the financial system, or the broader economy.

### 3.1.2 Risk differentials: What evidence to date?

In addition to SCRMs exercises, **some prudential authorities are seeking to assess the evidence for whether certain types of assets, sectors, investments, or activities may be more or less aligned with the decarbonization path of the economy (e.g., “green” vs. “non-green” assets) or may have higher or lower levels of risk**, with the aim of delineating the degree to which “green” characteristics may affect risk performance, and thereby warrant consideration within the prudential framework.

**A recent NGFS report<sup>43</sup> attempted to study and quantify potential credit risk differentials between green and non-green assets/activities, but there is limited evidence of ex-post risk differentials between them.** The paper, for example, cited an analysis by a surveyed bank where it found no difference in the degree of rating change between the renewable power and the carbon-related sectors. In case of default risk, the results of the analysis showed there was no

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<sup>42</sup> BCBS 2022

<sup>43</sup> NGFS 2022 (May)

significant difference between the probability of default (PD) in the renewable energy sector (2.5%) and the PD in the carbon-related sector (2.3%). The analysis also found that, in the carbon-related sector, the PD of medium-transition-risk borrowers (3.1%) was higher than the PD of high-transition-risk borrowers (0.8%). The report suggested that the lack of evidence may be partly attributed to the methodological limitation that conventional risk differential analysis based on historical data is backward-looking and concluded that introducing adjustment factors in the Pillar 1 capital framework using conventional risk differential analysis based on historical data remains a challenge.

In its 2022 Discussion Paper on the role of environmental risks in the prudential framework, the EBA<sup>44</sup> has summarized many papers that analyzed different exposure types including retail mortgages, corporates, sovereigns, and other retail exposures and tried to draw out information on risk differentials. While some of the papers suggested apparent evidence of risk differentials, those studies were narrowly scoped and counterevidence was founded in other papers, leading to the **EBA's general conclusion that "evidence of a risk differential between green and environmentally harmful assets appears to be rather scarce to date."** Like the NGFS, the EBA indicated that a current lack of evidence does not, however, necessarily imply that a risk differential does not exist or could not emerge in the future, but it emphasized that further empirical evidence on risk differentials should be collected prior to proposing any amendments to the capital framework.

### 3.2 What is the appropriate time horizon over which climate risks could be considered in capital frameworks?

**Climate-related risk drivers can cause risks to materialize over multiple timeframes.** Some risk factors are materializing today (for example, higher incidences of severe weather-related events and associated physical risks such as flooding), others are likely to unfold in the coming years, and some could be much more significant – under some scenarios – in future decades. This leads to questions about which, if any, potential climate-related risk drivers, regardless of the time horizon over which they are likely to generate material risks and losses for financial institutions, are relevant to prudential supervisors and the capital framework.

#### **Banks**

**The current bank supervisory risk time horizon extends out approximately three to five years – as seen in most existing regulations and financial resilience stress testing guidance<sup>45</sup> – in line with normal bank business planning horizons.** Outside of stress testing, the current bank prudential capital time horizon is typically much shorter; for example, risk weights for credit risk in the banking book are normally calibrated to account for unexpected credit losses over a one-

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<sup>44</sup> EBA 2022 (May)

<sup>45</sup> For example, see Financial Stability Institute, "[Stress-testing banks – a comparative analysis](#)," November 2018.

year horizon. In certain jurisdictions, the calculation of credit risk charges may involve the use of external credit ratings, providers of which may consider climate-related risk drivers in a variety of ways. Provisioning for expected credit losses is likewise related to the probability of a default occurring within one-year,<sup>46</sup> market risk in the trading book is calibrated for risks that can crystallize over a much shorter horizon (e.g., days) given the shorter-dated nature of those exposures. Capital-based macroprudential tools often have a less explicit time horizon but, since they interact with (i.e., scale the value of) the risk-weighted assets (RWA) or the leverage exposure measure (LEM), they are also implicitly linked to a one-year or less time horizon. Supervisors can of course take a longer-term view when it comes to supervisory engagement beyond capital requirements, such as by assessing business model risk and corporate governance.

**The current capital framework, therefore, is focused on the quantum of capital resources that may be depleted if tail risks materialize and there are 'unexpected losses' on an exposure (above and beyond expected losses which are provisioned for) within a specific time horizon.**<sup>47</sup> The fact banks are expected to maintain capital resources in excess of requirements at all times builds in a dynamic, continuous aspect over a series of discrete time horizons for unexpected losses. This conceptual approach is reasonable given the nature of capital resources: they are fungible and can be depleted by any loss event, they cannot be “stored up” to ensure they are available for specific future losses. From the perspective of banks’ own capital planning, there is also a natural limit on how far ahead balance sheet capital can be projected and managed as balance sheets change over time, as do capital and market financing conditions.

## Insurers

**The ICS capital requirement is based on the potential adverse changes in qualifying capital resources resulting from unexpected changes, events, or other manifestations of the specified risks.** Similar to the criteria adopted by the Basel Committee, the ICS is based on a target criteria of 99.5% value at risk over a one-year time horizon. Risks are measured using a stress approach and a factor-based approach. Catastrophe risks are measured using internal models (IM). The stress approach follows a dynamic methodology that considers the static balance sheet and a post-stress balance sheet, with risk charges reflecting the differences in capital resources between the two balance sheets. The factor approach applies factors to specific exposures. The specified risks covered by the ICS standard method include: (i) insurance risks, which encompass for life insurers mortality, longevity, morbidity, expense and lapse risks and which encompass for non-life insurers premium, claims reserve, and catastrophe risks; (ii) market risks, which encompass interest rate, non-default spread, equity, real estate, currency, and asset concentration risks; (iii) credit risk; and (iv) operational risks. Life insurance risks are measured using a stress approach whereas non-life insurance risks are measured using a factor approach,

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<sup>46</sup> BIS 2017 “The new era of expected credit loss provisioning” (March). Even if the provisioning method accounts for lifetime expected losses, for example under IFRS9 or CECL in the U.S.

<sup>47</sup> BIS 2017. In the case of ECL provisioning, 12-month ECL for a financial instrument is calculated as the portion of lifetime ECL that may result from default events occurring within the next 12-months.

with the exception of catastrophe risks which are measured using IMs. Market risk is measured using a stress approach, with the exception of asset concentration risk which is measured with a factor approach; credit and operational risks are measured using a factor approach. Some recognition is also given to risk mitigation techniques and management actions under the ICS standard method. For some books of business, geographic segmentation is used to derive the risk charges. Under the ICS, the use of external credit ratings is dependent on the rating agency having a track record of providing ratings for a sufficiently long period of time and meeting criteria relating to objectivity, independence, international access, and transparency, disclosure, resources, and credibility.

**Similar to the banking industry, the supervisory perspective extends beyond the one-year horizon to the normal business planning cycle of three to five years.** This is also consistent with the general time horizon for insurers' ORSAs. Some internal stress tests and scenario analyses extend beyond the business planning cycle of three to five years and extend out to 10 to 15 years. However, it is acknowledged that the outputs of these tests and analyses require significant expert judgment before they can be used in strategic planning or risk management.

## Implications

**Given the current time horizon of the global banking and insurance capital frameworks, material climate-related risk drivers of credit, insurance, and operational risks over a one-year and, in the case of prudential stress testing, over a three- to five-year horizon would be relevant from a prudential capital perspective.** Material climate-related risk drivers that are relevant to market and traded risk would be relevant from a prudential perspective over a much shorter time horizon. If the current prudential capital time horizon were to be extended to accommodate consideration of longer-dated climate-related risk drivers, the effect would be to widen the window over which the distribution of potential credit or insurance losses is measured/considered, but the effect would be (likely higher<sup>48</sup>) capital requirements "today" i.e., potentially long before those risks may materialize. If the capital time horizon for credit risk, for example, were extended from one-year unexpected losses to 10 year unexpected losses that would imply that all drivers of credit risk (all factors affecting bank borrower PD and/or LGD) would need to be assessed over a 10 year horizon; if only climate-related risk drivers were accounted for over a longer horizon that would be asymmetric and unduly weight climate-related factors.

While having higher financial system capital today could potentially increase firm-specific and system-wide resilience beyond the already high level achieved by the current capital framework,<sup>49</sup> such an approach would involve "front-loading" future risks, rather than enabling them to be reflected when they are likely to crystallize by virtue of the "moving time window" of the current capital framework. It is not clear that a "front-loading" approach would necessarily

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<sup>48</sup> Extending the time horizon over which the loss distribution is measured is likely to increase the quantum of losses captured, ceteris paribus, unless medium/longer-term factors reduce the probability or quantum of losses.

<sup>49</sup> See BCBS and IMF post-crisis assessments.

deliver a tangible difference in resilience at the point at which such resilience to crystallized risks is likely to be required. One potential near-term effect of front-loading distant future risks is the behavioral effect on capital planning; it can be difficult to estimate the impact of a change in capital requirements on lending, investment and underwriting decisions, real economy financing conditions, and credit provision.

### 3.3 What are supervisory perspectives on the degree to which the capital framework can enable climate-related risks to be addressed?

**There appears to be a building consensus among supervisors that certain components of the capital framework may already encapsulate climate-related risks; however, supervisors also recognize there are other components which, due to core design features, are unlikely to be relevant to climate-related risks.** Recent speeches, publications, and other statements from supervisors and other official sector stakeholder indicate a broad range of views on the applicability and relevance of different components of the prudential framework for climate risks, particularly the capital framework.<sup>50</sup> It is important to note that while some supervisors have begun to explore the relationships of climate risks to the capital framework, there is not agreement across jurisdictions on the feasibility or desirability of such an approach.

**At a high level, supervisors and industry stakeholders are aligned in considering that climate-related risks can be captured through traditional risk categories** (i.e., credit risks, insurance risks, market risks, operational risks, and liquidity risks)<sup>51</sup>. As the UK PRA's 2021 Climate Change Adaptation Report recognizes, *"the current regulatory capital framework captures the consequences of climate change to some extent, including through reference to credit ratings and the accounting regime."* The EBA has a similar view and states, *"the Pillar 1 framework already includes a number of mechanisms that allow for addressing new types of risk drivers, for example through internal models, external credit ratings and valuations of collaterals and financial instruments."*<sup>52</sup>

#### 3.3.1 Pillar 1

**Pillar 1 risk-weighted requirements (Risk-weighted Assets (RWA) measure and % requirement)**

**Standardized approach (SA) for credit risks:** SA is a comparatively simple method for calculating RWA as a product of the exposure amount and risk weights specified by supervisors. In some jurisdictions, banks may refer to external credit rating agencies' ratings for risk weights

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<sup>50</sup> Excluding Pillar 3, which is focused on disclosure and is discussed in other IIF publications, including [Prudential Pathways, Integrity through Alignment, Response to BCBS Consultation.]

<sup>51</sup> BCBS 2021, "[Climate-related risk drivers and their transmission channels](#)" (April).

<sup>52</sup> EBA 2021 (May)

that apply to corporate exposures<sup>53</sup>. Leading external credit rating agencies have started to incorporate climate-related risks in their rating process; as such, to the extent external credit ratings may be used for risk weights, climate-related risks could be already affecting banks' capital requirements. However, approaches to considering climate risks in ratings methodologies vary, and is not explicitly mandatory in credit ratings regulatory frameworks. Furthermore, there are divergences in the degree of use of such ratings across jurisdictions. Given that credit rating agencies themselves are also in the evolving process of climate-related risk incorporation, better disclosure which is expected to happen through TCFD, ISSB, and others will enable banks using SA to incorporate climate-related credit risks more precisely. However, it is still based on the fundamental principle of capturing one-year unexpected losses and is not designed to capture unexpected losses beyond that horizon. Depending on the availability of the necessary data, a supervisory review of the schedule of SA risk weights would be required to assess whether they adequately capture aggregate climate risk characteristics of different asset types but, as discussed above, there is not currently compelling evidence of significant risk differentials based on climate-related characteristics although there are several technical challenges associated with identifying this.

**Internal Rating Based approach (IRB) for credit risks:** IRB is a more complex approach than SA, involving calculation of RWA on the basis of PD, LGD, and EAD. Climate-related risks can be incorporated into these parameters to some extent. Banks can adjust internal ratings, which in turn affect these parameters, based on the climate-related risks for exposures. In addition, banks can reevaluate collaterals' value based on their physical and transition risks, affecting LGD. Some banks are aiming to eventually arrive at "climate-adjusted" PD and LGD estimates for credit risks models and for a form of "ESG screening" of clients.<sup>54</sup> More and better quality data, as well as advancements in modelling techniques, will lead to refinements in the ability of IRB estimates to reflect climate risk factors. However, to the extent that the parameters are calculated from historical data, this casts doubt on how well the calculation can capture climate-related risks. In addition, the ECB pointed out that the correlation between those parameters might be worth exploring.<sup>55</sup>

## **Pillar 1 Large Exposures Requirements**

There are restrictions in the current BCBS framework for the size of a bank's exposure to a single counterparty, or group of connected counterparties, as a proportion of capital. These requirements are more stringent for G-SIBs. Recent statements from supervisors indicate that the Large Exposures requirement may implicitly capture climate-related risks by providing a threshold which limits exposures to counterparties which may be exposed to physical or

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<sup>53</sup> Not all jurisdictions permit reference to external credit ratings for regulatory capital purposes, for example this is not permitted in the United States under the Dodd-Frank Act.

<sup>54</sup> IIF 2021

<sup>55</sup> ECB 2021, "[The Challenge of Capturing Climate Risks in the Banking Regulatory Framework: Is There a Need for a Macroprudential Response?](#)" (October).

transition risks. For instance, the EBA suggests that “to the extent that when the size of a green or environmentally harmful exposure towards a particular client or group of connected clients reaches the existing threshold (large exposure limit), it limits the maximum loss coming from such an exposure.” In addition, the ECB has stated that some institutions are integrating exclusion or phasing-out criteria to stop or limit financing of certain economic activities with elevated climate and environmental risks (C&E risks) in their lending policies<sup>56</sup>.

**Combined Buffers:** No jurisdiction has yet introduced a Pillar 1 buffer that has been specifically designed to capture climate-related risks. Neither the capital conservation buffer, the countercyclical buffer, nor the systemic importance buffers for global or domestically significant banks have been designed to explicitly capture long-date, uncertain risks such as climate change. However, as the sizes of those buffers are calculated as percentages of risk-weighted assets, any changes to the value size of risk-weighted assets inherently affect the size of the buffers. In this sense, Pillar 1 buffers may already capture the climate-related risks, to the extent that calculations of risk-weighted assets are appropriately reflecting climate risks, as previously discussed.

### **Potential amendments of the Pillar 1 Framework**

The current Pillar 1 credit risk framework captures risks up to one year based on historical data. Some regulators are exploring the way to capture climate-related risks, which are expected to materialize in the long-term in a different way than observed in most historical data, within the framework. In other words, they are considering if they could extend the time horizon and/or incorporate forward-looking elements by revising the overarching designs. The PRA’s adaptation report specifically mentioned, “regulators could amend some of the overarching design-features of Pillar 1, such as 1 year time horizon or reliance on historical data,” although it admitted “any changes to Pillar 1 would be time-consuming to deliver, so the costs of this approach would need to be assessed versus other available approaches.” The EBA discussion paper has also raised questions regarding whether or not it would be appropriate from a prudential perspective to take steps to integrate environmental risks into existing Pillar 1 instruments, or to have a dedicated adjustment factor for several exposure classes.

### **3.3.2 Pillar 2**

**Pillar 2 minimum and buffer requirements:** Where supervisors consider there to be risks that are not sufficiently capitalized within Pillar 1, or as the result of the supervisory review process (e.g., if there is an assessment that the bank is not appropriately managing material risks), supervisors can require additional firm-specific capital requirements or apply other discretionary measures such as restricting capital distributions. In many jurisdictions, Pillar 2 requirements are bifurcated into binding minimum requirements (sometimes referred to as “Pillar 2A” or “Pillar 2R”) and non-binding buffer requirements (sometimes referred to as “Pillar 2B” or “Pillar 2G”), where the latter are generally not publicly disclosed. In the cases where this distinction is made,

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<sup>56</sup> ECB 2021, “[The State of Climate And Environmental Risk Management in the Banking Sector](#)” (November).

the choice of a Pillar 2 mechanism can be important in terms of implications for capital distribution thresholds and transparency. No jurisdiction has yet introduced a Pillar 2 buffer to reflect climate-related risks specifically; however, debate in this area is evolving. The PRA has suggested that banks can propose add-ons under Pillar 2A where their material risks are not captured by Pillar 1, and that the PRA can use capital add-ons or scalars in response to significant weaknesses in firms' climate risk management and governance.<sup>57</sup> The ECB also suggests that shortcomings in the climate-related risk management may affect capital requirements through the SREP scores, and that capital add-ons could be warranted.<sup>58</sup>

Going forward, supervisors considering the potential introduction of a Pillar 2 buffer to reflect climate-related risks would need to be mindful as to whether RWA has adjusted to reflect climate-related factors as discussed above, and more broadly how climate-related risks are reflected in the P1 framework

### **Pillar 2 interventions on the basis of SCRM exercises and prudential stress testing**

**While an increasing number of authorities have undertaken or announced intentions to initiate supervisory SCRM exercises, including in the context of mainstreaming prudential stress testing, no prudential authority has to date indicated that the results of exercises would be used to inform quantitative prudential interventions,** and instead regard them as opportunities for capacity building for both banks and supervisors. For example, the ECB has described its 2022 climate risk stress test as a learning experience and stated that the result will feed into the SREP from a qualitative point of view but will not directly impact capital through Pillar 2 guidance. Jerome Powell, FRB Chair, commented at a U.S. House of Representatives Financial Services Committee hearing that *"... the idea is not to use [climate stress scenarios] in the way we use traditional stress tests to set capital levels in effect. ... The construct is going to be what I said, which is to help us understand better, not to set capital [requirements] or otherwise put further regulatory requirements on banks."*

Key methodological issues identified by supervisors include the degree to which the time horizon of current stress testing (usually three to five years) is relevant for assessing the financial impacts of climate change which may be material to banks, and the ways in which climate-related risks could be potentially assessed holistically alongside other risks within stress testing frameworks. The IIF believes regulators should continue to take this careful and evolutionary approach, which would start from qualitative incorporation, based on the data availability and methodology maturity. Future advancement from qualitative incorporation to quantitative incorporation would require especially cautious consideration to avoid misleading and unintended consequences.

While the general application of Pillar 2 in the context of the adequacy of risk management capabilities and governance of an individual bank or insurer remains valid, significant

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<sup>57</sup> PRA 2021 (October).

<sup>58</sup> Speech by Frank Elderson (ECB) 2022, "[Towards an immersive supervisory approach to the management of climate-related and environmental risks in the banking sector](#)" (February).

methodological challenges exist in order to specifically apply this tool in the context of climate-related risks. Going forward, it will be important to consider how the results of prudential stress tests – which may begin to reflect different types of climate-related risks – feed into firm-specific capital requirements or add-ons in many major jurisdictions. Further work is required to understand to what extent different types of climate-related risks may be correlated with macro-financial scenarios used in mainstream stress testing (e.g., in a downturn, lower output may presumably lower greenhouse gas (GHG) emissions, while changing interest rates may affect financing for low-carbon investment).

### 3.3.3 Insurance

Climate risk drivers are incorporated into jurisdictional and into the IAIS Insurance Capital Standard (ICS) through risk factors for catastrophe, reinsurance, credit, and operational risk. The IAIS has recently examined climate-related risks in the context of the Insurance Core Principles (ICPs). They have found that climate risks are broadly captured in the ICPs and that gaps are relatively minimal. The ICPs require the consideration of climate risks in insurers' governance, ERM, and disclosures. As data improves, internal models (IM) for climate risk (for insurers permitted to use IMs) can be used to reflect climate-related risks, which are highly idiosyncratic in the insurance sector. In the EU and UK, consideration is being given to climate-related adjustments to the Solvency Capital Requirement (SCR) and to improvements to IM specifications where IM usage is permitted.

## 3.4 What are the potential costs, benefits, and challenges associated with using different capital tools to address climate-related risks?

To evaluate whether and how climate-related risks could be addressed through the use of different P1/P2/ICS tools, the IIF has engaged with members to examine the comparative costs and benefits of different policy options, in terms of their degree of methodological robustness, underlying rationale, degree of relevance to a given prudential objective, and potential unintended consequences.

**The IIF and its members support current supervisory consensus that adjustments to the Pillar 1 framework (and related measures for insurers) should not currently be pursued, considering that:**

- **The existing prudential frameworks for banks and insurers may already enable climate risks to be appropriately accounted for, and prudential authorities are still in early stages of exploring how the framework could practically be used to address climate-related risks without modifications.** Considering that expectations pertaining to climate risk management are in place, and financial industry practices are evolving rapidly, further analysis as time elapses is necessary to evaluate the degree to which such may not be fully captured under Pillar 1. Furthermore, certain jurisdictions are now

strengthening consideration of climate-related risks in elements of supervisory frameworks which may be relevant from a Pillar 2 capital perspective, such as ICAAP (UK) and SREP (ECB).

- **Gaps in the evidence base, a lack of necessary data, and immature methodologies, would make modifications of the Pillar 1 framework on a climate risk basis extremely challenging to deliver in a robust, risk-based and data-driven manner, and could lead to potential unintended consequences.** IIF members consider that amendments or modifications to key design pillars to account for climate risks on a subjective basis are likely to be inefficient and potentially counter-productive for financial stability, market efficiency, and potentially broader decarbonization goals.

**The IIF and its members have a number of concerns regarding the potential use of Pillar 2 measures, including the significant degree of fragmentation that would result from individual jurisdictions developing their own approaches to Pillar 2 application with the resulting negative implications for a level playing field.** More significantly, the current methodological and data hurdles that exist in regard to climate risk measurement affect the ability of supervisors to make adequate judgements on the impact of solvency of such risks (beyond the general application of Pillar 2 as currently conceived). This is without prejudice to potential use of such tools in the future, under certain circumstances and on the basis of necessary preconditions in terms of data, methodology, and clarity regarding scope of application.

To evaluate whether and how climate-related risks could be addressed through the use of different P1/P2/ICS tools, the IIF has engaged with members to examine the comparative costs and benefits of different policy options, in terms of their degree of methodological robustness, underlying rationale, degree of relevance to a given prudential objective, and potential unintended consequences.

#### **3.4.1 Amendments to Overarching Design of Pillar 1 Measures: Should not be pursued at the current time**

**Looking beyond the question of whether or not the Pillar 1 framework enables climate risk to be appropriately accounted for, it is evident that there would be significant methodological challenges associated with amending the overarching design of Pillar 1 measures to specifically account for climate-related risks. The IIF and its members consider that such amendments should not be pursued at the current time,** including for aforementioned reasons such as the challenges of considering the impacts of climate-related risk drivers over a long time horizon, and the backward-looking nature of leading calibration methodologies. Of particular complexity would be the delineation of which elements of a changing credit or insurance risk profile of a given counterparty could be reasonably attributed to climate change. Furthermore, there would be ongoing challenges associated with flexibility of the Pillar 1 framework to reflect new data pertaining to levels of climate risk within the financial

system and broader macroeconomy. The challenges associated with introducing the use of forward-looking data in a Pillar 1 context could expose the broader capital framework to issues of credibility, in the instance that select risks were accounted for in differential manners. These technical challenges would complicate development of appropriate adjustments to the existing international capital standards, which are already difficult to approach due to different perspectives on the desirability and feasibility of various policy options and cross-jurisdictional differences in broader policy conditions. Uncoordinated implementation of modifications to a global standard could raise an array of issues in terms of fragmentation in the prudential framework (see section 4). As such, as far as the relationship between a more sustainable exposure and improved risk behavior is not robustly confirmed, no adjustments to the overarching design of the Pillar 1 framework should be undertaken.

### 3.4.2 Adjustment to Risk Weights (e.g., Green Supporting Factor, Brown Penalizing Factor): Should not be pursued at the current time

There has been some suggestions to adjust capital requirements at the exposure level to account for climate-related factors, either via a direct scalar on risk weights or via inclusion of an additional factor/variable in the calculation of risk weights. For example, a Green Supporting Factor (GSF) would give specific credit in risk weights to exposures associated with lower climate-related risks, or otherwise meeting policymakers' criteria as "green" exposures which should be favored in the capital framework. On the other hand, a Brown Penalizing Factor (BPF), would apply a specific penalty in risk weights to exposures associated with higher climate-related risks, or otherwise meeting (policymakers') criteria as "brown" exposures which should be disfavored in the capital framework.

**The IIF agrees with the supervisors' view that the adjustment of risk weights in the form of supporting or penalizing factors is inadequate.** First, as mentioned before, the IIF does not support the idea of "active transition" using prudential capital adjustments, which would distort risk-based capital requirements. Instead, governments should play the roles to support or penalize certain activities by using more direct tools, such as carbon taxes. Second, studies to date, including the NGFS 2022 (May) paper and the EBA 2022 (May) paper, have shown that there is little evidence of risk differentials across exposures' greenness. There is therefore no basis to introduce those factors to enhance financial resilience. Sam Woods, Deputy Governor for Prudential Regulation at the Bank of England, has noted the challenges with diverging from an empirically-founded risk-based approach to capital requirements: *"we might end up under-capitalizing banks and insurers for the risks they face, raising questions about their overall resilience. Or we could end up over-capitalizing them inefficiently, reducing their ability to support the economy through the transition."*<sup>59</sup>

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<sup>59</sup> BoE speech by Sam Woods 2022, "[Climate capital](#)" (May).

### 3.4.3 Climate System-wide buffer: Should not be pursued at the current time

The IIF and its members do not support the use of macroprudential buffers, such as so-called Climate System-wide Buffers, to address climate-related risks. This policy proposal would apply a constant climate capital buffer to financial institutions evenly on top of the current buffer stack. Under such an approach, if the regulator believes that the industries as a whole need to have, for example, 3pp more capital to absorb climate-related risks, all institutions would receive an additional 3pp capital buffer regardless of their actual risks, strategies, mitigation actions etc. As climate-related risks change over time, the regulator could adjust the buffer percentage. Since an approach based around a system-wide buffer would be comparatively simple to implement, some stakeholders may support this type of policy within a strategy of taking a “precautionary approach” to climate-related risks. However, given that the results of supervisory and industry scenario analyses and stress tests to date have shown that financial institutions would be able to absorb climate-related risks with current capital levels, such action would potentially imply the setting of buffers on a non-risk-based manner. Regulatory capital is fungible, and new buffers should not be introduced, without a firm evidence base, to deal with specific category of risks.

### 3.4.4 Climate Systemic Buffer: Unlikely to be usable in the short to medium-term

Compared to the system-wide buffer, this buffer would be applied to financial institutions based on their climate-related risk level. This proposal has some variations. The ECB indicated that the existing systemic risk buffer can be calibrated to reflect climate-related risks by applying higher rates to certain sets or subsets of exposures, for instance those subject to physical and transition risks due to climate change. Additionally, there is an argument to introduce new bespoke buffers determined by a measure of institutions’ “climate-related risk scores”, like the G-SIB scoring methodology. A risk-based objective of such a buffer could be to incentivize financial institutions to reduce their climate-related risk exposure in order to reduce their risk score and thereby capital requirement.

**However, several theoretical and empirical issues would need to be overcome for the implementation of such a buffer to be considered fully robust, which makes this policy option unattractive in the short to medium term.** First and foremost, it is prerequisite to find evidence of necessity of introducing the climate element in the current framework. As discussed before, regulators need to keep in mind that precautionary capital requirements without evidence would unproductively hamper the provision of credit including sustainable finance. Introducing a climate systemic buffer for its incentive effects alone driven by a broader desire to encourage certain activities over others would align with an ‘active transition’ policymaker objective, which we do not recommend for reasons discussed above. Second, to the extent that institutions reflect climate-related risks in their RWA through existing mechanisms such as external ratings, internal ratings, collateral values, etc., the absolute value of the existing buffers will

automatically reflect climate-related risks. Clear evidence of why additional “percentage” buffer requirements are required needs to be explored. Third, a clear understanding of the transmission channel between climate systemic buffers and real economy effects is essential and would need to influence the design of the climate risk score. For example, regulators would need to design the buffer to differentiate transition finance from “purely brown” finance in order to avoid unintentionally inhibiting the transition. If they cannot design the buffer while reflecting systemic elements and keeping its simplicity and objectivity, other policy options as following are worth exploring.

### **3.4.5 Concentration Limits (or Large Exposure Limits): Could potentially be usable in the medium to long-term**

The BCBS framework currently includes limits on a bank’s exposures to single counterparties or groups of connected counterparties, expressed as a percentage of capital resources; these limits could be tightened to reflect exposures to counterparties which are particularly exposed to climate-related risks. Alternatively, a new type of exposure-based (rather than counterparty-based) concentration limit could be introduced to limit a bank’s exposure to certain sectors or activities. Such limits could effectively prevent financial institutions from continuing to finance carbon-intensive industries, enjoying survivor profits, and accumulating climate-related risks, which in turn could lead to idiosyncratic financial instability. The limits might also help mobilize capital from carbon-intensive industries to sustainable finance.

**However, there are multiple implementation challenges with concentration limits to address climate-related risks.** First, while the concentration limits require a risk-based classification of exposures, there is currently no robust taxonomy in place for this objective. Second, there could be a situation where a specific sector/counterparty may cover some activities that are contributing to climate objectives, but at the same time its other activities may be harmful to the climate, which would make application of the limits less straightforward. Therefore, the extra reporting imposed by the new concentration limits may not help, as expected, to understand the size of exposures of banks towards environmentally harmful activities or counterparties. Third, the limits could hamper institutions efforts to transition the carbon-intensive activities precisely in sectors that most need it. In addition, certain geographic limits aimed at addressing physical risks by reducing capital allocation to high-risk areas would penalize vulnerable people and businesses who are most exposed to the risks, regardless of their responsibility or capacity to implement measures to reduce exposures. More generally, setting high limits would lead to market instability by encouraging financial institutions altogether to withdraw from sectors in scope abruptly, and capital from other sources could be sought by vulnerable firms or sectors, including from sources not regulated or supervised.

**Therefore, the IIF recognizes that while such limits could potentially be considered warranted, they would need to be carefully designed to appropriately classify exposures and not to disincentivize flows of transition finance, and financing for vulnerable**

**counterparties which may be exposed to higher levels of climate risk.** Additionally, even if regulators design the limits well, they should introduce them as Pillar 2 soft limits at a moderate level rather than as a hard limit to allow greater tailoring of the requirement to firm-specific circumstances and not to surprise the market. A phased approach would allow financial institutions to engage with clients and reallocate their finance gradually, to avoid significant negative unintended consequences. Considering the many challenges above, we would not support a Pillar 1 hard limit (i.e., large exposure limit) to address climate-related risks.

### 3.4.6 Enhanced Supervision and/or capital add-ons based on qualitative supervisory judgement: Dialogue could be started in the short-term, capital add-ons should not be implemented in the short-term

Where supervisors consider there to be risks that are not sufficiently capitalized within Pillar 1 or as the result of the supervisory review process (e.g., if there is an assessment that the bank is not appropriately managing material risks), supervisors could require additional, firm-specific capital requirements or apply other discretionary measures such as restricting capital distributions. In many jurisdictions, Pillar 2 requirements are bifurcated into binding minimum requirements (sometimes referred to as “Pillar 2A” or “Pillar 2R”) and non-binding buffer requirements (sometimes referred to as “Pillar 2B” or “Pillar 2G”), where the latter are generally not publicly disclosed; in the cases where this distinction is made, the choice of a Pillar 2 mechanism can be important in terms of implications for capital distribution thresholds, transparency, etc.

**Policy interventions under Pillar 2 could be most readily available to supervisors and encompass a large degree of flexibility – indeed, some jurisdictions consider this option already usable; however, there are issues that should be considered before such an approach is implemented.** A Pillar 2 approach could help to incentivize financial institutions’ efforts to enhance risk management practices and be flexible to reflect new developments over time. In the near term, however, regulators should focus on dialogue with institutions through supervisory engagement, instead of looking to implement capital add-ons. Given that data and methodologies are currently insufficient, steering the industries towards one direction through capital add-ons could have unintended consequences. As data and methodologies are established, regulators may be better positioned to assess the need for additional measures. **A critical precondition for consistent implementation would be the development of a set of principles and guidance on circumstances in which capital add-ons could be triggered.**<sup>60</sup> The following are examples of how Pillar 2 capital add-ons could potentially be implemented:

- **Option A: Further integration of climate risks into risk management frameworks:**  
Several prudential authorities have developed principles for the measurement and

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<sup>60</sup> The FSI advocates for common guidance for regulators that could contribute to a consistent implementation of requirements across entities and jurisdictions, including the way to integrate climate-related risks into supervisory review process and the situations when additional loss-absorbing capacity would be required. See: “[FSI Briefs No.16](#)” (February 2022).

management or climate-related risks. A related policy option could be to develop more detailed or prescriptive risk management guidance or increase the prudential implications if a bank fails to adequately meet regulatory expectations within a certain time period.

- **Option B: Qualitative assessment linked to climate scenario analyses and stress tests:** Supervisors may want to compare and assess the technical participation, general findings and responses of financial institutions to SCRMs analyses and potentially impose capital add-ons to institutions which do not meet their expectations in terms of execution or response to identified risks. Even when quantitative use of those tests is premature due to the lack of data etc., that does not necessarily mean qualitative use is also premature.
- **Option C: Supervisory engagement on financial institution transition plans:** Potentially a form of more forward-looking engagement on bank risk management and strategy. Likely linked to a mandatory requirement to produce (and/or publish) a transition plan, supervisors could engage with financial institutions through the supervisory review process under Pillar 2 on whether the plans represent an appropriate strategy from a microprudential and/or macroprudential perspective, and whether institutions' progress against the plans is appropriate. Different supervisory responses could be envisaged under Pillar 2 depending on the outcomes of the dialogue; for instance, supervisors may over time have significant regard for these client transition conversations. The result of the client engagement would allow financial institutions to classify their exposure in different risk buckets based on the counterparties' transition plans assessment and the bank's conclusion on its client's ability/willingness to transition.

### **3.4.7 Interventions on the basis of results of SCRMs exercises (e.g., climate scenario analysis and stress testing): *Could potentially be usable in the medium to long-term, provided that analytical basis improves***

In addition to qualitative use of the results of climate-related scenario analyses and stress tests could be used qualitatively in the ICAAP, ORSA, and the SREP, quantitative application of the results could also potentially be explored. For example, there is a question as to whether climate risk factors or scenarios could be incorporated into the current prudential stress tests that are undertaken in many jurisdictions. Traditional stress tests typically capture risks within three to five years, while climate stress tests and scenario analyses to date are generally trying to capture risks at least 30 years.

**The high degree of uncertainty, long time horizon, and forward-looking nature of climate-related risks suggest that stress tests and scenario analyses could be the right tools to explore and account for the risks which cannot be captured by the Pillar 1 framework; nevertheless, it is currently premature to use quantitative results to inform prudential interventions.** First, despite significant progress, there is still significant inconsistency in the

scenarios and design features of different exercises, which may render consistent application of results difficult. Although many financial institutions and supervisors are building their scenarios on the NGFS scenarios, those scenarios are still under development and if integrated stress testing is desirable then new avenues of research into joint climate and macrofinancial stress testing would be required<sup>61</sup>. In addition, comparison of supervisory climate scenario analyses shows that there are important differences in the choice of metrics used to quantify risks, segment analysis, and present results, which complicate efforts to compare the results of exercises. Second, in the absence of common approaches for assessing impacts on capital-relevant variables at the firm or system level, or an established set of approaches or guidance on how supervisors could apply other variables (e.g., exposures to carbon-related assets) in the context of prudential tools, it would be difficult for supervisors to take action without raising the risk of fragmentation. Third, if the appropriate time horizon is long (e.g., longer than five years), the dynamic balance sheet modelling assumption needs to be refined and applied because it is unrealistic to assume that financial institutions' balance sheets remain fixed regardless of institutions' and clients' transition decisions.

**Supervisors have identified several areas for further work on SCRM analysis, which should be considered near-term priorities.** For example, the BoE has called attention to the need to develop thinking on the use of forward-looking information in the existing prudential regime and the need to tackle issues stemming from model uncertainty, calibration, and validation.<sup>62</sup> Several authorities have clearly stated that pilot SCRM exercises are primarily intended as learning experiences for authorities and firms, with the primary objectives raising awareness building capacity. For instance, EIOPA has acknowledged that at this stage any climate change stress test should be considered more as an exploratory exercise and part of an important learning process to better understand the potential implications of climate change risks, rather than a conclusive quantitative assessment of the impact.<sup>63</sup> Supervisors such as the ECB are beginning to work through the numerous technical challenges identified through exercises completed to date, including amplification effects in an interconnected financial system of banks, investment funds, and insurers.<sup>64</sup> Given that both industry stakeholders and supervisors recognize the potentially severe consequences of underestimating future climate risks, regulators should continue to focus on developing approaches to respond to the significant technical and methodological challenges associated with assessing climate risks - particularly risk transmission channels, feedback loops, and cross-sectoral and cross-jurisdictional issues - and present milestones of how they intend to overcome those challenges. Meanwhile financial institutions should continue to expand their capabilities in climate stress tests and scenario analyses and consider the results in their strategic and capital planning including the ICAAP.

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<sup>61</sup> Including work on the scenario narrative and analysis of the calibration of shocks to key scenario variables.

<sup>62</sup> BoE 2022, BankUnderground "[Climate and capital: some outstanding issues](#)" (June).

<sup>63</sup> EIOPA 2022, "[Methodological principles of insurance stress testing - climate change component](#)" (January).

<sup>64</sup> ECB 2022, "[System-wide amplification of climate risk](#)" (June).

Figure 7: Assessment of Policy Options

	Policy option	Source of risk intended to address	Risk Sensitivity	Time horizon consideration	How banks are already incorporating	Potential readiness in a climate risk context	Future outlook
Pillar 1	Amendments to Overarching Design of Pillar 1 Measures	Individual exposure risks which are not currently captured, due to fundamental design aspects of the framework.	<b>High:</b> Intended to capture climate risks directly.	<b>Short:</b> Currently. Attempt to extend current 1-year time horizon to longer (e.g., 10 years).	[IRB] Adjust internal ratings based on exposures' climate risks. Reevaluate collateral values. [SA] External ratings already reflect climate risks to some extent.		<b>Should not be used.</b> Pillar 1 may already enable climate risks to be accounted for, and there would be significant methodological challenges in core design changes.
	Adjustment to Risk Weights	Risks stemming from "brown" exposures.	<b>High:</b> Could be overly high if GSF/BPF are strong.	<b>Short:</b> 1 year for credit risk framework.	Same as above.		<b>Should not be used.</b> Active transition is not the goal of prudential capital. Could potentially undermine credibility of the capital framework.
Pillar 2	Pillar 2 Concentration Limits (Pillar 1 Large Exposure Limits)	Massive losses by an individual carbon-intensive firm failure or industry-wide failure.	<b>High:</b> Set direct limits on exposures with climate risks	<b>Short-Medium:</b> 1 year with flexibility.	Current framework implicitly captures the risks. Some banks have exclusion or phasing-out criteria to limit carbon-intensive finance.		<b>Could be used in the Medium to Long Term.</b> Careful design and phased approach are critical not to hamper transition finance.
	Enhanced Supervision.	Banks' poor climate risk management or inadequate strategies.	<b>Medium:</b> Incentivize better management, practice, and portfolio	<b>Medium:</b> Within the supervisory review horizon (e.g., 3-5 years at present).	Banks are voluntarily implementing climate risk management, incl. scenario analysis, transition plans.		<b>Supervisory dialogue could be started in the Short Term</b> with FI to incentivize better risk management.
	Capital add-ons based on qualitative supervisory judgement	Banks' poor climate risk management or inadequate strategies	<b>Medium:</b> Incentivize better management, practice, and portfolio	<b>Medium:</b> Within the supervisory review horizon (e.g., 3-5	Banks are voluntarily implementing climate risk management, incl. scenario		<b>Capital add-ons should be avoided in the Short Term.</b> Several issues need to be solved before

				years at present).	analysis, transition plans.		implementing capital add-ons.
	<b>Capital Add-ons based on scenario analysis/stress test</b>	Forward-looking and medium/long term losses which cannot be captured by 1-year time horizon and backward-looking data.	<b>High:</b> Banks need to hold capital conservatively and adjust portfolio to mitigate risks.	<b>Medium:</b> Currently, stress test is 3-5 years. Scenario analysis could be 30+ years.	Banks are piloting those analyses voluntarily or with supervisors.		<b>Currently premature, but could be used in the Medium to Long Term</b> when conditions are met, such as data, common scenario, and proper methodologies (e.g., dynamic balance sheet approaches).
<b>Combi-ned Buffer</b>	<b>Climate Systemic Buffer</b>	System-wide vulnerability against climate risks.	<b>Medium:</b> Incentivize banks to reduce their climate risks.	<b>Short:</b> Linked to time horizon of RWA.	Existing buffers already capture the climate risks, because the sizes of buffers are calculated from RWA.		<b>Unlikely to be usable in the Short to Medium Term.</b> No basis to add climate elements on top of the current buffers.
	<b>System-wide Buffer</b>	System-wide vulnerability against climate risks.	<b>Low:</b> Buffers are evenly required regardless of climate risk level.	<b>Short:</b> Linked to time horizon of RWA.	Existing buffers already capture the climate risks, because the sizes of buffers are calculated from RWA..		<b>Should not be used.</b> No basis to add climate elements on top of the current buffers. Significantly limit banks' finance capacity regardless of their climate efforts

#### 4. Key Considerations: Rationale, Unintended Consequences, Comparative Effectiveness & Dynamic Impacts

There are several important challenges associated with using the regulatory capital framework to account for climate-related risks which warrant consideration in advance of action being taken, particularly where such actions could potentially result in unintended consequences.

##### 4.1 Rationale: Examining key assumptions

The rationale for taking policy action to address climate risks may vary significantly depending on a prudential authority's objectives, which may include strengthening the safety and soundness of institutions (resilience), reducing the potential for threats to macro-financial stability (system-wide alignment), or potentially seeking to incentivize the financial system to

allocate capital to facilitate and catalyze the decarbonization of the economy – even if the latter measures could be undertaken without the explicit aim of reducing financial system risks. As such, different interventions through the prudential framework could potentially have countervailing effects and could potentially lead to negative outcomes on broader policy objectives.

In the absence of robust evidence, data, and methodologies, some actors (including some academics, NGOs and civil society groups) have called for regulators to take a precautionary approach to addressing climate-related risks through the use of the regulatory capital framework, principally by changing regulatory risk weights. While the basis for such calls for intervention vary (e.g., reducing financial capacity of the high carbon economy, reducing financial stability risks, etc.), they reflect a similar underlying rationale regarding the role of the financial system, and that of financial regulation in particular, as a tool through which to influence the broader macroeconomic transition. This rationale can essentially be summarized as follows:

- i. **Changes to the capital framework including changes to risk weights for exposures (e.g., credit, investment, underwriting) to specific sectors designed to (dis)incentivize capital allocation by the financial system will,**
- ii. **Facilitate the reallocation of capital away from transition-exposed sectors that are negatively impacting the climate (e.g., via GHG emissions and other sources of pollution), which may,**
  - a. **Enable higher levels of capital allocation towards sectors that are aligned with the future Net Zero economy in terms of emissions, which will in turn,**
- iii. **Facilitate decarbonization of key sectors, and the economy at large.**

This rationale is based on a number of assumptions regarding financial market behavior, which warrant consideration. These are discussed below, taking the energy sector as an example.

**The first assumption pertains to inconsistent pricing of externalities.** Specifically, if financial markets are not appropriately pricing in climate risks to the energy sector, then interventions through financial policy could be required to correct for the absence of economy-wide policy instruments aimed at integrating externalities in market pricing (such as appropriate carbon prices). However, the high levels of uncertainty regarding the timing, size, and non-linear pathways of such risks materializing leads to complexity in evaluating exactly how inaccurate current pricing actually is, and by extension, what types of risks could emerge for financial institutions as they seek to transition investment and underwriting portfolios to be more in alignment with Net Zero pathways.<sup>65</sup> Considering the high level of uncertainty regarding the

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<sup>65</sup> Some regulators seem to even consider the potential risks of overcorrection of the externality, too. For example, [Sam Woods \(BOE\)](#) suggests the potential risks of over-capitalization for brown assets. [Claudio Borio et.al \(BIS\)](#) highlighted that compared to overvalued brown assets, which have attracted people's attention, overvalued green assets have attracted less attention.

speed and scope of measures which would rapidly shift market prices (e.g., carbon pricing, etc.), it is currently hard to evaluate whether or not the introduction of higher capital charges would be enough on their own to in fact tip the scales away from financing or insuring oil and gas, especially considering the sensitivity of profitability in the banking and insurance sectors to an array of non-climate factors, such as geopolitical risks.

**The second assumption pertains to market behavior**, specifically, that the introduction of capital charges would in fact lead to a reduction of capital allocation by regulated institutions to firms which may be exposed to high levels of transition risk – and that in turn would lead to a reduction in the available capital (or an increase in the cost of capital) for investments in or insurance capacity for new upstream fossil fuel infrastructure (such as opening of reserves, as well as investments in midstream and downstream infrastructure, which may otherwise hamper the capacity of the economy to transition rapidly). A key challenge associated with this rationale is the contention that a reduction in the availability of capital from regulated financial institutions would not be able to be fully substituted by capital from non-regulated entities in the non-bank financial sector, which may not be subject to similar prudential requirements; recent evidence suggests that significant influxes of capital into the energy sector are coming from hedge funds and other non-bank financial institution sources of capital.<sup>66</sup> As the mandates of prudential regulators in different jurisdictions vary, it may be difficult for global standard setters and jurisdictional authorities to develop coordinated interventions that address the banking, insurance, and non-bank financial institution sectors simultaneously in order to constrain the level shifting of financed emissions (and transition risks) across sectors.

The **third, and perhaps most fundamental**, assumption is that a reduction of capital available from the financial system for the oil and gas sector, and resultant constraints on new fossil fuel infrastructure investments, would materially reduce emissions from the sector across jurisdictions. Current oil and gas reserves under exploitation are enough to release significant volumes of GHGs if fully exploited, with no additional investments in capacity. Reductions in emissions from the public oil and gas sector, or other sectors highly reliant on capital allocation by regulated financial institutions, may not necessarily lead to reductions in emissions globally – not least considering state-owned enterprises, including in the energy sector, are significant sources of emissions<sup>67</sup>.

**Due to the range of assumptions regarding financial institutions' behaviour, and regarding market dynamics, the rationale for the use of the capital framework to address climate-related risks in any manner not exclusively focused on reducing risks to the financial system merits careful examination.** Increasing the desired sphere of influence of a given policy measure

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<sup>66</sup> For example, according to [the ECB 2021 \(May\)](#), while the relative share of high-emitting firms (i.e., industrial, energy, and materials sectors) in non-banks' portfolios has remained broadly stable at around 30% over the last seven years, the absolute amount has doubled, from €0.8 trillion in 2013 to €1.6 trillion in 2019, broadly in line with the growth of non-bank assets. [BCBS 2020 \(April\)](#) also raised evidence that corporates exposed to transition risks are subject to higher participation of shadow banking in their lending syndicates.

<sup>67</sup> OECD (2022) "[Climate Change and Low-carbon transition policies in state-owned enterprises](#)" (June)

(e.g., from micro to macro to broader economy) broadens the array of assumptions regarding market behaviour, potentially making it difficult to assess the degree to which unintended consequences may arise.

## 4.2 Addressing the risk of unintended consequences

Addressing climate-related risks through prudential capital policies would be highly challenging given the uncertainty of the precise extent of climate change, its risks, and the complex mechanisms through which capital indirectly affects financial institutions' actions. It is, therefore, important to take a holistic view when assessing policy options utilizing dialogues with peer regulators and industries. Potential unintended consequences arising from the use of the capital framework can be grouped into three main categories, as described below.

### 4.2.1 Negative impacts on climate outcomes

It would be clearly counterproductive if prudential policies to enhance financial resilience against climate-related risks in turn had negative effects on efforts in the real economy to reduce greenhouse gas emissions. However, such a result could arise in several ways:

- **Divestment at the expense of supporting the transition:** Some policy options directly or indirectly penalize finance for brown sectors, such as the fossil fuel industries. Those policies would simply encourage divestment and make it difficult for banks and insurers to engage with their clients and investees to support their transitions. Since brown sectors have huge potential to reduce GHG emissions, enabling financial institutions to continue transition finance for them would be indispensable for the 1.5 degrees pathway. Any prudential policies should allow banks to secure necessary time to help their clients' and investees' transition. Alternatively, policies need to be carefully calibrated to differentiate transition finance from financing of high-carbon sectors and firms without appropriately robust transition strategies in place.
- **Limits on financing capacity:** By definition, the more capital financial institutions are required to hold, the less finance they can deploy. A stringent capital requirement might achieve its objective to enhance financial resilience, but it could potentially create constraints to efforts to mobilize financial institution capital towards investments in a net zero economy. Such constraints in the near term could prove significantly counterproductive for climate goals, considering the need to reduce emissions by roughly 50% in the next 8.5 years in order to meet a net zero aligned emissions trajectory. Furthermore, limitations on capital could have broader influence. For example, positive correlations have been observed between banks' capital headroom above capital requirements and their finance capacity during the COVID-19 pandemic.<sup>68</sup> If banks cannot maintain enough headroom due to the introduction of new capital requirements

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<sup>68</sup> Bank of England 2021, "[Emerging prudential lessons from the Covid stress - speech by Victoria Saporta](#)" (July).

for climate-related risks, they might not be able to mitigate shocks in financial crises by supplying finance in the real economy in an economically optimal manner. Similarly, higher levels of capital not supported by a risk-based analysis would inappropriately constrain insurers' investment and underwriting capacities.

- **Operational burdens:** Additionally, authorities should be mindful about operational burdens and human resources to comply with new policies. For example, complicated internal rating requirements to account for climate risks would take up front-line resources and reduce financial institutions' time to engage with clients. Climate scenario analysis requirements which are not harmonized internationally would take up second-line worker resources and reduce their time to manage climate-related risks in more substantial ways. Authorities should pursue simple, flexible, and internationally harmonized policies instead of complex, prescriptive, and fragmented policies so that financial institutions can focus on their essential roles to mitigate climate change.

#### 4.2.2 Negative impacts on financial stability

Interventions through the capital framework aimed at addressing risks to financial stability could potentially have countervailing effects on stability objectives.

- **Risk of undermining the credibility of the capital framework:** Certain measures, such as adjusting risk weights based on exposures' greenness or brownness without sufficient data that validates such risk differentiation could potentially undermine the credibility of the capital framework. Moreover, redesigning the core elements of the Basel III capital framework, such as its one-year time horizon and reliance on historical data for Pillar 1, would expose the whole framework to the risk of losing its long-lasting credibility. Double counting of risks could also be an undesirable likely effect.
- **Migration of climate risks and financed emissions to unregulated entities:** If banks are forced to exit from finance for brown industries, non-bank sectors, which do not face the same level of regulation, or banks in less-regulated countries, will fill the gap. Not only would this offset banks' efforts but would also cost them the opportunity to build engagement and fund transition financing. Furthermore, it will become increasingly difficult for regulators to monitor those brown activities, allowing the risks to accumulate in a less-controlled manner.
- **Market instability:** Drastic changes in capital requirements might lead to market instability by encouraging fire sales of high-carbon assets, while also potentially leading to green bubbles if financial institutions crowd into a limited number of green assets across market segments. Policies should be implemented carefully and in a phased manner in order to avoid market disruptions.

### 4.2.3 Negative impacts on the broader economy, and other sustainability priorities

- **Impacts on vulnerable communities:** Sudden new prudential policies could drive financial institutions to withdraw abruptly from carbon-intensive sectors, such as fossil fuels, before sustainable alternatives become affordable and/or support for workers in the transition to new jobs is provided. This could lead to widespread shocks in energy prices and more broadly across the economy, especially for emerging markets and low-income communities.<sup>69</sup> In addition, requiring additional capital for physical risks would hit people and businesses in climate-vulnerable areas regardless of whether they are responsible for the cause or not.
- **Potential risk of misalignment and calibration due to the lack of data:** Climate change is still a highly uncertain area due to lack of data. Given this uncertainty, attempts to steer the whole financial system toward one direction through financial regulation could potentially lead to negative impacts on the broader economy. Authorities should avoid implementing non-data-driven precautionary approaches, and even when there seems to be sufficient data, they should take a phased approach, assuming that there are unknown unintended consequences.
- **Potential impacts on other sustainability priorities:** The IIF and its members would also encourage the prudential supervisors to consider risks associated with biodiversity as nature-related risks belong in the wider climate-related risk sphere. The NGFS notes that “nature-related risks, including those associated with biodiversity loss, could have significant macroeconomic implications, and that failure to account for, mitigate, and adapt to these implications is a source of risks for individual financial institutions as well as for financial stability<sup>70</sup>” and therefore these financial risks should be considered by central banks and supervisors. The IPBES and IPCC point out that “measures narrowly focused on climate mitigation and adaptation can have direct and indirect negative impacts on nature and nature’s contributions to people”. They suggest that an integrated approach treating climate, biodiversity and human society as coupled systems is key to successful outcomes from policy interventions. It will be pertinent for banks and supervisors to take into account these views when carrying out scenario analysis and stress testing, since what may seem to be a baseline scenario from a “climate first” perspective may not turn out to be the optimum course of action from an integrated approach.

### 4.3 Comparative Effectiveness and Dynamic Impacts

A key test for the design and implementation of any policy instrument is an assessment of its comparative effectiveness, in terms of the benefits and costs of its implementation compared to

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<sup>69</sup> World Bank, United Nations, OECD, and other international institutions as well as national governments advocate for “just transition.” For example, see 2021 “[Just Transition Declaration](#)” (November).

<sup>70</sup> “[Scientific Outcome of the IPBES-IPCC co-sponsored workshop on biodiversity and climate change](#)” 2021.

other policies available – both within the financial sector and across the broader economy. Evaluating the effectiveness of policy instruments oriented towards large-scale challenges – such as climate change – is inherently complex, considering the myriad factors that need to be weighed in assessing to what degree a given instrument may have a direct, indirect, or coincidental impact on climate outcomes. A first consideration when evaluating the comparative effectiveness of the use of the regulatory capital framework is the extent capital could serve as a direct tool to address climate-related risks in the absence of strong real-economy climate policies, vs. an ancillary tool to address certain aspects of climate related risks to the financial system, regardless of what broader climate policies may or may not be in place.

**Any future potential actions to use the capital framework to address climate risks will be influenced by an array of exogenous factors beyond the remit of prudential supervisors, such as climate policies and other economic policies.** The dynamic impacts of these cross-sectoral policies are hard to predict; as such, it may be difficult to calibrate how well a given financial regulatory tool may align, or potentially be mis-aligned, with broader transition goals. Given their statutory independence, it is understandably challenging for prudential authorities to ensure that policies and interventions under their mandate reflect, and are aligned with, the dynamic policy responses of different government ministries, which themselves may not be entirely consistent. This leads to a non-negligible risk of potential mis-calibration of the regulatory response. In a “first-best” policy environment, the most effective response from prudential regulators may be to offer governments a stable and predictable financial sector regulatory framework, as a basis for economy-wide solutions to be developed around. Ambiguity regarding the real or perceived role of prudential regulators with respect to climate change could potentially send conflicting signals to governments about what is needed in terms of ambitious real economy policies to achieve Net Zero – and potentially misrepresent the role of the financial sector in that endeavor.

**Looking forward in 2022 and beyond, several key policy development processes may influence the feasibility and desirability of using the capital framework to address climate-related risks.** The outcomes of official-sector policy development and consultation processes, the agendas of voluntary leadership efforts (e.g., NGFS), and the work of market-based initiatives (e.g., GFANZ) will help to clarify broader dimensions of the climate risk and alignment agenda for financial institutions, regulators, and policymakers, which will in turn influence thinking regarding the costs and benefits of the use of the capital framework to address climate-related risks. It will be critical for prudential authorities to consider this evolving agenda in deliberations regarding the costs and benefits of the use of prudential tools, including capital, to respond to climate-related risks and broader transition priorities.

## 5. Conclusions and Recommendations

**The global financial sector recognizes the critical threats that climate risks, if unaddressed, will pose for the stability of the economy, livelihoods, social stability, global conflict,**

**ecosystem health, and biodiversity, which could ultimately threaten human survival** – as illustrated by the conclusions of the IPCC 6<sup>th</sup> Assessment Report.<sup>71</sup> These risks cannot be underestimated. The global financial industry is responding rapidly by enhancing risk management capacities, developing products, and showing leadership on the climate agenda – including through setting net zero commitments.<sup>72</sup>

**The paucity of data and methodological development should not lead to policy or supervisory paralysis. The global financial sector recognizes this risk, and the dilemma it proposes for policy development.** We believe, however, that the focus should remain on adequate risk management, creating a policy environment that does not produce disincentives to transition finance. While it is understandably tempting to move forward with “precautionary measures” such as capital buffers, this would inevitably require a departure from the core risk-based foundations of the prudential framework and introduce subjective choices pertaining to broader policy objectives. While achievement of these objectives is critical, challenging choices are presented when considering the implications of these actions by prudential regulators, and their potential unintended consequences.

**The IIF and its members consider it critically important that policy frameworks respond to the realities and challenges associated with time horizons, data, and methodologies** – while also ensuring that supervisory and regulatory mandates and objectives are adhered to. There is a need for ongoing dialogue, technical work, and scientific analysis, which the financial industry and regulators are well placed to pursue collaboratively.

**Climate goals are truly jointly shared goals.** The financial industry has a desire to demonstrate commitment and provide evidence of ongoing progress on risk measurement and management. Supervisors do have the tools to correct in case the industry is not living up to such commitments.

Looking forward, the IIF would propose the following recommendations for consideration:

**Prudential authorities should take a nimble approach to the supervision and regulation of climate-related risks, which can be adapted to dynamic market, policy, and environmental conditions.** Prudential authorities should take purposeful, yet careful steps in the coming years in order to respond to changing conditions which may affect the relevance and impact of different prudential responses to climate-related risks, including the use of the capital framework. At the same time, prudential authorities should take caution to ensure that speeches and public statements do not apply pressure for firms to independently adopt capital or other responses to climate risks that are not necessarily supported by the available evidence or are oriented towards to policy objectives rather than evidence-based analytical outcomes about risk and solvency.

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<sup>71</sup> IPCC 2022 “[Sixth Assessment Report](#)”

<sup>72</sup> See, for instance, commitments made by the members of the [Glasgow Financial Alliance for Net Zero](#).

**Prudential authorities should collaborate, through global standard setters such as the BCBS and the IAIS, to develop common approaches regarding the use of prudential tools to respond to dynamic conditions at the international level – and critically, avoid contributing to fragmentation by preempting the development of formal standards at the local level. In particular, all decisions regarding changes to current Pillar 1 approaches should be thoroughly debated and agreed by the BCBS.** There should be no changes to Pillar 1 that preempt Basel in such a crucial and sensitive area. Pillar 2 capital is already significantly less harmonized and so current research and exploration of climate risks, while entirely reasonable and supported by the industry, could compound the fragmentation we already see with Pillar 2 capital. Authorities should find new levels of global cooperation if we are to avoid this escalating fragmentation of bank capital undermining net-zero transition efforts globally.

**Considering the concerns raised in this paper regarding the use of Pillar 2 measures for climate risk purposes, the IIF and its members believe that clear criteria are needed from prudential authorities to explain in which cases they could use tools available under their discretion within the Pillar 2 framework.** Such tools could address risk management deficiencies, including for instance, the absence of climate risk strategy, the absence or inadequacy of risk identification, monitoring and assessment procedures, or a lack of progress towards defined supervisory objectives and expectations.

**Prudential authorities, working together through the BCBS and the IAIS (in coordination with the FSB) and with input from the NGFS, should identify a set of standardized metrics that should be used to quantify the impacts of different scenarios.** A standardized set of metrics to communicate SCRMs exercise results would enable supervisors and financial institutions to assess potential future climate risks in the context of other financial stability risks, and could also be helpful in the context of global financial system vulnerabilities assessments undertaken by the FSB. This is similar to the practice that has developed over time with macro-financial stress testing in which certain key results can be easily accessed in all major jurisdictions' exercises however those exercises might otherwise differ (e.g., showing the impact of a stress on aggregate CET1 or Tier 1 capital ratios). Importantly, it would not be appropriate to fit the same results metrics to climate scenario analysis exercises in which the objective is not to assess near-term capital adequacy. Therefore, a debate on which common results metrics are appropriate in the context of different types of climate scenario analysis is needed. In addition, public-private dialogue is necessary to ensure that SCRMs exercises generate meaningful results, which firms can then use to help inform future climate alignment strategies.

**Prudential capital decisions need to remain both data-driven and risk-based.** Addressing difficulties in obtaining data, availability of disclosures, and inherent assumptions underpinning quantitative modelling would help to inform risk-based capital assessment, particularly through understanding counterparty transition plans. Industry stakeholders would welcome opportunities to engage with prudential authorities and other regulators (e.g., securities regulators) to implement innovative structures and platforms to enable greater consistency and completeness of data, including the provision of open-source data repositories.