

# Prudential transition plans: the great enabler for effective supervision and regulation of climate-related financial risks?

September 2023

## Summary

Prudential transition plans can be used in financial supervision and macroprudential monitoring to overcome some of the challenges inherent to assessing the climate-related financial risks that stem from the transition to a low-carbon economy. These challenges include the poor availability and consistency of data, modelling constraints, and the long time horizon over which risks may materialise. Prudential transition plans can provide supervisors with a multi-year account of financial institutions' risk management strategies to mitigate transition risks and incorporate these risks within the supervisory time horizon, and result in a truer reflection of climate-related financial risks within the prudential framework.

If prudential transition plans are to be integrated into the prudential framework, it must be done in a manner that is proportional to the risks faced by financial institutions. This means accounting for the size of financial institutions and the threat they pose to financial stability, as well as their exposures to transition-sensitive sectors and overall transition risks.

The reporting of transition plans could be integrated into several tools within the supervisory and prudential toolbox, including the large exposures framework, stress testing, risk management under the Basel Framework Pillar II, and disclosure under Pillar III.



Morgan  
Després  
(European  
Climate  
Foundation)



Hugh  
Miller  
(OECD  
& LSE)

This paper is part of a toolbox designed to support central bankers and financial supervisors in calibrating monetary, prudential and other instruments in accordance with sustainability goals, as they address the ramifications of climate change and other environmental challenges. The papers have been written and peer-reviewed by leading experts from academia, think tanks and central banks and are based on cutting-edge research, drawing from best practice in central banking and supervision.



Centre for  
Sustainable Finance

SOAS University of London



Grantham  
Research Institute  
on Climate Change  
and the Environment

## 1. Introduction

It is widely acknowledged that climate change and other environmental risks such as biodiversity loss are sources of systemic financial risk that affect not just individual financial institutions but the financial sector as a whole (NGFS, 2018; FSB, 2020; Giuzio et al., 2019; NGFS-INSPIRE, 2022). These sources of risk are primarily transmitted through physical and transition risk channels. Risks from climate change, typically referred to as climate-related financial risks (BIS, 2021; ECB, 2022a), and particularly transition risks, have a unique set of characteristics that limit the capacity of conventional risk approaches to adequately capture and measure them. These characteristics include: their non-linearity; the long time horizon over which they may materialise; their forward-looking nature; their breadth, scope and sectoral heterogeneity; the feedback loops, deep uncertainty and fat-tailed distributions; and their endogeneity to the financial system (Bolton et al., 2020; Aglietta, 2021; Weitzman, 2011; Schoenmaker et al., 2015; Carney, 2015). Specifically, variations in the 'narrative' of the transition (described below) and uncertainties surrounding climate policy introduce a significant amount of uncertainty into risk outcomes, with much higher expected risks under delayed or disorderly transition scenarios. In addition, transition risks are dependent on present or future policy decisions and their timelines, which also partially determine the level of uncertainty. To adequately capture transition risks within financial metrics, a forward-looking methodology needs to be adopted that can assess the risk characteristics mentioned above.

The current regulatory toolbox of central banks and financial supervisors is primarily calibrated using backward-looking methods to measure and capture financial risks (Monnin, 2022). It is therefore unable to capture forward-looking, non-linear climate-related financial risks, particularly their time horizon (Carney, 2015; Aglietta, 2021). Scenario analysis has emerged as a key forward-looking tool for climate risk assessment, with central banks and financial supervisors developing climate transition scenarios through the Network for Greening the Financial System (NGFS).<sup>1</sup> The NGFS has developed six transition scenarios (Net Zero 2050; Below 2 °C; Divergent Net Zero; Delayed Transition; NDCs [Nationally Determined Contributions]; and Current Policies)<sup>2</sup> which relate to four transition narratives representing varying levels of risk (orderly, disorderly, too little, too late, and 'hot house world') (NGFS, 2023a). While these scenarios can be used for a variety of purposes, one of the primary functions is to help financial supervisors and regulators explore vulnerabilities in financial systems through forward-looking scenario analysis (FSB-NGFS, 2022).

Several central banks and financial supervisory authorities have used the NGFS transition scenarios as a baseline for the design of stress test scenarios (Bank of Canada and OSFI, 2022; Bank of England, 2022; ECB, 2023; ACPR-Banque de France, 2021). Most of these exercises take a top-down approach, which has the benefits of consistency and including smaller players who may not have the capacity to participate under a bottom-up approach (FSB-NGFS, 2022). However, top-down approaches do not include the response of financial institutions to the climate scenarios, or their engagement with financial institutions' counterparties and clients to understand these intra-sectoral risk differentials. Moreover, there are limitations to the scenarios as they do not capture second-round effects, indirect exposures,<sup>3</sup> non-linearities, or the costs and externalities of risk management measures undertaken by financial institutions (FSB-NGFS, 2022). Hence, the scenarios likely understate the exposure and vulnerability of financial institutions to climate physical

**“Climate-related financial risks have a unique set of characteristics that limit the capacity of conventional risk approaches to adequately capture and measure them.”**

<sup>1</sup>The NGFS is a membership body of 121 central banks and financial supervisors and 19 observers.

<sup>2</sup>Currently none of these scenarios relate to the 'too little, too late' narrative.

<sup>3</sup>Indirect exposures happen through companies that are primarily exposed to climate risks through their value chain.

and transition risks. These limitations in turn hinder the ability of supervisory authorities to fully capture the risks and may explain why the outcomes of scenario analysis are yet to be reflected in prudential frameworks.

Data gaps are another key limitation to effective scenario analysis (FSB, 2022; FSB-NGFS, 2022; NGFS, 2022). This issue is compounded by the challenge of data reliability (NGFS, 2022). Having high-quality, comparable and consistent data is a prerequisite to effective bottom-up scenario analysis and the capture of the intra-sectoral dynamics in response to transition risk drivers. The Financial Stability Board (FSB) and Bank for International Settlements (BIS) have issued guidance and principles for supervisory and regulatory authorities to identify and collect additional information to help assess the materiality of climate-related financial risks (BCBS, 2022a; FSB, 2022).

One potential tool that can be utilised to overcome some of the challenges in assessing climate-related financial risks is the prudential transition plan. The concept of transition plans originates in the private sector with initiatives such as the Taskforce for Climate-related Financial Disclosures (TCFD) (TCFD, 2017). However, the concept of using transition plans for the purposes of financial supervision has gained momentum more recently following a speech by European Central Bank (ECB) board member Frank Elderson (Elderson, 2021), who pointed to the transition plan as a way to overcome what Mark Carney called the ‘tragedy of the horizon’ (Carney, 2015) (see further 3.1 below).

Since Elderson’s speech, research has been conducted on the use of transition plans for prudential purposes (Evain et al., 2022; Dikau et al., 2022). Three types of transition plan have been identified: (i) voluntary, market-led transition plans; (ii) mandatory corporate disclosure of transition plans; and (iii) mandatory prudential transition plans (Dikau et al., 2022). This paper focuses on the third type: prudential transition plans. Transition plans have been described as multi-year accounts to ensure that business models and strategies are aligned with environmental objectives (ibid.) *Prudential* transition plans would specifically focus on financial institutions’ risk management strategies to ensure they mitigate the possible transition risks and bring these risks within the time horizon that supervisors can take into account. Using transition plans for prudential purposes is already being considered by financial policymakers through the NGFS, which recently published a stocktake of transition plans for financial institutions (NGFS, 2023b).

This paper explores how transition plans could offer a technical solution to the challenge of integrating transition risks into the prudential framework. Specifically, it considers how the design characteristics of transition plans can be tailored for the integration of risks into several areas of supervision and macroprudential policy. Several examples are discussed, including the large exposures framework, stress testing and disclosure under Pillar III<sup>4</sup> of the Basel Framework. Mandatory prudential transition plans are closely intertwined with the mandatory corporate disclosure of transition plans, as the transition path of financial institutions is directly contingent on those of their clients and counterparties.

The paper is structured as follows: Section 2 looks at the conventional microprudential framework and its shortcomings when it comes to managing climate-related financial risk. Section 3 outlines a sustainability-enhanced approach, including the scope and assessment of transition plans. Section 4 examines the prerequisites and limitations, and Section 5 concludes.

“This paper explores how transition plans could offer a technical solution to the challenge of integrating transition risks into the prudential framework.”

<sup>4</sup>Pillar III of the Basel Framework consists of requirements published by the Basel Committee on Banking Supervision which seek to promote market discipline through disclosure.

## 2. The conventional microprudential framework and its shortcomings

Conventional microprudential supervision focuses on ensuring the safety and soundness of individual financial institutions by preventing them from taking on excessive risk and by safeguarding them from idiosyncratic risk (ECB, 2014). Conversely, macroprudential supervision examines the interactions among individual financial institutions and the feedback loops between the financial sector and real economy (ibid.). Various aspects of climate-related financial risks are partially captured by current capital frameworks for banking supervision.

The Basel Committee on Banking Supervision (BCBS) has developed responses to clarify how climate-related financial risks may be captured in existing Pillar I standards,<sup>5</sup> but the Committee also highlights the current limitations of data granularity and methodological limitations (BCBS, 2022). Additionally, capital frameworks are currently insufficient to fully capture climate-related financial risks (PRA, 2021). Overall, there are four main distinct but interrelated challenges when it comes to incorporating climate-related financial risks into current capital and prudential frameworks: (i) the relevant time horizons for capturing risks; (ii) data availability and consistency; (iii) variations in the models and methodologies used to assess and capture climate-related financial risks; and (iv) the granularity of assessment (PRA, 2023; Aglietta, 2021; Carney, 2015; Schoenmaker et al., 2015). These are discussed below.

### Time horizons

The prudential framework is calibrated retrospectively to assess, monitor and supervise against future financial risks over a one-year time horizon, relying on historical data (PRA, 2021). The framework includes forward-looking aspects, specifically firms' Internal Capital Adequacy Assessment Process (ICAAP) and stress-testing, which require a multi-year perspective to assess banks' capital positions (BIS, 2019). However, these are typically three- to five-year time-horizons, which may be too short to fully capture the materialisation of climate risks. As noted by Mark Carney (2015) and Michel Aglietta (2021), some risks from climate change will occur beyond the usual business, financial and policy cycles. Therefore, supervisory frameworks need to be adapted to be able to account for these longer-term risks.

### Data availability and consistency

Historical data is typically the basis for management of market risk and systemic shocks (BIS, 2021) and such data is explicitly required for the calculation of capital requirements within the Basel Framework (BIS, 2023). However, these measurement approaches likely underestimate or fail to capture the full extent of climate-related financial risks as climate risks are non-linear, subject to deep uncertainty, and forward-looking – characteristics that cannot be sufficiently captured by historical data (Weitzman, 2011; Chenet et al., 2021). Forward-looking data, measurements and qualitative approaches may instead be required to adequately measure and assess climate-related risks. However, there are significant challenges regarding data availability, which are further compounded by data reliability issues (NGFS, 2022). Specifically, there are considerable problems with data coverage (in terms of sectors and geographical representation), and granularity at the asset level, with the largest data gaps relating to biophysical impacts, emissions and geospatial data (ibid.). It is fundamental for banks to understand and assess their exposure to material climate risks. Due to the characteristics of climate transition risk, particularly the uncertainty, it is currently not possible to fully capture the risks using traditional quantitative approaches. Hence, there is a need for additional qualitative approaches to supplement quantitative analysis (Chenet et al., 2021; NGFS, 2020).

**“There are considerable problems with data coverage and granularity, with the largest data gaps relating to biophysical impacts, emissions and geospatial data.”**

<sup>5</sup>Pillar 1 of the Basel Framework is a regulation published by the Basel Committee on Banking Supervision to define the minimum capital requirements for banks.

### Variations in models and methodologies

There is significant variation in how firms translate climate science into scenarios and how they model climate-related risks (PRA, 2021). For example, estimates of the additional annual investments needed in the energy sector to limit global warming to 1.5°C range from \$150 billion to \$1,700 billion, depending significantly on initial assumptions and methodological choices (Bolton et al., 2020). Further, an analysis of 20 providers of climate risk assessments reveals significant variability in the type of risks considered, the use of scenarios, and the modelling assumptions used (Bingler and Colesanti Senni, 2022). The variation in approaches leads to a significant range in estimates used for financial risk management and hinders firms' ability to accurately estimate climate-related financial risks.

### Granularity of assessment

Finally, the high-level categorisation of assets into different 'buckets' within current frameworks overlooks the differences in sectoral and geographical impacts stemming from climate risks (PRA, 2021). There are intra-industry differences in the exposure to climate risk between non-financial firms (Schoenmaker et al., 2015). While sectoral analysis can be a useful initial approximation of risk, further assessment is required to ascertain important intra-sectoral differences (Giuzio et al., 2019). Hence, a corporate-level assessment to examine transition risks is preferable to a sector-level approach.

To overcome the current shortcomings of the capital framework, central banks and financial supervisors have developed supervisory expectations and climate transition scenarios. The Bank of England (BoE) and European Central Bank (ECB) have developed supervisory expectations for regulated firms to consider climate-related financial risk (PRA, 2019; ECB, 2020). The Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS) have developed recommendations for regulatory and supervisory authorities on climate-related financial risk, aiming to assist supervisors and regulators to develop approaches to monitor, manage and mitigate these risks (BCBS, 2022b; FSB, 2022). However, recent publications by the BoE and ECB suggest that firms are currently failing to meet these expectations adequately (Woods, 2020; ECB, 2022b). The ECB's assessment classifies 45% of banks' disclosure as insufficient, from both a content and substantiation perspective, insofar as they fail to adequately assess the potential risks stemming from climate change.

Beyond supervisory expectations, central banks and financial supervisors have developed climate transition scenarios through the NGFS. These scenarios have emerged as an essential tool for scenario analysis and stress tests (FSB-NGFS, 2022). However, they are yet to be used to adjust capital requirements under the Pillar II framework. This is partially because climate transition scenarios are still poorly understood; this needs to be improved if they are to be used for this purpose (Monasterolo et al., 2023). Specifically for transition risk, there is a need for pathways to explicitly include financial conditions, standardise technological assumptions, and broaden the consideration of climate policies beyond a carbon price (ibid.). Furthermore, the current use of these scenarios encounters the same limitations outlined above, particularly regarding data and methodological limitations (FSB-NGFS, 2022).

“There is significant variation in how firms translate climate science into scenarios and how they model climate-related risks.”



### 3. The sustainability-enhanced regulatory approach: prudential transition plans

#### 3.1. Transition plans as a supervisory tool

One approach to overcome the limitations of microprudential supervision discussed above is for regulated institutions to implement prudential transition plans. This approach was initially outlined by Frank Elderson, who stated in his aforementioned speech that transition plans will become the next addition to banks' climate and environment-related risk management practices (Elderson, 2021). The speech outlines how transition plans can help to overcome the 'tragedy of the horizon' (i.e. the challenge that climate change impacts accumulate and materialise far into the future) by setting intermediate milestones and incorporating climate and environmental risks within the timeframe relevant for supervisors (ibid.). The relevance of transition plans for managing transition risks and monitoring associated financial stability risks will be explored as part of the Financial Stability Board's 2023 workplan (FSB, 2023).

Initial research has outlined the potential structures and focus of transition plans. This research focuses on their integration into the Pillar II framework and the supervisory review and evaluation process (SREP), through an alignment-based approach (Evain et al., 2022; Dikau et al., 2022). However, much in the design of prudential transition plans is yet to be agreed. Two fundamental considerations for the design of prudential transition plans – the scope and assessment – are discussed in this section, with example applications to assess transition plans as part of the current prudential framework.

##### 3.1.1. The scope of prudential transition plans

The scope of transition plans may be broad, narrow or differentiated, depending on their implementation:

- i. **Broad scope:** applicable to the entire portfolio of all banks, including exposures to small and medium-sized enterprises (SMEs). A broad scope would capture all exposures but requires a balanced approach to reporting and substance to ensure the requirements are not overly burdensome for smaller banks or impact indirectly on small non-financial firms.
- ii. **Narrow scope:** only applicable to large banks and their largest exposures to non-financial firms that may be exposed to climate-related financial risks. This enables a more in-depth approach to reporting due to the greater capacity of the banks and related non-financial firms. However, it may fail to capture risks in the bank's wider portfolio.
- iii. **Differentiated scope:** the scope may differ depending on: the size of the bank and its respective capacity to disclose a transition plan; the size of the underlying exposure to non-financial firms; and the relevance of their economic activities for climate-related financial risks. Under this approach, the level of granularity and depth would be adjusted based on the perceived risk of the underlying exposures, and the risk of the bank's failure to the wider financial system.

We advocate using a *differentiated* scope approach for prudential transition plans, to ensure the level of reporting and other requirements placed on financial institutions reflect the level of risk to which they are exposed. The differentiated scope approach may distinguish reporting requirements for financial institutions based on their exposure to transition-sensitive sectors and the size of the institution. This ensures the full range of relevant exposures are captured within the reporting while enabling enough granularity to be included. It would also cater for an appropriate level of proportionality between the reporting requirements and the materiality of risk.

**“A differentiated scope approach would ensure the financial institution's reporting requirements reflect the level of risk to which they are exposed.”**

### Identification of relevant climate-related financial risk exposures

One identified approach to classifying relevant exposures to climate-related financial risks is the Climate Policy Relevant Sectors (CPRS) system. This classification system identifies economic activities that are directly and indirectly exposed to transition risks and considers: (i) their role in the energy value chain; (ii) their contribution to value chain greenhouse gas emissions (iii) specific policy processes; and (iv) different business models (FINEXUS, 2022). This classification has previously been utilised to assess transition risk (Battiston et al., 2020; Battiston et al., 2017; Giuzio et al., 2019). It goes beyond the consideration of stranded assets (i.e. a company's investments in fossil fuels that would become redundant and therefore lose value in a low-carbon economy) to capture economic activities that are also indirectly impacted by transition risks. Furthermore, it adopts the NACE classification<sup>6</sup> at the [most granular] 4-digit level to identify specific economic activities, and thus enables the assessment of intra-industry differences in transition risks.

The CPRS classification system identifies six categories of economic sectors that are exposed to significant transition risks (see Figure 1). Within these six categories are over 100 further categories that differentiate between high- and low-carbon activities (FINEXUS, 2022).

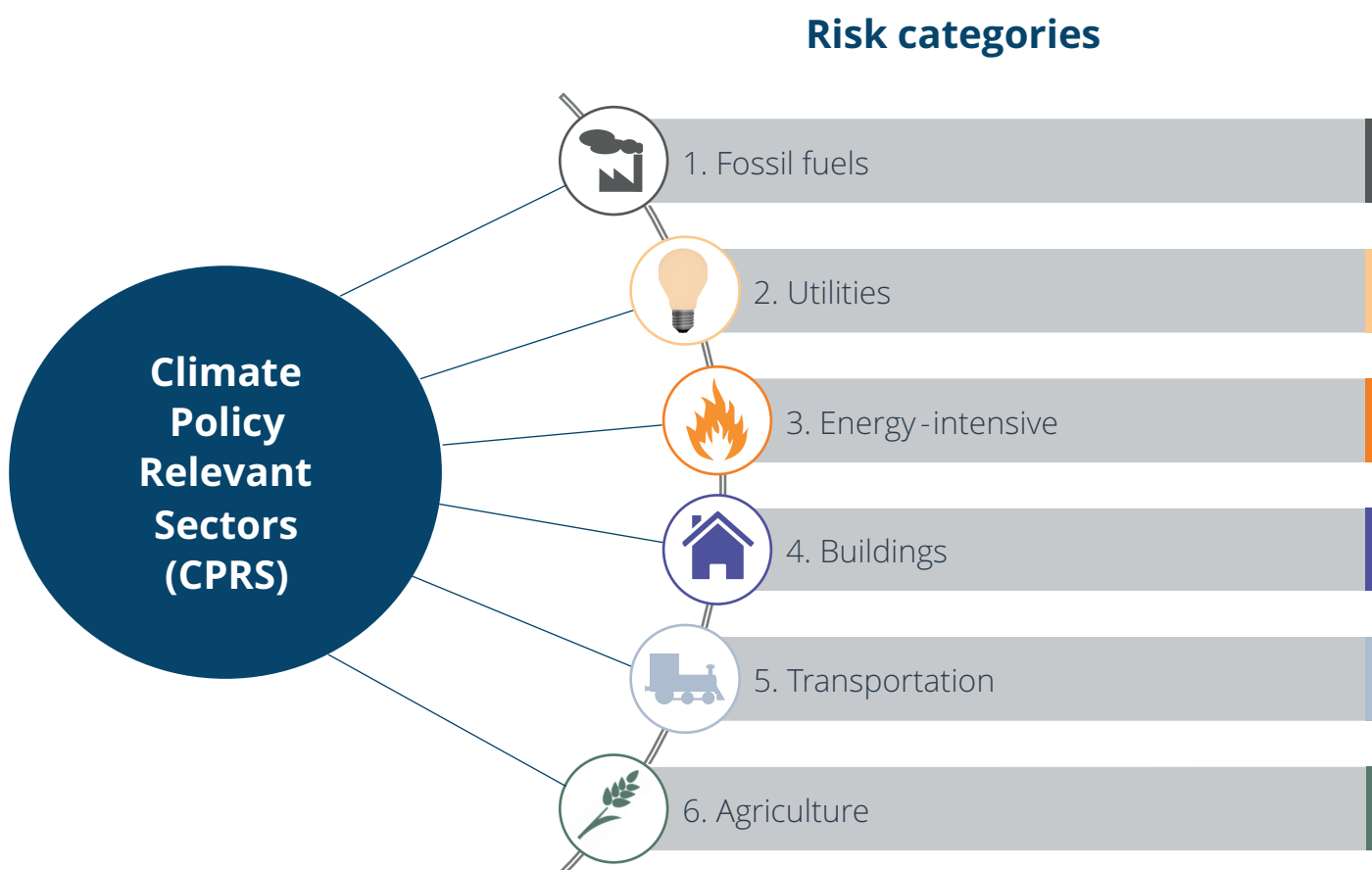
### Size of institutions and exposures

In addition to differentiating between the relevance of climate-related financial exposures, there is an argument to also distinguish between the size of financial

**“The CPRS classification system identifies six categories of economic sectors that are exposed to significant transition risks.”**

<sup>6</sup>The Statistical Classification of Economic Activities in the European Community (commonly referred to as NACE), is the industry classification system used in the European Union.

Figure 1. The main risk categories within Climate Policy Relevant Sectors (CPRS)



Source: Reproduced from FINEXUS (2022).

institutions and the size of exposures to transition-sensitive CPRS. Large financial institutions pose a greater threat to overall financial stability in the event of failure compared with small and medium-sized banks. This leads some to believe that large institutions should be required to carry out additional reporting requirements and analysis of climate-related financial risks. For example, the Federal Reserve recently announced principles for climate-related financial risk management that require only institutions with a total of over US\$100 billion in consolidated assets to comply (Federal Reserve System, 2022). The adoption of prudential transition plans may reflect the exposure and magnitude of risk within an individual financial institution.

Additionally, the size of the underlying exposures may be considered. The reason for this is twofold: first, larger financial exposures to CPRS economic activities pose a greater threat to the financial soundness of banks; and second, the economic activities relevant for climate-related financial risk tend to occur in sectors that consist of several large non-financial firms. These firms are therefore likely to be captured in the largest exposures of financial institutions. One approach to differentiate between the size of relevant exposures is the 'large exposure regime', which could be used to identify exposures that require more granular reporting on climate-related financial risks (Miller and Dikau, 2022). Evidence from the ECB's *Financial Stability Review* reveals the carbon-related concentration risks of banks stem from a limited number of the highest-emitting non-financial firms (ECB, 2022a). Hence, there may be an argument to differentiate reporting requirements based on the size and exposure of the institution.

### 3.1.2. Assessment of prudential transition plans

There are two potential approaches to the implementation and assessment of prudential transition plans. First is an alignment-based approach that examines financial institutions' alignment with decarbonisation targets, such as reaching net zero emissions by 2050. This approach uses alignment as a proxy to assess banks' long-term risk (Dikau et al., 2022). However, current climate alignment assessment methodologies do not take the same perspective as climate-related financial risk assessments. Climate alignment assessments consider 'environmental materiality', whereas financial risk assessments only consider 'financial materiality' (Noels and Jachnik, 2022). Therefore, there are considerable limitations in the use of climate alignment as a proxy for risk, particularly at the level of supervision.

A second approach is a more granular assessment of transition risk that reflects the primary drivers of transition risk (climate policy, technological advancements and market sentiment). This would require multiple metrics and sector specificities to accurately capture the risks in the underlying portfolio. However, it has the benefit of being closer to a risk-based approach, which underpins the conventional prudential framework (Miller and Dikau, 2022). The approach outlined here follows a risk-based approach in the adoption of prudential transition plans to assess climate-related financial risks.

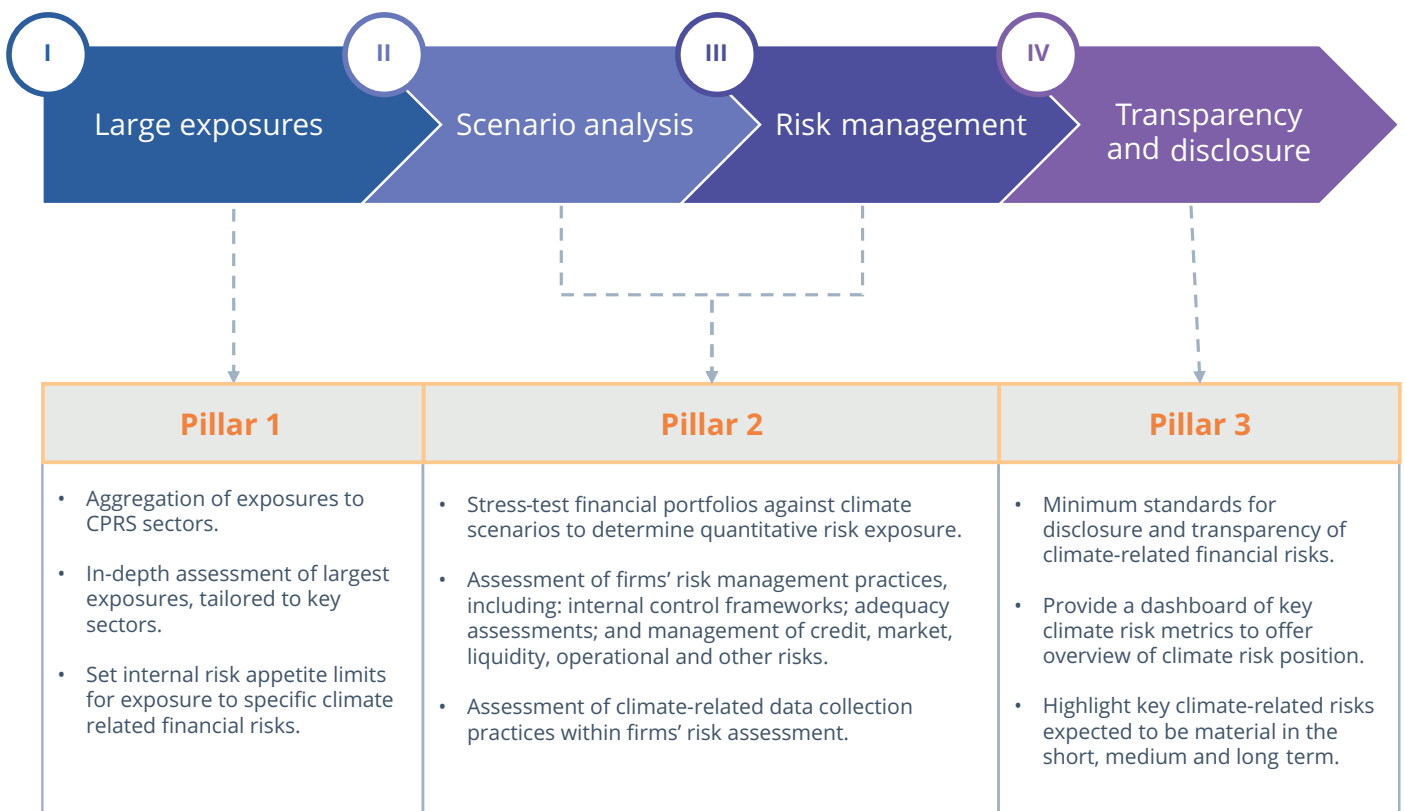
#### A four-component design of prudential transition plans

Prudential transition plans may comprise four key components that would enable their integration into different aspects of the prudential regime: (i) detailed assessment of CPRS exposures within banks' largest exposures; (ii) financial portfolio risk using scenario analysis; (iii) risk management practices, monitoring and assessment; and (iv) transparency and disclosure minimum requirements. These four components could be reflected within Pillars I, II and III of the Basel Framework and capture the different types of climate-related financial risk that may arise.

**“A large majority of financial institutions do not have the processes and tools in place to adequately reflect climate-related risks in their operations.”**



Figure 2. Overview of transition plan design and integration into the prudential framework



Source: Authors.

### 3.3. Enhanced large exposures framework

Additional reporting requirements at the corporate level for banks' largest exposures to CPRS would capture the exposures that pose the greatest threat to banks' resilience and capture intra-sectoral risk differentials. Aggregating institutions' large exposures to CPRS sectors may help capture and understand the greatest credit, market and liquidity risks stemming from climate-related financial risks. A 'soft limit' could be put in place to identify and monitor individual institutions' greatest exposure to transition risk (Miller and Dikau, 2022). Banks could be required to conduct in-depth corporate-level assessments against the different CPRS categories to identify and examine sector-specific risks. This would include an assessment of the business models of the individual firms and their decarbonisation strategies. The additional reporting would help overcome the lack of data granularity and consistency for banks' largest exposures to relevant counterparties. This assessment reflects the European Banking Authority (EBA) guidelines on exposure to shadow banking entities, where banks are required to identify exposures to shadow banking entities and tasked with setting internal risk appetites or limits to these exposures (EBA, 2016). If banks fail to adequately manage these risks and set internal risk appetites, hard limits could be imposed on their aggregate exposure to CPRS, akin to the EBA guidelines for shadow banking entities.

**“The large exposure regime has been identified as a potential area to capture the interaction between concentration risk and environmental risks.”**

However, further revisions to broaden the large exposures framework may be necessary as it currently only captures exposures above 10% of a bank's Common Equity Tier 1 capital (CET1) or their 20 largest exposures (BIS, 2023). To do this, one option is to alter the interpretation of 'groups of connected counterparties' so that it represents a level of interdependence between counterparties that are exposed to the same climate risks (Miller and Dikau, 2022). This would aggregate exposures to different counterparties undertaking the same economic activities relevant for climate transition risks into a single exposure and include the aggregated exposure within the scope of the framework. The large exposure regime has previously been identified as a potential area to capture the interaction between concentration risk and environmental risks (EBA, 2022a).

### 3.4. Scenario analysis

Climate scenario analysis is already being conducted by financial institutions. To address different risk management objectives, the scenario analysis should span a range of time horizons, from short to long-term (BCBS, 2022a), and should capture the full extent of climate-related financial risk materialisation, with greater emphasis on near-term risks. These scenario exercises face similar challenges to those outlined earlier (e.g. data limitations). However, incorporating scenario analysis into prudential transition plans would require banks to undertake this exercise on a regular basis, which would help financial institutions to build capacity and develop their methodologies to better reflect the nature of climate-related financial risk. The regular submission of climate scenario analysis will enable supervisors to track and monitor banks' management of climate-related risks over time and assess their actions to mitigate developing risks. In addition, the climate-related data captured at the corporate level within the large exposure component of transition plans may inform these exercises. For non-large exposures, sectoral averages and external data can be used to supplement the climate-related data reported by banks' large exposures, with a focus on exposures to transition-sensitive sectors. Consistent bottom-up approaches to stress tests across financial institutions may enable cross-institution comparison of such sectors.

Considerations from the results of these scenario exercises could be integrated into the current stress tests used to determine banks' Pillar II capital buffers. All material climate risks should then be reflected in banks' ICAAP assessments. In the current framework, supervisors can set capital targets where they see shortcomings of the ICAAP assessment process, capital needs through the supervisory stress test, and weaknesses in banks' capital adequacy (BIS, 2023). This could be extended to also include weaknesses or shortcomings in the methodologies and approaches used by banks in their scenario analysis of climate risks.

### 3.5. Risk management

Financial risk management could provide additional qualitative assessment of firms' management of climate-related risks to complement the quantitative assessment with scenario analysis. An initial starting point for this assessment is the *Principles for the effective management and supervision of climate-related financial risks* by the BCBS (2022b). These principles offer guidance on the integration of climate-related financial risk into risk management frameworks, such as into firms' internal control frameworks across the 'three lines of defence', while providing clear definitions and assigning responsibilities and reporting lines (ibid.). Within these principles, the BCBS recommends supervisors and banks to consider 'material' climate-related financial risks. However, due to the uncertainty around the size, materialisation and time horizon of these risks, an exposure-based approach may be a suitable proxy.

“The regular submission of climate scenario analysis will enable supervisors to track and monitor banks' management of climate-related risks over time.”

### 3.6. Transparency and disclosure

Finally, the reporting of banks' prudential transition plans needs to be communicated to financial regulators and supervisors in a succinct, transparent and consistent manner. Therefore, additional requirements related to the disclosure and communication of transition plans are necessary to ensure these plans are comparable across financial institutions. The development of minimum disclosure standards is necessary to ensure comparability, specifically: transparency on the identification of key climate risks; the use of metrics and data from external service providers; the choice of assessment and modelling methodologies; the use of scenarios; and key assumptions within quantitative assessments. These minimum standards could build on the EBA's technical standards for prudential disclosures of ESG (environmental, social, governance) risks, which already include templates for physical and transition climate risks (EBA, 2022b). However, additional standards may need to be developed to fully capture methodological assumptions associated with scenario analysis. Furthermore, to align with the current Basel Pillar III requirements, a 'dashboard' of key prudential metrics is needed, to provide an overview of a bank's prudential position regarding climate-rated financial risks (BIS, 2017), both for the present time and across future time horizons (based on the expected implementation of further risk management practices to mitigate climate-related risks).

Beyond these principles, the risk management pillar of prudential transition plans could require banks to identify and disclose their current gaps in assessing climate-related financial risks, specifically gaps in methodologies, data availability and understanding of risks. Additionally, supervisors may expect banks to develop a strategy for minimising these gaps to ensure best practice in climate-related financial risk management. In this regard, supervisors could incorporate the data collection and quality assessment practices of banks into their supervisory assessments of climate-related financial risks. For example, they could look at whether banks require non-financial corporate data on Scope 1, 2 and 3 emissions for extending credit to transition-sensitive sectors and whether the data is verified by a third-party or other reviewer. Whether banks have a clear and realistic strategy to reduce these data gaps over time could also be assessed through interim targets. This would help facilitate the improvement of climate-related financial assessments over time and reduce gaps in data availability.

### 3.7. Macroprudential application

Beyond their microprudential application, prudential transition plans could be utilised to help inform macroprudential assessments and policy. Pervasive misalignment with climate policy targets throughout the banking system could threaten financial stability (Dikau et al., 2022). The aggregation of banks' exposures to non-financial firms with activities in CPRS could be used to assess the financial system's alignment with climate policy targets – as well as the future timing of sectoral alignment to climate policy targets. This exercise is also a powerful tool for assessing whether the various net zero commitments and pathways of companies are consistent at a macro or aggregated level.

Initial analysis of large corporate entities under the CPRS classification finds them to be misaligned with climate policy targets and their climate commitments to be "backloaded" towards later time horizons (Miller and Dikau, 2022). This may create pressure points in the economy if sectors rely on new technologies to achieve emission reduction targets within a short period of time. These risks may spill over into the financial sector, creating financial risks for institutions. The aggregation of banks' exposures and the macroprudential assessments can help to identify the build-up of these risks, which can then be communicated to the market and inform macroprudential policy, for example the systemic risk buffer.

"Supervisors may expect banks to develop a strategy for minimising data gaps to ensure best practice in climate-related financial risk management."

#### 4. Prerequisites and limitations

While prudential transition plans may greatly advance the ability to identify, assess and monitor climate-related financial risk, there are several prerequisites and limitations that need to be considered.

##### Prerequisites

A first prerequisite is a clear regulatory accountability framework of the net zero commitments taken by non-financial firms, beyond individual and voluntary commitments. This disclosure needs to include firms' current emissions, including Scope 1, 2 and 3, as well as their future emission reductions outlined in their commitments to adapt their business models. Many jurisdictions are already introducing mandatory sustainability reporting for corporate entities, including the EU, UK and US (European Commission, 2022; UK Government, 2021; SEC, 2022). Some of the proposed legislation also includes required scenario analysis, which will help to inform financial institutions about firms' future exposure to transition risks. Additionally, the International Sustainability Standards Board (ISSB) is developing global minimum disclosure standards, which will help facilitate the availability of corporate sustainability data (IFRS, 2022). This information is necessary for financial institutions to then assess their exposure to climate transition risks through their portfolio.

However, market-led and mandatory corporate transition plan frameworks are not fit for the purposes of supervisory authorities. This is because central banks and financial regulators are primarily concerned with price and financial stability, whereas most frameworks available today opt for an 'alignment-based' approach (TCFD, 2021; GFANZ, 2022b), focusing on the achievement of or alignment with climate policy targets (e.g. net zero emissions by 2050), as opposed to the economic and financial risks that may emerge over the duration of the transition. As a result, new frameworks for the assessment of climate-related financial risks need to be developed for the implementation of prudential transition plans. Central banks and financial supervisors will also need a quantitative evidence base to support their development and implementation. Exercises to support the implementation of prudential transition plans should reflect granular-level analyses of transition risk, as carried out by Giuzio et al. (2019) and Battiston et al. (2020).

A second prerequisite is the improvement in supervisory capacity to identify, understand and assess climate-related risks. Currently, most central banks have adopted a 'hub and spoke' model to address climate-related issues within their institutions. For example, Banque de France and the European Central Bank have climate change centres, which are the focal point and home of climate-related research and knowledge (ECB, 2021; Banque de France, 2021). However, to effectively supervise against climate-related risks as disclosed through prudential transition plans, financial supervisory authorities themselves would need extensive understanding of climate-related risks. In particular, an understanding of sector-specific climate transition risks is critical and may require the hiring of industry experts for transition-sensitive sectors, such as the energy sector.

A third prerequisite is for the classification of non-financial firms to be considered relevant under the CPRS methodology. Current financial regulatory reporting only requires reporting at the aggregated sectoral level, rather than the detail of underlying corporate economic activities (European Union, 2019). For example, there is no obligation for banks to enter a NACE code when they disclose their large

**“Many jurisdictions are already introducing mandatory sustainability reporting for corporate entities, including the EU, UK and US.”**

exposures, or for granular 4-digit NACE reporting. This severely hampers the ability of financial institutions and supervisors to identify relevant climate transition risk exposures that fall under the CPRS classification. Additionally, many non-financial corporate entities undertake multiple economic activities, not all of which fall under the CPRS classification, so minimum thresholds can help to categorise non-financial firms based on their economic activities as a proportion of the entire business model.

### Limitations

The implementation of prudential transition plans alone will not resolve the current challenges to the incorporation of climate-related risks within the prudential regime, such as the methodological limitations of current scenario modelling, data availability and quality challenges, or the inherent uncertainty of future decarbonisation pathways. However, prudential transition plans would offer supervisory oversight over longer time horizons than conventional financial reporting, and a more granular assessment to understand risk differentials within sectors. Moreover, incorporating data collection practices into the supervisory assessment of banks' risk management practices and requiring frequent scenario analysis exercises would aid the improvement of data availability and modelling approaches. The implementation of prudential transition plans will therefore need to be undertaken in conjunction with other policies to adequately reflect environmental risks in the prudential framework.

## 5. Conclusion

There is a high likelihood that we will see sudden build-ups of prudential risks between now and 2050. This calls for the prudential assessment of transition risks and the implementation of microprudential policy, which currently faces a variety of implementation challenges due to the unique set of characteristics defining climate-related financial risks. Currently, there are several challenges to overcome in the identification, assessment and incorporation of climate risks into the financial regulatory framework, including data availability, the long time horizons of climate risks, methodological challenges and the need for granular corporate-level assessments. Prudential transition plans are one potential tool to further incorporate climate-related financial risks into the prudential regime.

Prudential transition plans for regulated firms could help overcome these challenges and enable the mitigation of these risks by requiring financial institutions to expand their risk management and assessment capabilities and clearly map their transition strategy. The disclosed information and assessments would inform microprudential instruments to mitigate the identified transition risks, help identify the build-up of macrofinancial risks in the financial system, and inform macroprudential policy. In this way, transition plans can bring distant risks within the timeframe of financial supervisors while supporting the economic transition to net zero by requiring detailed adjustment targets at specific mid-point milestones between now and 2050.

In the implementation of prudential transition plans, regulators should consider the size of financial institutions and their exposure to CPRS in their design to ensure these plans are targeted at the relevant risks to the financial system. These plans will not fully overcome all the limitations associated with assessing climate-related risks and so need to be undertaken in conjunction with other policy measures, for example: the further development and refinement of climate scenarios; possible recalibration capital requirements; and other supervisory tools.

**“Transition plans can support the economic transition to net zero by requiring detailed adjustment targets at specific milestones between now and 2050.”**

Two prerequisites are necessary for the effective implementation of prudential transition plans. First, central banks and supervisors will need to develop capacity to carry out the difficult task of assessing climate-related risks. This could include bringing in sector-specific expertise to boost understanding of how transition risks will originate and interconnect within the real economy. Second, a foundational basis for the incorporation of transition risk within prudential requirements needs to be created. This can be achieved through an assessment of transition risk within regulated banks, as done by the ECB and Austria's central bank (the ONB) through mapping exercises, for example (Giuzio et al., 2019; Battiston et al., 2020). This will also reveal the concentration of exposure to transition risks across regulated banks, which may inform how prudential transition plans can be implemented using a differentiated scope approach.

Prudential transition plans by themselves should not be perceived as a silver bullet to the issue of integrating climate-related financial risks. However, these plans could be an enabler to leverage other policy tools to better manage these risks, which may materialise beyond the traditional time horizon considered by financial supervisors and central banks.

“Prudential transition plans could be an enabler to leverage other policy tools to better manage climate-related financial risks.”



## References

- ACPR-Banque de France (2021) *A first assessment of financial risks stemming from climate change: The main results of the 2020 climate pilot exercise*. Autorité de contrôle prudentiel et de résolution and the Banque de France.
- Aglietta M (2021) Panel G. How should financial stability, regulation and supervision be considered in the context of increasing climate-related risk? *The Green Swan Conference 2021*. Bank for International Settlements.
- Bank of Canada and OSFI (2022) *Using Scenario Analysis to Assess Climate Transition Risk*. Bank of Canada and Office of the Superintendent of Financial Institutions.
- Bank of England (2022) *Results of the 2021 Climate Biennial Exploratory Scenario (CBES)*. Bank of England.
- Banque de France (2021) *Green Finance: the Banque de France launches its Climate Change Centre (CCC) and publishes its 3rd Responsible Investment Report (SRI)*. Press release, 31 March. <https://www.banque-france.fr/en/communique-de-presse/green-finance-banque-de-france-launches-its-climate-change-centre-ccc-and-publishes-its-3rd>
- Battiston S, Guth M, Monasterolo I, Neudorfer B and Pointner W (2020) Austrian banks' exposure to climate-related transition risk. *Financial Stability Report 40*. ONB.
- Battiston S, Mandel A and Monasterolo I (2017) A climate stress-test of the financial system. *Nature Climate Change*. Pp. 283-288.
- BCBS [Basel Committee on Banking Supervision] (2022a) *Frequently asked questions on climate-related financial risks*. Basel Committee on Banking Supervision.
- BCBS (2022b) *Principles for the effective management and supervision of climate-related financial risks*. Basel Committee on Banking Supervision.
- Bingler J and Colesanti Senni C (2022) Taming the Green Swan: a criteria-based analysis to improve the understanding of climate-related financial risk assessment tools. *Climate Policy*.
- BIS [Bank for International Settlements] (2023a) *The Basel Framework*.
- BIS (2023b) *Large exposures*. Bank for International Settlements.
- BIS (2021) *Climate-related risk drivers and their transmission channels*.
- BIS (2019) *Overview of Pillar 2 supervisory review practices and approaches*.
- BIS (2017) *Pillar 3 disclosure requirements - consolidated and enhanced framework*.
- Bolton P, Despres M, Pereira da Silva L, Samama F and Svartzman R (2020) *The green swan*. Bank for International Settlements.
- Carney M (2015) Breaking the Tragedy of the Horizon - climate change and financial stability. *Bank of England Governor's Speech - Lloyds of London*. September 29. London, United Kingdom: Bank of England.
- Chenet H, Ryan-Collins J and van Lerven F (2021) Finance climate-change and radical uncertainty: towards a precautionary approach to financial policy. *Ecological Economics*.
- Dikau S, Robins N, Smoleňka A, van't Klooster, and Volz U (2022) *Net zero transition plans: a supervisory playbook for prudential authorities*. London: Grantham Research Institute on Climate Change and the Environment.
- EBA [European Banking Authority] (2022a) *The role of environmental risks in the prudential framework - Discussion Paper*.
- EBA (2022b) *Final draft implementing technical standards on prudential disclosures on ESG risks in accordance with Article 449a CRR*.
- EBA (2016) *Guidelines: Limits on exposures to shadow banking entities which carry out banking activities outside a regulated framework under Article 295(2) of Regulation (EU) No 575/2013*.
- ECB [European Central Bank] (2023) *Results of the 2022 climate risk stress test of the Eurosystem balance sheet*.
- ECB (2022a) *Financial Stability Review 2022*.
- ECB (2022b) *Supervisory assessment of institutions' climate-related and environmental risk disclosures*.
- ECB (2021) *ECB sets up climate change centre*. Press release, 25 January. [https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210125\\_1~3fc4ebb4c6.en.html](https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210125_1~3fc4ebb4c6.en.html)
- ECB (2020) *Guide on climate-related and environmental risks*. European Central Bank.
- ECB (2014) *Financial Stability Review*. European Central Bank.
- Elderson F (2021) Overcoming the tragedy of the horizon: requiring banks to translate 2050 targets into milestones. *Keynote speech by Frank Elderson, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB at the Financial Market Authority's Supervisory Conference*. Vienna: European Central Bank.
- European Commission (2022) *Corporate sustainability reporting*. [https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting\\_en](https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en)
- European Union (2019) *Regulation (EU) 2019/876 of the European Parliament and Council of May 2019*. Official Journal of the European Union.
- Evain J, Calipel C and Noguès L (2022) *Include mandatory banking transition plans within Pillar 2*. I4CE.
- Federal Reserve System (2022) *Federal Register*. Récupéré sur Principles for Climate-related Financial Risk Management for Large Financial Institutions. <https://www.federalregister.gov/documents/2022/12/08/2022-26648/principles-for-climate-related-financial-risk-management-for-large-financial-institutions>
- FINEXUS (2022) *Climate Policy Relevant Sectors*. Center for Financial Networks and Sustainability. <https://www.finexus.uzh.ch/en/projects/CPRS.html>
- FSB [Financial Stability Board] (2023) *FSB Work Programme for 2023*.
- FSB (2022) *Supervisory and Regulatory Approaches to Climate-related Risks*. Financial Stability Board.
- FSB (2020) *The Implications of Climate Change for Financial Stability*. Financial Stability Board.
- FSB-NGFS (2022) *Climate Scenario Analysis by Jurisdictions*. Financial Stability Board and Network for Greening the Financial System.
- GFANZ [Glasgow Financial Alliance for Net Zero] (2022a) *Guidance on the use of Sectoral Pathways for Financial Institutions*.

- GFANZ (2022b) *Financial Institution Net Zero Transition Plans - Fundamentals, Recommendations, and Guidance*.
- Giuzio M, Krusec D, Levels A, Melo A, Mikkonen K and Radulova P (2019) Climate Change and Financial Stability. *Financial Stability Review*. European Central Bank.
- IFRS [International Financial Reporting Standards Foundation] (2022) *IFRS S2 Climate-related Disclosures*.
- Miller H and Dikau S (2022) *Preventing a 'climate Minsky moment': environmental financial risks and prudential exposure limits – Exploring the case of the Bank of England's prudential regime*. Grantham Research Institute on Climate Change and the Environment.
- Monasterolo I, Nieto M and Schets E (2023) The good, the bad and the hot house world: conceptual underpinnings of the NGFS scenarios and suggestion for improvement. Banco Espana Working Paper No. 2302.
- Monnin P (2022) *Is the Current Macroprudential Framework Fit for Climate Systemic Risk?* Blog post, 13 November. Council on Economic Policies. <https://www.cepweb.org/is-the-current-macroprudential-framework-fit-for-climate-systemic-risk/>
- NGFS [Network for Greening the Financial System] (2023a) *Scenarios Portal*. Network for Greening the Financial System. <https://www.ngfs.net/ngfs-scenarios-portal/explore/>
- NGFS (2023b) *Stocktake on Financial Institutions' Transition Plans and their Relevance to Micro-prudential Authorities*. Network for Greening the Financial System.
- NGFS (2022) *Final report on bridging data gaps*. Network for Greening the Financial System.
- NGFS (2020) *Guide for Supervisors: Integrating climate-related and environmental risks into prudential supervision*.
- NGFS (2018) *First Progress Report*.
- NGFS-INSPIRE (2022) *Central banking and supervision in the biosphere: An agenda for action on biodiversity loss, financial risk and system stability*. Network for Greening the Financial System – Occasional Paper.
- Noels J and Jachnik R (2022) Assessing the climate consistency of finance: *Taking stock of methodologies and their links to climate mitigation policy objectives*. OECD Environment Directorate.
- PRA [Prudential Regulatory Authority] (2023) *Bank of England report on climate-related risks and the regulatory capital frameworks*.
- PRA (2021) *Climate Change Adaptation Report*.
- PRA (2019) *Supervisory Statement SS3/19 - Enhancing banks' and insurers' approaches to managing the financial risks from climate change*. London.
- Schoenmaker D, van Tilburg R and Wijffels H (2015) What role for financial supervisors in addressing systemic environmental risks? *Sustainable Finance Lab Working Paper*.
- SEC (2022) *SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors*. Press release, 21 March. U.S. Securities and Exchange Commission: <https://www.sec.gov/news/press-release/2022-46>
- TCFD [Task Force on Climate-related Financial Disclosures] (2021) *Guidance on Metrics, Targets, and Transition Plans*.
- TCFD (2017) *Recommendations of the Task Force on Climate-related Financial Disclosures*. Task Force on Climate-related Financial Disclosures.
- UK Government (2021) *UK to enshrine mandatory climate disclosures for largest companies in law*. Press release, October 29. <https://www.gov.uk/government/news/uk-to-enshrine-mandatory-climate-disclosures-for-largest-companies-in-law>
- Weitzman M (2011) Fat-tailed uncertainty in the economics of catastrophic climate change. *Review of Environmental Economics and Policy* pp. 272-292.
- Woods S (2020) *Managing climate-related financial risk - thematic feedback from the PRA's review of firms' Supervisory Statement 3/19 (SS3/19) plans and clarification of expectations*. London: Prudential Regulation Authority.

## About the authors

**Morgan Després** is Executive Director of the European Climate Foundation.

**Hugh Miller** is a Policy Analyst at the OECD and a Visiting Fellow at the Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science.

## Acknowledgements

The authors would like to thank Dr Simon Dikau from the Grantham Research Institute on Climate Change and the Environment, and Pierre Monnin at the Council on Economic Policies for their insightful comments and feedback.

## Disclaimer

The findings, interpretations and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the European Climate Foundation or OECD Secretariat or its member countries, nor does the paper necessarily reflect the views of the series editors or the editors' host institutions.

## Briefing paper series editors

Dr Simon Dikau: [S.Dikau@lse.ac.uk](mailto:S.Dikau@lse.ac.uk)  
Professor Nick Robins: [N.V.Robins@lse.ac.uk](mailto:N.V.Robins@lse.ac.uk)  
Professor Ulrich Volz: [uv1@soas.ac.uk](mailto:uv1@soas.ac.uk)

Find out more about their work at [www.lse.ac.uk/granthaminstitute/research-areas/sustainable-public-and-private-finance/](http://www.lse.ac.uk/granthaminstitute/research-areas/sustainable-public-and-private-finance/) and [www.soas.ac.uk/centre-for-sustainable-finance/](http://www.soas.ac.uk/centre-for-sustainable-finance/).

## Editing and production

Georgina Kyriacou (Managing Editor), Natalie Pearson and Zoe Kay, with support from Sophie Scharlin-Pettee.

## About INSPIRE

**The International Network for Sustainable Financial Policy Insights, Research, and Exchange (INSPIRE)** is a global research network and designated research stakeholder of the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) in its work to manage climate risk and mobilise finance to support the transition to a sustainable economy. The INSPIRE secretariat is co-hosted by the Grantham Research Institute on Climate Change and the Environment and the ClimateWorks Foundation, and is guided by an Advisory Committee who provide domain expertise independently but in close interface with the work priorities of the NGFS. Philanthropic support for INSPIRE is provided by ClimateWorks Foundation. [www.inspiregreenfinance.org/](http://www.inspiregreenfinance.org/)