



*Research article*

## **The supervision and regulation of climate risks for banks: overview from the perspective of a European practitioner**

**Patrick Hess**

European Central Bank (ECB), 60640 Frankfurt am Main, Germany

\* **Correspondence:** Email: [patrick.hess@ecb.int](mailto:patrick.hess@ecb.int); Tel: +49-69-1344-6535.

**Abstract:** Climate change is one of the most pressing issues of our time, and in the transition to a greener and more environmentally sustainable economy and financial system, banks and their supervisors and regulators play a key role. By giving preference to climate-friendly borrowers and green assets in their financing and investment decisions, banks have a huge leverage over economic actors and financial market participants, and thus can help the transition to a greener economy. At the same time, banks must assess and manage the physical and transition risks that emanate from climate change and impact their clients via various transmission channels, thereby affecting the banks themselves. This risk dimension is the focus of this paper. Based on the euro area perspective it answers from a mainly practical perspective the question whether voluntary action by banks is sufficient, or whether additional regulatory requirements and respective supervisory scrutiny are necessary to cope with climate and environmental risks. Furthermore, the paper assesses whether such regulatory requirements should generally be of a qualitative, or also of a quantitative nature, and also the likelihood that regulators will going forward amend the rulebook to allow supervisors to impose direct capital requirements on banks for climate-related risks.

**Keywords:** climate change; pollution; central banks; banks; financial regulation

**JEL codes:** E58, G18, G21, Q53, Q54

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## 1. Introduction: The role of central banks in helping and flanking the green transition

The climate of our planet is warming, and in the financial sector the climate change<sup>1</sup> topic is also getting hotter every day. Central banks are issuing green bonds<sup>2</sup> and reviewing the composition of their reserve management portfolios and asset purchases<sup>3</sup>, to do their bit in helping the transition to a “greener” and ultimately climate-neutral economy (Robins et al., 2021). And in their roles as supervisors of financial market infrastructures (FMIs) and banks that many of them have, central banks are also increasingly witnessing and contributing to the green transition: On the one hand, the supervised entities can take climate action, e.g., by reducing their own carbon footprint, and even more importantly with regard to the banks, by financing the green transition. On the other hand, central banks can flank the green transition by raising awareness and ensuring that risks resulting from climate change are adequately managed both at entity (i.e., by individual banks and FMIs) and system level<sup>4</sup>. Banking supervisors within or outside of central banks already do that, for example by conducting climate stress tests<sup>5</sup>, and/or by monitoring and assessing how banks manage their climate-related risks.

This last area of climate change response, the risk dimension, is the focus of this paper. It is structured as follows: Section 2 describes what the main climate risks for banks are, and how they should monitor and manage those risks. Section 3 asks from a theoretical and euro area empirical perspective if voluntary action by banks is sufficient to cope with climate-related risks, or whether regulatory requirements and their scrutiny by banking supervisors are necessary. Section 4 reflects on the role of regulators and on whether climate-related regulatory requirements should be of a qualitative or quantitative nature, and how likely it will be that they amend the rulebooks for banks in the future to allow supervisors to impose capital requirements on banks for climate-related risks. Section 5 concludes with a summary and outlook.

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<sup>1</sup> According to one often cited view climate change is one of nine environmental limits or planetary boundaries (PBs), within which humanity can safely operate because the earth system remains stable. The others are freshwater use, the flows of nitrogen and phosphorus, ocean acidification, land-system change, stratospheric ozone depletion, atmospheric aerosol loading, pollution through chemicals (with plastic being the most prominent), and biodiversity loss. The other PBs are not necessarily independent of climate change and might in fact be exacerbated by it. For an updated and extended analysis of the concept of PBs, which was already introduced in 2009, see Steffen et al. (2015).

<sup>2</sup> See the recent green bond issuance in Denmark to finance wind and solar energy and the green transition of the Danish transport sector: [https://www.nationalbanken.dk/en/governmentdebt/green\\_bonds/Pages/default.aspx](https://www.nationalbanken.dk/en/governmentdebt/green_bonds/Pages/default.aspx).

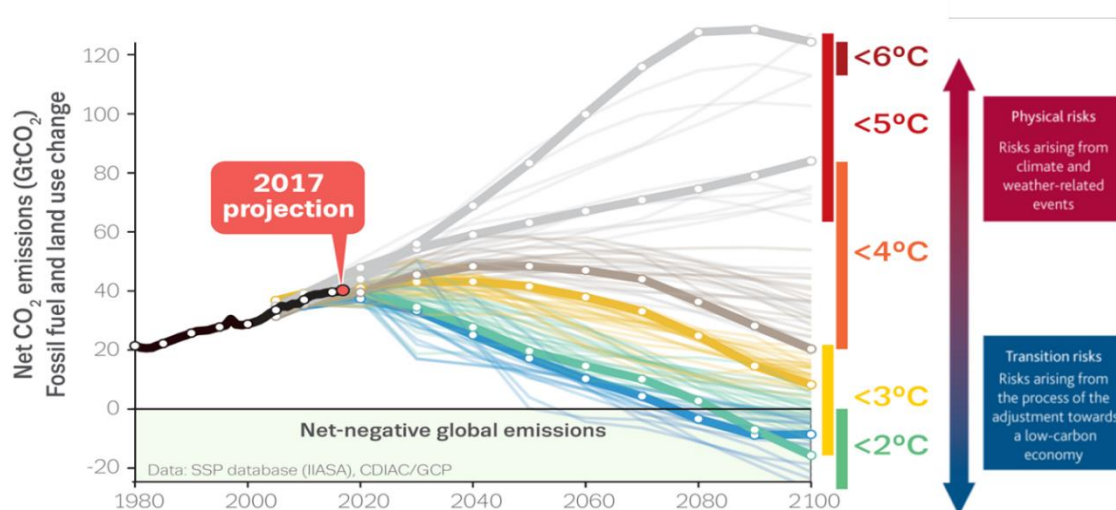
<sup>3</sup> An example among others for the latter is the inclusion of climate change into the ECB’s strategy review in 2020-21. In relation to the former, reserve management, central banks face the challenge that most of their key investment assets – government bonds – still lack ESG credentials, while alternative ESG bonds currently offer insufficient liquidity.

<sup>4</sup> For a discussion of the need for a macroprudential response to climate change, see for example Baranović et al. (2021) or D’Orazio and Popoyan (2019).

<sup>5</sup> The first and so far most comprehensive stress test of financial risks from climate change was the Bank of England’s 2021 Climate Biennial Exploratory Scenario, and in 2022 the ECB will also conduct a climate stress test for banks.

## 2. Climate-related risks for banks

The NGFS, which has become a widely accepted reference in terms of climate change and the financial sector,<sup>6</sup> divides climate-related financial risk drivers into two broad categories: financial risk drivers that are related to (1) the physical impact of climate change, and (2) the transition to a green (i.e., climate-neutral) economy. These categories are commonly referred to as physical risk and transition risk. They are not risks by themselves but drive the traditional risk categories of banks such as business risk, credit risk, operational risk, market risk, and liquidity risk (BCBS, 2021). How climate risks might materialise depends on the greenhouse gas emission scenarios and the political will to move towards a low-carbon economy and financial system (see Figure 1). It should be noted that a trade-off between transition and physical risks exists: Physical risks increase with a less ambitious climate policy, and transition risks are higher with a more ambitious climate policy.



Source: PRA (2018), p. 9

**Figure 1.** Possible carbon emission pathways and climate-related risk drivers.

But it is clear that the costs of unstopped climate change are much higher than the ones of transitioning<sup>7</sup>. While there is still some uncertainty about the ambitiousness of climate policies and the exact policy mix to decarbonise the economy, especially on a global level, the potential transmission

<sup>6</sup> The Central Banks and Supervisors Network for Greening the Financial System (NGFS) is a group of central banks and banking supervisors “willing, on a voluntary basis, to exchange experiences, share best practices, contribute to the development of environment and climate risk management in the financial sector, and to mobilize mainstream finance to support the transition toward a sustainable economy”. Launched at the Paris “One Planet Summit” in December 2017, the NGFS comprised 116 members and 19 observers (including the FSB and BIS) as of 14 June 2022.

<sup>7</sup> An Occasional Paper on the ECB’s first economy-wide climate stress test states that “the results [...] show that there are clear benefits in acting early. The short-term costs of the transition pale in comparison to the costs of unfettered climate change in the medium to long term”. See Alogoskoufis et al. (2021), p. 5. The importance of the costs of inaction is also a key result of the latest report of the Intergovernmental Panel on Climate Change – see IPCC (2022).

channels of physical and transition risks can be described relatively accurately. Physical risks arise from climate-related events, such as droughts, heat waves, floods caused by intensified rainfall, storms, and rising sea-levels that may result in operational disruptions and/or financial losses for banks. Such extreme weather patterns could for example be witnessed in the summer of 2021 in Europe with major river floods in Germany and Belgium on the one hand side, and forest fires in Greece, France, and Spain on the other. Transition risks result from the process of adjustment towards a lower-carbon economy and may take the form of changes in climate policy, technology, and market or consumer sentiment that can all prompt a reassessment of the value of a large range of assets, including those typically held by banks.

**Table 1.** Examples of climate and environmental risk drivers.

Risks affected	Physical		Transition	
	Climate-related	Environmental	Climate-related	Environmental
	<ul style="list-style-type: none"> <li>• Extreme weather events</li> <li>• Chronic weather patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Water stress</li> <li>• Resource scarcity</li> <li>• Biodiversity loss</li> <li>• Pollution</li> <li>• Other</li> </ul>	<ul style="list-style-type: none"> <li>• Policy and regulation</li> <li>• Technology</li> <li>• Market sentiment</li> </ul>	<ul style="list-style-type: none"> <li>• Policy and regulation</li> <li>• Technology</li> <li>• Market sentiment</li> </ul>
Credit	The probabilities of default (PD) and loss given default (LGD) of exposures within sectors or geographies vulnerable to physical risk may be impacted, for example, through lower collateral valuations in real estate portfolios as a result of increased flood risk.		Energy efficiency standards may trigger substantial adaptation costs and lower corporate profitability, which may lead to a higher PD as well as lower collateral values.	
Market	Severe physical events may lead to shifts in market expectations and could result in sudden repricing, higher volatility and losses in asset values on some markets.		Transition risk drivers may generate an abrupt repricing of securities and derivatives, for example for products associated with industries affected by asset stranding.	
Operational	The bank's operations may be disrupted due to physical damage to its property, branches and data centres as a result of extreme weather events.		Changing consumer sentiment regarding climate issues can lead to reputation and liability risks for the bank as a result of scandals caused by the financing of environmentally controversial activities.	
Other risk types (liquidity, business model)	Liquidity risk may be affected in the event of clients withdrawing money from their accounts in order to finance damage repairs.		Transition risk drivers may affect the viability of some business lines and lead to strategic risk for specific business models if the necessary adaptation or diversification is not implemented. An abrupt repricing of securities, for instance due to asset stranding, may reduce the value of banks' high quality liquid assets, thereby affecting liquidity buffers.	

Source: ECB (2020), p. 12

How should banks monitor and manage the climate-related physical and transition risks? To raise banks' awareness and preparedness for managing those risks, the European Central Bank (ECB) published in November 2020 a *Guide on climate-related and environmental risks* (hereafter the Guide) that allows to answer this question for euro area banks. The Guide is consistent with EBA and NGFS publications, and while it is non-binding and "serves as a basis for supervisory dialogue" with the

banks on these risks, the Guide clearly sets out “the ECB’s understanding of the safe and prudent management of climate-related and environmental risks under the current prudential framework”. (ECB, 2020). More specifically the Guide contains 13 supervisory expectations with more detailed sub-expectations that can be summarised as follows: Banks need to understand and monitor the impact of climate and environmental risks on their business, and integrate them into their strategy, governance, risk reporting and management (credit, operational, market and liquidity risk), as well as their external disclosures. If climate and environmental risks are found to be material for an institution, it should embed them in all of the above areas, including also in its business continuity planning and stress testing. How concretely physical and transitional risks may affect the traditional risks of banks, is illustrated with examples by the following table in the Guide:

The ECB’s banking supervisory arm, the Single Supervisory Mechanism (SSM), is serious about addressing the risks that climate change can bring, as this statement by the Chair of the SSM Andrea Enria shows:

We are not dealing with fundamental uncertainty, but with risk. [...] All of the available evidence shows that [climate change] is real, and it has consequences. But while we know that the challenge of climate change is a severe and potentially existential one, this knowledge also allows us to prepare. And prepare we must, the financial system included. ( Enria, 2020; Chenet et al., 2021)

The ECB is not alone in developing and publishing supervisory expectations on climate and environmental risks. Other supervisors that have done so include national competent authorities of the euro area such as De Nederlandsche Bank and Banco de España, but also for example the Danish Financial Supervisory Authority, the Bank of England, and the Monetary Authority of Singapore.<sup>8</sup>

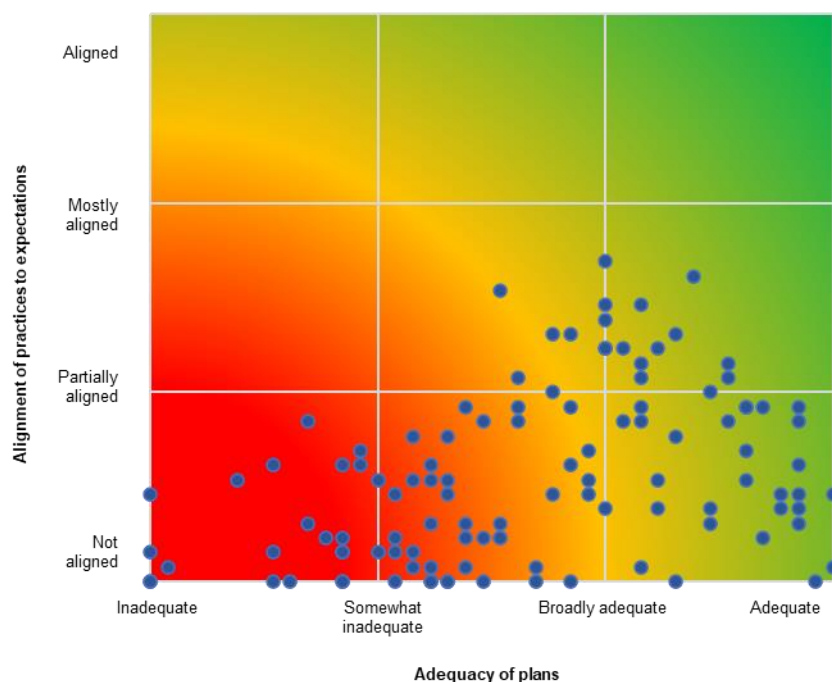
### **3. Voluntary action by banks versus regulatory action, seen from the euro area perspective**

After the publication of the Guide, all banks directly supervised by the ECB (“significant institutions” or SIs) were asked in early-2021 to assess their climate risk-related practices against the 13 Expectations, and their respective plans going forward. Following a supervisory review of these self-assessments and supervisory dialogues with the 112 SIs, the results of the exercise were published in anonymised form by the ECB in November 2021. They shed light not only on SIs’ exposure to and preparedness for physical and transition risks, but also help to answer the question if voluntary action by banks is sufficient.

Overall, the 112 SIs with total assets of 24 trillion euro are still lagging behind in addressing climate risks. None of the banks covered by the ECB’s first ever such assessment fully met all expectations regarding current practices, and less than one-fifth of institutions met most of them. In terms of future plans to close the gaps in their practices, the institutions generally scored better with one-third of banks having plans in place that were at least broadly adequate (see Figure 2 based on weighted average scores).

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<sup>8</sup> For the complete list of examples, see Table 3 in NGFS (2021a), p. 46-47. Caldecott et al. (2021) contains an overview of some key micro- and macroprudential responses to climate and environmental risks and in particular stranded assets.



Source: ECB (2021), p. 4

**Figure 2.** Alignment of SI's practices and plans with ECB expectations to address climate risks.

Examples of voluntary action by banks include the “Principles for Responsible Banking” launched in 2019 with now over 270 banks, and the “Net-Zero Banking Alliance” launched in April 2021, which passed the 100-member mark in January 2022, representing over 43% of global banking assets, and the signatories of which committed to align their lending and investment portfolios with net-zero emissions by 2050.<sup>9</sup>

To cope with the risks posed by climate change, it may however not be enough to solely rely on voluntary action by banks. The results of the ECB's exercise in 2021 seem to suggest that for climate risks, banks' self-awareness and proactivity can be enhanced by supervisory and also regulatory action. Formulating supervisory expectations how to deal with climate risks and providing feedback to the banks how they compare with their peers, has proven effective in the supervisory dialogues with the SIs to increase their ambitiousness. Also the fact that the scores for banks' plans surpass those for their current practices by some margin could be seen as an indication that the expectations and the benchmarking exercise fulfilled their purpose of raising banks' awareness of climate risks and getting them to start swiftly acting on them.

In its report on the outcome of the exercise, the ECB also highlighted good practices of SIs (with different business models and sizes) for exactly the reason that other SIs could learn from those practices to speed up their alignment with the 13 expectations, and to close the gaps identified during

<sup>9</sup> For details on the Principles for Responsible Banking, see <https://www.unepfi.org/banking/bankingprinciples/>. The Net-Zero Banking Alliance initiative (see <https://www.unepfi.org/net-zero-banking/>) is the banking element of the “Glasgow Financial Alliance for Net Zero” (GFANZ) launched in April 2021 by Mark Carney, UN Special Envoy for Climate Action and Finance and UK Prime Minister Johnson's Finance Adviser for COP26, and the COP26 Private Finance Hub.

the assessment. In total, 12 such practices were included under the four main sections of the report being business models, governance and risk appetite, risk management, and disclosures, and they range from strategy-setting procedures and specific qualitative and quantitative risk appetite indicators to materiality assessments and credit risk management. The fourth good practice lists a number of quantitative indicators used by banks, which are for example a *flood risk indicator at client level* to identify clients' assets with an increased flood risk, and a *transition risk indicator at sector level* measuring elevated sensitivity of highly affected industries to transition risk based on the recommendations of the Task Force on Climate-related Financial Disclosures set up by the FSB (TCFD, 2017). Another example is an *energy certificate indicator* that one institution uses to track the share of loans in its mortgage portfolio secured by real estate collateral that has a higher energy efficiency and is thus less exposed to transition risk.<sup>10</sup>

It is telling that the dozen good practices are observable across different SIs and that, while no single SI displays all of them, only an institution that would do so, may be considered as being fully aligned with the 13 expectations.<sup>11</sup> This means that the bar for a satisfactory climate risk management has been put relatively high, which in turn could be seen as an “educational” measure out of the conviction that purely relying on voluntary action by banks does not suffice to appropriately address climate risks.

Another indication that the ECB wants banks under its direct supervision to take climate risks seriously and make progress on “fully integrating [them] into their DNA”<sup>12</sup> is the fact that it will follow up the 2021 self-assessment by banks with a stress test and a thematic review on climate and environmental risks in 2022. The shortcomings identified in the 2021 exercise will be revisited as part of the thematic review, which is a bank-specific deeper dive into how SIs have embedded climate and environmental risks into their business strategy, governance, risk appetite, and general risk management framework, as well as for different sub-sets of SIs, into their concrete management of credit, market and operational risk.

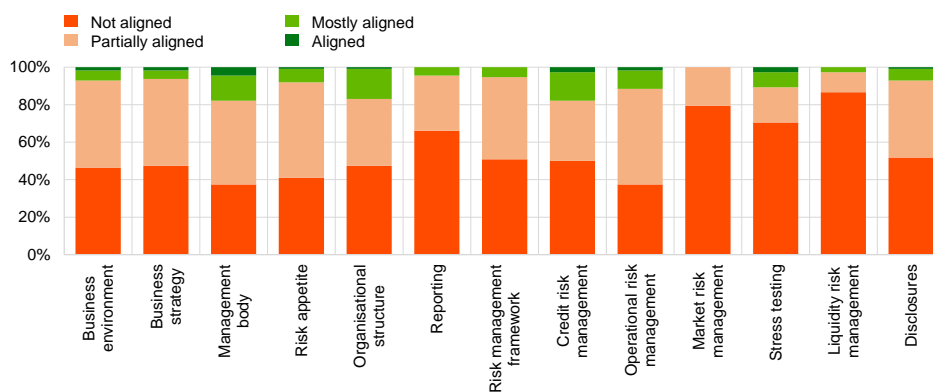
The expectations set out in the 2020 Guide are the points of reference for both the stress test and the thematic review, and in particular for the different modules of the latter, the detailed sub-expectations of the Guide form the basis for the assessment. The 2021 self-assessment and subsequent supervisory review had revealed that in some areas such as market and liquidity risk management, stress testing and internal reporting, SIs have a particularly long way to go to align themselves with the ECB's expectations (see Figure 3), so it will be interesting to see via the 2022 exercises which progress banks have made in the meantime in those areas, but also more generally in terms of climate risk management.

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<sup>10</sup>For all three examples, see Table A in ECB (2021).

<sup>11</sup>The report namely also states that “these good practices merely serve as an illustration and are not necessarily replicable, nor do they necessarily ensure alignment with supervisory expectations”. See ECB (2021).

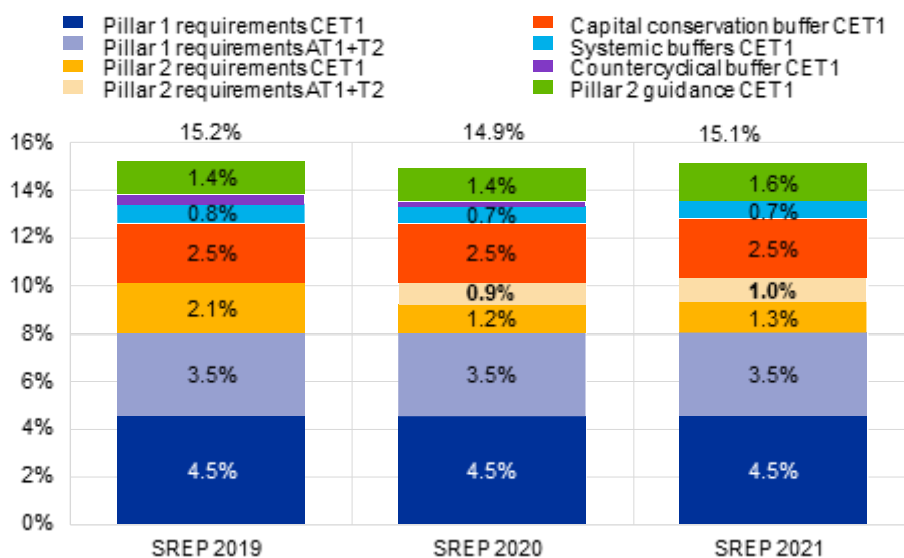
<sup>12</sup>See the blog post by Frank Elderson, ECB Executive Board Member and SSM Vice-Chair, 22 November 2021.



Source: ECB (2021), p. 12

**Figure 3.** Alignment of SIs' practices with expectations set out in ECB's 2020 guide (percentages).

With the stress test and thematic review, the ECB as banking supervisor moving up a gear on climate and environmental risks, the exposure to which have also been identified as a key vulnerability going forward, and hence these risks have been included in the SSM supervisory priorities for 2022–2024 as “emerging risks” that banks need to tackle.



Source: Enria (2022), right-hand side of Chart 5, p. 6

**Figure 4.** Overall capital requirements and guidance across all SIs.

It is worth noting that the results of the thematic review and the climate stress test will both feed into the 2022 Supervisory Review and Evaluation Process (SREP). The results will not only be integrated qualitatively in the SSM supervisory review process (Pillar 2), but potentially also quantitatively as they might via the SREP scores indirectly impact the capital that banks are required to hold, namely their Pillar 2 Requirement (P2R) (ECB, 2022), but not – as is usually the case with stress tests for SIs – the Pillar 2 Guidance (P2G). Over the last three SREP cycles, the average P2R across the total SI population – to be held in Common Equity Tier 1 (CET1) and due to the pandemic



exceptionally in 2020 and 2021 also in Additional Tier 1 (AT1) and Additional Tier 2 (AT2) capital – ranged between 2.1% and 2.3% of SIs’ risk-weighted assets (see Figure 4).

#### 4. Inclusion of climate-related requirements into the rulebook for banks

Apart from the supervisory realm, the speed of climate-related action is also increasing in the regulatory space, both at European and global level: At the European Banking Authority (EBA), work is underway on all three pillars (EBA, 2022), and after already publishing two analytical reports on climate risks in April 2021, the Basel Committee on Banking Supervision (BCBS) has in November 2021 released a public consultation on its *Principles for the effective management and supervision of climate-related financial risks*.<sup>13</sup> An important question however is whether climate risk-related changes to the rulebooks for banks should only be of a qualitative, or also of a quantitative nature, and how quickly these changes can be expected to happen in each case. Views on this vary quite a lot. While some central banks and supervisory authorities, as well as some observers, hope or even expect climate risk-related capital rules to be introduced rather sooner than later<sup>14</sup>, some others are more sceptical. Andrew Bailey A (2021) for example, the Governor of the Bank of England and its former Deputy Governor for Prudential Regulation, told the Reuters Responsible Business Conference in mid-2021 inter alia the following:

[...] Any incorporation of climate change into regulatory capital requirements would need to be grounded in robust data and be designed to support safety and soundness while avoiding unintended consequences or compromising our other objectives. In my view, the case for this has yet to be clearly established and possibly may never be. But our work to improve climate disclosures, scenario analysis, and risk management, could help unlock such assessments.

Time may not yet be ripe for the introduction of “carbon capital rules”, as Reuters (2021) called them, but it could be expected that eventually they will come, once the remaining data gaps, and also methodological issues, that still prevent the introduction of such rules, will have been sufficiently addressed.

While it is open how long this will take<sup>15</sup>, what is already happening, as the example of the SSM<sup>16</sup> shows, is not only the formulation of and scrutiny against supervisory expectations, but also the imposition of qualitative requirements for climate and environmental risks. The legal basis for the latter, and also for indirect quantitative requirements, does already exist in the European prudential

<sup>13</sup> See BCBS (2021) – as comments on the principles were invited by 16 February 2022, they were not yet available at the time of writing of this paper. The BCBS has also established a Task Force on Climate-related Financial Risks (TCFR), which is co-chaired by Kevin Stiroh from the Federal Reserve Bank of New York, and by Frank Elderson from the ECB. The TFCR is also the author of the BCBS report on transmission channels mentioned in footnote 7.

<sup>14</sup> See Caswell (2022), who writes for *Green Central Banking* and interprets statements by Frank Elderson at the SSM industry outreach on 18 February 2022 in the direction of climate capital requirements already being “on the way”.

<sup>15</sup> See in this context also Andrea Enria’s speech, in which he addresses “the capital question”: Enria (2022).

<sup>16</sup> Smoleńska and van ‘t Klooster (2021) call the SSM initiative a “microprudential approach” to climate risk and contrast it with a “credit guidance approach” as a more effective but riskier alternative to greening EU banking.

framework, in particular via Articles 73, 74, 76, 79, 83, 85 and 91 of the Capital Requirements Directive (CRD), and also further specified in various relevant Guidelines by the EBA<sup>17</sup>.

In order to nevertheless strengthen the resilience of the EU banking sector to environmental, social and governance (ESG) risks, while at the same time “contributing to the transition to climate neutrality”, the European Commission has in its proposal for amendments to the CRD and the Capital Requirements Regulation (CRR) not only further articulated the integration of climate and environmental risks into the legal framework, but also included specific provisions for banks to develop transition plans, and for supervisors to scrutinise them.<sup>18</sup> Other areas where further work is ongoing or still needed include the disaggregation of the traditional ESG notion into its environmental, social and governance parts, and within the “E” part also the disentanglement of climate risks from environmental risks beyond climate change, such as pollution, water stress, land degradation and the loss of biodiversity. These issues, as well as the measurement of these latter risk drivers that cannot be captured by carbon footprint or greenhouse gas emissions, pose non-trivial methodological challenges that all the existing work of supervisors, regulators and standard-setting bodies has not yet been able to fully address.

What is clear is that apart from the banks, the “early movers” of which increasingly see adequate climate risk management also as a source of reputational gains and competitive advantages, and apart from their supervisors, also banking regulators may play an important role: They could enhance banks’ resilience to climate and environmental risks by adjusting the rulebooks, thereby also flanking the green transition.

Due to the long horizon of climate change that Marc Carney famously called a “tragedy [...] imposing a cost on future generations that the current generation has no direct incentive to fix” (Carney, 2015), solely relying on the far-sightedness of banks and their intuition to grasp the opportunities offered by pro-active climate risk management is apparently not enough. Banks must instead be “helped” by supervisors, which in turn should be helped by regulators to get the necessary supervisory powers to incite the banks to act on climate and environmental risks. And it goes without saying that these “incentives” for banks are far bigger if the regulatory requirements for climate and environmental risks are not only of a qualitative, but also a quantitative nature: It is the percentage of capital that banks can save, that may accelerate their action.

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<sup>17</sup> One example are the EBA’s *Guidelines on loan origination and monitoring*, the paragraph 57 of which states the following: “Institutions should take into account the risks associated with ESG factors on the financial conditions of borrowers, and in particular the potential impact of environmental factors and climate change, in their credit risk appetite, policies and procedures. The risks of climate change for the financial performance of borrowers can primarily materialise as physical risks, such as risks to the borrower that arise from the physical effects of climate change, including liability risks for contributing to climate change, or transition risks, e.g. risks to the borrower that arise from the transition to a low-carbon and climate-resilient economy”.

<sup>18</sup> See European Commission (2021). The corresponding press release states the following: “Today’s proposal will require banks to systematically identify, disclose and manage ESG risks as part of their risk management. This includes regular climate stress testing by both supervisors and banks. Supervisors will need to assess ESG risks as part of regular supervisory reviews. All banks will also have to disclose the degree to which they are exposed to ESG risks. To avoid undue administrative burdens for smaller banks, disclosure rules will be proportionate”.

## 5. Conclusions and outlook

Climate change poses an existential threat to mankind, and in the green transition that is necessary to ensure the long-term liveability of our planet, banks play an important role as they finance the economic activities that need to become more sustainable. By giving preference to climate- and environment-friendlier borrowers and green assets in their lending and investment decisions, banks have considerable leverage over economic actors and financial market participants and can support the transition to a greener economy. At the same time, banks must monitor and manage the risks that emanate from climate change or environmental degradation and that impact their clients and also themselves via various transmission channels. It is especially in this area of physical and transition risks stemming from climate-related and environmental damage that also banking supervisors and regulators play a crucial role, as solely relying on voluntary action by banks does not seem to be sufficient for making fast enough progress in this area. At least this can be concluded from the analysis of the experience in the euro area where banks are now acting on climate and environmental risks, which they surely would not have done without the described activities of supervisors and regulators.

By setting supervisory expectations how banks should deal with climate and environmental risks, and by following up on them via regular supervisory review processes and climate stress tests with qualitative and potentially quantitative implications for the banks, supervisors can induce banks under their supervision to improve the management of physical and transition risks related to climate change and environmental degradation. This is not only a theoretical consideration. The SSM experience with directly supervised banks in the euro area provides empirical evidence that such an approach also works in practice. In the future, it will also be important that more jurisdictions around the globe follow suit. So far, climate risk has not been treated as a new, standalone risk, but rather as a driver of the existing risk categories. By adapting the rulebooks for banks to make supervisory powers more explicit for imposing qualitative and quantitative – under Pillar 2 or even Pillar 1<sup>19</sup> – requirements on banks, also regulators may play a key role. While the current micro-prudential framework already allows to impose qualitative and also quantitative regulatory requirements on banks to ensure that they appropriately manage their climate and environmental risks, more explicit and direct supervisory powers for imposing quantitative requirements for those risks might be more effective. But introducing those powers will take time, and more efforts by the regulatory community will be needed, to close the remaining data gaps<sup>20</sup>, and also to address the methodological issues<sup>21</sup>, which are particularly pronounced for environmental risks beyond climate change. Going forward, it will thus be crucial for banks, supervisors and regulators to work and learn together, and to combine their efforts in order to live up to the challenges posed by climate-related and environmental risks.

In a speech in December 2021, Frank Elderson, who also used to head the NGFS<sup>22</sup>, has expressed this expectation in relation to its 2020 Guide for supervisors, but it also nicely summarises more

<sup>19</sup> A recent Financial Stability Institute (FSI) paper concludes that “given the longer time horizons and the higher degree of uncertainty associated with the materialisation of climate-related financial risks, standard Pillar 1 instruments might be suboptimal in addressing such risks”. See Coelho and Restoy (2022).

<sup>20</sup> See in particular the respective NGFS workstream and its latest progress report: NGFS (2021b).

<sup>21</sup> For more details see for example NGFS (2022) and BCBS (2021b).

<sup>22</sup> Since 2022, the NGFS is chaired by Ravi Menon, Managing Director of the Monetary Authority of Singapore.

generally where at the current juncture European banks and supervisors stand in terms of managing climate and environmental risks:

Both supervisors and financial institutions are in the early stages of the journey towards sound management of climate-related and environmental risks. It is therefore to be expected that the guidance will be refined, and the bar will be raised over time as expertise and regulations are developed and capabilities are improved (Elderson, 2021a).

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## Conflicts of interest

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