

Nieto, María J.; Papathanassiou, Chryssa

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# Financing the orderly transition to a low carbon economy in the EU: the regulatory framework for the banking channel

María J. Nieto<sup>1</sup> · Chryssa Papathanassiou<sup>2</sup>

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## Abstract

Among the largest economies of the world, the EU not only has set the most ambitious and legally binding objectives for the reduction of the GHG emissions but also it has accompanied these objectives with a “state of the art” regulatory framework in the realms of investor protection and safety and soundness. Our paper focuses on the bank financing channel and highlights regulatory areas for improvement. To mobilize the necessary funds worldwide, a degree of interoperability of regional taxonomies is required, which calls for international cross-pollination and coordination to mitigate financial risks and the risk of harmful market fragmentation (BCBS 2022, FSB 2022). Also, the full interoperability between the international and the EU corporate reporting standards is a desirable objective. A building bloc methodological approach would make such interoperability easier having the sustainability impact perspective of the “double materiality objective” as an additional layer of the international requirements well understood to all investors in EU undertakings. As per the inclusion of climate risks in prudential regulation, it is completed for Pillar 3 disclosures relating effectively with the EU Taxonomy. Climate risk’s long-term horizon still needs to be implemented in Pillar 2 by linking bank transition plans with stress testing based on climate risk scenario analysis covering both transition and physical risk. The inclusion of climate risks in Pillar 1 faces challenges similar to those of supervisors internationally. Fostering global ambition is an explicit objective of the EU. Its leadership on the realms of investor protection and prudential regulation of climate risks should ideally inform international cooperation and impregnate international standards. This will secure that investments for the fulfillment of the EU climate objectives will flow from in and outside the EU.

**Keywords** ESG · Climate risk · Banking supervision

**JEL Classification** G21 · K23 · O38

## Introduction

The orderly transition to a low carbon economy demands high investments in energy efficiency, renewable energies for electricity as well as technologies to capture and permanently storage CO<sub>2</sub> in the next ten years until 2030 (IEA, 2021, Wolf et al. 2021).<sup>1</sup> The European Union (EU) has a

legally binding strategy to fulfil the net zero GHG emissions around 2050 pledge enshrined in the EU Climate Law.<sup>2</sup> The academic research has so far focused on the impact of climate risk on financial stability, the macroeconomic effects and implications for the conduct of monetary policy ([14, 29, 16, Diffenbaugh et al. [18, 36]], as well as banks’ exposure

✉ Chryssa Papathanassiou  
chryssa@aya.yale.edu

María J. Nieto  
maria.nieto@bde.es

<sup>1</sup> Bank of Spain, Alcala 48, 28014 Madrid, ES, Spain

<sup>2</sup> EBS Law School, External Lecturer,  
Gustav-Stresemann-Ring 3, 65189 Wiesbaden, Germany

<sup>1</sup> Ph.D., Senior Adviser, Banco de España and, Dr. jur., LL.M (Yale), external lecturer, EBS Law School. The views are those of the authors and do not necessarily reflect those of the ECB or Banco de España.

Nieto [42] estimates that the required accumulated investments for the EU would be approximately 5% in terms of GDP in the 2025–2030 period to meet the Net Zero 2050 target.

<sup>2</sup> Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 (‘European Climate Law’), OJ L 243, 9.7.2021, p. 1–17.



to climate transition risk, an assessment of the effectiveness of capital requirements, and the impact of a climate shock on banks Nguyen et al. [41, 45], de Marco and Limodio (2022), Nieto (43, 44). Our paper, while taking into account the above research, focuses on bank regulatory prudential and business conduct approaches, and analyses the extent to which this new regulatory framework is consistent with channelling resources to finance the transition to a low carbon economy.

Considering the importance of bank financing in the EU (European [23], the objective of this paper is to make a critical assessment of the regulatory development of the European Commission's 2018 Action Plan on Sustainable Finance (the 2018 Action Plan) based on its three main objectives: i reorienting capital flows towards sustainable investment in order to achieve sustainable and inclusive growth; ii managing financial risks stemming from climate change and resource depletion and iii fostering transparency and long-termism in financial and economic decisions. Following the European Green Deal in 2019, the Commission published the 'Strategy for financing the transition to a sustainable economy' (the '2021 Strategy') as a new edition of the 2018 Action Plan with an added objective: (iv) fostering global ambition.<sup>3</sup> Our assessment covers safety and soundness, as well as market conduct financial regulation relevant for banks and it is based on the objectives in the 2021 Strategy.

We conclude that the EU not only has set ambitious objectives for the reduction of the Green House Gas (GHG) emissions but also it has accompanied these objectives with a "state of the art" regulatory framework in the realms of investor protection and safety and soundness following the implementation of the 2021 Strategy. The EU framework under development fosters international and EU investments for the fulfillment of the climate objectives.

This paper is organized in four sessions in addition to this introduction. Section "[How ambitious are the EU objectives to decarbonize? The importance of the bank financing channel](#)" presents the EU decarbonization objectives and briefly describes the policy levers to be used and the existing sustainable and green bank financing. Section "[Market conduct regulation as a tool to reorient capital flows towards sustainable bank finance](#)" analyses the EU market conduct regulations that will most directly affect banks in light of the objective of attracting capital flows and correcting market failures. Section "[Managing financial risks from climate change and natural depletion: The prudential regulatory approach](#)" assesses the developing EU prudential regulatory approach for climate risks. The last section concludes and highlights the challenges going forward.

<sup>3</sup> COM/2021/390 final.

## How ambitious are the EU objectives to decarbonize? The importance of the bank financing channel

Although the EU GHG emissions only account for approximately 6% of the global emissions at the end of 2019,<sup>4</sup> the EU abatement policies are ambitious in terms of objectives and policy levers.<sup>5</sup> Figure 1 shows the negative historical correlation between GDP (current prices PPP international USD) and CO<sub>2</sub>e (GHG in Mt -CO<sub>2</sub>e-) from peak in 1990 to 2018 (Panel A) and the estimated larger negative correlation needed for the 2020–2050 period (Panel B) to reach Net Zero around 2050.

The main legal instrument of the EU strategy is the EU Climate Law, approved in June 2021. The Climate Law sets a legally binding target of net zero GHG emissions and bounds both Member States and the "relevant" EU institutions to take the necessary steps to achieve the target. Among the largest economies of the world, the EU is the only one that has enshrined the net zero objective in law [42]. In order to operationalize these objectives, the EU Commission (EC) has proposed a package (denominated "Fit for 55")<sup>6</sup> that heavily relies on emissions pricing as a policy tool. Annex 1 summarizes the policy levers and the sectors affected by the "Fit for 55" package. In October 2022, the REPowerEU plan ramps up the ambition of objectives on renewables, energy efficiency and key hydrogen infrastructure. In order to finance key investments and reforms that will help achieve the REPowerEU objectives, Member States will be able to add a new REPowerEU chapter to their national recovery and resilience plans under NextGenerationEU (recovery plan to emerge from the pandemic and transform the EU economies including the environmental dimension).<sup>7</sup> According to the calculations of the EC, this greater ambition of objectives demands an additional investment push (public and

<sup>4</sup> Climate Data Watch (CAITS) 2019.

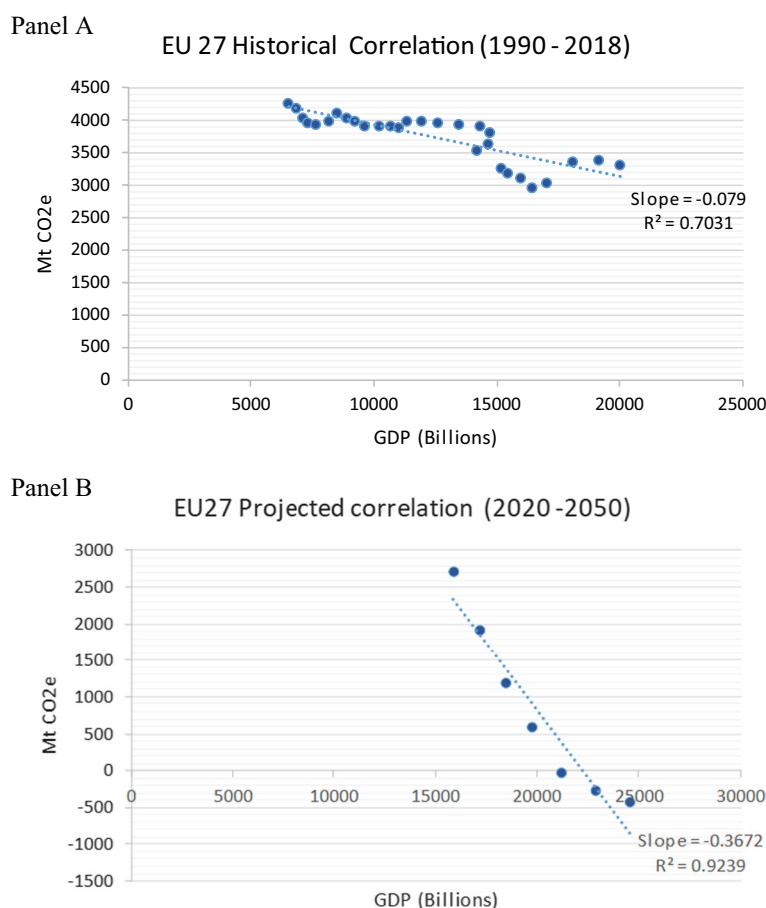
<sup>5</sup> Only the EU, UK, Chile and Costa Rica now have adequately designed net zero targets (Climate Action Tracker Climate Action Tracker), 2021 <https://climateactiontracker.org/publications/glasgows-2030-credibility-gap-net-zeros-lip-service-to-climate-action/> accessed 30/11/2021).

<sup>6</sup> Fit for 55 Package (20 September, 2021): <https://data.consilium.europa.eu/doc/document/ST-11840-2021-INIT/en/pdf>. The Council adopted its general approach on the environment-related proposals of the 'Fit for 55' package on 29 June 2022.

<sup>7</sup> REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition (18, may 2022) ([https://ec.europa.eu/commission/presscorner/detail/en/IP\\_22\\_3131](https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131) accessed 30 June, 2023; [https://www.consilium.europa.eu/en/press/press-releases/2022/10/04/repower-eu-council-agrees-its-position/?utm\\_source=dsms-auto&utm\\_medium=email&utm\\_campaign=EU+recovery+plan%3a+Council+adopts+REPowerEU](https://www.consilium.europa.eu/en/press/press-releases/2022/10/04/repower-eu-council-agrees-its-position/?utm_source=dsms-auto&utm_medium=email&utm_campaign=EU+recovery+plan%3a+Council+adopts+REPowerEU) accessed 13 March, 2023).



**Fig. 1** EU27 Correlations between nominal GDP and CO<sub>2</sub>e emissions to meet Net Zero emissions around 2050 *Source:* Historical data, Climate Data Watch (CAITS) 2009–2018. Nominal GDP current prices 2017 PPP international USD, IMF, World Economic Outlook April 2021. CO<sub>2</sub>e emissions projections REMIND-MAgPIE 2.1–4.2 model. Authors' elaboration



private) of up to 210 billion euros in total until 2027, in addition to what was calculated in the “Fit for 55” (520 billion euros per year in the next decade).<sup>8</sup> At least 37% of the Next Generation EU funds need to be allocated to climate change projects. In December 2021, as a comparison, the participation of EU banks in the syndicated environmental loans and sustainability loan markets amounted to 5.7 billion and 9.3 billion USD, respectively (REFINITIV LPC Deal Scan). Although these figures only represent bank financing via syndicated loans, they are indeed, far from the annual objectives set in the “Fit for 55” and the REPowerEU plans.<sup>9</sup> The objective of Environmental Loans is to finance in whole or in part new and/or existing eligible Green Projects, which should provide clear environmental benefits and comply with the Green Loan Principles, subject to a review process. The objective of Sustainability-Linked Loans is to incentivize the borrower’s achievement of ambitious,

predetermined sustainability performance objectives (Environmental, Social, Governance or ‘ESG’). Hence, in terms of the environmental objectives, this type of financing is key for the transition to a low carbon economy. The borrower’s sustainability performance is measured using predefined sustainability performance targets that should be consistent with the borrowers overall ESG strategy.<sup>10</sup> Figure 2 shows the syndicated Environmental Loans by type of industry in USD. Figure 3 shows the syndicated ESG loans (December 2021) in USD. Energy is the leading sector for use of proceeds as it is the case worldwide.

<sup>8</sup> Approximately half of the additional investment is explained by measures to accelerate the production of solar energy by 2025.

<sup>9</sup> Both types of lending represent a mere 2.7 percent of the total amount of required investment. If we add the green bonds issued in 2021, the financing represents an additional 52 percent.

<sup>10</sup> Borrowers must obtain independent and external verifications. Both types of loans comply with voluntary agreed recommended guidelines by the financial industry. For the definition of Environmental Loans see Green Loan Principles (2021) (<https://www.lsta.org/content/green-loan-principles/>) and for the definition of ESG loans see Sustainability – Linked Loan Principles(2022) (<https://www.lsta.org/content/sustainability-linked-loan-principles-sllp/>).



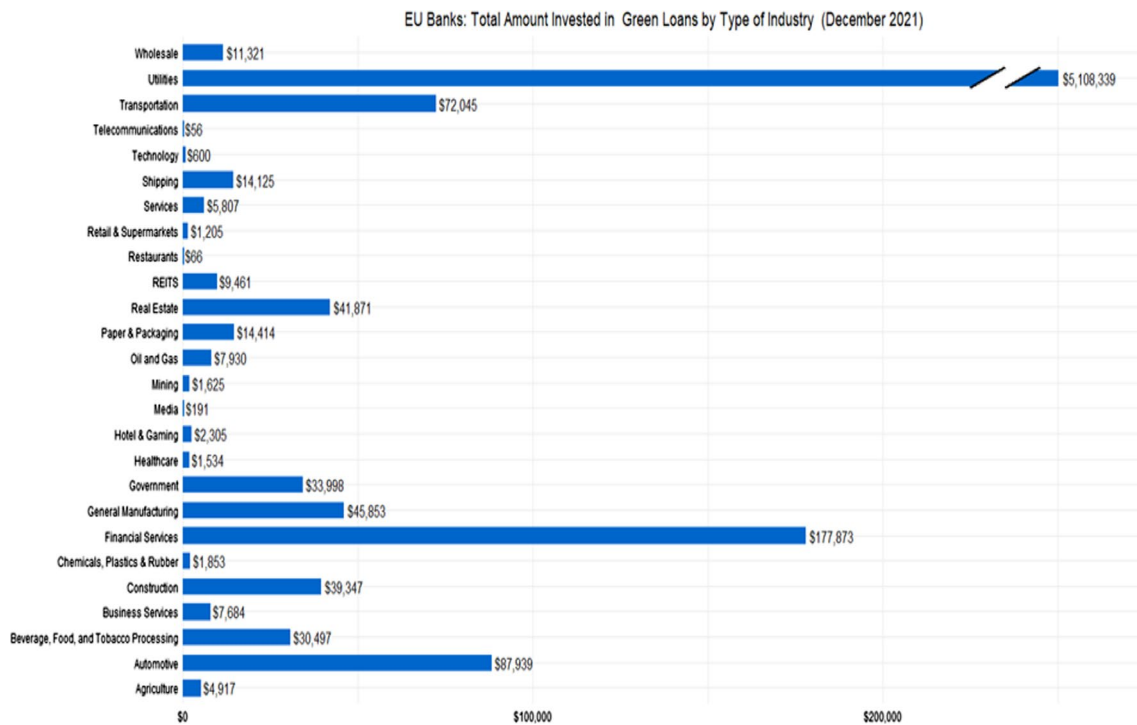


Fig. 2 Source: REFINITIV LPC Deal Scan

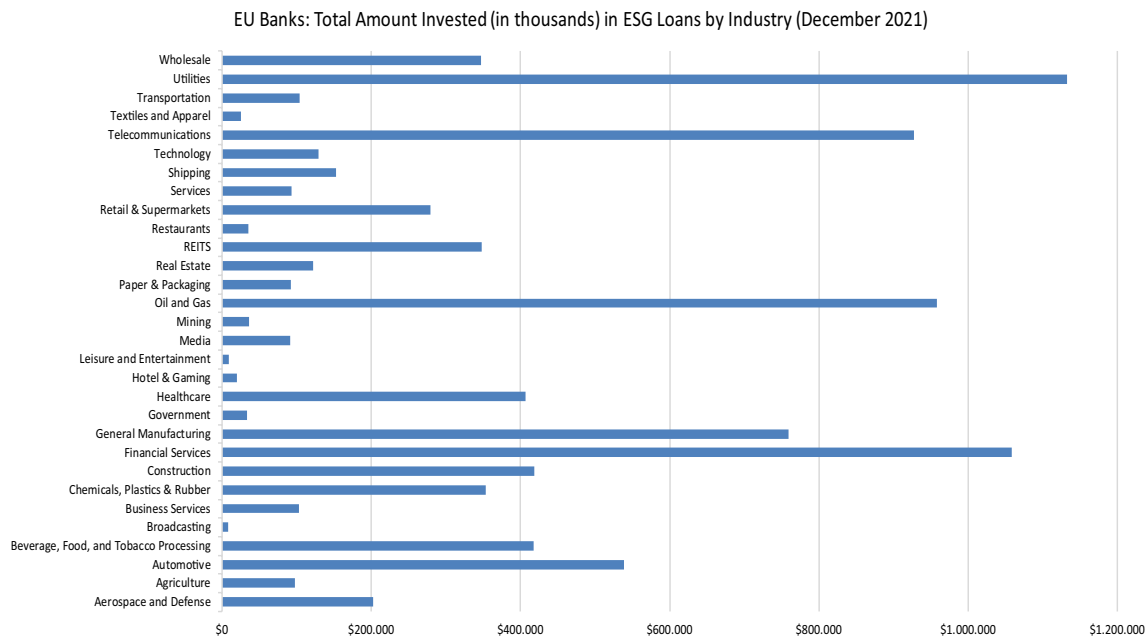


Fig. 3 Source: REFINITIV LPC Deal Scan. Environmental and ESG syndicated lending peaked in 2021 showing a growing upward trend from 2017

### Market conduct regulation as a tool to reorient capital flows towards sustainable bank finance

Based on the 2021 Strategy, the foundations of the EU sustainable finance strategy for financing the transition to a sustainable economy rests on three pillars: Taxonomy, disclosures, and a tool to prevent green washing (climate



benchmark regulation and green bond standards).<sup>11</sup> This section focuses on the first two given their importance for fair market conduct of deposit taking institutions.

### The EU classification system for sustainable activities: the Taxonomy

The EU defined the sustainable economic activities in the Taxonomy Regulation and delegated regulations ('EU Taxonomy')<sup>12</sup> and will periodically incorporate the scientific evidence available over the long cycle of decarbonization. Taxonomy-aligned (green) activities are those contributing substantially to one or more of the six environmental objectives and that do no significant harm to any others (DNSH principle) (climate change mitigation and adaptation, protection of water and marine resources, transition to a circular economy, pollution prevention, protection and restoration of biodiversity and ecosystems). In parallel, they must comply with minimum social safeguards and the technical screening criteria established in delegated regulations.

The EU Taxonomy is complemented by the technical criteria of the Sustainable Finance Delegated Regulation (Delegated Regulation)<sup>13</sup> which determine the economic activities that contribute substantially to climate change mitigation by avoiding and reducing greenhouse emissions, or by increasing long-term carbon storage. This shows the breadth of the financing needed to redirect the EU economy to sustainable activities [47]. The degree of alignment with the EU Taxonomy is monitored via the Green Asset Ratio (GAR)<sup>14</sup>, i.e. a banks' taxonomy-aligned exposures to counterparties

subject to disclosure under Directive 2014/95/EU compared to its total assets. The Delegated Regulation is being extended to significantly harmful and low impact activities with a transition focus.

This classification system is important because it helps to identify the recipient sectors and activities of the financing to reduce their emissions. For instance, transport accounts for 23% of EU direct greenhouse emissions, followed by energy (22%) and manufacturing (21%), and are subject to technical screening criteria to finance their decarbonization. In 2021, only an estimated 1.3% of the EU bond and equity markets financed taxonomy-aligned activities (bonds and equity borrow the taxonomy character of the activities they finance) [2]. There is growth potential for capital markets [10] and banks<sup>15</sup> to redirect more financial resources towards sustainable activities. For a taxonomy to be usable, it needs to be coupled by data from borrowers and banks that enable supervisors to assess if banks finance taxonomy-aligned activities and benchmark with peers [38].

As the transition to a low carbon economy is a world-wide effort, in comparison with other regions [38]<sup>16</sup>, the EU Taxonomy provides for clarity and disclosure for financial and non-financial firms, is dynamic, science-based, mindful of transition activities and international standards to ensure that green activities attract the requisite capital from in and outside the EU.

### Corporate sustainability reporting directive (CSRD) and the European sustainability reporting standards (ESRS)<sup>17</sup>

The CSRD is a regulatory framework for disclosure relevant for banks both directly (because they fall into its scope) and indirectly (because of the enhanced data stemming from corporates' disclosures).<sup>18</sup> More generally, the scope includes all large companies and all listed companies (except listed micro enterprises) and non-EU companies with branches or subsidiaries in the EU above certain thresholds expanded to include upstream and downstream value chain within the EU

<sup>11</sup> See Introduction of Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Strategy for Financing the Transition to a Sustainable Economy, COM(2021) 390 final. Strasbourg, 6.7.201 (<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0390>).

<sup>12</sup> Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020, p. 13–43 entered into force on 12 July 2020.

<sup>13</sup> Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, OJ L 442, 9.12.2021, p. 1–349. On 5 April 2023, the Commission launched a consultation regarding potential amendments to the above regulations, see [https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2022-environmental\\_en.pdf](https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2022-environmental_en.pdf). The EU Platform on sustainable finance provided its response on 3 May 2023, see [https://finan.ce.ec.europa.eu/system/files/2023-05/230503-sustainable-finance-platform-response-draft-taxonomy-delegated-acts\\_en.pdf](https://finan.ce.ec.europa.eu/system/files/2023-05/230503-sustainable-finance-platform-response-draft-taxonomy-delegated-acts_en.pdf).

<sup>14</sup> Commission Delegated Regulation (EU) 2021/2178, OJ L 443, 10.12.2021, 9, Annex V, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2178>.

<sup>15</sup> EBF (2021), 43; Plavec [46], 307.

<sup>16</sup> Table 1.2, 21.

<sup>17</sup> The European Financial Reporting Advisory Group (EFRAG) is a private association established in 2001 with the encouragement of the European Commission to serve the public interest. EFRAG extended its mission in 2022 following the new role assigned to EFRAG in the CSRD, providing Technical Advice to the European Commission in the form of fully prepared draft EU Sustainability Reporting Standards (ESRS) and/or draft amendments to these Standards.

<sup>18</sup> Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (Text with EEA relevance), OJ L 322, p. 15–80).





and third countries, when necessary to allow understanding of material impacts.<sup>19,20</sup>

The ESRS implement the CSRD principles. Hence, the urgency of European institutions to develop this framework in parallel to the International Sustainability Standards Board (ISSB) that it is developing the International Financial Reporting Standards on sustainability (IFRS-ISSB). Note that the ISSB implementation will depend upon governments requiring their use.

A principle that is central to the CSRD is the “double materiality,” which is represented accordingly in the ESRS materiality assessment approach: a sustainability matter meets the criteria of double materiality if it is material from an impact perspective or from a financial perspective or from both.<sup>21</sup> Furthermore, the CSRD explicitly acknowledges that both “impact and financial materialities” are not only on equal terms but also intertwined. However, it must be recognized that it is not always easy to determine when impact materiality could affect cash flows of the company.<sup>22</sup>

A sustainability matter is material from an impact perspective if the undertaking is connected to actual or potential significant impacts on people or the environment over the short, medium or long term. This includes impacts directly caused or contributed to by the undertaking and impacts

which are otherwise directly linked to the undertaking’s upstream and downstream value chain.<sup>23</sup> This approach is different from the one of the IFRS-ISSB that focuses on “financial materiality” (Enterprise Value Impact), although it could be argued that “impact materiality” is implicitly considered as a source of risks and opportunities in the IFRS-ISSB S1 that requires to locate the information in the general purpose financial reporting.<sup>24</sup> By contrast, the CSRD requires the sustainability disclosure to be an identifiable and dedicated part of the management report.<sup>25</sup> This is a relevant difference of approach with the IFRS-ISSB. Assurance of such information by the statutory auditor or audit firm is an obligation, which confirms the integrated approach of the CSRD. The Commission shall adopt delegated acts in order to provide assurance standards for reasonable assurance of sustainability reporting no later than 1 October 2026.<sup>26</sup> The approach will be gradual from limited to reasonable assurance.<sup>27</sup> At present, the sustainability reporting requirements are sector agnostic, although in a second stage by 30 June 2024, the EU Commission will adopt a set of sustainability standard obligations specific to sectors.<sup>28</sup>

The list of sustainability matters to be covered includes ESG related matters.<sup>29</sup> The European Banking Authority (EBA) has publicly stated concerns in the implementation of double materiality when undertakings are asked to disclose how the prioritization of the negative impacts “on people

<sup>19</sup> CSRD (Recitals 29, 40 and 46; Article 1.3) and ESRS1 (Paragraphs 63 to 77). For three years, if a company cannot obtain value-chain information, it should explain: a) the efforts made, b) why information could not be obtained; and c) the plans to get information in the future.

<sup>20</sup> The CSRD (article 29b) requires the Commission to adopt: a first set of sustainability standards covering at least information needed by financial market participants subject to the Sustainable Finance Disclosures Regulation -SFDR- reporting obligations (European Commission Delegated Act supplementing Regulation (EU) 2019/2088: [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en)) and a second set of standards covering information that is specific to the sector in which undertakings operate. For non-EU companies with branches or subsidiaries in the EU above certain thresholds, standards are separate and not covering all reporting areas: impact focus and no reporting on risks. However, listed subsidiaries cannot use subsidiary exemption.

The entry into application is staggered: financial market participants subject to SFDR (reports published 2025), other large companies (reports 2026) and listed SMEs (reports 2027).

<sup>21</sup> ESRS 1 paragraph 46.

<sup>22</sup> CSRD (Recital (29)). In the consultation process of the ESRS, EBA encourages the EFRAG to provide more guidelines and examples regarding the impact materiality, in order to clarify:

the scope of the impact materiality; the affected stakeholders; and which sustainability issues are relevant only from the impact perspective and they are expected not to produce financial effects even in the medium and long term (1.B Overall ESRS Exposure Drafts Relevance\_ Implementation of CSRD Principles. April 2022).

<sup>23</sup> ESRS 1 paragraph 49. The ESRS also envisages requirements for preparing and presenting adverse impacts and financial risks of actions or action plans to avoid sustainability impacts or financial risks that may have adverse effects on another sustainability topic or subtopic (ESRS 1 paragraph 125).

<sup>24</sup> “A reporting entity shall disclose material information about all of the significant sustainability-related risks and opportunities to which it is exposed” (IFRS-ISSB 1 Paragraphs 1 to 7). The CSRD (Article 29b(2)) explicitly acknowledges that the EU standards should take into account to the greatest extent possible the work of global standard-setting initiatives for sustainability reporting.

<sup>25</sup> CSRD Article 19a(1) and ESRS 1 (paragraph 144 to 152).

<sup>26</sup> CSRD Article 26a(3).

<sup>27</sup> CSRD Recital (60).

<sup>28</sup> CSRD Recitals 53 and 54, and Article 29b. The sector-specific standards should be proportionate to the scale of risks and impacts in the sector concerned. Hence, particularly relevant in sectors with high impacts.

<sup>29</sup> CSRD (Article 29b). In the consultation process of the ESRS, EBA encourages the EFRAG to provide more guidelines and examples regarding the impact materiality, in order to clarify:

the scope of the impact materiality; the affected stakeholders; and which sustainability issues are relevant only from the impact perspective and they are expected not to produce financial effects even in the medium and long term (1.B Overall ESRS Exposure Drafts Relevance\_ Implementation of CSRD Principles. April 2022).



or the environment over the short, medium or long term” reflects their severity and likelihood.<sup>30</sup>

<sup>31</sup>The reporting time horizon covers the short term (one year), the medium term (two to five years) and the long term (more than five years).<sup>32</sup> Estimation uncertainties regarding possible future events influence on future cash flows, impacts on people or the environment and the likelihood of the possible outcomes are contemplated and also are subject to requirements. The CSRD on sustainability reporting standards for SMEs specifies reporting requirements for listed SMEs. This is a reduced list from the requirements that will apply to other companies under scope. Also, the CSRD opens the possibility for SMEs to opt-out after a transitional period of two years.<sup>33</sup>

Reflecting the principle of double materiality, the scope of application of CSRD/ESRS refers to a broader group of stakeholders than just primary users that need the information to assess the enterprise value (investors, lenders and other creditors). Indeed, the scope of application reflects the needs for transparency corresponding to sustainability as “European public good.”<sup>34</sup> Moreover, explicit sustainability due diligence requirements will be legally binding.<sup>35</sup> The presentation of sustainability information should be clearly differentiated from other information included in the management report.<sup>36</sup>

Source: ESRS 1 paragraph 86 and authors’ analysis.

<sup>30</sup> ESRS 1 (paragraph 74b(iii)). All topical standards need to be covered, hence, the prioritisation is expected to focus on disclosures within a standard or a phasing-in.

<sup>31</sup> The CSRD (article 29b paragraph 1) requires the Commission to adopt: a first set of sustainability standards covering at least information needed by financial market participants subject to the Sustainable Finance Disclosures Regulation -SFDR- reporting obligations (European Commission Delegated Act supplementing Regulation (EU) 2019/2088: [https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector\\_enfinance/sustainable-finance/sustainability-related-disclosure-financial-services-sector\\_en](https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_enfinance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en)) and a second set of standards covering information that is specific to the sector in which undertakings operate. For non-EU companies with branches or subsidiaries in the EU above certain thresholds, standards are separate and not covering all reporting areas: impact focus and no reporting on risks. However, listed subsidiaries cannot use subsidiary exemption. The entry into application is staggered: financial market participants subject to SFDR (reports published 2025), other large companies (reports 2026), listed SMEs (reports 2027) and non-EU companies with branches/subsidiaries (reports 2029).

<sup>32</sup> ESRS 1 (paragraphs 83 and 84).

<sup>33</sup> CSRD (Recitals 21; Article 1 (7)). CSRD leaves the door open to the possibility of “voluntary” use also by non-listed SMEs (Recital 21).

<sup>34</sup> CSRD Recital 39.

<sup>35</sup> On 23 February 2022, the Commission adopted a proposal for a Directive on corporate sustainability due diligence.

<sup>36</sup> ESRS1 (Paragraphs 108–109). This is different from the IFRS1 that requires to locate the sustainability information in the general purpose financial report.

Given the global nature of capital markets, the full interoperability between the IFRS-ISSB and the CSRD-ESRS is the most desirable objective. A building bloc methodological approach would have made such interoperability easier having the “double materiality objective” as an additional layer of requirements well understood to all investors in EU undertakings.

## Managing financial risks from climate change and natural depletion: The prudential regulatory approach

The ESG risks must be included in Union law owing to their materiality (EBA 2021), namely in the prospective revised banking regulation (Capital Requirements Regulation (CRR3)<sup>37</sup>/Capital Requirements Directive (CRD6)<sup>38</sup>) and the mandates to the EBA on sustainable finance: Under Article 98(8) CRD5, EBA shall first, assess the potential inclusion in the supervisory review and evaluation process (SREP) of ESG risks; second, define the Pillar 3 quantitative and qualitative disclosures of ESG (Article 449 a) CRR); and third, whether a dedicated prudential treatment for exposures associated with climate and environmental risk would be justified (Article 501c CRR and Article 34 IFR).

The above legislation will have three consequences.<sup>39</sup> First, banks will be required to manage their exposures to ESG risks. Second, it will have an impact on banks’ lending behaviour and will induce them to lend to carbon reduction and renewable energy activities.<sup>40</sup> Third, the disclosure mandated by the regulation indirectly mitigates the financial markets’ inefficient pricing of carbon risk because information about climate risk has been usually ignored.<sup>41</sup> However, information on GHG emissions (particularly Scope 3) face methodological limitations as well as limited reliability and

<sup>37</sup> COM(2021) 664 final, [https://eur-lex.europa.eu/resource.html?uri=cellar:14dcf18a-37cd-11ec-8daf-01aa75ed71a1.0001.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:14dcf18a-37cd-11ec-8daf-01aa75ed71a1.0001.02/DOC_1&format=PDF) with new definitions in Article 4 of ESG (point 52d), environmental risk (point 52e), physical (point 52f) and transitional risk (point 52 g).

<sup>38</sup> COM (2021) 663 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021PC0663>.

<sup>39</sup> New article 87a, amendments to Articles 73, 74, 76, 91, 98 on SREP, 100, 104 CRD5; Article 4, point 52d-i CRR3, (‘ESG risk’ means the risk of losses arising from any negative financial impact on the institution stemming from the current or prospective impacts of environmental, social or governance (ESG) factors on the institution’s counterparties or invested assets), Articles 449a and 501c CRR3.

<sup>40</sup> Mueller and Sfrappini (2022), 7. In Europe banks tend to lend to firms that will benefit from climate regulation.

<sup>41</sup> Bolton and Kacperczyk (2020) showed that investors do not fully integrate the carbon risk because the cash flow scenarios do not typically include carbon emissions and their possible repricing.





comparability [14].<sup>42</sup> For example total emissions may not be a reliable measure: in the automobile industry, Volkswagen AG declared similar average emissions with Stellantis NV by using different methodologies—even though the scope 1–3 emission intensity of Volkswagen AG was 4 times higher. Moreover, environmental ratings do not often match low carbon emissions [38], while existing transparency around their data and methodologies is insufficient (Nieto, 2020).

More in general, in parallel with the addition of ESG risks in the banking regulation, supervisors in and outside the EU<sup>43</sup> published their expectations for the identification of climate and environmental risks. In the euro area, the ECB's supervisory expectations apply to 111 significant institutions.<sup>44</sup> In comparison, the Office of the Comptroller of the Currency (OCC) and the Federal Deposit Insurance Corporation (FDIC) proposed six principles targeting the 32 largest US banks concerning governance, risk management, limits, disclosure, scenario analysis.<sup>45</sup> What all these expectations have in common is that they aim at instilling a forward-looking approach in banks' risk management with the use of long-term scenario analysis, since past historical records are not suitable to gauge climate risks. In addition, the results of the 2022 climate stress test feed qualitative elements into the SREP and may have an indirect effect on Pillar 2 capital requirements (P2R), but no direct impact on Pillar 2 guidance (P2G). An international alignment regarding the management of climate-related financial risks for banks and supervisors ([6], BCBS 2021) will help mitigate these risks and the risk of harmful market fragmentation (FSB 2022).

### Climate risk in Pillar 2: long-term horizon, regional and sectoral challenges

Climate and environmental risks are to be incorporated in their risk assessment by banks and their supervisors. On the one hand, the EBA [20, 22] expects banks to cover their

ESG risks in internal capital adequacy assessment process (ICAAP) and attribute capital for each risk or explain if the bank thinks this is not the case. A big challenge for banks and supervisors is to develop methodologies to detect and quantify those risks with a longer horizon that extends to 2050,<sup>46</sup> so this is work in progress, and quantitative considerations go in parallel with advancements in data quality, risk assessment methodologies, and disclosure.

On the other hand, the losses from the materialization of climate risk cannot be underestimated,<sup>47</sup> however, asking banks to set aside capital for risks that might materialize from 10 to 30 years, if economic policy tools and technological changes in the meantime are not successful in fighting climate change, is incompatible with the Pillar 1 prudential framework which relies on annual cycles (probabilities of default have one-year time horizon).<sup>48</sup> Instead, Pillar 2 is more flexible to handle climate risk as supervisors can avail themselves of a variety of “deterrence” tools before they opt for a capital add-on. Such measures vary from climate stress tests and thematic reviews to gauge banks' preparedness and climate risk literacy, setting limitations on certain exposures or distribution of dividends, asking for a strategic plan to address climate in the context of ESG risks and other qualitative requirements. Ultimately, bank-specific Pillar 2 additional capital can be imposed based on stress testing scenario based analysis and assessments of the business strategies and processes (EBA Guidelines on loan origination and monitoring<sup>49</sup>), governance (EBA Guidelines on internal governance<sup>50</sup> and on remuneration<sup>51</sup>), risk management (future EBA Guidelines on ESG risk management<sup>52</sup>), and business models, which need to be analysed until 2050.

While financial institutions committed voluntarily to financing green activities and drawing up transition plans [32] for that purpose, proposed Article 76 (2) of the future

<sup>42</sup> GHG emissions do not take into consideration the issuers' energy technology profile, which plays a key role in the firms' alignment to climate objectives and drives the forward looking exposure to transition risks.

<sup>43</sup> ECB 2020; UK PRA (2021), and ‘Enhancing banks' and insurers' approaches to managing the financial risks from climate change’, Supervisory statement 3/2019, 15 April.

<sup>44</sup> On 1 April 2022. The ECB Guide's supervisory expectations are based on Union law and the national transposition of Articles 74 and 76 of Directive 2013/36/EU.

<sup>45</sup> These principles will apply to banks with over 100 billion USD in total consolidated assets (32 banks on 31 March 2022). Principles issued for comments by the FDIC <https://www.govinfo.gov/content/pkg/FR-2022-04-04/pdf/2022-07065.pdf> and the OCC <https://www.occ.gov/news-issuances/news-releases/2021/nr-occ-2021-138a.pdf>.

<sup>46</sup> ECB (2022a), 21.

<sup>47</sup> The ECB (2022a), 6.

<sup>48</sup> Coehlo et al. (2016), 4.

<sup>49</sup> EBA/GL/2020/06, 29 May 2020, [https://www.eba.europa.eu/sites/default/documents/files/document\\_library/Publications/Guidelines/2020/Guidelines%20on%20loan%20origination%20and%20monitoring/884283/EBA%20GL%202020%2006%20Final%20Report%20on%20GL%20on%20loan%20origination%20and%20monitoring.pdf](https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Guidelines/2020/Guidelines%20on%20loan%20origination%20and%20monitoring/884283/EBA%20GL%202020%2006%20Final%20Report%20on%20GL%20on%20loan%20origination%20and%20monitoring.pdf).

<sup>50</sup> EBA/GL/2021/05, 2 July 2021, [https://www.eba.europa.eu/sites/default/documents/files/document\\_library/Publications/Guidelines/2021/1016721/Final%20report%20on%20Guidelines%20on%20internal%20governance%20under%20CRD.pdf](https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Guidelines/2021/1016721/Final%20report%20on%20Guidelines%20on%20internal%20governance%20under%20CRD.pdf).

<sup>51</sup> EBA/GL/2021/04, [https://www.eba.europa.eu/sites/default/documents/files/document\\_library/Publications/Guidelines/2021/1016720/Draft%20Final%20report%20on%20GL%20on%20remuneration%20policies%20under%20CRD.pdf](https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Guidelines/2021/1016720/Draft%20Final%20report%20on%20GL%20on%20remuneration%20policies%20under%20CRD.pdf).

<sup>52</sup> EBA (2021), <https://www.eba.europa.eu/eba-publishes-its-report-management-and-supervision-esg-risks-credit-institutions-and-investment>.



CRD6 renders transition plans a legal obligation. The current wording is risk-based concerning a potential misalignment of the business model with ‘Union policy objectives or broader transition trends towards a sustainable economy in relation to environmental, social and governance factors’. It should be improved by linking the transition plans to the climate scenario analysis, requiring the management body to develop milestones and Key Performance Indicators (KPIs) how bank products and services will become taxonomy-aligned over five-year intervals until 2050. Supervisors will be tasked to assess the transition plans (Articles 87a (4) CRD6).

The [26] stress testing showed that development/regional and small retail banks’ income relies disproportionately heavily on GHG-emitting sectors in Europe, while G-SIBs hold the largest share of exposures to carbon-intensive sectors. This shows that not only physical,<sup>53</sup> but also transition risks are not negligible, while their impact on banks may be heterogeneous. Since more than 60% of bank revenue is derived from 22 carbon-intensive EU sectors, banks need also to assess their customers’ transition plans to green activities.<sup>54</sup>

The long-term transition perspective that permeates the EU Taxonomy and the CSRD/ESRS framework is not yet reflected in the EBA SREP Guidelines, therefore, the EBA intends to update them with the ESG risks.<sup>55</sup> The EBA (2021) recognized that the existing assessment under the SREP may not enable supervisors to sufficiently understand ‘the longer-term impact of ESG risks’, which requires the introduction of a longer-term perspective in the supervisory assessment, in the form of an evaluation of whether credit institutions sufficiently test the ‘long-term resilience of their business models against the time horizon of the relevant public policies or broader transition trends, applying at least a 10-year horizon’.<sup>56</sup> Introducing this long-term approach is desired and vital because the Commission’s targets for the next decade up to 2030 and the target of net zero carbon emissions by 2050 is given for banks and supervisors. This long-term perspective should be enshrined in law to ensure that all banking supervisors follow this perspective, which is a novelty for the prudential framework. Systemic risk buffers<sup>57</sup> are thinkable in response to unaddressed systemic climate risk [5], but they do not introduce the long-termism

required in Pillar 2, which is a novelty for the existing prudential framework that focuses on historic trends and a short horizon of 1–5 years.<sup>58</sup>

On the other hand, the four SREP elements, business model, governance and risk management, risks to capital, and risks to liquidity need to be calibrated so that supervisors may assess different geographical and sectoral determinants of physical risks, as well as transition risks [39, 40].<sup>59</sup> The above considerations suggest that in the future, prudential assessments will likely assess the results of forward-looking scenario analysis<sup>60</sup> based on banks’ dynamic balance sheets, sectoral and geographical determinants of climate risk, and monitor long-term qualitative requirements for banks.

To sum up, climate and environmental risk is part of the ESG objective to be introduced in EU banking regulation, implementing the 2021 Strategy. In addition, banks’ transition plans<sup>61</sup> need to be linked more explicitly with climate stress testing providing a supportive narrative, as well as with the EU Taxonomy which defines sustainable activities. As a result of consensus reached in international fora (BCBS 2022a, BCBS 2022b, FSB 2022), the long-termism of climate risk will gradually inform Pillar 2 for transition plans and stress testing, which both should be aligned in terms of targets and scenarios.<sup>62</sup> For example, the International Energy Agency Net Zero Emissions by 2050 scenario is mandated by the EBA as a benchmark for emissions reduction targets in the Final draft implementing technical standards on prudential disclosures on ESG risks in accordance with Article 449a CRR. Stress tests should be based on climate risk scenario analysis in order to capture the uncertainties around climate risks, while progress is made with data availability, data quality and methodologies for forward-looking climate risk analysis.

### Pillar 3 disclosures for ESG risks

Market assessment of the attainment of climate objectives requires data from banks based on a reliable and consistent

<sup>53</sup> ECB (2022a), 42, found a strong heterogeneous impact of drought on banks depending on their geographic location.

<sup>54</sup> ECB (2022a), 28. High level best practices at p. 52.

<sup>55</sup> EBA (2021), 151; The current EBA SREP Guidelines [22] apply from 1 January 2023 and refer to ESG risks only in relation to the sustainability of the bank’s business models.

<sup>56</sup> EBA (2021), 12, 139.

<sup>57</sup> Article 113 CRD. For the US financial system, CFTC [17], ii.

<sup>58</sup> Coelho and Restoy (2022).

<sup>59</sup> NGFS [24, 39, 40].

<sup>60</sup> FSB (2022a), 9.

<sup>61</sup> Green transition plans are multiyear accounts of targets and actions that set out how a firm will ensure that its business model and strategy are compatible with environmental objectives, Dikau et al. (2022). <https://www.lse.ac.uk/granthaminstitute/publication/net-zero-transition-plans-a-supervisory-playbook-for-prudential-authorities/> Bank transition plans form part of a bank’s long-term strategic planning and build on their clients transition pathways which can then be used to estimate potential climate-related losses, [https://www.bankingsupervision.europa.eu/press/speeches/date/2023/html/ssm.sp230203\\_annex\\_2-ba0987ac97.en.pdf?ffe5b02059a678941f6e5a38b18a2f42](https://www.bankingsupervision.europa.eu/press/speeches/date/2023/html/ssm.sp230203_annex_2-ba0987ac97.en.pdf?ffe5b02059a678941f6e5a38b18a2f42);

<sup>62</sup> Alexander (2015); Alexander and Lastra (2022).



reporting framework. This explains why this is the first time that the prudential regulatory process prioritizes disclosure over capital requirements, without excluding a capital add-on at a later stage.<sup>63</sup> In the same vein, the Financial Stability Board (FSB 2022) sees the need for banks to report data, regularly, and ad hoc via thematic reviews, supervisors to conduct stress tests with climate scenarios.

A credible Pillar 3 framework demands consistent and comparable disclosures from banks. In line with the 2021 Strategy, the EBA [20, 22] closed this gap by following a sequential approach focusing first on the climate change risks. Using its powers under Article 434 a CRR, the EBA published Implementing Technical Standards on ESG (P3 ITS ESG), including reporting templates to cover ESG, and in particular climate risk.<sup>64</sup> The P3 ITS ESG apply to large banks with instruments traded in EU regulated markets and introduced the Banking Book Taxonomy Aligned Ratio (BTAR), i.e. green exposures to all counterparties over all assets to address the GAR's limitations.<sup>65</sup>

The EBA links the EU Taxonomy with the banking regulation because the P3 ITS ESG include templates for quantitative disclosure concerning climate change transition risk, and KPIs on climate change mitigating measures, including the GAR and the BTAR from the EU Taxonomy. Templates for qualitative disclosure concern climate change physical risk. Under Article 449a CRR large, listed banks must disclose information on ESG risks on a regular basis from 28 June 2022.

As mentioned in Sect. "Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS)", disclosure increases transparency as part of market conduct regulation, however, it may also intensify the wave of private climate-related litigation. The first private lawsuit seeking compensation owing to climate impact is true. In 2017, the Higher Regional Court of Hamm in Germany, ruled that a lawsuit brought by Saúl Luciano Lliuya from the Huaraz region in Peru against RWE, the energy company, (the Huaraz case) was admissible. Relying on research showing that the retreat of Andean glaciers is due to GHG emissions, the plaintiff asked for EUR 17,000 which represent the costs of preventing damage from a potentially devastating outburst flood from Lake Palcacocha. The plaintiff computed that RWE had contributed to 0.47% of historical global emissions and sued the

company for compensation to cover 0.47% of the cost of draining Lake Palcacocha and building a dam to save his house.<sup>66</sup> Other large GHG-emitters could face similar litigation in the future, as disclosure of ESG risks and more reliable data render computations easier to link the GHG-emitters to climate risks.<sup>67</sup>

Finally, litigation can provide impetus for more progress in respect of governments' climate commitments.<sup>68</sup> In this regard, when the German Federal Climate Change Act was challenged successfully at the Federal Constitutional Court, the latter affirmed that a lack of precautionary measures which are required by fundamental rights to guarantee freedom over time and across generations is incompatible with the state's duty of care which extends also to the future. As a result, the German Federal Parliament advanced the GHG-emission neutrality by five years to 2045 and raised the emission reduction rate by 2030 at 65% (instead of 55%).<sup>69</sup>

The ECB's priority until 2024 is to determine how resilient banks are to climate-related and environmental risks. As part of the 2022 thematic review, the ECB reviewed the risk management, strategy and governance, but also risk management practices for risks other than climate risks including biodiversity, water stress, and pollution.<sup>70</sup> Climate risks will be embedded in day-to-day supervision by joint supervisory teams (JSTs) and qualitatively integrated in the SREP scores, and thus may indirectly impact capital requirements, while supervisory measures are possible if banks fail to conduct a materiality assessment of climate and environmental risks.

To sum up, inclusion of climate risks in Pillar 2 and, definitely, in Pillar 3 is less controversial, while inclusion in Pillar 1 requires more analysis because it would transform the prudential framework profoundly.<sup>71</sup> Pillar 3 requirements are already in place, while the shape and form of Pillar 2 is under discussion.

<sup>63</sup> NFGS 2020, 52.

<sup>64</sup> Commission Implementing Regulation (EU) 2022/2453 of 30 November 2022 amending the implementing technical standards laid down in Implementing Regulation (EU) 2021/637 as regards the disclosure of environmental, social and governance risks (Text with EEA relevance).

C/2022/8396, OJ L 324, 19.12.2022, p. 1–54.

<sup>65</sup> EBA [20, para. 17].

<sup>66</sup> The decision is expected in 2023, <https://stiftungzukunft.org/en/court-taking-evidence-in-peru-for-rwe-case/>

<sup>67</sup> United Nations Environment Programme, Global Climate Litigation Report (2020), 27 identified greenwashing and failure to disclose climate information as potential bases for litigation; Setzer/Higham (2022), 19.

<sup>68</sup> Abraham et al. (2023), 10.

<sup>69</sup> BVerfG, Order of the First Senate of 24 March 2021—1 BvR 2656/18 –, paras. 1–270, 131, 142, 149; <https://www.bmu.de/gesetz/bundes-klimaschutzgesetz> 24 June 2021.

<sup>70</sup> [https://www.bankingsupervision.europa.eu/press/speeches/date/2022/html/ssm.sp220218\\_](https://www.bankingsupervision.europa.eu/press/speeches/date/2022/html/ssm.sp220218_)

annex ~ 1f075839e6.en.pdf; The final report is expected in October 2022.

<sup>71</sup> NFGS [39, 55].



## Is there a need for a dedicated prudential treatment for exposures to assets/activities associated with environmental risk (Pillar 1)?

In the context of the 2021 Strategy, the EBA was mandated to assess whether a dedicated prudential treatment for banks' exposures to environmental risk would be justified (Article 501c CRR and Article 34 IFR). Such mandate was subject to two restrictions: first, the sequencing of the mandate, which was only after the assessment of the potential inclusion of ESG risks in the SREP and the definition of the quantitative and qualitative Pillar 3 disclosures; and, second, the approach that EBA is asked to follow, which is a prudential risk-based approach as opposed to an economic policy approach.<sup>72</sup>

From the conceptual viewpoint, the prudential risk-based capital approach of climate-related financial risks faces a number of challenges. Most important, the particular characteristics of climate risks, which are global, characterized by nonlinearities and materialize over long-term horizons with high uncertainty.<sup>73</sup> Hence, scenario analysis [40] is an essential tool to assess the impact of climate risk on the economy and the financial system. In turn, the existing regulatory capital framework is backward-looking, as it relies on dependable historical data to calibrate the relationships between risk factors and exposures, including under adverse economic conditions or unexpected events. In the existing capital regulatory framework, long-term probabilities of default over the past business cycle are used to produce one-year estimates under the strong assumption of invariability of the banks' portfolio composition. This is at odds with the differences of vulnerability to climate risks across countries, regions, sectors and activities. Against this background, physical risks (particularly acute) that have materialized in the past and on which there is reliable data on the impact on defaults should already be incorporated in the capital assessment.

Regarding climate transition risks, the NGFS (2022b) concludes the historical analysis of the risk differential between green and non-green activities and or assets does not reach robust conclusions on the existence of evidence of such historical risk differentials. Other important limitation is the lack of dependable data on climate-related risks and the parameters to assess particularly transition risks (FSB

2012). Bressan et al. (2022) highlight the need of harmonization of the methodologies used to gauge scope 1, 2 and 3 emission intensities.

These challenges of quantifying and modelling climate-related financial risks also limit the possibility to use macroprudential tools to disincentivize banks' exposure to climate risks as discussed above.<sup>74</sup> In this context, the use of non-risk-weighted prudential tools such as the limits to large exposures are open to debate. Any penalizing treatment should be fully consistent with the EU Taxonomy still under development and in line with Pillar 3 requirements. The climate risk conceptual framework would need to be based on the assessment of corporate activities and not on a particular corporate or a group of connected firms. Hence, the revision of the current framework for large exposures would be needed. Still, we could only speculate whether a large exposures limit to corporate activities that are not aligned with EU Taxonomy would provide the sufficient incentive to lend to sustainable activities and, in case the climate risks materialize, whether it would be sufficient to cover the ensuing losses.

Against this background, the EBA has published a Discussion Paper on the role of environmental risks in the prudential framework for credit institutions and investment firms.<sup>75</sup> The Paper explores whether and how environmental risks are to be incorporated into the Pillar 1 prudential framework. It launches the discussion on the potential incorporation of a forward-looking perspective in the prudential framework. It also stresses the importance of collecting relevant and reliable information on environmental risks and their impact on institutions' financial losses.<sup>76</sup> Table 1 summarizes the limitations to assess climate risks for the purpose of the bank capital framework. The leverage ratio, liquidity ratios, securitizations and macroprudential tools are excluded from this consultation process. The Paper acknowledges that to the extent that environmental risks are already captured in the existing prudential framework, any further adjustment should be designed bearing in mind that double counting should be avoided. The EBA does not favour risk-weighted adjustment factors "given the various challenges

<sup>72</sup> The "Green Supporting Factor" could be considered an economic policy approach. For an analysis, see Nieto [8, 44].

<sup>73</sup> For a description of the characteristics of climate risk, see María J Nieto presentation at the 3<sup>rd</sup> JRC Summer School, 8 July, 2021 "Climate Scenario Analysis" [https://www.researchgate.net/publication/353364138\\_CLIMATE\\_SCENARIO\\_ANALYSIS](https://www.researchgate.net/publication/353364138_CLIMATE_SCENARIO_ANALYSIS)

<sup>74</sup> Baranović et al. (2021) analyze the gaps and limitations in the Pillar 1 framework for credit, market and operational risks as well as the leverage and liquidity ratios.

<sup>75</sup> EBA Discussion paper on the role of environmental risks in the prudential framework <https://www.eba.europa.eu/regulation-and-policy/credit-risk/discussion-paper-role-environmental-risk-prudential-framework>. (accessed 23/03/2023).

<sup>76</sup> EBA Discussion paper on the role of environmental risks in the prudential framework <https://www.eba.europa.eu/regulation-and-policy/credit-risk/discussion-paper-role-environmental-risk-prudential-framework>. (accessed 23/03/2023).





**Table 1** Challenges to assess climate risks

	Lack of good quality data and methodologies (e.g. Scope emissions) on environmental factors	Lack of fully developed standardized classification system	Uncertainties regarding the quantification of acute physical risk (e.g. geolocation information) and mitigation strategies	Lack of transparency of methodologies and comparability of ESG ratings	Climate risk is just one determinant of credit, market and operational risks
Corporates (includes financial and non-financial, SMEs)	X Specially SMEs	X Taxonomy needs to develop: (i) other than the climate mitigation objective (ii) the “do not significant harm” “to the six environmental objectives (iii) identify low environmental impact activities	X	X	X
Sovereigns	-	X	X	X	X

Source: EBA Discussion Paper (2022) and authors' analysis

associated with their design and implementation.” Last but not least, the EBA acknowledges that “Fundamental questions remain as to whether risks to the overall system are likely to grow due to increased environmental risks or if it is more likely that environmental risks imply the need for a reassessment of the risk profiles of firms and sectors in a way that is predominantly neutral to the overall capital requirements.”

## Conclusions

<sup>77</sup> Among the largest economies of the world, the EU not only has set the most ambitious and legally binding objectives for the reduction of the GHG emissions but also it has accompanied these objectives with a “state of the art” regulatory framework in the realms of investor protection and safety and soundness following the implementation of the 2021 Strategy. The EU framework fosters investments for the fulfillment of the climate objectives. Our paper focuses on the bank financing channel.

As the transition to a low carbon economy is a worldwide effort, international Taxonomy benchmarks would be desirable. Thus far, the EU Taxonomy has focused on ensuring that green activities attract investments. The Taxonomy is being extended to significantly harmful and low impact activities with a desirable transition focus. To mobilize the necessary funds worldwide, a degree of interoperability of regional taxonomies is required, which calls for a global approach to mitigate climate-related financial risks and the risk of market fragmentation.

While the EU will mandate the Corporate Sustainability Reporting standards developed by EFRAG through the CSRD, the ISSB will depend upon governments requiring their use. The tension with the EU is obvious also because the EU “double materiality” approach will demand that sustainability information, material from an impact perspective, should be clearly differentiated from other information included in the management report. Furthermore, explicit sustainability due diligence requirements are expected to be legally binding. The scope of application reflects the needs for transparency corresponding to sustainability as a “European public good.”

Climate risk will be introduced via the ESG risks in banking prudential regulation. The inclusion of climate and ESG risks in Pillar 3 disclosure is almost completed and links effectively with the EU Taxonomy. Climate risk long-term horizon still needs to be implemented in Pillar 2 to complete the 2021 Strategy by linking bank transition

<sup>77</sup> Berg et al. [11] analyzes the divergence among the ESG ratings.





plans not only with the EU Taxonomy, but also with stress testing based on climate scenario analysis for transition and physical risks using banks' dynamic balance sheets, in line with the guidance of the BCBS (2022). As per the inclusion of climate risks in Pillar 1, EU regulators face challenges similar to those of supervisors in other countries: 1) lack of good quality data and harmonized methodologies on environmental factors (e.g. Scope 1,2 and 3 emissions measurement); 2) lack of fully developed standardized classification system or taxonomy with a transitioning approach; 3) incomplete information necessary for the quantification of acute physical risk (e.g. geolocation information) and mitigation strategies; 4) lack of transparency of methodologies and comparability of ESG ratings.

As stated in the 2021 Strategy, fostering global ambition is an explicit objective of the EU. Its leadership on the realms of investor protection and prudential regulation of climate risks should ideally inform international cooperation and impregnate international standards on investor protection and safety and soundness regulation. This will secure that investments for the fulfillment of the EU climate objectives will flow from in and outside the EU.

## Appendix

See Table 2.

**Table 2** Table summarizing the policy levers and the sectors affected by the “Fit for 55” (including the new REPowerEU chapter) *Source: Authors' analysis*

		Electricity	Industry	Transport	Buildings
Explicit Pricing	ETS reform and creation of a separate ETS for buildings and road transport				
	Carbon Border Adjustment Mechanism				
	Revision Energy Taxation Directive				
Regulation	Energy Efficiency Directive				
	-New cars CO2 emissions restrictions -Ban on ICV vehicles -Targets for EV -EV Charging Networks -Revision alternative fuels infrastructure				
	Revision Renewable Energy Directive (targets)				
Financing	NextGenerationEU (NGEU)				
	Innovation Fund				
	Frontloading ETS allowances				
	Social Climate Fund (SCF)				



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## Declarations

**Conflict of interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

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**Maria Nieto** is a senior adviser at the Bank of Spain, with a particular expertise in financial stability, financial regulation and crisis management. Nieto has co-operated as an adviser for the International Monetary Fund and the Federal Reserve Bank of Atlanta, and she is member of the Advisory Panel of the Central Banking Training Advisory Board. Nieto previously worked for the European Central Bank, the Council of Economic Advisers to the Spanish president, European Bank for Reconstruction and Development, and the IMF. She has an MBA (finance) from the University of California, Los Angeles, and a PhD cum laude from the Complutense University of Madrid. Nieto received the Fundación Ramón Areces Scholarship to pursue graduate studies at UCLA.

**Chryssa Papathanassiou** is Team Lead-Legal Counsel at the ECB where she has worked in various functions for 24 years. Chryssa received the Friedrich-Naumann-Stiftung scholarship to complete her doctoral thesis at the University of Konstanz and completed an LL.M. at Yale Law School as a Fulbright Scholar. Chryssa is external university lecturer at the Law School of the European Business School (EBS) in Wiesbaden, Germany and has published articles on financial market infrastructures, banking supervision, and governance.

