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DESIGN OF A PRUDENTIAL TRANSITION PLAN TEMPLATE

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ABSTRACT:

Climate change represents one of the most significant systemic challenges of the XXI century, with deep consequences for financial stability and prudential supervision. Banks are exposed both to physical risks and to transition risks, which can propagate through the traditional channels. There is one specific tool that can help banks to disclose climate risk information: the transition plan template.

However, a credible and comparable transition plan template in line with prudential expectation was not available in the European banking sector before this thesis, which aim is to close this gap and guide banks to translate their climate strategies into operational prudential tools.

Strengthening the governance structure, the disclosure practices, risk management processes and the capital adequacy assessments, this thesis redefines the transition plan no longer as a mere sustainability document, but as a prudential instrument to guarantee an efficient communication.

OUTLINE

LITERATURE REVIEW

The theme of climate risk and its integration in the financial sector presents several challenges: a lack of reliable data, the relative novelty of the topic, and limited integration in certain regions of the world. In this context, the literature review plays a crucial role as it allows us to understand how the scientific and, above all, institutional debate has addressed this issue in recent years. Climate change and risks it generates have gradually emerged as a source of financial risk, pushing the academic community, supervisory authorities and institutions to develop new analytical instruments and methodologies to measure and manage these risks in both short and long term.

The impact of climate change on the financial sector is a relatively new and constantly evolving issue. One of the main challenges concerns the availability of data: often incomplete, inconsistent and non-comparable. The lack of historical data and consistent methodologies for comparable climate risk disclosure impedes market pricing and therefore the integration of climate risks into the financial sector (Bolton et al., 2020). Moreover, the lack of updated data on properties and geographical exposures to physical and transition risks constitutes a direct risk for banks, as they are unable to properly assess their exposure to climate risks (Harris & Arnold, 2025). This has also been confirmed by the ECB's analysis, which showed that banks were not able to collect adequate data on climate risks (ECB, 2022a).

To address this gap, new forms of financial disclosure have been introduced, though they are still in the process of consolidation. In Europe, the CSRD requires companies to report ESG information and to include transition plans in their management reports, thereby providing essential information for financial institutions. At the global level, the ISSB through IFRS S1 and IFRS S2, has introduced common standards for collecting data on how financial institutions report sustainability-related financial information.

But even when data are available, the traditional risk management methods, which rely on historical data, are considered inadequate in the assessment of future climate risks (Bolton et al., 2020). Methods based on historical data may in fact underestimate risks, for example by undervaluing insurance premiums (Bevere et al., 2020), thereby creating a direct risk for the bank financing the counterparty. Indeed, when properties can no longer obtain insurance coverage, banks become more vulnerable to collateral devaluation and credit risks (Global Risk Institute, 2025).

In this sense, it is possible to talk about a genuine epistemological break: given the absence of adequate historical data and the high uncertainty, it is necessary to develop new approaches based on the analysis of prospective scenarios (Bolton et al., 2020). In line with this perspective, BCBS has included in its supervisory principles the recommendation for banks to conduct scenario analyses, including those related to climate shocks, with the aim of more realistically assessing the resilience of credit portfolios against transition and physical risks (BIS, 2022).

At the same time, the geographical dimension has also played a relevant role: in some jurisdictions, where the impacts of climate change emerged with greater intensity or where supervisory authorities have placed greater emphasis on the issue (as in Europe), the integration of climate risks into supervisory and banking management practices has progressed more rapidly. In other areas, by contrast, the perception of climate risk as more remote has slowed down the adoption of appropriate standards and tools.

A crucial step in the development of the debate was the Paris Agreement of 2015, which encouraged the increase of academic studies on this topic, making evident how climate risks can have significant effects (systemic consequences) on markets. The recognition of climate change as a financial risk marks a turning point in economic and prudential thinking. This recognition is also reflected in regulatory and stakeholders' choices: climate change introduces new risks that influence the decisions of policy makers and investors (Bouri et al., 2023).

Mark Carney's speech in *"Breaking the tragedy of the horizon – climate change and financial stability"* highlights how climate risks are a direct concern for financial stability and economic growth (Carney, 2015). In particular, the speech emphasizes the challenge of managing risks whose materialization goes beyond the typical planning and supervisory horizons. Therefore, arises the need to modify the focus dimension, shifting attention from an exclusively environmental issue to a financial one, with the goal of making such risks measurable and manageable within risk management processes.

In 2017, the TCFD proposed recommendations that structure the disclosure of climate-financial risks into four pillars: governance, strategy (including scenario analysis), risk management, metrics & targets. These recommendations became an integral part of the requirements of supervisory authorities: in 2020, the ECB published its supervisory expectations on climate risks (ECB, 2020a) and later analysed how disclosure requirements had been integrated by banks through a climate stress test exercise (ECB, 2022a). At the same time, the network of central banks and supervisory authorities (NGFS) launched the development of increasingly coherent and complex climate scenarios, with the goal of quantifying macro-financial effects while providing comparable inputs for climate stress tests. The ECB, in its article *"Climate risks: no longer the tragedy of the horizon"*, recognizes the importance of the scenarios developed by the NGFS in demonstrating how climate-related extreme events and climate policies influence the economy (Mauderer & Stracca, 2025). Meanwhile, in 2021 the TCFD, through its guidance, provided an example of metrics and targets that are essential to ensure proper disclosure through the use of an effective transition plan (TCFD, 2021).

In summary, from 2015 to today the issue has shifted from a conceptual acknowledgment to an attempt at operationalization based on disclosure, scenarios, and climate stress tests: the foundation on which recent literature has begun to measure impacts on firms and banks, market reactions, and prudential implications.

Starting from the assumption that ESG factors can have a positive or negative impact on the financial results and the solvency of an entity, this is directly reflected on the risk profile of banks (Bellinvia et al., 2025). The economic damages that may derive from physical and transition risks threaten the profitability of firms and their financial capacity to satisfy their debts, and this causes a direct consequence for financial institutions (Schult et al., 2023). ESG risks can lead to reputational damages and higher financing costs for banks, reducing the value of loan portfolios and collateral (Chen et al., 2025). The exposure of banks to carbon-intensive sectors has direct impacts on reputation and on the relationship with their stakeholders (Mirza et al., 2024). Moreover, a high transition risk due to financing in high carbon-intensity sectors increases the credit risk of banks, demonstrating how the financial sector is closely vulnerable to the uncertainties deriving from climate change (Bellinvia et al., 2025).

In addition, "brown" sectors must face an increase in prices due to transition risk. In fact, according to an analysis, European firms with high greenhouse gas emissions show a higher CDS spread (credit risk) (Costola & Vozian, 2025). This is also confirmed by Mirza et al. (2024), who state that the probability of default in high-emission sectors can cause significant effects especially for the creditors of firms in that sector.

It emerges that the adaptation to regulations, technology, and consumer preferences also creates a risk for climate transition, undermining firms' cash flows and thus their debt repayment capacity (Ugolini et al., 2024). This entails a change of perspective on the part of banks when analysing the solvency level of counterparties, since a company that in the future may be more exposed to transition risk could have effects on the financial institution itself.

As a consequence, climate change increases the pressure on the financial system, compromising banks' liquidity. As demonstrated by the study of Lang et al. (2023), climate risk is negatively associated with the liquidity of financial institutions.

Considering that the goal of the Paris Agreement of 2015 and COP26 was to support a green transition, the role of banks in this process is fundamental. Engagement in green finance practices has a positive impact on stakeholders (Umar et al., 2021) and on the economy; for this reason, institutional and supervisory authorities have asked banks to encourage such practices. However, in order to provide their stakeholders with well-detailed informative decisions, banks need to collect information directly from their counterparties. To ensure the achievement of emission reduction targets, the individual effort of banks is not sufficient, as it may not be significant if it is not accompanied by policies aimed at achieving those objectives. In fact, according to an analysis carried out by the ECB (ECB, 2024d), the banking sector is still in the phase of effective integration of climate information into transition plans; therefore, the need for supervisory intervention to encourage their concrete adoption.

Therefore, assuming that supervisory authorities can influence the behaviour of banks, it is possible to use the banking supervision process to redirect and modify banks' objectives (Schreiner & Beyer, 2024), for example through SREP, ICAAP and Pillar 3 disclosure, in addition to specific expectations regarding transition plans.

A granular analysis of risks is therefore necessary also on the part of banks, mapping exposures by sector and geographical area and translating them, through the use of forward-looking scenario analysis, into the calculation of RWA that include climate risks. Within the prudential framework of Basel III, RWAs are the basis for calculating capital requirements: integrating climate drivers into their estimation aligns risk management with supervisory principles and European banking policies (European Union, 2024b). According to the study by Alessi et al., (2024), banks that want to include climate risks within their RWA may need to increase buffers, since such risks may increase banks' level of exposure.

Market discipline reinforced by Pillar 3 disclosure on ESG risks makes climate risk management observable and comparable: metrics, sectoral/geographical exposures, targets and transition progress enter the disclosure perimeter. This information feeds both benchmarking across banks and supervisory assessment, which can require alignment between what the bank declares (plans/objectives) and what it actually integrates into credit and capital processes. In case of gaps, supervision may require action plans with verifiable milestones.

The instrument adopted by banks to communicate with the supervisory authority is the transition plan. In this context, the transition plan becomes an operational tool of dialogue with supervision, with time horizons consistent with capital planning, metrics and alignment targets of the portfolio and credit process, and the definition of internal policies and strategies aimed at achieving these objectives. Moreover, the transition plan provides supervisors with a basis to assess the institution's prudential strength and resilience and to safeguard financial stability (Jakovlev, 2024). The transition plan must therefore become the key instrument to ensure effective communication during the SREP process and thus of monitoring.

In conclusion, the literature converges on several points: climate risks are financially relevant and are transmitted through credit, capital, and market risk; methods based on historical data are inadequate, therefore new forward-looking approaches based on scenario analysis are needed; the role of supervisory authorities and banks' transition plans assume a central role in linking metrics, credit policies, and business planning. This framework constitutes the basis for defining, in the following, the minimum elements and the effectiveness criteria of a prudential transition plan.

1. INTRODUCTION

1.1 Background

Climate change is one of the key challenges of the 21st century, with evident accelerating dynamics that intensify the frequency and severity of extreme meteorological events (Ebi et al., 2021). Rising temperatures are deteriorating ecosystems, intensifying natural disasters, increasing humanitarian crisis and reducing the availability of food resources, especially in the most vulnerable areas. This crisis is not limited to individual sectors but generates both direct and indirect consequences across several dimensions of daily human life. The main cause is human activity, which, since the Industrial Revolutions, has increased the production of consumer goods and as a result, significantly raised greenhouse gas (GHG) emissions due to the usage of carbon, oil and gas. It is enough to consider that in the last decade, just four emitters (China, United States of America, the European Union and India) have been responsible for over 55% of global emission (UNICEF, 2020).

Fighting climate change requires a global effort, as it can affect different areas and continents simultaneously. In the past ten years, various commitments have been made by individual countries or international organizations, including the conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC), which was adopted in 1992 for the first time during the Earth Summit in Rio de Janeiro (United Nation, 1992). Considering the goals set by all the COP conferences, the most significant one is COP21 in Paris (2015), which established the objective of limiting global warming to below 2°C, and if possible, to below 1,5°C, compared to the pre-industrial levels. It involved 195 parties from all over the world. The Paris Agreement is based on a five-year ambitious action plan, pursued by individual countries and global institutions (UNFCCC, 2015).

The European Union replied in a united and cohesive way by proposing an ambitious goal: to become the first climate-neutral continent by 2050. In order to achieve this scope, the EU adopted the Green Deal, a strategic and legislative package aimed at eliminating net GHG emissions, promoting and supporting economic growth decoupled from resource use, while, at the same time, safeguarding human rights and the environment (European Commission, 2024a). It is important to consider the economic aspects of these actions aimed at limiting the rise in temperature. In fact, the value of investments will vary from one country to another, depending on the existing capital stocks and on different political, technological and socioeconomic conditions (NGFS, 2019b). To make this change a reality, it is necessary a direct action from the drivers of sustainable development, so from the enterprises, that embrace the concept of sustainable development and adapt their business strategy to achieve the expected results. According to what has just been outlined, it is clear that the climate crisis is not only an environmental issue, but also a financial, economic (Stroebel & Wurgler, 2021), social and systemic challenge, with significant implications for financial stability and prudential supervision. In particular, banks are directly and indirectly exposed to climate risks, through their investments and stakeholders. When discussing climate risks in relation to banks, we

refer to physical and transition risks. Physical risks include, for example: flood and inundations, which can compromise the operational continuity of counterparties. At the same time, transition risks may arise from climate policies or technological developments, that can generate economic losses and have direct consequences for high carbon-intensive sectors. As a result, banks are exposed to credit, market and reputational risks. In the first case, sudden shocks may occur, originating immediate financial losses, while, in the second case, the development is more gradual (Zhou & Ma, 2025). This topic will be analysed in detail in chapter 5. In recent years, there have been many efforts to converge reporting standards addressing environmental issues, with the aim of harmonizing GHG accounting methods in order to help financial institutions to measure the amount of financed emissions. As consequence, the data collection process plays a strategic role in guiding enterprises toward a low-emission economy (TCFD, 2021). This happens through transition plans, which include metrics and targets to monitor progress.

At the same time, prudential supervisory authorities have begun integrating climate risks into their supervisory tools. For example, in 2022 the ECB conducted a climate risk stress test, aimed at strengthening the analytical and operational capacity of both financial intermediaries and supervisors in identifying and managing climate risks. The assessment highlighted shortcomings in governance, in the measurement and planning of decarbonization strategies by intermediaries. In parallel, it is possible to find a significant activity by the EBA (in the: Discussion paper on ESG Risk Management and Supervision, 2020a) and the BIS (BCBS, 2019a), which respectively published guidelines to integrate ESG risks in the risk management process.

In this context the necessity emerges for a standardized template and structured guidelines that can harmonize the work of banks by helping them to communicate their transition plans toward a low-emission economy in a credible way. The transition plans not only facilitate dialogue between banks and supervisory authorities but also help financial institutions measure and manage potential climate risks in both the short and long term.

1.2 Objective and scope of the thesis

The purpose of this document is to design a transition plan template, that can be used by financial institutions subject to prudential supervision. The template aims to support banks in their disclosure efforts by suggesting the initial steps they should follow in order to answer the requirements of prudential supervisory authorities.

Although this thesis also takes into account the contribution of several international organizations, such as BIS and the Task force on Climate-related Financial Disclosures (TCFD), it is primarily situated within the European regulatory framework and the context of banking supervisory authorities, whose aim is to integrate climate risks into their prudential processes. In particular, the work focuses on the requirements and guidelines issued by the EBA and the orientations provided by the ECB regarding ESG risk management.

This thesis does not include a case study applied to a single banking institution, nor does it conduct quantitative stress tests. Instead, it focuses on the conceptual and methodological design of a transition plan template within the European banking system, in line with supervisory expectation.

In conclusion, the template aims to provide a flexible basis for banks in anticipation of future operational developments, facilitating dialogue between banks and supervisory authorities, while simultaneously promoting the integration of climate related aspects into banking strategies.

1.3 Research Question:

Although attention to climate risk has increased over the last decade, banks are still facing difficulties in drafting clear, coherent and comparable transition plans that can meet the expectations of prudential supervision. The lack of methodological clarity and uniform guidelines in the definition of targets, metrics and objectives makes it difficult for banks to prepare plans that can comply with current regulatory requirements.

In particular, the evaluation of bank portfolios and of counterparties from a climate risk perspective requires a well-defined system of rules and metrics, in order to avoid the uncertainty during the drafting of transition plan. In his speech, Frank Elderson, member of the ECB's Executive Board, stated that a misalignment in the pathway within the European market could lead to significant consequences for the market itself, which may be exposed to financial, legal and reputational risks (ECB, 2024a).

In support of what has just been mentioned, it becomes clear that the ability to identify and measure transition risk is a necessity, and not an optional practice that banks can choose to adopt later. Furthermore, an essential element in drafting a transition plan is a shift in mindset. More specifically, banks should begin expanding the range of risk areas considered material. This means that banks need to evolve their approach, considering that also climate risks can have an impact across various dimensions, including financial, economic and governance related aspects.

Starting from these premises, this thesis aims to address the following research question:

What key components should a bank's transition plan include to be considered credible by prudential supervisors and useful for internal climate risk management?

This question is particularly relevant and shapes the basis for the development of the present work, as banking supervisory authorities require European financial institutions, and those operating within the European market, to disclose how they intend to address climate risks through their governance processes. Supervisory authorities are pushing banks to rethink and evolve their risk monitoring frameworks. While several frameworks and methodologies for integrating climate and ESG risks into banks' internal models already exist, for example in the academic literature (Auzepy & Bannier, 2025), there is still no officially standardized and

supervisory template at the European level to guide the design of climate transition plans. Therefore, banks still lack harmonized approaches for embedding climate-related risks into the three pillars of the Basel framework, especially within Pillar 2 supervisory expectations.

In conclusion, answering this research question helps to fill the current methodological gap, contributing to improving comparability of transition plans and facilitating the interaction between banks and supervisory authorities.

Furthermore, the drafting of this thesis fits coherently within the current context, which is characterized by growing regulatory attention to the integration of transition risks and disclosure practices. In particular, the European Union is promoting increasingly stringent directives, such as the CSRD and the ECB's guidelines, a more transparent and structured approach to managing climate risks, in order to foster a more effective dialogue with stakeholders and to improve the quality of non-financial communication. At the same time, it can support supervisory authorities in comparing the structure and content of transition plans across different banks, thereby improving consistency and benchmarking practices. The thesis therefore provides both a practical tool for institutions and a conceptual contribution to the ongoing debate on how to embed transition risk into prudential supervision frameworks.

1.4 Expected contribution

This thesis provides a dual contribution both conceptual and practical to the integration of climate related risks into prudential supervision frameworks, with a particular focus on the European banking system,

On the conceptual level, it contributes to the literature by proposing a structured interpretation of supervisory expectations on transition plans. It analyses how a climate transition plan can improve communication between banks and supervisors, especially when integrated into prudential instruments such as the Materiality Assessment, Risk Assessment Statement (RAS), Risk Assessment Framework (RAF), ICAAP and the SREP process. It also explores how a clear risk taxonomy can support the internal classification and prioritization of climate-related risks across different portfolios.

On the operational side, the thesis develops a methodology for identifying and selecting the key requirements of a credible transition plan, from a prudential perspective. Particular attention is paid to the governance dimension of data collection and policy design, describing how banks should organize internal responsibilities and decision-making processes to meet create a transition plan in order to meet supervisory expectations.

Building on this analysis, the thesis proposes a transition plan template specifically designed for banks under prudential supervision. The template provides structured guidance on how to define climate-related objectives, collect relevant data, assess material risks, and communicate alignment strategies in a way that ensure credibility from a prudential supervisory perspective.

Overall, this thesis aims to address both methodological and supervisory gaps by providing banks with a practical framework to reinforce their prudential approach, while assisting supervisors in evaluating transition plans.

In conclusion, this thesis is structured into five chapters: the first chapter is the “Introduction” which defines the research question, outlines the objectives, the scope of the thesis, and describes the expected contribution in both conceptual and operational terms.

The second chapter is the “Context Analysis and Supervisory Framework” that examines the international and European regulatory landscape and analyses how climate risks are progressively integrated in the prudential analysis.

The third chapter is “Risk Categories and Transmission Channels” which identifies and analyses the main categories of climate risks, investigating the channels through which these risks propagate into prudential risks with particular focus on counterparties’ external dependencies.

The fourth chapter is the “Methodology” that describe the design of the research (materiality assessment, the construction of taxonomy and the development of risk assessment framework and statement) and details how climate risks can be integrated into prudential processes, with a specific focus on ICAAP and SREP. Furthermore, the chapter also focuses on the design of the transition plan template, that is the core of the thesis and acknowledges the main limitations of the work, notably the absence of empirical testing of the proposed template.

Finally, the last chapter “Conclusions” includes the main findings and contributions.

2. CONTEXT ANALYSIS AND SUPERVISORY FRAMEWORK

2.1 International regulation and Global frameworks

In recent years, climate change has been increasingly recognized as a driver of significant risks for financial and economic markets. In response to this threat, several international organizations have started drafting guidelines aimed at standardizing corporate disclosure of information in order to guarantee comparability. Although these guidelines are not legally binding they have assumed a key role in addressing supervisory expectation.

Among the main frameworks and guidelines are the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), the sector-specific standards of the Sustainability Accounting Standards Board (SASB) and the recommendations of the Network for Greening the Financial System (NGFS). In addition, there are technical bodies such as the Basel Committee on Banking Supervision (BCBS) and the International Sustainability Standards Board (ISSB).

The purpose of this subchapter is to analyse the main international frameworks and their role in supporting financial institutions to identify, assess and communicate the climate-related risks, thereby laying the foundation for a coherent and comparable future regulatory framework.

Among the first global initiatives on financial transparency there was the Enhanced Disclosure Task Force (EDTF), established by the Financial Stability Board (FSB) in 2012. The aim of the EDTF was to improve the quality and comparability of risk information provided by banks after the 2008 financial crisis (EDTF, 2012). Although the EDTF did not directly address environmental and climate-related risks, it constituted a preliminary step towards the creation of the TCFD by focusing on financial materiality and on the integration of both qualitative and quantitative information (EDTF, 2012). In its report of 2012, entitled “Enhancing the Risk Disclosures of Banks” the EDTF identified 7 fundamental principles for improving risk disclosures. These principles are applicable to all banks, especially large institutions operating at an international level.

The following table provides the seven fundamental principles for enhanced risk disclosures, and their description according to the report 2012.

Number:	Principle:	Description:
1	Disclosures should be clear, balanced and understandable	The communication should be simple and immediate. The information should be granular, in order to meet the needs of more experienced users. A balance between quantitative and qualitative information is required to

		ensure the quality of the disclosure.
2	Disclosures should be comprehensive and include all of the bank's key activities and risks.	The information should highlight the bank's activity in risk identification and risk management. It should provide reasoning and examples of processes and internal procedures, in order to allow external users to understand the governance role of bank's internal bodies. Where necessary, the information should be complemented with scenario analysis.
3	Disclosures should present relevant information	The information communicated should be material to the bank. The quality of the information is fundamental: it has to be as much as detailed as possible in order to provide an overview of the bank's risk appetite, level of exposure, and risk management processes.
4	Disclosures should reflect how the bank manages its risks.	The bank should provide information about the actions of senior management, while retaining the right not to disclose information that could compromise or expose the bank from a legal or commercial perspective.
5	Disclosures should be consistent over time.	The information should be consistent over time, allowing for comparisons across different periods. Any changes in disclosure or data collection, due to modifications in internal

		processes, should be explained in detail.
6	Disclosures should be comparable among banks.	The disclosed information should enable users to perform cross-bank comparability analyses.
7	Disclosures should be provided on a timely basis.	The timeliness of information disclosure and the effectiveness of its transmission channels are key requirements for external users' analysis and understanding.

Table 2.1.1: Principles for Enhancing the risk disclosures of banks, own elaboration based on (EDTF, 2012).

From the summary of the principles emerge some particularly relevant innovative aspects. First, an emphasis is placed on forwards-looking perspective, which at that time was still uncommon in the banking sector, as banks were asked not only to focus on the present but also to collect information that would be comparable across several years (principle 5). At the same time, it was highlighted that quantitative information alone was not sufficient to provide stakeholders with a comprehensive overview, making it necessary to integrate them with qualitative information (principle 1). The need to ensure both timely disclosure (principle 7) and comparability of information (principle 6), while acknowledging potential jurisdictional constraints, represented significant advancements for the banking sector at that time.

A second step undertaken by the EDTF, looking towards the future, was the identification of recommendations to improve risk disclosure. In particular, in order to make its recommendations timely and relevant, the EDTF organized them into seven macro risk areas, corresponding to the main categories recognized in the banking sector and in international supervision. This classification allows for the structuring of disclosure in a consistent manner with internal risk management processes as well as with supervisory expectations. The macro areas are listed below:

Risk area:	**Description:**
Risk governance and risk management strategies/business model	Organizational structure, strategies to identify, monitor, and manage risks; includes consistency with the business model.
Capital adequacy and risk-weighted assets	Capital adequacy and alignment between regulatory capital and risk exposure, in accordance with Basel standards.

Liquidity	Ability to meet short-term financial obligations while preserving business continuity and without incurring significant operational disruptions.
Funding	Composition and stability of the bank's funding structure over time, including analysis of diversification and concentration risks.
Market risk	Bank's exposure to market risk factors arising from changes in interest rates, foreign exchange rates, equity prices, and commodity prices.
Credit risk	Exposure to counterparty credit risk, including overall quality of the credit portfolio.
Other risks	Residual risk category covering exposures not included in the previous areas (e.g., operational, reputational, legal, and other non-financial risks).

Table 2.1.2: Macro risk areas, own elaboration based on (EDTF, 2012).

The main objective of the recommendations was to provide guidelines defining key requirements for disclosure across different risk areas. The recommendations were conceived as explanatory indications aimed at enhancing both the communication and the interpretation of information, with a particular focus on the relationship between bank and external stakeholders. For instance, in the case of capital adequacy and risk-weighted assets, the document highlights the importance of complying with the instructions issued by the national supervisory authority, which were themselves based on the definitions set out under Basel I and Basel II. Since the interpretation of the Basel framework was delegated to national authority, significant challenges arose in terms of information comparability cross banks operating in different jurisdictions.

It is important to highlight that the EDTF report was drafted at a time when the adoption of Basel disclosure template was still not mandatory. This circumstance significantly affected the comparability of information across banking institutions, leaving a wide margin of interpretation to national supervisory authorities. Within this context, the EDTF recommendations aimed at preparing the sector for a more harmonized and transparent future, anticipating the evolution towards common disclosure standards.

Furthermore, the EDTF outlined a structured methodology that later influenced the development of the TCFD framework, which will be analysed in the following section. In conclusion, the EDTF represented a milestone in the evolution of transparency within the banking sector, anticipating many of the principles that are now embedded in climate-related disclosure framework. Although it did not explicitly address climate and environmental risks, its approach based on clarity, comparability and relevance contributed to shaping a common language, providing both supervisory authorities and market participants with a solid reference basis for the communication of financial risks.

Information provided by companies to financial markets is essential not only to support capital allocation decisions by investors and stakeholders, but also to enable banks to properly assess the risks associated with their credit and investment portfolios. To achieve this, data collection must be detailed and accurate: without consistent and specific information, not only investors but also financial institutions and supervisory authorities would risk underestimating or misjudging assets, with potential systemic consequences. This highlights the need to establish a body capable of defining which information should be disclosed, in order to ensure informed decision-making and to prevent risks related to climate change.

The body responsible for this task was the TCFD, established by the FSB, which worked from 2017 to 2023 to provide recommendations on climate-related financial disclosures. An interesting feature of the TCFD recommendations is that they focused on four thematic areas: governance, strategy, risk management, and metrics and targets.

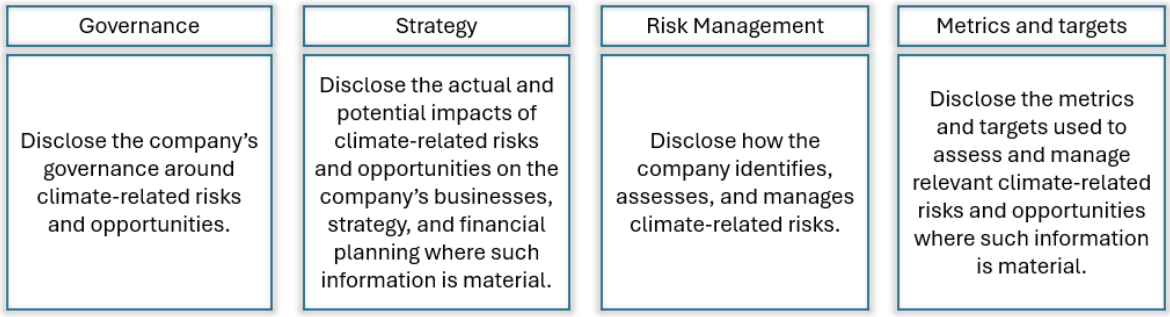


Figure 2.1.1: Adapted from figure A1 from TCFD Recommendations on Governance, Strategy, Risk Management, and Metrics & Targets (TCFD, 2021).

In particular, the TCFD supported the implementation of its recommendations through two key publications: the Annex 2017 (TCFD, 2017), which focused on practical sector specific disclosure examples with detailed explanations based on the four thematic areas, and the 2021 Guidance (TCFD, 2021), which concentrated mainly on metrics, targets and transition plans for supporting a forward-looking perspective.

The 2017 Annex provided sectoral insights, identifying the key disclosure requirements for banks. Given the crucial role of financial institutions, they are particularly exposed to climate risks, which may materialize through both debtors and counterparties. Specifically, when

banks are involved in intermediate activities or hold credit exposures to companies operating in high carbon sectors, the related risks must be adequately disclosed in the bank's financial documents.

At this point, it is necessary to take into account the impact of climate risks on banks, which can be assessed through metrics that can quantify such effects. According to the 2017 Annex the proposed metrics may concern credit exposure, equity and debt holdings, or trading positions. These metrics should be complemented with quantitative information on the absolute and relative amount of carbon-related assets compared to total assets, as well as the extent of financing and credit activities associated with climate-focused initiatives.

The 2021 Guidance (TCFD, 2021) outlines the principles for effective disclosures, highlighting that such a plan should reflect the specific characteristics of the institutions and their sector of activity. As defined by the Task Force, an effective transition plan should include the four previously mentioned dimensions: governance, strategy, risk management, metrics and targets. The following figure summarizes the key elements for each area.

Category	Element	Description
Governance	Approval	The transition plan should be approved by the board or climate risk committee
	Oversight	The execution of the plan should be supervised by an authoritative body
	Accountability	The senior management is responsible for the execution of the transition plan
	Incentives	Remuneration and incentives reflect the organization's commitment to achieving its climate transition goals
	Reporting	The authoritative body receives regular status reports

	Review	The plan is periodically updated
	Transparency	The transition plan is shared with external stakeholders, including financial aspects, performances, targets and impacts on the organization's business
	Assurance	A third-party assurance is essential to guarantee the independence of the transition plan
Strategy	Alignment with strategy	The business strategy should be aligned with the transition plan, particularly with regard to the planned activities and the temperature goal.
	Plan assumptions	Within the transition plan, the organization identifies key assumptions related to transition path uncertainties and implementation barriers, which should be coherent with those reflected in financial accounts, capital expenditure planning, and investment choice
	Prioritized opportunities	The transition plan should describe the organization priorities in order to support the transition to a low-carbon economy
	Action Plans	The transition plan should translate the objectives in

		actions, including current and planned initiatives to reduce climate-related risks and increase climate-related opportunities
	Financial Plans	The transition plan incorporates the financial roadmap, specifying budgets and key financial milestones that support the transition objectives
	Scenario Analysis	The organization tests achievability of the transition plan and associated targets using multiple climate-related scenarios.
Risk Management	Description of the risk	The transition plan describes the risks for the organization during the transition to a low-carbon economy
	Plan challenges and uncertainties	The transition plan defines the challenges and uncertainties the organization may face during its implementation.
Metrics and Targets	Metrics	The transition plan describes metrics that the organization will monitor to track progress against plans and targets.
	Targets	The transition plan should include qualitative and quantitative targets.

	Methodology	Metrics and targets in a transition plan are based on widely recognized and transparent methodologies
	Dates	The transition plan specifies the dates by which the goals should be achieved
	GHG emissions reductions	The transition plan addresses the relative contribution of reductions, removals, and offsets for achieving GHG emissions targets

Table 2.1.3: own elaboration from table E1 from TCFD Recommendations on Governance, Strategy, Risk Management, and Metrics & Targets (TCFD, 2021)

The document recognized the importance of the relation between transition plans and financial information, underlining how certain elements are essential for stakeholders. The main aspects that should be disclosed by companies, and as consequently by financial institutions, are:

- current GHG emissions performance;
- impact on businesses, strategy, and financial planning from a low-carbon transition; and
- actions and activities to support transition, including GHG emissions reduction targets and planned changes to businesses and strategy

During the description and disclosure phase, organizations are expected to report the target dates by which they aim to achieve their objectives, thereby providing a comprehensive overview of the strategy to be implemented. The disclosure process should highlight both progresses already implemented and the ongoing actions, as well as the pathways through which the future goals are expected to be achieved. According to the TCFD (TCFD,2021) an effective transition plan must provide investors and financial institutions with comprehensive information, enabling them to assess the actual and potential impacts and opportunities of climate risks on the financial position of the organization. This is crucial since an entity can be financially affected by climate risks for three main reasons:

- from its direct exposure
- from the actions it has planned to manage the risks
- from the financial consequences that such actions have on the income statement, cash flow statement, and balance sheet

Therefore, transition plans drafted by counterparties are fundamental for all types of stakeholders and particularly for banks. The latter are strongly encouraged to support the transition towards a low carbon economy through their investment activities. As a consequence, it becomes evident that the financial and climate-related information disclosed by companies can directly influence the strategy and objectives of financial institutions.

In conclusion, the document represents a major step towards the integration of climate disclosure into the strategic planning of financial institutions, providing the first operational definition of a transition plan from a financial perspective. Despite the success of these recommendations, their concrete implementation had faced challenges, especially in the definition of climate scenarios and in the selection of forward-looking financial metrics.

A complementary element of the TCFD framework is represented by the sector-specific ESG standards developed by SASB, which support organizations in disclosing sustainability-related information, risks and opportunities. These factors can influence directly the financial situation of the organizations, for example through access to financing, changes in cash flows, or variations in the cost of capital. SASB's work has been structured around seventy-seven industries, with standards specifically designed to capture sector-relevant ESG issues (SASB, 2024).

For the financial sector, SASB has developed metrics for Commercial Banks, Asset Management & Custody Activities, and Investment Banking. In these cases, the analysis focuses on aspects such as:

- capital allocation and advisory activities
- support for purchase/sale transactions of contracts, equities, and bonds

The rationale behind this analysis arises from the recognition of the fundamental role investment banking profits play in global markets, which consequently expose institutions to diverse regulatory regimes. These characteristics can generate vulnerabilities for both banks and supervisory authorities, particularly in the phase of comparing sustainability-related information. SASB highlights how banks may contribute to both positive and negative environmental and social externalities, with direct impacts on the bank's revenue streams and shareholder value. Therefore, it becomes essential for financial institutions to identify, analyse and manage ESG risks and opportunities, integrating them into credit granting processes and portfolio risk assessments.

Furthermore, banks can be directly influenced by their own investment choices: financing decisions may positively or negatively affect their market position. For instance, investing in fossil fuel projects may expose them to reputational risks. For these reasons, supervisory authorities require banks to disclose how they manage climate risks, especially given that financial institutions are at the core of the market mechanisms.

Since august 2022, SASB has been placed under the responsibility of the ISSB, established by the IFRS foundations with the mandate of developing a common set of global sustainability

disclosure standards. This transition enabled the integration of SASB's sector metrics into a broader and harmonized framework, ensuring greater comparability of ESG information at the international level.

The SASB guidelines played a pivotal role in shaping the first two IFRS Sustainability Disclosure Standards, published by the ISSB in June 2023:

- IFRS S1: *General Requirements for Disclosure of Sustainability-related Financial Information* (IFRS, 2023c)
- IFRS S2: *Climate-related disclosure* (IFRS, 2023d)

The IFRS S1 (*IFRS, 2023b)*, of horizontal nature, requires organization to disclose information on sustainability related risks and opportunities, enabling stakeholders to assess their financial impact. Specifically, it requires the disclosure of information that may affect the institution's cash flows, access to finance, or cost of capital over the short, medium, or long term. Moreover, it also provides indication on how financial institutions should disclose financial information related to sustainability, by defining the general disclosure requirements and the minimum contents to be provided.

The IFRS S2, instead, is the ISSB standard specifically dedicated to the reporting of risks and opportunity related to climate change with potential financial implications for institutions. The ISSB based the structure on TCFD, so replicated the four pillars: Governance, Strategy, Risk Management, Metrics and objectives. The standard provides detailed definition of physical and transition risk, identifies potential climate opportunities and specifies the requirements for scenario analysis. Its objective is to ensure comprehensive and comparable disclosures, thereby allowing stakeholders to assess how climate change may affect the institution's future performance and resilience.

The IFRS S2 is particularly relevant for banks, because it requires them to do a granular analysis of information before disclosing. In particular, institutions are required to consider all fifteen categories of Scope 3 emissions across the value chain, in conformity with the GHG Protocol Scope 3 Standard (Greenhouse Gas Protocol, 2011). For financial institutions, this requirement is crucial, since they are exposed to counterparties' decisions and transition risks.

Such risks may materialize, for example, in form of credit risk arising from financing clients exposed to carbon taxation, stricter environmental regulation, or technological change. Banks must therefore monitor these exposures through the measurement of financed emissions, which provides an indication of the institution's level of exposure climate risks.

Financed emissions are today regarded as a key KPI by the supervisory authorities, including the EBA and the ECB, within the framework of climate risk guidelines and Pillar 3 disclosure templates. This allows for an assessment of the bank's climate exposure, directly linking credit activities and investment activities to the environmental impacts they generate, while at the same time fostering alignment between global standards and European prudential supervisory expectations

Finally, an innovation introduced by the ISSB is the publication, alongside the IFRS standards, of a taxonomy in XBRL format (IFRS, 2024). This taxonomy provides descriptive labels clarifying the meaning of each element, together with a presentation view that supports easy consultation and navigation. The adoption of XBRL, an open international standard, facilitates the visualization and comparability of data across different software solutions, thereby enhancing the accessibility of information for investors, analysts, and supervisory authorities.

While the ISSB, through IFRS S1 and IFRS S2, defined a harmonized framework for climate risk and opportunities reporting, NGFS provides climate scenarios and best practices for disclosure. 'NGFS, launched at the Paris One Planet Summit on December 12 in 2017, is a network of central banks and supervisory authorities committed to sharing practices for the development and management of climate-related risks in the financial sector (NGFS, 2017)

Among its key initiatives are the NGFS Climate Scenarios, which are macroeconomic and climate-based models used to conduct climate stress tests and increasingly adopted by banks (NGFS, 2025). In detail, they integrate climate policies, meteorological events, economic and sectoral trends to create scenarios that embed climate risks in economic cycles. They are structured over multiple future time horizons (short, medium, and long term) and are particularly relevant for application in the financial sector. Therefore, the analysis does not only cover physical risks, but also considers transitional risks, which are more complex to identify yet but are crucial in order to achieve a net-zero economic transition.

Secondly, NGFS provides guidelines for supervisory authorities, suggesting recommendations on how to integrate climate risks into prudential supervision processes. In its report "A call for action", published in April 2019, the banking group invited central banks and supervisory bodies to embed climate risks into financial monitoring practices and micro prudential supervision (NGFS, 2019a).

In light of this progress, in 2020 the NGFS published a guide that translated the recommendations into practical tools applicable in the prudential context (NGFS, 2020a). The document, developed from a survey of 34 supervisory members and enriched by external contributions, provides a clear framework for practical implementation. One of the main findings that emerged is the critical importance of data collection and data management by banks. Indeed, only through granular analysis is it possible to provide supervisors with tools for precise assessments, including climate scenarios and stress testing.

In addition, the NGFS carried out a "stocktake on transitions plans": an analysis of the current state of transition plans within the banking sectors, highlighting their potential relevance over the medium and long term. The report published in May 2023 evaluates how transition plans are linked to the mandate of micro-prudential authorities and how they can be effectively integrated into supervisory processes and instruments (NGFS, 2023). This work led to the identification of six key findings: the role of transition plans as a source of information for prudential authorities and the common elements that all credible transition plans should have.

This stocktake represents a key milestone within a broader vision of transition plans as informative and communicative instruments designed to facilitate the relationship between banks and supervisory authorities. In summary, NGFS activities provide an essential framework for the definition of credible and comparable transition plans, offering scenarios, guidelines and analytical tools that support both banks and supervisory authorities in integrating climate risks into prudential processes. Furthermore, it constitutes a methodological pillar for the development of the template for this thesis, providing strategic guidance that can be translated into operational requirements for banking transition plans.

After analysing the NGFS, which provides climate scenarios and good practices to support disclosure, it is appropriate to examine the contribution of the Basel Committee on Banking Supervision (BCBS). The BCBS is a body hosted by the BIS that develops guidelines and standards for banking regulation. It is composed of 45 members, including central banks and supervisory authorities, and its main objective is to strengthen regulation and supervision in order to enhance financial stability (BCBS, 2011). Among its most important contributions is the drafting of the three prudential supervisory pillars (pillar I, II and III), which are embedded in the Basel Accords.

Moreover, in recent years the BCBS has extended its application scope to the management of climate risks in the financial sector, publishing in 2022 the "Principles for the effective management and supervision of climate-related financial risks" (BIS, 2022). The document sets out eighteen principles, divided into two macro areas: the first one (principles one to twelve) establishes indications for the management of climate-related financial risks, while the second one (principles thirteen to eighteen) outlines the guidelines for prudential supervision. Given the significant relevance of this document for the thesis, this section will focus on the principles most pertinent to banks, while those concerning supervisory authorities will be addressed in Section 2.3.

Area	Principle	Description
Corporate Governance	1	Banks should establish a structured process to assess the potential impact of physical and transition risk drivers over the short, medium and long term. An evolution of the institution strategy and risk management framework is required; banks must consider how these risks may affect the business model and expose them to both internal and external structural changes.
	2	The governance framework of the bank must establish a hierarchical structure with clearly

		defined responsibilities for the management of climate-related financial risks. It is essential that the Board of Directors and senior management ensure adequate risk oversight and possess the necessary expertise to address these challenges. Furthermore, the organizational functions and business units must be provided with sufficient resources and institutional capacity to effectively identify, assess, and manage climate-related risks.
	3	To ensure the effective management of climate-related financial risks, the bank must adopt internal policies and procedures that oversee their identification, assessment, and mitigation.
Capital and Liquidity adequacy	4	The internal control framework must be clearly articulated across the three lines of defence. The first line of defence includes the assessment of climate-related risks within customer acceptance phase and review processes. The second line of defence is responsible for conducting independent evaluations and ensuring compliance with regulations. The third line of defence provides an independent review of the effectiveness of the preceding lines of defence as well as of the overall internal control system.
	5	In the assessment of climate-related financial risks, banks are required to evaluate their solvency over the capital planning horizon, ensuring that material exposures are appropriately integrated into the ICAAP. Simultaneously, institutions should conduct an analysis of the potential impact of these risks on cash flows and liquidity.

Risk management process	6	During the assessment phase of climate-related financial risks, the bank must consider how they may affect financial stability and liquidity positions. A clear and comprehensive analysis is required, which defines the materiality criteria adopted. Furthermore, where appropriate, banks should establish mitigation measures and continuously monitor the emergence of new channels of risk transmission.
Management monitoring and reporting	7	The bank's reporting framework should ensure the production of relevant, consistently updated, and timely information to effectively support decision-making processes. In addition, active engagement with counterparties is indispensable to obtaining supplementary data required by supervisory authorities
Comprehensive management of credit risk	8	Banks should establish and implement comprehensive policies and procedures designed to identify, measure, assess, monitor, report, and mitigate the impact of climate-related risk factors. Particular attention should be given to the management of risk concentrations across different risk categories, especially those linked to sectors, geographical regions, or counterparties with significant exposure to climate factors.
Comprehensive management of market, liquidity, operational and other risks	9	Banks should assess how risk factors affect the value and volatility of their portfolios, and the potential risk of losses. Shock scenario analysis can be used to evaluate the exposure of the portfolio. In addition, banks should consider how the price and availability of risk mitigation instruments may change depending on different climate transition

		scenarios, including those characterized by an unstructured transition.
	10	Banks should assess the potential impact of risks on net cash outflows and on the value of the assets that constitute the liquidity buffer. Where such impacts are material, they should be incorporated into the adjustment of the liquidity buffer and into the liquidity risk management frameworks.
	11	Banks should assess how climate-related risk factors may affect operational, strategic, reputational, and regulatory compliance risks, as well as investment-related liability costs. This includes the integration of material risks into business plans and strategic decision-making.

Table 2.1.4: Principles for the effective management and supervision of climate-related financial risks" (BIS, 2022).

The set of principles proposed by the BCBS provides a solid basis for integrating climate risks into banks' governance, risk management and reporting frameworks. This approach is aligned with the requirements outlined by IFRS S2 and with European regulatory and prudential expectations. The following chapters will examine the European regulatory framework in detail, analysing how these principles are translated into supervisory requirements and how they can be operationally incorporated into a bank's transition plan.

2.2 European Regulation

Within the European context, various directives are obliging companies and banks to provide disclosure requirements on ESG issues and to adopt transition plans. These must be functional to the collection and sharing of information, both for stakeholders and for prudential supervisory authorities.

To provide a logical overview, it was decided to present the directives on a chronological basis and therefore according to the date of their publication.

Before proceeding with the analysis of the directives, it is important to make a preliminary consideration of the historical context in which they are implemented (European commission, 2025c). The fragmented and chaotic international context is having significant impacts on the economy, obliging the EU to take into account the role of European companies in the global context. Energy costs have increased the expenses that companies pay for their activities, forcing them to raise the prices of their products on the market. In this context, the

implementation of the following directives could imply high burdens for companies, not only in terms of costs but also in terms of competitive positioning. The objective of the EU is to protect the European companies from the hostile geopolitical context (European commission, 2025c).

In light of what has just been mentioned, the European Commission has decided to make proposals aimed at reducing costs for European companies and those operating in the European market, as will be analysed in the following sub-chapters.

The Corporate Sustainability Reporting Directive, also known as CSRD, is Directive 2022/2464 of 16th December 2022 (European Union, 2022b). The CSRD aims to bring transparency and consistency in companies' sustainability practices across Europe, and for this reason it obligates large companies and listed firms to report on social and environmental risks and to disclose the impact of their activities on the environment and society. This helps stakeholders to evaluate the company's sustainability.

Before the entry into force of the directive, companies had to provide similar information if they were subject to the Non-Financial Reporting Directive (NFRD) n° 2014/95/EU (European Union, 2014). Anyway, the previous regulation had several limitations, including the absence of uniform standards and insufficient mechanisms to verify the accuracy of the information provided.

To overcome these limitations, the new directive provides to establish a unified system of standards and principles for sustainability reporting. This process is supported by the introduction of specific guidelines called ESRS (European Commission, 2023), developed by the EFRAG to help businesses in implementing the CSRD requirements. They are practical standards that help to achieve this alignment, originally, they were grouped into three major areas: Cross-cutting Standards, Topical Standards, and Sector-Specific Standards.

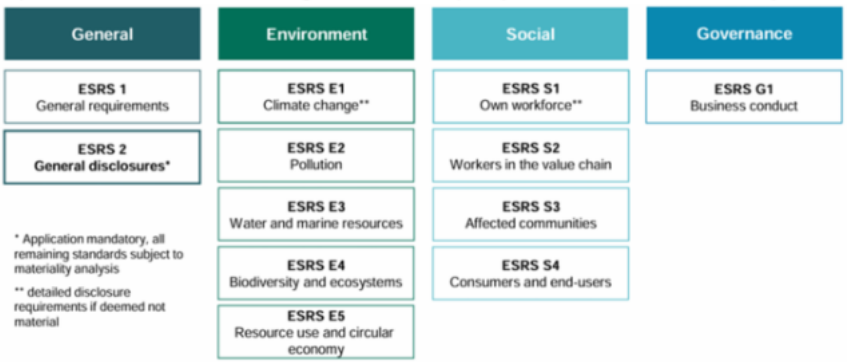


Figure 2.2.1: Detailed analysis of ESRS (EFRAG, 2022).

Moreover, another feature that makes this directive and the information provided particularly important is the presence of two requirements: Double Materiality and Due Diligence.

The first one considers two dimensions: Outside In and Inside Out. The idea behind this is that the company should think about its conduct with its impact on the environment and the people (Inside Out) and, separately, how the sustainability issue impact could affect the company

itself (Outside In) (Odobaša & Marošević, 2023). To fully understand the two pillars of the CSRD, the requirement of double materiality and the due diligence process, figure 2.2.2 summarizes their main characteristics, highlighting for each the primary recipients of the impacts generated by business activities and the key steps of the management process.

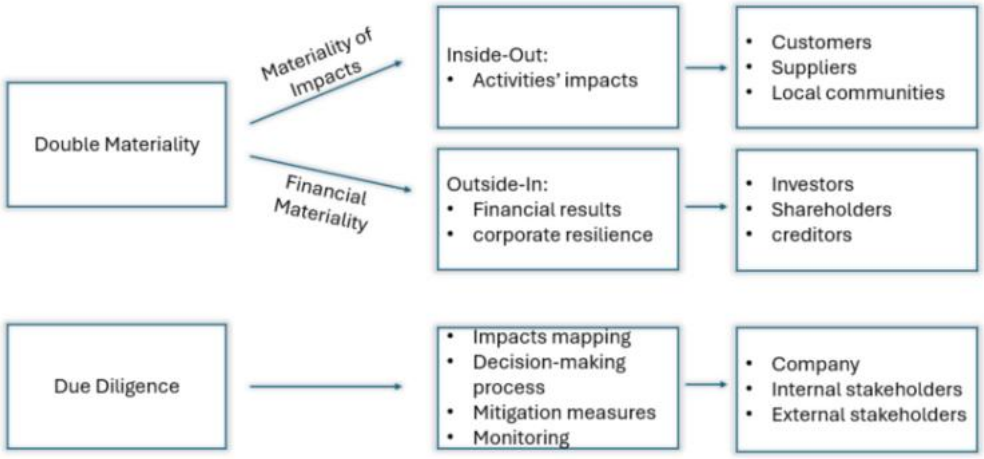


Figure 2.2.2: Framework di Double Materiality e Due Diligence

In this context, it is required that companies think about the external effect of its actions (materiality of impacts), as well as how these could affect the financial side (financial materiality) of the company. It is not only about reputation risks but also negative impacts that can harm human life and the environment, in fact, impact materiality focuses on the types of positive and negative impacts that can be made on stakeholders involved or affected by the company. Instead, financial materiality focuses on the influence that sustainability issues may have on the company's financial situation, i.e., how the ESG factors are likely to impact business outcomes (e.g. cash flows, access to capital, performance). The Due Diligence concept refers to how the information required under the first requirement should be managed and communicated.

With regard to all the sustainability information required by the directive, it must be reported in accordance with article 19, which states that such information must be included in sustainability management. This includes a description of time-bound objectives, a description of progress made, and the role of the company's internal bodies with respect to sustainability issues. In addition, both potential and actual risks related to climate risks must also be reported, thereby obliging companies to make decisions based on scientific methods in order to find solutions aimed at preventing or addressing them. From a banking and prudential perspective, this represents an important step for the collection of information that will subsequently be used by banks. This is because it will facilitate banks' data-gathering activities, by immediately providing specific information without the need to ask ad hoc questions.

However, currently the CSRD and other directives, which will be examined later, are under a modification phase. On 11th February 2025, the Commission announced its initiative to

simplify the implementation of Directives (EU) 2022/2464 and (EU) 2024/1760, and this would take place through the Omnibus package, which is a set of legislative proposals of the European Commission aimed at updating and harmonizing various regulations in the financial sector (European Commission, 2025a). In particular, it concerns a broad simplification in the areas of reporting on sustainable finance, sustainability due diligence, and simplifications in the EU taxonomy (European Commission, 2025b). With regard to the CSRD, Omnibus provides for a change in the thresholds, as can be seen from Figure 2.2.3.

Current Thresholds	**Proposed Changes**
1st wave: *Large EU PIEs*	
- >500 employees	- > 1000 employees
2nd wave: Large EU Companies	
- > 250 employees - > 50 million € turnover - > 25 million € balance sheet	- > 1000 employees (and) - > 50 million € turnover (or) - > 25 million € balance sheet
3rd wave: Listed SMEs in EU	
- Listed SMEs	- Excluded
4th wave: Ultimate non-EU parent	
Turnover: - > 150 million € in EU (and) - > 40 million € of an EU subsidiary meeting CSRD criteria	Turnover: - > 450 million € in EU (and) - > 50 million € of one large EU subsidiary

Figure 2.2.3: proposed changes by the Omnibus package

The new proposal provides for a reduction in the number of companies involved, thus making the amount of the total administrative costs paid by companies will be less, especially because small-sized companies will no longer be obliged to disclose information about ESG. However, for SMEs and for all the companies not subject to the CSRD there is the possibility to follow a voluntary standard called VSME. The package also provides for changes concerning the ESRS as well: it is expected that there will be a reduction in the number of information disclosed due to the reduction in ESRS datapoints. The core content and disclosures are expected to remain unchanged, but the overall complexity will be reduced, as the amount of granular information required from large companies will be decreased. Furthermore, with regard to the immediate future, the sector-specific standards will not be required; however, companies may supplement their reporting using other international sector-specific standards. Furthermore, the package has another consequence: since the number of companies still obligated to draft sustainability information has been reduced, the quantity of information available to banks is also limited. This means that Omnibus is effectively removing a large amount of climate data, as the number of counterparties involved has decreased.

Furthermore, the package, in addition to providing for a change in the ESG contents and in the companies involved, also calls for a modification of the timelines set for the drafting and publication of reports by companies.

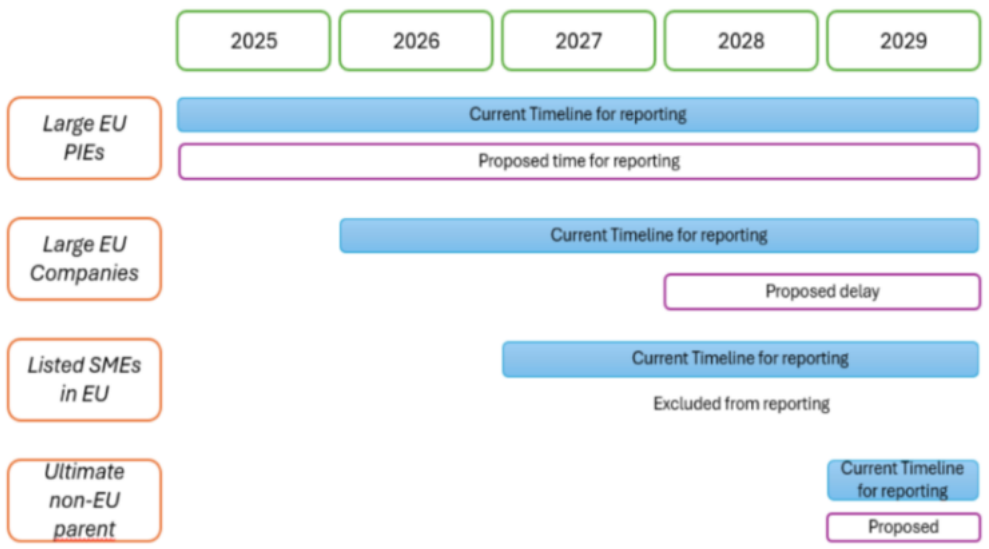


Figure 2.2.4: proposed timeline changes by the Stop-o'clock

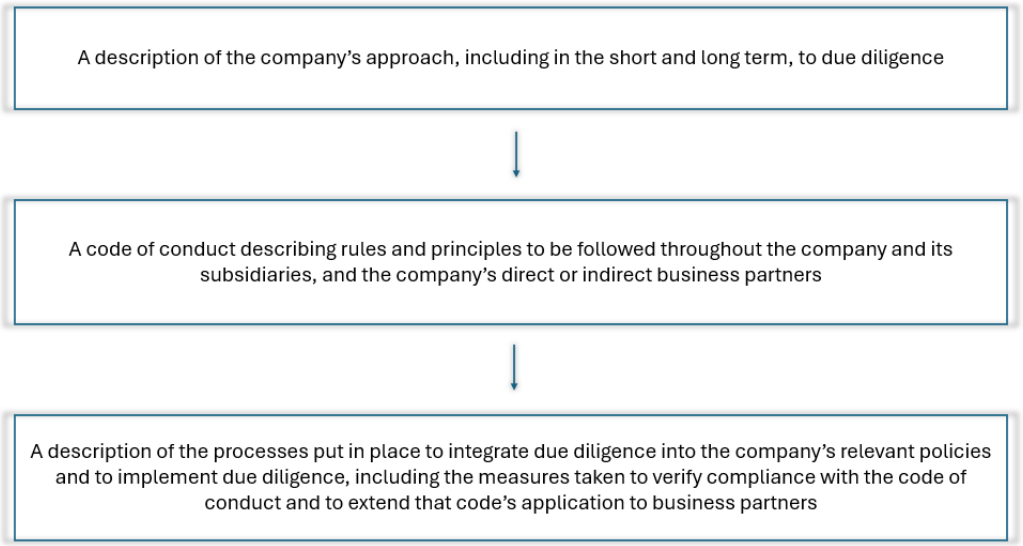
On 16 April 2025, the European Parliament and the Council adopted the new directive (2025/794), which entered into force on 17 April 2025 (European Union, 2025). Member States must transpose these directives into national law by 31 December 2025.

The European process to develop a uniform system is still under development; however, the CSRD represents a good starting point for the disclosure of ESG information, imposing on a large number of companies the principles of double materiality and a rigorous due diligence process, while at the same time laying the foundations for more transparent, comparable, and reliable reporting throughout Europe.

While the CSRD primarily focuses on ensuring transparency and comparability of ESG information through standardized reporting obligations, the forthcoming CSDDD moves one step further, shifting from disclosure to action. The CSDDD requires companies not only to report but to effectively implement due diligence processes aimed at identifying, preventing, and mitigating adverse impacts on human rights and the environment across their entire value chain. In this sense, the CSRD and the CSDDD are highly complementary: the first one provides the informational background, while the latter enforces corporate accountability in practice.

Directive 2024/1760 of 25 July 2024 is the CSDDD (European Union, 2024c), the objective of which is to promote sustainable corporate behaviour along the entire value chain, addressing important issues such as the negative impacts of corporate activities on human rights and on the environment (European Commission, 2024b).

The requirement underlying the directive is the implementation of the duty of due diligence, that is, a mandatory mechanism for the assessment and management of ESG risks that companies must apply along the entire value chain. The directive provides that companies integrate this duty within their business processes and that a policy be implemented to ensure a duty of due diligence on risk. Figure 2.2.5 summarizes the characteristics that the policy relating to the duty of due diligence must have within the corporate context.



Source: Figure 2.2.5: Characteristics of Due Diligence duty (European Union, 2024c).

In contrast to the CSRD, the CSDDD requires the identification not only of the potential and actual impacts of the company itself, but also of those of its business partners (European Commission, 2024b). This significantly broadens the scope of the directive, extending it beyond the boundaries of the individual enterprise and encompassing both Tier 1 suppliers (those with whom the company maintains a direct contractual relationship) and Tier 2 suppliers (the suppliers of direct suppliers, with whom no direct contractual link exists). Within this framework, the role of financial institutions is particularly relevant. According to paragraph 51 of the directive, they are expected to take into consideration the negative impacts of activities situated upstream in the value chain: the activities they finance or support rather than downstream impacts on their final clients. Moreover, the directive explicitly requires regulated financial operators to exercise their influence by applying the so-called leverage effect, with the aim of steering the conduct of the companies they intend to finance.

Another key step is reflected in article 22 of the CSDDD, which makes it mandatory for all companies to adopt a transition plan to mitigate climate change and to ensure that their strategies and business models are compatible with a sustainable transition. The transition plan must include the following information:

- Timeline targets for 2030 and 2050, as well as greenhouse gas emission reduction targets covering scope 1, 2, and 3;
- A description of the decarbonization levers to be implemented;
- Quantification and explanation of the investments supporting the implementation plan;
- A description of the role of internal management and supervisory bodies with regard to the transition plan.

This article is particularly important from a banking perspective, as companies' transition plans can become one of the main sources of data for banks. The presence of a detailed plan, including the objectives and strategies to be adopted by companies, can therefore assist banks in the customer engagement phase and, above all, in the reporting of data during supervisory authorities' verification processes.

Figure 2.2.6 outlines the types of companies that are required to comply with the CSDDD and also indicates the implementation timelines for the directive by companies, both before and after the Omnibus package.

THRESHOLDS	ORIGINAL TIMELINE	OMNIBUS TIMELINE
1st wave:		
• > 5000 employees • > 1.5 billion € turnover	2027	2028
2nd wave:		
• > 3000 employees • > 900 million € turnover	2028	2028
3rd wave:		
• < 1000 employees • < 450 million € turnover	2029	2029

Figure 2.2.6: Companies under CSDDD regulation European Union, 2024c).

The Omnibus package introduces several changes, first of all it postponed the first wave, from 2027 to 2028, while keeping unchanged the application dates of the other waves. Moreover, it establishes that the Due Diligence obligation will not be extended to both Tier 1 and Tier 2, but will instead focus only on Tier 1. This choice was made for several reasons: difficulties in data collection, time-consuming processing procedures, and the capital- and human resource-intensive cost for companies. Despite the various amendments, the Omnibus package has not altered the obligation to adopt a transition plan; but it has emphasized its importance and the need for continuous updates in order to ensure timely and detailed information for all stakeholders.

In summary, the European regulatory framework on sustainability is progressively shaping an integrated and binding system, in which reporting obligations, due diligence, and transition plans converge to strengthen transparency, comparability, and the resilience of the financial and corporate sectors in the face of climate and ESG risks.

2.3 Prudential Supervisory Expectations

After analysing the international standards addressed to banks and the European framework on disclosure, this section examines the expectations of supervisory authorities regarding the integration of climate risks into the financial landscape.

The European Union has intervened through the issuance of the CRR, with the objective of adopting the international rules agreed by the Basel Committee, introducing the output floor as

a prudential tool for capital and liquidity (European Union, 2024b). Internal risk assessment models tend to underestimate risks and, consequently, potential losses, leading to insufficient capital reserves. The integration of the output floor is one of the requirements of Basel III, which stipulates that RWA calculated using internal models cannot be lower than 72.5% of those obtained through standardized approaches, thereby limiting unjustified variability and the risk of undercapitalization.

Furthermore, alongside Pillar 1 there is also another crucial component, which illustrates the standardized rules for the calculation of minimum capital requirements in relation to risk-weighted assets, assigning a higher weight to riskier exposures in the case of credit, market, and operational risks. Within this framework, the mechanism ensures that capital remains adequate even for exposures in high-risk sectors. One of the main challenges is to identify and incorporate climate risks into the calculation of capital requirements, since an underestimation of such risks could generate systemic impacts. The research (Auzepy & Bannier, 2025) suggests the integration of climate risks into the standardized approach. RWA, which reflect the value of assets adjusted for their underlying risk through the application of risk weights, represent the key parameter for determining minimum capital requirements. It is widely accepted that climate risks are not a stand-alone risk category but rather act as drivers of conventional risks. In line with this view, the EBA describes climate risks as a particularly relevant driver of credit risk (EBA, 2022c).

In the evaluation risks context, the robustness of capital requirements depends on the proper identification of risks. In particular, the CRR asks banks to disclose information related to material risks, including climate risks if considered materials. This principle is recognized by article 431 of the CRR, which requires institutions to adopt a formal internal policy aimed at encouraging the disclosure of material information, so that such information may be subject to verification by supervisory authorities. In this way, if climate risks are considered material, they must be disclosed in accordance with Pillar 3, thus ensuring transparency for both investors and supervisory bodies.

Another instrument through which the European Union has adopted the principles of the Basel Pillar is CRD IV, introduced in 2013 and amended several times up to the most recent version of 2024. Article 74 (“Internal governance and recovery and resolution plans”) establishes that entities must adopt an internal structure that allows the reporting, identification, monitoring and management of risks (European Union, 2013b). This is a concept already recalled in the previous subchapters: the need to have effective internal processes and policies to prevent and to face the birth and the development of significant risks. This approach is directly extendible to climate risks, for which the preparation of a plan that reports how the entity intends to manage and mitigate such risks is fundamental to demonstrate to the supervisory authorities their integration into the entity’s strategy.

Furthermore, article 76 states and highlights the central role of having a management body responsible for the approval and the periodic management of strategies and policies. Through

the evaluation of activities, the use of external credit ratings and internal models, it must ensure an adequate allocation of resources to face potential risks. Therefore, the importance of the timeliness of information, and of their periodic review, is underlined, therefore ensuring an effective corporate strategy against risks. This principle is also applied to the integration of climate risks in business processes.

Article 79 requires institutions to adopt internal methodologies for the assessment of credit risk, with particular attention to portfolio-level risk and, consequently, to that of individual counterparties. Within the context of climate risks, the evaluation of an institution's portfolios represents a crucial step in drafting an effective transition plan, as it allows the assessment of the exposure of financed entities to physical and transition risks.

Finally, article 83 addresses the concept of market risk, assigning to the supervisory authorities the task of monitoring the adequacy of internal capital reserves and supporting institutions in the identification, measurement, and management of material risks. This also encompasses the assessment of risks stemming from climate change, ensuring that capital buffers remain proportionate to the identified exposures.

The CRD6 introduced changes in some of the aforementioned articles (European Union, 2024a). For instance, article 76 establishes that the competent body must review the institution's strategies every two years and develop implementation plans that include quantifiable objectives for the management of financial risks arising from ESG factors, emphasizing the significant impact that climate risks can generate.

The CRD6 explicitly integrates the dimension of climate risks, specifically by adding a new article concerning the ESG dimension: article 87-bis. The article requires supervisory authorities to support institutions in the identification, measurement, management, and oversight of environmental, social, and governance risks over the short, medium, and long term. A notable advancement in this context is the explicit inclusion of the time horizon dimension, exceeding 10 years in the case of strategies, policies, and processes aimed at managing climate risks. Furthermore, institutions are required to use credible scenarios that reflect the potential impact of risks arising from social, environmental, and policy changes; the assessment of such plans is carried out within the SREP. The article also delegates to the EBA the task of issuing guidelines regarding the standards that must be adopted by financial institutions for the identification, measurement, management, and oversight of ESG risks. It further requires the provision of guidelines to identify qualitative and quantitative criteria for assessing the impact of climate risks and to establish the criteria for defining the scenarios to be used.

In conclusion, while the CRR and CRD4 were more oriented towards financial aspects, the European framework has undergone a significant shift with CRD6 and CRR3, particularly regarding the integration of climate risks into the financial context. This regulatory development is aligned with the evolution of international standards elaborated by the Basel Committee at BIS, which in recent years has defined specific principles for management and supervision of

climate risks. The CRD6 incorporates and makes binding many of the indications contained in the principles addressed to supervisory authorities, thereby strengthening the consistency between the European framework and global best practices.

Among the 18 principles recognized in the BIS document entitled *Principles for the Effective Management and Supervision of Climate-Related Financial Risks* (BCBS, 2022), the last six are addressed to supervisory authorities in their analysis and verification of climate risk within the banking context. The objective of principles 13 to 18 is to ensure that banks effectively integrate climate risks into their strategic, governance, and control processes. The following table presents these principles, following the same analytical framework adopted in section 2.1:

Area	Principle	Description
Prudential regulatory and supervisory requirements for banks	13	Supervisory authorities have the responsibility to ensure that banks effectively and robustly integrate climate-related financial risks within their corporate strategies, governance frameworks, and control systems. Moreover, supervisory authorities must ensure that the institution consistently incorporates, across different time horizons, an assessment of how these risks may affect the achievement of corporate objectives.
	14	Supervisory authorities should ensure that banks are able to identify, monitor, and adequately manage ESG risks during the process of assessing their risk appetite and within their overall risk management frameworks. Moreover, banks are required to adopt data aggregation methods and reporting practices in order to communicate their level of exposure to

		climate-related risks. As a consequence, this process must be subject to supervisory review.
	15	Supervisory authorities must ensure that banks integrate climate risks and assess how these risks are considered in the management of credit, market, liquidity, and operational risks. Moreover, banks are required to adopt scenario analyses, with the objective of evaluating their business models in relation to potential climate-related events.
Responsibilities, powers and functions of supervisors	16	In the case of a misalignment between banks' policies and processes and supervisory expectations, the competent authorities should adopt follow-up measures.
	17	Supervisory authorities should have adequate capital and sufficient resources to ensure that the analysis is credible and realistic.
	18	Supervisory authorities should assess the adoption of scenarios or stress tests related to climate risks in order to identify the level of exposure of the financial institution with respect to its portfolio and to evaluate the adequacy of the policies adopted by

		the financial institution. Moreover, during the analysis, the following factors must also be taken into account: different time horizons, levels of uncertainty, and possible gaps in disclosure.

Table 2.3.1: Summary of BCBS Principles for the Management and Supervision of Climate-related Financial Risks (adapted from BCBS, 2022)

The guidance issued by the Basel Committee was immediately translated into the European context: the ECB, as the direct supervisory authority in the euro area, adopted these principles as a reference framework for developing its supervisory expectations on climate risks.

In the document "*Guide on Climate-Related and Environmental Risks: Supervisory Expectations Relating to Risk Management and Disclosure*" (ECB, 2020a), the ECB defines its supervisory expectations towards banks, taking into account the fundamental principles established by the CRR and the CRD. Within the Guide, the ECB identifies specific expectations regarding the internal governance of banks. In the table below, these expectations are presented according to the dimension in which they should materialize.

Macro-area of interests	**Expectation**	**Expectation definition**	**Explanation**
Supervisory expectations relating to business models and strategy	N° 1: Business Environment	Institutions must identify how climate risks may impact the operating context in the short, medium, and long term, in order to make strategic decisions	The operational context in which institutions operate makes them subject to geographical and sectoral exposures. These exposures include macroeconomic and regulatory variables that may be subject to climate risks, potentially generating significant consequences for the institutions. Therefore, a key step is the systematic analysis of exposures, in order to understand how climate risks may impact the institution's activities. Such analysis must be internalized within the organization, so as to define

			an effective corporate strategy to be implemented by the management bodies
	N° 2: Business strategy	In the phase of corporate strategy definition, institutions must integrate climate risks into the operational context over the short, medium, and long term.	The ECB recognizes corporate strategy as the key instrument for an institution in order to generate returns consistent with its risk appetite. Environmental risks can affect both the implementation and the effectiveness of corporate strategy; for this reason, institutions must employ scenario analyses and stress tests to anticipate the occurrence of such situations. The institution must monitor the evolution of its corporate strategy with respect to the emergence of climate risks through measurable and quantifiable performance indicators. Furthermore, institutions must take into account risks at the credit portfolio level, considering both sectoral and geographical exposures.
Supervisory expectations relating to governance and risk appetite	N°3: Management body	The management body, during the strategy development phase, must consider how climate risks may affect the achievement of corporate objectives. For this reason, constant	The management body has the responsibility to ensure that an appropriate risk management governance framework is adopted, acting as the supervisory body. In addition, roles and responsibilities must be clearly defined within the organizational structure, in line with the institution's risk profile. The

		oversight of these risks is required.	management body must possess the necessary expertise to understand the institution's activities and how the emergence of climate risks may impact its operations. Furthermore, the management body is responsible for determining the materiality of climate and environmental risks, providing both quantitative and qualitative information during the development phase of the corporate strategy.
	N° 4: Risk appetite	Institutions are required to explicitly include climate and environmental risks in their risk appetite framework	The institutions should have a Risk Appetite Framework (RAF) that integrates all the risks to which the entity may be exposed. A detailed description of climate and environmental risks is required, and therefore a comprehensive inventory of risks is essential for the identification process. The institutions are required to monitor these risks through Key Performance Indicators (KPIs) and to report their exposures to climate risks based on both current and forward-looking estimates.
	N° 5: Organisational structure	Institutions must assign responsibilities for the management of climate risks in accordance with the three lines of defence.	It is necessary for institutions to have a clear, transparent, and documented decision-making process. Responsibilities should be explicitly assigned within the organizational structure. The entity must have an internal oversight

			function, designed to verify internally its ability to manage climate and environmental risks.
	N° 6: Reporting	Institutions must provide data that show their level of exposure to climate risks, in order to allow management bodies to make informed decisions.	EBA's guidelines suggest that institutions establish regular reporting mechanisms so that the competent bodies can make decisions in a timely and accurate manner. The reports must be able to demonstrate the impact that climate risks have on the business model, strategy, and risk profile.
	N° 7: Risk management framework	Institutions must consider climate risks as drivers of existing risks, and for this reason they must be able to identify and quantify these risks in order to ensure capital adequacy.	Institutions must have a risk management framework, as suggested by article 73 of the CRD, which requires institutions to define the amount of internal capital that must be allocated to cover the insurgence of climate-related risks.

Table 2.3.2: Summary of supervisory expectation (adapted from ECB, 2020b)

Among the risk management frameworks, the ECB document identifies expectations for the following transmission channels: credit risk management, operational risk management, market risk management, liquidity risk management. They will be examined in detail in chapter 5.

Furthermore, expectation 6 of ECB's guidelines requires banks to collect granular climate risk data, in order to guarantee that the management body can make informed strategic decisions. However, the information should also be directed to supervisory authorities, and not only to internal bodies, so that they can verify the adequacy with respect to the bank's performance and its exposure to climate and environmental risks.

In this context, the ECB in the "Report on climate and environmental disclosures" evaluated the climate and environmental disclosures in the euro area, measuring the degree of alignment with the 13 ECB expectations (ECB, 2022c). The analysis highlighted that the majority of institutions still show wide margins for improvement: in fact, only a minority has adopted disclosure policies that include climate risks. Moreover, about three-quarters of the institutions

examined do not disclose the impact of such risks on their risk profile, and a similar number do not make public the information on materiality. These shortcomings not only represent a deficit of transparency, but can also directly affect the prudential assessment, with potential consequences in the SREP process.

The importance of climate risk evaluation and their integration into the financial context is an integral part of the ECB Supervisory priorities for 2025-2027 (ECB, 2024d). The Supervisory Board of the ECB has established the supervisory priorities for the next three years, indicating how it is necessary to make efforts with regard to the credit risk management framework and the identification of risks, climate-related and not, that may have potential consequences on the institution. The scope is to avoid the development of a disorderly transition that could increase physical and transitional risks. Moreover, the new priorities ask financial institutions to comply with the supervisory expectations and the requirements of the new banking package CRR3/CRD6 in the matter of ESG risks. The reason for this is due to the continuous increase of physical risks caused by the warming of global temperatures, and at the same time the slow achievement of the net zero objectives. An objective for the 2025–2027 period is to assign supervisory authorities the responsibility of periodically reviewing the adequacy of risk management practices within the financial sector, this will be further possible thanks to the disclosure obligations of the CRR3/CRD6 package which provides that financial institutions elaborate a prudential transition plan.

Climate risk expectations will also be reviewed under the Supervisory Review and Evaluation Process (SREP). During this evaluation, the supervisory authorities examine the adequacy of governance processes, risk management and capital planning, including the integration of climate and environmental risks. In this way, supervisory expectations are transformed into real prudential constraints for financial institutions.

These concepts are restated also by the EBA in its internal governance guidelines (EBA, 2021b), which states that it is necessary to have a risk management framework, which extends to all business activities recognizing the underlying economic reality of all its risk exposures. The risks that must be included in the analysis are both current and future ones, paying particular attention to credit, market, liquidity, and reputational risks but above all environmental, social and governance risks.

The EBA supports what has already been mentioned by the ECB guidelines, by the BIS principles and by the European regulatory package: it is necessary that risk control procedures implemented ensure the identification, measurement, monitoring, management, mitigation and reporting of risks, in a timely manner. Moreover, during the phase of risk measurement and assessment, financial entities should adopt stress tests or internal scenarios to evaluate the level of risk appetite of the entity (par. 156). It is further restated how the management body must consider environmental, social and governance risks, since they can affect prudential risks (par. 23).

Moreover, at the request of the Commission, the EBA adopted guidelines to implement the new article of the CRR (Article 449a), which states: "*That article requires large institutions that have issued securities that are admitted to trading on a regulated market of any Member State to disclose, as from 28 June 2022, information on environmental, social and governance (ESG) risks, including physical risks and transition risks*." (European Union, 2022a).

Among the various guidelines it proposed, there are annexes aimed at defining the concepts of physical and transition risks and their potential impact on the financial activity of the institution. Furthermore, in accordance with Article 449a of the CRR, on 20 January 2022 the EBA submitted to the European Commission the final draft of the Implementing Technical Standards (ITS) on prudential disclosure of ESG risks (EBA, 2022b).

This represents the first binding standard that translates Article 449a CRR into operational requirements, thus no longer generic recommendations, but mandatory modules, templates, and tables.

The document proposes 10 templates, which are the operational core of the ITS, since they standardize which information banks must identify regarding ESG risks, which will then be subject to prudential supervision (EBA, 2025a).

Category	**Template**	**Main content**	**Impact on prudential transitional plan**
Transitional Risks	Credit quality of exposures by sector, emissions and residual maturity	Exposure of the institution's assets to transition risks, through the classification of loans granted to non-financial corporates based on NACE codes and the reporting of financed greenhouse gas emissions (Scope 1, 2 and 3).	Assessment of the sectoral concentration level of the institution's portfolio, and consequently the credit risk related to decarbonization policies.
	Loans collateralised by immovable property: energy efficiency of the collateral	Prudential information on climate transition risk regarding the gross amount of loans secured by real estate and on repossessed real estate collateral must be based on the collateral's energy efficiency	It highlights the vulnerability of the real estate portfolio with respect to regulations and energy costs.

	Alignment metrics for the banking book	Disclosure of financed Scope 3 emissions, split by economic sector and reported with reference to the transition alignment metric. The template requires indicating the methodology and data sources used, as well as the degree of the entity's position with respect to the NZE2050 scenario.	It provides quantitative inputs to verify the consistency of the bank with net-zero transition trajectories.
Physical Risk	5. Exposures subject to physical risk	It measures the level of institutions' exposure to non-financial corporations through loans secured by real estate and real estate collateral, with particular attention to acute and chronic physical risks. The classification of exposures is carried out by economic activity sector (NACE) and by geographical area.	Supports scenario analysis on the physical impacts on the portfolio.
Mitigation actions and KPI	6. Summary of KPIs	The template requires reporting the GAR Stock, which measures the current alignment of the balance sheet, and the GAR Flow, which highlights the new financing granted in line with the European taxonomy	Integrates the main ESG indicators into a single framework, providing a reference basis for the transition plan.
	7. Assets for the calculation of the	Identification of the assets and costs that contribute	It allows to identify which specific

	Green Asset Ratio (GAR)	to the GAR, based on the alignment of revenues.	exposures support the transition, facilitating the definition of sectoral objectives and the reallocation of capital towards activities with lower climate risk.
	8. Green Asset Ratio (GAR) KPIs	The template provides KPIs for the calculation of the level of exposures and the institution's GAR.	A set of KPIs to assess the percentage of "green" of the portfolio and to set transition targets.
	9. Banking Booking taxonomy	Template provides further details for those non-financial companies that are not subject to disclosure obligations (NFRD and CSRD).	It allows to map areas of the portfolio where climate risk has not yet been quantified (SMEs, non-EU activities).
	10. Other climate change mitigating actions	The template requires a detailed explanation of the other actions implemented by the entity to mitigate climate risks, specifying the timing of the measures.	It shows other strategies adopted by the entities, which are not included in the taxonomy.

Table 2.3.3: Summary of the ten templates on prudential disclosure of ESG risks (adapted from EBA, 2022b)

In this context, template 4 (exposure to the 20 most carbon-intensive counterparties) is not examined, since its value lies mainly in reputational transparency and comparison among institutions, while the analysis focuses on the templates that have a direct impact on the prudential measurement of risks and on the definition of transition plans.

The introduction of the templates has two direct implications for prudential transition plans: on one hand, it provides supervisory authorities with a tool to monitor banks' exposure to climate risks; on the other hand, it requires institutions to adopt data collection methodologies capable of meeting the disclosure requirements. In this context.

One of the main critical issues of the ITSs lies in their close connection with the EU Taxonomy Regulation, which defines the transitional activities. These are economic activities which, although not fully "green", contribute substantially to the gradual reduction of emissions and support the economic system in moving towards climate neutrality.

The EU Taxonomy defines the technical criteria to determine whether an economic activity can be considered environmentally sustainable. In particular, Articles 10 (Substantial contribution to climate change mitigation) and 11 (Substantial contribution to climate change adaptation) explicitly address transitional activities (European Union, 2020). For an economic activity to be considered aligned with the EU Taxonomy, it must make a substantial contribution to at least one of the six environmental objectives set out in the regulation. At the same time, it must comply with the “do no significant harm” (DNSH) principle with respect to the other objectives and ensure the observance of minimum social safeguards (MSS) (European Union, 2020).

However, the technical complexity of the criteria and the absence of fully operational guidelines generate interpretative uncertainty (Copenaghen Business School, 2025). In fact, one of the main complexities lies in the persistent need for clarifications regarding the normative text of the EU Taxonomy, which remains despite the numerous methodological specifications issued over time (Autorité des Marchés Financiers, 2024). Moreover, the stringent selection criteria set out in the Taxonomy Regulation result in the exclusion of a significant share of investments, due to the particularly restrictive definition attributed to transitional activities (EDHEC Climate Institute, 2025). The absence of a clear and consistent implementation guide regarding the technical criteria and the disclosure methods provided for by the Taxonomy contributes to generating high regulatory uncertainty, making their application challenging (García-Torea et al., 2024).

As a consequence, the ITSs, which are based on the Taxonomy as their main regulatory reference, also reflect and amplify these uncertainties. Furthermore, a study conducted by the ECB (ECB, 2024b) shows that several banks have misinterpreted the instructions contained in the ITSs, confirming the need for greater regulatory and operational clarity.

Despite the critical issues highlighted, the technical complexity, interpretative ambiguity, and the close link with a taxonomy that is still evolving, the ITSs represent an important step towards the standardization of environmental information relevant for prudential purposes. In a context characterized by increasing expectations of transparency and comparability, the templates provided by the ITSs constitute a potentially useful tool for strengthening the dialogue between banks and supervisory authorities, facilitating the integration of climate-related risks into supervisory processes.

3. RISK CATEGORIES AND TRANSMISSION CHANNEL

3.1 Integration of climate risks into transition plans

The integration of climate-related financial risks into a transition plan involves assessing bank's vulnerabilities. In this context, "vulnerabilities" are the system characteristics that reflect the accumulation of imbalances of various types. When climate shocks affect banks' vulnerabilities, their stability is at risk. These shocks can impact the bank directly (through client default) or indirectly (through damage to counterparties' assets), causing losses and capital strain (FSB, 2025a). This happens because there is a positive and statistically significant correlation between climate risk and the financial market (Wu & Wan, 2023).

3.1.1 Risk categories

Before proceeding with the analysis, it is necessary to provide a definition: when discussing climate risks in a transition plan, we distinguish in two types: physical and transitional (Auzepy & Bannier, 2025; BCBS, 2021b). Figure 3.1.1 summarizes the main drivers (determinant factors): physical risks on the left and transitional risks on the right, which will be analysed in the following sections.

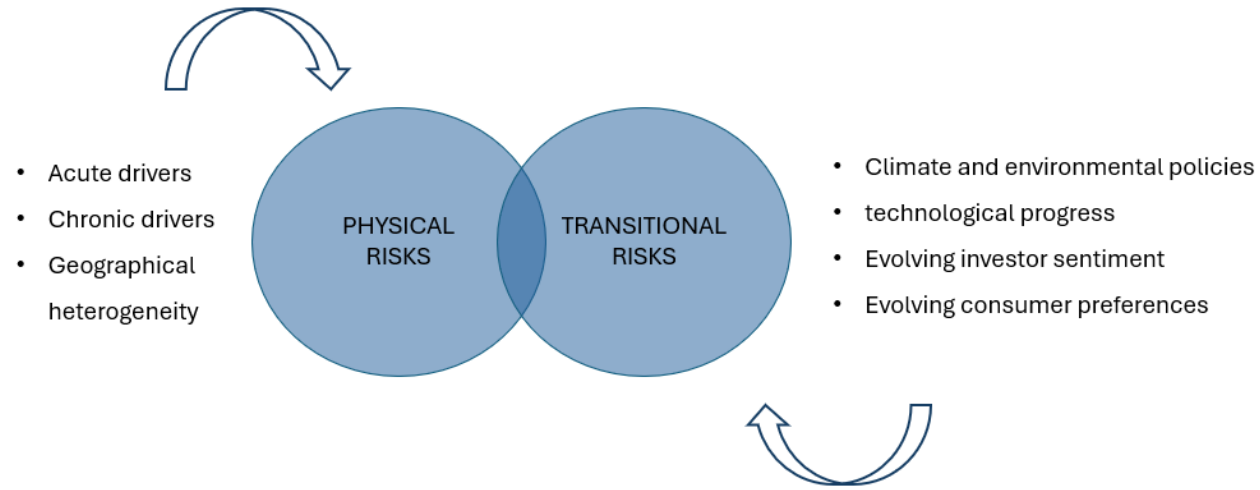


Figure 3.1.1: Own elaboration based on ECB, 2020a; BCBS, 2021b

This conceptual distinction also reflects the approach adopted by the scientific community and by the Intergovernmental Panel on Climate Change, which organizes its assessment into three working groups: the first one focusing on the physical science basis of climate change; the second one on impacts, vulnerabilities and adaptation; and the third one on emissions mitigation (IPCC, 2019). This division highlights the multidimensional nature of climate risk, encompassing physical, social and economic dynamics, and at the same time underscores the need the financial sector to develop new analytical tools aligned with this level of complexity. Furthermore, even instances of unclear or unsystematic transition over a short period of time expose the bank to vulnerability issues (Chalabi-Jabado & Ziane, 2024).

A significant conceptual advance is the recognition that climate risks arise both from the direct impacts of climate change and from the political, regulatory, and economic measures implemented to mitigate its effects (Simpson et al., 2021).

The interconnection of socio-economic, environmental and technological system facilitates the propagation of the risk from one sector to another, creating new risk typologies or worsening existing ones (Simpson et al., 2021).

In the banking context, these risks represent a relatively new concept for the supervisors, obliging banks to review and modify their internal monitoring processes. Moreover, they are difficult to integrate because they do not constitute an independent risk, but instead they act as drivers of prudential risks. Another challenge is the limited availability of data, which makes it more difficult to assess and predict potential future events (Auzepy & Bannier, 2025).

A missing quantification or limited comprehension of their verifiability can create significant economic incongruities; for this reason, they must be included in economic evaluations and decision-making processes (Rising et al., 2022). Furthermore, a missing integration of these risks into banking strategies can increase corporate insolvency cases and cause financial losses (Chalabi-Jabado & Ziane, 2024).

Therefore, it can be concluded that climate risk assessment (CRA) is fundamental for banks, their stakeholders and supervisors (Arribas et al., 2022).

3.1.2 Physical risks

Physical risks arise from extreme or gradual weather events. In the first instance, there are landslides, floods, wildfires, hurricanes; while the latter include changes in precipitation and temperature, such as sea level rise. The European Central Bank (ECB, 2020a) and the Basel Committee on Banking Supervision (BCBS, 2021b) categorize physical risks into acute, chronic and geographical heterogeneous risks. In the next figure (3.1.2.1), it is possible to examine how they are split and their potential consequences.

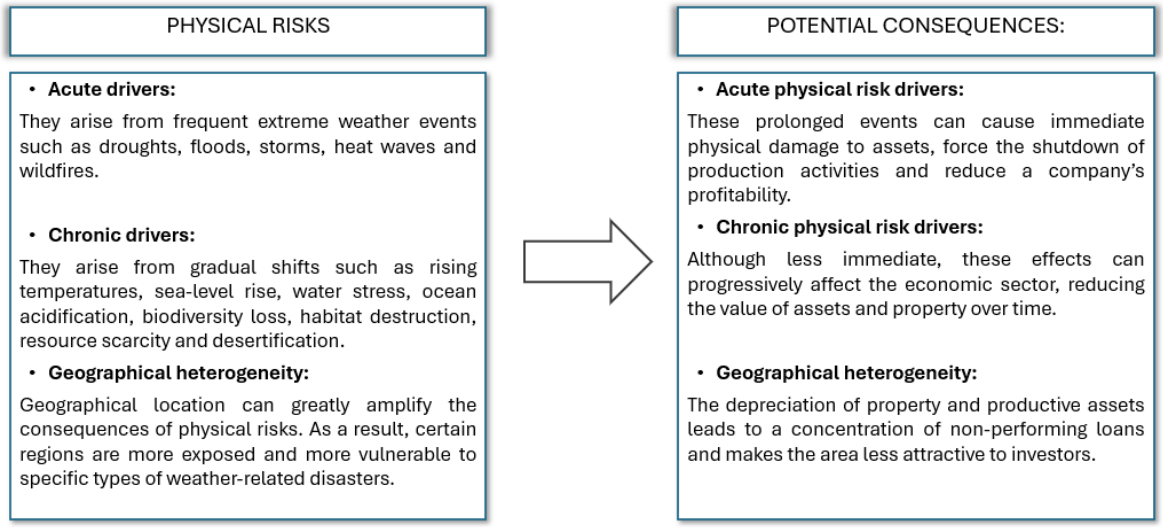


Figure 3.1.2.1: Own elaboration based on ECB, 2020a; BCBS, 2021b

This refers to physical hazards that can damage client companies' assets, leading to higher financing needs (Bayangos et al., 2021) and an increased likelihood of corporate defaults. It also results in reduced bank performance and the granting of loans (Chalabi-Jabado & Ziane, 2024).

3.1.3 Transitional risks

Transitional risks refer to the economic impacts resulting from the shift from a high-emission economy to a low-emission one (ECB, 2020a). They can arise from changes in the government policies that require corporates to invest in new technologies (that can undermine the competitiveness of other enterprises), or from shifts in consumer preferences (such as a move toward eco-friendly products). Unlike physical risks, transitional risks are global in scope and effects can have a large-scale impact on the entire economy rather than being confined to a specific area. Figure 3.1.3.1 summarizes the typologies of transitional risks and their potential consequences.

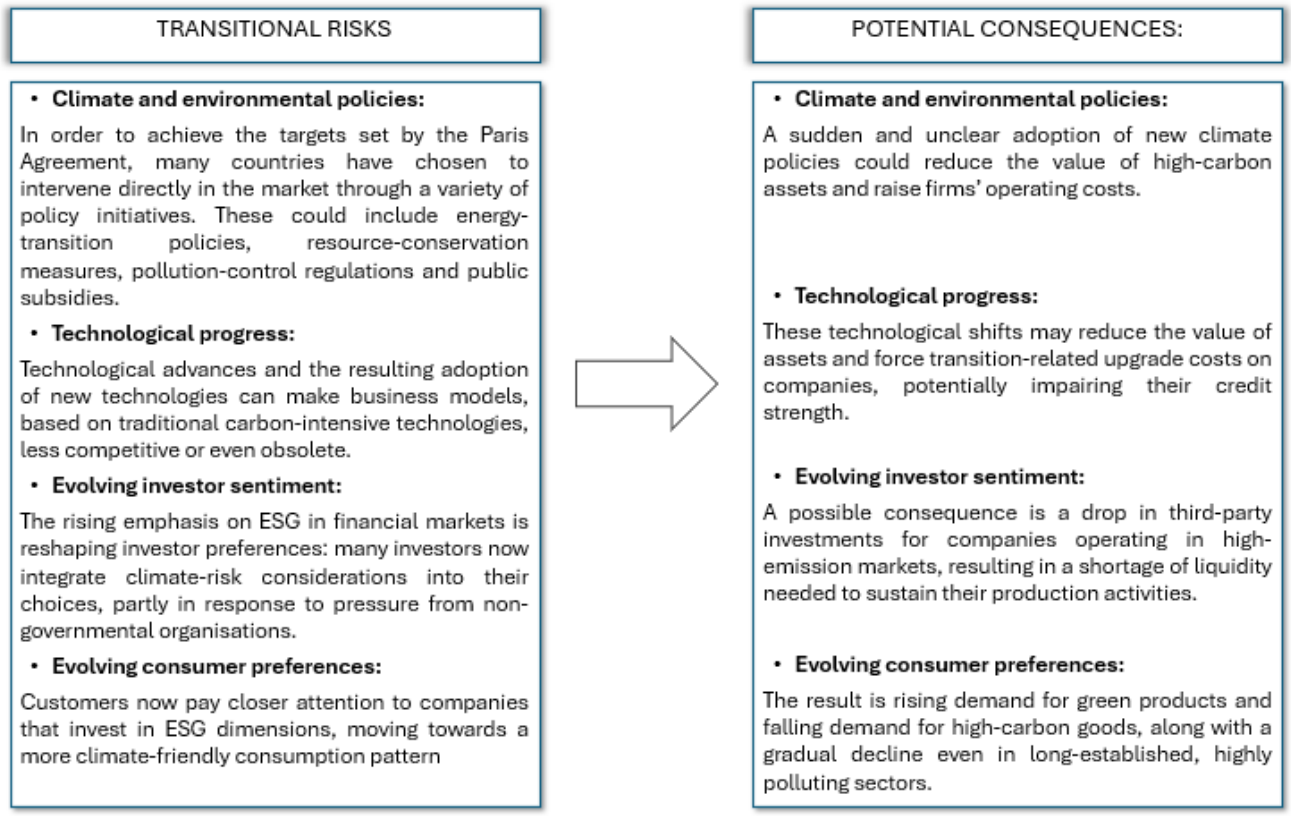


Figure 3.1.3.1: Own elaboration based on ECB, 2020a; BCBS, 2021b

This type of climate risk will generate impacts of varying severity on institutions' portfolios, depending on the sector of origin. For this reason, greater granularity and geographic segmentation are essential when evaluating a client's profile (EBA, 2025d).

In conclusion, now it is possible to state that physical and transitional risks can impact economic activities, and as consequence the financial system as well. Considering the fact that some companies can be influenced by them, this could be translated into a problem for

the bank sector. Even because, climate risks as already anticipated are drivers of existing prudential risks, like reputational risks, operational risks, market risks, liquidity and credit risks. Some of them are considered as main channel for the transition of climate risks, and they will be analysed in the next sub-chapter.

Furthermore, an effective CRA requires not only an understanding of climate phenomena across different spatial and temporal scales, but also the ability to integrate heterogeneous data asset exposures, socio-economic system vulnerabilities, and the intrinsic uncertainty in the available models. The main challenge is combining these dimensions to support strategic decision-making and capital allocation, overcoming the limitation of traditional assessment methods used by banks until now (Arribas et al., 2022).

3.2 Transmission channels

When discussing climate shocks and how the physical and transitional risks can propagate and impact business activities and the economic system, we refer to transmission channels.

According to NGFS (2020a) "*they can also be viewed as the way through which climate change might materialise as a source of financial risk*" (BCBS, 2021b, p.10). The main transmission channels are three: credit, market and operational channels, followed by others such as underwriting and liquidity risks. Figure 3.2.1 summarizes the climate risks and the transmission channels.

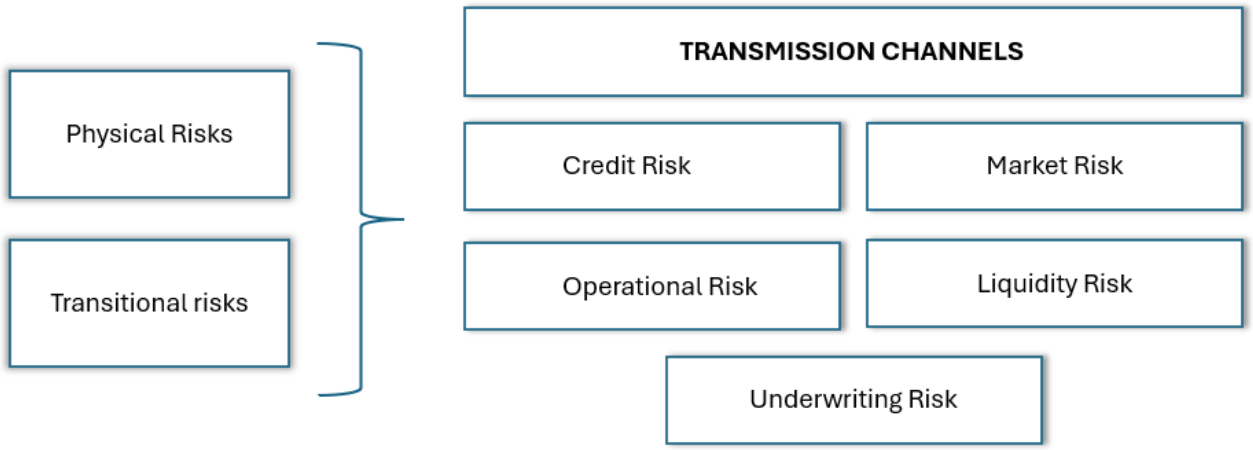


Figure 3.2.1: Climate risks and the transmission channels

At this point, it is necessary to analyse individually the transmission channel before going on with the interconnection among them and the climate physical risks. According to (BCBS, 2021b) and (NGFS, 2020a) the importance of the transmission channels depends on the nature of climate shock, structure of the real economy and financial system characteristics.

Channel:	Definition:	Impacted entities:	Typical impact:

Credit risk	Risk drivers can negatively affect a client's ability to repay the debt, and as consequence, the ability of the bank to recover the loan's value. In the context of credit risk, climate drivers operate through counterparties, damaging the debtor's assets and their ability to meet obligations.	• Households • Corporates • Sovereigns and subnational institutions	• probability of default • decreasing collateral valuations • increasing Loan-loss provisions
Market risk	Risk drivers can impact both real and financial assets. In this scenario, banks must actively manage these risks, especially if correlations between assets break down. Furthermore, a large scale climate shock could threaten the solvency of many financial institutions, originating a systemic risk	• Equities • Corporate bonds • Commodities	• high levels of stock price volatility • abrupt repricing of financial assets • correlation breakdown
Operational risk	It is the risk of losses resulting from disruptions or malfunctions in a bank's processes, information systems, or human resources. These events can disrupt business continuity, incur extraordinary restoration costs, and increase exposure to fines and litigation.	• Banking operations • IT infrastructure • Employees	• Emergency repair and recovery costs • Regulatory fines and legal expenses for non-compliance • Increased operational risk-capital requirements

Liquidity risk	Climate shocks can expose banks to unexpected cash needs, forcing them to draw down liquid reserves and raising refinancing risk. Moreover, such shocks can limit banks' ability both to raise new funds and to divest assets quickly, further increasing liquidity tensions.	• Financial institutions • Depositors • Institutional investors • Interbank market counterparties • Supervisory authorities • Central banks	• re-pricing of financial instruments • withdraw deposits or draw on credit lines
Underwriting risk	The risk of losses arising from a bank's underwriting activities - such as loan origination, bond issuance, guarantees or credit commitments - when climate risk drivers lead to mispriced or deteriorating exposures.	• Treasury and capital markets divisions • Risk management and provision teams • Investors in underwritten securities	• Increased asset damage • Unexpected credit losses • Reduced fees and underwriting revenues due to repricing or cancellations

Table 3.2.1: Climate Risk Transmission Channels in the Banking Sector (adapted from BCBS, 2021b; NGFS, 2020a)

To clarify how climate-related risks feed into prudential risk categories, figures 3.2.2 and 3.2.3 map the links between physical climate risks and their transmission channels. The two figures differ in the nature of their initial risk drivers but share the same four-stage structure:

- Driver risks
- Economic impact
- Transmission channels
- Financial impact

Figure 3.2.2 focuses on physical risks (acute events, chronic trends and geographical vulnerabilities), whereases figure 3.2.3 applies the same framework to transitional risks, which arise from climate policies, technological innovation and shifts in market sentiment.

This methodology continuity shows that, whatever the initial driver, the transmission path into banking system follows similar dynamics and therefore requires an integrated approach to measuring and monitoring these risks.

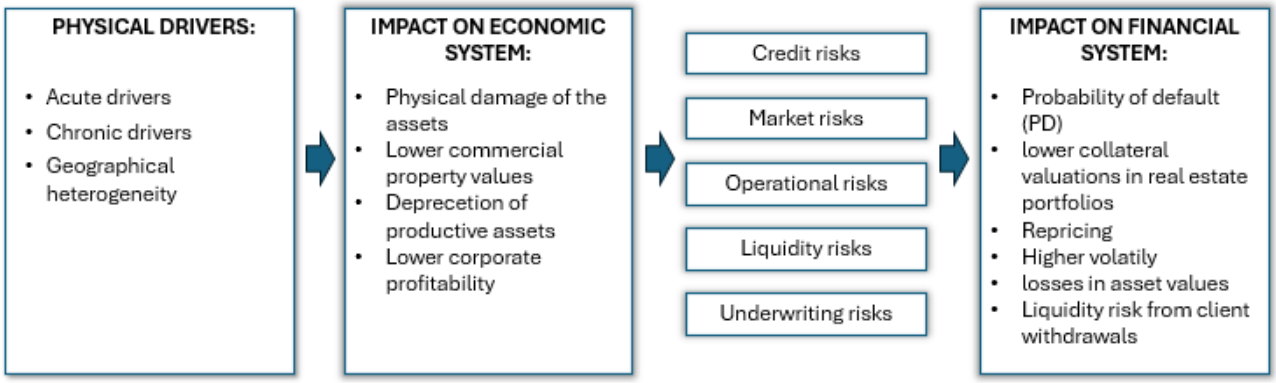


Figure 3.2.2: Propagation of physical-risk drivers through their effects on the real economy all the way to prudential risks and financial losses. Own elaboration based on NGFS (2020a, figure 1); ECB (2020a).

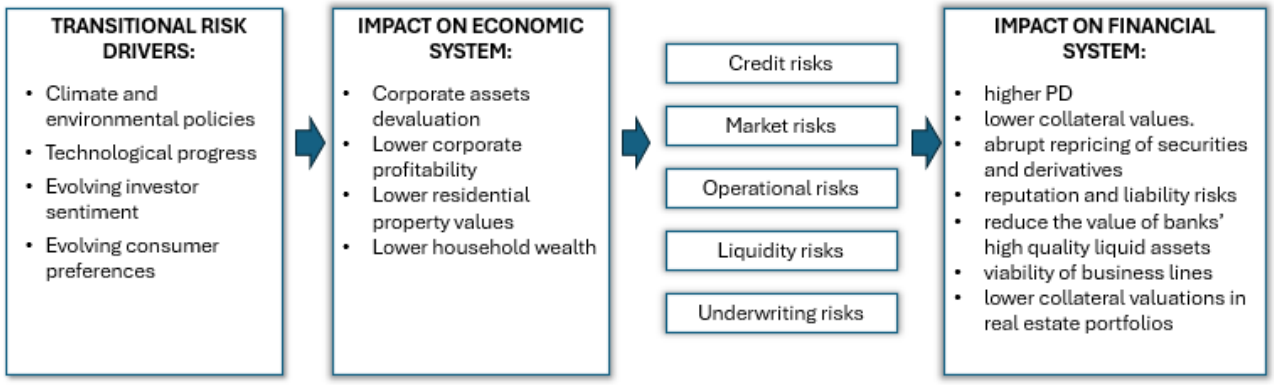


Figure 3.2.3: Propagation of transition drivers to financial risks and losses. Own elaboration based on NGFS (2020a, figure 1); ECB (2020a).

In conclusion, it is important to highlight that climate risks can affect banks through multiple channels, both macroeconomic ed microeconomic, at the same time. Figures 3.2.2 and 3.2.3 illustrate the importance of integrating both the risks and their transmission channels into the transition plan, as they translate into real effect on the economy and the financial system. For this reason, it is essential for banks to adopt a transition plan that incorporates the risks from the beginning, in order to establish solid governance and define specific quantitative indicators.

3.3 Counterparties related dependencies

3.3.1 The concept

In the context of risk management within the banking sector, it is important to consider the counterparties related dependencies, which refer to the extent to which the financial performance of the counterparty depends on uncontrollable external factors: supply chain, the sector, access to energy and material sources for example. However, such dependencies are also subject to climate risks, such as technological developments, reduction of financing, physical damage to assets, and regulatory evolution. The focal point of such dependencies is that they do not depend on the will of the firm and therefore are not direct consequences of its activity; rather, they reflect its level of exposure to vulnerabilities deriving from the industrial ecosystem in which it operates.

For example, in the case of companies belonging to energy-intensive sectors, they depend significantly on fossil fuels. Their capacity to adapt to new low-emission technologies or to regulatory changes is often limited by the structural characteristics of the ecosystem. Consequently, the financial stability of such companies does not depend only on internal governance strategies, but also on the overall resilience of the industrial sector in which they operate with respect to climate shocks and transition policies.

As a consequence, the identification of external dependencies plays a fundamental role also from a prudential perspective, since they represent transmission channels that amplify climate risks for the bank. In fact, if a sector is not aligned with climate transition objectives, the banks financing that sector is directly exposed to greater credit and reputational risks. For this reason, the bank must analyse the dependencies of counterparties, because they directly reflect the level of exposure of the financial institution itself (EBA, 2021a). The higher the financial institution's level of exposure, the worse its performance in terms of ROA and ROE (Khemiri et al., 2025).

This concept is linked to the principle of connectivity, which highlights the importance of the connection between sustainability disclosure (e.g., the level of emissions) and financial disclosure (consequences in terms of FCF and liquidity).

In conclusion, external dependencies represent the link between the climate vulnerabilities of counterparties and their translation first into risks for the financial institution, and subsequently into prudential risks. The analysis and identification of such dependencies therefore constitute the first step toward the integration of climate risks into transition plans and into the dialogue with banks.

3.3.2 Connectivity and prudential relevance

One of the first references for the concept of connectivity is the 2013 Integrated Reporting, later updated in 2021. It is seen as one of the seven guiding principles of the International Integrated Reporting Council, which underlines the importance of integrated reporting as a standard practice to ensure an efficient allocation of capital, with the objective of achieving financial stability and sustainable development (IFRS, 2021). The role of connectivity within the integrated report is to integrate information and capitals with interdependencies, facilitating internal and especially external communication. Consequently, the driving role of connectivity emerges, namely that of creating value over time by acting as a bridge between quantitative and qualitative information.

The concept is further integrated with IFRS S1 and S2, which requires a constant connection of information. Moreover, the IFRS underlines how integration in reporting does not concern only the technical connection of information (where, what and how), but also requires considering in a unified way the interdependencies between resources, relationships and impacts. In this way, it becomes possible to communicate clearly and comprehensibly the links between financial performance and sustainability, highlighting synergies and trade-offs (IFRS, 2023a).

One of the concerns raised by EFRAG, which has taken up this concept, is that of avoiding the overlap of information; therefore, it requests that attention be paid to preventing duplication or gaps within the corporate reporting system (EFRAG, 2023b). A further step towards the application of the concept of connectivity is provided by the ESRS, specifically by ESRS 1 in paragraph 9.2, which requires the undertaking to describe the connection between the sustainability statement and the financial statements, clearly indicating how quantitative and qualitative data are consistent and reconcilable with each other. In particular, it is necessary to explain the link between strategies, metrics, targets and the related financial effects, including specific references to the items of the financial statements. This approach aims to strengthen transparency and comparability of information, reducing inconsistencies and ensuring integrated disclosure (EFRAG, 2023a).

Furthermore, the concept of connectivity not only involves the integration of information within the same report, but also has a forward-looking vision, so across different periods. This is extremely important from a prudential perspective, which requires banks to provide information, through the transition plan, that can be comparable and above all future oriented. In addition, the absence of a connection between sustainability data and accounting data can compromise transparency, reducing the reliability of the information provided and, consequently, undermining market confidence (ESRB, 2024).

It is therefore a matter of considering the expected financial effects, taking into account the interdependences of companies and consequently how they manage or are affected by climate risks (EFRAG, 2025). As already mentioned in Chapter 3 and as will be reiterated in the following chapter, supervisory authorities look at forward-looking resilience based on stress tests and NGFS scenarios. This is because climate risks materialize gradually and therefore require prospective analyses so that banks are able to anticipate and attempt to manage them, thus avoiding systemic consequences on the market. Empirical evidence shows how the integration of ESG factors reduces credit risk and improves the quality of the banking portfolio, strengthening the connection between sustainability and financial stability (Maztoul, 2025).

Therefore, for banks, the application of the principle of connectivity to external dependencies allows not only for a consistent representation of the links between climate risks and financial performance, but also for strengthening the overall resilience of the system. At the same time, it makes it possible to avoid underestimation of risks and to ensure a more adequate capital allocation, in line with the expectations of supervisory authorities.

In this framework, connectivity represents the methodological basis for integrating climate risks and financial performance; however, its full effectiveness also depends on the active dialogue that banks establish with their counterparties. Engagement with clients becomes the operational tool through which banks can collect data, verify transition plans, and reduce their exposures to vulnerable sectors.

3.3.3 Engagement of counterparties

The integration of climate risks into banking processes cannot simply be limited to internal measurement but rather requires a constant dialogue with counterparties. This process is called engagement, and it takes place especially in the initial phase of the relationship with the counterparty. However, the engagement process requires a continuous supervisory approach on an ongoing basis throughout the entire relationship with the client (ECB, 2020a). It represents a fundamental tool for understanding the degree of companies' exposure to climate risks, assessing their credibility, their position with respect to decarbonization plans and transition objectives. Several empirical studies confirm this aspect: for example, Chava (2014) emphasizes that a high exposure to environmental risks leads to an increase in interest rates for companies that show environmental concerns. The level of exposure of counterparties must be assessed based on the three ESG dimensions (EBA, 2020a).

Through engagement, banks collect significant information for the financial institution itself, which is indispensable for applying the concept of connectivity between sustainability information and financial information. Moreover, through this process financial institutions directly influence corporate strategies, encouraging choices consistent with emission reduction.

Companies with a high carbon footprint are perceived as more likely to default; therefore, in the engagement phase banks must assess the carbon footprint of counterparties in order to evaluate risks and mitigate the consequences of climate change. In this sense, banks must not only evaluate the carbon footprint of counterparties but also adopt granular approaches to map in detail the impacts of climate risks on the business (ECB, 2020a).

Furthermore, it is important to consider that companies are not only directly exposed to climate risks, but also indirectly through climate policies that may indirectly increase the level of exposure of financial institutions (Battiston et al., 2017). In line with this, (Capasso et al., 2020) show that high climate exposure negatively affects the creditworthiness of the company.

It is up to institutions to be informed and so to be aware of the client's sector and geographical location (ECB, 2020a). Therefore, the need arises for every financial institution to define its own engagement strategy in order to interact with the client. For example, two companies (ING and Nordea) have implemented two tools to assess the level of their clients' dependencies. In the first case, ING uses a digital platform that integrates various international standards to assign scores useful for strategic planning and risk models (ING, 2024); in the second case, Nordea assesses clients on five levels of maturity based on climate targets, GHG reporting, implementation, and governance, in line with CSRD, ECB, and NZBA (Nordea, 2024). Many institutions have also developed a client assessment framework to choose the type of dialogue to maintain with the company and the actions to implement (UN Environment Program, 2024).

In this sense, engagement acts as a two-way channel: on the one hand, it allows banks to better manage their credit and reputational risk; on the other hand, it encourages counterparties to undertake sustainable transition paths, with benefits for the overall stability of the financial

system. Engagement is not only functional to credit risk management, but represents a pillar of the transition plan, as it documents how the bank interacts with high-emission counterparties to reduce exposures that are not aligned with climate objectives.

However, the engagement process continues to present several challenges. First, the scarcity of granular and comparable data makes it difficult to accurately assess exposures, especially with respect to small and medium-sized enterprises. Added to this is the availability of internal resources: many banks still do not have specialized teams or adequate digital tools to conduct structured engagement. Finally, the timing of the transition requires banks to balance short-term objectives with the need to ensure long-term resilience.

3.3.4 Implications for banks' transition plans

The integration of external dependencies into transition plans constitutes a fundamental step to ensure that these do not remain simple declaratory exercises, but concrete tools of prudential management. Counterparties' disclosure practices remain highly heterogeneous: external dependencies are rarely identified systematically, and when they are, assessments of their impact, probability, and management are largely absent. Consequently, banks are expected to move beyond a passive use of counterparties' disclosures and are required to undertake independent and more thorough analyses, aimed at integrating and validating the available evidence (Valenzuela et al., 2025).

A continuous dialogue with counterparties allows the bank to have a clear view of the company's position. In fact, the assessment of the sectoral and counterparties related dependencies enables banks to better understand the transmission of climate risks into their portfolios, estimating more accurately the impacts on profitability, liquidity, and capital adequacy.

Moreover, an analysis of counterparties allows the bank to identify potential scenarios of insolvency and difficulties on the part of counterparties in meeting their debt obligations. In this context, transition planning must also include an estimate of the effects of physical and transitional risks on the risk profile of firms, taking into account not only corporate strategies but also their key dependencies and externalities that may amplify vulnerability (FSB, 2025b).

The inclusion of this information within the transition plan means ensuring that exposure-reduction strategies are based on realistic and comparable data, in line with the expectations of supervisory authorities. A credible transition plan must therefore make explicit how the bank has identified and measured clients' external dependencies and which metrics it uses to monitor them over time. Indeed, within their transition plan financial institutions must communicate how they have assessed the level of climate risk exposure of counterparties (UN Environment Program, 2021).

Dialogue with the client is one of the first steps that a financial institution must implement if it wishes to create value (UN Environment Program, 2024), therefore, defining the engagement process as an essential element for the implementation of transition plans, alongside, for

example, the assessment of portfolio exposure/risks and national policies (UN Environment Program, 2025a). Active engagement within transition plans must include the identification of the most relevant counterparties and the definition of a structured process for gathering the information necessary to assess their resilience and financial solidity (NGFS, 2024).

In this way, the institution not only demonstrates that it has an integrated view of climate risks but also provides the authorities with clear tools to assess the consistency between declared strategies, established targets, and the resources actually available to achieve them. An additional benefit consists in the support that transition plans can offer to macroprudential monitoring: they enable authorities to better analyse systemic risks, develop stress scenarios, and assess the overall resilience of the financial system (FSB, 2025b).

From a prudential perspective, the inclusion of external dependencies in transition plans strengthens the dialogue with supervisors, facilitates comparability among banks, and helps reduce the risk of information asymmetries within the financial system. In the end, transition plans assume a central role not only in capital allocation decisions and risk management, but also in reinforcing the stability and resilience of the entire financial sector (FSB, 2025b). In conclusion, this approach not only enhances the credibility of the individual institution but also supports the overall stability of the market, showing how transition plans can become genuine instruments of risk governance.

4. METHODOLOGY

4.1 Research Design:

This section aims to illustrate the methodological structure adopted for the development of the transition plan from a prudential perspective, outlining the main tools and internal processes through which a banking institution can identify, assess, and manage climate-related risks in line with supervisory expectations. In particular, the phase of materiality assessment is examined in depth, as it represents an essential starting point for identifying climate risks to be integrated into prudential frameworks such as ICAAP and SREP.

Subsequently, the role of the risk taxonomy is analysed as the foundation for the coherent and structured classification of risks, serving as a prerequisite for the construction of a Risk Assessment Statement that effectively communicates material risks to internal governance bodies and supervisors. The Risk Assessment Framework is then examined as the methodological infrastructure that enables the bank to transform risk analysis into a continuous, traceable process aligned with capital planning objectives.

The section concludes with the integration of climate-related risks into the ICAAP process, highlighting the operational contribution of the transition plan in each of its components (identification, quantification, stress testing, and capital adequacy), and into the SREP, where the plan assumes the role of a forward-looking tool for dialogue with supervisory authorities, supporting the assessment of business model sustainability, risk governance, and capital adequacy.

4.1.1 Materiality Assessment

The materiality assessment represents a preliminary phase in the construction of a climate transition plan, as it makes it possible to identify exposures and areas of activity that are relevant for risk management and the definition of strategic objectives. From a prudential perspective, the principle of materiality translates into the need to select both traditional and climate-related risks (ECB, 2020a) that may generate significant impacts on the bank's capital soundness, profitability, liquidity, or operational continuity (BIS, 2022), with direct or indirect effects on the ICAAP, the Risk Appetite Framework, and the SREP process.

The materiality assessment therefore plays a critical role within institutions, influencing the overall management of risks and the bank’s strategic planning. The reason for its importance lies in the need to avoid blind spots, and especially due to the nature of climate and environmental risks, this need becomes even more relevant (ECB, 2022d).

In the context of climate-related risks, materiality must be assessed from a forward-looking perspective, as these risks have an impact across multiple sectors and geographical areas, and require both short and long-term actions (ECB, 2022d).

Due to the uncertain nature of climate risks, it is necessary for the institution to adopt a methodological approach that takes into account both the probability of manifestation and the severity of potential impacts. During this phase, it is essential to include both qualitative and quantitative factors (ECB, 2020a), such as, for example, the vulnerability of counterparties.

Moreover, evidence shown from recent supervisory research shows that institutions that have conducted a thorough materiality assessment tend to acknowledge that climate and environmental risks will have a significant impact on their risk profile within the next three to five years (ECB, 2025). Interestingly, institutions that did not classify climate risks as materially relevant are often the same ones that did not carry out a structured materiality assessment (ECB, 2025).

In general, the materiality assessment must take into account the specific characteristics of the institution's business model, operating environment, and risk profile. Furthermore, it is important to emphasize that the size of a bank's assets is not necessarily correlated with its level of exposure to climate risks: even smaller institutions are required to conduct a solid and comprehensive assessment, based on the nature and magnitude of the risks to which they are exposed (ECB, 2025).

In parallel, supervisory authorities are also called to play an active role: supervisors should verify that banks identify climate risks that are materially relevant in the jurisdictions and sectors in which they operate (NGFS, 2020b).

In this perspective, the bank should structure the materiality assessment along three main levels: materiality by risk type, materiality by portfolio and materiality by counterparty.

In the first case, it is necessary to identify the risk categories (such as physical and transition risks, and the transmission channels) that are relevant to the bank's business model. In the second case, it is necessary to assess the degree of exposure to material risks across individual portfolio segments: an aspect directly linked to the third level, which involves the evaluation of the counterparty and its related dependencies (sectoral and geographical).

It is also essential that the materiality assessment process be formalized within the bank's governance system, with the involvement of the risk management, strategic planning, and compliance functions. This ensures traceability of decisions and consistency with other prudential tools. Moreover, the EBA states that banks should regularly carry out a materiality assessment of ESG risks, providing a view on their financial materiality in relation to the institution's business model and risk profile (EBA, 2025b).

In conclusion, the materiality assessment represents a central methodological step to ensure that the climate transition plan is effectively integrated into the bank's prudential processes. Only through a solid, forward-looking analysis, structured according to institution-specific criteria, is it possible to identify truly relevant risks and define coherent management actions, capital allocation strategies, and supervisory dialogue. In this respect, the materiality

assessment is not a formal exercise, but an enabling element for the credibility and effectiveness of the transition plan itself.

4.1.2 Risk taxonomy

According to the ECB, risk taxonomy is *"A categorisation of different risk types/factors enabling the institution to assess, aggregate and manage risks in a consistent way through a common risk language and mapping"* (ECB, 2018).

A complete banking Risk Taxonomy should include four types of risks: financial risks (credit, market, liquidity, and operational), emerging risks (such as climate and environmental risks, reputational risks), strategic and business risks, and finally legal and compliance risks. The risk taxonomy must therefore provide a categorization of the different types and factors of risk, clearly defining climate and environmental risks (ECB, 2020a). For this purpose, European authorities require financial institutions to identify and record in their operational loss the losses connected to environmental risks, in accordance with the risk taxonomy and the methodology for classifying loss events (EBA, 2025b).

The role of the Risk Taxonomy is fundamental, because if correctly implemented it allows risks to be consistently aggregated without neglecting any of them, thereby creating a hierarchical structure between categories and subcategories of risk. A well-structured taxonomy allows risks to be assessed and managed consistently on an aggregated basis, enabling the institution to compare the risk profiles of different business units and to ensure uniform methodologies.

It represents the starting point for the Risk Assessment Framework, since without a consistent classification, the processes of identification, evaluation, and reporting (Risk Assessment Statement) risk being incomplete or inconsistent. The taxonomy constitutes a fundamental step within the risk management process, as it allows this process to be connected, for example, with capital planning and risk appetite (Risk Appetite Framework). This is because once the bank has identified the risks, it can establish how much exposure it intends to assume in the future and how it plans to manage potential losses. Consequently, taxonomy is fundamental in enabling the banking institution to implement concrete actions; in fact, taxonomy is the foundation on which the entire risk management system is built: risk strategy, policies, assessment processes, and reporting are all organized according to the categories defined in the taxonomy.

Taxonomy is the starting point of the ICAAP process. According to Principle 4 of the ECB guide (ECB, 2020a), it requires financial institutions to identify material risks based on an internal taxonomy and to consider them in every ICAAP component. Therefore, for each risk category identified, the bank must estimate the possible unexpected losses and allocate adequate capital to cover them.

From a prudential perspective, the EBA, with the aim of supporting financial institutions in this phase, published in August three final draft projects that provide a taxonomy for operational

risk losses, offering for example a list of types, categories, and operational risk events (EBA, 2025e).

In conclusion, a well-structured taxonomy makes the ICAAP process more solid and consequently also the relationship with supervisory authorities, allowing for easier and at the same time fully informative communication.

4.1.3 Risk assessment framework

The Risk Assessment Framework is the set of processes, methodologies and procedures that allow the bank to identify, assess and monitor risks. The objective of the process is to ensure that all material risks are taken into account and translated into useful information for internal bodies and supervisory authorities. When talking about material risks, it is necessary to also include climate-related financial risks; in fact, the bank must ensure that its internal reporting systems, and before that its identification systems, are able to monitor such risks (BCBS, 2019b).

It is important to underline that the Risk Assessment Framework is distinct from the Risk Appetite Framework: while the former concerns the measurement and understanding of risks, the latter defines the level and types of risk that the bank is willing to accept in order to pursue its objectives. In essence, while the Risk Assessment Framework creates the map of risks and their magnitude, the Risk Appetite Framework indicates how much and what type of risk the financial institution is willing to assume.

The Risk Assessment Framework therefore plays a key role, defining how risks are identified and evaluated by the institution. In fact, it deals with recognizing current and emerging risks in business lines, and therefore at portfolio and single counterparty level. It defines how such risks are to be measured, establishing the types of qualitative or quantitative techniques that must be used. Finally, it deals with the assessment of the risk itself, to identify the impact it may have on the bank.

The bank must therefore identify the most appropriate methodologies to monitor exposure to climate-related financial risks (BCBS, 2021a). When defining internal policies and methodologies, banks should consider their own portfolio, the sector to which their clients belong, and their geographical location.

The methodology must therefore ensure the collection of accurate and reliable aggregated data, so that supervisory authorities, at the time of the SREP, can easily check the risks and confirm that the methodologies are consistent with the risks to which the bank is exposed (BCBS, 2019b).

Among the methodologies that can be used there are sectoral sensitivity analyses, measurement of carbon-related assets, calculation of the carbon footprint of banking assets, carbon price sensitivity, and counterparties' ratings or scorings (BCBS, 2021a).

Once the financial institution has identified the risk identification procedures and implemented them, it must then map the risks so as to present them to the competent bodies; therefore, the output of this process is the Risk Assessment Statement.

In conclusion, for a solid Risk Assessment Framework, the availability and accuracy of data are essential elements. The financial institution must therefore identify internal procedures aimed at collecting the most reliable and granular data possible. However, in the case of climate risks, it is necessary to adopt adequate measurement strategies and methodologies capable of managing the uncertainty of such risks (EBA, 2021c).

In this perspective, as underlined by the EBA Action Plan on sustainable finance (2019), proactive strategies and forward-looking approaches aimed at ensuring resilient business models in the long term, combined with adequate governance arrangements, must be understood as tools for mitigating ESG risks, in particular physical and transition risks related to climate change. Inserted within the Risk Assessment Framework, such strategies make it possible to translate ESG risks into processes that can be assessed and monitored, thus strengthening the overall effectiveness of the framework.

4.1.4 Risk assessment statement

Once the material risks that may affect the financial institution have been identified, the risk management function must communicate these risks to the competent bodies or those involved in the process of defining the institution's strategies and policies. The document used is called the Risk Assessment Statement (RAS), and it is a declaration that describes which risks are material for the institution, including climate-related risks.

Before being a tool that can be used in the supervisory process, it is therefore an internal tool. Internal communication is fundamental to promoting a risk culture based on awareness of materiality (BCBS, 2015). At the core of the principle of internal communication is the need for key, detailed and granular information to be reported to bodies such as the board of directors and senior management, so as to facilitate the definition phase of the bank's strategy. For example, in the case of ICAAP, information regarding risks must be updated at least quarterly, which therefore already entails a definition of the timing of management reporting (ECB, 2018).

At the same time, however, it is necessary that risks are not reported only at the level of the institution as a whole, but also at the level of portfolios (i.e., the relationship with counterparties), as well as at the market and trends level (BCBS, 2015). The management reporting phase therefore necessarily includes an internal risk inventory, that is, a constantly updated map of risks that reports the material risks identified (ECB, 2018).

The document must therefore have a dual focus: not only on the bank itself but also on the relationship between the bank and its counterparties, and between the bank and the market. The Risk Assessment Statement is essential to demonstrate the bank's position with respect to whether it is in line with its risk profile, and therefore to the types of risk and the level of risk it is willing to assume. In the first case, the types of risk that the bank is willing to accept are

reported in the Risk Appetite Statement, while in the second case it is defined in the Risk Appetite Framework, which serves to ensure that risk-taking is in line with the institution's strategic priorities (Auzepy & Bannier, 2024). To ensure greater clarity, it is necessary to state that in this work, Risk Assessment Statement refers to the summary document that reports the material risks identified and assessed by the bank and it is therefore distinct from the concept of Risk Appetite Statement.

The Risk Assessment Statement is a fundamental communication tool in the relationship with supervisory authorities; in fact, during the SREP it must demonstrate that banks have solid processes for risk identification and assessment. During the SREP, the supervisory authority verifies the level of interaction between the governing bodies and the units responsible for risk analysis, examining how information is reported. It is therefore a tool that helps the bank to take a snapshot of risks; in other words, it can be considered a monitoring tool usable by supervisors (BCBS, 2019b). The Risk Assessment Statement is essential to indicate the type of imminent and potential risks, so a solid Risk Assessment Statement provides supervisors with greater transparency and confidence that the bank understands and manages its risks.

4.1.5 ICAAP

The Pillar 2 requirement is a capital requirement that applies in addition to that of Pillar 1. This addition occurs in cases where there is an underestimation or insufficient capital coverage of risks. The requirements set out under Basel Pillar 2 are binding for prudential purposes; this means that failure to apply them entails the imposition of sanctions on credit institutions (ECB, 2024c).

For the purposes of the prudential review process, the credit institution must demonstrate that it has sufficient capital to cover not only the risks provided for under Pillar 1 (credit, market, operational) but also all other material risks that could affect its stability. Principle 1 of Basel Pillar 2 concerns the process of assessing capital adequacy, where the bank must link risk management with capital management, including the assessment of the level of risk and the risk appetite assumed by the institution, and ensuring that the amount and quality of available capital are consistent and adequate with respect to that risk profile (BIS, 2019).

During the ICAAP analysis process, the supervisory authority, for the purposes of the SREP process, should assess the soundness, effectiveness and completeness of the ICAAP. With regard to the principle of robustness, it is necessary that the authority relate the policies and processes that constitute the ICAAP to the complexity of the institution: thus assessing whether the level of capital set aside is sufficient to cover the current or potential risks of the institution (EBA, 2018).

To make this possible, it is necessary that the credit institution relies on empirical data for the assessment of the capital to be set aside, according to the type of risk. In this perspective, the transition plan becomes a fundamental tool: it provides empirical evidence on the nature and extent of the climate risks to which the bank is exposed, translating them into portfolio trajectories, stress scenarios and quantitative indicators. This information can be used directly

in the ICAAP to estimate the capital needs linked to transition risks or physical risks. It follows that a solid transition plan, based on verifiable metrics and observable data, strengthens the overall robustness of the ICAAP and contributes to reducing the risk of capital underestimation.

The second principle, that of effectiveness, focuses on the governance process related to ICAAP management. Specifically, it analyses whether there is a clear distribution of responsibilities among the committees involved, whether the allocation of resources among the business lines is correct, whether communication between bodies is effective (a timely and regular reporting system), and finally whether the ICAAP has a forward-looking function (EBA, 2018). In this context, the transition plan represents a complementary tool, enabling supervisory authorities to better understand how climate risks are: integrated into corporate governance, what the responsibilities of the bodies are, and how capital and credit resources are reallocated in support of the transition. Moreover, the drafting of a prudential plan can strengthen the information flows towards senior management and the management body, facilitating decisions consistent with the objectives of capital adequacy and with the climate commitments of the institution.

Finally, the last principle is that of exhaustiveness, which analyses the application of the ICAAP, seeking to understand whether it is able to cover all material risks (EBA, 2018). The transition plan can represent a methodological support, allowing climate and environmental risks to be more easily identified. The systematic inclusion of such risks in the plan enables the institution to demonstrate to the supervisor that the ICAAP does not ignore potentially critical areas, thus strengthening the exhaustiveness of the capital assessment and preventing possible underestimation.

In this framework, the transition plan can be considered a natural extension of the ICAAP in a climate-related key. Just as the ICAAP requires policies, robust methodologies and reliable data to demonstrate the coverage of all material risks (BCBS, 2019b), in the same way the transition plan, if structured according to a prudential template, provides quantitative and qualitative evidence on climate risks and on the strategies adopted to manage them. Through standardized metrics, stress scenarios and comparative analyses, the plan helps to ensure the completeness and robustness of the ICAAP, becoming a useful source of information also for supervision. In this sense, the transition plan is not only a sustainability document, but a real prudential tool that strengthens the dialogue with the authorities and reduces the probability of corrective interventions, in line with the logic of Basel Pillar 2.

The ICAAP is articulated in several phases, which according to the research (Auzepy & Bannier, 2025) are split into four main dimensions.

The first one relates to risk identification, materiality evaluation and the inventory of risks. The evaluation of materiality requires both internal and external data: internal data could be the information obtained from the analysis of the financial situation of counterparties, while external data could take into account dependencies and therefore sector risks that, for example, may influence the probability of default of counterparties. To ensure that material

risks are adequately captured, it is essential to combine qualitative approaches (interviews, assessment of governance structures) with quantitative approaches (stress testing, scenario analysis). The integration of these perspectives makes it possible to build a dataset that is at once granular while at the same time consistent and coherent, allowing for consistency across the institution and for supervisory purposes.

The second one is methodologies of risk quantification and data collection. In this regard, some banks have developed internal scorecards to assess and monitor climate-related risks (Auzepy & Bannier, 2025). However, a significant data gap remains, as the information generated through internal models and proprietary data collection practices may not be fully comparable across institutions. This lack of comparability highlights the need for more standardized approaches and common supervisory benchmarks in order to ensure consistency and reliability of climate risk assessments.

The third element concerns the implementation of climate stress tests, which involve the use of heterogeneous scenarios incorporating multiple variables across both the short and the long term. According to the research, the main challenge lies in identifying an appropriate baseline scenario, against which alternative transition or physical risk channels can be compared. Other important data include the level of future investment required and the potential depreciation of fixed assets. It is indeed crucial to estimate how much capital clients will have to allocate in order to move towards greener technologies and to assess the risk of stranded assets (Auzepy & Bannier, 2025).

Finally, the fourth dimension includes internal capital adequacy assessments and capital considerations, where the key process is the presence of the stress test, which is necessary to quantify the impact of climate and environmental risks (ECB, 2022b). The research states that stress tests fall into two broad categories: comprehensive and exploratory. The former are macroeconomic in nature, while the latter are specialized on risk factors and specific portfolios. The two approaches are complementary; therefore, one does not exclude the other. The objective of stress tests, in the context of their use for ICAAP formulation, is linked to the fact that stress testing helps the institution identify the future behaviour of material risks. Hence, it helps the institution define the level of risk coverage (ECB, 2018), a concept that is identified as capital adequacy. During the capital adequacy estimation phase, it is necessary to consider possible capital losses (Auzepy & Bannier, 2025).

According to research conducted by the ECB (ECB, 2020b), for the majority of banks ICAAP-related information is disclosed on a quarterly basis, thus ensuring continuous updates from risk management to the management bodies.

However, the ICAAP determination process includes two important phases: the normative perspective (relating to disclosure to management bodies and to prudential supervisory authorities) and the economic perspective (minimum requirements, amount of economic risk) (ECB, 2020b). The perspectives are expected to complement and inform each other, thus playing a role of complementarity (ECB, 2018). The first is oriented towards legal and

supervisory thresholds, answering the question: *"Is the financial institution able to comply with regulatory capital requirements even under adverse conditions?"*; while the second is forward-looking and adapted to the bank's risk profile, answering the question: *"Is the internal capital sufficient to ensure the continuity of the business model and to cover the bank's actual risks?"*.

In conclusion, the ICAAP must ensure that the institution adequately quantifies risks; therefore, risk quantification methodologies must be institution and portfolio specific (ECB, 2018). From this perspective, the transition plan does not only provide a strategic description of the bank's climate objectives, but becomes a true capital planning tool: it allows for the estimation of the impact of climate risks on capital requirements, the anticipation of potential needs for additional buffers, and the demonstration to supervisors of a proactive approach in managing risks not yet fully captured by the Basel framework. The combination of ICAAP and the transition plan therefore allows supervisory authorities to calibrate potential climate capital buffers in a proportional and targeted manner, strengthening the resilience of the most exposed banks without imposing excessive requirements on those with a lower climate risk profile (Bartsch et al., 2024). In this context, the institution's level of risk appetite plays a key role, as it defines the level of losses that the institution is able to absorb over time (ECB, 2018).

4.1.6 SREP

The SREP represents the central mechanism through which the supervisory authorities assess the overall health of credit institutions. In the European Union, this responsibility falls on the ECB for the banks subject to the SSM (European Union, 2013a) and on the national authorities for the other credit institutions. SREP is conducted annually and has the objective of assessing the resilience of credit institutions.

The process has a micro-prudential and macro-prudential dimension. At the micro level, the process examines the capacity of each institution to identify, measure, manage and cover the risks to which it is exposed, ensuring capital adequacy, liquidity and proper governance within the institution. At the macro level, SREP contributes to safeguarding the stability of the entire banking system, by monitoring the concentration of risks and the potential transmission channels.

SREP provides for an analysis beyond a simple static assessment of balance sheet indicators but represents a process that integrates supervisory expectations on risk management, business model (based on the concept of economic sustainability), governance, capital and liquidity planning (EBA, 2025c). SREP process has the objective of analysing all the risks to which the credit institution may be exposed. Moreover, considering the ECB's request to incorporate climate change (ECB, 2020a), as a consequence the SREP also takes on the task of analysing how the credit institution relates to climate risks. According to the ECB, such risks must be integrated into strategies, governance and risk management processes, in line with the ECB's expectations (ECB, 2020a). These risks must in fact be reflected in the ICAAP and ILAAP processes in coherence with the forward-looking supervisory approach.

The effectiveness of the SREP also depends on the principle of proportionality: the level of granularity of the analysis changes according to the size, business model and complexity of the institution's activities (EBA, 2022a). Moreover, the supervisory authorities implement an ongoing dialogue with credit institutions in order to revise the sections subject to deep assessment.

A main aspect of the SREP process is its articulation into four fundamental areas of assessment: Business Model Analysis (BMA), Governance and Risk Management, Capital Adequacy (ICAAP), and Liquidity Adequacy (ILAAP).

In the case of BMA, supervision assesses the economic sustainability of the business model in the medium and long term, that is, its capacity to generate acceptable profits within the considered time horizon. The transition plan provides an essential contribution in this phase, as it illustrates how the bank intends to reorient its exposures towards sectors consistent with the European decarbonization objectives and reduce dependence on carbon-intensive activities, supporting a transition towards a low-emission economy.

Regarding the Governance and Risk Management section, the authorities verify the capacity of the corporate bodies to integrate emerging risks into decision-making and control structures. The transition plan documents the degree of involvement of the board, the definition of roles and levels of responsibility, while at the same time considering climate risk management and mitigation policies, thus representing concrete evidence of the implementation of internal governance within the credit institution.

The ICAAP and ILAAP aspect involves an analysis of a predominantly financial nature. In the ICAAP analysis process, attention is focused on the institution's capacity to quantify the relevant risks and translate them into internal capital requirements. Moreover, within this process only material risks are considered, as they are considered as essential for determining capital needs and for ensuring consistency between risk management and capital planning. The transition plan also contributes here, providing analysis of counterparties, their dependencies, and supplying climate scenarios, which can be used to estimate the capital necessary to absorb possible losses deriving from transition risks.

Finally, in the ILAAP, supervision analyses the resilience of the institution on the liquidity front. The transition plan also proves useful in this dimension, as it allows for the assessment of the extent to which climate risks may affect the stability of funding sources, the value of collateral, or the capacity to access markets under stress conditions.

In this context, a transition plan structured according to a comparable and informative template can facilitate the proportional application of SREP, reducing the time and burdens of analysis. If integrated into the SREP cycle, the transition plan plays an important role, evolving from being a simple disclosure and reporting tool to becoming an operational instrument of dialogue with the supervisory authorities. The transition plan can also play a fundamental role in the monitoring process. If used to gather information on risk analysis and on their

manifestation in the short, medium and long term, it allows supervisory authorities to be provided with updated data on the changes that have occurred in the financial conditions and risk profiles of institutions (EBA, 2022a).

SREP has a forward-looking orientation, as it aims to assess not only the current situation of institutions, but above all their capacity to face future risks in scenarios of increasing complexity. From this point of view, the transition plan is perfectly aligned with the language and the needs of supervision: it is indeed by its nature a forward-looking tool, as it defines decarbonization targets, exposure reduction trajectories, and intermediate milestones. This parallelism reinforces the function of the plan as a methodological bridge between the internal management of climate risks and regulatory expectations, allowing for a more coherent and comparable assessment in the SREP process.

In this way, the plan becomes a useful tool to reduce burdens and analysis times, facilitating the timely identification of possible critical developments. Moreover, it becomes functional to the alignment of climate risk management with the horizons of capital planning and with portfolio alignment objectives. In this sense, the transition plan contributes directly to the prudential objective of SREP: ensuring the safety and soundness of credit institutions and preserving financial stability (European Union, 2013a).

Considering that SREP includes the analysis of the business model and the financial institution's strategy, the transition plan can once again prove to be an effective tool for communicating the strategies that the institution intends to adopt for facing climate risks (EBA, 2022a).

Furthermore, in line with what is provided by the EBA Guidelines, the analysis of the business model carried out within the SREP is also aimed at identifying the main vulnerabilities of the institution: those factors that are most likely to significantly affect its soundness or to lead, in the long term, to a structural deterioration of the model itself.

From this perspective, the transition plan, if built according to a prudential template, can constitute a key source for supervision, as it makes it possible to highlight transparently both the strategies of adaptation and mitigation of climate risks and the areas of potential future vulnerability.

The process concludes with the assignment of a score that reflects the potential prudential impact of risks on the institution. The scores, arranged on a scale from 1 (low risk) to 4 (high risk), represent an overall judgment on the bank's capacity to manage risks (EBA, 2022a). When a bank is assigned a high-risk score, such as 3 or 4, the corresponding Pillar 2 Requirement (P2R) is usually set at a higher level, as additional capital is considered necessary to ensure adequate loss absorption capacity (Auzepy et al., 2025).

Therefore, the SREP determinates additional capital requirements (P2R) and capital guidance (P2G): it is important to note that while the P2G is less binding than the P2R, as it does not constitute a legal minimum requirement, it still plays a significant role in shaping the bank's

risk management practices. In cases where the recommendations of the supervisory authority concerning the P2R are not followed, credit institutions may be subject to supervisory measures, including administrative sanctions (ECB, 2024c), restrictions on business activities, or the imposition of additional prudential burdens (EBA, 2022a). In particular, it can influence how institutions integrate emerging risks, such as climate and environmental risks, into their capital planning and governance processes (Auzepy et al., 2025).

In addition to the determination of the P2R and P2G, SREP may also result in qualitative measures. These include recommendations aimed at strengthening governance, limitations on the distribution of dividends and, in the most serious cases, actual operational restrictions. A robust and credible transition plan can contribute to reducing the probability of additional measures by supervision, strengthening the prudential positioning of the bank.

4.2 Requirement Collection and Selection Criteria

The key stage in designing a climate transition plan is the definition and selection of data collection requirements. In this context, by requirements we mean the set of conditions that the bank must fulfil in order to credibly and measurably guide its data collection trajectory to ensure decarbonization objectives. In this sense, the requirements become the building blocks of a governance framework that allows the institution not only to ensure regulatory compliance, but also to guide its counterparties and portfolios toward alignment with climate scenarios. This phase, therefore, aims to identify the data needed to align its portfolio with climate objectives.

The collection and selection of requirements thus have a dual function: on the one hand, they ensure that the transition plan is consistent with supervisory expectations, and on the other, they provide management with concrete tools to translate such requirements into internal policies and engagement behaviours capable of encouraging virtuous conduct by counterparties. It is therefore necessary that climate risks be integrated through the revision of the structures of the board of directors, mandates, and documentation; at the same time, the presence of bodies dedicated to sustainability tasks is fundamental to managing climate risks within the various functions of the bank (Mavraki, 2023). It is through this logic that the transition plan becomes a governance mechanism capable of shaping the evolution of portfolios, guiding the reallocation of capital from high-carbon-intensive sectors toward those compatible with a decarbonization pathway.

In this way, the selection of requirements is not a merely technical exercise, but a key step in transforming the transition plan into an operational tool for dialogue with clients and for the progressive redefinition of sectoral exposures.

4.2.1 Data Collection Process

The collection of requirements in a climate transition plan cannot be considered a purely technical exercise but constitutes a multi-level governance process that simultaneously involves the bank's internal bodies and counterparties. The objective is to ensure that the

identified requirements reflect not only regulatory obligations but also the bank's strategic needs and the decarbonization trajectories of the economic sectors to which it is exposed.

The first step consists in defining a structured analysis process led by senior management. The Board of Directors and internal committees must approve a common methodology and ensure that the identified requirements are consistent with the institution's risk objectives. From this perspective, the emergence of climate and environmental risks requires intermediaries to review their decision-making processes and related organizational structures, preparing specific action and governance plans that allow these risks to be integrated into ordinary management (Banca d'Italia, 2022). At this stage, the involvement of the following corporate functions is essential: Risk Management, business lines, compliance and internal audit (EBA, 2025c).

The first function is responsible for translating the requirements into risk metrics and analysis; the second deals with client engagement, and finally the latter two ensure adherence to regulations and international standards (BCBS, 2022).

Once the responsibilities of the different functions are clarified, it becomes essential to adopt a data governance model capable of ensuring the quality, consistency, and traceability of climate and environmental data. Such a structured governance allows for the collection of data that is not only relevant from a regulatory perspective but also compatible with the internal policies of the financial institution. It is essential that banks are able to track the source of information; therefore, traceability and transparency from data collection through data use are key elements to ensure effective internal governance and the production of reliable climate information (Mavraki, 2023).

An effective data governance model should articulate information management processes on three levels (strategic, tactical, and operational), making use of tools that enable version control and the automation of key quality indicators, thus ensuring the consistency, traceability, and reliability of ESG data (Leoni et al., 2023). A quality information flow also represents the necessary condition for the governing body to make informed strategic decisions on climate risks, avoiding governance choices based on incomplete or unreliable data (Banca d'Italia, 2022).

It is essential that the institution provides for the implementation of information management systems aimed at identifying, collecting, and analysing the data necessary for the assessment, management, and monitoring of climate risks. Such systems must be considered an integral part of overall data governance (EBA, 2025c). In addition, it is essential that such practices be periodically reviewed to ensure their effectiveness in light of regulatory developments (EBA, 2025c).

Several tools can be used for data collection; first of all, it is necessary that the bank be aware of the binding banking regulations in force at the time. It is therefore necessary to map the regulations and guidelines issued by supervisory authorities and international bodies. This step

enables the bank to identify the binding requirements and distinguish them from those which, although not having immediate legal force, represent best practices widely recognized by the market. At the same time, banks must reorganize their data governance processes to ensure that the environmental and climate data collected are consistent, complete, and comparable; while at the same time transforming data availability into an operational and reporting advantage (Heller et al., 2023).

The value of this exercise serves a dual purpose. On the one hand, it allows mapping of the binding provisions that the bank must comply with in order to ensure compliance and minimize legal or reputational risks. On the other hand, it allows anticipating regulatory developments and incorporating into the transition plan practices that, although not mandatory, are destined to become supervisory or market standards in the near future. In this sense, this process takes the form of a tool not only of compliance, but also of strategic positioning: a bank that adopts the most advanced requirements in advance strengthens its credibility with supervisors, investors, and counterparties.

At the same time, continuous dialogue between the bodies and the technical structure is necessary in order to ensure an effective internal governance policy and at the same time to stimulate the involvement of operational functions in the implementation of the transition plan.

Finally, the data collection process should not ignore dialogue with stakeholders. It is necessary that banks, through analysis procedures, be able to define the risks to which counterparties are exposed, with the aim of collecting granular data on them and their activities (EBA, 2025c).

To translate these assessments into concrete decisions, banks can use three key tools: due diligence procedures to identify climate high-risk counterparties on the basis of predefined criteria; the integration of ESG risks into internal/external scores or ratings; and the adjustment of credit conditions (rates, collateral, covenants) to encourage decarbonization pathways (EBA, 2025c).

From this perspective, banks should not limit themselves to considering aggregated macro-level data but must integrate more granular sectoral and geographical information to capture the different vulnerabilities of counterparties. The analysis can therefore range from national-level indicators to more detailed datasets, such as regional or postal code-based, so as to identify specific exposures to physical climate risks (such as floods or heat waves) and to transition risks depending on sector and geographic location (UN Environment Program, 2025b).

At the heart of this methodological approach lies the concept of alignment: the assessment of ESG risks and the collection of data on counterparties must in fact make it possible to measure the extent to which the bank's portfolio and activities are consistent with global climate objectives, in particular with the 2°C scenario of the Paris Agreement (EBA, 2021c).

According to research (Auzepy & Bannier, 2025), some financial institutions adopt methodologies based on internal ratings to estimate the probability of default of their

counterparties. Such tools make it possible to integrate climate-related variables into traditional models, collecting relevant information on counterparties and enabling a quantitative assessment of environmental risks. Other institutions, on the other hand, complement their internal ratings with external ratings produced by specialized agencies, in order to obtain a broader and comparative perspective on the riskiness of counterparties. This combined approach strengthens the bank's ability to identify the informational requirements necessary to assess counterparties' climate resilience and, consequently, to guide credit and sectoral engagement policies.

However, institutions prefer to adopt internal scores rather than basing exclusively on external scores developed by agencies, because these are perceived as too general and not sufficiently focused on the segment or dedicated to the single counterparty (Auzepy & Bannier, 2025).

In general, external engagement can take various forms such as consultations with major corporate counterparties, meetings with institutional investors, or exchanges with ESG rating agencies. There are two objectives: on the one hand, to acquire information from counterparties' transition plans, so as to integrate such data into portfolio assessment processes. In this context, the institution needs internal data as much as external data, provided by counterparties in accordance with the European Sustainability Reporting Standards or the voluntary reporting standards for unlisted small and medium-sized enterprises (EBA, 2025c) in the European context.

On the other hand, to consider the expectations of investors and sustainability analysts, which by now represent an essential driver for the bank's access to capital and reputation. Looking ahead, external engagement with counterparties makes it possible to transfer part of the requirements to counterparties, making access to credit or favourable conditions contingent on the presence of credible and verifiable climate objectives. Therefore, risk culture must include climate drivers as central elements of assessment (EBA, 2020b). In this sense, the collection of requirements also becomes a governance tool: the bank does not merely observe the strategies of the financed sectors but should actively contribute to guiding their decarbonization process.

A concrete example is represented by ING, which collected climate information and transition plans from its counterparties, assigning each a score in the Climate Transition Plan (CTP). These scores, incorporated into risk assessment and credit approval processes, allow the bank to measure the degree of maturity of counterparties and to direct financing toward clients most committed to decarbonization (ING Bank, 2025).

An approach such as that developed by ING represents a first step to follow in the European banking landscape. Banks therefore have significant levers to influence the behaviour of counterparties and push them toward climate action. When they have an adequate degree of control over their counterparties, for example through the credit relationship, banks can leverage this position to use financing conditions as a lever, guiding companies to reduce their emissions consistently with the climate commitments undertaken (Reclaim Finance, 2025).

However, according to research (Reclaim Finance, 2025), most institutions do not use this lever and, when it is used, it does not lead to the emergence of any escalation strategy. In addition, counterparties' engagement actions are generic and not described in detail, thus limiting the assessment of materiality by stakeholders and supervisory authorities. This also results in a limitation of declared strategies, because there is no concrete link between intentions and impact on counterparties. Moreover, the need to monitor engagement plans is also essential, in order to make clearer internally the level of interaction of the bank itself and the level of alignment with climate objectives. A good practice could be to monitor the percentage of clients that have drafted a transition plan during the current year, the percentage of the portfolio covered by engagement, or the escalation rate.

It is therefore essential to define a structured and measurable engagement strategy within the transition plan, complementing such methodology with an escalation strategy. In practice, this implies setting clear engagement objectives, linking them to defined timelines, and providing for specific levers of intervention, which may include the reduction of business relationships or the application of penalties to non-compliant counterparties. It is necessary to define a broader and more structured set of escalation measures, which allows banks to justify, both internally and externally, the choice to continue the relationship with a high-risk client or, on the contrary, to consider the return unsatisfactory in relation to the risk taken and terminate the relationship (Bhat et al., 2023).

Through this plurality of tools, the bank is able to build a dataset that can then be used for the phase of analysis and verification of potential, traditional, and climate material risks.

In conclusion, a key aspect at this stage lies in the bank's ability to guide clients toward decarbonization processes. In fact, the data collection phase must begin before data collection itself, through the presence of requirements that counterparties must meet or, in any case, through the analysis of the financial situation and dependencies of counterparties that take place during the engagement phase. The objective is to transfer conditions to counterparties through credit policies. In this sense, the bank takes on the role of urging its counterparties to adopt transition plans consistent with the Paris Agreements, to adopt decarbonization policies, and to invest in green technologies that allow their sector to become net zero.

Therefore, the collection of requirements becomes not only a lever for the prudential management of risk, but also for the credible and measurable transmission of climate objectives to the value chain through clients and financed sectors, strengthening overall alignment with global sustainability objectives.

4.3 Template:

The proposed template represents the operational component of this thesis. It has been developed with the aim of providing banks with a standardized tool to integrate climate risks into their internal processes of governance, risk management, and capital planning.

The model has been designed with a focus on the main requirements set by supervisory authorities and European reporting standards.

The structure of the template reflects the logical path that a bank should follow to translate its climate strategy into a prudential plan. It is organized into several main sections: introduction and sustainability strategy, regulatory disclosure, governance, risk analysis, ICAAP, ILAAP, connection with the SREP, and conclusion.

Through this framework, the transition plan is not merely a descriptive document but becomes an operational tool that ensures methodological consistency, effective communication, and comparability across banking institutions.

In the template some examples are provided, however the list of examples is not exhaustive but serves only as a guideline.

Section	Sub-section	Description
1 Introduction	**Purpose and scope**	In this section, the purpose of the transition plan must be explained. The objective is to clarify that the transition plan has been created as a prudential tool to integrate climate risks and ensure effective communication with the supervisory authority.
	Structure of the plan	In this section, it is necessary to describe the structure of the document.
2 Sustainable strategy	**The bank's strategy**	This section should illustrate the bank's sustainability strategy and climate commitments. It should show how the transition plan is integrated into the transition towards decarbonization and how it supports alignment with international and European objectives.
	Climate commitment	In this section, the institution identifies the targets it intends to adopt in relation to its climate objectives. The disclosure should clarify which climate commitment intend to pursue, and the type of commitments, for example whether they are aligned with: climate science (SBTi)

		sectorial decarbonization scenarios (IEA Net Zero Roadmap) supervisory benchmarks (NGFS climate scenarios) industry specific initiatives (NZBA) The bank should also explain how these commitments are integrated into its strategy, governance and risk management.
3 **Introductory Disclosure on Regulatory Framework**	**Regulatory framework**	The bank should explicitly state the regulations, guidelines, and standards used for the preparation of the transition plan. It should clarify how each regulatory reference has been integrated and ensure transparency towards the supervisory authority and stakeholders. In addition, the institution should disclose the jurisdictions in which it operates, providing information on all jurisdictions covered by its portfolio. Furthermore, for each jurisdiction, the bank should specify the relevant transition-related laws highlighting how these are reflected in the transition plan (for examples: CSRD, EU Taxonomy Regulation, CRR, CRD VI).
4 **Governance**	The bank should provide a narrative disclosure describing how internal governance is structured to identify, integrate, manage, and analyse climate and environmental risks. In particular, it should explain the role of the management and internal bodies, the methods of supervision of internal committees, the information and reporting mechanism, as well as the link between the climate strategy and the institution's risk culture. This disclosure should demonstrate consistency with supervisory requirements and with international standards (ECB, EBA, ESRS). In the disclosure, the focus is placed especially on the relationships among the different bodies and on how they work together to manage climate risks.	

4.1 **Governance**	**Role of the Board of Directors**	In this section, indicate the role of the Board of Directors with respect to the climate strategy and climate objectives. In addition, it is necessary to highlight the internal processes that involve it regarding climate and environmental risks. For example, indicate whether: • The level of responsibility with respect to climate risks • Whether it approves the transition plan • Whether it receives updated sustainability reports and, if so, their frequency • % of members with expertise in climate and environmental risks • % of salary incentives related to the achievement of climate objectives
	Internal committees involved in sustainability	In this section, indicate all internal committees involved. Highlight the internal processes that involve them regarding climate and environmental risks (approval of internal policies, supervision of transition plans, monitoring of KPIs, etc.). For example, indicate: • Frequency of meetings (annual/semi-annual or specify the number) • % of new climate KPIs integrated during the year • Share of executives/managers with bonuses linked to ESG targets • % of approved policies related to climate and environmental risks • % of implemented policies related to climate and environmental risks • % of implemented policies that have had positive impacts
	Business lines (first line of defence)	In this section, illustrate how the business lines apply climate requirements in credit granting processes, in client monitoring, and in the offering of financial products. For example, indicate: • Data collection system: analysis of transition plans, surveys, etc.

		• % of portfolio subject to climate due diligence • % of new loans with ESG criteria • % of counterparties that have received loan linked to climate KPIs • % of new financial products with green characteristics
	Risk management (second line of defence)	In this section describe how the Risk Management function integrates climate risks into the overall risk framework, verifies consistency with the transition plan, and supports the Board of Directors and the committees involved. In particular, it should show the use of methodological tools and the ability to update the risk profile in a dynamic way. For example, indicate: • % of policies updated to include climate risks out of the total risk policies; • % of climate risks included in internal risk models; • % of new climate risks verified during the annual review of the risk taxonomy; • Use of internal ratings, scenarios, stress tests (at this stage it is not necessary to go into detail, it is only necessary to indicate their use and annual frequency); • % of portfolio covered by climate assessment methodologies (to highlight the ability to quantify the majority of exposures).
	Compliance and Internal audit (third line of defence)	Indicate the role of the third line of defence in the process of verifying the regulation adopted in the previous lines of defence. Describe the compliance process, that is, the internal procedures created to monitor regulatory updates and then implement them internally. For example, indicate: • Number of ESG audits carried out in the reference year;

		• % of reviews with positive outcomes compared to the total; • % of reviews with negative outcomes compared to the total; • % of recommendations implemented within the deadline; • % of climate risk regulations mapped and integrated into governance processes; • % of quality controls on ESG data; • Use of independent assurance; • Audit of data provided by counterparties; • Methods of reporting results (quarterly/semi-annual/annual reports, recommendations).
4.2 Counterparties engagement	**Engagement disclosure**	In this section, the bank should describe how it uses the engagement process as a tool to guide its counterparties towards decarbonization pathways and to reduce climate risks in the portfolio. The disclosure should highlight the overall engagement strategy, the methods of interaction with counterparties, and how such activities are integrated with the overall climate strategy. Particular attention should be given to the presence (or absence) of escalation strategies, the monitoring of results, and the connection with credit policies.
	Engagement strategy	In this section, the engagement policy with counterparties should be described. For example, indicate: frequency of meetings • objectives of engagement (e.g.: emission reduction, adoption of transition plans, willingness to increase climate engagement for counterparties, alignment with climate scenarios, willingness to increase the % green share of the bank's portfolio)

		• classification of sectors in which the bank is most active, indicating which of these may be subject to climate risk • levers intended to be used to achieve climate objectives (financial and non-financial) • adoption of an escalation strategy (time-bound objectives, minimum KPIs to be achieved) • % of portfolio covered by engagement
	Engagement tools	In this section describe whether internal ratings with ESG factors, transition plan scores, probability of default models integrated with climate variables, or external ESG ratings are used. For example, indicate: • % of clients assessed with internal ESG climate scores • % of clients with positive scores (respect to decarbonization trajectories) • % of clients with negative scores (respect to decarbonization trajectories) • % of clients assessed with external ESG ratings • % of climate scores used in engagement processes • Types of scoring methodologies used (climate scorecards, scenario models, etc.)
	Counterparties' vulnerabilities analysis **(sectoral, geographical, financial, technological, regulatory)**	In this section, it is necessary to describe the process of analysing the climate vulnerabilities of individual counterparties. For example, indicate: • % of sectoral exposure to carbon-intensive industries (material climate risk) compared to total exposures • geographical location in areas subject to physical risk • financial dependence on fossil fuels • technological delay • regulatory risks

		• % of companies subject to climate risk • % of clients assessed for vulnerabilities • % of vulnerabilities identified per counterparty • average vulnerabilities identified per portfolio • average vulnerabilities identified across all portfolios • number of sectors and sub-sectors classified as high climate risk
	KPI and engagement result	In this section, it is necessary to define performance indicators to measure the results of engagement (e.g., clients' emissions reduction, alignment with climate scenarios) and the results of the KPIs. For example, indicate: • % of counterparties subject to mandatory climate disclosure • % of counterparties that prepare transition plans (mandatory and voluntary) • % of clients with verified transition plans • % of climate objectives achieved by clients • % of portfolio reallocated from brown to green sectors • % of counterparties that have improved their climate KPIs thanks to engagement • %/amount of emissions reduction achieved through the adoption of the engagement process
5 **Risks analysis**	The analysis of climate risks must follow a clear and sequential logic, which must be clarified by the bank. The bank should demonstrate the entire process, starting from the identification of counterparties' dependencies, as they are the main transmission channels through which climate risks materialize. On the basis of these dependencies, the institution should develop its own risk taxonomy, ensuring that climate and environmental risks are classified in a coherent way and linked to traditional risk categories. The bank should then report how the risk taxonomy is the basis for classifying the materiality of risks. Moreover, since only material	

	risks are integrated into the Risk Assessment Framework, Risk Appetite Framework, Risk Appetite Statement, Risk Assessment Statement and the ICAAP, the bank should demonstrate how it ensures consistency between risk classification, prudential planning and capital allocation.	
	Risk taxonomy	In this section, the bank should provide a clear classification of risks that includes climate and environmental risks among the main risk categories. It is necessary to distinguish between physical and transition risks, specifying how they are linked to the traditional risk categories. Indicate the process of drafting, approving, and reviewing (frequency) the taxonomy.
	Materiality assessment	The bank should describe the process by which it assesses the materiality of the climate risks identified in the taxonomy, specifying the qualitative and quantitative criteria used (demonstrating transparency in the criteria adopted). It should indicate how such an assessment is fundamental to ensuring that the strategies, policies, methodologies, and processes adopted are proportionate to the risks that are truly significant for the institution. It should clarify the frequency of review (at least annually) and how the results are integrated into the decision-making process. It should explain the relationship between financial materiality and impact materiality, leaving aside the specific features that must be disclosed in subsequent sections.
	Financial materiality	In this section, it is necessary to disclose how the bank determines whether the risk has a material effect on its financial profile. It is necessary to explain and describe how the outcome of the materiality assessment, and consequently of financial materiality, may be used in processes and decisions.

	Impact materiality	In this section, the bank should clarify how it assesses the effects of its activities on the climate and the environment. Describe the scope of analysis (Scope 1, 2, and 3; investments in high-impact sectors, etc.) and the metrics used (for example, the % of taxonomy-aligned financing, or % of green allocations). Describe how the results guide the sustainability strategy, policies, and the engagement process.
	Climate risks: Physical and transitional risks	In this section, identify and classify the risks related to climate and environmental changes (distinguishing between physical and transition risks) and highlight how they are reflected (have an impact) directly on other risk categories. For example, indicate: • % of climate risks mapped compared to total risks • % of climate risks identified compared to the previous year • incidence of physical risks (e.g., floods, droughts, heatwaves) on credit and operational exposures • incidence of transition risks (e.g., carbon pricing, stricter regulation, stranded assets) on asset value and capital • how climate risks may influence other risk categories (financial risks, strategic & business risks, reputational risks) • how climate risks may create a negative/positive impact on the financial institution
	Financial risks: Credit, market, liquidity, operational risks	In this section, it is necessary to classify and describe how climate risks are reflected in traditional financial risks (e.g., credit deterioration, market volatility, liquidity risks, operational disruptions). For example, indicate: • % of credit exposures in high climate-risk sectors (physical and transitional)

		• Change in expected default rate and expected loss under adverse climate scenarios • Estimated impact on liquidity requirements following climate shocks • Change in market value of carbon-intensive assets (% of portfolio subject to potential write-downs) • % of assets at risk of depreciation (e.g., coal plants, oil & gas) • Number of operational events/activities related to physical risks (IT disruptions, infrastructure damages, etc.)
	Strategic and business risks	In this section, it is necessary to describe how climate risks can impact the bank's strategy and business model. For example, indicate: • Changes in product demand • Competitiveness risks • Compliance costs • % of revenues from counterparties exposed to climate risks • Number of strategic reviews due to climate risks • % of products/services redesigned to meet ESG requirements • Level of sectoral concentration in carbon-intensive activities
	Legal and compliance risks	In this section, it is necessary to classify legal and compliance risks arising from climate and environmental regulations. It is important to include risks of sanctions, legal disputes, and non-compliance with disclosure obligations (ESRS, EU Taxonomy), as well as risks arising from potential gaps in climate reporting.

		For example, indicate: • number of ongoing or concluded climate/environmental disputes • % of non-compliances identified in internal controls • % of audit recommendations on climate matters implemented • number of fines or sanctions incurred due to regulatory non-compliance • reputational risks arising from cases of counterparties' greenwashing
5.2 **Risk Assessment framework**	In this section, it is necessary to indicate how the bank drafts the Risk Assessment Framework, and how it defines the processes, methodologies, and procedures to identify, assess, and monitor all material risks, including climate and environmental risks. This section must indicate how the document describes data quality requirements (accuracy, reliability, granularity, and traceability). Furthermore, it is necessary to indicate how the framework supports the business model, integrating forward-looking strategies and approaches.	
	Risk Appetite Framework	This section should describe the overall framework within which the bank defines its level of risk appetite, including climate risks. Among the elements to be reported, it is necessary to indicate how it defines climate risk appetite, the integration of climate risks, and the governance structure for drafting, approval, and review.
	Risk Appetite Statement	In this section, indicate the purpose of the risk appetite statement, as a snapshot of the risk appetite framework. Describe the characteristics of the document, indicating how it defines the quantitative and qualitative risk limits effectively adopted by the institution. Among the elements to be reported, it should include the list of metrics and limits specific to climate and ESG risks, the distinction between hard limits (binding) and soft limits

		(tolerance, alert levels), and the frequency of review.
5.3 **Risk Assessment Statement**	In this section, the bank must indicate how the Risk Assessment Statement clearly and structurally communicates the material risks identified in the framework. It should indicate the role of the Risk Assessment Statement as an internal tool for promoting risk culture, for communication with the various internal bodies, how it documents the existence of an internal risk inventory, and how it can serve as a useful tool for the supervisory process.	
5.4 **Aggregated Sector and Portfolio Analysis**	In this section, the data from an integrated analysis must be presented, combining the data collected through engagement with counterparties and the data relating to the material climate risks identified in the taxonomy. In addition, it is necessary to indicate how these are then integrated with macro scenarios such as stress tests, NGFS scenarios, to assess the overall vulnerability of the portfolio. Describe the sectoral and geographical concentration of physical and transition risks, indicating the KPIs used to measure the level of alignment with the climate scenarios set as objectives by the institution in the first place, and international ones in the second.	
6 **ICAAP**	In this section, the results of climate analysis must be integrated into the ICAAP. Indicate how the ICAAP links risk management (with respect to all types of material risks) and capital management. Describe quantification methodologies, scenarios considered and estimated impacts on capital requirements. Indicate the additional buffers calculated while also considering climate risks (explicitly indicate how climate risks may generate additional buffers) and the frequency of updates of climate stress tests. Indicate the frequency of ICAAP reporting, highlighting compliance with legal capital thresholds under stress (regulatory perspective) and the adequacy of internal capital against risks (economic perspective). Indicate how the ICAAP meets the three assessment criteria (robustness, effectiveness, and completeness) set out in the SREP.	

<table>
<tr><td>7
ILAAP</td><td colspan="2">In this section, it is necessary to demonstrate how the bank has adequate liquidity and funding resources to cover the risks to which it is exposed.

Include therefore how the assessment of the impact of climate risks on the stability of the banking institution is carried out.

The bank should therefore, among other things, indicate the methodologies used for climate liquidity stress tests, and exposures to sectors or counterparties that may reduce access to funding in the event of reputational or regulatory deterioration, as well as the strategies to diversify funding sources and mitigate concentration in brown activities.</td></tr>
<tr><td rowspan="3">8
SREP</td><td colspan="2">In this section, it is necessary to indicate how the transition plan supports the prudential review and evaluation process carried out by the authorities.

The objective is to demonstrate that the strategies, governance, and tools adopted by the bank make it possible to integrate climate risks into the assessment of the business model and in the prospective decarbonization objectives, fostering consistent alignment with European prudential standards.</td></tr>
<tr><td>Business model analysis</td><td>In this section, it is necessary to explain how the transition plan supports the integration of sustainability into the business model, highlighting the ability to generate sustainable profits in the medium and in the long term.

Demonstrate how such integration makes it possible to direct activities towards decarbonization objectives, strengthening the economic sustainability of the model and reducing structural vulnerabilities.

Some of the relevant information that can be integrated includes showing the reallocation of portfolios towards low-emission sectors, and the reduction of dependence on carbon-intensive activities.</td></tr>
<tr><td>Forward-looking climate objectives</td><td>In this section, it is necessary to explain how the transition plan supports the integration of sustainability into the business model, highlighting the ability to generate sustainable profits in the medium to long term.</td></tr>
</table>

		Demonstrate how such integration makes it possible to direct activities towards decarbonization objectives, strengthening the economic sustainability of the model and reducing structural vulnerabilities. Some of the relevant information that can be integrated includes: showing the reallocation of portfolios towards low-emission sectors, and the reduction of dependence on carbon-intensive activities.
7 **conclusion**		The conclusion should summarize the main elements of the climate transition plan, highlighting the following aspects: • The prudential value of the plan as a risk management tool and as an essential tool to guarantee dialogue with supervisory authorities; • The forward-looking nature of the plan, which makes it possible to align strategic objectives, risk management, and capital planning; • The contribution of the plan to the overall resilience of the bank and to the stability of the financial system.

4.4 Limitation:

A significant limitation of this work concerns the absence of an empirical validation of the proposed template for the transition plan. Although the methodological framework has been developed on the basis of regulatory sources, industry best practices, and academic contributions, the model presented remains, to date, a theoretical framework that needs to be tested in operational practice.

The purpose of the validation should be to verify whether the template allows information to be reported in a granular way and to assess its practical applicability in a concrete banking context, through the use of empirical data, evaluating its ability to adapt to different organizational structures and risk portfolios.

The main limitation identified is linked to the lack of a pilot experimentation phase within a banking institution or in the context of a supervisory exercise. Only through a practical test is it possible to measure the effectiveness of the template in the prudential management of climate risks and in its ability to guide clients towards the transition.

For this reason, future research should focus on validation activities of the model, through real case applications, climate stress tests, and direct dialogue with supervisory authorities. Such

a phase would not only consolidate the reliability of the template but also enhance it with operational elements, increasing its usefulness for both banks and supervisors.

CONCLUSION

The aim of the thesis was to design a prudential transition plan model capable of addressing the supervisory challenges linked to climate risks in the banking sector. After a depth analysis of international and European regulatory frameworks, supervisory expectations, and available methodological tools, the research has demonstrated that transition plans are not mere sustainability reports but true operational instruments of a prudential nature.

The results achieved highlight three main contributions. First, the template consolidates climate risks within existing prudential frameworks, by integrating risk taxonomy, materiality assessments, and counterparties' dependencies into ICAAP and SREP processes.

Second, the model highlights the importance of governance and disclosure dimensions. It formalizes the role of boards of directors, committees, and risk management functions in overseeing climate risks, ensuring clarity of responsibilities and transparency in reporting mechanisms. Furthermore, it introduces engagement strategies with counterparties as an essential tool to assess vulnerabilities, realign portfolios with decarbonization objectives, and reduce systemic risks.

Third, the model improves and makes the dialogue between banks and supervisory authorities more efficient. Furthermore, by translating climate objectives into prudential terms, it facilitates supervisory review, increases comparability among institutions, and directly contributes to safeguarding the financial stability of both the institution and the financial system.

The thesis recognizes some important limitations. The template remains a conceptual model that requires empirical validation. Its effectiveness depends on the availability of granular and comparable data, the adoption of standardized methodologies, and the ability of banks to allocate adequate resources to climate risk management. Moreover, the regulatory and supervisory process at the European level is still evolving; therefore, the model must be adapted according to regulatory developments.

Future research should therefore focus on a testing phase of the template, allowing its applicability to be verified. Such empirical applications would make it possible to test its feasibility, assess its ability to capture exposures, and refine its operational aspects. In addition, they would provide useful feedback to supervisory authorities, contributing to the development of binding guidelines for prudential transition plans.

In conclusion, the thesis provides both a conceptual and operational contribution to the debate on the integration of climate risks into prudential supervision. It places the transition plan at the centre of capital planning, risk governance, and supervisory dialogue. It provides banks with a structured guide and supervisors with a coherent assessment framework; such an instrument represents a step forward in aligning the banking sector with climate objectives while safeguarding financial stability.

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ACRONYMS:

BCBS: Basel Committee on Banking Supervision

BMA: Bermuda Monetary Authority

CDS: Credit Default Swap

COP: Conference of the Parties

CRA: Credit Rating Agency

CRD: Capital Requirements Directive

CRR: Capital Requirements Regulation

CSRD: Corporate Sustainability Reporting Directive

CSDDD: Corporate Sustainability Due Diligence Directive

ECB: European Central Bank

EFRAG: European Financial Reporting Advisory Group

EDTF: Enhanced Disclosure Task Force

ESG: Environmental, Social and Governance

SRS: European Sustainability Reporting Standards

EU: European Union

FSB: Financial Stability Board

GHG: Greenhouse Gases

ICAAP: Internal Capital Adequacy Assessment Process

IFRS S1: International Financial Reporting Standard S1 – General Requirements for Disclosure of Sustainability-related Financial Information

IFRS S2: International Financial Reporting Standard S2 – Climate-related Disclosures

ILAAP: Internal Liquidity Adequacy Assessment Process

IPCC: Intergovernmental Panel on Climate Change

ISSB: International Sustainability Standards Board

KPI: Key Performance Indicator

NFRD: Non-Financial Reporting Directive

NGFS: Network for Greening the Financial System

NZBA: Net-Zero Banking Alliance

P2G: Pillar 2 Guidance

P2R: Pillar 2 Requirement

RAF: Risk Assessment Framework

RAS: Risk Assessment Statement

RWA: Risk-Weighted Assets

SASB: Sustainability Accounting Standards Board

SREP: Supervisory Review and Evaluation Process

TCFD: Task Force on Climate-related Financial Disclosures

UNFCCC: United Nations Framework Convention on Climate Change

UNICEF: United Nations International Children's Emergency Fund