Universidade do Minho
Escola de Economia, Gestão e Ciência Política

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Banks and the reporting of non-financial and climate-related information

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Banks and the reporting of non-financial and climate-related information

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(†) Professor Lúcia Lima Rodrigues passed away during the preparation of this thesis, having provided invaluable guidance and supervision until that time.

January 2026

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

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OS BANCOS E A DIVULGAÇÃO DE INFORMAÇÃO NÃO FINANCEIRA E RELACIONADA COM O CLIMA

RESUMO

O papel central dos bancos na economia, aliado às suas extensas interligações com diversos setores de atividade, torna imprescindível uma avaliação rigorosa dos riscos a que estão expostos.

A Diretiva 2014/95/UE, acompanhada pelas orientações subsequentes, reforçou a importância da divulgação de informação não financeira pelas entidades de interesse público, especialmente no domínio da informação relacionada com o clima, reconhecendo o seu impacto na estabilidade financeira e na tomada de decisões estratégicas.

Este estudo analisa o grau de adaptação dos bancos à Diretiva 2014/95/UE e respetivas orientações, nomeadamente, as orientações sobre a comunicação de informações relacionadas com o clima, identificando limitações como a não uniformidade na divulgação, o reduzido número de entidades abrangidas e as dificuldades de comparabilidade. Os bancos, enquanto agentes fundamentais na concessão de crédito e mobilização de capital, necessitam de informação relacionada com o clima fiável, detalhada e comparável para sustentar decisões financeiras responsáveis e alinhadas com os objetivos de sustentabilidade.

O estudo avalia também a divulgação de informação relacionada com o clima pelas empresas cotadas em Portugal, analisando o conteúdo, o grau de detalhe e o nível de aproximação às exigências da Diretiva (UE) 2022/2464. A análise evidencia a necessidade de melhorias significativas no detalhe e na padronização da informação reportada, essenciais para garantir maior transparência, comparabilidade e utilidade, com ênfase nos potenciais impactos financeiros e na evolução prospetiva.

Reconhece-se a necessidade de orientações claras e vinculativas, aplicáveis a todas as entidades sujeitas a reporte financeiro, dada a sua importância económica e a crescente interdependência global. A Diretiva (UE) 2022/2464 constitui um instrumento para o fortalecimento dos critérios de avaliação climática, embora se considere a necessidade de ajustamentos adicionais.

Esta tese destaca, assim, a importância da adoção de práticas padronizadas e orientações claras na divulgação de informação não financeira e relacionada com o clima, ajustadas à dimensão e setor de atividade das entidades, reconhecendo o papel determinante dessa informação na concessão e monitorização do crédito e na promoção de decisões financeiras mais responsáveis.

Palavras-chave: bancos; empresas cotadas; informação não financeira; informação relacionada com o clima; Portugal

BANKS AND THE REPORTING OF NON-FINANCIAL AND CLIMATE-RELATED INFORMATION

ABSTRACT

The central role of banks in the economy, combined with their extensive interconnections across various sectors, makes a rigorous assessment of the risks to which they are exposed essential. Directive 2014/95/EU, together with subsequent guidelines, reinforced the importance of non-financial disclosure by public interest entities, particularly in relation to climate-related information, recognising its impact on financial stability and strategic decision-making.

This study examines the extent to which banks have adapted to Directive 2014/95/EU and its associated guidelines, particularly those concerning the disclosure of climate-related information. It identifies key limitations, including inconsistent reporting practices, limited entity coverage, and challenges in comparability. As fundamental actors in credit provision and financial resource allocation, banks require reliable, detailed, and comparable climate-related information to support responsible financial decision-making aligned with sustainability objectives.

The study also assesses climate-related disclosures by listed companies in Portugal, analysing the content, level of detail, and degree of alignment with the requirements of Directive (EU) 2022/2464. The analysis highlights the need for significant improvements in the granularity and standardisation of reported information, which are essential to ensure greater transparency, comparability, and usefulness, with emphasis on potential financial impacts and forward-looking developments.

There is a recognised need for clear and binding guidance applicable to all entities subject to financial reporting, given their economic relevance and the growing global interdependence. Directive (EU) 2022/2464 serves as an instrument for strengthening climate assessment criteria, although further adjustments are considered necessary to address remaining challenges.

This thesis thus emphasises the importance of adopting standardised practices and clear guidance for the disclosure of non-financial and climate-related information, tailored to each entity's size and sector. It recognises the critical role that such information plays in credit allocation and monitoring, as well as in promoting more responsible financial decision-making.

Keywords: banks; listed companies; non-financial information; climate-related information; Portugal

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LIST OF ABBREVIATIONS AND ACRONYMS

AAF	Accounting Advisory Forum
APB	Associação Portuguesa de Bancos
B4BW	Banks for a Better World
BCSD	Business Council for Sustainable Development
BIS	Bank for International Settlements
BP	British Petroleum
CDP	formerly known as Carbon Disclosure Project
CDSB	Climate Disclosure Standards Board
CED	Committee for Economic Development
CERES	Coalition for Environmentally Responsible Economies
CMVM	Comissão do Mercado de Valores Mobiliários
CO_2	Carbon Dioxide
COP	Conference of the Parties
CRD	Corporate Reporting Dialogue
CRD IV	Capital Requirements Directive IV
CRD V	Capital Requirements Directive V
CRD VI	Capital Requirements Directive VI
CRR	Capital Requirements Regulation
CRR II	Capital Requirements Regulation II
CRR III	Capital Requirements Regulation III
CSDDD or CS3D	Corporate Sustainability Due Diligence Directive
CSR	Corporate Social Responsibility
CSRD	Corporate Sustainability Reporting Directive
EAD	Exposure at Default
EBA	European Banking Authority
EBF	European Banking Federation
ECB	European Central Bank
EEA	European Environment Agency
EEAS	European External Action Service
EEC	European Economic Community
EFRAG	European Financial Reporting Advisory Group
EL	Expected Loss
EMAS	Eco-Management and Audit Scheme
EPA	Environmental Protection Agency
ERM	Environmental Resources Management
ESG	Environmental, Social and Governance
ESRS	European Sustainability Reporting Standards
EU	European Union
FASB	Financial Accounting Standards Board
FP	Financial Performance
FSB	Financial Stability Board
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
HLEG	High-Level Expert Group on Sustainable Finance
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
IOSCO	International Organization of Securities Commissions
IPCC	Intergovernmental Panel on Climate Change
IR	Integrated Report

IIRC	International Integrated Reporting Council
ISO	International Organization for Standardization
ISSB	International Sustainability Standards Board
KPIs	Key Performance Indicators
LGD	Loss Given Default
MDGs	Millennium Development Goals
MNCs	Multinational Corporation
NACE	Nomenclature of Economic Activities
NASA	National Aeronautics and Space Administration
NFI	Non-Financial Information
NFRD	Non-Financial Reporting Directive
NGFS	Network for Greening the Financial System
NGOs	Non-Governmental Organizations
NPLs	Non-Performing Loans
OECD	Organisation for Economic Co-operation and Development
PD	Probability of Default
PRI	Principles for Responsible Investment
PTF-ESRS	Project Task Force on European Sustainability Reporting Standards
RBC	Responsible Business Conduct
SASB	Sustainability Accounting Standards Board
SDGs	Sustainable Development Goals
SEC	Securities Exchange Commission
SFDR	Sustainable Finance Disclosure Regulation
SMEs	Small and medium-sized enterprises
TCFD	Task Force on Climate-related Financial Disclosures
TEGSF	Technical Expert Group on Sustainable Finance
TR	Taxonomy Regulation
UK	United Kingdom
UN	United Nations
UN Global Compact	United Nations Global Compact
UNCTD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environmental Program Financial Initiative
UNFCCC	United Nations Framework Convention on Climate Change
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
USNRC	United States Nuclear Regulatory Commission
VRF	Value Reporting Foundation
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WMO	World Meteorological Organization
WSBI-ESBG	World Savings and Retail Banking Institute – European Savings and Retail Banking Group

Banks and the reporting of non-financial and climate-related information

CHAPTER I: General Introduction and Research Objectives

1.1 GENERAL INTRODUCTION

1.1.1 The Framework of the Theme

Non-financial information has become increasingly important over the years, as stakeholders are interested in having a global and complete view of organisations that reflects all the impacts of their activities (Hart, 1997; Marsiglia & Falautano, 2005; Perrini, 2006). This non-financial information must be more transparent, clear and comparable (Lament, 2016).

Non-financial information also reflects Corporate Social Responsibility (CSR) by disclosing social, environmental and corporate governance issues. It contributes significantly to analysing the performance and impact of organisations in society, identifying their sustainability risks and aiming to strengthen the confidence of investors and consumers (European Parliament and the Council of the European Union, 2014; República Portuguesa, 2017).

In the European Union (EU), the Directive 2014/95/EU (known as the "Non-Financial Reporting Directive" - NFRD) is a milestone in this area. The Directive came into force in 2017 to strengthen the consistency and comparability of non-financial information disclosed across the EU. It defined that certain large companies should prepare a non-financial statement containing at least information on environmental, social, and employee-related issues, respect for human rights, anti-corruption, and bribery (European Parliament and the Council of the European Union, 2014). The NFRD was transposed into Portuguese legislation by Decree-Law 89/2017, which requires all large companies and groups that are Public Interest Entities (PIEs) and have more than 500 employees on average during the year to prepare a "non-financial statement" (República Portuguesa, 2017).

Associated with Directive 2014/95/EU (European Parliament and the Council of the European Union, 2014), the EU guidelines on non-financial reporting emerged in 2017, establishing that climate-related non-financial information is part of non-financial reporting (European Commission, 2017). Subsequently, in 2019, the European Commission strengthened these guidelines by including a supplement that provided enhanced climate-related information (European Commission, 2019c).

The National Aeronautics and Space Administration (NASA, 2021) defines climate change as the result of problems and reflects long-term changes in weather patterns that affect the Planet, the economy, and all of us. These changes are the greatest economic and moral challenges we face and require a collective effort to combat them (Bowman, 2010). By the end of 2021, the speeches made at COP26 (Conference of the Parties (COP)) clearly demonstrated the growing importance of climate change and, on the contrary, the lack of speed of action to slow it down (UK COP26 Presidency, 2021b). Climate

change is now a reality, and we must stop it at the source! The need for banks and companies to play an active role is well understood.

To address the limitations of the NFRD, particularly regarding the scope, reliability and comparability of non-financial information, the Corporate Sustainability Reporting Directive (CSRD) was adopted by the European Union in December 2022, seeking to promote more standardised, rigorous and aligned disclosure practices in accordance with European commitments to sustainability and organisational transparency (European Commission, 2022d).

Banks and companies are relevant actors because they can act, directly or indirectly contribute to reducing, mitigating, or eliminating activities that may affect the climate. They play a crucial role in the transition to a low-carbon and climate-resilient economy (European Commission, 2019c).

The European Banking Authority (EBA, 2020b), in its guidelines on lending and monitoring, states that banks should consider the risks associated with Environmental, Social and Governance (ESG) factors on the financial condition of borrowers, with a focus on the potential impact of environmental and climate change factors, on their credit risk appetite, policies and procedures. As part of this follow-up, banks will need to collect relevant information to analyse the risks associated with the borrower when providing capital to companies, at the time of origination and during credit monitoring, of which climate-related information is an essential part (EBA, 2020b).

Therefore, banks play a critical and active role in sustainable development, mainly through their intermediation role in allocating capital, especially to industry (Emtairah et al., 2006; Zhang et al., 2011). They need climate-related information from companies when granting or monitoring loans in their business relationships to make informed decisions. Banks have begun to realise that they will be held accountable for their lending, investment, and project financing decisions and have started to scrutinise the social and environmental (with a focus on climate change) performance of their clients more closely and to determine their risk exposure to protect banks from potential losses (De La Cuesta-González et al., 2006). Banks play a key role in modern economies (Anagnostopoulos et al., 2018) and should contribute to better non-financial information reporting.

This thesis forms part of the Ph.D. in Management, with a specialisation in Accounting. It addresses the imperative for organisations, including banks and companies, to disclose both financial and non-financial information to their stakeholders, and examines whether such disclosures are comparable and comprehensible in ways that enhance decision-making. Information is needed not only on the economic and financial consequences of business activities but also on their social and environmental impacts (Çalişkan, 2014). The development of a comprehensive view of organisations as a whole, in a

multidimensional perspective, will bring new challenges and responsibilities for accounting and its professionals (Çalişkan, 2014).

Having concluded the presentation of the context of this thesis, I aim to assess the non-financial statements of banks operating in Portugal, in the first year of application of Directive 2014/95/EU (2017), in terms of compliance, comparability and detail of information, and how the regulation should be revised to improve non-financial information. Then, I will highlight and evaluate the climate-related information disclosed by banks operating in Portugal. Banks have a relevant role in the economy and should include this climate-related information in the concept of double materiality: inside-out and outside-in (European Commission, 2019c). Banks have never been more important in building the future, as the businesses they choose to finance will be geared towards slowing global warming and moving the economy towards cleaner technologies (Cogan, 2008). Regulators, aware of this role of banks, have set guidelines for banks to play a key and active role in solving the problems that may cause climate change. Therefore, it was important to assess whether banks in Portugal disclose climate-related information, how disclosure has evolved (2014 to 2019), what limitations and restrictions have been encountered (2019), and what could be improved. Finally, following Directive 2014/95/EU, large listed companies must disclose non-financial information. In Portugal, banks are the most probable funding entity for companies' financing. Therefore, I aim to analyse whether listed companies in Portugal (2020 and 2022) disclose climate-related information, whether this aligns with EU Guidelines, to assess whether the climate-related information disclosed by companies provides the necessary level of detail to support banks' decision-making in credit-granting and monitoring, and, in light of the entry into force of the CSRD and the ESRS standards, to identify the expected changes in reporting practices aimed at enhancing the quality and usefulness of such information for credit decisions aligned with sustainability criteria.

1.1.2 Research Motivation

The aim of this research is to understand how banks are positioning themselves in light of recent developments in the disclosure of non-financial and climate-related information, and to provide guidance on how this should evolve in the future, given the important role that banks play in society.

My personal motivation stems from a long-standing interest in "sustainability", having developed academic work in this area: my undergraduate thesis entitled "Management and Environment: Contributions to Environmental Awareness in Companies" (1998), and the Master's thesis entitled "Impact of the Environment on Accounting and Auditing" (2003).

In addition to this personal motivation, I also have a professional motivation, having worked in the banking sector as a corporate manager and then as head of corporate centres (Small and Medium-Sized Enterprises (SMEs) and large corporations), where I got to know a wide range of companies of different sizes and sectors. I then moved into credit analysis, in which the emphasis was consistently placed on social and environmental issues, and more recently (in 2023), into a role as an ESG risk manager..

Additionally, my motivation is also based on the fact that I am a member of society who wishes to contribute to the creation of a more sustainable future. Furthermore, it is evident that banks, companies and each of us shall have a role to play in this endeavour. The thesis contributes to a better understanding and knowledge of:

- The evolution process of non-financial reporting: from voluntary to mandatory stage;
- What banks, as fundamental parts of the economy, have done in terms of disclosure of non-financial information and climate-related information;
- What climate-related information do banks need to obtain from companies in order to support assertive decision-making at the level of lending and monitoring; and
- What synergies are needed between banks, companies, and regulators to make information increasingly comparable and useful for decision-making.

1.2 RESEARCH OBJECTIVES AND THESIS OUTLINE

1.2.1 Objectives and Methodology

This thesis aims to assess how banks have adapted to Directive 2014/95/EU (NFRD) and the Guidelines on non-financial information and climate-related information, and to explore how this adaptation should evolve in the future. Enhancing the role of the implementation of the Directive and the Guidelines, the study presents a conceptual model of the behaviour of banks, companies, and regulators in the fight against climate change, in adapting to the Directive and the Guidelines in terms of compliance/requirements, considering the main implementations and proposing new strategies, but also not forgetting inconsistencies, failures and lack of achievements/issues. The underlying idea is to enhance the collection of information, enabling better decision-making on climate-related matters, based on the impact of banks on the climate and the impact of the climate on banks.

Chapter I – This chapter provides a general introduction and the research objectives, an overview of the issue of linking with non-financial information and climate-related information and the importance of

banks in this context, against the background of Directive 2014/95/EU and subsequent Guidelines. This chapter describes the main objectives of this study and how the thesis was developed.

Chapter II – This chapter presents a literature review to understand CSR, the evolution of non-financial disclosure, the relevance of banks in the economy and society, and the challenges they face. This chapter also includes an analysis of the disclosure of non-financial and climate-related information.

Chapter III – This chapter explains the research methodology applied to the study, mainly the research philosophy adopted, as well as the research method, the data source and the procedures used in data analysis.

Chapter IV – Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal seeks to evaluate the non-financial reporting of financial institutions operating in Portugal, in the first year of implementation of Directive 2014/95/EU (2017). It addresses three research questions: (i) To what extent did banks in Portugal comply with the Directive in the first year of adoption (2017)? (ii) How was the non-financial information presented? and (iii) How should regulations be revised to improve the non-financial statement?

This chapter is based on the published paper: Santos, A. L., and Rodrigues, L. L. (2022). Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal. In *Corporate Responsibility, Sustainability and Markets* (pp. 75-100). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-79660-0_5.

Study also presented at the International Conference "The 8th International Conference on Social Responsibility, Ethics and Sustainable Business", entitled "Banks' Non-Financial Reporting: Empirical evidence from Portugal", University of Minho (Braga), on 25 October 2019.

Chapter V - Banks and Climate-Related Information: The Case of Portugal aims to assess the climate-related information of banks operating in Portugal, in the year of publication of the climate associated guidelines (2019). It focuses on three research questions: (i) Whether banks disclose climate-related information and how disclosure has evolved; (ii) The limitations and restrictions found in terms of climate-related information disclosure; and (iii) What can be improved.

This chapter is based on the published paper: Santos, Aldina Lopes, & Lúcia Lima Rodrigues. (2021). Banks and Climate-Related Information: The Case of Portugal, *Sustainability* 13, no. 21: 12215. https://doi.org/10.3390/su132112215.

Study also presented at the International Conference "7th International Conference Corporate Social Responsibility, Sustainability, Ethics & Governance", Politécnico de Lisboa (Lisboa), on 23 June 2021.

Chapter VI - **The Impact of Climate-related Information on Bank Lending**: Evaluates the information provided by listed Companies in Portugal, in 2020, the first year after the publication of the climate-related information supplement. It seeks to answer three questions: (i) Are listed companies disclosing climate-related information?; (ii) Does the disclosed information comply with the NFRD climate-related information guidelines?; (iii) Are companies providing banks with sufficiently detailed climate-related information to support informed decision-making in credit-granting and monitoring? (iv) Considering the CSRD and ESRS, what changes are expected in companies' disclosure of climate-related information to assist banks in better making their lending decisions?

Study also presented at the "4th International Conference on Accounting and Finance Innovation", Universidade de Aveiro (Instituto Superior de Contabilidade e Administração), on 10-11 July 2023.

This chapter is based on a publication by IGI Global – Scientific Publishing, under the book Corporate Climate Responsibility and Education: Leveraging Green Fiscal Measures: Santos, A. L., & Brás, F. A. (2026). Climate-Related Information Disclosure and Banks' Decision-Making. In Corporate Climate Responsibility and Education: Leveraging Green Fiscal Measures (pp. 191-272). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3373-1937-7.ch007.

Chapter VII – Final reflections on the overall data and several conclusions, including research contributions, limitations, and suggestions for future research. Finally, a conceptual model is presented concerning banks and the importance of developing non-financial and climate-related information.

It is important to highlight that Chapters IV, V, and VI are structured as independent essays. While each essay addresses a distinct research question and adopts its own methodological approach, they are thematically interconnected and collectively contribute to the overarching objectives of the thesis. This structure reflects a coherent analytical framework, allowing for a multifaceted exploration of the subject matter while maintaining conceptual continuity across chapters.

According to the Organisation for Economic Cooperation and Development (OECD, 2015), the research is a creative and systematic work aimed at increasing the stock of knowledge. And it is understood as the search for knowledge and truth (Grover, 2015). Research philosophies include positivism, realism, interpretivism, and pragmatism (Saunders et al., 2012). This thesis adopts positivism as its philosophical orientation. In order to achieve its objectives, the thesis provides a series of empirical studies (essays) on the disclosure of non-financial information and climate-related information by banks and the climate-related information disclosed by companies that may be useful to banks in credit decision-making. The last date for collecting information for this thesis is december 2025.

1.2.2 Expected Contributions

Taking non-financial disclosure as a reference topic, the importance of which is gradually increasing, with a special emphasis on climate-related information, and considering the importance of banks in the economy and society, this thesis is expected to contribute to a better knowledge and understanding of the disclosure of non-financial and climate-related information by banks and, in turn, of the climate-related information they need from companies in order to support decision-making when granting and monitoring of loans.

The thesis aims to provide knowledge and data to help regulators understand how disclosure of non-financial information and climate-related information should evolve, issues that have gained significant prominence, particularly in Europe, and to increase the importance of this disclosure by banks and companies.

1.2.3 Structure of the Thesis

In order to achieve the main objectives of this study, several approaches have been adopted, which are identified in this thesis and organised into seven chapters as described above and illustrated in Figure 1.1.

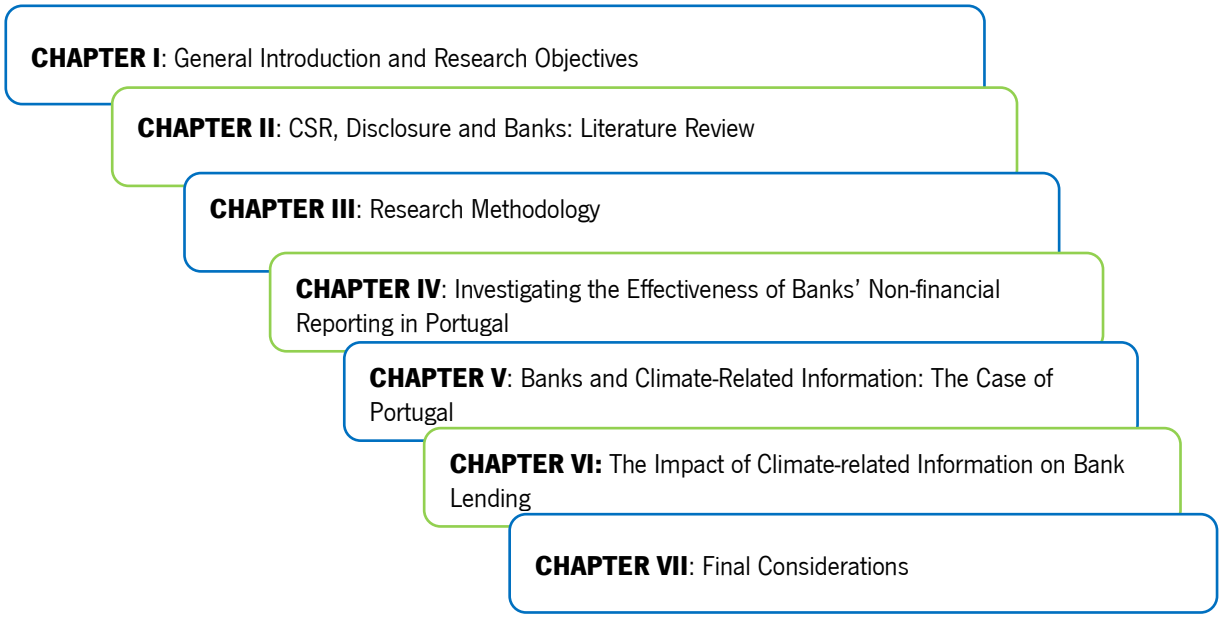

Figure 1.1 Illustration of the thesis structure.

CHAPTER II: CSR, Disclosure and Banks: Literature Review

CSR, DISCLOSURE AND BANKS: LITERATURE REVIEW

The non-financial reporting is grounded in CSR. Therefore, it is important to understand the evolution of the concept of CSR over the last few decades in order to provide a better framework for the issue of this thesis, the events that led to the changes, and to identify the efforts that have been made to standardise the disclosure of information on CSR.

The concept of CSR has a long and broad history, recording over the centuries evidence of the business community's concern for society, but it is primarily a product of the 20th century, with a focus from the early 1950s to the present. Therefore, the beginning of the 20th century is considered an appropriate starting point for analysis (Carroll, 2008).

According to the European Commission (2022b), CSR is important for business, the economy and society. For business, CSR and Responsible Business Conduct (RBC) offer important benefits in terms of risk management, cost reduction, access to capital, customer relations, people management, sustainability of operations, innovation capacity, and profit opportunities; they make businesses more sustainable and more innovative, thus creating more sustainable economy; and for society, they offer a set of values on which we can build a better society, more united in the transition to a sustainable economic system (European Commission, 2022b).

CSR is a relatively modern concept that has evolved dynamically over the years (Lee, 2008; Visser, 2014). The different definitions of CSR are derived from the social, economic, political and environmental contexts of each era, and there is no single definition, but different definitions over time, representing different dimensions of CSR (Rahman, 2011).

The number of organisations involved in non-financial reporting is increasing worldwide, but there is still no consensus on terms such as “social and environmental”, “corporate social responsibility”, “sustainability”, “ethical”, and “triple bottom line” (Skouloudis et al., 2014, p. 174).

In 2021, Sheehy & Farneti (2021) questioned the difference between the terms “corporate social responsibility”, “sustainability”, “sustainable development” and “corporate sustainability”. The study points out that these terms are used to make decisions about investments, policies and strategy development, that they have emerged in different contexts and at different times, and therefore have different meanings, but that over time, they have come to be used interchangeably (Sheehy & Farneti, 2021). They show that “CSR" is the best term for focusing on individual business organisations, “corporate sustainability” is an organisation level environmental policy, “sustainable development” is a public policy, and “sustainability” is the broadest term encompassing global, local and organisational levels” (Sheehy & Farneti, 2021, p. 1).

This chapter consists of a literature review on the issues to be addressed. It is divided into sub-chapters, with the following structure: in the first sub-chapter, we will have some highlights on the evolution of the CSR concept, the events and regulations that have occurred over the years, to understand how it all started, followed by a chapter on CSR disclosure, focusing on the search for standardisation. The third section looks at the role of banks in society and the challenges they face, followed by an analysis of the disclosure of non-financial information and climate-related information. We conclude with a review of the theories that underpin the research.

2.1 CSR: CONCEPT, EVENTS AND REGULATIONS

In exploring the concept of CSR, the study seeks to understand the evolution of the issue and developments over time, with a particular focus on the EU. For a better understanding, we have grouped the research by decades, not exhaustively, but trying to highlight the most relevant information, definitions and considerations in the literature, normative, and related events.

The concept of CSR has evolved (Agudelo et al., 2019; Carroll, 1979). From a concept limited to profit generation, it has gradually evolved to a broader set of responsibilities, to the notion that the primary responsibility of organisations should be to generate shared value, a concept that has been changed in parallel with societal expectations of organisational behaviour (Agudelo et al., 2019), as organisations are part of society (Khan et al., 2012).

2.1.1 The CSR Awakening (1920s to the 1960s)

In the mid to late 19th century, companies were particularly concerned with their employees and how to make them more productive, and philanthropy emerged (Carroll, 2008).

The 1920s and 1930s are notable for the emergence of fiduciary management (Carroll, 2008). In parallel with business growth during World War II (1939-1945), a climate of business opinion was created that encouraged the initiative to explore the social dimensions of business (Heald, 1970). References to a concern for social responsibility appeared earlier, particularly in the 1930s and 1940s (Carroll, 1999). There was no single definition of CSR, but these decades set the stage for the birth and growth of CSR in the 1950s (Carroll, 2008). As early as 1945, the Charter of the United Nations (UN, 1945) established as one of its principles the search for international cooperation in solving international problems of an economic, social, cultural, or humanitarian nature.

Discussions of corporate social responsibility became widespread in the 1950s, largely due to the lack of consensus on the meaning of the concept. It has been suggested that the modern era of social responsibility can be marked by the publication in 1953 of Howard R. Bowen's 1953 book "Social

Responsibilities of the Businessman" (Carroll, 1979). One of the earliest definitions of social responsibility was "the obligations of businessman to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society" (Bowen, 1953, p. 6), which relates the responsibility of business to society. That is, the decisions of the businessman affect the lives and fortunes of all.

Levitt (1958), aware of the dangers of social responsibility, argued that social problems should be the responsibility of the government to look after the general welfare.

Definitions of CSR expanded in the 1960s (Carroll, 1999). Interest in CSR was influenced by the growing awareness of society and social movements, and it was approached as a response to the problems and aspirations of modern society (Agudelo et al., 2019).

According to Davis (1960), the changes in society have made it necessary for businessmen to re-analyse their role in society and business functions. Businessmen have considerable social power, and their responsibilities should be commensurate with their social power, which is achieved by influencing the community through what they say and do.

Also in 1960, Frederick (1960) stated that businessmen should direct the operation of an economic system that meets the expectations of the public, which requires that social responsibility implies a public position that the economic and human resources of society should be used for broad social purposes and not only in the interests of individuals and companies.

In contrast, Friedman (2002) argued that business has a social responsibility to use its resources and engage in activities that increase its profits, as long as it engages in open and free competition without deception or fraud.

CSR gained prominence with the birth of the environmental movement, highlighted by Rachel Carson's (1962) book "Silent Spring", which was highly critical of the chemical industry and highlighted the irresponsibility of industrial and technological society towards the natural world.

A year later, McGuire (1963) recognised the difficulty of establishing the concept of social responsibility, due to the multiplicity of definitions, and stressed that the modern corporation could no longer pursue the goal of profit alone. It has not only economic and legal obligations, but also responsibilities to society, including politics, community welfare, education and the "happiness" of its employees, and it must act in a correct manner, as if it were a true citizen.

In 1965, notable is Ralph Nader's (1965) consumer advocacy book "Unsafe at Any Speed: The Designed-in Dangers of the American Automobile" which focused on the fact that car manufacturers

resisted installing safety features (such as seat belts) and were reluctant to spend money to improve safety, and the impact this had on safety at General Motors is noteworthy (Cutcliffe, 1966).

The following year, Kenneth Boulding (1966) argued in his article "The Economics of the Coming Spaceship Earth" that the economy of the future could be called the economy of the "spaceman", in which the Earth becomes a spaceship, without unlimited reserves of anything.

In turn, Walton (1967) provided a definition of social responsibility that recognised the intimacy of the relationship between business and society.

This CSR awakening is summarised in Figure 2.1.

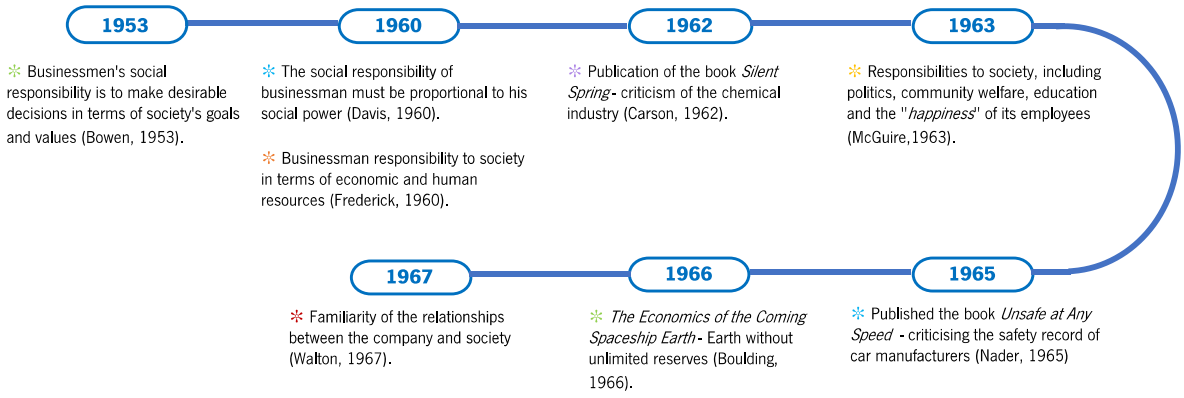

Figure 2.1 Highlights of the CSR awakening.

2.1.2 Years of Social Transformation of Companies (1970s)

The modern environmental movement was born in 1970 with the establishment of "Earth Day" on 22 April. In previous years, society had been oblivious to environmental concerns and how a polluted environment threatened human health (EarthDay.Org, 2022). This day was created to give voice to this emerging environmental awareness and to bring environmental concerns to the forefront.

However, Friedman (1970) describes social responsibility activities as an inappropriate use of the company's resources, with unjustified expenditure of money for the general social interest. In a capitalist system, a manager is accountable to the owners of the company and is responsible for running the business according to their wishes, usually to make the maximum profit, in accordance with the basic rules of society, whether enshrined in law or enshrined in ethical custom.

In the 1970s, definitions of CSR began to diversify (Carroll, 1999). In 1971, the "three concentric circles" approach, which brings together economic and non-economic concerns in the definition of social responsibility, was advocated by the Committee for Economic Development (CED) (Carroll, 1979). The CED (1971) stated that business should operate with the consent of the public and that its

basic purpose should be to constructively serve the needs of society, often referred up to today as the "license to operate". Public expectations of business had broadened. Society had begun to look to business to help solve major social problems, such as poverty and urban decay, not because it blamed them individually responsible for these problems, but because it believed that large corporations had significant resources and skills that could make a difference in solving these problems (CED, 1971).

In 1972, the book "The Limits to Growth" was published, and it is considered outstanding for warning against exponential human growth in a closed system, a concept that is rarely mentioned but has many implications for the future of a finite Planet (Meadows et al., 2018). In the same year, the "United Nations Conference on the Human Environment" was held in Stockholm, and it is considered the first world conference to highlight the environment as a major issue (UN, 1972). It produced a set of principles for sound environmental management, such as the Stockholm Declaration and the Action Plan for the Human Environment. At the "Summit Conference" meeting in Paris (1972), the heads of state or of government stressed the importance of a community environmental policy and asked the European Commission to draw up an action programme on the environment (Council of the European Communities, 1973).

Social responsibility has become the hallmark of a mature, global civilisation, necessary for an interdependent world, and should be part of the social values in their decision-making (Davis, 1973). The company that wavers or chooses not to enter the arena of social responsibility may find itself gradually sinking into customer and public disfavour.

Holmes (1976) noted that the early 1970s were marked by a major shift in the views and business philosophies of managers towards social responsibility, who believed that corporate reputation and goodwill would be enhanced by social efforts.

In 1976, the OECD (2001b, 2001a) issued the "Guidelines for Multinational Enterprises", a set of recommendations from governments to multinational enterprises that contained voluntary principles and standards for responsible behaviour consistent with applicable laws.

Of particular note are the "Sullivan Principles", a code of corporate conduct, developed in 1977 by Leon Sullivan to promote CSR, at the time to put economic pressure on South Africa against its system of apartheid (racial segregation) (Sullivan, 1977).

In the spring of 1978, a toxic chemical leak (approximately 20,000 tonnes) from a former landfill in an upstate New York Community (a suburb of Niagara Falls), known as "Love Canal", became synonymous with "environmental disaster". The waste had been dumped and capped in an old canal (1940s and 1950s) by a local chemical company and began to seep into the backyards and basements

of neighbouring homes, with some residents claiming that these chemicals had caused them a range of health problems. A grassroots movement was organised, forcing the state to evacuate around 900 families and laying the groundwork for the Superfund legislation of 1980, which aimed to prevent similar situations in the future and provide funding to remediate those that had already occurred (Olsen, 2013).

In March 1979, the reactor at Three Mile Island Unit 2 near Middletown, Pennsylvania, partially melted down in the most serious accident in the history of commercial nuclear power plant operations in the United States (United States Nuclear Regulatory Commission (USNRC, 2018)). It led to radical changes in emergency response planning, reactor operator training, human factors engineering, radiation protection, and many other areas of nuclear power plant operations. By this time, Carroll presented a conceptual model describing that: "social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organisations at a given point in time" (Carroll, 1979, p. 500).

The 1970s saw a proliferation of definitions of CSR (Carroll, 1999). Also in this decade, legislative initiatives would lead companies to create mechanisms to comply with laws dealing with the environment, product safety, discrimination, and worker safety (Carroll, 2008).

The 1970s were years of greater social transformation by companies, motivated by self-interest or in response to regulatory demands or activist protests, entering what Carroll describes as the era of "corporate social responsibility management" and gradually beginning to formalise and institutionalise their responses to social and public issues (Carroll, 2015).

Figure 2.2 summarises the key features of corporate social transformation in the 1970s.

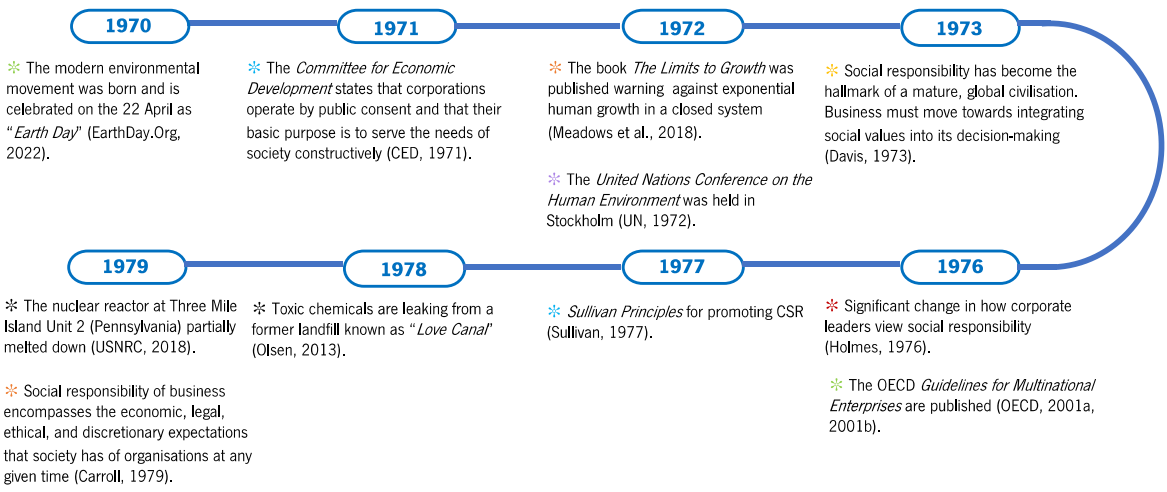

Figure 2.2 Highlights of years of social transformation in companies.

2.1.3 The Rise of Sustainable Development (1980s)

The 1980s were a time when new social concerns began to emerge, as evidenced by a series of events that reflected the international community's approach to sustainable development and also to corporate behaviour (Agudelo et al., 2019).

At the beginning of the decade, Jones defined CSR as "the notion that companies have obligations to constituent groups in society other than stockholders and beyond those prescribed by law or union contract", which must be broad and voluntary (Jones, 1980, pp. 59–60). The CSR should be seen not as a set of outcomes, but as a process, so that companies need to analyse the social consequences of their decisions before taking steps to minimise the social costs of those decisions (Jones, 1980).

In 1980, Toffler's (1980) book titled "The Third Wave" describes three types of societies, based on the concept of "waves": the first wave was the agricultural society, the second wave was the industrial age society, and the third wave was the post-industrial (information age) society, where knowledge would become more important than ever.

In 1983, the World Commission on Environment and Development (WCED, 1987a) was established, including a special commission to report on the environmental and global issues to the year 2000 and beyond, including proposed strategies for sustainable development.

In December 1984, the Union Carbide chemical plant in JP Nagar, on the outskirts of the Indian city of Bhopal, exploded. This was the world's worst industrial disaster, with the release of 40 tonnes of toxic methyl isocyanate gas, causing the immediate death of more than 3,000 people and condemning hundreds of thousands to a doomed future (of disease) (Ellis-Petersen, 2019).

In the early 1980s, scientists began to notice that the ozone layer (which protects life on Earth) was shrinking significantly each spring over Antarctica. This decline became known as the ozone hole (NASA, 2019c). This phenomenon alerted the world to the global impact of human activity on the atmosphere (caused by the use of chlorofluorocarbons). The article was published in the scientific journal *Nature* in 1985 and sent shockwaves worldwide (UK Research and Innovation, 2022). In the same year, the "Vienna Convention for the Protection of the Ozone Layer", a multilateral environmental agreement coordinated by the United Nations Environment Programme (UNEP, 1985), set the stage for an international reduction in the production of chlorofluorocarbons, as they were contributing to the destruction of the ozone layer. Wartick and Cochran (1985) warn of the need for corporate social engagement.

In 1986, the "Single European Act" provided a legal basis for a European environmental policy, considering the environment of fundamental importance for the future of the Community and its citizens (European Parliament, 1986).

Also in 1986 occurred the *Chernobyl* nuclear disaster, classified as the worst accident in the history of nuclear energy, which heightened environmental awareness (United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR, 2022). The reactor was destroyed, and significant amounts of radioactive material were released into the environment.

In 1987, the UN agreed on the "Montreal Protocol on Substances that Deplete the Ozone Layer", a multilateral agreement designed to protect the ozone layer by phasing out the production of a number of ozone-depleting substances (UN, 2022; UNEP, 1988). It is considered one of the few treaties to have achieved universal ratification.

In addition, the report "Our Common Future" (Brundtland Report), presented by the Brundtland Commission, and published by the UN in 1987, defined sustainable development, stating that "humanity has the capacity to make development sustainable, so that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987b, p. 15).

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 by the World Meteorological Organization (WMO) and the UNEP to provide governments at all levels with scientific information to support the development of climate policies, and its reports contribute to the international negotiations on climate change (IPCC, 2022).

In 1988, the "Toronto Conference on Changing Atmosphere: Implications for Global Security" is notable for reaching the first global scientific consensus on climate change:

> [H]umanity was conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a global nuclear war. The Earth's atmosphere is being changed at an unprecedented rate by pollutants resulting from human activities, inefficient and wasteful fossil fuel use and the effects of rapid population growth in many regions.
>
> (WMO & UNEP, 1988, p. 292)

In 1989, the Exxon Valdez tanker struck Bligh Reef in Prince William Sound, Alaska, causing a spill of over 11 million gallons of crude oil, the largest in United States history at the time, and testing the ability of local, national, and industry organisations to respond to a disaster of this scale (Environment Protection Agency (EPA), 2022). An event that raised the international community's awareness of environmental protection and sustainable development and had a direct impact on corporate behaviour (Agudelo et al., 2019).

The 1980s highlighted corporate practices in relation to: environmental pollution, employment discrimination, consumer abuse, worker health and safety, quality of working life, deterioration of urban life, and questionable/abusive practices of multinational corporations (Carroll, 2008).

The highlights of the 1980s, when sustainable development began to take shape, are summarised in Figure 2.3.

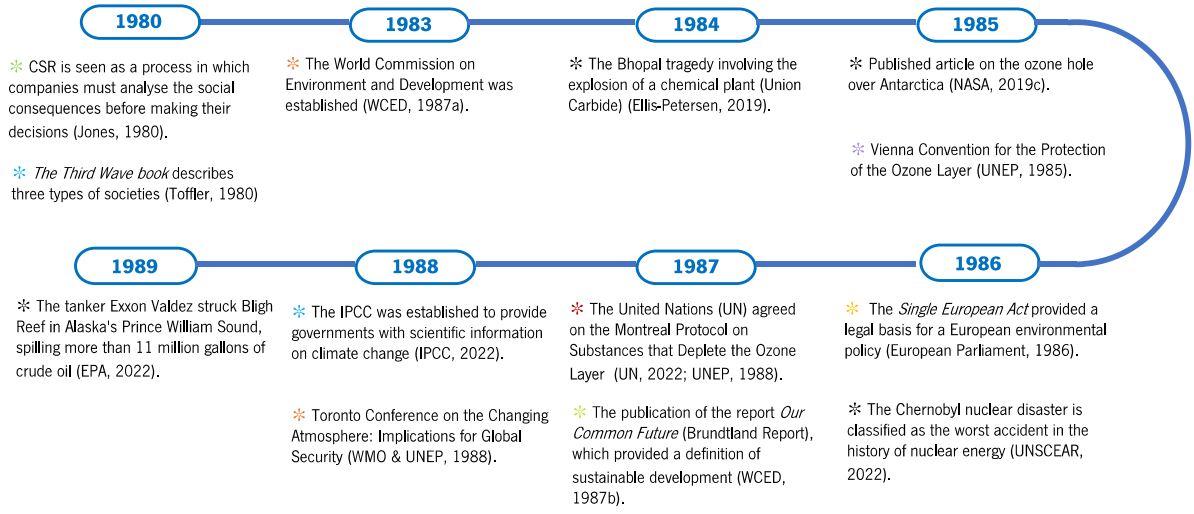

Figure 2.3 Highlights of the 1980s, when sustainable development emerged.

2.1.4 CSR Behind Borders (1990s)

In the 1990s, several relevant developments influenced the international perspective on social responsibility and the approach to sustainable development. The concept gained relevance as a result of the international approach to sustainable development alongside the ongoing globalisation process (Agudelo et al., 2019).

At the beginning of the decade, the European Environment Agency (EEA, 2022b) was established (1990) to provide sound and independent information on the environment.

Following the Exxon Valdez oil spill in 1989, a group of social investors, environmental groups, religious organisations, and pension fund trustees formed the Coalition for Environmentally Responsible Economies (CERES). They drafted ten CERES Principles (originally the *Valdez Principles*), signed in 1990, covering environmental protection, resource conservation, risk reduction, product safety, public access to information, and accountability (West, 1992).

In 1991, Carroll's (1991) created a pyramid of CSR and at its base, he placed the "economic responsibilities" (on which all other responsibilities rest); followed by the "legal responsibilities" (the law

and would dictate the rules); followed by the "ethical responsibilities" (the obligation to do what would be right, just and fair, preventing harm); and at the top of the pyramid the "philanthropic responsibilities" (contributing resources to the community to improve the quality of life), which help organisations understand their social and environmental responsibilities towards to stakeholders.

In June 1992, the UN Conference on Environment and Development, the "Earth Summit", was held in Rio de Janeiro, a landmark event that brought together more decision-makers than any other meeting in the history of international relations, and resulted in the "Rio Declaration on Environment and Development", often shortened to the "Rio Declaration", consisting of 27 principles to guide countries in future sustainable development (signed by over 175 countries) (UN, 1992a). One of the main outcomes of the conference was "Agenda 21", a non-binding UN plan of action for sustainable development that addresses existing problems and prepares the world for the challenges ahead, representing a global consensus and political commitment at the highest level for social and environmental development and cooperation (UN, 1992b). The United Nations Framework Convention on Climate Change (UNFCCC), which also emerged from this conference, established an international agreement to stabilise atmospheric concentrations of greenhouse gases at a level that would prevent the dangerous interference by human activities with the climate, leading to further global warming of the Earth with adverse effects on natural ecosystems and humankind (UN, 1992c).

In 1993, the Eco-Management and Audit Scheme (EMAS) emerged as an environmental policy tool developed by the European Commission, a voluntary environmental management tool that enables organisations to assess, manage, and continuously improve their environmental performance (Council of the European Communities, 1993a).

It should also be noted that the "Fifth Environmental Action Programme" entitled "Towards Sustainability", adopted in 1993, defined the EU environmental policy up to the year 2000 (Council of the European Communities, 1993b). This document states that, in order to maintain or improve companies' awareness of environmental issues and to ensure that environmental costs and risks be considered, and to facilitate the management function of accounts on environmental issues, companies should: (i) disclose in their annual reports details of their environmental policies and activities and their effects; (ii) disclose in their accounts expenditure on environmental programmes; (iii) provide in their accounts for environmental risks and future environmental expenditure (Council of the European Communities, 1993b). The document was notable for providing a community initiative in the field of accounting, mainly concerning the ways and means used by companies to report on financial aspects related to the environment (European Commission, 2001a).

Another piece of work worth highlighting relates to Elkington's (1994) concept of the “triple bottom line” in the context of sustainability, which combines companies' social, environmental, and economic impacts. Later, Elkington (1998) noted that partnerships between the private and public sectors, as well as partnerships with other companies or groups, are essential for good triple bottom line performance, both to be more efficient in what they do and to provide a basis for achieving goals that they could not achieve alone.

The European Commission has also played a leading role in the implementation of CSR by establishing CSR Europe (founded in 1995), as the leading European business network for corporate social responsibility, providing its members with the expertise and support they need to engage in CSR (Grayson & Nelson, 2013).

In 1995, the World Business Council for Sustainable Development (WBCSD, 2022) was established as a platform for businesses to respond to the challenges of sustainability, alongside a growing collective business conscience. In the same year, the Accounting Advisory Forum (AAF, 1995) - an advisory body of experts from the main accounting stakeholders in the EU with the aim of harmonisation - published a paper on “Environmental Issues in Financial Reporting”. The document focuses on the presentation of comparable and equivalent information in the context of the accounting directives on environmental issues in financial reporting, which also apply to banks and similar financial institutions (AAF, 1995).

In 1996, the International Organization for Standardization (ISO), an independent, non-governmental international organisation with a number of national standards bodies, launched the ISO 14000, a series of standards to provide guidelines for environmental management in companies (ISO, 2022a).

Later, Mitchell et al. (1997) developed a model that advanced the idea that stakeholders become relevant to managers because they perceive stakeholders to have power, legitimacy, and urgency in relation to the firm. While Hart (1997) notes that many companies have accepted their responsibility not to harm the environment, products and production processes are becoming cleaner, and more and more companies in industrialised countries are “going green” as they realise that they can reduce pollution and increase profits at the same time. Indeed, companies of the past have often ignored their negative environmental impact, those of the present are striving for zero impact, and those of the future will learn to have a positive impact.

In 1997, the “Treaty of Amsterdam” recognised that economic and social progress should be based on sustainable development and that policies should be implemented to ensure progress in various fields, strengthening the principle of integration of environmental requirements into other policies (European Union, 1997).

In the same year, the "Kyoto Protocol", an international treaty aimed at reducing the emissions of gases that contribute to global warming, was adopted and entered into force in 2005 (UN, 1998).

In 1998, the United Nations Conference on Trade and Development (1998) published a report entitled "Environmental Financial Accounting and Reporting at Company Level", which provides guidance on best practices for the accounting and disclosure of environmental costs and liabilities and identifies key environmental performance indicators and examines their relationship to financial performance, beyond the traditional accounting model. In the same year, the Cardiff European Council set out a strategy for integrating environmental concerns into its policies (European Council, 1998a). This strategy was confirmed and further developed by the Vienna European Council with the integration of environment and sustainable development into all Community policies (European Council, 1998b).

In 1999, the Commission adopted a Communication on the "Single Market and Environment", in which it considered essential to strengthen the synergies between the Single Market and environmental policy through a series of measures in the fields of public procurement, state aid, standardisation, financial reporting and eco- labelling (European Commission, 1999). It stated that the Community should use economic instruments (e.g. environmental taxes and charges), which would help to implement the polluter pays principle.

Also in 1999, the new "Sullivan Global Principles" appeared, broader than the first, aiming to increase the active participation of business in improving human rights and social justice internationally (Sullivan, 1999).

In the 1990s (and beyond), increased global competitiveness increased the reputational risk and encouraged companies to rigorously plan their responsibility and ethical initiatives where they operate (Carroll, 2015). Corporate responsibility knows no borders, which has increased the challenges for managers and companies as they have to balance and reconcile the pressures, demands, and conflicting expectations of home and host country stakeholders, with companies wanting to achieve legitimacy in the eyes of other countries and recognising that being a socially responsible company is the surest way to legitimacy. Another trend of the 1990s was the development of the institutionalisation of CSR in the daily life of companies, with some more developed than others, and the investors becoming more active, vocal and visible.

The 1990s also saw the emergence of a trend towards strategic reconciliation in managers' thinking about CSR and profitability, i.e., whether socially responsible companies are also profitable companies, based on the following arguments: enhancing corporate legitimacy and reputation; reducing corporate

costs and risks; building or enhancing strategic and competitive advantage; and creating win-win situations through synergistic value creation (Carroll, 2015).

In the 1990s, it was noticed an increasing number of corporate social responsibility reports, standards, and codes of conduct indicating an interest in CSR (Maç & Çalış, 2011). The first attempts to enforce corporate accountability and transparency in the EU were also observed (Kinderman, 2015). The highlights of the 1990s, which were characterised by an international approach, are summarised in Figure 2.4.

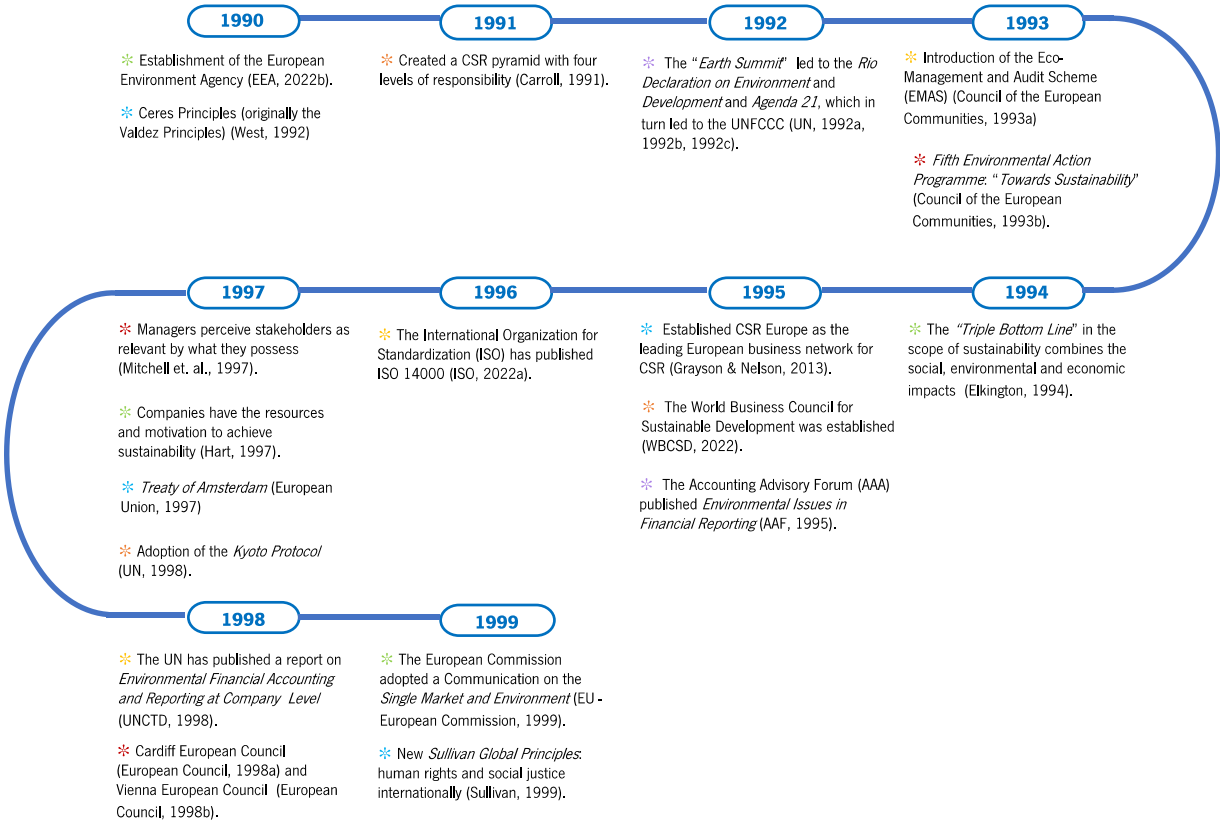

Figure 2.4 Highlights of the 1990s, characterised by an international approach.

2.1.5 Gradual Integration of CSR (2000s)

The 2000s were marked by several relevant events surrounding CSR, including its recognition and implementation and the strategic approach to CSR (Agudelo et al., 2019).

In 2000, the United Nations Global Compact (United Nations Global Compact, 2014) launched a global call for businesses to voluntarily align their operations and strategies with ten universally accepted principles, namely in the areas of human rights, labour, the environment, and anti-corruption. It was the largest corporate sustainability initiative in the world. It stated that sustainability starts with the

company's value system and a principled approach to doing business. By integrating the UN Global Compact's Ten Principles into their strategies, policies, and procedures and creating a culture of integrity, companies not only meet their fundamental responsibilities to people and the Planet but also set themselves up for long-term success.

Also in 2000, the UN (2000b) adopted the "Millennium Declaration" to build a safer, more prosperous, and equitable world, and set targets, such as promoting gender equality and empowering women, and ensuring environmental sustainability, to be achieved by 2015, known as the Millennium Development Goals (MDGs).

Of particular relevance is the OECD (2001a), whose "Guidelines for Multinational Enterprises" have been regularly updated, most notably with the changes in 2000 when the chapter on disclosure and transparency was expanded to recognise and encourage progress in enhancing corporate social and environmental responsibility. The aim was to harmonise with government policies, promote mutual trust between business and society, improve the climate for foreign investment and enhance the contribution to sustainable development OECD (2001b). It encouraged disclosure or communication practices, with information beyond financial performance, being one way of demonstrating a commitment to social responsibility. It also declared that "enterprises should apply high-quality standards for disclosure, accounting, and audit. Enterprises are also encouraged to apply high-quality standards for non-financial information, including environmental and social reporting where they exist" (OECD, 2001b, p. 15).

In 2001, in the Commission Communication "A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development", it was stated that all publicly listed companies with at least 500 employees were invited to publish a "triple bottom line" in their annual reports to shareholders, measuring their performance against economic, environmental and social criteria (European Commission, 2021b). In addition, EU companies were required to demonstrate and disclose their global compliance with the OECD Guidelines for multinational enterprises or other comparable companies.

Also in 2001, the EU defined its strategy with the presentation of a "Green Paper: Promoting a European Framework for Corporate Social Responsibility", which responded to the new social expectations and concerns of the time, namely the growing concern about the environmental impact of economic activities (Commission of the European Communities, 2001). It launched a broad debate on how the EU could promote CSR at the European and international level and proposed an approach based on the development of partnerships in which all actors play an active role, where the CSR is understood as "a concept whereby companies integrate social and environmental concerns in their

business operations and in their interaction with their stakeholders on a voluntary basis" (Commission of the European Communities, 2001, p. 6).

In addition, the Sixth Environment Action Programme "Environment 2010: Our Future, Our Choice" set out environmental objectives and priorities as an integral part of the EU's sustainable development strategy for the next 5 to 10 years and detailed the actions that had to be taken (European Commission, 2001b). However, in the same year, Lantos' (2001) study noted some uncertainty about the definition of CSR, which was considered a fuzzy concept with poorly defined boundaries and questionable legitimacy. CSR implies the obligation arising from the implicit "social contract" between business and society, so that the former responds to the needs of the latter in the long term, maximising the positive effects and mitigating the negative effects of its actions on society (Lantos, 2001).

In the same year, the Commission Recommendation 2001/453/EC on the "Recognition, Measurement and Disclosure of Environmental issues in the Annual Accounts and Annual Reports of Companies" was issued. It noted that a lack of regulation had contributed to a situation where various stakeholders, including regulators, investors, financial analysts, and the general public, may have perceived environmental information (disclosed by companies) as inappropriate or unreliable (European Commission, 2001a). It noted that voluntary disclosure of environmental information in company annual accounts and annual reports remains low and identified several reasons for this, including the cost of collecting and reporting environmental data and the sensitivity or confidentiality that may exist. Users of financial statements need information to make decisions about the company's attitude to the environment, its environmental performance and the impact of environmental risks and liabilities on the financial position.

The Recommendation aimed to help ensure that these users receive meaningful and comparable information on environmental issues. It confirmed the need to facilitate greater harmonisation of what should be disclosed about environmental issues in companies' annual accounts and annual reports in order to increase the amount, transparency, and comparability of environmental information (European Commission, 2001a). The Commission has therefore supported the work of the International Accounting Standards Committee (IASC), which has set itself the objective of developing a core set of high-quality International Accounting Standards (IAS), using as a reference source several IAS of particular relevance to environmental issues: IAS 36 on impairment of assets; IAS 37 on provisions, contingent liabilities and contingent assets, and IAS 38 on intangible assets. The Recommendation covered the recognition, measurement, and disclosure of environmental expenditures, environmental

liabilities and risks, and related assets arising from transactions and events that affect or might affect the financial position and performance. The accounting requirements would also apply to banks, as the financial implications of environmental issues are no different for this type of organisation (European Commission, 2001a).

Following the Green Paper, the Commission published a further Communication, entitled "Corporate Social Responsibility: A business contribution to Sustainable Development", and it became increasingly clear that sustainable business success and shareholder value could not be achieved solely through short-term profit maximisation alone (Commission of the European Communities, 2002). In this Communication, the European Commission proposed the creation of an "EU Multi-Stakeholder Forum on Corporate Social Responsibility" to promote transparency and convergence of CSR practices and instruments (European Commission, 2003).

In 2002, Friedman & Miles (2002) developed a model that highlights the importance of distinguishing between different stakeholders (they have different levels of influence, and the level of influence varies) and of analysing the organisation/stakeholder relationship not only from the organisation's perspective, but also how and why the organisation/stakeholder relationship changes over time.

The following year, Directive 2003/51/EC on the "Annual and Consolidated Accounts of certain types of Companies, Banks and other Financial Institutions and Insurance undertakings" stated that the annual report and the consolidated annual report are key elements of the financial information and that the information should not be limited to the financial aspects of the business, but that an analysis of environmental, social and other aspects relevant to an understanding of the development and position of the company is expected (European Parliament and the Council of the European Union, 2003b). Article 46 left the decision to disclose non-financial information to company managers and other stakeholders, which had little impact on the quantity and quality of non-financial information disclosed (Kinderman, 2015).

Marrewijk (2003) notes that sustainability was associated with the environment and CSR with social aspects, but many now consider CSR synonymous with corporate sustainability. According to this study, the different approaches to corporate responsibility show that CSR has emerged as a new and distinct phenomenon and that its approach seems to be a response to changing circumstances and new business challenges that did not exist before.

The "Equator Principles" were developed in 2003 as a credit risk management framework accepted by financial institutions for identifying, assessing, and managing environmental and social risks in project finance (used to finance the development and construction of large infrastructure and industrial

projects), providing a minimum standard of due diligence for responsible decision-making. In this way, financial institutions commit not to lend to projects/borrowers that do not or would not comply with the relevant social and environmental policies and procedures (Equator Principles, 2012). It should be noted that the standards have subsequently been updated and apply globally to all industries and financial products (project finance advisory services; project finance; project-related corporate loans; bridge loans; project-related refinancing and project-related acquisition finance) (Equator Principles, 2020).

As early as 2004, the "Who Cares Wins" report of the UN Global Compact (2004), a joint initiative of financial institutions at the invitation of the UN, intending to connect financial markets to a changing world, made recommendations for better integration of environmental, social and governance issues into securities analysis, asset management and brokerage. The term ESG was first used in this report and became popular following these recommendations.

In 2005, the EU launched the "European Roadmap for Business - Towards a Competitive and Sustainable Enterprise", which set out European CSR goals for the following years (CSR Europe, 2010). According to Werther & Chandler (2005), CSR is not a question of "right or wrong", but a relative question of what good business practice in the light of emerging societal demands is that shapes future expectations and becomes a strategic imperative leading to a sustainable competitive advantage for the company.

Kinderman's (2015) study notes that in the mid-2000s, the European Commission tried to pursue the transparency standards agenda, but attempts were blocked by powerful business groups who wanted a purely voluntary approach.

The Principles for Responsible Investment (PRI, 2021) were created in 2005 when UN Secretary-General Kofi Annan invited a group of the world's largest institutional investors to help define them. The Principles set out actions and are designed by investors for investors: (i) integrate ESG issues into investment analysis and decision-making; (ii) own assets that integrate ESG issues into their investment policies and practices; (iii) seek disclosure of ESG issues by the companies in which they invest; (iv) promote the adoption of the Principles in the investment sector; (v) work together to enhance the effectiveness of the Principles; and (6) report on activities and progress in applying the Principles.

According to Husted & Allen (2007), CSR activities add to the behaviour of the company which, in addition to providing product or service attributes that create value, must also provide a social good, i.e. there are new opportunities, but also additional demands. Heslin & Ochoa (2008) state that CSR presents seven strategic principles: nurture talent; develop new markets; protect the well-being of

workers; reduce environmental footprint; profit from by-products; engage customers; and develop a green supply chain.

In particular, the bankruptcy of Lehman Brothers in 2008, due to the subprime mortgage crisis, is an example of a corporate crisis caused solely by the progressive and rapidly growing reputational crisis of the company and its management (Pacelli, 2016). It raises questions in the areas of corporate social responsibility, corporate governance, remuneration policies, and stakeholder engagement, among others.

According to Dahlsrud (2008), despite efforts to arrive at an objective definition of CSR, there has been some confusion about how this should be done, i.e., how CSR is socially constructed in a particular context.

In 2009, the Commission launched workshops and consultations on ESG disclosure (Kinderman, 2015). Strictly speaking, during this decade, all these EU events became a unified vision and understanding of CSR that would be promoted around European companies (Agudelo et al., 2019).

The main features of the gradual integration of CSR are summarised in Figure 2.5.



Figure 2.5 Emphasises the gradual integration of CSR.

2.1.6 CSR and the Changing World (2010s)

In 2010, the "Communication from the Commission - Europe 2020: A strategy for smart, sustainable and inclusive growth" proposed 2020 targets for employment; research and innovation; climate change and energy; education; and the fight against poverty. The document presented priorities such as smart growth, by developing an economy based on knowledge and innovation, sustainable growth, and inclusive growth (European Commission, 2010a). In the same year, the "Deepwater Horizon" oil rig suffered an explosion followed by a huge fire, an accident that was considered the largest oil spill in US history, with loss of life, and economic and environmental consequences. The company British Petroleum (BP) suffered significant financial losses and reputational damage as the public believed that BP had not done enough to stop the leak (Mejri & De Wolf, 2013). This event exposed the shortcomings of existing financial and sustainability disclosure standards and practices, as the financial and sustainability reports concealed fundamental weaknesses in the way the company managed maintenance and safety issues (Lewis, 2011).

Also in 2010, ISO published ISO 26000, the first international standard to guide social responsibility, which has established itself as a global benchmark for organisations concerned with their impact on society at large (ISO, 2022a). It is designed to help organisations to contribute to sustainable development by going beyond legal compliance, promoting a common understanding in the field of social responsibility and complementing other social responsibility tools and initiatives (ISO, 2022b).

In addition, CSR Europe noted (back in 2010) that it was crucial to make economic growth and employment the immediate goal while meeting social and environmental objectives, and that urgent reforms and more targeted actions may be needed. The European Commission has proposed the creation of a "European Platform against Poverty and Social Exclusion: A European framework for social and territorial cohesion", which identifies the challenges of poverty and exclusion, sets out the contribution of different policies to reducing poverty and increasing inclusion, and lists some related actions (European Commission, 2010b).

In 2011, Porter and Kramer (2011) pointed out that companies were stuck in an antiquated approach to value creation that had evolved over the previous decades, optimising short-term financial performance while ignoring the factors that had led to their long-term success, and clinging to a social responsibility mentality in which social issues were peripheral rather than central.

In the same year, the "OECD Guidelines for Multinational Enterprises" were updated, calling on companies to apply high standards of financial and non-financial accounting and disclosure, including environmental and social reporting, where available OECD (2011). Furthermore, companies should also

present an independent, competent, and qualified auditor to provide external and objective assurance to the board of directors and shareholders that "the financial statements fairly represent the company's financial position and performance in all material respects" (OECD, 2011, p. 28). To improve understanding and interaction with society and the environment, companies need to be transparent in their operations and respond to the increasingly demanding information requirements of stakeholders (OECD, 2011). High-quality standards of financial and non-financial accounting and disclosure provide greater reliability and comparability of reporting and a better understanding of performance, while the audit should contribute to better control and compliance by the company. The OECD encourages disclosure practices in areas such as social, environmental, and risk disclosure, such as greenhouse gas emissions, biodiversity, and the activities of subcontractors and suppliers or joint venture partners, which are useful in controlling the transfer of environmentally harmful activities to counterparties.

In 2011, "A renewed EU Strategy 2011-14 for Corporate Social Responsibility" was published to create favourable conditions for sustainable growth, responsible business conduct, and sustainable jobs in the medium and long term. As the economic crisis and its social consequences have, to some extent, damaged consumer confidence and levels of trust in business, CSR is defined as: "the responsibility of enterprises for their impacts on society" (European Commission, 2011a, p. 6). It refers to the regulation of non-financial reporting to achieve transparency, create conditions for responsible business conduct, and hold companies accountable (Kinderman, 2015).

Companies, in cooperation with their stakeholders, integrate social, environmental, ethical, human rights, and consumer concerns into their business operations in order to (i) maximise the creation of shared value for their owners/shareholders and its other stakeholders, and for society at large; (ii) identify, prevent and mitigate their potential negative impacts (European Commission, 2011a). CSR should go beyond legal obligations towards society and the environment. The same document states that the disclosure of social and environmental information, including climate-related information, can foster stakeholder engagement and the identification of material sustainability risks, as well as being a form of accountability to increase trust in companies, and notes that an increasing number of companies are disclosing social and environmental information.

In 2011, the "UN Guiding Principles on Business and Human Rights" were published, which aim to improve standards and practices in the area of business and human rights in order to achieve achievable outcomes for affected individuals and communities and to contribute to a socially sustainable globalisation (UN, 2011).

Also noteworthy is the "Consolidated version of the Treaty on European Union", which declares that the member states are determined to promote economic and social progress with sustainable development at its core, and to establish policies to ensure that progress in economic integration is supported by parallel progress in other areas (European Union, 2012).

Another landmark event is the collapse of the Rana Plaza factory in Bangladesh, which killed over 1100 workers producing cheap clothes for the West in 2013 (Burke, 2013).

Alongside the various landmark events, there was a growing recognition that voluntary disclosure was not enough. CSR policy has become the subject of voluntary and soft law solutions (Kinderman, 2015).

In its concession, Directive 2014/95/EU has faced strong resistance from the business community, with attempts to weaken it and render it meaningless, demonstrating the weakness of the policy. Kinderman (2015) highlights the strong resistance from Germany, which is partly due to the size and importance attributed to German SMEs, as a powerful political force.

Although German companies and political representatives lobbied the Commission not to proceed with the disclosure requirements, the proposal was approved by an overwhelming majority of the members of the European Parliament in 2014, and the EU Council formally adopted the directive in the same year. However, the text was significantly weakened during the negotiations. The original proposal was to apply to companies with more than 500 employees, but the scope of the requirements was reduced to apply only to public interest entities with more than 500 employees, such as listed companies and financial institutions, and several proposal articles were also written in more flexible wording. For example, while the original proposal stated that non-financial information should be included in the company's annual report, the revised proposal allowed the information to be provided separately and up to six months after the annual report. The revision also includes a "safe harbour" clause that allows member states to omit the reporting of information in certain cases where it would be detrimental to the commercial position of the company (Kinderman, 2015).

In 2014, "Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups", usually referred to as NFRD, is issued, requiring certain large companies and groups that are public interest entities (such as listed companies, banks, insurance companies and other entities considered by national authorities to be public interest entities), with an average number of employees exceeding 500, to disclose non-financial and diversity information in their reports in 2018 (financial year 2017) (European Parliament and the Council of the European Union, 2014). The European Parliament recognises the crucial role of non-financial disclosure within the scope

of CSR in the EU (Agudelo et al., 2019). The NFRD has become a major political priority (Kinderman, 2015).

In 2015, the EU held a "Multi-stakeholder Forum on CSR" from which it emerged that the European Commission should continue to play an important role in promoting CSR, thereby helping to integrate social responsibility into business strategies (European Commission, 2015). Again, CSR is increasingly recognised as key in communicating what stakeholders expect from companies beyond making a profit and complying with the law. Various concepts, such as business ethics, corporate citizenship, stakeholder management, and sustainability shared value creation, are interrelated and overlapping terms that have been incorporated into CSR, which is at the heart of the socially conscious business movement. CSR has never been purely altruistic, rather, companies engage because they see a range of benefits for themselves and society (Carroll, 2015).

According to Rangan et al. (2015), the main purpose of CSR is to align a company's social and environmental activities with its goals and values. Ideally, this is done in order to mitigate risks, enhance reputation, and generate business results. However, results should be a consequence and not the reason for being.

In the same year, CSR Europe (2015) launched the "Manifesto Enterprise 2020". The aim was to set the course for business in Europe and take a leading role in the development of a sustainable economy. This "manifesto" is seen as a response to the EU CSR strategy, but also to the UN Sustainable Development Goals (Agudelo et al., 2019).

Change in Europe calls for all companies to adopt and strengthen environmental, social, ethical, and good governance strategies, with a focus on creating shared value (CSR Europe, 2015). In addition, according to Sheehy (2015), "an organisation that complies with and can point to standards has a much clearer path to follow and a stronger defence against unjustified accusations, and a body opposed to industrial practices can more clearly identify the standards and harms" (p. 643).

The 2030 Agenda for Sustainable Development "Transforming our world: the 2030 Agenda for Sustainable Development" has been adopted by the EU (UN, 2015). It is an action plan for people, Planet, and prosperity, recognising that eradicating poverty is the greatest global challenge and essential for sustainable development. It sets out the 17 Sustainable Development Goals (SDGs) and ambitious targets that balance the economic, social, and environmental dimensions of sustainable development:

End poverty in all its forms everywhere (Goal 1);
End hunger, achieve food security and improved nutrition and promote sustainable agriculture (Goal 2);
Ensure healthy lives and promote well-being for all at all ages (Goal 3);
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (Goal 4);

> Achieve gender equality and empower all women and girls (Goal 5);
> Ensure availability and sustainable management of water and sanitation for all (Goal 6);
> Ensure access to affordable, reliable, sustainable and modern energy for all (Goal 7);
> Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (Goal 8);
> Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (Goal 9);
> Reduce inequality within and among countries (Goal 10);
> Make cities and human settlements inclusive, safe, resilient and sustainable (Goal 11);
> Ensure sustainable consumption and production patterns (Goal 12);
> Take urgent action to combat climate change and its impacts (Goal 13);
> Conserve and sustainably use the oceans, seas and marine resources for sustainable development (Goal 14);
> Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (Goal 15);
> Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (Goal 16);
> Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development (Goal 17).
>
> (UN, 2015, p. 14)

According to the UNFCCC (2015), the Paris Agreement (an international climate change treaty established in 2015) covers climate change mitigation, adaptation, and finance. The Agreement was based on strengthening the global response to the threat of climate change in the context of sustainable development and poverty eradication efforts by: (i) keeping the global average temperature increase below 2°C above pre-industrial levels and seeking to limit the temperature increase to 1.5°C above that level; (ii) promoting adaptation to the adverse effects of climate change and promoting climate resilience and low greenhouse gas emission development; and (iii) promoting financial flows for low greenhouse gas emission and climate-resilient development (UNFCCC, 2015). It should be noted that the Paris Agreement to reduce global greenhouse gas emissions entered into force at the end of 2016 (Council of the European Union, 2023). Until then, 2016 was considered the warmest year since 1880 (NASA, 2017).

Also in 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD, 2017b) to help identify the information needed by investors, lenders, and insurance underwriters to assess and measure climate-related risks and opportunities. The objective was to develop voluntary and consistent climate-related financial disclosures to understand material risks that are useful to investors, lenders, and insurance underwriters (TCFD, 2017b).

In 2017, the TCFD published the final report, "Recommendations of the Task Force on Climate-Related Financial Disclosures", to help companies disclose climate-related financial information (TCFD, 2017b). Also in 2017, a Commission Communication presented the non-binding "Guidelines on non-financial reporting (methodology for reporting non-financial information)", aiming to help companies disclose

high-quality non-financial (environmental, social, and governance) information that is relevant, useful, consistent, and more comparable, to develop lasting and sustainable growth and jobs, and to provide transparency to stakeholders, under the requirements of Directive 2014/95/EU (European Commission, 2017).

In 2018, the "Action Plan: Financing Sustainable Growth" set out a comprehensive strategy to further link finance to sustainability, in particular by: redirecting capital flows towards a more sustainable economy; integrating sustainability into risk management; and introducing a "green backing factor" in EU prudential rules for banks and insurance companies (European Commission, 2018a). It notes that the financial sector supports the economy by financing economic activity, employment, and growth, and that environmental and social considerations are often not considered in investment decisions because these risks are likely to materialise over a longer time horizon. Sustainable finance "generally refers to the process of taking due account of environmental and social considerations in investment decision-making, leading to increased investments in longer-term and sustainable activities" (European Commission, 2018a, p. 2).

Also in 2018, the OECD (2018) published "Due Diligence Guidance for Responsible Business Conduct" based on the OECD Guidelines for Multinational Enterprises. Due diligence is a process to identify, prevent, mitigate, and account for how multinational companies manage these actual and potential adverse impacts (related to corporate governance, labour, human rights, the environment, bribery, and consumers) in their operations, supply chain, and business relationships.

In 2019, as a follow-up to the 2011 CSR Strategy, the European Commission published a document "Corporate Social Responsibility, Responsible Business Conduct, and Business & Human Rights: Overview of Progress", which provides an overview of the progress made by the Commission and the European External Action Service (EEAS) in implementing CSR/RBC and human and business rights (European Commission, 2019b).

The EU is proving to be at the forefront of international efforts to combat climate change (European Commission, 2018b). In 2019, under Directive 2014/95/EU, a new Commission Communication on "Guidelines on non-financial reporting: Supplement on reporting climate-related information" was published, which is non-binding and aims to help companies disclose non-financial information in a relevant, useful, consistent, and more comparable way. This is an additional supplement to the NFRD (2017) (European Commission, 2019c). These guidelines state that companies should read the TCFD's recommendations and, where appropriate, the additional guidance for the financial sector and for companies operating in the energy, transport, materials and buildings, and agriculture, food, and

forestry sectors contained in the document “Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures” (TCFD, 2017a).

At the same time, in 2019, two important regulations were issued.

“Regulation (EU) 2019/2088 of the European Parliament and of the Council on sustainability-related disclosures in the financial services sector*”,* known as the Sustainable Finance Disclosure Regulation (SFDR). This regulation imposes ESG disclosure requirements on asset managers and other financial market participants (European Parliament and the Council of the European Union, 2019b).

“Regulation 2019/2089 of the European Parliament and of the Council as regards EU Climate Transition Benchmarks, EU Paris-aligned benchmarks and sustainability-related disclosures for benchmarks” associated with EU climate transition benchmarks, EU Paris-aligned benchmarks (introduction of these new indices) and sustainability-related disclosures for benchmarks (sets out ESG disclosure requirements that apply to all investment benchmarks, except for currency and interest rate indices) (European Parliament and the Council of the European Union, 2019c).

“The European Green Deal” was published in 2019. It confirms the Commission's commitment to act and respond to climate and environmental challenges (European Commission, 2019e). It is a new growth strategy that aims for a fair and prosperous EU with a modern, resource-efficient, and competitive economy and no net greenhouse gas emissions (2050). The renewed sustainable financing strategy focus on (European Commission, 2019e): (i) strengthening the basis for sustainable investment (defining of a taxonomy to classify environmentally sustainable activities; the sustainability should be further integrated into the corporate governance frameworks, with a focus on long-term financial performance; and companies and financial institutions will need to increase their disclosure of climate and environmental data to report on the sustainability of their investments); (ii) increasing opportunities for investors and companies by facilitating the identification of sustainable investments and ensuring their credibility (e.g. labelling of investment products and standard for green bonds); and (iii) managing and integrating climate and environmental risks into the financial system (integration into the EU prudential framework; assessing the adequacy of existing capital requirements for green assets); examining how the financial system can contribute to increasing resilience to climate and environmental risks, in particular with respect to physical risks and damages from natural disasters).

Developments in the 2010s are summarised in Figure 2.6.

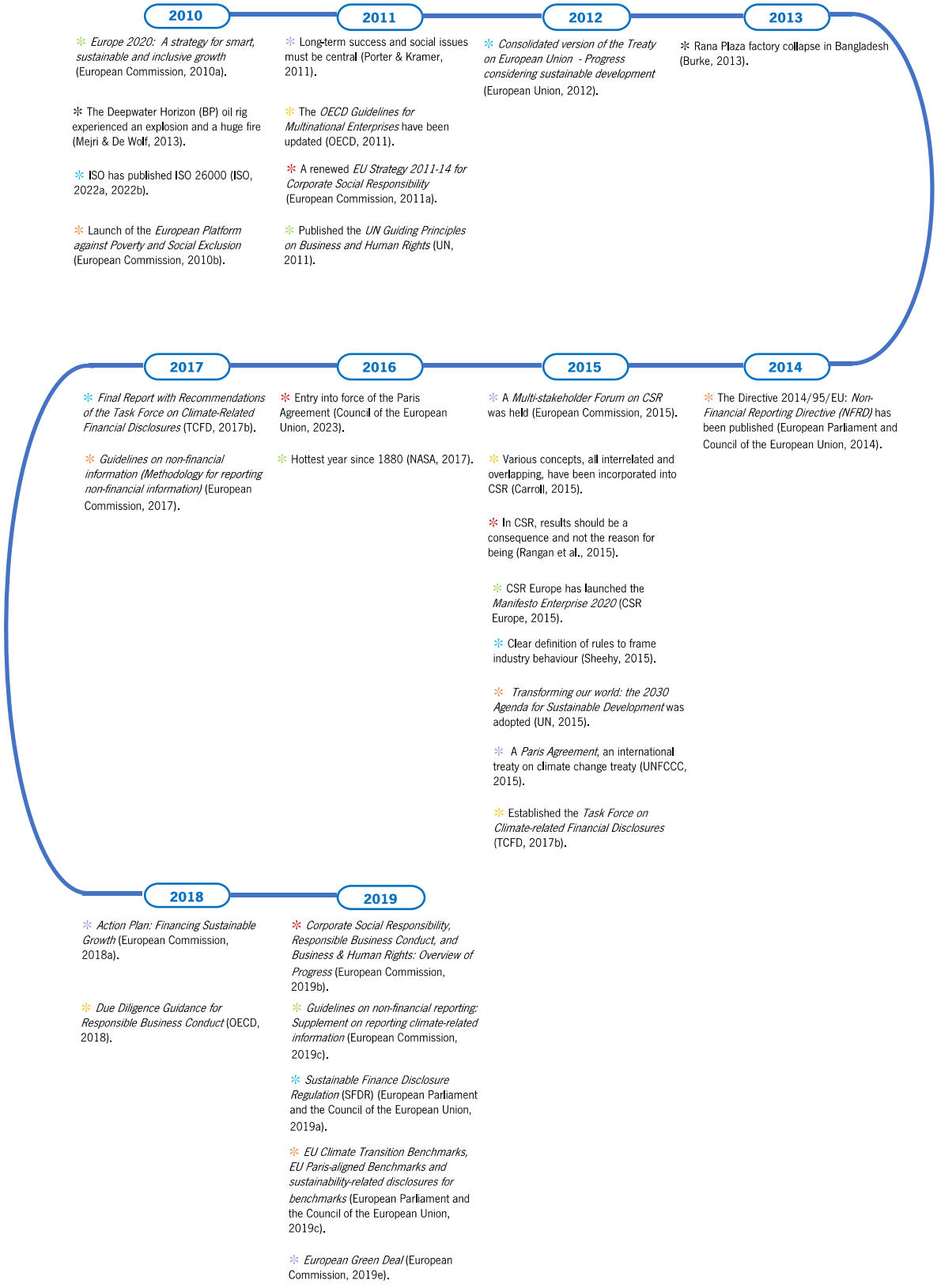

Figure 2.6 Highlights of the 2010s, a changing world.

2.1.7 The Climate Change Era (early 2020s)

The European Commission established a Technical Expert Group on Sustainable Finance (TEGSF, 2020) to develop recommendations on a number of issues, in particular, technical evaluation criteria for the taxonomy of climate change mitigation and adaptation targets. In 2020, the TEGSF published the report "Taxonomy: Final report of the Technical Expert Group on Sustainable Finance". It provides final recommendations to the European Commission for an EU classification system (taxonomy) that establishes selection criteria for economic activities that can make a significant contribution to climate change mitigation and adaptation. This document should be complemented by delegated acts with detailed technical assessment criteria for determining whether an economic activity can be considered sustainable and thus aligned with the taxonomy (TEGSF, 2020).

In 2020, Regulation (EU) 2020/852 (Taxonomy Regulation (TR)) of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 was published, which sets out the basis for the EU taxonomy. It presents the conditions that an economic activity must meet to be considered environmentally sustainable, in order to determine the degree to which an investment is environmentally sustainable (European Parliament and the Council of the European Union, 2020). The TR identifies six environmental objectives: (i) climate change mitigation; (ii) climate change adaptation; (iii) sustainable use and protection of water and marine resources; (iv) transition to a circular economy; (v) prevention and control of pollution; and (vi) protection and restoration of biodiversity and ecosystems.

The COVID-19 pandemic emerged at the end of 2020, highlighting the lack of corporate awareness of non-financial activities, particularly biodiversity, highlighting the need for companies to apply the circular economy for a sustainable business model and to report on biodiversity and extinction in an organised and mandatory way (Hassan et al., 2021).

In 2021, a "Proposal for a Directive of the European Parliament and the Council amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No. 537/2014 concerning corporate sustainability reporting", also known as the CSRD, was presented to create a consistent and coherent flow of sustainability information across the financial value chain. The document revises the sustainability reporting requirements set out in the NFRD to ensure that sustainability reporting requirements are more consistent with the broader legal framework for sustainable finance, including the SFDR and the Taxonomy Regulation, and linked to the objectives of the European Green Deal (European Commission, 2021e).

Also in 2021, the "Fit for 55" package was presented to achieve the objectives of the European Climate Change Act, i.e., climate neutrality by 2050 and a 55% reduction in net greenhouse gas emissions by 2030 (compared to 1990) (European Parliament and the Council of the European Union, 2021). It sets out interlinked proposals for the revision of existing EU climate and energy legislation and for new legislation to accelerate the reduction of emissions in the sectors covered (Erbach & Jensen, 2022).

Also, in 2021, it was published the

> Commission Delegated Regulation (EU) 2021/2139 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.
>
> (European Commission, 2021b)

And

> Commission Delegated Regulation (EU) 2021/2178 is also published, which "supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities, and specifying the methodology to comply with that disclosure obligation.
>
> (European Commission, 2021c)

specifying the content, presenting the information to be disclosed by companies on environmentally sustainable economic activities, and detailing the methodology for compliance (European Commission, 2021c).

"European Climate Law" was published in 2021, "setting out a framework for the irreversible and progressive reduction of anthropogenic greenhouse gas emissions by sources and enhancement of removals by sinks regulated in Union law" (European Parliament and the Council of the European Union, 2021, p. 8). This law: sets a binding target for climate neutrality in the Union by 2050; presents a framework for making progress towards the global adaptation target; and sets a binding Union target for net domestic greenhouse gas emission reductions for 2030 (European Parliament and the Council of the European Union, 2021). Of note was the "United Nations Climate Change Conference (COP26)" in Glasgow in 2021, an event seen by many as "the world's best last chance to get runaway climate change under control" (UK COP26 Presidency, 2021b).

In parallel with the CSRD proposal came the European Sustainability Reporting Standards (ESRS). They were developed by the European Financial Reporting Advisory Group (EFRAG) to define the CSRD rules and outline the structure and disclosure requirements for covered companies, banks, and insurers (EFRAG, 2023). In November 2022, the EFRAG Board endorsed and submitted the first set of European Sustainability Reporting Standards (ESRS) to the European Commission, as part of the development of sustainability reporting under the CSRD (EFRAG, 2022b).

At the end of 2022, COP27 was held, and its decisions called for all countries to make additional efforts to immediately address the climate crisis (UNFCCC, 2022). Clearly, "the world is facing a critical point for global climate action", urging unprecedented co-operation across society and the economy (p. 1).

The CSRD was published in December 2022 and represents a breakthrough in the rules on the social and environmental information that companies have to disclose. The first companies would apply in the 2024 financial year, for reports published in 2025 (European Commission, 2022d).

In early 2023, the International Sustainability Standards Board (ISSB), a standard-setting body under the International Financial Reporting Standards (IFRS) Foundation, published IFRS S1 - General Requirements for Disclosure of Sustainability-related Financial Information (ISSB, 2023a) and IFRS S2 - Climate-related Disclosures (ISSB, 2023b). The former comprises the general requirements for an entity to disclose sustainability-related financial information about its sustainability-related risks and opportunities (ISSB, 2023a), and the latter comprises and builds on the recommendations of the TCFD and incorporates industry-specific disclosure requirements derived from Sustainability Accounting Standards Board (SASB) standards (ISSB, 2023b). They require an entity to disclose information about all material sustainability and climate-related risks and opportunities "that could reasonably be expected to affect the entity's cash flows, its access to financing or cost of capital over the short, medium, or long term" (ISSB, 2023a, p. 5).

In June 2023, Delegated Regulation (EU) 2023/2486 was published, complementing the EU Taxonomy by establishing technical screening criteria to identify economic activities that contribute substantially to four environmental objectives: sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems. These criteria help ensure that activities are environmentally sustainable and do not harm the other objectives of the taxonomy (European Commission, 2023c).

In July 2023, Delegated Regulation 2023/2772 published the ESRS, which aims to specify the sustainability information to be disclosed (European Commission, 2023d), which would be applicable from January 2024.

In October of that same year, Delegated Directive (EU) 2023/2775 adjusted the company size criteria for sustainability reporting purposes, directly impacting the scope of the CSRD (European Commission, 2023b).

The CSRD came into force in January 2024, requiring companies previously covered by the NFRD to start reporting under the new ESRS (European Commission, 2022d). By the end of 2024, the CSRD had not yet been transposed in Portugal (Comissão do Mercado de Valores Mobiliários, 2024).

In June 2024, the "Corporate Sustainability Due Diligence Directive (CSDDD or CS3D)" was adopted, establishing a legal framework that requires companies to identify, prevent, mitigate, and account for adverse human rights and environmental impacts in their operations and value chains, supported by appropriate governance, risk management systems, and action plans (European Parliament and the Council of the European Union, 2024b).

At the value chain level, in December 2024, the Commission adopted a voluntary reporting standard based on EFRAG's *Voluntary Sustainability Reporting Standards for non-listed SMEs* (VSME) targeting entities with fewer than 1,000 employees (EFRAG, 2024; European Commission, 2025g). This standard serves as a safeguard to limit the reporting requirements imposed by entities and banks subject to the CSRD (European Commission, 2025f, 2025g). Although not within the scope of the CSRD, other companies may still choose to report using the VSME. This standard acts as a protective measure, restricting the extent of information that CSRD-covered companies or banks can request from smaller entities in their value chain (EFRAG, 2024; European Commission, 2025f, 2025g). In July 2025, the European Commission adopted an official recommendation encouraging the use of the VSME by SMEs (European Commission, 2025d, 2025c).

According to the Copernicus Climate Change Service (2025), 2024 will be remembered as the warmest year ever recorded globally. It also represents the first occasion on which the average global temperature exceeded 1.5°C above pre-industrial levels – a critical and concerning milestone for the stability of the planet's climate.

In February 2025, the European Commission introduced the "Omnibus" package of proposals aimed at simplifying sustainability-related legislation, enhancing competitiveness, and unlocking investment potential (European Commission, 2025e). The package encompasses several interlinked regulatory domains, including sustainable financial reporting, sustainability due diligence, the EU Taxonomy (European Commission, 2025a), the Carbon Border Adjustment Mechanism (CBAM), and European investment programmes (European Commission, 2025e). These measures are intended to reduce regulatory complexity, particularly for SMEs and mid-cap companies, while concentrating obligations on larger undertakings.

In response to the CSRD, a "stop-the-clock" proposal was advanced to defer the implementation of reporting requirements by two years for large companies yet to begin reporting, as well as for listed SMEs. The initiative also seeks to revise the scope of the Directive, redefine value chain boundaries, remove the requirement for reasonable assurance, and update the ESRS (European Commission, 2025g, 2025f).

The revised scope will apply solely to large companies with over 1,000 employees, annual turnover exceeding € 50 million, or total assets above €25 million (European Commission, 2025f). At the value chain level, the Commission will introduce a voluntary reporting standard based on EFRAG's VSME framework for non-listed SMEs with fewer than 1,000 employees (European Commission, 2025f, 2025g). This standard is designed to shield smaller entities from excessive data requests by companies and banks subject to the CSRD, although its use remains optional for those outside the Directive's scope (EFRAG, 2024; European Commission, 2025f, 2025g). In July 2025, the European Commission issued a recommendation on a voluntary sustainability reporting standard for SMEs (European Commission, 2025a).

Further simplifications include the removal of sector-specific standards and the elimination of the transition to reasonable assurance. The ESRS will be amended to reduce the volume of mandatory disclosures, clarify ambiguous provisions, and improve alignment with other EU instruments such as the CSDDD and Carbon Border Adjustment Mechanism (CBAM) (European Commission, 2025f, 2025g). Nonetheless, core elements of the ESRS remain intact, notably the requirement for companies to assess impacts, risks, and opportunities through a dual materiality lens (European Commission, 2025g).

The European Commission adopted a "quick-fix" delegated act revising the initial set of ESRS to provide greater reporting flexibility for companies subject to the first phase of CSRD implementation. This revision ensures that, for the financial years 2025 and 2026, these entities are not required to disclose more information than was mandated for the 2024 reporting period (European Commission, 2025b).

Highlights from early 2020, with a focus on climate change, are shown in Figure 2.7.

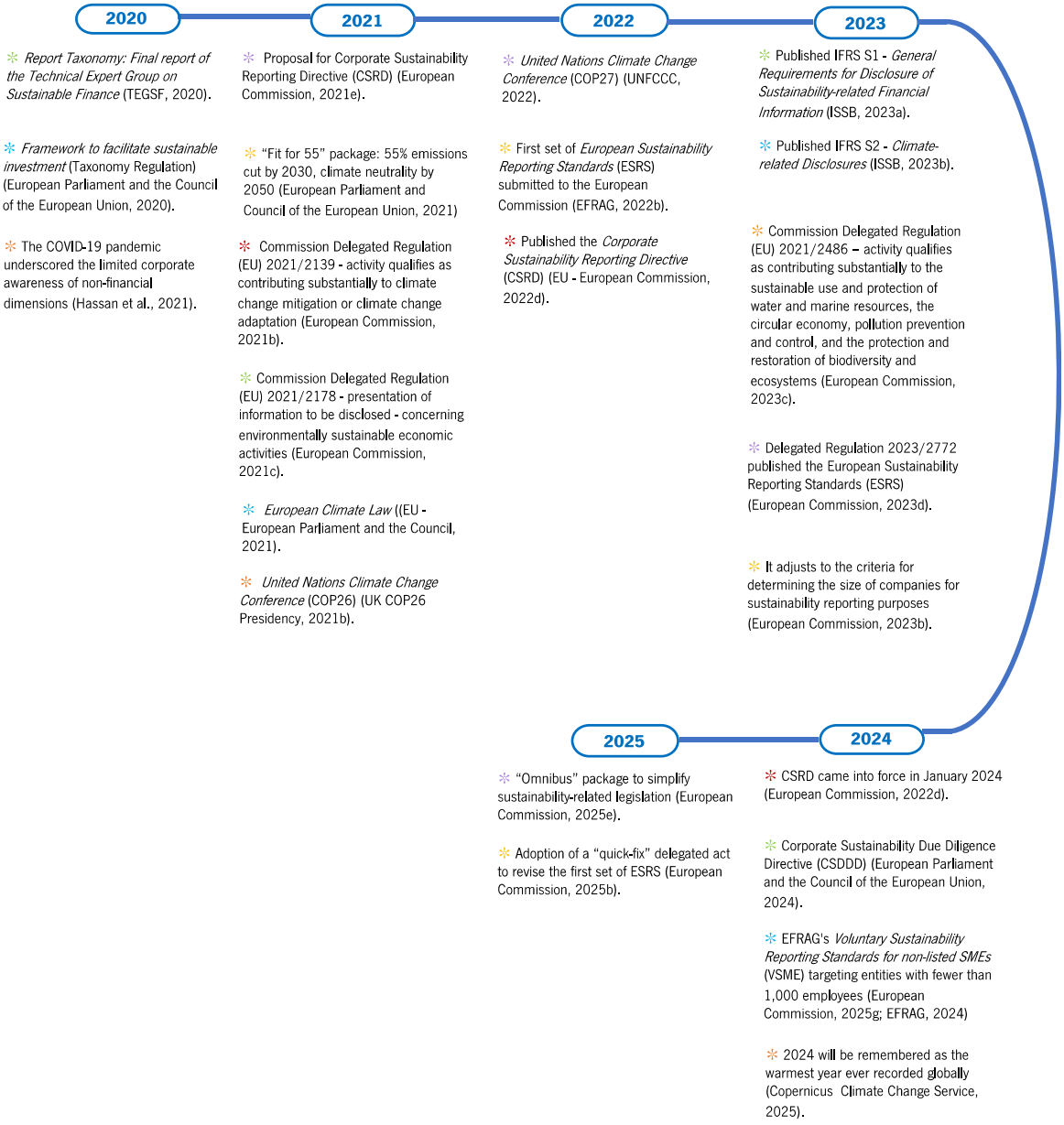

Figure 2.7 Highlights from the early 2020s, with a focus on climate change.

2.2 DISCLOSURE: THE SEARCH FOR STANDARDISATION

According to Buhr (2017), the beginning of social, environmental, and sustainability reporting is largely associated with the emergence of the modern organisation. Accountants have sought to capture the economic world by developing different forms of financial and management accounting, but it was only in the last century, with the need for corporate financing, that accounting standards for financial reporting emerged. The standardisation of accounting, reporting, and sustainability has followed a slow process that is not more than a hundred years old, starting with employee reporting, then social reporting, environmental reporting, triple bottom line reporting, and now sustainability reporting (Buhr, 2017).

There is a growing awareness that CSR reporting is not just about being a good citizen, but also about driving innovation, learning, business development and adding value to the business. This outreach is about remaining competitive in a social context and recognising CSR activities' impact and benefits, such as cost savings and new business opportunities (KPMG, 2011). It therefore goes well beyond an obligation to society and is seen as an imperative for companies to demonstrate that it adds financial value (direct cost savings and/or enhanced reputation in the marketplace) and drives innovation. CSR reporting has undergone an evolutionary process, with improvements in data collection, methodologies, definitions and inclusions. The objective is to improve reporting standards, as inaccurate data reduces credibility and increases reputational risks that can affect management's perception and innovation (KPMG, 2011).

Furthermore, the discussion of voluntary versus mandatory reporting arises, and according to Buhr (2017, p. 63), "not been well explored is the idea of voluntary and mandatory being different shades of a rainbow instead of black or white possibilities". Buhr (2017) notes that voluntary reporting is insufficient, and mandatory reporting is not necessarily the solution. Sustainability reporting should not be considered a solution for saving the Earth; rather, it should be seen as evidence of societal change, our ability to collaborate, and the individual roles we play. Society's commitment to seeking change and driving social change is crucial for accountability in the pursuit of sustainability and sustainability reporting (Buhr, 2017).

Europe has experimented with CSR reports or non-financial reports. Denmark, Netherlands, Norway, and Sweden (1995-1999) adopted legislation requiring certain companies to disclose annual information on their environmental performance; France, in 2001 passed article 116 of the *Nouvelles Regulations Economiques* which required companies to report on their environmental and social impacts; the United Kingdom (UK), in 2005 required companies to include information on their

environmental and social performance in their annual report (Hess, 2007). In Germany, there were no specific regulations on environmental reporting. However, the “Deutche Institut Fur Normierung” (National Institute for Standardisation) issued a memorandum in 1997 entitled "Leitfaden für Umweltberichte" (Guidelines for Environmental Reporting to the Public), which defined the minimum amount of information that should be included in environmental reports (Barbu et al., 2014).

More recently, with the adoption of the NFRD, the concept of non-financial reporting has become mandatory in most European countries (Vukić et al., 2017).

Notably, some CSR reporting has been combined with financial reporting and is a step forward in understanding the overall impact of corporate responsibility on the business, providing value to both internal management and external stakeholders (KPMG, 2011). However, sustainability reporting faces the challenge of establishing standards for sustainability information that are as rigorous as those for financial information and that allow performance to be compared across companies and over time (Eccles et al., 2012). The ability to make comparisons is key to incorporating sustainability performance information into financial models and can transform them into more robust business models (Eccles et al., 2012). Like traditional financial reporting, it monitors and controls corporate behaviour (Dierkes & Antal, 1986).

2.2.1 Understanding the Reporting and the claim for Standardisation

Sustainable development embraces environmental, social, and economic policies as a whole and considers their long-term impact on the Planet and people (Egan et al., 2003).

Gokten et al. (2020) state that history allows us to understand the reasons behind the development of sustainability reporting, which is one of the most important developments in accounting. It confirms that sustainability reporting has led accounting to cover a wide area, rather than focusing only on financial information, as stakeholders demand information about the environmental and social impacts of companies’ activities. According to these authors, the history of the development of sustainability reporting can be divided into three periods: the pre-standardisation period (1962 and 1998), the standardisation (institutionalisation) period (1999 and 2016), and the post-standardisation period (after 2016) as follows (Gokten et al., 2020).

2.2.1.1 Pre-standard Period

In the pre-standard period (1962-1998), Gokten et al. (2020) defined three sub-periods:

- The root period (1962-1979) was a period of events that created awareness of environmental issues. The years covered by the root period can be seen as the first years of the process that led to sustainability reporting;
- Period of theoretical preparation (1980-1988), with the development of theoretical approaches to solving environmental problems (economic and natural);
- Emergence period (1989-1998), when the main frameworks for communicating the environmental impacts of activities emerged.

In the Roots period (1962-1979), the 1960s and 1970s were marked by attention to the relationship between business and society, the need for awareness of the social impact of business activities, and reorganisation of the concept of corporate interests and responsibilities, which led to the search for ways to develop information systems such as reporting, social performance indicators, and evaluation criteria (Dierkes & Antal, 1986). The aim was to develop internal management information and ways of communicating aspects of corporate social responsibility, and interest in such experiences and new ideas grew during this period. Dierkes and Antal (1986) note that the voluntary adoption of corporate social information has served as a starting point for development, but would be useless if it had no real impact on behaviour.

Companies can influence business decisions by collecting and publishing information about their social impacts, so social reporting functions similarly to financial reporting, which enables the monitoring and control of corporate behaviour (Dierkes & Antal, 1986). Dierkes and Antal (1986) have mentioned the need to develop social reporting guidelines to define the overall scope of the report and the general guidelines to be followed.

In 1976, Epstein et al. (1976) noted that over the previous five years, attempts had been made to develop operational frameworks for implementing and institutionalising corporate social accounting, resulting in a wide variety of measurement models and reporting frameworks.

From 1969 to 1978, large companies significantly increased their voluntary disclosure of social information (Shane & Spicer, 1983) and disclosed more about the environment, energy, and products, as did companies in the primary and secondary sectors (more information on the environment and energy) and disclosed more than in the tertiary sector (more information on community involvement) (Kelly, 1981). The 1960s and 1970s saw the emergence of a new awareness of the range of positive and negative social impacts of business activities and a redefinition of corporate responsibilities and interests (Dierkes & Antal, 1986).

Since the 1970s, the extent of CSR disclosure has increased significantly, and the relationship between legitimacy factors and differences in CSR disclosure has remained largely unchanged over time (Cho et al., 2015). The theoretical preparation period (1980-1988) shows the need for sustainability reporting, based on the principle of sustainable development (Gokten et al., 2020).

In the early 1980s, the changes were accompanied by a loss of momentum: companies that had pioneered the concept of social reporting continued to be involved, but few others joined in (except in countries where there were legal requirements for social reporting), and methodological progress was slow. Benston (1982a) pointed out that accounting had taken hundreds of years to develop, so social responsibility accounting would take time. The study also showed that the problems of measuring externalities put the solution beyond the reach of accounting, but that accountants could help to estimate the costs and benefits. Therefore, accounting standards could not play a useful role in social responsibility because the necessary measurements could not be made (Benston, 1982b).

According to Dierkes (1985), the evaluation of social reporting approaches raises questions about the methodology of measuring and reporting social impacts, whether the information published is useful, whether it is used internally by management and externally by stakeholders, whether its use actually changes behaviour, and whether social reporting is an effective way of achieving social responsiveness.

Voluntary adoption of social reporting has been a starting point and the main source of development, but only a few companies have participated. There is no guarantee of the validity of the data, and the information is based on perceived management interests and requirements (Dierkes & Antal, 1986). Dierkes and Antal (1986) notes that mandatory social reporting could be a way of ensuring widespread practice and standardisation, but points to the French case where mandatory reporting existed. However, the details of the law defining the requirement and the specific indicators to be covered prevented the integration of methodological advances over time. The way to minimise this situation would be to outline a prerequisite for social reporting that would determine the overall scope of the report and define the guidelines to be followed (Dierkes & Antal, 1986).

In the emergency period (1989-1998), the concept of environmental accounting emerged (Gokten et al., 2020) as the methodological basis for the idea of sustainability reporting was the concept of environmental accounting (Elkington, 1993). Some companies produce environmental performance reports as a result of regulations, new business requirements, or changing public expectations. The accountancy profession recognises that industry's environmental liabilities are likely to increase significantly and is beginning to consider how companies should reflect these liabilities in their annual reports and accounts. According to Elkington (1993, p. 42), “corporate environmental reporting

provides an excellent means of ensuring that a company is in touch with - and responding to - the evolving needs of the main environmental stakeholders".

During this period, environmental reporting, which discloses the impact of activities on the environment to stakeholders, gained importance with the Exxon Valdez accident (1989), mainly for investors. Sustainability reporting was developed (early 1990s) as part of environmental accounting, and reporting focused on the environmental impacts of companies' activities (Gokten et al., 2020).

In the 1990s, a new stakeholder reporting methodology based on the principle of sustainable development was initiated due to the growing need for non-financial information. Studies began to develop a conceptual framework for how the environmental impacts of companies' activities should be disclosed, in particular to monitor whether companies' activities are in line with the CERES Principles (Gokten et al., 2020).

The 1990s also saw an increase in the number of companies publishing such sustainability reports, a voluntary business activity, especially when viewed against the background of an earlier, short-lived wave of social reporting and accounting in the 1970s, and discussions about the reliability of disclosure and auditing (Kolk, 2004a, 2004b).

As documented by Gray (1997), social and environmental information has tended to be scattered throughout the companies' annual reports. In sectors plagued by environmental disasters, most companies have started to report in order to avoid the negative stakeholder perception that they have something to hide, even though these companies themselves may have nothing to do with any specific environmental incident (Cerin, 2002). Therefore, through environmental reporting, companies protect and enhance their material asset of legitimacy. Environmental reports had few emission performance indicators or quantifiable targets, and it is noteworthy that the rapid increase was mainly in the largest companies. Most companies did not follow any particular disclosure practice, resulting in a wide variety of report content (Cerin, 2002).

There was also a gap between what companies wrote in their environmental reports, what they disclosed in their annual reports, and what they actually did, leading to difficulties in the comparability and credibility of environmental reporting (Cerin, 2002). Several organisations tried to influence how and what was reported, rather than improving the situation that should be working together towards a common goal. Environmental reporting was seen as a marketing tool rather than an accounting innovation (Cerin, 2002).

2.2.1.2 Standardisation Period

The standardisation period (1999-2016) includes events that focused on the development of sustainability reporting institutions (Gokten et al., 2020). The Global Reporting Initiative (GRI) stands out in this period, and it has been recognised that sustainability reporting requires specific knowledge and experience, and the learning and implementation gaps necessary for sustainability reporting have been closed (Gokten et al., 2020).

Between 1999 and 2002, the number of companies producing sustainability reports increased, and it is now common practice for large companies to do so, with an increasing number of reports being externally verified (Kolk et al., 2002). Questions have been raised about the reliability of disclosure and verification, as scandals (at Enron and Ahold) that have cast doubt on efforts at environmental, social, and ethical accountability and on whether these reports reflect business practice (Kolk, 2004b). This period saw an increase in reporting on environmental and social policies and/or performance, mainly by industrial sectors and multinational companies (Kolk, 2003). With the standardisation of sustainability reporting, mainly through the GRI, government regulation, and encouragement, social and environmental dimension reporting began to increase in quantity and quality (Kolk, 2003).

Kolk (2004b) found that disclosure had moved more towards environmental than social issues, and that some reports were mere statements of policy and intent, referring to vague standards, without much substance, and without details of commitments.

In another study, (Kolk, 2005) found that the most active companies in sustainability reporting were the most polluting industrial companies, and that the financial sector had grown the fastest (more in Europe than in the USA) due to the need to consider the environmental, social and economic dimensions of their activities (climate-related risks and opportunities, microcredit, project financing, sustainable asset management). A clear "change of mentality" had emerged, very much focused on the self-footprint, recognising the need to pay attention to their products, but also to the environmental, social, and economic impacts of their activities (Kolk, 2005).

An international survey conducted in 2005 by Pleon (2005) found that CSR reports are mainly aimed at shareholders and investors and that the financial community does not find them useful. It also found that the main reason for reporting was to protect or enhance reputation. Regulation of these reports was perceived by stakeholders as having more advantages than disadvantages, and external verification was seen as evidence of credibility (Pleon, 2005).

Sweeney and Coughlan (2008) found a significant difference in how organisations in different industries approached CSR. Companies appeared to report on CSR according to the expectations of their key

stakeholders, demonstrating that CSR reporting was a marketing tool (Gautam & Singh, 2010; Sweeney & Coughlan, 2008).

Chiu (2010) notes that CSR reports are narrative and not amenable to evaluation by objective standards such as accounting, and are criticised for being incomparable, vague, and subjective.

With the focus on sustainable companies, reporting by Multinational Corporations (MNCs) has become quite common, with differences between sectors (Kolk, 2010). The difficulty of collecting data and selecting performance indicators, as well as the additional cost and effort involved, was evident. On the other hand, companies may have been reluctant to provide certain information that may be sensitive for competitive reasons or because of potential legal implications (Kolk, 2010).

According to Ioannou and Serafeim (2011), mandatory sustainability reporting has had a positive impact on socially responsible management practices: increased CSR, sustainable development, employee training, more effective supervision of managers by boards of directors, increased implementation of ethical practices, reduced bribery and corruption, and improved management credibility in society. Sustainability reporting and increased transparency could change corporate behaviour, the way business is conducted and even the economic value created by a company (Ioannou & Serafeim, 2011).

The benefits and pressures associated with social and environmental reporting could be business efficiency, market factors, reputation, stakeholder management, internal advocates, and mimetic motivations (Herzig & Schaltegger, 2011). Disclosure of non-financial activities demonstrates a commitment to addressing social issues and could serve as a basis for the strengthening of ongoing good relations with the company's stakeholders (Herzig & Schaltegger, 2011).

According to Herzig and Schaltegger (2011), by 2011, several national and international bodies had published guidelines (non-binding guidelines issued by a governmental or non-governmental organisation), standards (developed by standardisation organisations and are the daily basis for certification procedures), regulations (issued by associations and ministries and with a binding character) or sets of criteria to harmonise sustainability reporting and provide management guidance on reporting. The GRI guidelines have been the most widely accepted and universally applied sustainability reporting framework, but other organisations, such as the WBCSD (2002) and ISO (2006), have also developed international guidelines and standards (Herzig & Schaltegger, 2011).

The history of corporate sustainability reporting and the development of approaches to evolve sustainability reporting show that sustainability disclosure results in a dynamic corporate response to different societal challenges, information needs, and expectations of different stakeholders (Herzig &

Schaltegger, 2011). Guidelines, standards, ratings, as well as auditing and verification processes should be intended to support proper sustainability reporting, but for their effectiveness, the methodical linking of business strategy, information management, and the reporting activities from an outside-in and inside-out perspective was crucial (Herzig & Schaltegger, 2011).

Explaining how to identify, analyse and manage the business issues was the most relevant for contributing to sustainable development, business strategy, responding to external expectations, and reporting on these issues, at the risk of being seen as greenwashing or a mere public relations exercise aimed solely at enhancing reputation (Herzig & Schaltegger, 2011).

Khan et al. (2012) found a positive relationship between CSR and financial performance, which could improve the relationship between the company and investors and, therefore, in both investment decisions.

According to Eccles et al. (2012), there has been a significant increase in sustainability disclosure over the past decade, but companies still do not disclose comparable material information.

If CSR reports influence the decisions and actions of different stakeholder groups, then stakeholder demands and expectations will influence these reports (Freundlieb & Teuteberg, 2013). As Tschopp and Nastanski (2013) point out, if CSR reporting is to be used as a market-based mechanism to bring about change, its comparability and consistency are crucial.

Reporting is a key aspect of corporate sustainability activities. The number of companies publishing CSR/sustainability reports has increased, and the lack of comparability, mainly due to the multiplicity of reporting guidelines, has been highlighted (Albu et al., 2013).

According to Albu et al. (2013), a single standard for CSR reporting would not significantly improve disclosure practices. They believed that in case of convergence, it would also reduce the level of comparability as several factors influence disclosure practices (legitimacy strategies, cost-benefit of disclosure, stakeholder expectations, level of law enforcement, among others). Standardisation would serve several disclosure objectives, but comparability would not be an objective from the perspective of companies that use standards and reporting to communicate, attract resources, or meet stakeholder expectations. Therefore, a single set of reporting guidelines would not achieve comparability but would allow the macro level to reorganise its influence (Albu et al., 2013).

According to Tschopp and Huefner (2015), CSR reporting may not follow the same path as the evolution of financial reporting due to the different stakeholders involved. Financial reporting has evolved into a comparable and reliable market-based resource, but CSR reporting is still in its infancy

(Tschopp & Huefner, 2015). In 2015, some leading companies tried to innovate and move towards integrated reporting with sustainability and financial reporting (Carroll, 2015).

2.2.1.3 Current Considerations

Financial reports provide stakeholders with information on a company's financial position, results of operations and cash flows, which is necessary for decision-making, but insufficient since stakeholders are increasingly demanding more information on environmental, social, and economic impacts (Gokten et al., 2020).

Financial reporting and CSR reporting are subject to global constraints and increasing demand for comparability and accountability (Rupley et al., 2017; Sengur, 2020).

According to Christensen et al. (2018), CSR standards are not limited only to investors, as a wide range of stakeholders have emerged. Therefore, it is conceptually difficult to distinguish information relevant to investors from information relevant to other stakeholders. Moreover, investors are interested in companies' CSR activities and policies for non-monetary reasons, which expands the set of CSR issues relevant to investors' decisions and makes it difficult to define the scope of CSR standards (Christensen et al., 2018).

To implement an effective CSR disclosure mandate, companies need to consider the CSR standard-setting process, the materiality of disclosures, the use of standard language, and the enforcement or assurance of CSR reporting (Christensen et al., 2019). The objective of using CSR standards is to help reduce the use of traditional language by defining what and how companies provide information, through the use of specific metrics with quantitative disclosures, among other methods. However, specificity also limits the ability to communicate private information about the company, and if the standards are at the sectoral level, they will reduce comparability across sectors. Enforcement of standards plays an essential role for CSR disclosure to have a significant economic impact and requires significant investment in infrastructure and human expertise (Christensen et al., 2019).

According to Hassan et al. (2021), since nature is made up of both human and non-human elements, companies should improve the quality of their reporting by considering non-human elements in their reporting and making it more comprehensive for stakeholders. For example, the adoption and implementation of the circular economy can increase the stakeholder credibility and trust, create short, medium and long-term value for the company, reduce the impact of organisations on the Planet, biodiversity loss and extinction, and support a sustainable global future. The study suggests that a well-

executed allocation of capital between financial and non-human activities can reduce the likelihood of systematic risk in the economy (Hassan et al., 2021).

In 2021, EFRAG published "Interconnection between financial and non-financial information", which states that the interconnection between financial and non-financial information is fundamental to the quality of financial reporting and is operationally challenging (EFRAG, 2021b).

The Covid-19 pandemic has engulfed and strangled the world, creating economic, social, technological and political shockwaves, a kind of tsunami that has created a new normal, and priorities may have measurably changed for the future (Carroll, 2021). In a new environment of transparency, CSR reporting, now typically sustainability reporting, will expand and become more sophisticated due to stakeholder demands and more forward-looking CSR leadership (Carroll, 2021).

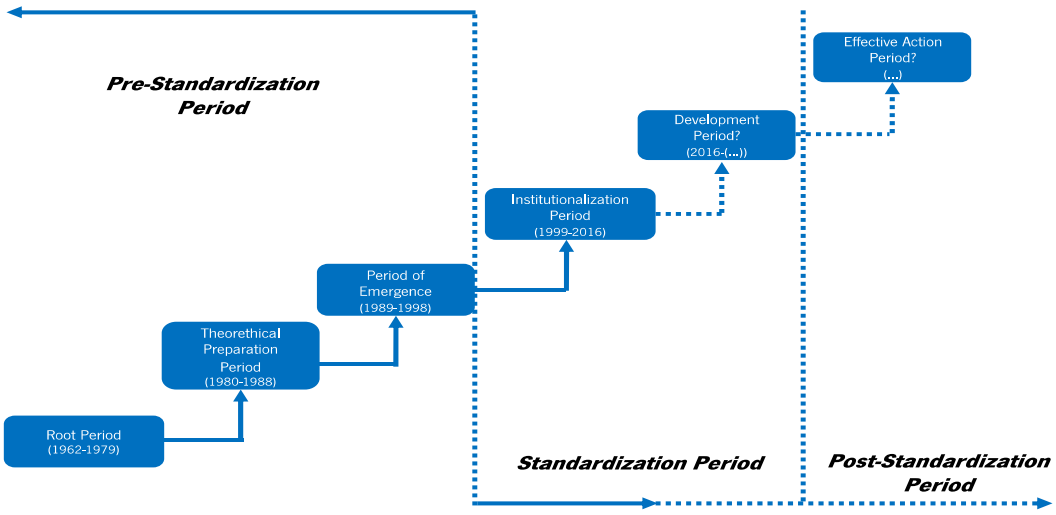

Figure 2.8 Periods in the historical development of sustainability reporting (adapted from Gokten et al.(2020, p. 102)).

The observed timeline was adapted from Gokten's matrix, with two additional periods added (see Fig. 2.8): “Development Period” with changing regulations (such as the NFRD and the CSRD) and another future “Effective Action Period” that will respond to society's expectation of effective action, namely with highly demanding and well-defined regulations that impose a wider range of actions on organisations. What leads us to look at these present and future periods is the demonstrated need and urgency to continue to develop and improve the regulations, making them more understandable, clear, workable, comparable and increasingly applicable to a wider range of organisations.

2.2.2 Disclosure Standards and Frameworks

Sustainability reports are used by a wide range of stakeholders for decision-making, and over the years, various organisations/commissions have evolved to address these different information needs, based on disclosure standards and frameworks as their foundation. The aim is to promote the disclosure of comparable, consistent, and reliable information (SASB, 2022c).

It is interesting to understand the difference between sustainability frameworks and sustainability standards: frameworks provide principle-based guidance on how to structure and prepare information and indicate the broad topics covered ("how" a report is structured), while sustainability standards provide specific, detailed, replicable requirements on what should be reported for each topic and also metrics (requirements on "what" should be reported) (SASB, 2022c).

2.2.2.1. Disclosure Standards and Frameworks before the NFRD

This section will examine some of the disclosure frameworks and standards that have emerged at an international level since the late 1990s, before the publication of Directive 2014/95/EU (Fig. 2.9).

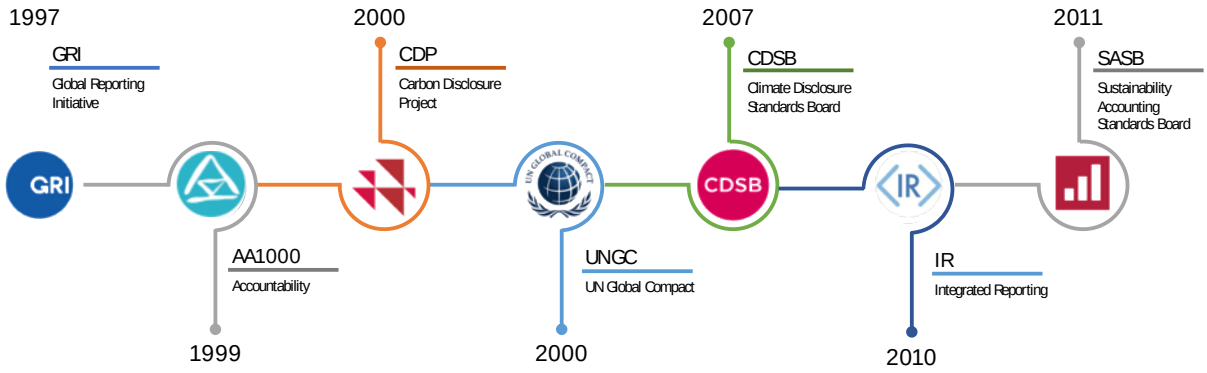

Figure 2.9 Relevant milestones in standards and disclosure frameworks from 1997 to 2011 (adapted from International Finance Corporation (IFC 2023, p. 2)).

2.2.2.1.1. Global Reporting Initiative (GRI)

Examining the relevant milestones in disclosure standards and frameworks over the period 1997-2011 (Fig. 2.9), we observe that it goes back to the 1990s, spurred by the environmental damage caused by the Exxon Valdez oil spill in 1989, and the work began on a "universal environmental reporting framework" to create a global accountability mechanism (GRI, 2022). The GRI emerged as a flexible framework for disclosing information, and the GRI Standards are designed to enable organisations to report comprehensively on their impacts on sustainable development (GRI, 2020). Founded in 1997,

the GRI expanded beyond environmental issues to include social, economic, and governance issues, with the first "GRI Guidelines" published in 1999 (GRI, 2022).

In 2008, KPMG (2008) found that the majority of companies were using the GRI Guidelines as a leading standard for reporting. KPMG also noted an increase in the number of companies obtaining external assurance, demonstrating the value of external assurance.

In the initial steps, the GRI Guidelines evolved into G2 in 2002, G3 in 2006, and G4 in 2013. In 2016, GRI launched the GRI Sustainability Reporting Standards, which were internationally recognised and regularly updated (GRI, 2022). In 2017, GRI and the UN Global Compact launched several SDGs reporting resources, making GRI reporting a central reference point for the business implications of the SDGs (GRI, 2022).

In 2021, a major revision of the Universal Standards took place, strengthening the foundations of GRI reporting and making GRI the first and only organisation to establish reporting standards that reflect due diligence expectations on sustainability impacts, including on human rights, as set out in UN and OECD intergovernmental instruments (GRI, 2022).

GRI has developed a set of performance indicators - environmental, social and economic, and integrated disclosures on what data should be covered in sustainability reports, including the interest in presenting standardised data (Kolk, 2004b). The GRI reporting framework is the most widely used by companies (Carroll, 2015; Larrinaga & Bebbington, 2021). In July 2022, GRI announced its role as co-constructor of the EU Sustainability Reporting Standards, which were at that time under development by EFRAG (Climate Disclosure Standards Board (CDSB, 2022c). The GRI is expected to be a global leader in setting standards for sustainability reporting, focusing on the information needs of different stakeholders and on the compatibility between the GRI Standards and the disclosure standards developed by the ISSB, with an emphasis on meeting the needs of investors (CDSB, 2022c). According to Villiers (2022), the GRI has had a dominant position in setting standards for sustainability reporting with regard to information on impacts on society and the natural environment, and is one of the most widely recognised standard-setting bodies for sustainability reporting.

2.2.2.1.2. AccountAbility

Since 1995, a global sustainability standards and consulting firm, AccountAbility (2018) has collaborated with a diverse range of entities (including companies, governments, and multilateral organisations) to integrate ethical, environmental, social, and governance responsibility into their core operations. Later, AccountAbility promoted a set of standards based on the principles of inclusiveness,

materiality, responsiveness, and impact (the stakeholder-driven AA1000 series standards) and developed strategies for companies to identify and respond to specific stakeholder needs (Tschopp & Nastanski, 2013).

The AA1000 “Framework Standard” was published in 1999, and it had been designed to strengthen the quality of professional accountability standards, in order to serve as an independent system for guiding, managing and communicating accountability and social and ethical performance (AccountAbility, 2018). In 2003, the AA1000 “Assurance Standard” was published as the world's first sustainability assurance standard, followed by a second edition in 2008 with revisions and improvements (AccountAbility, 2018). In 2005, the AA1000SES “Stakeholder Engagement Standard” emerged as the first internationally recognised standard for stakeholder engagement, and the standard was improved in 2015. In 2018, following stakeholder feedback, the AA1000 "AccountAbility Principles Standard" was submitted, which takes the form of an overarching framework and guidance mechanism for principles-based sustainability management and reporting (with the addition of the Impact Principle) (AccountAbility, 2018).

A revised version of the AA1000 "Assurance Standard" was published in 2019, focusing on organisations' adherence to the "Principles of Accountability", the commitment to sustainability assurance through mandatory licensing (AccountAbility, 2018). The revised 2020 “Assurance Standard” aims to optimise its relevance, usability and applicability, and it was developed through an extensive multi-stakeholder process (AccountAbility, 2020). The new version provides clarity, consistency, uniformity, and ease of use by applying various ESG standards and sustainability practices to comply with sustainability disclosures such as GRI, SASB, and TCFD (AccountAbility, 2022).

The AA1000 is voluntary and measures compliance rather than performance. It is useful for organisations of different sizes and at different stages of developing sustainability strategies in relation to the organisation’s internal and external relationships (Beckett & Jonker, 2002).

2.2.2.1.3. CDP (formerly the Carbon Disclosure Project)

The CDP (formerly the Carbon Disclosure Project) was founded in 2000, aiming to transform capital markets by making environmental reporting and risk management the norm in the corporate world. It is an international organisation covering 50 countries (CDP, 2022a). It is a not-for-profit global environmental impact platform that enables the reporting of information on the impacts of climate change, deforestation and water security impacts for companies, cities, states and regions. CDP aims

to prioritise environmental reporting and provide the knowledge and in-depth analysis to drive it forward, given the urgency of climate, deforestation and water security (CDP, 2022a).

Companies in high-impact areas are asked sector-specific and generic questions and are categorised according to the most relevant sectors, focusing on the different income-generating activities and linking them to climate change (CDP, 2022a). CDP provides the mechanism for reporting in line with the TCFD recommendations, translates the TCFD recommendations into real-world disclosure issues and provides investors and disclosers with a single platform where the TCFD framework is translated into real-world practice in a comparable and consistent manner that is relevant and accessible (CDP, 2022b).

CDP has the world's largest environmental database, and “CDP scores are widely used to drive investment and procurement decisions towards a zero carbon, sustainable and resilient economy'' (CDP, 2023a, p. 1). Furthermore, ''to manage, we must measure” the impacts of climate change to exploit opportunities and mitigate risks. CDP presents a standardised and recognised disclosure system that reduces the burden of data collection and presentation and simplifies measurement and comparison. “Disclosing climate change data is a journey and it is the first step to mitigating risks and taking opportunities” (CDP, 2023a, p. 1). Across a wide range of key factors, it provides an understanding of best practice and comparison with global peers (CDP, 2023a).

According to Matisoff et al. (2013), by encouraging voluntary reporting and disclosure, CDP provides a way for companies to differentiate themselves from competitors and to be recognised beyond compliance. By comparison, the EU Emissions Trading System, which requires reporting but does not publicly disclose direct emissions, provides no incentives to go beyond compliance (Matisoff et al., 2013).

In 2021, CDP published ''A Climate Disclosure Framework for Small and Medium-Sized Enterprises (SMEs)'' because a significant proportion of the world's businesses are SMEs (CDP, 2021a).

2.2.2.1.4. United Nations Global Compact (UN Global Compact) - Communication on Progress

Another sustainability disclosure initiative is the UN Global Compact - Communication on Progress, based on the UN Global Compact, which was formally launched in 2000 (UN, 2000a). It originated from a proposal by UN Secretary-General Kofi Annan as a special initiative on sustainability, which became a resolution of the UN General Assembly, based on ten fundamental principles in the areas of human rights, labour practices, environmental protection and anti-corruption, and it is designed to be integrated into business strategy and operations (UN Global Compact, 2021). Since 2015, it has also been responsible for contributing to the achievement of the SDGs and the 2030 Agenda. To

demonstrate their commitment to the principles of the UN Global Compact Principles, organisations prepare and publish an annual "communication on progress", a report in which organisations disclose their activities based on these principles (UN Global Compact, 2021).

By integrating the Ten Principles of the UN Global Compact (2020) into their strategies, policies, and procedures, and by creating a culture of integrity, businesses are meeting their fundamental responsibilities to People and Planet and setting themselves up for long-term success.

The principles are:

> Human Rights:
>
> Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
>
> Principle 2: Ensure they are not complicit in human rights abuses.
>
> Labour:
>
> Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
>
> Principle 4: The elimination of all forms of forced and compulsory labour;
>
> Principle 5: The effective abolition of child labour; and
>
> Principle 6: The elimination of discrimination in respect of employment and occupation.
>
> Environment:
>
> Principle 7: Businesses should support a precautionary approach to environmental challenges;
>
> Principle 8: Undertake initiatives to promote greater environmental responsibility; and
>
> Principle 9: Encourage the development and diffusion of environmentally friendly technologies.
>
> Anti-Corruption:
>
> Principle 10: Businesses should work against corruption in all forms, including extortion and bribery.
>
> (UN Global Compact, 2020, pp. 1–3)

In 2006, the UN Global Compact (2006) and the GRI formed a strategic alliance to undertake efforts to encourage companies and corporate responsibility organisations to support the synergistic platforms of the Compact and the GRI. The UN Global Compact has established a partnership with the GRI to promote the GRI as a reporting mechanism to address the principles of the Communication on Progress, and both have produced a guide to help users achieve this goal (Tschopp & Nastanski, 2013), entitled "Integrating the SGDs into Corporate Reporting: A practical guide" (GRI & UN Global Compact, 2018). It is worth noting that the UN Global Compact does not require the use of GRI reporting for its Communication on Progress. It rewards reporting through GRI but accepts any reporting method that highlights its principles (Tschopp & Nastanski, 2013).

Climate change is no longer a marginal issue; it has become a global priority. The UN has brought together almost every country for international climate summits, known as COPs, or Conference of the Parties. The most notable was COP21 held in Paris (2015), where all countries agreed to work together to limit global warming to well below 2 degrees and aim for 1.5 degrees, to adapt to the impacts of a changing climate, and to allocate the money needed for these goals, giving birth to the Paris

Agreement. In 2021, COP26 was held (UK COP26 Presidency, 2021b). After days of negotiations, the parties at COP26 agreed on the Glasgow Climate Pact, a global agreement that will accelerate the pace of climate action (UK COP26 Presidency, 2021a). In 2022, the 27th Conference of the Parties in Sharm El Sheikh, Egypt, called for a loss and damage compensation fund for developing countries (UNFCCC, 2022).

2.2.2.1.5. Climate Disclosure Standards Board (CDSB)

The CDSB (2022a) was established in 2007 and is an international consortium of business, environmental, and social Non-Governmental Organizations (NGOs) committed to advancing and aligning the global corporate reporting model to put natural capital on an equal footing with financial capital. It provides a framework for companies to report environmental information with the same rigour as financial reporting. It allows these entities to provide useful environmental information for decision-making through the core business report, enabling investors to allocate capital efficiently. It is therefore recognised that information on natural and financial capital is essential to understanding a company's performance (CDSB, 2022a).

It sets out how environmental information can be communicated in the core business report, provided that the information is relevant to understanding the financial risks and opportunities of companies and the adaptability of their business model (CDSB, 2018). In 2018, the framework was updated to include alignment with the TCFD recommendations. These climate and natural capital reports help stakeholders in a sustainable financial system: investors, companies, regulators, the stock exchanges, accounting firms and analysts, by providing them with information on climate change and natural capital to determine the impact on future cash flows and also on company valuations (CDSB, 2018).

In 2022, the CDSB (2022a) was incorporated into the IFRS Foundation to support the ISSB.

2.2.2.1.6. Integrated Reporting (<IR>)

Another challenge in sustainability reporting is to determine which environmental, social and governance issues are most relevant to value creation. In this context, the Integrated Reporting (<IR>), developed by the International Integrated Reporting Council (IIRC), should be highlighted (IIRC, 2022c). The International Integrated Reporting Framework and Integrated Thinking Principles have been developed and are used around the world with the primary goal of promoting communication about value creation, preservation and erosion. The integrated information and thinking cycle lead to an efficient and productive capital allocation for financial stability and sustainable development (IIRC,

2022c). The IIRC was established in 2010 and is a global coalition of companies, investors, policymakers, the accountancy profession, and civil society (IIRC, 2022b).

In 2013, the “International Integrated Reporting <IR> Framework” (the "<IR> Framework"), a principles-based framework for the preparation of integrated reports, was published (Deloitte, 2013). Integrated reporting aims to: improve the quality of information for providers of financial capital (more efficient and productive allocation of capital); promote a consistent and efficient approach to reporting; improve accountability and management of the financial, industrial, intellectual, human, social, relational, and natural capital bases and understanding of interrelationships; support integrated thinking, decision-making and action focused on short, medium and long-term value creation (IIRC, 2022c).

A revised version of the Integrated Reporting Framework was published in 2021 to provide more useful reporting for decision-making, while ensuring that the principles remain appropriate and robust(IIRC, 2022a). The Integrated Reporting Framework is used to link financial statements and sustainability disclosures (IIRC, 2022a). There are seven guiding principles associated with the preparation and presentation of an integrated report that relate to the content and way in which information is presented: strategic focus and future direction, linking of information, stakeholder relationships, materiality, conciseness, reliability and completeness, and consistency and comparability (IIRC, 2022c). It includes eight elements that must be linked together and are not mutually exclusive: organisational landscape and external environment, governance, business model, risks and opportunities, strategy and resource allocation, performance, outlook, and basis of presentation (IIRC, 2022c).

It should be noted that the International Accounting Standards Board (IASB) and the ISSB of the IFRS Foundation are jointly responsible for the Integrated Reporting Framework (IIRC, 2022a).

Sustainability and transparency, like corporate reporting, are trending towards combining financial and non-financial metrics together in a single integrated report (Affan, 2019).

There is a positive effect of integrated reporting on corporate performance, with a strong relationship between stakeholders and managers, resulting in the ability to identify the opportunities and risks of each strategy adopted that will affect corporate performance (Affan, 2019). Efforts have been made to find the best way to present the multitude of financial and non-financial information relevant to stakeholders (Rupley et al., 2017). The <IR> presents the most relevant financial and non-financial information to stakeholders in a single report. As integrated reporting becomes more mainstream, reports will change to meet the information requirements of stakeholders (Rupley et al., 2017).

In 2021, IIRC (2022b) merged with the SASB Foundation to form the Value Reporting Foundation (VRF). The VRF provided a comprehensive set of resources (Integrated Thinking Principles, the Integrated Reporting Framework, and the SASB Standards) designed to help companies and investors develop a common understanding of enterprise value (SASB, 2022a).

In 2022, the IFRS Foundation assumed responsibility for the Integrated Reporting Framework. The IFRS Foundation and the chairs of IASB and ISSB encouraged the continued adoption of the Integrated Reporting Framework by preparers (IIRC, 2022c).

2.2.2.1.7. Sustainability Accounting Standards Board (SASB)

SASB (2022a) was established in 2011 as a non-profit organisation to help companies and investors develop a common language about the financial implications of sustainability. The SASB's standards guide companies' disclosure of material financial sustainability information to their investors by identifying the environmental, social and governance issues that are most material to financial performance in each industry. There is no doubt that sustainability impacts the financial position, operational performance, and value of companies (SASB, 2022a).

Interestingly, GRI and SASB complement each other as two comprehensive and internationally recognised sets of sustainability standards for corporate reporting, with complementary standards providing the tools they need to communicate effectively with stakeholders now and in the future. GRI and SASB have worked together to help companies communicate with their various stakeholders (GRI & SASB, 2021).

SASB supports the Securities Exchange Commission's (SEC) increased interest and initiative in the area of sustainability-related financial disclosure and believes that generally accepted sustainability disclosure standards can play a key role in this approach (Guillot, 2021). SASB was established to address the market's need for consistent, comparable and reliable sustainability information that is material to the creation of business value (Guillot, 2021).

2.2.2.2 Disclosure Standards and Frameworks in Recent Years

Recent developments in CSR reporting (or sustainability reporting) include Directive 2014/95/EU, which aims to improve corporate disclosure. The relevant milestones for disclosure standards and frameworks in the period 2012-2023 (Fig. 2.10) will be analysed in this section.



Figure 2.10 Relevant milestones in standards and disclosure frameworks from 2012 to 2023 (adapted from International Finance Corporation (IFC, 2023, p. 2)).

2.2.2.2.1. Directive 2014/95/EU

In Europe, Directive 2014/95/EU of the "European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards the disclosure of non-financial information and diversity information by certain large companies and groups" (NFRD), was published in 2014 and it would be applicable for the 2017 financial year (European Parliament and the Council of the European Union, 2014). It responds to the needs of stakeholders and the need to provide easy access to information on the impact of business on society. It wants companies to present the multi-dimensional nature and diversity of their CSR policies with a sufficient level of comparability (European Parliament and the Council of the European Union, 2014).

The NFRD applies only to large companies and groups that are public-interest entities and exceed the threshold of 500 employees on average at their balance sheet data (European Parliament and the Council of the European Union, 2014). NFRD requires a non-financial statement in the annual report, containing at least information on environmental, social and employee matters, respect for human rights, and combating corruption and attempted bribery. Auditors must ensure that the non-financial statement has been presented (European Parliament and the Council of the European Union, 2014). It is important to note that the guidelines were formulated within the management report, but an alternative presentation of the "non-financial statement" as a separate report would also be possible under the conditions set out in Directive 2014/95/EU, allowing flexibility to disclose the information in the format they consider most appropriate (European Commission, 2017).

In 2017, the European Commission published a communication entitled "Guidelines on non-financial reporting (methodology for reporting non-financial information)" with the intention of providing support to companies in the disclosure of high-quality, relevant, useful, consistent, and comparable non-financial information in accordance with the Directive, which was non- binding (European Commission, 2017). Later, in 2019, the European Commission published a complementary document, "Guidelines

on non-financial reporting: Supplement on reporting climate-related information'' (European Commission, 2019c). This supplementary guidance aims to provide suggestions on how to include more detailed information in the recommended disclosures and provides further guidance to banks and insurance companies. It integrates the TCFD recommendations and provides companies with guidance in line with the NFRD and TCFD recommendations (European Commission, 2019c). These issues (NFRD and Guidelines) are analysed in more detail in section 2.4. Disclosure of non-financial and climate-related information.

2.2.2.2.2. Corporate Reporting Dialogue (CRD)

The Corporate Reporting Dialogue (CRD) was convened in 2014 to strengthen cooperation, coordination and alignment among leading standard setters and framework setters with international influence on corporate reporting (CDSB, 2022b).

The CRD was introduced by the IIRC, which brought together organisations with international influence on corporate reporting. The aim was to seek better alignment and burden reduction in corporate reporting (CDSB, 2022b). The CRD consisted of: CDP; CDSB; Financial Accounting Standards Board (FASB); GRI; IASB; IIRC; ISO; SASB (CDSB, 2022b).

The organisations share a common interest in integrated reporting and in improving the quality and consistency of corporate reporting worldwide, intending to provide greater assurance to companies and investors. The impetus was to promote greater coherence, consistency and comparability of corporate reporting frameworks, standards and related requirements in order to achieve greater efficiency and effectiveness (CDSB, 2022b).

At COP26, the IFRS Foundation announced the formation of ISSB and that it had reached an agreement to consolidate with the CDSB, a CDP initiative, and the VRF (CDSB, 2022c). It achieved a ''better alignment'', which laid the foundation for the recent announcements to consolidate and deliver a comprehensive and aligned reporting system that meets the needs of capital markets and society globally. The CRD demonstrates the alignment of the main global reporting frameworks with the TCFD recommendations (CDP, 2019). As a result, the CRD was phased out (end of 2021) (CDSB, 2022c).

2.2.2.2.3. Task Force on Climate-Related Financial Disclosures (TCFD)

When talking about the TCFD, it is important to understand its origins. Given the growing importance of climate finance, in 2015, the G20 asked the FSB (2020, p. 1), “an international body that monitors and makes recommendations about the global financial system”, to bring together public and private sector participants to examine how the financial sector can consider climate-related issues into account (G20,

2015). Subsequently, the FSB met with the public and private sectors to assess the implications of climate change issues for financial stability (FSB, 2015a). Accordingly, the FSB (2015a) proposed to the G20 Leaders to establish an industry-led disclosure working group to develop voluntary and consistent climate-related disclosures that are useful to lenders, insurers, investors and other stakeholders in understanding material risks.

Policymakers need to ensure the resilience of the financial system to all forms of risk, including climate risks: physical risks (impacts on the value of financial assets that may result from climate-related events), liability risks, and transition risks (financial risks of the adjustment process to a low-carbon economy). The potential risks of climate change to the financial sector are complex and still far from being understood (FSB, 2015a).

With climate-related risk disclosures, financial institutions and other stakeholders can assess the feasibility of companies' transition plans and analyse the potential changes in the value of their assets and liabilities that may result from a transition to a low-carbon economy or from climate-related events (e.g. physical or legal risks), allowing them to manage and price these risks, but also, to make lending or investment decisions based on their view of transition scenarios (FSB, 2015b).

In addition, financial institutions could also be encouraged to disclose their exposures to climate risks and their management of those exposures, allowing for an assessment of those risks, facilitating market discipline, and encouraging firms to manage what they measure (FSB, 2015b). It would provide a source of data that could be analysed at a systemic level, allowing for an assessment of the materiality of the risks posed by climate change to the financial sector.

Accordingly, the FSB (2015b) has established a Task Force on Climate-Related Financial Disclosures, the TCFD, to develop voluntary and consistent disclosures on climate-related financial risks for use by firms in providing information to lenders, insurers, investors and other stakeholders.

At the end of 2016, the TCFD (2016) published the report “Recommendations of the Task Force on Climate-Related Financial Disclosures”, which provides a set of recommendations for voluntary, decision-useful, climate-related disclosures and was subject to public consultation.

The Task Force focuses on disclosures related to the financial impact of climate change on a company, rather than a company's impact on climate change (TCFD, 2016). In June 2017, the TCFD (2017c) published its final climate-related financial disclosure recommendations to increase transparency and improve climate risk management. It sets out recommendations for the disclosure of clear, comparable, and consistent information on climate change risks and opportunities, which should be widely adopted so that the impacts of climate change are routinely considered in business and investment decisions.

This will enable smarter and more efficient allocation of capital by facilitating the transition to a more sustainable, low-carbon economy (TCFD, 2017a). Over time, the TCFD (2018) has published status reports on disclosure practices, with the first of which was published in September 2018.

In 2019, the Network for Greening the Financial System (NGFS, 2019), which is a group of 72 central banks and supervisory authorities, called for action to consider climate change as a source of financial risk and to encourage companies issuing public debt or equity and financial sector institutions to disclose climate risks in line with the TCFD recommendations. In 2022, the Task Force published its fifth status report, highlighting that the number of companies disclosing TCFD-aligned information and publicly committing to net-zero emissions transition plans has increased since 2017 (TCFD, 2022). In 2023, the TCFD concluded its activities after fulfilling its mission, transferring to the ISSB the responsibility for monitoring companies' progress on climate-related disclosures (TCFD, 2023).

2.2.2.2.4. IFRS Foundation

In 2020, at the initiative of the Trustees of the IFRS Foundation, a Task Force was established to prepare the "Consultation Paper on Sustainability Reporting" for public consultation. This paper aimed to identify stakeholder needs in the area of sustainability reporting and to understand what could be done (IFRS Foundation, 2020). In 2021, the IFRS Foundation announced the formation of the ISSB, which will utilize the TCFD and other frameworks as its basis for work (IFRS Foundation, 2021a). It has been confirmed that sustainability reporting continues to be of increasing importance to stakeholders, and there is an urgent need to improve the consistency and comparability of sustainability reporting (IFRS Foundation, 2020). It concludes that a set of comparable and consistent standards will enable companies to build trust through greater transparency of their sustainability initiatives and will be useful to users as society demands initiatives to address climate change (IFRS Foundation, 2020).

Options for addressing sustainability reporting were identified, as was the urgency for greater consistency in reporting and comparability of information, with the following options: maintaining the *status quo*; facilitating existing initiatives; establishing a Sustainability Standards Board and becoming a standards body working with existing initiatives (IFRS Foundation, 2020). The latter was considered the best of the options discussed to help reduce complexity and achieve comparability in sustainability reporting (IFRS Foundation, 2020).

In 2022, the IFRS Foundation (2022b) completed its consolidation with the VRF (home of the SASB standards). The VRF SASB Standards serve as the basis for the development of the IFRS Sustainability Disclosure Standards, and the Integrated Reporting Framework provides the link between financial

statements and sustainability disclosures. The consolidation aimed to simplify the sustainability disclosure framework and follows the consolidation of the CDSB into the IFRS Foundation in early 2022 (IFRS Foundation, 2022b).

2.2.2.2.5. International Sustainability Standards Board (ISSB)

Furthermore, the ISSB should also be highlighted, and its origins understood. It is first necessary to acknowledge that the International Organization of Securities Commissions (IOSCO), founded in 1983, is still an international body that brings together securities regulators from around the world and is recognised as the global standard-setter for the securities industry (IOSCO, 2021a). IOSCO develops, implements, and promotes compliance with internationally recognised standards for securities regulation and works closely with the G20 and the FSB on the global regulatory reform agenda. It provides technical assistance, education, training, and world-class research to its members and other regulators as it seeks to build sound global capital markets and a robust global regulatory framework (IOSCO, 2021a).

In 2021, IOSCO's (2021b) public statement identified an urgent need for globally consistent, comparable, and reliable sustainability disclosure standards. Subsequently, it announced the priorities and vision for a Sustainability Standards Board under the IFRS Foundation in developing a plan to establish a new board to set standards for sustainability reporting. It noted that investors are not satisfied with sustainability-related information, citing as an example that companies typically report sustainability-related information with reference to different frameworks. IOSCO identified three priority areas for improving sustainability disclosure: promoting globally consistent standards; promoting (industry-specific) metrics and comparable narratives; and coordinating cross-cutting approaches (international consistency), with a focus on value creation (IOSCO, 2021b).

IOSCO worked with the Trustees of the IFRS Foundation to establish a Sustainability Standards Board, and with the IASB to establish an effective system for setting sustainability disclosure standards that are: accepted in the marketplace as the basis for consistent and comparable approaches to mandatory sustainability disclosures; compatible with financial reporting standards; and the basis for the development of an audit and assurance framework (IOSCO, 2021b). IOSCO recognises the alliance of leading sustainability reporting organisations and their efforts to combine their respective principles, frameworks, and guidelines in pursuit of common international standards for sustainability disclosure. They are also based on the recommendations of the TCFD (IOSCO, 2021b).

The Trustees of the IFRS Foundation presented the formation of the ISSB, at COP26 (2021) to develop a comprehensive global baseline of high quality sustainability disclosure standards; a commitment from leading investor-focused sustainability disclosure organisations to consolidate into the new board (the IFRS Foundation will complete the consolidation of the CDSB and the VRF (which hosts the Integrated Reporting Framework and SASB standards); the publication of prototype climate and general disclosure requirements developed by the Technical Readiness Working Group, which consolidated key aspects of content from various organisations into an improved and consistent set of recommendations for consideration by the ISSB (IFRS Foundation, 2021a).

The ISSB aim to develop sustainability disclosure standards to ensure a global approach to climate risk disclosure to financial markets (UK COP26 Presidency, 2021a). It identified four key objectives: to develop global sustainability disclosure standards; to meet information needs; to enable companies to provide comprehensive sustainability information to global capital markets; and to facilitate collaboration (IFRS Foundation, 2022a).

The ISSB is developing standards to provide a global benchmark for comprehensive, high-quality sustainability disclosure focused on the needs of investors and financial markets. It has international support from the G7, the G20, IOSCO, the FSB, African finance ministers and central bank governors from over 40 countries. It builds on the work of investor-focused and market-driven disclosure initiatives, including the CDSB, the TCFD, the Value Reporting Framework, including the Integrated Reporting Framework and the industry-based SASB standards, as well as the “World Economic Forum's Stakeholder Capitalism Metrics” (IFRS Foundation, 2022a). The objective is to provide cost-effective, decision-useful and market-driven standards, developed to help companies report what investors need globally, providing the right information in the right way to support decision-making and facilitate international comparability to attract capital. A company can avoid duplicate reporting by applying the ISSB (IFRS Foundation, 2022a).

In 2022, ISSB (2022) published two exposure drafts in response to the needs of users (investors, creditors, and other lenders) of general-purpose financial information for more consistent, complete, comparable, and verifiable financial information, and both standards were published in June 2023:

- “IFRS S1 General requirements for disclosure of sustainability-related financial information”, with the objective "to require an entity to disclose information about its sustainability-related risks and opportunities that is useful to primary users of general-purpose financial reports in making decisions relating to providing resources to the entity" (ISSB, 2023a, p. 6); and

- "IFRS S2 Climate-related Disclosures", based on the TCFD recommendations, including consistent metrics and standardised qualitative disclosures to enable an assessment of climate-related issues and the related risks and opportunities that affect the financial position and financial performance; the amount, timing and the future short, medium and long-term cash flows and, therefore, the assessment of the value of the entity by users of general financial reporting; and an entity's strategy and business model (ISSB, 2022). The objective is "to require an entity to disclose information about its climate-related risks and opportunities that is useful to primary users of general-purpose financial reports in making decisions relating to providing resources to the entity" (ISSB, 2023b, p. 5).

ISSB is seen as a protector of investors, with standards that promote the disclosure of financial and sustainability information focused on environmental and social impacts (Villiers et al., 2022).

2.2.2.2.6. European Financial Reporting Advisory Group (EFRAG)

The EFRAG was established in 2001 in response to a request from the European Commission to the private sector to provide input to the development of IFRS issued by the IASB and to provide accounting expertise and guidance to the European Commission (EFRAG, 2022e). In 2022, due to its role under the CSRD, it extended the mandate to provide technical advice to the European Commission in the form of draft "EU Sustainability Reporting Standards" (EFRAG, 2022d). The activities are divided into financial reporting (influencing the development of IFRS standards from a European perspective and how they contribute to the efficiency of capital markets) and sustainability reporting (developing draft standards). As part of its financial reporting activities, it ensures that European views are considered in the IASB standard-setting process and in related international discussions. Cooperate with relevant international and European initiatives on sustainability reporting, including the ISSB (EFRAG, 2022d).

In 2021, EFRAG (2022i) published two reports on the proposals made: 1) "Proposals for a relevant and dynamic EU sustainability reporting standard-setting" from the multi-stakeholder project Task Force on preparatory work for the development of possible EU non-financial reporting standards, established by EFRAG at the request of the European Commission; and 2) "Potential need for changes in EFRAG governance and funding of EFRAG". Both proposals and the CSRD proposal are focused on building on and contributing to international convergence.

In 2022, EFRAG (2022g) launched a public consultation on the draft ESRS, which includes disclosure requirements in line with the recommendations of the TCFD. The draft standard sets out the mandatory concepts and principles to be applied in preparing sustainability reporting under the CSRD (EFRAG,

2022f). However, it recognises that in order to achieve a high degree of comparability, disclosure requirements for all entities or a specific sector should be standardised on a sector-agnostic and sector-specific basis. However, as each entity operates under specific facts and circumstances and deals with a unique combination of impacts, risks and opportunities, these disclosure requirements may not be sufficient for the entity to faithfully describe all of its material sustainability-related impacts, risks and opportunities following its dual materiality assessment, and consideration should be given to defining additional specific disclosures where necessary (EFRAG, 2022f).

It is worth recalling that, at the end of 2019, the Commission announced its intention to revise the NFRD, and launched a public consultation to gather stakeholder views, identifying several shortcomings in implementation, a notable lack of comparability, reliability, and relevance of non-financial information, and overlaps between different pieces of legislation on sustainability reporting (Hahnkamper-Vandenbulcke, 2021). The EU recognises the importance of the private sector in financing the green transition and long-term signals to direct financial and capital flows towards green investments, avoiding stranded assets. Companies and financial institutions must improve their disclosure of non-financial information so that investors are fully informed about the sustainability of their investments (Hahnkamper-Vandenbulcke, 2021).

2.2.2.2.7. Corporate Sustainability Reporting Directive (CSRD)

In 2021, the European Commission adopted a legislative proposal for a Corporate Sustainability Reporting Directive (CSRD) to align reporting with the ESRS adopted by the European Commission as delegated acts (EFRAG, 2022i). In the same year, the Project Task Force on European Sustainability Reporting Standards (PTF-ESRS) received a comprehensive submission of a working paper "Prototype Climate Standard", which was considered to be a robust basis for a draft standard and was developed and published for transparency purposes (EFRAG, 2021a).

The CSDR proposal breaks new ground compared to the NFRD in the following ways: it extends the scope of the reporting requirements to other companies, including all listed companies (except micro-companies); it requires assurance on the reliability of the information; it provides more detail on the information to be reported and requires it to be in line with mandatory EU sustainability reporting standards; and it ensures that all information is published as part of the management report and in a machine-readable digital format (European Commission, 2022e).

It clarifies the principle of dual materiality, removing any confusion about whether companies should report information to understand how sustainability issues affect their performance, position, and

development (the outside-in perspective) and their impact on people and the environment (the inside-out perspective) (European Commission, 2022e). The CSDR was published at the end of 2022 (European Commission, 2022d). The CSRD also proposes to make mandatory verification of the sustainability information reported by companies and the digitisation of sustainability information (European Commission, 2022c).

A brief comparison between NFRD and CSRD is given in Table I.

Table I Comparison of the NFRD and the CSRD.

	NFRD	CSRD
Designation	Disclosure of non-financial and diversity information	Sustainability reporting
Characterisation	First non-financial reporting Directive in the EU	Amends the Non-Financial Reporting Directive (NFRD)
Objective	Information to the extent necessary for an understanding of the undertaking's development, performance, and the position of the company, and the impact of its activities	Information necessary to understand the company's impact on sustainability issues and information required to understand how sustainability issues affect the company's development, performance, and position
Scope	Large public-interest entities (more than 500 employees)	Large companies and listed companies (except listed micro-companies)
Minimum content	Five sustainability topics covered ("environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters")	Three sustainability topics covered ("environmental, social, and governance factors") and sector-specific, sector-agnostic information as defined by EFRAG
Perspective taken	(Ultimately) outside-in	Outside-in and inside-out
Relevant time horizons for materiality	Not specified	Short, medium, and long-term
(Main) Target group for the information	Providers of financial resources	Stakeholders (in a broad sense)
Localisation	Included in the management report or a separate report corresponding to the same financial year	All information will be published as part of the companies' management reports and disclosed in a digital, machine-readable format
Options to omit information	Safeguard clause; comply or explain principle	Safeguard clause
Penalties	Not specified	Penalties, administrative sanctions, or measures
Links to financial reporting	Optional reporting as part of the management commentary, and mandatory reference to and additional explanation of other information included in the annual report	Mandatory reporting as part of the management commentary, and compulsory reference to and additional explanation of other information included in the management commentary and the annual report
Standards or measures	No standards on how information should be disclosed	Specify the information that companies should report and require them to report in line with mandatory EU sustainability reporting standards
Calendar	Financial year beginning 1 January 2017 or during the calendar year 2017	Financial years starting on or after 1 January 2024
External assurance	Not mandatory	Mandatory (requires assurance on sustainability information)

Source: Adapted from Baumüller & Sopp (2022, p. 21), European Commission (2022d), European Parliament and the Council of the European Union (2014).

According to Baumüller & Sopp (2022), the proposed change in the EU from non-financial reporting to sustainability reporting has implications that extend beyond the terminology used, necessitating a different understanding of the objectives of sustainability reporting and the purpose of reporting. The need and desire to properly interpret the materiality principle established in the NFRD (a shift from single materiality to dual materiality) drives this change. It is challenging and likely to be costly, as

companies and banks will need to establish the relevant reporting processes, systems, and formats to comply with the increasing number of reporting requirements (Baumüller & Sopp, 2022). The scope of information to be reported has been expanded, and sector-specific reporting requirements have been introduced to ensure comparability. The redefinition of the materiality principle has shifted the perspective from financial materiality as the primary point of evaluation for sustainability reporting obligations, leading to an increasingly explicit preference for integrated reporting, as it can ensure the link between economic, environmental, and social performance (Baumüller & Sopp, 2022).

The CSRD is underpinned by the modernisation and strengthening of the rules on the social and environmental information that companies are required to disclose (European Commission, 2022c).

The European Commission mandated the EFRAG to develop a draft of ESRS to address the disclosure requirements of the CSRD (European Commission, 2022c). Following a public consultation, EFRAG submitted to the European Commission a first set of draft ESRS for endorsement, with further sector-specific standards foreseen at that time to be issued in due course. Environmental, social, and governance projects introduce the concept of dual materiality (a multi-stakeholder approach) and extend a company's reporting boundaries to its entire value chain (European Commission, 2022c).

In late 2022, the EFRAG Board endorsed the first set of ESRS and submitted them to the European Commission (EFRAG, 2022b, 2023), regarding sustainability reporting standards (European Commission, 2023a). The first set of ESRS comprises 12 standards. It addresses environmental, social, and governance (ESG) issues, including cross-cutting and thematic standards, with the publication of sector-specific standards pending (EFRAG, 2022c, 2022h, 2023). Under the Omnibus proposal, the requirement to adopt sector-specific standards will be eliminated (European Commission, 2025f). The standards for SMEs were recently published in December 2024 (EFRAG, 2024). Figure 2.11 provides a summary of these situations.

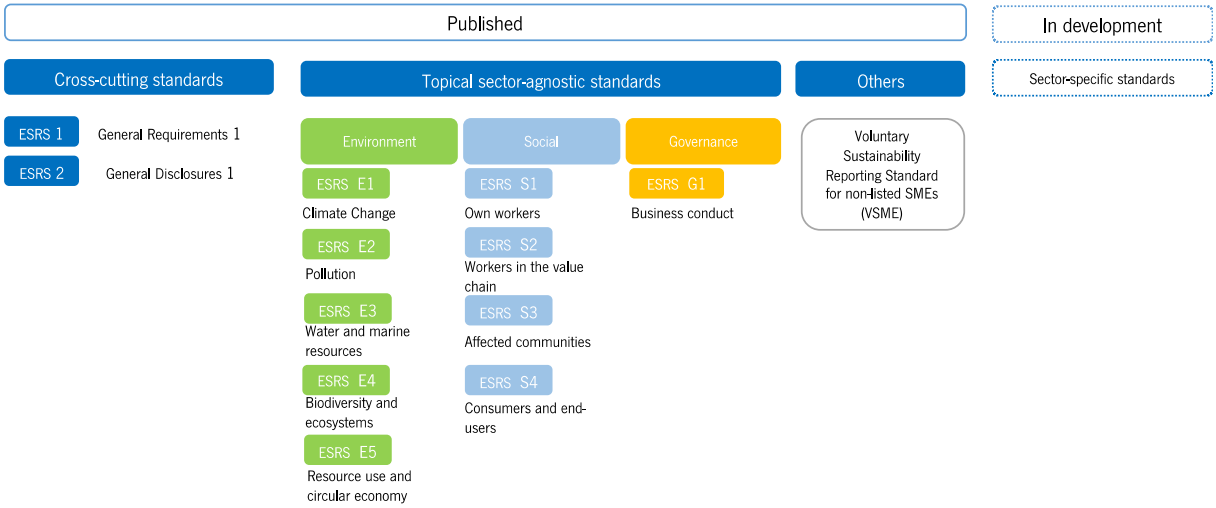

Figure 2.11 First set of ESRS (adapted from Ernst & Young (2022, p. 2) and based on EFRAG (2024)).

2.3. THE IMPORTANCE OF BANKS AND CHALLENGES IN THE CONTEXT OF SUSTAINABILITY REPORTING

Banks play an important role in society. To understand the importance of banks and the challenges they face today, it is essential to have an overview of banks' contributions to financial stability and their corresponding relationship with sustainability.

2.3.1 The Role of Banks in Society

2.3.1.1 The Importance of Banks - A Comprehensive View

According to Gobat (2023, p. 1), banks are "at the heart of the matter". They link depositors and borrowers, helping to ensure that economies function efficiently by providing credit, creating money (in the form of reserves), and playing a crucial role in the transmission of monetary policy. Regulation is key to maintaining the safety and soundness of banks (Gobat, 2023). Formally, according to the Bank for International Settlements (BIS), banks are an

> entity whose business is to receive deposits, or close substitutes for deposits, from the public and to grant credits for its own account (...) include the following entities: commercial banks, universal banks, savings banks, post banks, giro institutions, agricultural credit banks, cooperative credit banks and credit unions.
>
> (Bank for International Settlements, 2019, p. 1)

The banking sector comprises banks and other financial institutions that invest and lend within their scope (Formisano et al., 2019) and plays a crucial role in economic growth by directing funds (Maudos & Guevara, 2003).

Banks are part of the financial sector, which consists of one or more entities, namely: (i) a credit institution, a financial institution or an ancillary banking services company (banking sector); (ii) an insurance undertaking, a reinsurance undertaking or an insurance holding company (insurance sector); (iii) an investment company or a financial institution (investment services sector); and (iv) a mixed financial holding company (European Parliament and the Council of the European Union, 2003a). A financial institution is an "entity that is principally engaged in providing financial services, such as financial intermediation, financial risk management or liquidity transformation (...) and includes the following entities: central banks, banks and non-bank financial corporations" (BIS 2019, p. 1).

The financial system is designed to channel funds from agents with surpluses to those with deficits, and one of its key functions is to share risks. It is often said that financial markets are well-suited to achieving this goal (Allen & Gale, 2001). In addition to the financial sector, the financial system also encompasses the real sectors, as these sectors utilize or do not utilize financial services from the financial sector, or forego their use, as well as the interaction between the demand and supply of financial sector services (Schmidt, 2001).

Banks' products include savings, loans, investments, intermediation and advice, payments, guarantees, and ownership and trust of real estate(Jeucken & Bouma, 2001). Income-generating activities are interest income (at the bank's own risk) and provisioning income (at the customer's risk) (Jeucken & Bouma, 2001).

Finance underpins the functioning of the economy and society. The financial system has recently undergone significant changes, raising several concerns for the future (UNEP, 2017). Decisions made by banks regarding their involvement in projects have significant consequences for the performance of sectors and economies, with global implications. Therefore, disruptions and failures in the financial system (due to adverse circumstances) spread quickly and last for a long time, and policy solutions to make them sustainable take a long time (UNEP, 2017). Banks are intermediaries and influence other industries (Zimmermann, 2019) and can direct capital to different markets, regions, sectors, or projects (Weber, 2014).

In 1993, the SWIFT banking network (a financial sector cooperative), through the Innotribe initiative, proposed an ambitious and widely considered unlikely idea: "Banks for a Better World" (known as B4BW), i.e., to get the banking community to contribute to sustainable development in the financial sector (Stephens & Skinner, 2013). "The challenge is enormous" (Stephens & Skinner, 2013, p. 176). Banks alone cannot achieve this; the whole system needs to be committed to both sustainable social and environmental development (Stephens & Skinner, 2013).

The relationship between banks and sustainability is demonstrated through access to finance, which has a direct impact on investments in specific sectors or an indirect impact through lending activities. Pressure from stakeholders can impact reputation, and the challenge of balancing financial performance with social and environmental impacts needs to be addressed (Elalfy & Weber, 2019).

According to the UNEP Finance Initiative (UNEP FI, 2022), the UNEP was established in 1972, following the historic "United Nations Conference on the Human Environment". UNEP was established to monitor the environment, develop policies based on scientific evidence, and coordinate responses to the world's environmental challenges, collaborating with industry on environmental management strategies. In the early 1990s, UNEP began working with innovative organisations in the financial services sector, "convinced that the financial sector had a valuable contribution to make in protecting the environment while maintaining the health and profitability of their businesses" (UNEP FI, 2022, p. 1). In 1992, before the Rio Summit, a small group of banks developed the UNEP Statement by Banks on the Environment and Sustainable Development, and the Banking Initiative was formed. This initiative involved a large number of financial institutions that promoted the integration of environmental issues into the financial sector. In late 1999, they joined forces with banks and insurance companies, and in 2003, the groups merged to form the UNEP FI (2022).

By reviewing the literature, this study aims to identify the increasing importance that banks have attributed to sustainability issues over time (Table II).

Table II Banks and sustainability over time (since 2000).

YEAR	DESCRIPTION	REFERENCE
	THE 00'S	
2000	Creating an enabling environment for development and poverty eradication depends on good governance at both the national and international levels, as well as transparency in the financial, monetary, and trading systems.	(UN, 2000c)
2001	Financial institutions can play a crucial role by directly investing in projects that benefit specific communities or constituencies, particularly in economically disadvantaged areas.	(Commission of the European Communities, 2001)
	The contribution of banks to sustainable development is enormous because they act as intermediaries between people with capital shortages and surpluses in an economy, transforming money into time, scale, place, and risk, with a major impact on the economic development of nations. Their role is both quantitative and qualitative, as they can influence the pace and direction of economic growth.	(Jeucken & Bouma, 2001)
2004	Bank lending can affect and be affected by the state of the natural environment. Environmental awareness, as reflected in legislation and consumer behaviour, poses risks to the bank's loan portfolio.	(Thompson & Cowton, 2004)
2007	The specificity of bank loans is evidence of banks' superior ability to monitor counterparties exposed to environmental liabilities.	(Aintablian et al., 2007)
2008	"Banks are the backbone of the global economy, providing capital for innovation, infrastructure, job creation, and overall prosperity". In society, they influence household spending and the growth of industries.	(Cogan, 2008, p. i)

Table II Banks and sustainability over time (since 2000) (cont.).

YEAR	DESCRIPTION	REFERENCE
	THE 10'S	
2010	Banks have unique business practices and can influence the business practices and Greenhouse Gas (GHG) emissions of other economic actors. A bank is an evaluator, risk manager, financier, and lender. They decide whether to finance large projects or to lend to companies and on what terms.	(Bowman, 2010)
2011	"A strong and resilient banking system is the foundation for sustainable economic growth, as banks are at the centre of the credit intermediation process between savers and investors".	(BCBS, 2011, p. 2)
2012	Banks can steer investment towards low-emission technologies and infrastructure through their lending terms, but the indirect impact that banks can have on climate change remains underestimated.	(Furrer et al., 2012)
	Banks make the economy more dynamic and contribute to the well-being of society, and are considered a fundamental part of financial and economic stability.	(Dufays, 2012)
	Sustainable development is the responsibility of governments, businesses, and individuals, and it requires a collective effort. Banks play a key role through their interaction with other economic sectors and consumers, as well as through their financing, investment, and trading activities.	(UNEP FI 2012)
2013	Banks play a crucial role in sustainable social and environmental development.	(Stephens & Skinner, 2013)
2015	Climate change poses significant risks for banks, which means that decision-makers must assess climate change risk and integrate it into the credit management process.	(Georgopoulou et al., 2015)
2017	The transition to a low-carbon economy requires profound and, in some cases, disruptive changes in economic sectors and industries in the short term. It is necessary to understand the implications for the financial system to avoid financial dislocation and sudden losses in asset values.	(TCFD, 2017b)
2018	Banks can suffer significant losses because of severe weather events.	(Campiglio et al., 2018)
	Through their lending activities, which include corporate portfolios, banks can be in the most influential position to drive the transition to a low-carbon economy.	(UNEP FI et al., 2018)
	Banks are viewed as key players in the transition to a sustainable economy. Banks are no longer seen as neutral intermediary organisations but are observed as active agents in economic and social processes.	(Ryszawska & Zabawa, 2018)
	Banks will be key players in redirecting capital and steering the financial system towards sustainability. Banks can be exposed to the risks associated with unsustainable economic development and may be affected by the loss of profitability of companies most vulnerable to climate change or those dependent on dwindling natural resources. Banks are fundamental and can play a part in the solution to a greener, more sustainable economy.	(European Commission, 2018a)
	Banks must direct capital to sustainable investments and to protect the financial system from sustainability risks.	(HLEG, 2018)
2019	Banks can make a significant indirect contribution to sustainable development through their lending and investments, for example, by investing in or financing companies that engage in environmentally or socially responsible activities.	(Neto & Branco, 2019)
	Banks have a significant indirect impact on the environment through their role as financial intermediaries.	(Kılıç & Kuzey, 2019)
	An adverse scenario may affect banks' exposure to systemic risk based on GDP growth resulting from supply and/or demand disruptions (caused by the adverse effects of environmental risks, environmental regulations, and technological shocks); exposure to high-risk environmental sectors; and secondary effects due to indirect exposure to climate-impacting assets.	(Nieto, 2019)
	Banks need to be involved in CSR because they benefit from society and need to give back.	(Matuszak & Rózańska, 2019)
	As major providers of capital, they play a crucial role in the transition to a new, sustainable, and circular economy.	(Siri & Zhu, 2019)
	Banks are fundamental to society and essential to economic development.	(Scholtens & Klooster, 2019)
	Banks are intermediaries that have an impact on other sectors and are key to achieving the SDGs, facing diverse challenges.	(Zimmermann, 2019)
	The "Action Plan on Financing Sustainable Growth" highlights the systemic importance of the financial sector in enabling the transition to a low-carbon and climate-resilient economy.	(European Commission, 2019c)
	When making investment decisions, it is important to consider of sustainability factors, which that can enhance the resilience of the real economy and the stability of the financial system. The EU is committed to coordinating international efforts to build a cohesive financial system that supports sustainable solutions. Climate and environmental risks need to be managed and integrated into the financial system, which can help to increase resilience to climate and environmental risks, including physical risks and damage from natural disasters.	(European Commission, 2019e)

Table II Banks and sustainability over time (since 2000) (cont.).

YEAR	DESCRIPTION	REFERENCE
	THE 20'S	
2020	Climate-related financial risks pose a threat to the safety and soundness of banks and the financial system as a whole. They pose a significant threat to the stability of the financial system.	(Feridun & Güngör, 2020)
	Banks can be affected by climate change, and they are essential to the implementation of consolidated practices and behaviours to combat climate change.	(Caby et al., 2020)
	Banks can make a significant contribution to environmental protection and sustainable development in the financial sector by moving beyond business as usual and changing their lending guidelines and policies.	(Malandrakis & Drakos, 2020)
	The banking sector has a crucial role to play in supporting climate change adaptation and enhancing financial resilience to climate-related risks. It can help mitigate climate change and sustainability risks by reducing their impact, adapting to climate change, and supporting recovery by reallocating funds to climate-sensitive sectors.	(Park & Kim, 2020)
	The financial system must adapt to promote the sustainable functioning of the economy, which should be standard practice. The sustainability impact of financial products and services must also be considered.	(European Parliament and the Council of the European Union, 2020)
2021	For banks, ESG performance is important because they affect most industries through their investments and lending.	(Tóth et al., 2021)
	There is a growing need for banks to assess the climate risk associated with climate change and to incorporate it into their risk management practices. Financial regulators consider climate risk to be an emerging risk.	(Walles et al., 2021)
	Banks play a crucial role in facilitating the transition to a sustainable and inclusive economic and financial system, in line with the European Green Deal.	(European Commission, 2021e)
	Banks, as intermediaries, will play a crucial role in financing the transition to a more sustainable economy. Sustainable finance must be at the heart of the financial system.	(European Commission, 2021d)
2022	The banking sector interacts with the economy through credit and by balancing its stability.	(Lupu et al., 2022)
	Banks have a great potential to help protect the Planet and create greater energy awareness by educating their customers and helping them implement techniques that can help protect the environment.	(Mir & Bhat, 2022)
2023	Although it's still unclear which exact approach regulators will take, banks must become more aware of climate-related risks and be prepared to address key risk management concerns.	(Anderson et al., 2023)
2024	Banks must assess the potential financial implications of ESG risks and, in accordance with Basel guidelines, implement measures to manage these risks and maintain financial stability.	(Yébenes, 2024)

Table II presents data for the last three decades. We verified and documented the increasing importance of sustainability for banks, particularly in relation to environmental and climate issues, over the last decade.

In essence, the financial sector has a significant impact on the economy and sustainable development, particularly in terms of risk management and stakeholder pressure to become more sustainable (Weber et al., 2012).

2.3.1.2 Banks and Financial Stability

Over the last 15 years, the ESG has become a reference in the definition of public policies and sustainability strategies for companies and banks (Banco de Portugal, 2022). It is recognised that ESG factors are central to the objectives of central banks and financial supervisors for macroeconomic and financial stability (Aevoae et al., 2022; Banco de Portugal, 2022; Batten et al., 2016; Roeland, 2022). Among the environmental risks, we highlight those related to climate change, which are particularly

relevant for banks and have macroeconomic implications that could be significant for the conduct of monetary policy (Banco de Portugal, 2022).

Since the late 1980s, banks in the US have been held directly liable for pollution caused by their customers and must pay for clean-up costs, under specific circumstances, but they are not automatically liable for such pollution (Comprehensive Environmental Response, Compensation, 1980). Some banks have gone bankrupt under this regime, making them pioneers in considering their environmental policies, particularly in relation to credit risk. In Europe, banks began developing environmental policies in the mid-1990s, with a focus on new product development (Jeucken & Bouma, 2001).

The bankruptcy of Lehman Brothers in 2008 marked the beginning of a financial crisis in major developed countries. The banks caused the crisis through their irresponsible lending policies, which led to a pool of toxic assets (Martínez et al., 2020). This was not expected because the banks were covered by strict regulations that gave an image of safety and risk control. As a result, governments stepped up measures to protect savings through financial bailouts and nationalisations, and stricter regulations were introduced (Martínez et al., 2020).

The financial crisis has led to a distrust of the conventional financial system, and investors have begun to look to banks that invest in social and environmental activities (Martínez et al., 2020).

According to Dufays (2012), socially responsible banks have developed business principles to act fairly, transparently, and prudently towards their customers and to contribute to the well-being of citizens and their societies. One of the causes of the last financial crisis was greed in the financial markets, as well as pressure on commercial banks to increase shareholder returns through increased leverage (Dufays, 2012).

The EU Multi-Stakeholder Forum on Corporate Social Responsibility examined how to integrate CSR into decision-making and processes, as well as what can be done in Europe to enhance the impact of CSR through financial institutions (European Commission, 2015). Some outcomes of the meeting were: (i) further to introduce discipline in the sector; (ii) voluntary commitments can be worth more than imposed decisions; (iii) creation of a financial industry working group on responsible banking; and iv) inclusion of CSR aspects in financial regulation (CSR commitments could have helped banks to rebuild their reputation) (European Commission, 2015).

When examining the scope of financial stability supervision, it is essential to highlight the role of the Basel Committee on Banking Supervision (BCBS, 2022), a global standard-setting body for prudential regulatory policy. The Committee is responsible for defining key standards that underpin international

banking regulation (BCBS, 2022). The Basel Accords are the foundation of EU legislation in international banking regulation.

The first Basel Accord (Basel I - published in 1988, in Basel - Switzerland), aimed to ensure international convergence of supervisory, rules and set minimum capital requirements for banks (BCBS, 1988).

The Basel II (in 2004), implemented in the European Union in 2007 (European Parliament and the Council of the European Union, 2006a, 2006b) presents banking regulation in three pillars (see Fig. 2.12): Pillar 1 - "Minimum Capital Requirements" (in addition to the calculation of capital requirements for credit risk and market risk, it provides for the determination of requirements for operational risk); Pillar 2 - "Supervisory Review Process" (emphasises the importance of supervisory review); Pillar 3 - "Market Discipline" (disclosure requirements of institutions to the public in relation to solvency and other elements identifying their risk profile) (BCBS, 2006).



Figure 2.12 Basel II structures banking regulation into three key pillars: capital requirements, supervisory review, and market discipline – adapted from BP (2023, p. 2).

Subsequently, Basel III stems from the need to improve the banking sector's ability to absorb shocks arising from adverse economic and financial scenarios, regardless of their origin, by reducing the risk of spillovers from the financial sector to the real economy (BCBS, 2011). In this sense, it introduced a stricter definition of capital requirements, defined, for the first time, internationally harmonised liquidity requirements (liquidity coverage ratio and net stable funding ratio), and added a supplementary requirement to the capital adequacy ratio based on risk-weighted assets, translated into the leverage ratio forecast. In addition, Basel III included additional requirements for the constitution of capital requirements, of a structural or countercyclical nature, to enhance the resilience of institutions and

promote the internalisation of the costs that their performance may impose on the financial system (BCBS, 2011). The EU has adopted the Basel rules.

At the level of the European Union, the Regulation (EU) n.º 575/2013 on prudential requirements for credit institutions - Capital Requirements Regulation (CRR), which includes the Pillar 1 requirements (capital, risk coverage, and leverage) and Pillar 3 requirements (market discipline and disclosure requirements), ensures the application of Basel III standards (European Parliament and the Council of the European Union, 2013c), which was amended in 2019 by the Regulation (EU) 2019/876 (Capital Requirements Regulation (CRR II) as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements (European Parliament and the Council of the European Union, 2019a).

In addition, we have the Directive 2013/36/EU on the access to the activity of credit institutions and the prudential supervision of credit institutions - Capital Requirements Directive IV (CRD IV), which contains the requirements for Pillar 2, supervisory review, and the buffers framework (European Parliament and the Council of the European Union, 2013b). Amended by the Directive (EU) 2019/878 (Capital Requirements Directive V (CRD V)) as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers, and capital conservation measures (European Parliament and the Council of the European Union, 2019a).

Financial stability is related to sustainability. The development of tools to monitor financial stability will take into account the extent to which banks' activities are sustainable (Lupu et al., 2022). The CRR reinforces the need to mitigate systemic risk, which refers to the risk of a disruption in the financial system that could have serious negative consequences for both the financial system and the real economy (European Parliament and the Council of the European Union, 2013b).

In Europe, policymakers have intensified their efforts to establish a regulatory framework that enhances the financial system's sustainability (Bruno & Lagasio, 2021). Following Basel II, European banks are expected to disclose the risks related to ESG factors to which they are exposed, as well as the mitigating actions they take to reduce these risks. Banking regulation has given several mandates to the EBA to issue specific rules and guidelines for banks and supervisors related to sustainable finance (Bruno & Lagasio, 2021).

The EU has been a leading proponent of international cooperation in banking regulation (European Commission, 2021d). In 2021, the European Commission published the Banking Package, which includes the Capital Requirements Directive VI (CRD VI) and the Capital Requirements Regulation III

(CRR III) (European Commission, 2021d, 2021f). Amendments to CRR II and CRD V aim to contribute to the stability of the economy's financing, with a set of objectives that focus on increasing the consideration of ESG risks within the prudential framework ((European Commission, 2021d).

In June 2024, the Directive 2024/1619 was published as regards supervisory powers, sanctions, third-country branches, and environmental, social and governance risks, introduces new provisions and adjustments to several articles of the CRD V and CRR II to address, among other ESG risks, the risks that banks will face due to climate change and the economic transformations needed to manage them (European Parliament and the Council of the European Union, 2024a). For example, Article 87°-A introduces a sustainability dimension into the regulatory framework to underpin better management of ESG risks and promote the more effective allocation of a bank's resources to contribute to the transition towards a more sustainable economy (European Parliament and the Council of the European Union, 2024a).

The CRR III (Regulation (EU) 2024/1623), published in June 2024, introduces new harmonised definitions of the different types of risks in the ESG risk universe, as many institutions fall outside the scope of the CRR disclosure requirements (Article 449°-A "ESG risk disclosure"), with a view to extending the ESG risk disclosure requirements to all institutions (including small and non-complex institutions) and also aims to improve the supervision of ESG risks (Article 430° amended to require institutions to report their ESG risk exposures to their competent authorities) (European Parliament and the Council of the European Union, 2024c). Amendments to the CRD V aim to ensure that the short, medium, and long-term horizons of ESG risks are incorporated into banks' strategies and processes for assessing internal capital requirements and appropriate internal governance (European Parliament and the Council of the European Union, 2024c).

In turn, at the beginning of 2022, the EBA (2022) published the "Final draft implementing technical standards on prudential disclosures on ESG risks following Article 449°-A CRR". These Implementing Technical Standards (ITS) on Pillar 3 disclosures on ESG risks aim to provide comparable indicators and disclosures to show how climate change may amplify other risks on banks' balance sheets, how banks mitigate these risks, and the ratios (including the Green Asset Ratio (GAR) for exposures financing taxonomy-aligned activities) (EBA, 2022).

The GAR on taxonomy-aligned activities in accordance with Regulation (EU) 2020/852 on the establishment of a framework to promote sustainable investment (the Taxonomy Regulation) has extended information on the taxonomy alignment of exposures in the banking book and other mitigation measures (EBA, 2022).

At the end of 2022, the Commission implemented Regulation (EU) 2022/2453, which amended the implementing technical standards laid down in Implementing Regulation (EU) 2021/637 regarding the disclosure of environmental, social, and governance risks (European Commission, 2022a). These standards: (i) aim to ensure that stakeholders are aware of ESG exposures, risks, and strategies in order to make informed decisions and exercise market discipline; and (ii) provide comparable disclosures and Key Performance Indicators (KPIs) (GAR and a Banking Book Taxonomy Alignment Ratio (BTAR)) (EBA, 2022). In addition to following the recommendations of existing initiatives, such as those of the FSB and the TCFD, mandatory templates, tables, and instructions have been defined to ensure that institutions' disclosures are consistent, comparable, and meaningful. For banks, disclosing information on ESG risks is essential to promote market discipline and enable stakeholders to assess ESG risks and the related financial strategy (EBA, 2022).

In this context, the EBA (2022) aims to address the shortcomings of current ESG disclosure in the EU and to establish best practice internationally, by providing qualitative information on the integration of ESG considerations into their governance, business model, strategy and risk management framework and the lending and other activities will also be expected to be consistent with their its financial and ethical objectives in relation to ESG factors (Roeland, 2022).

The study by Tóth et al. (2021) demonstrates that ESG performance significantly reduces the non-performing loan ratio of credit institutions, confirming the positive impact of regulatory capital on financial stability; thus, ESG performance has a positive effect on financial stability. The relevance of ESG information to banks' business is undeniable (Tóth et al., 2021).

Similarly, the research by Janicka and Sajnóg (2022) confirms a positive relationship between a company's market capitalization and the quality of its ESG reporting. In fact, investors expect ESG reporting and companies with ESG reporting are more highly valued by the market (extrapolating this to banks, when they invest in companies or lend to companies, they will certainly look for companies with ESG reporting based on their performance and valuation, which will reduce risks) (Janicka & Sajnóg, 2022). This empirical evidence is a crucial piece of information for understanding the impact of ESG on European financial stability in the banking sector (Lupu et al., 2022).

There is an urgent need to estimate the impact of climate risks on the financial system (Battiston et al., 2017). According to Battiston et al. (2017), climate policy risks can propagate through the financial system. They found that the share of banks' loan portfolios exposed to climate policy-relevant sectors is comparable to banks' capital. They believe that a delayed and abrupt policy framework could have adverse systemic consequences, but this depends on the ability to anticipate climate policies. They

point out that climate-related financial disclosures are essential for risk assessment, and that a stable policy framework is needed to address the multiplicity of possible outcomes (Battiston et al., 2017).

Affected by turbulent economic changes and increasing regulatory demands that have had a significant and negative impact on the functioning of the global banking industry, banks have sought to reverse the trends of declining profitability, customer relationships, and competitive positions through approaches they consider socially responsible Deutsch & Pintér (2016).

According to Deutsch & Pintér (2016), in response to the global financial crisis and market losses, banks have prioritised customer retention and strict regulatory enforcement, resulting in negative returns in the short term, but with positive returns in the long term, as capital adequacy is positively correlated with net income. However, it would only mean higher net returns if banks can achieve the same capital adequacy in the long term by improving the size and quality of their loan portfolio and better risk management. The asset quality will be positively affected by the restructuring and reclassification of the loan portfolio, strict risk management, and increased liquidity coverage due to the success of the loan for growth programme. The customer base will be a key factor in ensuring the bank's survival, market competitiveness, and profitability growth, based on safer and better risk management (Deutsch & Pintér, 2016).

There is also a positive relationship between bank performance and sustainability, where higher sustainability scores of banks are correlated with lower default risk, and higher sustainability performance also reduces banks' contribution to systemic risk, suggesting that banks' sustainability performance can have an impact on the financial system, i.e., sustainability is relevant for banks and supervisors (Scholtens & Klooster, 2019). Awareness of ESG issues has led to a renewed focus on the financial system and systemic risk as a component of financial stability in light of the financial turmoil of recent decades (Lupu et al., 2022).

2.3.1.3 Banks and Sustainability

CSR is increasingly present in the activities of banks (Scholtens, 2009). CSR is important in the banking sector because it promotes several competitive advantages, particularly the improvement of the bank's reputation, which is a crucial factor in attracting and retaining customers, retaining employees, and achieving better financial results (Lorena, 2018). CSR practices are viewed as a significant reputational factor that can add value over time, and it is worth noting that CSR reporting and reputation are positively correlated (Lorena, 2018). Banks have additional concerns about their reputational risk, as they attach value to it and therefore fear being associated with illegal or socially unacceptable activities

(Thompson & Cowton, 2004). In turn, Istianingsih et al. (2020) mention that CSR in banks impacts the environment and society and conclude from their analysis that the higher the profit level in banks, the more banks will engage in CSR activities.

According to Weber (2014), three aspects link banks to sustainability: (i) banks can influence the sustainability impacts of their customers (indirect impact); (ii) the increasing introduction of environmental regulations that has affected and continues to affect the financial sector in an increasingly demanding way; and (iii) the pressure from stakeholders focused on sustainable development influences the reputational risk of financial institutions. However, banks have been more reactive than proactive (Weber, 2014). For the financial sector to consider sustainability, it must move from a reactive, outside-in, business-focused sustainability strategy to a proactive, inside-out strategy that considers the sustainability of banking; achieving sustainable finance requires impetus from sustainability leaders within organisations; it must use a systemic approach to develop intervention strategies that consider sustainability issues; integrating sustainability into banks' core business strategy creates win-win situations for both business and sustainable development (Weber, 2014).

Sustainability is a systemic concept, not an organisational one (Gray & Milne, 2004). According to Gray and Milne (2004), financial and economic organisational systems lead us to try to associate all relevant issues with organisations, because that is where power and decision-making seem to be. However, the environment is unaware of companies and institutions. The search for a concept of harmony will require a redesign of decision-making and therefore of organisations along ecological lines, and our economies will have to privilege life, justice and the environment, making economics and finance a means, not an end (Gray & Milne, 2004).

Banks do not significantly impact the environment and society through direct emissions or resource use, unlike other industries (Weber et al., 2012). Weber et al. (2012) demonstrate that CSR performance in the financial sector is subpar. They identify weaknesses in reporting, business ethics, product stewardship, and labour issues. They also highlight community relations as a key strength. Finally, they conclude that the financial sector's performance is significantly lower than that of the energy, consumer staples and materials sectors, and on par with the other service sectors (consumer staples, health care, information technology and telecommunications).

CSR involves integrating ESG considerations into banks' management, financial decision-making, and portfolio decisions (Liang & Renneboog, 2020). To evaluate companies, ESG criteria must be considered to identify and mitigate associated financial risks (Lupu et al., 2022).

Socially responsible organisations internalise the externalities they create and are accountable to their stakeholders (Liang & Renneboog, 2020). In this context, the question arises whether responsible investors are willing to trade financial returns for a moral dividend, such as green finance, to promote decarbonisation, as climate change affects financial markets and investor behaviour (Liang & Renneboog, 2020).

The financial system is complex and needs to improve in order to contribute to comprehensive sustainable growth (High-Level Expert Group on Sustainable Finance (HLEG), 2018). The (HLEG, 2018) recommended the development of a sustainability taxonomy in the EU, as follows: (i) climate change mitigation to identify areas where investment is most needed; (ii) encouraging investors to consider longer-term investments and to pay attention to ESG factors; (iii) transparent disclosure of sustainability opportunities and risks; (iv) encouraging retail investors to invest in sustainable finance opportunities; (v) developing European sustainability standards for some financial assets (e.g. green bonds); (vi) creating the necessary infrastructure for a more sustainable economy for member states; and (vii) integrating sustainability into bank governance and financial supervision.

Sustainable finance is a means for banks to become more resilient, for businesses to access better-priced and more intensive capital, and for individuals to feel that sustainability values are reflected in their financial choices (HLEG, 2018). The Commission's Green Finance Strategy aims to put green and sustainable finance at the heart of the financial system (European Commission, 2021d).

The principles of responsible banking are as follows: (i) alignment (strategy, individual needs and societal goals); (ii) customers and consumers (promoting sustainable practices); (iii) stakeholders (proactive and responsible engagement); (iv) governance and culture (effective governance and responsible banking culture); and (v) transparency and accountability (transparent and accountable for positive impacts) (UNEP FI, 2019).

The financial performance of banks would improve if their lending practices were enhanced, and if they increased their lending to projects with positive environmental impacts, business performance would also improve (Nizam et al., 2019). Financial institutions are shifting from altruism or greenwashing to strategic goals, incorporating social and environmental sustainability into their strategic objectives and performance, based on non-financial disclosure (Nizam et al., 2019).

Greater confidence in the disclosure climate-related disclosures will encourage sustainable financial products and innovation in sustainable investment strategies in the global financial system (TEGSF, 2019).

Figure 2.13 illustrates some of the likely benefits of climate-related disclosure for banks.

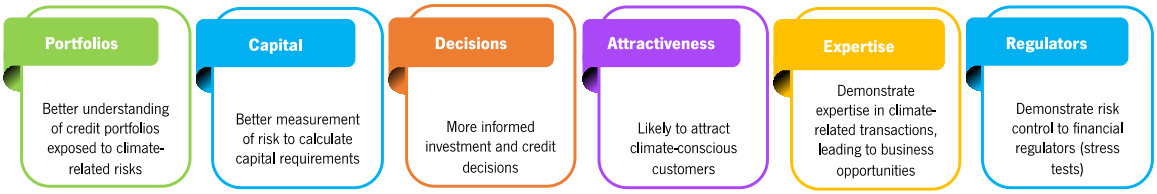

Figure 2.13 Banks and the likely benefits of disclosure of climate-related information (adapted from TEGSF (2019, p. 5)).

The path to sustainable development requires shared responsibility at all levels of society, including governments, regional and local authorities, non-governmental organisations, financial institutions, production, distribution, and retailing companies, as well as individual citizens (Council of the European Communities, 1993b). It will require changes in pricing policies, substantial investment in equipment and technology, and even the closure of some of the most polluting production units, as well as extensive credit and forward-looking lending policies by national and international banking institutions (Council of the European Communities, 1993b).

2.3.2 Regulatory Requirements for Banks

When the EU – formerly the European Economic Community (EEC) – was established in 1957, it lacked an environmental policy, management, and legislation. It was an intergovernmental agreement between six like-minded states aimed at increasing economic prosperity and rebuilding political relationships in Europe, which had been devastated by two world wars (Jordan & Adelle, 2013). Most environmental policies have emerged over the last 40 years and are now at the forefront of global efforts (Jordan & Adelle, 2013).

In the 1990s, the opportunities associated with sustainable development began to be explored, leading to the launch of mutual funds, indices, and other sustainability-related financial products and services (Weber, 2013). The "Kyoto Protocol" on climate change mitigation has influenced the financial sector through the need for financial instruments to reduce carbon emissions. Therefore, there was a need to integrate sustainability issues into the financial sector (Weber, 2013).

The UNEP FI highlighted environmental and sustainability considerations in banking and was one of the first initiatives by a non-polluting sector to consider environmental issues. Initiatives to integrate sustainability issues into banking have begun (GRI, 2000; Weber, 2013): (i) the UNEP FI, which for the first time considered environmental and sustainability issues in the financial sector; (ii) the publication

of the "Financial Services Sector Supplement" is the G3 Guidelines for sector-specific content, which aims to standardise sustainability reporting; (iii) the Equator Principles and the PRI, which stand out as guidelines in the financial sector, where lending is central; and iv) the beginning of the use of financial products and services to have a positive impact on sustainable development.

Building on the Paris Agreement on climate change and the UN's "Agenda 2030 for Sustainable Development," governments around the world are pursuing a transition to a low-carbon and more circular economy, as highlighted by the European Central Bank (ECB, 2020b).

Financial activities entail the assumption of a variety of risks that, if not properly managed, are likely to jeopardise the viability and sustainability of an institution, with negative consequences for maintaining financial stability (Banco de Portugal, 2008). Therefore, financial activities are subject to a set of regulatory requirements of a prudential nature aimed at promoting behaviours consistent with maintaining financial stability and protecting the interests of depositors and other customers (Banco de Portugal, 2008).

The Basel III Accord establishes a global regulatory framework to make banks and banking systems more resilient, enhancing the banking sector's ability to absorb shocks arising from financial and economic stress, regardless of their origin, and reducing the risk of financial sector spillovers to the real economy (BCBS, 2011). In addition, they provide essential services to consumers, small and medium-sized enterprises, large corporations, and governments, which rely on them to conduct banking business (BCBS, 2011).

Regulation (EU) No. 575/2013 "on prudential requirements for credit institutions and investment firms" has the overall objectives of promoting economically useful banking activities that protect the general interest and discouraging unsustainable financial speculation without added value (European Parliament and the Council of the European Union, 2013c). Article 449°-A relates to "Disclosure of environmental, social and governance risks (ESG risks)". It requires large institutions that have issued securities and are admitted to trading on a regulated market in any Member State to disclose this information, including physical and transition risks, as of June 2022 (European Parliament and the Council of the European Union, 2013c).

In 2014, Directive 2014/95/EU (NFRD) requires that large listed companies, banks and insurance companies, which have been designated as PIEs with more than 500 employees, disclose policies on social responsibility, treatment of workers, respect for human rights, anti-corruption and bribery, and diversity (European Parliament and the Council of the European Union, 2014).

In 2017, the "Guidelines on non-financial reporting (methodology for reporting non-financial information)" guided how to disclose the non-financial information required by the Directive in a way that is of high quality, relevant, useful, consistent, and more comparable (European Commission, 2017).

In 2017, the TCFD (2017b) developed a framework to help organisations disclose climate-related risks and opportunities through their existing reporting processes. Its "Recommendations of the Task Force on Climate-related Financial Disclosures" applies to organisations in the financial sector, including banks, which could influence the companies they might finance to provide better climate-related financial disclosures (TCFD, 2017b).

In 2018, two documents were published in the area of financial regulation: the "Report of the European Commission's High-Level Expert Group on Sustainable Finance", which provides a sustainable finance roadmap with practical policy recommendations for the EU (HLEG, 2018), and the "Action Plan: Financing Sustainable Growth", which calls for an EU strategy on sustainable finance and outlines work across the financial system (European Commission, 2018a).

In the EU, the European Green Deal has set the goal of making Europe the first climate-neutral continent by 2050, and the financial sector is expected to play a key role in this regard, as the Commission pointed out in the "Action Plan: Financing Sustainable Growth" (ECB, 2020b).

In 2019, the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" provided additional guidance for banks (and insurance companies), recommending disclosures related to their business activities, including lending and investments (European Commission, 2019c). At the same time, Regulation (EU) 2019/2088 on "Sustainability-related disclosures in the financial services sector" ("SFDR" or "Disclosure Regulation") was published, which aims are to establish harmonised rules for financial market participants on transparency concerning the integration of sustainability risks and the consideration of negative sustainability – impacts in processes, as well as the provision of sustainability-related information for financial products (European Parliament and the Council of the European Union, 2019b).

As part of the renewed sustainable finance strategy, the "Strategy for Financing the Transition to a Sustainable Economy" was published in 2021, presenting new measures to promote investment in sustainable projects and activities, as well as to manage and integrate climate and environmental risks into the financial system (European Commission, 2021g).

Regulation (EU) 2020/852 "on the establishment of a framework to facilitate sustainable investment" (Taxonomy Regulation) creates a framework to facilitate sustainable investment by establishing a "green

list" of environmentally sustainable economic activities. It establishes stricter rules for banks regarding the consistency, transparency, and comparability of information on green financial products and processes (European Parliament and the Council of the European Union, 2020).

In 2020, the ECB outlined supervisory expectations for risk management and disclosure in its "Guide on climate and environmental risks". The ECB (2020b) recognises that the transition to a low-carbon and more circular economy presents risks and opportunities for the economy and financial institutions, with the physical damage caused by climate change and environmental degradation likely to have a significant impact on the economy and the financial system.

In 2021, the Commission published the Delegated Regulation (EU) 2021/2178 "specifying the content and presentation of information" to be disclosed on concerning environmentally sustainable economic activities, where the GAR appears as being the primary key performance indicator for banks that are subject to disclosure requirements, showing the proportion of exposures related to activities aligned with the taxonomy compared to the total assets of these credit institutions (European Commission, 2021c).

The EBA (2021) also published the report "On Management and supervision of ESG risks for credit institutions and investment firms". It provides institutions with definitions of ESG risks and their transmission channels, and identifies the assessment methodologies required for effective risk management. It recommends the timely integration of ESG risks into business strategies, governance, and risk management, as well as supervision. The report focuses on the ability of institutions to assess the potential financial impact of ESG risks in the short, medium, and long term, which should be rigorously evaluated and ensured by institutions and supervisors with a comprehensive and forward-looking view, as well as early and proactive action (EBA; 2021).

Legislators in the EU and globally are taking steps to modify economic activities that have a negative impact on ESG factors and to mitigate their consequences (EBA, 2021). Policies are being introduced gradually, affecting financial market participants over a longer period, and the EBA is committed to developing strategies to support these changes. It should be noted that the same report focuses on ESG risks, but emphasises risks arising from environmental factors, particularly climate change, highlighting the ongoing initiatives and progress made by institutions and supervisors on this specific issue in recent years (EBA, 2021).

In 2021, the European Commission presented its proposal for a CSRD (European Commission, 2021e), effectively extending the scope of its NFRD, which was published in late 2022 (European Commission, 2022c). As previously mentioned, the ESRS were approved in July 2023 to establish uniform and

mandatory requirements for the disclosure of sustainability information by companies covered by the CSRD, aiming to enhance transparency, comparability, and the quality of non-financial reporting practices (European Commission, 2023d).

In 2022, the Commission implemented the Regulation (EU) 2022/2453 "amending the implementing technical standards laid down in Implementing Regulation (EU) 2021/637 as regards the disclosure of environmental, social and governance risks" (European Commission, 2022a).

Article 449º-A of the CRR (Prudential disclosures on ESG risks) sets out how ESG information should be presented in qualitative and quantitative terms (the first disclosure relates to 31 December 2022, and the templates will be completed in stages). It is summarised as follows:

> (a) qualitative information on environmental, social and governance risks (...);
> (b) quantitative information on climate change transition risk (...);
> (c) quantitative information on climate change physical risks (...);
> (d) quantitative information on mitigating actions associated with economic activities that qualify as environmentally sustainable (...);
> (e) quantitative information on other mitigating actions and exposures to climate-change-related risks that do not qualify as environmentally sustainable economic activities (...).
>
> (European Commission, 2022a, p. 3)

The information is presented in tables and templates. The qualitative information indicates the points to be covered in each table in a free format, while the templates (quantitative information) have specific fields for the information. There are three tables of qualitative information (European Commission, 2022a): (1) qualitative information on environmental risk (T1); (2) qualitative information on social risk (T2); (3) qualitative information on governance risk (T3). And the quantitative models: (M1) banking book - indicators of potential climate change transition risk: credit quality of exposures by sector, emissions and residual maturity; (M2) banking book - indicators of potential climate change transition risk: loans collateralised by immovable property - energy efficiency of the collateral; (M3) banking book - indicators of potential climate change transition risk: alignment metrics); (M4) banking book - indicators of potential climate change transition risk: exposures to top 20 carbon-intensive firms; (M5) banking book - indicators of potential climate change physical risk: exposures subject to physical risk; (M6) summary of KPIs on the Taxonomy-aligned exposures; (M7) mitigating actions: Assets for the calculation of GAR; (M8) GAR (%); (M9) mitigating actions: BTAR; (M10) other climate change mitigating actions not covered in Regulation (EU) 2020/852.

In December 2023, Delegated Regulation (EU) was published, complementing the EU Taxonomy by establishing technical criteria to identify environmentally sustainable economic activities (European

Commission, 2023c). These criteria address four key objectives: the protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the preservation of biodiversity. The aim is to ensure that activities contribute positively to the environment without undermining the other objectives of the taxonomy (European Commission, 2023c).

In November 2024, Implementing Regulation (EU) 2024/3172 revised the ESG disclosure requirements for financial institutions, replacing the previous Regulation 2021/637 (European Commission, 2024). It introduced mandatory semi-annual reporting of environmental, social, and governance risks, with greater detail and granularity. The scope was expanded to encompass a broader range of counterparties and enhanced alignment with CRR III and Basel standards. The aim is to enhance transparency and comparability in the prudential management of ESG-related risks (European Commission, 2024).

The Pillar 3 disclosure framework aims to promote transparency as a key driver of market discipline in the financial sector, thereby reducing information asymmetries between credit institutions and information users, and addressing uncertainties about potential risks and vulnerabilities (EBA, 2022).

The EBA (2022) aims to increase the efficiency of disclosure by institutions and strengthen market discipline by developing a comprehensive framework with consistent and comparable disclosures, promoting transparency of ESG risks, improving the management of these risks, and raising awareness of their crucial role in the transition to a green economy.

It is worth highlighting the CSDDD, Directive (EU) 2024/1760, published in July 2024 (European Parliament and the Council of the European Union, 2024b). For banks, the CSDDD requires the disclosure of measures adopted to identify, prevent, and mitigate adverse impacts across value chains, including environmental, climate-related, and human rights risks. Banks must report on how they integrate due diligence into their decision-making processes and relevant business relationships, thereby contributing to greater accountability and resilience in the face of climate transition challenges (European Parliament and the Council of the European Union, 2024b).

In parallel, the “Guidelines on the management of ESG risks” issued by the EBA (2025) were approved in January 2025, entering into force on 11 January 2026 for larger institutions and on 11 January 2027 for small and non-complex entities. These guidelines aim to integrate ESG risks into the overall risk management framework of financial institutions. They are aligned with the objectives of the CSRD and the ESRS, thereby reinforcing regulatory coherence across the European Union (EBA, 2025).

To simplify corporate disclosure obligations and reduce the administrative burden associated with sustainability reporting, while enhancing regulatory efficiency without compromising the objectives of

the European Green Deal, the Omnibus I proposal was approved by the European Parliament in May 2025 (European Commission, 2025f).

The Omnibus Package aims to reduce administrative burdens, harmonize key regulations, and support the transition toward a more effective sustainability reporting framework. It is structured in two parts (European Commission, 2025f): Omnibus I focuses on making reporting standards simpler and more accessible, easing regulatory burdens and boosting business competitiveness (European Commission, 2025g); Omnibus II is linked to the InvestEU program, which aims to stimulate investment across the European Union, supporting business growth, innovation, and the transition to a more sustainable model (European Commission, 2025e).

The Omnibus I include:

- A proposal to postpone the application of reporting requirements in the Corporate Sustainability Reporting Directive (CSRD) for some companies, and the transposition deadline and the first wave of application of the Corporate Sustainability Due Diligence Directive (CSDDD) by one year to 2028 (stop-the-clock proposal);
- A proposal for a Directive amending the CSRD and the CSDDD;
- A draft Delegated act amending the Taxonomy Disclosures and the Taxonomy Climate and Environmental Delegated Acts subject to public consultation;
- A proposal for a Regulation amending the Carbon Border Adjustment Mechanism Regulation.

(Spinaci, 2025, p. 1)

According to the "stop-the-clock" proposal, the European Commission recommends a two-year postponement of the reporting obligations under the CSRD for companies scheduled to begin this process in 2026 and 2027, referred to as Wave 2 and Wave 3 entities. This measure covers, on the one hand, large companies that are not public interest entities and have more than 500 employees, as well as large companies with fewer than 500 employees. Likewise, listed SMEs, small enterprises, non-complex credit institutions, and captive insurance and reinsurance undertakings (Spinaci, 2025).

According to EBA (2021), the challenges of integrating ESG risks into the management processes and supervision of financial institutions are numerous, in particular: (i) the level of uncertainty (related policy and regulatory interventions, and the impact of physical risks); (ii) insufficient data (lack of relevant, comparable, reliable, and user-friendly data); (iii) methodological constraints (risk management models based on historical data, and translation of ESG risks into financial risks); (iv) time lag between standard management tools and the time of materialisation of ESG risks (likely to be over decades); (v) multi-faceted impact of ESG risks on institutions (ESG risks can affect the financial position of institutions in multiple ways); and (vi) non-linearity (ESG, especially environmental ESG, are non-linear in nature).

EU financial services legislation requires companies to disclose a wide range of documents, information, and data to increase transparency and reduce information asymmetry. These datasets can, for example, relate to an organisation's financial performance, environmental, social, or governance issues, products and services provided (Spinaci, 2023). That is, financial and non-financial information that allows them to assess their risk exposure better, is easy for both parties to understand, and is more effective when it includes forward-looking information (Folger-Laronde & Weber, 2018).

The lack of ESG data that banks need from their counterparties is recognised. For large corporations, it is becoming more accessible, but for SMEs, it remains scarce, and it remains challenging to convert existing ESG data into expectations of a counterparty's financial performance (EBA, 2021).

Figure 2.14 illustrates the disclosure requirements for banks regarding sustainability disclosures. These requirements have become more sophisticated over time. However, we can see that there is a tangle of regulations, and we can expect further simplification/unification in the future, always with the underlying need for better disclosure to enable real positive action on sustainability.

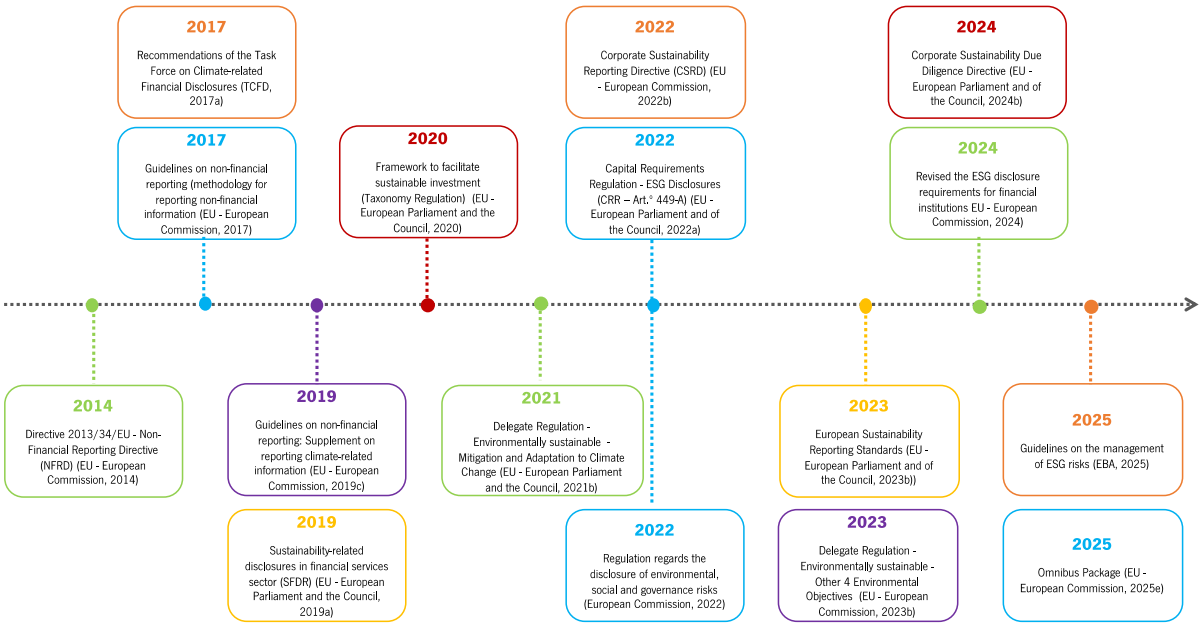

Figure 2.14 Timeline highlighting the regulatory requirements for banks in relation to sustainability disclosure (adapted from Synadino & Caers (2022, p. 2)).

2.3.3 The Climate and the Challenges for Banks

2.3.3.1 Banks Awakening to Climate Change

At COP26, David Attenborough highlighted that everything humanity has achieved in the last 10,000 years has been due to stability, where the global temperature has not varied by more than one degree Celsius (Attenborough, 2021). However, human activities have released carbon into the atmosphere at an unprecedented rate and scale, causing the global temperature to rise abnormally in a matter of decades (Attenborough, 2021; Tiseo, 2021).

In 2020, Carbon Dioxide (CO2) levels reached 414.24 parts per million, compared to levels of around 316 parts per million in 1960 (Tiseo, 2021). If global greenhouse gas emissions continue to rise at current rates, warming is expected to reach 1.5°C by 2040 and up to 4°C by the end of the 21st century. Moreover, even a warming of 1.5°C will lead to severe climate impacts (IPCC, 2018). The severity of climate change is increasing, and action is needed from all stakeholders, including businesses and banks (Folger-Laronde & Weber, 2018). “We are already in trouble. The stability we all depend on is breaking” (Attenborough, 2021, p. 1)!

According to Attenborough (2021), knowledge enables us to understand the problem and makes us the best problem solvers that have ever walked the Earth. If we work separately, we are powerful enough to destabilize our Planet, but if we work together, we will surely be powerful enough to save it. We can all play a role in preventing global warming (Mir & Bhat, 2022). “In nature, everything is connected. This is equally true of a healthy environment and a healthy economy” (Attenborough, 2019, p. 5).

By mid-century, climate challenges are expected to severely disrupt economies and change how citizens live across the Planet (Allen & Craig, 2016). The risks associated with climate change have gone from hypothetical to certain because not enough action has been taken to address these risks (World Economic Forum, 2016), the impacts are unpredictable (Jaworska, 2018), and it is one of the most critical issues in the field of sustainability (Stanghellini et al., 2008). This means that avoiding negative social and environmental risks, and seizing financial opportunities for certain business sectors are motivating factors for corporate engagement (Ortar, 2014). As Ortar (2014, p. 3) states, it is "time to act!". Indeed, climate change policies present new risks but also offer new opportunities for banks (Allianz Group & World Wide Fund for Nature, 2005).

According to Bowman (2010), the relationship between banks and climate change is based on risk assessment, financing, and profit-making. As lenders, investors, advisors, and supply chain leaders, banks can influence the business practices and greenhouse gas emissions of other economic actors.

There is consensus that climate change poses an immense economic and moral challenge, but not on how to address it, due to its complexity, which requires all sectors of society to coordinate diverse and interrelated strategies. Banks are exposed to risk through client activities and ESG-related investments (Bowman, 2010).

Investors and banks have increasingly been asking companies to disclose more information about the risks associated with climate change so that they can be considered financially. Banks are pressuring the private sector to commit to new obligations that mitigate climate change (Caby et al., 2020). Henningsson (2019) asks whether banks have become climate activists and concludes that banks will become activists, collectively and involuntarily.

A weather-related natural disaster can lead to financial instability and macroeconomic recession if it causes severe damage to the balance sheets of households, firms, banks and insurers (physical risks) (Batten et al., 2016; Mir & Bhat, 2022). The impact will be less if the financial system has allocated risk efficiently. Increased global warming can affect the potential growth rate of an economy. Therefore, more robust quantitative estimates that capture the sectoral impact would be needed before central banks could incorporate this effect into their monetary policy analysis (Batten et al., 2016). Unforeseen changes in carbon emission policies could lead to a disorderly repricing of carbon-intensive assets and trigger a negative supply shock (transition risks), potentially leading to significant balance sheet losses and financial instability (Batten et al., 2016). As such, climate change will affect banks, and it is critical that key players adopt practices and behaviours to address it (Caby et al., 2020).

Environmental issues encompass the quality and functioning of the natural environment and its natural systems, including greenhouse gas emissions, renewable energy, energy efficiency, the scarcity of natural resources, ozone depletion, ocean acidification, and biodiversity (UNEP, 2016). “Climate change mitigation” means reducing or mitigating the effects of climate change, making them less severe by reducing or avoiding the emission of greenhouse gases into the atmosphere, and in turn, “climate change adaptation” means taking measures to prevent or reduce the current and future impacts of climate change, anticipating its effects and taking advantage of possible opportunities (EEA, 2022a).

The increasing impacts of climate change will affect all sectors of the economy (Park & Kim, 2020). These climate-related risks pose physical and transitional risks to banks. Central banks and financial regulators play a crucial role, as they have the power to influence and regulate the functioning and outlook of the financial sector (Park & Kim, 2020).

In 2017, the TCFD (2017b) established standards to enable the industry to address climate-related risks and opportunities with recommendations on climate-related financial disclosures. Transparent disclosure is crucial for analyzing the impacts of climate change and developing solutions to mitigate and adapt to it (Folger-Laronde & Weber, 2018). The TCFD's (2017b) recommendations include: (i) developing and implementing indicators and templates for assessing climate-related risks (direct and indirect); (ii) developing and implementing of climate-related accounting for financial products and services; (iii) implementing of standardised carbon disclosure; and iv) offering climate-related risk assessment as a service to clients (Folger-Laronde & Weber, 2018).

The TCFD's recommendations include scenario-based, forward-looking assessment of climate change by financial institutions and companies to incorporate the results into their strategic decisions (Connell et al., 2020). And the emphasis on climate-related risks and opportunities is undoubtedly driven by the increasing impacts of climate change (Connell et al., 2020). Section "2.4.2 Guidelines for reporting climate-related information" analyses these recommendations.

The "Guide on climate-related and environmental risks" outlines supervisory expectations regarding risk management and disclosure. It presents the ECB's (2020b) perspective on the safe and prudent handling of climate and environmental risks. It details how institutions are expected to integrate these risks into their frameworks to enhance transparency and improve their climate and environmental disclosures.

In turn, the "Guidelines on the management of environmental, social and governance (ESG) risks (Final Report)" establish the link between climate change and banking soundness by requiring banks to integrate climate risk into their models, credit-granting decisions, governance structures, and strategic planning, thereby ensuring that the financial system is prepared for the associated impacts (EBA, 2025).

2.3.3.2 The Climate Change Risks and the Way Forward

Carbon risks or climate-related risks are non-physical factors related to climate change that affect banks and investors exposed to these assets, which may not perform as expected due to political and legal, technological, economic and market factors, as well as reputational risks ((Fulton & Weber, 2015).

Strictly speaking, climate-related risks can represent risks to a bank's financial assets, either through the physical impacts of climate change on real economic assets or as a result of policy and market responses to environmental factors (Henningsson, 2019), with increased default risk in loan portfolios or lower asset values (Grippa et al., 2019). Climate-related risks can manifest as various financial risks

for banks. Stress testing is one way to understand how these risks can lead to different financial risks (Henningsson, 2019). “Materiality” is fundamental to risk management and is central to regulatory frameworks. Companies are increasingly recognising the materiality of climate impacts, but still in a conceptual way in relation to banks, namely how climate-related risks and opportunities can materialise into financial risks. The long-term perspective of climate-related factors means that these factors are typically outside the usual risk management horizon of banks (Henningsson, 2019).

When banks are exposed to climate-related financial risks, they must allocate sufficient capital to protect their solvency and assets, thereby safeguarding the financial system (Henningsson, 2019). When climate-related factors are integrated into banks’ risk management frameworks, they become part of risk profiling and risk appetite activities (Henningsson, 2019; Walles et al., 2021).

Under capital requirements regulations, banks are required to disclose their overall risk profile and implement practices to manage those risks in accordance with a defined risk appetite (Henningsson, 2019). Risk profile and risk appetite are closely intertwined, with the former representing the risks inherent in the bank's activities and the latter outlining how the bank intends to address and mitigate those risks. In this way, the bank indirectly defines the "risk" context that will drive its business and credit decisions (Henningsson, 2019; Thompson & Cowton, 2004).

The FSB defines the risk profile as a “point in time assessment of the financial institution’s gross and, as appropriate, net risk exposures (after taking into account mitigating factors) aggregated within and across each relevant risk category based on forward looking assumptions” and risk appetite as “the aggregate level and types of risk a financial institution is willing to assume within its risk capacity to achieve its strategic objectives and business plan” (FSB, 2013, p. 3).

To monitor and mitigate these climate risks, the ECB (2022a) designed the first climate stress test in 2022 to assess the preparedness of European banks to address financial and economic shocks arising from climate-related risks. This test is a learning exercise for banks and supervisors to identify vulnerabilities, best practices, and challenges. The ECB is required to conduct annual stress tests on supervised entities as part of its supervisory review and assessment process (ECB, 2022a).

Banks can have a negative impact on climate change risks if they finance economic activities that contribute to polluting emissions or environmental degradation; conversely, banks can also promote the transition to a low-carbon and climate-resilient economy (Spasić et al., 2021). Furthermore, banks can also raise environmental protection awareness through transparent financial and non-financial disclosure (Spasić et al., 2021).

Banks are reducing their exposure to the most polluting sectors and supporting the sectors most needed to achieve carbon neutrality (FIS Global, 2022). It is worth noting that the link between climate change and credit risk is growing (Oguntuase, 2020), as credit risk is the biggest concern for banks. It is linked to new climate change mitigation policies that shift new responsibilities (Allianz Group & World Wide Fund for Nature, 2005).

The impact of climate change on the financial sector is recognised, albeit indirectly, and can be potentially severe when it occurs (Ozili, 2021). Ozili's (2021) study of the relationship between central banks and climate change risk management proposes five policy solutions: (i) imposing a climate change capital surcharge; (ii) imposing a fixed rate of risk capital (based on Tier 2 capital); (iii) reducing lending to industries whose activities harm the environment and climate; (iv) creating a climate bank; and (v) requiring financial institutions to relocate their major assets to areas less vulnerable to climate change events.

Financial institutions will need to hedge against climate change events, and climate change regulation is expected to increase (Ozili, 2021). The policy options will require banks to exercise extreme caution when lending to companies that cause significant environmental damage. They will therefore put pressure on their clients to develop solutions and internal policies to reduce the environmental and climate damage caused by their activities (Ozili, 2021).

In 2017, a group of central banks and supervisors created the NGFS, whose goal is to help develop environmental and climate risk management in the financial sector and catalyse financing for the transition to a sustainable economy, supporting the TCFD (Connell et al., 2020).

Banks play a critical role in supporting the development of a robust, low-carbon economy (Mir & Bhat, 2022). As climate policy evolves, financial sector regulators will need to meet new expectations in assessing risk and providing finance to governments, businesses, and consumers to invest in adaptation measures (Connell et al., 2020). Thus, if carbon-intensive companies are deemed the riskiest, their financing should be restricted or reduced in favour of companies with innovative technological solutions that absorb or reduce carbon emissions (Mir & Bhat, 2022).

Since the adoption of IFRS 9 – Financial Instruments, banks have been required to recognise credit losses earlier and, in many cases, at higher levels. However, a conservative approach has persisted, highlighting the need to proactively integrate climate-related impacts into risk estimates. Forward-looking recognition of expected credit losses has become essential to avoid reactive approaches, demanding greater resources, technical capacity, and managerial judgement, particularly

in a context of economic damage exacerbated by extreme climate events (Nkwaira & van der Poll, 2023).

Banks are also beginning to recognise that extreme climate events — such as more severe floods and the increasing incidence of wildfires across Europe — are generating losses for the companies they finance, thereby increasing default risk and directly affecting the quality of their credit portfolios (Lau et al., 2024).

Climate risk is virtually ubiquitous and diverse, affecting all sectors differently from industry to industry (SASB, 2022b). For example, companies in the agricultural sector must manage water as an increasingly scarce resource, and forestry companies need to address the risk of wildfires. Additionally, banks must identify carbon-related risks in their loan portfolios (SASB, 2022b).

2.3.4 Loan Origination and Monitoring

2.3.4.1 An Overview

The existence of many companies depends on the availability of natural resources and their ability to adapt and reinvent themselves by taking a hard look at their long-term strategies (Jeucken & Bouma, 2001). The banking sector has been slower than other sectors to respond to sustainability challenges, as it considers itself relatively environmentally friendly. However, due to its potential exposure to risk, it has been slow to examine the environmental performance of its clients (Jeucken & Bouma, 2001).

In 2001, the Commission of the European Communities (2001) pointed out that banks are increasingly taking social and environmental issues into account when assessing the risks of lending to and investing in companies, integrating environmental risks into the credit risk management process from rating, costing, pricing, monitoring and workout (Weber et al., 2008). This integration ensures proper risk management (Weber et al., 2008). This implies that banks recognise the environmental implications of their lending decisions and the importance of environmental information on companies (Thompson & Cowton, 2004).

According to Goss & Roberts (2011), it has long been established in the literature that banks differ from other stakeholders because banks have access to information about the companies that may not be available to others. They use this information to make initial decisions about a company's ability to repay its loans and to monitor repayment throughout the loan's life. To mitigate the risk, banks require collateral, shorten the maturity, include covenants, or increase the spread to reflect the risk. It should be noted that, banks are more sensitive to CSR concerns when loans are unsecured (Goss & Roberts, 2011).

Banks incorporate environmental awareness into their corporate lending decisions (Nandy & Lodh, 2012). Companies with higher environmental scores receive more favourable loans than others; moreover, by considering this environmental awareness when lending, banks can reduce their default risk and benefit society. It is noteworthy that, by signing the UNEP, banks in several countries have agreed to become more environmentally conscious in their activities (Nandy & Lodh, 2012). By digging deeper into company information, banks can reduce the Probability of Default (PD) and stabilise the country's financial economy (Horcher, 2011; Nandy & Lodh, 2012). The results strengthen the existing stakeholder theory by demonstrating that environmental disclosure is a relevant indicator of improved corporate governance, which in turn affects the terms of the company's loan agreement (Nandy & Lodh, 2012).

Credit risk refers to the potential for a borrower or counterparty to default on their agreed-upon obligations. Its management is about maximising a bank's risk-adjusted rate of return while keeping credit risk exposure within acceptable parameters. It is a critical component essential to the long-term success of any bank (BCBS, 2020). Credit risk can arise from extreme weather events that cause significant losses to companies, reducing their ability to repay loans and devaluing their assets (González & Núñez, 2021). It can arise from the bank's credit exposure to companies whose business models are not aligned with the transition to a low-carbon economy; and therefore, have a higher probability of suffering a loss of profits and business interruption, as well as defaulting on loans and other financial obligations, in addition to the loss of value of their businesses (González & Núñez, 2021).

Credit risk is

> the risk of a financial loss resulting from a borrower's failure to repay part of or all the interests and the principal of a loan (...) is calculated based on the borrower's ability to repay and service its debt. Three dimensions play a key role in determining credit risk: a borrowers' capacity to generate enough income to service and repay its debt, as well as the capital and collateral that back the loan.
>
> (Monnin, 2018, p. 3)

Thus, physical and transition costs are sources of credit risk (climate credit risk) (Monnin, 2018). To identify credit risk, banks need to assess the borrower's ability to generate income that can service and repay the debt, as well as the capital and collateral underlying the loan. The strong the cash flows, the overall financial wealth, borrower's own capital, and the collateral value, the lower the credit risk (Monnin, 2018).

Banks perform a credit assessment before lending money to their customers. The calculation aims to quantify the Expected Loss (EL) of the loan based on the PD and the Loss Given Default (LGD). LGD is the expected loss if a borrower defaults. It depends on the credit equivalent and the loss severity, which

is the expected loss on the exposure expressed as a percentage, depending on the amount the banks estimate they would receive if they were to call in the security for a loan and subsequently sell it (Weber et al., 2008).

Figure 2.15 shows the schematic calculation of this expected loss.

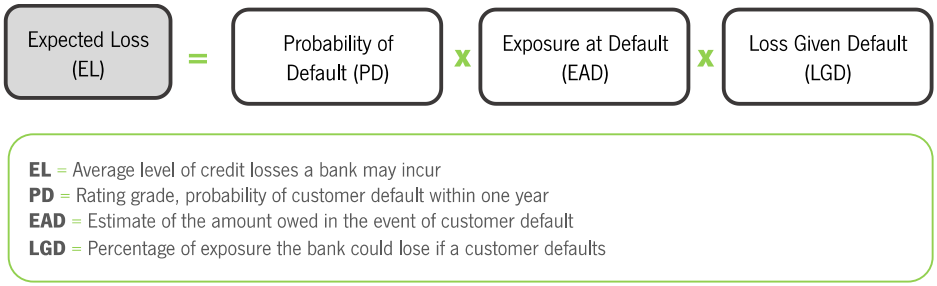

Figure 2.15 Expected loss calculation (adapted from BCBS (2005, p. 4)).

Weber et al. (2008) concluded that most banks are not aware of the importance of environmental risks. Although environmental risks are generally considered in the credit risk management process, there is a lack of systematic and quantitative integration at all stages. In addition, there are also large differences between banks that consider environmental risks in the credit management process (from asking a single question to using sophisticated assessment tools) (Weber et al., 2008).

According to the EU document "Environment 2010: Our Future, Our Choice", the EU states that the lending and investment activities of the financial sector have significant indirect environmental impacts through the companies it finances, and the conditions attached (European Commission, 2001b). Disclosure of relevant information by the financial sector and companies can provide an incentive for "greener" behaviour (European Commission, 2001b).

Banks can also encourage greater disclosure of sustainability reports by companies in other sectors, as the financial sector will begin to see this as a normal business practice and request this information (Kolk, 2005). Companies and banks are part of society. They have an impact on the environment, so one of the roles of accounting should be to disclose information about an organisation's environmental impact (Crowther & Aras, 2008).

Companies are analysed as a whole, so their performance must be understood in terms of their contribution to sustainability, in addition to "purely" financial metrics, because a successful company must take into account economic, environmental, and social aspects (Hastalona & Sadalia, 2021). Weber et al. (2010a) demonstrate that sustainability criteria can be utilised to predict a borrower's financial performance and enhance the credit rating process. In this way, the sustainability

demonstrated by a company influences its creditworthiness as part of its financial performance (Weber et al., 2010). The CSR has the ability to build a strong image and reputation, which leads to better company performance and confirms that CSR acts to reduce the risk of default (Sun & Cui, 2014).

2.3.4.2 Guidelines on Loan Origination and Monitoring

Climate change will profoundly impact companies' asset values, credit ratings, and how the banks engage with companies through financing (Cogan, 2008). Bank lending is an important source of finance for the private sector (FIS Global, 2022), and banks are well aware of the climate change issues and the risks they pose (Stanghellini et al., 2008). Their role in financing a "greener" economy is crucial, especially in the energy transition (FIS Global, 2022).

Climate change has become one of the biggest challenges, and it is essential to identify and explain the following key aspects: climate-related risks, financial aspects of climate change, credit implications of climate change, the integration of climate-related risks into credit risk assessment, and climate risk management (IFRS Foundation, 2020; Oguntuase, 2020).

Capasso et al. (2020) found that the market perceives companies with a high carbon footprint as more likely to fail. Hence, exposure to climate risks affects the creditworthiness of loans and bonds issued by companies. Anginer et al. (2021) found that loans initiated after news of the borrower's impact on climate change have significantly higher spreads, shorter maturities, greater covenant restrictions, and a higher probability of collateralisation. Huang et al. (2022) also found that climate risk leads to less favourable borrowing conditions for companies, including higher interest rates, a higher likelihood of loan collateralisation, and more covenant restrictions. In short, negative climate reputation incidents play an important role in bank lending (Anginer et al., 2021).

However, in addition to the long-time horizon and uncertainty of these risks, there is also a lack of information and knowledge on appropriate methodologies, which requires the implementation of new skills and the integration of these risks throughout the organisation, as well as the adoption of a forward-looking approach (González & Núñez, 2021; Network for Greening the Financial System, 2018). According to Monnin (2018), to assess the impact of climate change on credit risk, a three-step methodology should be followed: (i) defining climate scenarios, (ii) estimating the economic and financial impacts, and (iii) translating the financial impacts into a credit risk measure. As climate risk is expected to impact all stages of a loan's life cycle, banks should incorporate climate risk metrics into their credit risk management processes to effectively manage risk and achieve carbon neutrality (ECB, 2020b). Long-term loans should not be made to high-risk sectors unless an assessment of all climate

change risks for the sector has been made and an early repayment clause has been included in the contract, the identified risk exposure has been covered, or the price of the loan has been negotiated to reflect the risk exposure (UNEP FI, 2006). It may also require the borrower to cover the climate change risk before making the loan is made (UNEP FI, 2006). Risk management should encompass both on- and off-balance sheet risks, considering both financial and non-financial risks, as well as those to which banks are currently exposed and those to which they may be exposed in the future (ECB, 2020b).

The ECB (2020b), in its "Guide on climate-related and environmental risks - Supervisory expectations relating to risk management and disclosure", provides some guidance on the management and information disclosure of climate-related and environmental risks: (i) integrate climate-related and environmental risks at all relevant stages (credit approval, amendment, renewal and refinancing) of the credit process; (ii) adapt risk classification procedures to identify and assess (at least qualitatively) climate-related and environmental risks; (iii) consider climate-related and environmental risks in the valuation of collateral; (iv) monitor and manage credit risk in their portfolios, in particular by analysing sectoral, geographical and individual borrower concentrations analyses arising from climate-related and environmental risks, with exposure limits or de-leveraging strategies; (v) ensure that credit pricing reflects their credit risk appetite and business strategy in relation to climate-related and environmental risks; and (vi) ensure that credit pricing reflects the differential costs arising from climate-related and environmental risks.

In this context, the EBA's (2020b) "Guidelines on loan origination and monitoring", published in June 2020 (applicable to banks from June 2021), have the "the objective (...) to improve banks' credit-granting practices and governance arrangements in order to ensure that they have robust and prudent lending standards", which advocates loan origination procedures (EBA, 2020a, p. 3). Additionally, "should ensure that newly originated loans are of high credit quality and contribute in the future to lower levels of Non-Performing Loans (NPLs)" (EBA, 2020a, p. 4). However, institutions benefit from a number of transitional provisions: (i) two years for existing loans that need to be renegotiated or modified; and (ii) four years for institutions to fill any data gaps and adapt their monitoring frameworks and infrastructures (EBA, 2020a). The document refers to the need for credit assessment and decision-making models to incorporate ESG factors, which should be: (i) integrated into the assessment of the borrower's financial situation; (ii) establish an internal definition of environmentally sustainable lending; (iii) set qualitative and, where appropriate, quantitative targets to support environmentally sustainable lending (EBA, 2020b). Banks should consider the impact of environmental factors and climate change on borrowers' financial conditions, their risk appetite (the level of risk tolerance that they are willing to

accept in order to achieve their strategic and business objectives), and their policies and procedures. For example, a borrower's financial performance may be affected by climate change risks in the form of physical, transition, and other related risks (EBA, 2020b).

Physical risks arise from the risks of the physical effects of climate change, including liability risks for contributing to climate change (EBA, 2020b). Physical risks correspond to potential economic and financial losses caused by climate-related hazards and are divided into: acute risks (when they arise from extreme weather events) and chronic risks (from progressive changes in weather patterns), which have direct impacts (e.g. property damage or disruption of business operations) or indirect impacts (e.g. supply chain disruptions or lower aggregate demand from affected markets) (Monnin, 2018).

Transition risks arise from the transition to a low-carbon and climate-resilient economy, and other risks may emerge from changes in market and consumer preferences, as well as legal risks that could impact the performance of the underlying assets (EBA, 2020b). Transition risks are related to economic disruptions and financial losses associated with the adjustment process to a low-carbon economy, including: policy changes (e.g. higher carbon prices or limits on carbon emissions); technological changes (e.g., low-carbon technologies becoming more competitive than carbon-intensive technologies), and changes in market preferences (e.g., households switching to greener consumption due to environmental concerns), all of which will require companies to make financial efforts to adapt their business models to the new economic conditions (Monnin, 2018). This adjustment process is evident on the equity side of banks, which may suffer losses from exposure to companies whose business models are not aligned with the low-carbon economy (Grippa et al., 2019).

These EBA guidelines cover lending to micro, small, medium, and large enterprises. For "lending to micro and small enterprises", the impact of ESG factors should be assessed at the borrower level, with a focus on environmental and climate factors, including the adequacy of mitigation strategies and, where justified, at the portfolio level. It also outlines a two-pronged approach, one with a simplified view of ESG risks where no relevant risk exposure is assessed, and another with a detailed view of the ESG impact on the borrower's business model (for higher-risk borrowers) (EBA, 2020b). For "lending to medium-sized and large enterprises", banks should assess the exposure to ESG factors, and there is also reference to a dual approach, with a more simplified view of ESG risks if no relevant risk exposure is assessed, or a more in-depth assessment of the ESG impact on the borrower's business model. Thus, a deeper analysis of the borrower's actual business model includes "a review of current and projected greenhouse gas emissions, the market environment, supervisory ESG requirements for the

companies under consideration and the likely impacts of ESG regulation on the borrower's financial position" (EBA, 2020b, p. 42).

In terms of "credit decision and loan agreement", the loan agreement and disbursement should be documented and clear. It should include conditions and preconditions, including those to mitigate environmental and climate risks (so that the contractual agreements provide the bank with the necessary safeguards - contractual conditions and new types of loan covenants), for the loan agreement and disbursement (EBA 2020b).

In 2022, a review document entitled "Walking the talk - Banks gearing up to manage risks from climate change and environmental degradation" showed (considering institutions' credit risk management of climate risks) that: only 25% institutions had established basic practices at all stages of the credit risk management cycle; most had integrated them into the credit underwriting and client onboarding processes; and credit risk management practices often did not cover all relevant portfolios and risk factors (ECB, 2022b). This empirical evidence suggests that there is still a considerable distance to cover before climate change and environmental degradation risk management is widely and thoroughly applied.

In banks, the first line of defence should assess ESG risks at all stages of the client relationship — from onboarding, credit application, and credit review to investment, ongoing monitoring, and new product approval — based on sustainability requirements, taking into account materiality and proportionality (EBA, 2025).

2.4 NON-FINANCIAL AND CLIMATE-RELATED INFORMATION DISCLOSURE

CSR is a relevant component of communication with stakeholders, and a response to the need for non-financial reporting and international rules is required for CSR reporting, specifically regarding the format and scope, to provide a transparent message about CSR- related activities (Krištofík et al., 2016). CSR reporting is dynamic and should integrate the process of defining the organisation's strategy, implementing action plans, and evaluating results, supporting continuous improvement of CSR over time, involving stakeholders, and obtaining their input (GRI, 2012).

2.4.1 The Non-Financial Reporting Directive and its Scope

In 2017, Haller et al. (2017) observed that there was no consensus regarding the meaning or definition of "non-financial information". This lack of clarity harmed the efficiency and effectiveness of corporate reporting, prompting the suggestion of a binding guideline or a change in the terminology.

Erkens et al.(2015) also observed that a significant proportion of articles did not define the concept of "non-financial information", but rather related concepts, such as social, environmental, human capital, or CSR reports.

The term "non-financial information" has its origins in various conceptual backgrounds and is understood in multiple ways. This mix hinders the effective communication of information, which is explained by the different applicable contexts and the broad target audience with different backgrounds (Haller et al., 2017). Furthermore, there is no clear understanding of the distinction between "financial information" and "non-financial information" and no generally accepted definition.

EU Directive 2014/95/EU (NFRD) identifies the significance of disclosing "non-financial information". However, the meaning of "non-financial information" remains ambiguous and multifaceted, and there was no consensus or single, generally accepted definition (Haller et al., 2017).

Subsequently, the NFRD reiterates that non-financial information should be defined and understood as information about CSR, society, and the environment. This statement demonstrates the convergence of the main issues underlying the terms "non-financial information" and CSR (Tarquinio & Posadas, 2020). Several dimensions of non-financial information have been identified, confirming the lack of a common understanding of the term, such as CSR issues, intellectual capital information, information outside the financial statements, business performance, ESG information, strategy, and non-accounting information (information that is not expressed in financial terms) (Tarquinio & Posadas, 2020).

The recent CSDR states that the term "non-financial" is inaccurate because it implies that they have no financial importance, whereas their importance is growing (European Commission, 2022c).

Before the NFRD, non-financial reporting was voluntary in most EU member states; companies were required to report their revenues, profits, and losses, but had considerable latitude in reporting on their social and environmental impacts (Kinderman, 2015). The NFRD changed this by requiring EU companies to report on the social, environmental, and human rights impacts and risks of their activities, facilitating the comparability of information and enabling companies to identify risks associated with their activities, as well as allowing stakeholders to take action to mitigate these risks (Kinderman, 2015).

Directive 2014/95/EU "as regards disclosure of non-financial and diversity information by certain large undertakings and groups" came into force at the end of 2014 and requires companies covered by it to publish a "non-financial statement" that provides an understanding of the development, performance, position and impact of their activities, including (as a minimum) "environmental, social and employee

matters, respect for human rights, anti-corruption and bribery matters" (European Parliament and the Council of the European Union, 2014, p. 4) including:

> (i) a brief description of the group's business model;
> (ii) a description of the policies pursued by the group in relation to those matters, including due diligence processes implemented;
> (iii) the outcome of those policies;
> (iv) the principal risks related to those matters linked to the group's operations including, where relevant and proportionate, its business relationships, products or services which are likely to cause adverse impacts in those areas, and how the group manages those risks;
> (v) non-financial key performance indicators relevant to the particular business
>
> (European Parliament and the Council of the European Union, 2014, pp. 4–5)

The adoption of the NFRD introduced new rules for the disclosure of non-financial information, also referred to as CSR information (Szabó & Sørensen, 2015).

The NFRD requires companies within its scope to publish a non-financial statement on their ESG performance alongside their annual report, aiming to help stakeholders assess the non-financial performance of large companies and develop a responsible approach to business (European Parliament and the Council of the European Union, 2014).

The NFRD had a transposition deadline for Member States of 6 December 2016, which applies to companies in the financial year starting on 1 January 2017 or during the calendar year 2017 (European Parliament and the Council of the European Union, 2014).

The scope of the NFRD includes: "large undertakings which are public interest entities and which, at the date of closure of their balance sheet, exceed the criterion of an average number of 500 employees during the financial year" (European Parliament and the Council of the European Union, 2014, p. 4). It may also apply to public interest entities which are parent companies of a large group that, on a consolidated basis at its balance sheet date, exceeds the threshold of 500 employees on average during the financial year, and which is required to include in its consolidated annual report a consolidated non-financial statement meeting the same criteria (European Parliament and the Council of the European Union, 2014).

The EU Accounting Directive (Directive 2013/34/EU) states that to be a large company, an undertaking must exceed two of the following three criteria in two consecutive accounting periods: (a) a balance sheet total of EUR 20 million, (b) a net turnover of EUR 40 million, and (c) an average number of employees of 250 (European Parliament and the Council of the European Union, 2013a).

A PIE, in turn, is an undertaking that is: (i) a dealer in transferable securities on a regulated market in a Member State; (ii) a credit institution; (iii) an insurance undertaking; (iv) designated by a Member State as a public interest entity (e.g. undertakings with significant public relevance because of the nature of

their business, size or number of employees) (European Parliament and the Council of the European Union, 2013a).

Despite the above considerations regarding the disclosure of non-financial information, it should be noted that there is some disclosure flexibility: if there is a separate report covering the same financial period, Member States could exempt that company from the obligation to prepare the non-financial statement, provided that it: is published together with the annual report; or is made available to the public on the website no later than six months after the balance sheet date and is referred to in the annual report (European Parliament and the Council of the European Union, 2014).

The following may be authorised

> may allow information relating to impending developments or matters in the course of negotiation to be omitted in exceptional cases where, in the duly justified opinion (...) such omission does not prevent a fair and balanced under- standing of the undertaking's development, performance, position and impact of its activity.
>
> (European Parliament and the Council of the European Union, 2014, p. 5)

In relation to the audit, the NFRD recommends that

> statutory auditors and audit firms should only check that the non-financial statement or the separate report has been provided. In addition, it should be possible for Member States to require that the information, included in the non-financial statement or in the separate report, be verified by an independent assurance services provider.
>
> (European Parliament and the Council of the European Union, 2014, p. 3)

In Portugal, the NFRD was transposed into law by Decree-Law N.º 89/2017 of 28 July 2017 (República Portuguesa, 2017). In addition, the "Código do Mercado dos Valores Mobiliários" [Portuguese Securities Market Code] was amended to require issuers of shares admitted to trading on a regulated market in Portugal to disclose, in the annual corporate governance report a description of the diversity policy applied by the company in relation to its management and supervisory bodies, namely in terms of age, gender, qualifications and professional background, the objectives of this policy, the way it has been applied and the results in the relevant period (República Portuguesa, 2017).

This way, instead of submitting a non-financial statement, companies could prepare a separate report in accordance with:

> national frameworks, Union-based frameworks such as the Eco-Management and Audit Scheme (EMAS), or international frameworks such as the United Nations (UN) Global Compact, the Guiding Principles on Business and Human Rights implementing the UN 'Protect, Respect and Remedy' Framework, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, the International Organisation for Standardisation's ISO 26000, the International Labour Organisation's Tripartite Declaration of principles concerning multinational enterprises and social policy, the Global Reporting Initiative, or other recognised international frameworks.
>
> (European Parliament and the Council of the European Union, 2014, p. 2)

In addition to the NFRD, guidelines have been published that are not mandatory. Companies can choose to use international, EU or national frameworks and, if so, specify the framework(s) they use (European Commission, 2017). The EU has published guidelines in line with the NFRD:

- In 2017, the EU published the "Guidelines on non-financial reporting (methodology for reporting non-financial information)" (European Commission, 2017);
- In 2019, the EU published the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (European Commission, 2019c).

"Guidelines on non-financial reporting (methodology for reporting non-financial information)", developed following the NFRD, are non-binding and aim to support companies in disclosing non-financial ESG information that is of high quality, relevant, useful, consistent and more comparable (European Commission, 2017). The underlying rationale is to ensure resilient and sustainable growth and jobs, as well as transparency for stakeholders (European Commission, 2017).

Companies were asked to identify specific issues and material information, and disclosure should be faithful, balanced, and comprehensive in collaboration with stakeholders. Information should also be linked and, where possible, explained (European Commission, 2017). It sets out a framework in which the key principles are: (i) disclosure of relevant information ("material" - analysis of the significance of this information to understand its development, performance, position and impact); (ii) rigorous, balanced and understandable; comprehensive but concise; (iii) strategic and forward-looking; (iv) stakeholder-oriented; and (v) logical and coherent. Content (description and some examples and KPIs) should integrate: (i) business model, policies and due diligence; (ii) results; (iii) key risks and their management; (iv) key performance indicators; and (v) thematic aspects (European Commission, 2017).

Figure 2.16 presents a summary of the "Guidelines on non-financial reporting".



Figure 2.16 Summary of non-financial reporting guidelines (European Commission, 2017).

The NDRD refers to the disclosure of relevant information (material) and states that companies "shall include in the management report a non-financial statement containing information to the extent necessary for an understanding of the undertaking's development, performance, position and impact of its activity" (European Parliament and the Council of the European Union, 2014, p. 4). This impact, whether positive or negative, is critical to consider when disclosing non-financial information and should be reflected in the relevant disclosures in a clear and balanced manner. It is assumed that the non-financial statement gives a true and fair view of the information that stakeholders need (European Commission, 2017).

The materiality of the information to be disclosed needs to be assessed in a context (internal and external), with each entity having elements to consider for inclusion in the non-financial statement. This assessment should take into account specific situations and sectoral issues that are likely to share common challenges. To assess materiality, the company must analyse the importance of the information to be disclosed in order to understand its development, performance, position and impact (European Commission, 2017).

Within the framework of the NFRD, particular attention is given to the "Non-financial reporting guidelines: Supplement on reporting climate-related information". This section does not analyse the supplement; given its relevance, the following subchapter is devoted to it.

The disclosure scope of the NFRD is comprehensive and appears to be in line with current best practice in regulating the disclosure of non-financial, CSR, or sustainability information (Szabó & Sørensen, 2015).

The NFRD marks the transition from voluntary to mandatory disclosure, and it is the first attempt to determine whether this transition affects the value relevance of non-financial information, which is related to the ESG disclosure requirements of the Directive (Cordazzo et al., 2020). It should be viewed as a shift towards greater organisational accountability, as it requires PIEs to report on their social, environmental, and human rights impacts, as well as the risks their activities pose to stakeholders (Kinderman, 2015). They should standardise the rules for reporting non-financial information, as well as its transparency and usefulness (Krištofík et al., 2016). However, an increase in the quantity of disclosure may not be accompanied by an increase in quality (Szabó & Sørensen, 2015), thus calling into question its effectiveness in managing ESG performance (Aluchna et al., 2022).

Non-financial information helps identify issues relevant to organisations and the associated risks, providing additional information that is not apparent in financial reports (Krištofík et al., 2016). According to Krištofík et al. (2016), the lack of obligations to disclose non-financial information is conducive to the emergence of information asymmetry. To limit information asymmetry, non-financial data should be presented with appropriate (specified) measurement, in a proper form (allowing comparability and transparency), and according to defined standards (e.g., sectors). Communication with stakeholders is the foundation for disclosing non-financial information (Krištofík et al., 2016).

CSR disclosures vary between and within sectors, indicating a need for standardisation or reflecting the diversity of business activities, the materiality of these activities, and an understanding of the costs and benefits of CSR information (Christensen et al., 2021). Norms and standards for CSR reporting in specific industries would help to define characteristics with a view to standardisation (Krištofík et al., 2016).

Mandatory CSR reporting may potentially enhance stakeholder information, and the extent to which this disclosure affects the information will depend on the amount of material CSR information already available (Christensen et al., 2021). In addition, mandatory CSR disclosure is expected to lead organisations to make changes in their business operations, with stakeholder pressure and peer

comparisons justifying these changes (Christensen et al., 2021), which ultimately translate into improved performance (Aluchna et al., 2022).

Several relevant issues related to implementation have been identified, including the standard-setting process, the concept of materiality, language as an evasion tool, and assurance of CSR standards (Christensen et al., 2021). CSR standard setting is likely to be driven by social, political, and moral debates about CSR issues rather than by issues related to the utility, measurement, or presentation of decisions aimed at changing corporate behaviour of firms through CSR disclosure (Christensen et al., 2021).

The materiality of CSR information could draw on the principles of financial disclosure, but the link is tenuous. Another consideration is the concept of relevant materiality, perhaps dual materiality (Christensen et al., 2021). In terms of language, standards can dictate what and how organisations should present information, and should be specific, for example, with specific metrics or numerical disclosures. However, if they are too specific, they may not fit a particular entity, which industry standards can mitigate, but this reduces comparability across sectors. Ultimately, mandatory disclosure results in an increased demand for assurance services (Christensen et al., 2021).

The NFRD aims to restore investor and consumer confidence (Battiston et al., 2021), and it appears to be the lever for organisational accountability, helping the organisations and other stakeholders to proactively manage risks and reduce negative externalities (Kinderman, 2015).

Aluchna et al. (2022) show an improvement in ESG performance after the introduction of the NFRD. The NFRD is a fundamental part of advancing the EU's progress on CSR (Hahnkamper-Vandenbulcke, 2021).

2.4.2 Guidelines for Reporting Climate-related Information

As previously stated, climate exhibits temporal variability. However, the current rate of climate change, attributed to greenhouse gas emissions, is considerably accelerated compared to historical trends (Munich Re, 2021). Globally, temperatures are rising, sea levels are rising, and weather patterns are changing dramatically (Munich Re, 2021).

The UNEP FI's (2021) Collective Commitment to Climate Action with Guidelines for Climate Target Setting has been developed. According to the guidelines, banks should: (i) set and disclose long-term and intermediate targets to support compliance with the Paris Agreement; (ii) establish an emissions baseline and measure and disclose the emissions profile of their loan portfolios and investment activities; (iii) use decarbonisation scenarios based on widely accepted scientific data to set long-term

and intermediate targets; and (iv) periodically review targets to ensure consistency with up-to-date climate data (UNEP FI, 2021).

The goals of the Paris Agreement, which aim to limit the rise in global temperature, require ambitious action from all sectors of the economy, combined with government policy commitments and corporate action (UNEP FI, 2021). Banks will need to adapt their short, medium, and long-term business models with realistic strategies backed by robust targets and action plans. The banking sector plays a central role in meeting this challenge, supporting the transition to a net-zero economy through lending and financing decisions, and facilitating the transition of customers (UNEP FI, 2021). This banking sector role contributes to climate change mitigation and the transition to a low-carbon economy (Bowman, 2010).

Undoubtedly, the physical risks of climate change pose several financial risks to the banking sector, namely: (i) operational (increased catastrophes, combined with insurance, may affect lending capacity and default rates in exposed areas); (ii) land devaluation (in highly exposed areas); and (iii) balance sheet volatility (increased volatility of revenues and losses due to adverse weather conditions, combined with increased capital requirements) (Munich Re, 2021).

A quantitative understanding of the portfolio's risk profile is necessary to select the most effective risk management approach, particularly for banks to manage their exposure to physical weather risk (Munich Re, 2021). They can decide whether to accept (low level of risk accepted within the bank's risk appetite), adapt (moderate to high risks to be addressed with adaptation and long-term mitigation strategies), transfer (moderate to high risks can be transferred to risk markets, such as reinsurers), or avoid (extreme risks are undesirable and can best be avoided through risk selection). The choice will be determined by the exposure of a collateral or portfolio to physical weather risk and may also differ for existing and new business (Munich Re, 2021).

Climate change has only recently been identified as a source of risk to the financial system, with several central banks and financial supervisors recommending that investors and financial institutions assess their exposure to climate-related financial risks (Battiston et al., 2021). Climate risks involve profound uncertainty, non-linearity, and endogeneity, which pose significant challenges for macroeconomic and financial risk analysis, necessitating new perspectives to understand the macroeconomic relevance of climate change fully (Battiston et al., 2021).

Banks' response to the Paris Agreement, a milestone in banks' perceptions of climate-related regulatory risk, has been found to vary by firms' exposure and location (Mueller & Sfrappini, 2022). In the United States, banks lend relatively more to companies that may lose from future regulation, limiting the

transition, whereas in Europe, banks shift the supply of credit to companies that believe they will benefit from future regulation, enabling the transition (Mueller & Sfrappini, 2022).

Since the introduction of the Paris Agreement, banks have increased their climate disclosures (Elliott & Löfgren, 2022). Climate-related financial disclosures should consider banks' climate impacts related to their clients' financing in a transparent and explained manner, so that regulators and the public can hold banks accountable based on their disclosures (Elliott & Löfgren, 2022).

According to the study by Mueller and Sfrappini (2022, p. 3), "the stringency of the existing regulatory environment is more important than banks' public commitments in determining lending behaviour". The "Recommendations of the Task Force on Climate-related Financial Disclosures", published in 2017, aimed to support companies in providing the best information to inform capital decisions (TCFD, 2017b). These recommendations are based on four key thematic areas for companies: governance, strategy, risk management, and metrics and targets (see Fig. 2 .17).



Figure 2.17 Key climate-related financial disclosure elements recommended by the TCFD (adapted from TCFD (2017b, p. v)).

These four key recommendations underpin the recommended disclosures, helping stakeholders understand how disclosing entities consider and assess climate-related risks and opportunities (TCFD, 2017b). The TCFD (2017a) has developed additional guidance to highlight key considerations for the financial sector, including the "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures" document, which prominently features banks, to provide a more comprehensive picture of the potential climate-related financial impacts on banks.

In the supplementary disclosures for banks, under "strategy," it is indicated that they should describe the relevant concentrations of credit exposure to carbon-related assets and disclose climate-related risks (transition and physical) in their lending and other financial intermediation activities (TCFD, 2017a). Under "risk management", banks should describe climate-related risks within the traditional banking risk categories (credit risk, market risk, liquidity risk, and operational risk) and explain any risk classification frameworks used (TCFD, 2017a).

In the "metrics and targets" section, banks should present the indicators used to assess the impact of climate-related risks (physical and transition) on lending and other financial intermediation activities over different time horizons (short, medium, and long term) (TCFD, 2017a). Indicators may be linked to credit exposures, equity and debt holdings, or trading positions, disaggregated by sector, geography, credit quality (e.g., internal rating system), and average maturity. Banks should also disclose the amount and percentage of carbon-related assets relative to their total assets, as well as the amount of loans and other financing linked to climate-related opportunities (TCFD, 2017a).

According to the TCFD (2017b), to make informed financial decisions, investors, lenders, and insurers need to understand how climate-related risks and opportunities may impact an organisation's future financial position, which is reflected in the income statement, cash flow statement, and balance sheet (see Figure 2.18). Climate change affects almost all sectors, but the level and nature of exposure, as well as the impact of climate-related risks, vary by sector, type of industry, location, and organisation (TCFD, 2017b).

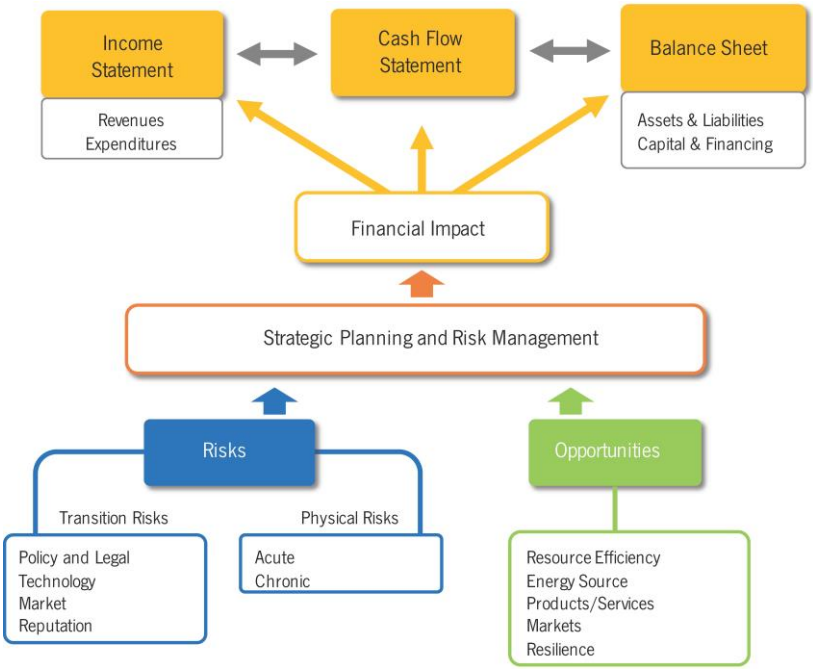

Figure 2.18 TCFD climate-related risks, opportunities and financial impacts (adapted from TCFD (2017b, p. 8)).

The TCFD (2017b) classifies climate-related risks as physical risks and transition risks. There are risks associated with the transition to a low-carbon economy (transition risks) and risks associated with the physical impacts of climate change (physical risks) (TCFD, 2017b). Both types of risks are correlated in that the more transition policies are in place, the less likely physical risks are to occur, and if the economy is hit by these physical risks, the greater the need for effective transition policies (Pointner & Ritzberger-Grünwald, 2019).

The "Guidelines on non-financial reporting: Supplement on reporting climate-related information" have been developed under the NFRD to help companies disclose relevant, useful, consistent, and more comparable non-financial information by complementing the "Guidelines on non-financial reporting (methodology for reporting non-financial information)" (European Commission, 2019c). These guidelines are non-binding, and companies applying them may also use international, EU, or national systems (European Commission, 2019c).

The Guidelines offer guidance to companies on how to communicate the impact of their activities on the climate and the potential impact of climate change on their operations (European Commission, 2019c). The guidelines are based on the opinion of the TEGSF, which published its final report in January 2019 (TEGSF, 2019). According to the TEGSF (2019), the disclosure will lead to greater awareness and understanding of climate-related risks and opportunities, better management, and informed strategic planning. Good disclosure should contribute to a lower cost of capital and a more diversified investor base.

The TCFD Recommendations are widely regarded as robust guidance on material climate-related financial reporting, and the Commission encourages companies to adopt them (European Commission, 2019c).

The guidelines for climate-related information disclosure incorporate the TCFD Recommendations and guide companies in line with the NFRD and the TCFD Recommendations. These guidelines take into account stakeholder feedback on the TCFD Recommendations and the results of online consultations conducted by the European Commission services (European Commission, 2019c).

The NFRD materiality perspective considers both financial and environmental and social materiality, while the TCFD only considers the former (European Commission, 2019c). In the context of climate-related reporting, in terms of dual materiality, it should be disclosed when it is necessary to understand: (i) the company's development, performance, and position (primarily investors); or (ii) the company's external impacts (stakeholders, including investors) (European Commission, 2019c).

The Guidelines include general considerations, materiality information, climate-related risks, dependencies and opportunities, disclosure structure, and consistency with recognised reporting frameworks and standards (European Commission, 2019c). They also provide recommended disclosures and further guidance on: business model, policies and due diligence processes, outcomes, principal risks and their management, and KPIs. An annex provides additional guidance for banks and insurance companies, while another annex offers a mapping of the NFRD requirements and the TCFD recommended disclosures (European Commission, 2019c).

A summary of the disclosures, with some details, is shown in Figure 2.19, adapted from the European Commission (2019c).



Figure 2.19 Summary of the information presented in the NFRD Supplement on Reporting Climate-related Information (European Commission, 2019c).

In the case of banks, the risks can arise from the bank's exposure to companies that experience climate shocks (direct) or from the impact of climate change on the broader economy and feedback effects within the financial system (indirect), with increased default risk in loan portfolios or lower asset values (Grippa et al., 2019).

2.4.3 CSRD and Climate Reporting

The CSRD establishes that, in the context of climate-related information, users seek to understand companies' physical and transition risks, their resilience, and their plans to adapt to different climate scenarios and to the EU's carbon neutrality target by 2050 (European Commission, 2022d). It is also essential to disclose the level and scope of GHG emissions, including the use and origin of offsets, and to ensure the reliability and integrity of such data to avoid double-counting and overestimations. Furthermore, companies must demonstrate concrete efforts to reduce absolute GHG emissions, covering Scope 1 and Scope 2, and, where applicable, Scope 3, as part of their climate mitigation and adaptation strategies (European Commission, 2022d).

Considering the double materiality perspective (see Fig. 2.20), climate-related risks to the undertaking and the undertaking's impacts on climate each represent a distinct materiality perspective (European Commission, 2022d).

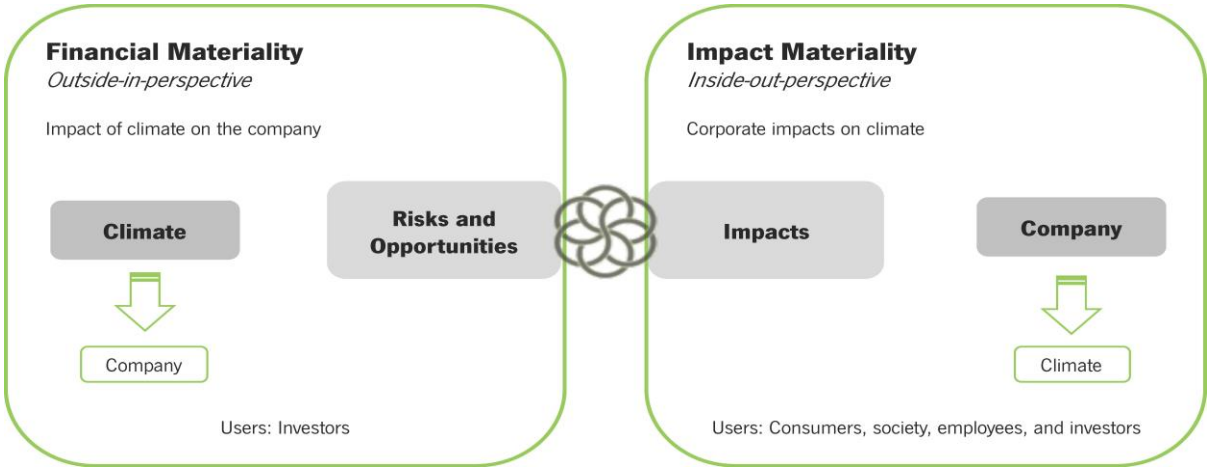

Figure 2.20 Understanding climate through the lens of double materiality - adapted from PWC (2025, p. 3).

The ESRS gives substance to the CSRD. The ESRS establishes disclosure requirements for action plans, targets, policies, climate scenarios, and transition strategies, whose applicability depends on whether such elements exist within the company, which may, in turn, be influenced by its size, capacity, resources, and competencies (European Commission, 2023d).

ESRS E1 is dedicated to "Climate Change" and aims to establish disclosure requirements that enable users of sustainability information to understand:

> (a) how the undertaking affects climate change, in terms of material positive and negative actual and potential impacts;

(b) the undertaking's past, current, and future mitigation efforts in line with the Paris Agreement (or an updated international agreement on climate change) and compatible with limiting global warming to 1.5°C;
(c) the plans and capacity of the undertaking to adapt its strategy and business model, in line with the transition to a sustainable economy and to contribute to limiting global warming to 1.5°C;
(d) any other actions taken by the undertaking, and the result of such actions to prevent, mitigate or remediate actual or potential negative impacts, and to address risks and opportunities;
(e) the nature, type and extent of the undertaking's material risks and opportunities arising from the undertaking's impacts and dependencies on climate change, and how the undertaking manages them; and
(f) the financial effects on the undertaking over the short-, medium- and long-term of risks and opportunities arising from the undertaking's impacts and dependencies on climate change.
(European Commission, 2023d, p. 73)

ESRS E1 interacts with other ESRS standards. Figure 2.21 presents its specific disclosure requirements.

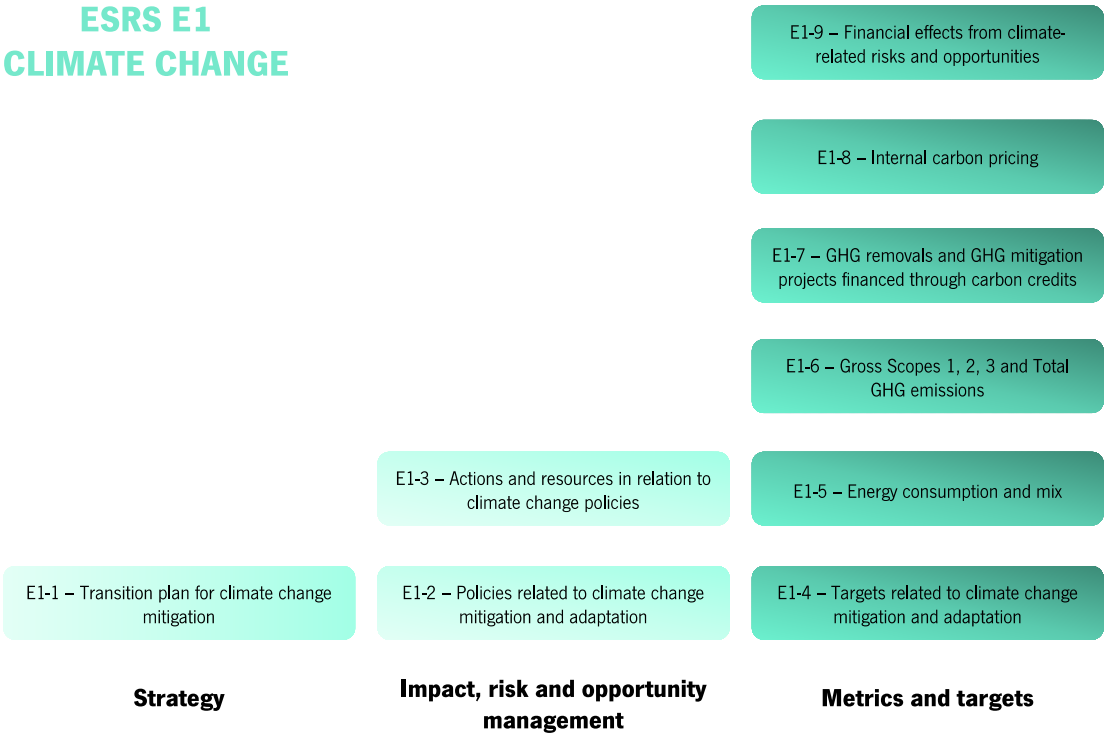

Figure 2.21 Reporting Requirements under ESRS E1 – Climate Change – based in European Commission (2023d, p. 72).

ESRS E1 is based on the European Climate Law, the Climate Transition Benchmark Regulation, the SFDR, the EU Taxonomy, and the Pillar 3 disclosure requirements of the EBA (European Commission, 2023d).

With the CSRD, a significant increase in data requirements is expected throughout value chains, affecting even entities not directly obliged to report, but which will be indirectly involved in meeting the ESRS requirements (Bostedt & Henriksson, 2024). According to Bostedt and Henriksson (2024),

although the European Union aims to ensure transparency, consistency, and comparability in sustainability performance data, doubts remain regarding the effectiveness of the new CSRD directive in addressing the gaps identified in the NFRD. This context raises concerns about the comparability of data between companies and the reliability of investors' trust in declared corporate sustainability (Bostedt & Henriksson, 2024).

According to Aelst (2023), the most significant challenge faced by companies in adapting to the climate-related requirements of the CSRD lies in quantifying the financial impacts associated with climate-related risks and opportunities, a key element of the "double materiality" principle. This aspect is the main obstacle in preparing the reports required by the CSRD.

Broniewicz et al. (2024) examined the environmental disclosure practices adopted by Polish banks and found that, overall, they do not fully meet the requirements set out by the ESRS. Nevertheless, a greater concentration of information was observed in the area of "climate". At the same time, data on "biodiversity and ecosystems" was scarce — a disparity that may reflect the specific characteristics of the banking sector.

Compliance with the ESRS poses a significant challenge for many organisations. Although some companies already have solid experience in non-financial reporting, due to the requirements of the 2014 NFRD Directive, a considerable portion of the market remains unfamiliar with ESG disclosure practices, highlighting uneven preparedness among different economic actors (Broniewicz et al., 2024).

The study of Broniewicz et al. (2024) validated the criticisms raised by Korca et al. (2023) regarding the standards proposed by the European Commission, highlighting that the standardized and predefined format for non-financial disclosure overlooks the specific characteristics of different business models and the relative importance of specific issues for each organisation.

Korca et al. (2023) criticize the standardization of disclosure topics and materiality assessments in sustainability reports, arguing that this approach overlooks the specific needs of stakeholders and the dynamic nature of materiality. Although it facilitates the comparison of reports, there is a risk that the standardized topics may lose relevance over time, thereby undermining the usefulness of the information for decision-making. They argue that policymakers, regulators, and standard setters should encourage comparability within organisations, enabling companies to monitor their performance over time, respond to the expectations of various stakeholders, and align with long-term sustainability goals. This approach can turn sustainability reporting into an effective accountability tool, fostering the genuine integration of sustainable practices into corporate management and driving positive societal change (Korca et al., 2023).

According to Trieu (2025), it is essential to continuously improve the guidelines, with particular emphasis on developing sector-specific ESRS standards, as well as ensuring that companies are genuinely prepared to adopt a holistic approach to sustainability. Although the CSRD provides a significant boost to capacity building and encourages a more integrated perspective, the path toward deep and lasting sustainability is gradual, demanding, and full of challenges (Trieu, 2025).

Although the CSRD is acknowledged for its aim to enhance transparency and consistency in the disclosure of CSR practices, it proves to be excessively complex and resource-intensive, posing a particular challenge for small and medium-sized enterprises. The high data requirements, combined with the lack of clarity in the ESRS, have led many organisations to increasingly rely on specialized consultancy services (Nilsson, 2025). Nevertheless, according to Trieu (2025), companies view the CSRD as demanding but potentially transformative. To tackle its challenges, they combine internal resources with external support, while stakeholder pressure — especially from investors — guides their strategic decisions.

According to Bertram (2025), the Omnibus Package was introduced as an attempt to simplify the implementation of the European Green Deal; however, it failed to achieve this goal. Rather than delivering genuine simplification, it merely reduced the number of amended instruments, excluded certain companies from its scope, and extended compliance deadlines. However, these changes came too late, at a point when many companies were already prepared to meet the original requirements, potentially increasing — rather than reducing — the administrative burden. Bertram (2025) reinforces the view that the European Commission's “stop the clock” measure was too late, and the proposed changes weakened the initial environmental objectives while offering few real benefits to the business sector. It is a pragmatic approach aimed at reducing administrative burdens and boosting competitiveness, but it ultimately creates uncertainty, undermines the consistency of reporting, and may erode stakeholder trust (Nilsson, 2025).

According to Nilsson (2025), many organisations remain engaged in CSR practices not merely out of legal obligation, but primarily due to stakeholder pressure and the recognition of their strategic value. While extended regulatory deadlines may offer temporary relief, there is a risk that such flexibility could undermine stakeholder trust in the long term. Even in a context of regulatory uncertainty, some companies show commitment to continuing their sustainability efforts, even when not legally required to do so. As stakeholder expectations grow, sustainability reporting becomes a key tool for building credibility and gaining a competitive advantage (Nilsson, 2025).

In fact, the legislation aims to direct investment toward sustainable practices, but without a legal mandate, many companies will only continue reporting if they identify strategic value in doing so (Lucas, 2025). Sustainability should be embedded in corporate strategy as a source of competitive advantage, and investments should be seen as opportunities for value creation — not as sunk costs. The Omnibus Package reignites the debate over the future of the European Green Deal, with uncertainty remaining as to whether it will lead to practical simplification or broader deregulation (Lucas, 2025).
Uncertainties for banks and for the companies that finance them!

2.4.4 Research on Non-Financial Information and Climate-Related Disclosures

A significant challenge for sustainability reporting is to develop measures for managing climate change impacts (Elalfy & Weber, 2019).
Banks are responsible for the negative impacts of their clients. If they are not disclosing these indirect impacts, they are not disclosing the main material risks (Elalfy & Weber, 2019). Organisations are increasingly motivated to address sustainability issues and their associated risks (English & Schooley, 2014). Increased awareness of sustainability issues and their risks is driven by regulation, pressure from investors and customers, internal commitment to environmental responsibility, maintaining competitiveness, and the goodwill generated by these activities (English & Schooley, 2014).
According to Fiechter et al. (2022), entities falling under the scope of the NFRD had already increased their CSR activities even before the regulation came into force (in the financial year 2017). Crous et al. (2022) suggest that higher-quality reporting potentially attracts more investors, demonstrates a commitment to quality and performance to stakeholders, and conclude that companies in environmentally sensitive sectors tend to produce higher-quality external reports. However, according to La Torre et al. (2020), the NFRD has failed to restore trust between companies, investors, and society. The disclosure of non-financial information under the NFRD has increased in quantity, albeit with a slight quality improvement (Korca et al., 2021).
During this research, I found studies that either preceded or followed the essays presented in this thesis, which relate to the disclosure of non-financial and climate-related information in banks and listed companies. Tables III and IV present a chronological series of studies conducted within the context of the NFRD and the Guidelines, specifically focusing on the reporting of climate-related information by banks and companies.

Table III Chronology of studies carried out on non-financial information in banks and companies.

Year	Entity	Description	Main Findings	Reference
2008	Companies	Factors Influencing Social Responsibility Disclosure by Portuguese Companies It compared the websites of Portuguese listed companies (2004) and annual reports as means of publicising social responsibility, as well as the factors that influence this publicity, in the period 2003. They combine legitimacy theory and a resource-based perspective to explain the disclosure of information on social responsibility. They use statistical analysis with multiple linear regression models (control variables).	The results suggest that companies with higher visibility are more concerned with improving their image by publicising their social responsibility, even in sectors with high visibility.	(Branco & Rodrigues, 2008a)
	Banks	Social responsibility disclosure: A study of proxies for the public visibility of Portuguese banks Analyses the disclosure of social responsibility on the Internet by banks (12) in the period 2004-2005 and compares it with the disclosure in the 2003 and 2004 annual reports in Portugal. It uses content analysis. The analysis is based on legitimacy theory.	The results indicate that banks with higher visibility attach greater importance to social responsibility disclosure as part of their reputation management strategies, thereby demonstrating a greater concern for improving corporate image.	(Branco & Rodrigues, 2008b)
2016	Banks	Quality of non-financial information reported by Financial Institutions. The example of Poland Assesses the quality of non-financial information presented in the CSR reports of financial institutions in Poland. Financial institutions (6 banks, 1 insurance company and 1 financial intermediary) on the Polish market prepare their CSR reports in different ways, which makes them difficult to compare. The study examines a group of financial institutions by analysing the content of their CSR reports (2010-2015) in terms of the quality of information, i.e. usefulness and comparability.	It concludes that they prepare their reports in different ways, which makes comparability difficult. It highlights the principles and areas of reporting, including the frequency and scope of reporting, as well as verification. CSR reports are inconsistent and unclear, suggesting the introduction of sectoral reporting standards.	(Lament, 2016)
2017	Companies	Directive 2014/95/EU: Are Italian Companies Already Compliant? Assesses the information gap of Italian companies and the requirements of the NFRD (2015). They created an assessment model, the "Non-financial information score", which records the required information in percentages. The sample consisted of 223 companies.	The results indicate that an information gap still exists, but they believe the NFRD will help reduce it in the future. They consider the regulation relevant for improving the quality of non-financial disclosure.	(Venturelli et al., 2017)
	Companies	CSR Disclosure in Polish-Listed Companies in the Light of Directive 2014/95/EU Requirements: Empirical Evidence Examines the extent and quality of CSR reporting by 150 companies listed on the Warsaw Stock Exchange and their compliance with the NFRD (2015). Content analysis of annual reports, separate CSR reports, and websites. The research is based on the legitimacy theory.	The results show that companies prefer annual reports as a means of communicating voluntary CSR disclosures; however, most did not comply with the new requirements. Disclosure of information on human rights and anti-corruption was low. The NFRD is likely to increase the volume and quality of non-financial disclosures.	(Matuszak & Różańska, 2017)
2018	Companies	Between mandatory and voluntary: non-financial reporting by German companies Based on trends and developments in voluntary reporting based on the quality of German companies' sustainability reports (2014-2015). They analysed the non-financial information provided by 522 German companies in 2015-2016. It acknowledges the need for quality improvements, but many reports remain incomplete in terms of content (2014-2015).	The study concludes that many reports require improvement (2015-2016). They report that there is a need for more rigorous selection and linking of financial and non-financial information, a clearer description of policies, and a more effective treatment of risks. Generally, stand-alone sustainability reports contain more information than annual reports.	(Hoffmann et al., 2018)
	Companies	Ex-Ante Impact Assessment of Sustainability Information—The Directive 2014/95 Analyses the expected impact of the Directive (empirically) before the mandatory approach in the oil and gas sector (extended sustainability disclosures). European extractive oil companies listed on the DJSTOXX 600 Europe index as at 30 June 2015 - 10 companies - are analysed.	The results show a reasonable level of completeness of non-financial information, but with areas for improvement to comply with the NFRD. There is an overlap of information between financial and sustainability reporting. The quality of the NFRD is good, as it will increase disclosure in already advanced sectors.	(Carini et al., 2018)

Table III Chronology of studies carried out on non-financial information in banks and companies (cont.).

Year	Entity	Description	Main Findings	Reference
2018	Companies	Ensuring More Sustainable Reporting in Europe Using Non-Financial Disclosure—De Facto and De Jure Evidence Examines the European level of non-financial reporting from a regulatory and practical perspective. It analyses the elements that the NFRD guidelines have in common with the IIRF and GRI 4 guidelines and assesses compliance with the former (content analysis of 2016 annual reports and integrated reports). Sample of the 50 largest European companies. They use the legitimacy theory perspective to explain the results.	They conclude that the content required by the NFRD exceeds the requirements of the other frameworks and find a high level of compliance with the guidelines by large European companies (in particular attention to social, environmental and employee issues) and a demonstrated need to report comprehensively on their activities.	(Manes-Rossi et al., 2018)
	Banks	Non-Financial Reporting in Banks: Emerging Trends in Italy Analyses emerging disclosure practices on institutional websites and investigates how banks use the corporate annual report to communicate non-financial information (2017). Sample of listed Italian banks (8 banks by total assets and market capitalisation).	The study suggests that mandatory disclosure improves the quality and comparability of non-financial information disclosure. The results show that large banks are highly involved in non-financial disclosure. All banks have a sustainability section on their websites, demonstrating their commitment to sustainability.	(Strano & Kabli, 2018)
2019	Companies	The Non-Financial Reporting Harmonization in Europe: Evolutionary Pathways Related to the Transposition of Directive 95/2014/EU within the Italian Context Analyses the gap in the quality of non-financial reporting (2015-2017) and conducts an empirical analysis on the factors affecting the quality of non-financial reporting, carried out in 2017. Italian public interest entities listed on the Milan Stock Exchange were analysed, including 147 companies that had published. A content analysis was conducted to understand the various aspects related to the implementation and to interpret the content of the disclosed information.	The results confirm the qualitative increase of non-financial statements prepared in compliance with the NFRD. And early adopters of the NFRD adapted their non-financial statements more easily to the new requirements.	(Caputo et al., 2019)
	Companies	The state of the art of corporate social disclosure before the introduction of the non-financial reporting directive: a cross-country analysis Assesses the quality of non-financial information in the UK and Italy prior to the implementation of the NFRD (2016) and identifies factors that affect quality. They use content analysis and create non-financial scores based on specific items related to the NFRD requirements. They analysed the disclosures of 343 listed companies.	The results indicate that the UK is more compliant than Italy, suggesting that regulation will have a greater impact on improving non-financial information in Italy.	(Venturelli et al., 2019)
2020	Companies	Does the EU Directive on non-financial information influence the value relevance of ESG disclosure? Italian evidence Examines the application of the NFRD (voluntary to mandatory disclosure) in Italy for the first time. Whether the transition affects the value relevance of non-financial information related to ESG disclosure requirements. It analyses the non-financial disclosure practices of 231 Italian listed companies before (2016) and after (2017) the application of the NFRD. They use content analysis. They emphasise the signalling theory, according to which companies are driven to disclose even more than before the NFRD to show good performance to investors, and the agency theory,	The results do not show a significant increase in disclosure, as Italian listed companies limit such disclosure to a minimum requirement. Companies were already voluntarily providing a non-financial report. They believe that non-financial information does not add value to financial accounting information.	(Cordazzo et al., 2020)
2021	Companies	Credibility of environmental issues in non-financial mandatory disclosure: Measurement and determinants Within the concept of corporate environmental report credibility, related determinants, measures, and indicators are presented. It is considered from the perspective of legitimacy theory, based on the use of Habermas's theory. Using content analysis, the non-financial reports of 152 companies that published their first social and environmental reports at a mandatory level in 2018 are analysed (Italy).	It yields good results, with the reports demonstrating a high level of credibility and comprehensibility, but a low level of completeness.	(Balluchi et al., 2021)

Table III Chronology of studies carried out on non-financial information in banks and companies (cont.).

Year	Entity	Description	Main Findings	Reference
2022	Companies	Real Effects of a Widespread CSR Reporting Mandate: Evidence from the European Union's CSR Directive Examines the actual impact of the NFRD. The sample period spans from 2011 to 2018 for listed companies that meet the requirements. Balanced sample of 4,608 firm-year observations from the EU and 4,608 from the US. Use of content analysis.	The study concludes that covered firms increase their CSR activities and that they started before the Directive came into force, with the real effects being more pronounced in covered firms (with lower levels of prior disclosure). And it finds that the real effects are due to the NFRD rather than to general EU trends.	(Fiechter et al., 2022)
	(...)	The multi-faceted dimensions for the disclosure quality of non-financial information in revising Directive 2014/95/EU Examines the quality of non-financial information, as it is necessary to identify the dimensions of non-financial information quality that should be considered in order to improve the NFRD for more transparent disclosure. Based on an integrative review of the literature and documents collected during the public consultation for the revision of the NFRD on the quality of non-financial disclosure (content analysis) (2016-2021). Refers to institutional theory. In terms of completeness (content of non-financial information), refer to the agency theory and legitimacy theory.	The results show a consensus on the need to improve comparability. It concludes that there is agreement on: reinforcing a dual materiality perspective; specifying content related to sustainability issues; clarifying the relevance of non-financial information; and integrating non-financial information into management reporting. There is also agreement on timeliness in favour of a risk management process and a forward-looking approach.	(Fiandrino et al., 2022)
	Companies	Mandatory Non-Financial Information Disclosure under European Directive 95/2014/EU: Evidence from Portuguese Listed Companies Examines the impact of the NFRD on the quality of non-financial information disclosed by Portuguese listed companies (34) and explains the reporting practices adopted. It conducts a content analysis of non-financial disclosures made one year before (2016), and in the first and second years of the Directive's implementation (2017 and 2018). Theoretically, it provides an in-depth analysis of the impact of the Directive on non-financial reporting practices and the quality of non-financial information disclosures. Based on the isomorphisms of institutional theory, it is confirmed that a normality effect with a limited coercive effect of the Directive determined the choices made by companies.	The results indicate that the main effects on the quality of non-financial disclosures were observed in the first year of implementation and that companies with voluntary and high-quality disclosures (e.g. sustainability reports) maintained these practices after the Directive. Even after two years, they did not disclose information on sensitive issues. Need to identify and improve aspects of the NFRD requirements.	(Carmo & Ribeiro, 2022)
	Companies	From talk to action: the effects of the non-financial reporting directive on ESG performance Examines the impact of NFRD on ESG scores and whether it actually translates into improved performance. Uses institutional and strategic perspectives of legitimacy theory. Conducted in Poland. Sample of all companies listed on the Warsaw Stock Exchange for which Refinitiv provided ESG performance data for the period 2014-2019 (n = 43).	It finds an improvement in ESG performance following the introduction of the NRFD.	(Aluchna et al., 2022)

Table IV Chronologic presentation of studies carried out in the context of climate-related information in banks and companies.

Year	Entity	Description	Main Findings	Reference
2008	Banks	Corporate Governance and Climate Change: The Banking Sector Analyses the corporate governance and strategic approaches of 40 of the world's largest banks to the challenges and opportunities of climate change (2007).	It finds that banks are increasingly addressing climate change-related business opportunities in their annual reports and have doubled the volume of climate change-related research reports published in the past year. However, no bank identified climate change as a material risk.	(Cogan, 2008)
2012	Banks	Much Ado About Nothing? How Banks Respond to Climate Change The research aims to understand how banks respond to climate change (2007). They analyse 114 listed banks (worldwide) and find evidence of deflective decoupling (they implement a climate strategy but decouple it from value creation processes such as lending and investment).	It concludes that for the financial sector, key capabilities, risk, and data management need to be further developed for the substantial implementation of a climate strategy. Sector-specific climate strategy frameworks are needed.	(Furrer et al., 2012)
2014	Companies	Voluntary Disclosure of Greenhouse Gas Emissions: Contrasting the Carbon They examine the consistency of GHG information voluntarily disclosed by French listed companies (350 observations, corresponding to 140 different firms) through the CDP and corporate reports, namely the reported GHG emission quantities and the methodological explanations provided. Based on the stakeholder theory perspective, they find that GHG quantities are significantly higher in CDP.	It concludes that there is a need to enhance the credibility of information across various channels.	(Depoers et al., 2014)
2018	Companies	Climate Change and Mandatory Carbon Reporting: Impacts on Business Process and Performance Examines mandatory carbon disclosure to explore the purpose, practice, and impact of non-financial disclosure. It empirically analyses the carbon disclosures of 176 large FTSE 100 listed companies.	The study concludes that companies disclose their emissions in response to financial incentives, social pressure and/or regulatory compulsion. The importance of disclosure varies across sectors, depending on energy intensity and economic regulatory status, and there is little evidence that disclosure contributes to emissions reductions (warning of the need for caution in incentivising companies to improve environmental performance and social responsibility through disclosure requirements).	(Tang & Demeritt, 2018)
2019	Companies	Implementing the Task Force on Climate-related Financial Disclosures Recommendations: An Assessment of Corporate Readiness Assesses the difficulty of implementing the TCFD recommendations. Sample of disclosures from 15 of the largest oil and gas companies by market capitalisation (10-K or 20-F) before the publication of the TCFD recommendations (2016).	The results show that reporting was inconsistent, with some TCFD categories reported accurately and others not. Variations were found between companies, with most disclosing information quite modestly and others disclosing it quite progressively. Most disclosures were made in (voluntary) sustainability reports. One company responded to all but one of the 11 recommendations, demonstrating that it is possible for companies in the sector to disclose in line with the recommendations.	(Eccles & Krzus, 2019)
	Companies	How climate change disclosure reveals business risks and opportunities Aims to provide companies and regulators with climate-related disclosures globally, and to identify differences in disclosures across regions and sectors. The sample consisted of disclosures (2017-2018) from 500 companies from different sectors (18 countries). Content analysis was conducted.	Concludes that disclosures are not yet integrated into annual reports. Some companies disclose their approach to sustainability in the annual report, as part of the corporate strategy discussion, or as part of the directors' report or the operational and financial review (future outlook). However, most have included their disclosures in non-financial reports, such as sustainability reports or CDP reports.	(Nelson, 2019)
	Banks	Determinants of climate change disclosures in the Turkish banking industry Examines the extent of climate change disclosure in the Turkish banking sector and explores the factors that explain the extent of such voluntary disclosure. Sample of 24 banks operating in Turkey (2010 to 2016). Uses a disclosure index to examine the extent of disclosure and multiple regression and split regression analysis for the factors. Use the political cost and legitimacy theory to explain the results.	Results indicate that more banks are providing climate-related disclosures; however, some banks have not integrated climate change issues into their credit policies or business strategies. Explanatory factors: bank size, profitability, bank age, and listing status.	(Kılıç & Kuzey, 2019)

Table IV Chronologic presentation of studies carried out in the context of climate-related information in banks and companies (cont.).

Year	Entity	Description	Main Findings	Reference
2019	Companies	The Relevance of Climate Change Related Risks on Corporate Financial and Non-Financial Disclosure in Italian Listed Companies Aims to promote a better understanding of how and to what extent companies disclose climate change risks in annual and stand-alone reports in line with the TCFD recommendations, the scope and depth of climate change risk disclosure, and the category of risks they disclose. The sample consists of 25 non-financial companies included in the FTSE MIB (2017). It uses legitimacy theory to explain corporate responsibility for climate change.	The results show that comprehensive reporting on climate risks, in line with the TCFD recommendations, is not yet in place (further away for smaller companies). The gap is significant even in high risk sectors. Apparent gaps on the financial impact of climate risks. There is a need for greater transparency and rigour in the preparation of climate-related disclosures (e.g. methodologies).	(De Bernardi et al., 2019)
	Banks	Banks' climate commitments and credit to brown industries: new evidence for France Examines banks' green intentions in terms of credit allocation policies to more or less carbon-intensive industries in France. It uses datasets on banks' credit exposures to fifty industries and two size classes of companies for the main banking groups operating in France. It is combined with information on the GHG emission intensity of the industries and a score for the banks' climate commitments (2010-2017).	The results show that higher levels of bank climate commitments are associated with less lending to large companies in the five most carbon-intensive sectors. The need for carbon reporting by SMEs is also predicted.	(Mésonnier, 2019)
	Companies	A new measure of environmental reporting practice based on the recommendations of the Task Force on Climate-related Financial Disclosures Compliance of the 40 largest capitalisations on Euronext Paris with the TCFD recommendations, with a view to establishing a Comprehensive Compliance Index to measure the disclosure of environmental information. Content analysis of companies' reference documents (2015-2017). Use legitimacy theory as a framework for analysing environmental disclosure.	The results show a gradual improvement in companies' environmental disclosure over the years. Satisfactory levels in 2015 and 2016, with no TCFD recommendations, but discrepancies remain. Sectors with high environmental impacts have higher scores. In 2017, these companies communicated the most in the areas of risk management, metrics and governance, well ahead of strategy, with improvements in environmental disclosure in each area. Developing opportunities and risks by sector.	(Demaria et al., 2019)
2020	Banks	The determinants of voluntary climate change disclosure commitment and quality in the banking industry Examines the determinants of voluntary climate change disclosure by banks and the quality of this disclosure. Sample with data from 117 banks from 40 developed and developing countries around the world. Ordinary least squares regression and multivariate logit analysis to show that country and bank-level characteristics are much more predictive of banks' engagement in voluntary carbon disclosure initiatives and environmental ratings than the quality of carbon disclosure. They used data from the BankTrack website, CDP (year 2018) and the Banker Database. Banks' commitment to voluntary carbon disclosure supported by stakeholder theory, legitimacy theory and greenwashing.	The study concludes that bank strategy and the economic and financial patterns of the country in which the bank is located have a significant impact on the extent and quality of bank climate change disclosure (the banking sector needs to ensure that reporting is effective and not just for minimal benchmarking, especially in more developed countries).	(Caby et al., 2020)

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Table IV Chronologic presentation of studies carried out in the context of climate-related information in banks and companies (cont.).

Year	Entity	Description	Main Findings	Reference
2020	Companies	Corporate environmental reporting: Are French firms compliant with the Task Force on Climate Financial Disclosures' recommendations? Examines the environmental disclosure practices (highlighting climate-related risks) of French companies. The sample comprises 40 Euronext Paris companies and examines compliance with the TCFD recommendations. Content analysis of companies' reference documents (2015 and 2018) and Climate Compliance Index (CCI), assessing whether companies disclose information on climate-related risks and opportunities regarding governance, strategy, risk management, and metrics	The results indicate a gradual increase in the Comprehensive Compliance Index, although variations exist between sectors and management areas. They present indicators by area, defining climate risks and opportunities, as well as their financial implications, by sector.	(Demaria & Rigot, 2020)
2021	Companies	An Exploratory Study on Climate-Related Financial Disclosures: International Evidence Examines the extent of climate-related financial disclosures following the TCFD recommendations. Sample of 3,887 observations, 1860 companies from 57 countries responding to the CDP climate change questionnaire (CDP2019 to CDP2020).	Results show that the level of climate-related financial disclosure increased following the issuance of the recommendations.	(Bose & Hossain, 2021)
2022	Companies	The climate-related information in the changing EU directive on non-financial reporting and disclosure: first evidence by Italian large companies Examines the quality and quantity of climate-related information disclosed by PIEs under the NFRD and the guidelines. A content analysis of the sustainability reports (2019) of 34 large listed companies in the industrial sector in Italy was used. The study is based on corporate disclosure theory, legitimacy theory, and stakeholder theory.	It concludes that several required climate-related disclosures are missing or not presented in sufficient depth. Climate-related disclosure is at an early stage of compliance with the guidelines (reporting of climate-related information).	(Lombardi et al., 2022)
	Companies	Changes in the climate-related disclosure of German listed companies during the first years of the new reporting standard Examines the development of climate-related disclosure within the NFRD. The study uses an index of climate-related disclosure in the non-financial statement and a t-test with dependent variables, with content analysis as the basis of the study. Sample (130 companies) based on the non-financial statements of companies in the German Share Index, Mid-Cap-DAX and Small-Cap-DAX (2018-2020).	The study concludes that there has been an improvement in climate-related reporting, accompanied by an increase in the number of climate-related topics disclosed. They disclose a greater number of environmental targets and there are more climate-related topics in the reports.	(Leicht & Leicht, 2022)
2023	Banks	Corporate Climate Reporting of European Banks: Are These Institutions Compliant with Climate Issues? This study analyses how the banks that make up the STOXX Europe 600 index disclosed climate-related information between 2017 and 2020, based on the general and specific recommendations of the TCFD. They use the legitimacy theory to explain the quality of climate reporting.	Although there has been an overall improvement in the quality of disclosures in recent years, a lack of forward-looking data, particularly scenario analyses, remains.	(Friedrich et al., 2023)
	Companies	Corporate reporting on Climate Change: evidence from Belgian listed companies This study examines how Belgian listed companies are preparing for the CSRD climate standards, identifying areas that are well-disclosed and those that are challenging to report on.	The study concludes that, according to the CSRD, the main flaw in climate disclosure is the difficulty of quantifying the financial impact of climate risks and opportunities — a central element of “dual materiality”.	(Aelst, 2023)
2025	Companies	Climate change and Task Force on Climate-related Financial Disclosures (TCFD) reports. A comparison between Italy and Spain The study compares the TCFD reports of Italian and Spanish companies listed on the FTSE MIB and IBEX-35. It assesses how compliant companies are with climate disclosure requirements and the level of detail in their disclosures from 2020 to 2023.	The study reveals that Italian and Spanish companies adhere to the TCFD guidelines. However, the way topics such as governance and risk management are reported varies, indicating a potential for more detailed analysis.	(Xhindole et al., 2025)

The list of relevant publications has grown over time. Tables III and IV give titles, details of the research, methods, and associated theory(s), if any, followed by the main conclusions. In these articles, content analysis is the most common method, and legitimacy theory is the primary theoretical framework employed.

Climate disclosure in companies has evolved rapidly (Haddon et al., 2022), and the last decade has seen a significant increase in demand for information on climate-related financial risks. The absence of regulatory disclosure requirements has led to a proliferation of standards that has quickly become confusing, and both users and producers of information have called for convergence and harmonisation of reporting standards (Haddon et al., 2022). According to Tay & Parker (1990, p. 73), harmonisation "is a movement away from total diversity of practice" and standardisation "is a movement towards uniformity". Progress towards such harmonisation was made in 2021, with IOSCO concluding that investor demand for consistent and comparable sustainability disclosures had not yet been met (Haddon et al., 2022).

2.4.5 Theoretical Approaches

According to Buhr (2017), several theories can explain the motivation for sustainability reporting.

Many theories influence the integration of non-financial information in corporate reporting in a context- and jurisdiction-specific manner, i.e., organisations in different countries and sectors adopt practices that differ from those of other companies in different countries or sectors (Maama & Mkhize, 2020). For example, organisations in sectors whose activities have a greater negative impact on society and the environment may be influenced by, among others, legitimacy theory. In contrast, companies in the service and trading sectors, which have a less significant impact, may be influenced by, among others, stakeholder theories (Maama & Mkhize, 2020).

In institutional theory, organisations are influenced by normative pressures, either from external sources (e.g., the state) or internal sources (the organisation itself). In some cases, pressures lead organisations to be guided by legitimated elements, such as standard operating procedures, professional certification, and government requirements, which sometimes divert attention from task performance (Zucker, 1987).

The institution is based on the existence of a typification of habitual actions by certain actors, with reciprocity between actions and actors; in other words, in certain circumstances, a type of actor is expected to perform a specific action (Berger & Luckmann, 1966). It should be noted that institutions

always have a history and control, establishing pre-defined standards of behaviour that point in one direction out of many other possible directions (Berger & Luckmann, 1966).

Institutional factors influence the link between economic conditions and the socially responsible behaviour of organisations:

> public and private regulation, the presence of nongovernmental organizations and other independent organisations that monitor corporate behavior, institutionalised norms regarding appropriate corporate behaviour, associative behavior among corporations themselves, and organised dialogues among corporations and their stakeholders.
>
> (Campbell, 2007, p. 948)

Campbell (2007)concludes that there are institutional conditions that mediate basic economic relationships, and that organisations can be expected to be more socially responsible the stronger the state regulation, collective industry self-regulation, NGOs, and other independent organisations that monitor them, and a normative institutional environment that encourages socially responsible behaviour.

Institutional theory is a theoretical framework for analysing social (particularly organisational) phenomena that sees the social world as primarily made up of institutions - enduring rules, practices and structures that set the conditions for action, where institutions are central to explaining the social world because they are embedded in the social order and guide the flow of social life (Lawrence, 2008). Institutions constrain action because deviations from them are automatically countered by social controls that make deviations from the social order costly (Lawrence, 2008).

“Institutional theory alerts scholars to the simple fact that corporate agency is largely shaped by the dominant intuitions of the ‘business system’ or ‘organisational field’ within which firms operate” (Brammer et al., 2012, p. 21). In their study, Brammer et al. (2012, p. 7) state that "institutional theory suggests seeking to place CSR explicitly within a wider field of economic governance characterized by different modes, including the market, state regulation and beyond", rather than in the realm of voluntary action. When applied to the study of CSR, institutional theory provides a better understanding of the responsibilities of organisations in diversity and dynamics (Brammer et al., 2012).

DiMaggio and Powell (1983) state that institutional theory is related to the forms used by organisations and explains why they become more homogeneous within an organisational field. According to Islam & Deegan (2008, p. 12) institutional theory can help explain certain non-financial reporting practices because "organisations will be coerced by their powerful stakeholders into adopting and maintaining particular practices, including particular reporting practices". Powerful stakeholders that have been identified as influencing non-financial information include, among others: foreign investors, government,

regulators, NGOs, parent companies and subsidiaries (Amran & Haniffa, 2011), multinationals, the media (Islam & Deegan, 2008), and the workers, suppliers, environmentalists, communities, etc. (Doh & Guay, 2006).

According to Fiandrino et al. (2022), non-financial reporting requirements have become standards that companies adopt in response to societal pressures. The ever-changing regulations, coupled with increasing accountability to and from stakeholders, will catalyse the quality of these non-financial disclosures, clarifying the multidimensional nature of such reporting in light of regulatory developments aimed at enhancing the quality of non-financial information and ensuring greater transparency for all stakeholders (Fiandrino et al., 2022).

Legitimacy theory requires that organisations, in addition to fulfilling society's expectations, must ensure that they are perceived as conforming to society's expectations and norms for the multitude of stakeholders (An et al., 2011). "Legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p. 574). Legitimacy theory posits that legitimacy is a form or condition achieved when an organisation's value system aligns with the societal value system (Chen & Roberts, 2010), and is essential for the long-term survival of organisations (Deegan, 2002; Ihlen, 2009).

When there is a perception that an organisation's behaviour is not in line with society's norms, there is a threat to legitimacy (Brown & Deegan, 1998; Farache & Perks, 2010). Therefore, companies will seek to do whatever is necessary to protect their image as a legitimate company, through objectives supported by legitimate methods of achieving them (De Villiers & van Staden, 2006).

"Legitimacy theory is closely linked to stakeholder theory" (Guthrie et al., 2006, p. 256), which suggests that organisations continually seek to ensure that they operate within the boundaries and norms of the societies in which they operate (Brown & Deegan, 1998; Guthrie et al., 2006). "These bounds and norms are not fixed, but change across time, thereby requiring the organisation to be responsive" (Brown & Deegan, 1998, p. 22). An organisation needs to demonstrate to its relevant stakeholders that its activities are consistent with its values; reputation and legitimacy are inseparable, so legitimacy requires a reputation that needs to be maintained (Branco & Rodrigues, 2008a). The level of legitimacy varies between organisations, with those that are more visible to their stakeholders needing a higher level of legitimacy (Branco & Rodrigues, 2008b). Legitimacy theory is associated with interpreting organisations' motives for disclosure as a means to strengthen their legitimacy (Al Amosh & Khatib, 2022).

There are two main drivers of legitimacy: action (activities undertaken by the company in line with social values) and disclosure (publicising activities in line with social values) (De Bernardi et al., 2019). Disclosure is considered an essential part of the legitimacy process because even if the company's activities reflect social values, legitimacy can be threatened if there are communication failures (Kouloukoui et al., 2018). According to Archel et al. (2009) and Demaria et al. (2019), organisations use disclosure as a strategic tool to legitimise their activities in the eyes of stakeholders.

Suchman (1995) identifie three forms of legitimacy: pragmatic, based on public self-interest; moral, based on normative approval; and cognitive, based on understandability and acceptance and provides a broader view of legitimacy theory, extending the earlier view that explores the strategic uses of voluntary CSR as a reactive action to repair legitimacy and presents the strategic and institutional aspects of legitimacy theory. Following Elsbach (1994), Suchman (1995) distinguishes between strategic and institutional approaches: “is a matter of perspective, with strategic theorists adopting the viewpoint of organisational managers looking 'out', whereas institutional theorists adopt the viewpoint of society looking ‘in’” (Suchman, 1995, p. 577). Thus, based on the goal of legitimacy, there are two levels of legitimacy: institutional and organisational (or strategic) (Chen & Roberts, 2010).

In the context of legitimacy theory, Dumay et al. (2015) presented a model known as "material legitimacy." They define material legitimacy “as the form of legitimacy that enables organisations to blend what is important to the organisation (strategic legitimacy) with the primary concerns of its major stakeholders (institutional legitimacy)”, and describe how companies seek to achieve beneficial outcomes for themselves and their stakeholders. Still, the problem is defining which issues are material and whether they should be disclosed (Dumay et al., 2015, p. 2). The authors believe that organisations are more likely to achieve better outcomes for all stakeholders by focusing on material issues. Therefore, organisations are required to disclose non-financial information that is relevant and material to them and their stakeholders (Dumay et al., 2015; La Torre et al., 2018).

La Torre et al. (2018) point out that, in the context of mandatory non-financial disclosure, the coercive force of the law stands out, with organisations disclosing because they are compelled to do so. In this way, the NFRD can be understood as a political action aimed at giving material legitimacy to companies’ non-financial information (Mazzotta et al., 2020). According to Mazzotta et al. (2020), the NFRD can also be seen as a way of legitimising non-financial disclosure by organisations, and on the other hand, the mandatory nature of the disclosure means that the effectiveness of the disclosure should be considered rather than the motivation. Understanding how and what is reported is more

important than explaining the motivations that drive the disclosure of non-financial information (La Torre et al., 2018).

Mio et al. (2020) conclude that legitimacy theory continues to explain companies' decision to disclose non-financial information, even after the implementation of the NFRD. That is, even in the context of mandatory disclosure, companies still use the disclosure of non-financial information to gain legitimacy.

Bartolacci et al. (2022) analysed several publications between 1989 and 2019 to understand the most and least used theories. The main theories include legitimacy theory, stakeholder theory, and institutional theory. About legitimacy theory, it has been widely used to explain the behaviour of organisations regarding non-financial disclosure. The authors conclude that legitimacy, institutional, and stakeholder theories have been used to support empirical or conceptual studies on non-financial information, and that the number of studies on non-financial information has increased exponentially in recent years (Bartolacci et al., 2022). Indeed, it is more likely than not that there is no single motivation for disclosing non-financial information (Omran & Ramdhony, 2015).

2.5 CONCLUSIONS

Based on the literature review, it can be inferred that there has been growth and increased interest in CSR in Europe over the last decade, with "a bright future" predicted (Carroll, 2018, p. 12). The concept and regulation have evolved in tandem with various events, and there is a heightened awareness of social responsibility among companies, banks, investors, and society. The emergence of regulations in various areas (environmental, climate, social, governance, etc.) illustrates the significance of these issues.

The contemporary globalised world is witnessing a growing recognition of the interdependence and the need for cooperation between various entities of the economic and financial system, while the development of business activities and information dissemination is influenced by social, political, environmental, technological, and natural changes (Vukić et al., 2017). Several events have driven CSR and the regulation of its disclosure. According to Carroll (2018), organisations have responsibilities to society that extend beyond their shareholders, investors, customers, employees, the community at large, the government, and the natural environment. CSR applies to all organisations, although the focus is on large organisations because they are more visible and have more power and responsibility (Carroll, 2018).

According to Hess (2019), non-financial information should lead to changes and impacts on performance at environmental, social, and governance levels, and this is the only way non-financial

information can be truly meaningful. Standards are key to establishing a dialogue around accountability and sustainability reporting (Villiers et al., 2022).

Different organisations have coexisted in the pursuit of CSR reporting, and this diversity has not led to the development of comparable disclosure standards, resulting in competing standards. We have also observed that the main CSR reporting organisations are now seeking to network and support each other. According to Driver et al. (2023), the collaborative efforts of the major sustainability reporting organisations point to the future path of standardisation in corporate reporting.

A confusing system of financial, CSR, non-financial, and integrated reporting has been identified, and comparability and credibility are essential if companies are to be held accountable and act to prevent damage to the Planet (Tsagas & Villiers, 2020). This confusion led to the creation of the NFRD, a milestone in the field of non-financial reporting that seeks to address the market's information needs. It was a first step, notable for its mandatory nature, and supported by guidelines that strengthened its scope and sought to complement it. The guidelines on reporting climate-related information stand out, reflecting the importance of this issue today.

The CSRD and the ESRS aim to build upon and deepen the progress achieved by the NFRD. The level of rigor embedded in their requirements is undeniable and, although not expected to be perfect, it represents another milestone in the pursuit of transparent and comparable information.

However, the recent Omnibus Package appears to be a step backward, delaying progress toward consolidating sustainability-related information. This step backward is justified by the complexity of the process and the need to reduce costs for organisations. Yet, it remains uncertain whether such obstacles could be overcome through enhanced information and training provided by European and national authorities, thereby transforming complexity into something more accessible and understandable.

Climate change is a key issue for the EU, the world leader in this field. Climate change is here to stay, and the slowdown in CO_2 emissions that has been much discussed seems a long way off. There is an increasing focus on the disclosure of climate-related information. Beyond their own climate-related disclosures, banks rely on information provided by their clients, especially corporate entities. In lending and monitoring, there is a fundamental opportunity for banks to work with their clients, particularly corporations, to help achieve carbon neutrality. Historical and prospective non-financial information is needed (Flöstrand & Ström, 2006).

Because banks have been involved in past crises, they are closely monitored by society, investors, regulators, and others, and it is essential to maintain financial stability, which can be easily destabilised.

In summary, banks must be closely aligned with sustainability now and even more so in the future. At the same time, banks face numerous regulatory challenges, and the regulatory storm may still be far from over.

The need for a global understanding of organisations is recognised, requiring both financial and non-financial information. Sustainability reporting is destined to become part of the overall structure of annual reports. The combination of financial and non-financial reporting is beginning to be recognised as very important. However, there is still a need to ensure that standardised reports do not focus too much on financial performance or cater only to financial stakeholders, providing reliable information for all stakeholders (Driver et al., 2023). Standardisation of sustainability reporting is expected to be implemented globally, as regulators and stakeholders undoubtedly require reliable, valid, and comparable sustainability information on corporate performance (Driver et al., 2023).

However, just as financial reporting took time to develop, it is clear that CSR reporting has a long way to go to achieve the global acceptance that financial reporting now enjoys, as evidenced by the search and development of sustainability reporting standards in recent years.

A comprehensive understanding of organisations requires the inseparable integration of financial and non-financial information, as only a combined perspective captures organisational reality and its true potential for value creation or destruction.

CHAPTER III: Methodology

3.1 ONTOLOGY, EPISTEMOLOGY, AND PARADIGM OF RESEARCH

“Research is a process of intellectual discovery, which has the potential to transform our knowledge and understanding of the world around us” (Ryan et al., 2002, p. 7). Research is the logical and systematic search for new and relevant information on a given subject to find solutions to scientific and social problems through objective (Al-Saedi, 2020) and systematic analysis (Al-Saedi, 2020; Mishra & Alok, 2017). It can be said that it is a search for knowledge (information about subjects) that can generate new contributions to existing knowledge and promote progress in a given field (Al-Saedi, 2020). It is supported by study, experience, observation, analysis, comparison, and reasoning, and is pervasive. It seeks predictions, explanations, relationships, and theories for events (Al-Saedi, 2020).

According to Al-Saedi (2020), research is made up of "re" and "search", where "re" means new and "search" means to examine closely and carefully, to test, experiment, or explore, together describing a careful, systematic, and composed study in a particular field to establish facts or principles. It uses scientific methodology to solve problems and create new knowledge (Al-Saedi, 2020).

Grover (2015) pointed to the existence of different research approaches: philosophical worldview (defining a paradigm according to the philosophical orientation of a research approach), research design (representing the plan for collecting, measuring, analysing data, interpreting, and communicating conclusions), and research methods (how information is obtained from the sample).

In describing the methods, the researcher must demonstrate how they address the research questions and/or hypotheses, which should be presented with rigour and detail to justify the choice and the possibility of replication by another researcher or in another situation (Grover, 2015).

According to Mishra and Alok (2017), there are several types of research:

(a) Descriptive (consisting of inquiry and investigation to establish facts of various kinds) vs. Analytical (using facts, information, and data already available; and analysing all of it to formulate an evaluative hypothesis);

(b) Applied (finding a solution to a specific, practical problem faced by, for example, an organisation or society) vs. Fundamental (finding information with a broad sense of application to the body of scientific knowledge that already exists);

(c) Quantitative (based on the aspect of quantity or extent) vs. Qualitative (associated with qualitative phenomena, i.e., related to quality or variety);

(d) Conceptual (related to an abstract idea or theory) vs. Empirical (based on experience or observation, acquiring knowledge through direct and indirect observation or experience).

Based on these definitions, the three essays presented in this thesis are based on analytical, applied, quantitative, and empirical research.

According to Mishra and Alok (2017, p. 5), the research process "consists of a sequence of actions or steps necessary to effectively carry out research and the desired progression of these steps", several stages that underpin the research process, which are common to all types of research and approaches (Collis & Hussey, 2014).



Figure 3.1 Research process (adapted from Collis & Hussey (2014, p. 9)).

Figure 3.1 provides an overview of the research process as a simple, orderly process in which one phase leads to the next (Collis & Hussey, 2014).

When analysing the sources of knowledge, it is vital to understand empiricism and rationalism (Ryan et al., 2002). Empiricism (knowledge through observation and categorisation) versus rationalism (true belief is accessible only through reason) is a classic distinction that focuses on the source of knowledge (Ryan et al., 2002). According to Ryan et al. (2002), the empiricist view leads to the idea that science, whether natural or social, should be value-free, without unjustified beliefs and ideologies about the objects of study. This way, empiricism influenced one of the most important philosophical movements: positivism.

Understanding the ontology, epistemology, and research paradigm is relevant to the investigation that will be undertaken.

Ontology refers to the nature of "reality" (Hopper & Powell, 1985). The social world and structures can have an empirical and concrete external existence (independent of and before any individual's

cognition), or reality is a product of individual consciousness (Hopper & Powell, 1985). To describe the ontology (study of existence) of what we know, we can turn to realism and idealism (Ryan et al., 2002). In realism, reality is perceived as existing in objects; in idealism, reality is perceived as existing in the subject's mind (Ryan et al., 2002).

Epistemology is the theory of knowledge embedded in the theoretical perspective and methodology (Crotty, 1998). Epistemology is interested in the nature of knowledge, its forms, and how it can be acquired and transmitted (Hopper & Powell, 1985). Knowledge can be acquired through observation and constructed in a fragmented way. Alternatively, it can take on a more subjective and essentially personal nature, as human nature is shaped by relationships between people and their environment (Hopper & Powell, 1985).

According to Crotty (1998), a wide variety of epistemologies exist, including objectivism, constructionism, and subjectivism.

The objectivist view of "what it means to know" posits that positioning and values are objectified in the people being studied, allowing for the discovery of objective truth through correct action or behaviour (Crotty, 1998). Constructionism argues that there is no objective truth to be found and rejects the human view of knowledge. Here, different people can construct different meanings, even in relation to the same situation. Subjectivism holds that the subject imposes meaning on the object, and therefore does not arise from the interaction between the subject and the object (Crotty, 1998).

The theoretical perspective is the philosophical position that guides the methodology, thus providing a background for the process and underpinning its logic and criteria (Crotty, 1998). The philosophy of research is linked to the development and nature of knowledge (Saunders et al., 2012). Thus, research begins with the development of knowledge in a particular field. The choice of research philosophy entails important assumptions about how you perceive the world and will be at the heart of the research strategy and method selection (Saunders et al., 2012).

The **research paradigm** determines the researcher's methodological approach to investigating the research question (Ragab & Arisha, 2017). It refers to a framework that guides how research should be conducted, concerning people's philosophies and assumptions about the world and the nature of knowledge (Collis & Hussey, 2014). The paradigms concern “are about several things, most notably about what is to be studied, what kind of research questions are supposed to be formulated in relation to these subjects, with what methods these studies should be conducted, and how their results should be interpreted” (Lukka, 2010, p. 111). Findings are guided by research paradigms based on their

assumptions and principles; understanding these assumptions enables the clarification of the quality of the results that underpin scientific studies and the identification of possible gaps (Park et al., 2020).

Rynes and Gephart Jr. (2004) highlight three perspectives used in management research: positivism and post-positivism, interpretive research, and critical postmodernism. This thesis is based on the research paradigm of positivism because, in positivism, there is "the assumption that social reality is singular and objective, and is not affected by the act of investigating it. The research involves a deductive process with a view to providing explanatory theories to understand social phenomena" (Collis & Hussey, 2014, p. 43). And “the outcomes of positivist research are replicable factual generalisations about social phenomena” (Ragab & Arisha, 2017, p. 3).

There are advantages to the positivist approach to research: the use of large samples that could be generalised to the whole population; statistical methods of analysis could guarantee reliable empirical evidence; reproducibility, in that another researcher could carry out the same research and obtain comparable results; and independence between the researcher and the object of study guaranteed objectivity in data collection and analysis (Ismail & Zainuddin, 2013).

Positivism differs from other research paradigms; positivism and post-positivism embrace realism and assume an objective world that exists outside the mind, as reflected in scientific data and theories (Rynes & Gephart Jr., 2004). They represent the search for truth or true reality, although post-positivism, a more modern perspective, differs from positivism in that it argues that reality can only be known probabilistically and cannot be verified (Rynes & Gephart Jr., 2004).

On the other hand, interpretive research aims to understand the actual creation of meanings and concepts used by social actors in real contexts. It adopts a relativist stance, assuming that different meanings influence the way people understand and respond to the objective world (Rynes & Gephart Jr., 2004). It describes how the different meanings held by various individuals or groups produce and sustain a sense of truth, particularly in the presence of differing definitions of reality. The interpretive (inductive) approach, described as 'phenomenological', focuses on the uniqueness of an individual's thoughts and perceptions (utilizing qualitative methods, such as interviews or case study analysis) to gather information about how an individual interprets a phenomenon (Ismail & Zainuddin, 2013).

It is worth noting that, in positivism, reality is considered objective, implying a single reality, whereas in interpretivism, reality is perceived as subjective, with multiple realities and interpretations (Ikram & Kenayathulla, 2022). Positivism seeks to test the theory and prove the hypothesis (or not), whereas interpretivism seeks to assign meaning and understand knowledge and behaviour (Ikram & Kenayathulla, 2022).

Positivism also differs from critical postmodernism, which encompasses critical theory and postmodern thought, in which critical inquiry identifies the historical emergence of social structures and the contexts in which contradictions arise, with implications for social action and human freedom (Rynes & Gephart Jr., 2004). Postmodernism assumes that realities carry values and contain contradictions, and focuses on signs and symbols and the idea that they are divorced from the realities they represent (Rynes & Gephart Jr., 2004).

The research underpinning this thesis is based on realism (the way things are), objectivism (the generation of knowledge), and positivism (a research paradigm). The study aims to provide regulators with knowledge and data to inform their understanding of how non-financial and climate-related information disclosure should evolve. It is based on real, objective data from public disclosures by banks and companies that can be replicated and appeals to theories to explain the results.

3.2 RESEARCH METHOD

Methodology refers to the strategy, plan of action, process, or design associated with selecting specific methods and linking the choice and use of methods to the desired outcomes (Crotty, 1998). Researchers must employ methods that are consistent with the assumptions and objectives of the theoretical perspective used (Rynes & Gephart Jr., 2004). Research methods refer to the techniques and methods used to conduct research, and research methodology is the process that allows research problems to be addressed in depth, i.e., how research is organised (Mishra & Alok, 2017). Researchers describe the various steps taken to investigate a particular research problem. Thus, methodology refers to the scientific approach used to carry out a research project (Mishra & Alok, 2017).

When the social world is treated like the natural world, the methods of the natural sciences will be used to locate, explain and predict social regularities and patterns (statistical techniques to test hypotheses and analyse data collected by research instruments), or when it is based on the subjective experiences of individuals and the creation of a social world, we will have methods that allow us to know the inner world of an individual (participant observation and interviews) (Hopper & Powell, 1985).

Rynes and Gephart Jr. (2004) indicate that many authors advocate that quantitative analysis of qualitative data is often qualitative research. However, quantitative analysis of qualitative data requires the data to be quantified, making it a form of quantitative research. They pointed out that when management researchers apply quantitative or calculation techniques or perspectives to qualitative data, they encountered many mathematical, statistical, and measurement challenges (Rynes & Gephart Jr., 2004).

Archival research (the use of documentary sources) is associated with the analysis of documents containing information related to what is being studied (Mogalakwe, 2006). According to Scott (1990), a document is an artefact with an inscribed text produced by individuals and groups in the context of their practices, intended to serve their practical needs. They have an underlying purpose, are based on specific assumptions, and are presented in a particular form or style, so the researcher must be fully aware of their origin, purpose, and original audience (Grix, 2001). An example may be private documents from private sector companies, such as annual reports (Mogalakwe, 2006). According to Mogalakwe (2006), the principles of handling documentary sources are no different from those applied to other areas of social research. For Scott (1990), there are quality control criteria for working with documentary sources: authenticity (authentic evidence from reliable sources), credibility (appropriate evidence typical of the field), representativeness (the documents consulted are significant in the overall body of relevant documents), and meaning (clear and understandable evidence).

Importantly, secondary data analysis (for example, data collected from existing sources, such as publications and databases, available in print or online) provides a sample and a permanent record that can be reviewed multiple times. It is also non-intrusive, as the subjects of the study are unlikely to be aware of or influenced by its interest, and the systems and procedures of content analysis are clear (Collis & Hussey, 2014).

According to Devi Prasad (2019), the history of content analysis is rooted in quantitative analysis, with researchers influenced by the logical positivism popular in the 1940s and the dominance of quantitative forms of analysis. Content analysis is a widely used method for quantifying qualitative data" (Collis & Hussey, 2014, p. 166). "Content analysis is a method by which selected items of qualitative data are systematically converted to numerical data for analysis", and it is a widely used method for the quantification of qualitative data, usually in the context of a positivists" (Collis & Hussey, 2014, p. 166),

Content analysis seeks to describe the content created in the communication process through conversations or texts, and it involves systematic processes for collecting quantitative or non-quantitative indicators that enable knowledge to be inferred (Cavalcante et al., 2014). Essentially, it is a research technique used to identify the presence of certain words or concepts in a text (Sweeney & Coughlan, 2008), and is considered the most common method for analysing non-financial information in companies (Milne & Adler, 1999), allows replicable and valid inferences from the data within the context in which it is used (Krippendorff, 2004). However, we are also aware of its limitations. For Guthrie and Abeysekera (2006) content an alysis has limitations, including the inability to obtain a

quantity of information in terms of frequency and volume, but not in terms of quality, and being subjective because it captures narratives as representations of information.

"There is no one particular research method and there is no research method that is superior to others. The choice of a research method should only be on the basis of a method's appropriateness" (Ahmed Jashim, 2010, p. 11), "because every method has its own strengths and weaknesses" (Ismail & Zainuddin, 2013, p. 50).

The quantitative research method was deemed appropriate for addressing the research questions outlined in this thesis. This thesis aims to understand how banks and companies have adapted to EU non-financial and climate-related information rules and identify the best way for this adaptation to evolve. To achieve this aim, the study analyses banks' and companies' annual and sustainability reports, translating qualitative and even quantitative data into numerical data for analysis.

The thesis comprises three independent essays that are globally related. The positivist paradigm guides the selection of the following methodology:

- The first essay aims to assess the non-financial reporting of financial institutions operating in Portugal during the first year of the NFRD's application. It is based on a documentary analysis of the annual and sustainability reports of banks in Portugal subject to the NFRD in 2017. The data collected was analysed using content analysis;
- The second essay aims to evaluate the disclosure of climate-related information by the banks in Portugal. It identifies the main Guidelines to understand the evolution of this disclosure. This essay is also based on a documentary analysis of annual and sustainability reports from 2014 to 2019, followed by a subsequent content analysis;
- The third essay examines the impact of the NFRD and its guidelines on climate-related disclosure by listed companies in Portugal, assessing the detail of such data for credit decision-making by banks. It also explores the anticipated changes introduced by the CSRD and the ESRS standards. The study draws on documentary analysis of annual reports, sustainability reports, and CDP questionnaires from 2020 and 2022, followed by content analysis.

The primary documents for analysis are the annual report and/or the sustainability report (integrated in the annual report or stand-alone), as these are the documents referred to in the NFRD where non-financial information must be included. Furthermore, these reports are publicly available.

In the three essays, data were collected, processed, and analysed using content analysis to obtain and process the quantitative data, allowing for an objective comparison of the data. In this study, Excel is utilised to perform the mathematical calculations based on the information obtained from the

documents. This approach was the most suitable for quantifying the qualitative information and thus answering the questions posed in the different essays. Content analysis has been one of the techniques used by several researchers (Caputo et al., 2019; Cordazzo et al., 2020; Lombardi et al., 2022; Matuszak & Różańska, 2019), enabling deductions to be made and facilitating the interpretation of fundamental data in the discussion.

3.3 SOURCES, DATA COLLECTION, AND ANALYSIS

This subsection is divided and presented within each of the thesis's three essays to provide a clearer description of the data collection and processing procedures for each essay.

Before describing the methodology of the articles, it is essential to understand the framework in Portugal, particularly in the social and environmental fields, without being exhaustive, but highlighting some key aspects.

According to the Gender Equality Index 2019, Portugal stands out as the country that has made the most progress in gender equality between 2015 and 2017, in comparison to the average of other EU countries (Comissão para a Cidadania e a Igualdade de Género, 2017). Additionally, according to Hsu & Zomer (2016), Portugal is ranked 7th out of 180 countries in the Environmental Performance Index - "EPI 2016 Rankings".

The Climate Change Performance Index assesses and compares the climate change performance of 56 countries and the EU countries, which (collectively) contribute to more than 90 per cent of GHG (Burck et al., 2018). In 2018, Portugal ranked 17th overall among the countries with the best climate performance. Portugal ranks high in climate policy and excels in the renewable energy category, but its energy use is average, and it struggles in the transport sector. The first three places were empty, as no country was considered to have achieved a very high level of performance (Burck et al., 2018).

As Portugal is a country at the forefront of these issues, it would be of great interest to analyse how banks and listed companies operating in its market disclose non-financial information, particularly climate-related information.

The literature review revealed a global need for more studies on non-financial and climate-related information, particularly in relation to Portugal, for which only limited literature was available. This way, a great effort was made to assess and analyse in detail annual reports and/or sustainability reports, and CDP questionnaires were examined in detail, as well as scientific articles, legislation, and reports (from official entities, among others).

These essays have been discussed among experts at international conferences and reviewed by peers.

3.3.1 First Essay: Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal

The primary objective of the first essay, "Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal," was to assess the non-financial reporting of financial institutions operating in Portugal in the first year (2017) of implementing the NFRD (Directive 2014/95/EU). Therefore, the study aimed to answer the following questions: (i) To what extent did banks in Portugal comply with the Directive in the first year of adoption (2017)? (ii) How was the non-financial information presented? and (iii) How should regulations be revised to improve the non-financial statement?

According to the research objective, the study identifies identified which banks operate in the Portuguese financial system. Then the study analyses which ones were obliged to disclose their non-financial statement according to the parameters of the NFRD.

The first step was to consult the Banco de Portugal (2018) website, which lists authorised institutions (banks). The study identifies thirty banks and two savings banks. Then, I consulted the website of Banco de Portugal (2018) and/or the banks' websites to obtain their annual reports (2017), to verify their compliance with the requirements of Directive 2014/95/EU, transposed in Portugal by Decree-Law 89/2017 (República Portuguesa, 2017).

The subsequent step was to verify which institutions were covered by the NFRD, considering their respective balance sheets, turnovers, and numbers of employees (individual and/or consolidated, as recommended by the NFRD). Those banks that did not meet the requirements of the NFRD were excluded. This way, only nine entities (eight banks and one savings bank) were obliged to comply with the NFRD requirements. The sample, therefore, consists of these nine institutions (i.e., 28%) that are PIEs and subject to the NFRD. The selected institutions were evaluated in terms of total assets and average number of employees (see Fig. 3.2).



Figure 3.2 Characterisation of the sample of banks (regarding 2017).

The data suggest a discrepancy between the size of banks in terms of total assets and the average number of employees. However, it is worth noting that two banks have individual data, while the others have consolidated data (see Fig. 3.2).

There were no significant difficulties in obtaining the reports, as they are public. All reports refer to the year 2017 (January 1 to December 31, 2017), which encompasses the entire universe of the banking system in Portugal that was obliged to disclose non-financial information in the first year of application (2017). After collecting these annual reports, the study also collects the sustainability reports, if available. The reports were collected and analysed during the second half of 2018 and the first half of 2019.

The study analyses the reports using content analysis in an objective and systematic way (Guthrie & Abeysekera, 2006). It consists of coding qualitative and quantitative information into pre-defined categories in order to identify patterns in the presentation of information, thus providing a better empirical understanding of non-financial information (management, measurement, and communication). The classification criteria were prepared to be clear and operational (in terms of units of analysis); the data collection was also designed to be systematic (encompassing a specific category) and to possess characteristics of reliability and validity (Guthrie & Abeysekera, 2006).

After collecting the banks' reports, the study analyses the content of each annual report/sustainability report to obtain a set of data to answer the questions associated with the essay.

In the essay, I assess the following NFRD- related issues (European Parliament and the Council of the European Union, 2014):

a) Non-financial reporting location (identify where non-financial information can be found);
b) Denominations used for non-financial information in the reports (identification of the titles used);
c) Volume (number of pages) of non-financial information disclosed by banks (number of pages dedicated to non-financial information);
d) Compliance with the Directive and Decree-Law N.º 89/2017 (identify compliance with the NFRD according to the defined contents, based on the contents of the NFRD);
e) Diversity of topics addressed by analysed banks (non-financial information topics mentioned in the reports of at least one bank);
f) Matters in the non-financial statements on the main topics from the NFRD: environmental matters, social and employee matters, equality between women and men, and non-discrimination, respect for human rights, fighting corruption and bribery attempts;
g) The process of granting bank loans (to companies) considering environmental information was exceptionally analysed qualitatively, to analyse the differences in approach and quality of this information among banks, whenever this disclosure takes place. I conducted this analysis because the granting and monitoring of bank loans to companies is a crucial issue, particularly for the health of banks and the financial system.

The study uses the binary coding system, assigning a score of 1 (one) if a category was disclosed/considered for a bank and 0 (zero) otherwise, within the themes analysed. The values are summed and then presented as relative values (compared to the total number of banks: a), b), d), and f), or presented as absolute values e). Other situations include numerical counts: c), and analysis of descriptions: g).

This simple form of classification of binary coding enables an overall assessment of the scale and standards of disclosure, supported by a scoring map constructed according to the categories of information (Woods et al., 2008). This form of analysis aligns with the primary research objectives of this essay and provides necessary references within the context of the categories of information analysed, which are derived from the manual extraction of data from the banks' reports.

3.3.2 Second Essay: Banks and Climate-Related Information: The Case of Portugal

The main objective of the second essay, "Banks and Climate-Related Information: The Case of Portugal", was to provide answers to the following questions: (i) whether banks disclose climate-related information and how disclosure has evolved; (ii) the limitations and restrictions found in terms of climate-related information disclosure; and (iii) what can be improved.

In general, the essay evaluates whether banks are already disclosing climate-related information and whether there is consistency in the disclosure and the level of disclosure of climate-related information.

As in the previous essay, the study follows the same procedure to identify the selectable banks, meaning all banks subject to the NFRD in 2017. The study is supported using the respective annual reports and the sustainability reports (where available) for the years 2014 to 2019 (covering the period from January 1 to December 31). It was not difficult to obtain these reports. The study undertakes the collection and analysis of the reports from the second half of 2019 to the first half of 2021.

The study performs a content analysis of the annual reports and sustainability reports (both standalone and integrated into the annual report), searching for climate-related information disclosed by the banks to assess the quality and quantity of climate-related information from 2014 to 2019. The focus was on climate-related information from 2014 to 2016 (before the NFRD became applicable), 2017 (the first year of application of the NFRD), and the two subsequent years, 2018 and 2019.

The evaluation provides a better understanding of the disclosure of climate-related information by banks before and after the applicability of the NFRD (2017) and its subsequent guidelines ("Guidelines on non-financial reporting (methodology for reporting non-financial information)" (2017) and "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (2019)) and how disclosure can contribute to climate change development (European Commission, 2017, 2019c; European Parliament and the Council of the European Union, 2014).

My analysis of the annual and sustainability reports provided a wide range of information to answer the initial questions regarding banks and climate-related Information. In this second essay, the subjects to be analysed are associated with:

a) Banks disclosing climate-related information (some kind of climate-related information);
b) Use dispersion of the terms "climate" and "climatic" (identifying whether the terms are used);
c) Number of pages of climate-related information in the reports (in comparison to the total number of pages in each bank's reports);
d) Recommended disclosures according to the "Guidelines on Non-Financial Reporting: Supplement on Reporting Climate-Related Information" (European Commission, 2019c):

business model, policies and due diligence processes; outcomes; principal risks and their management, and KPI's;

e) Qualitative analysis of the descriptions, if any, of risk analysis in the evaluation of projects and lending, with extracts from reports on addressing climate issues in lending, to assess differences in approach and quality. This topic is selected because analysing loans to companies is a crucial issue for banks. This topic will be analysed in more detail in the third essay due to its relevance. For this evaluation, the year of publication (2019) of the guidelines on climate-related information is selected.

I also employed the binary coding system in the second essay, assigning a score of 1 (one) if a category was disclosed by a bank and 0 (zero) otherwise, based on the analysis conducted. The values presented regarding a) and b) are relative ones, being the scores of each bank summed up and its percentages obtained in relation to the total number of banks. Other situations include numerical counts, b) and c), and analysis of the descriptions, e).

Considering the main research objectives of the essay, the analysis methodology enables the provision of necessary data for the categories of information analysed, derived from the manual extraction of data from the banks' reports. The analysis involved two triennials: one three years before (2014-2016) and one three years after (2017-2019) the introduction of the NFRD.

3.3.3 Third Essay: The impact of climate-related information on bank lending

"The impact of climate-related information on bank lending" is the third essay, and it aims to answer the following questions: (i) Are listed companies disclosing climate-related information? (ii) Does the disclosed information comply with the NFRD climate-related information guidelines? (iii) Are companies providing banks with sufficiently detailed climate-related information to support informed decision-making in credit-granting and monitoring? (iv) Considering the CSRD and ESRS, what changes are expected in companies' disclosure of climate-related information to assist banks in better making their lending decisions? In this way, the essay seeks to provide a clearer understanding of how the NFRD and its guidelines influence the behaviour of listed companies regarding climate-related disclosures, evaluate whether these disclosures meet the information needs and expectations of banks, and consider the potential future impacts arising from the implementation of the CSRD and the ESRS requirements. To answer these questions, the study focused on analysing non-financial, climate-related information, considering companies listed in Portugal due to its specific characteristics and visibility. The sample comprises 37 companies listed on the Portuguese regulated stock market (Euronext

Lisbon) as of 31 December 2020 (Euronext, 2021), representing various sectors of activity. Following the application of exclusion criteria — such as an incompatible reporting period, the absence of an annual report, an insufficient number of employees, or classification as a financial institution — nine companies were removed. As the study focuses on climate disclosure practices in 2022, it was necessary to exclude two additional companies because they no longer met the defined criteria. The final sample consists of 26 companies, classified according to NACE and spanning various sectors of the Portuguese economy. For specific analyses, only companies that responded to the CDP Climate Change Questionnaire were considered: 10 in 2020 and 11 in 2022. The majority of listed companies are large companies. Figure 3.4 presents the company size in terms of turnover and number of employees of the listed companies considered.

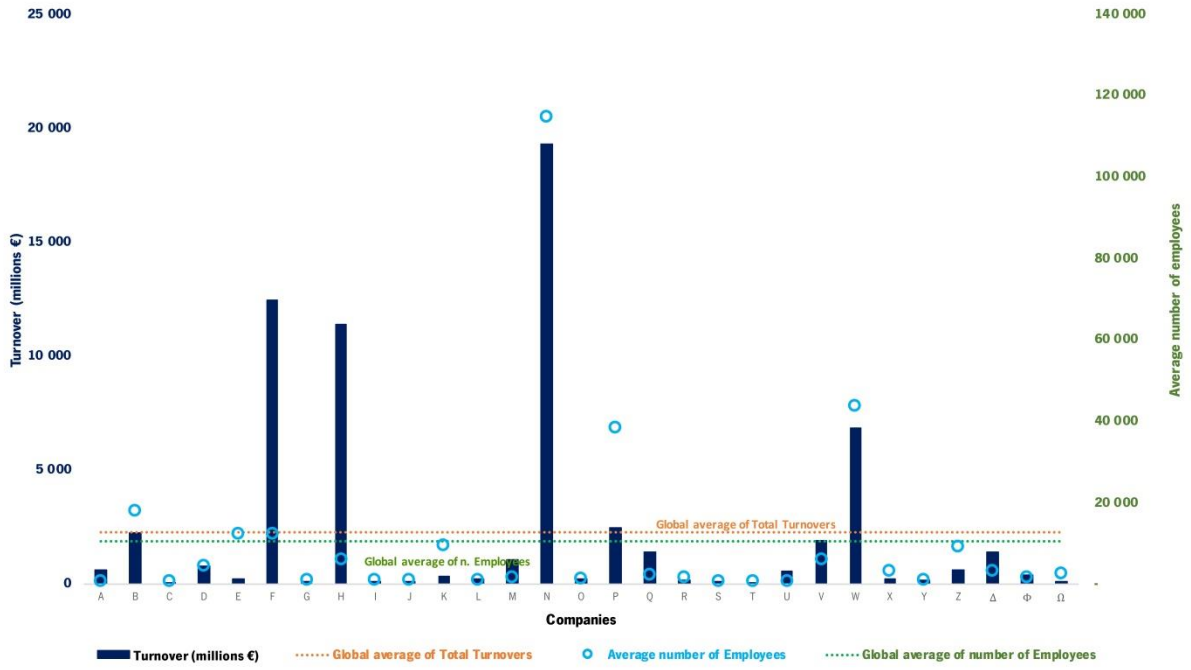

Figure 3.4 Characterisation of the sample listed companies (2020).

Considering the listed companies (see Fig. 3.4), five stand out in terms of turnover and/or number of employees. This information is based on the consolidated accounts.

Climate-related information is gathered from the companies' annual and/or sustainability reports. These reports refer to the financial years 2020 (January 1 to December 31, 2020), which marked the first reporting period following the publication of the guidelines, and 2022 (January 1 to December 31, 2022), the year in which the CSRD was published. The reports were collected and analysed during the second half of 2021 and the second half of 2023, respectively, with one report analysed in the second

half of 2024. The study also includes an analysis of the Climate Change Questionnaire, voluntarily completed by companies. It incorporates data from the years 2020 and 2022, as reported in 2021 and 2023, respectively.

After collecting the reports, the study employs a content analysis of each annual report and/or sustainability report to answer the essay's questions. The analysis is based on the following:

a) The companies' activities were classified according to the Statistical Classification of Economic Activities in the European Community – NACE Rev. 2 (Eurostat, 2008), enabling a coherent segmentation by economic sector;
b) Based on European Commission (2020), the study identifies the sectors with the most significant impact on climate change, and the number of sample companies operating within them was recorded;
c) Climate-related information is searched for in the companies' annual and/or sustainability reports, with a focus on the frequency of the word "climate". Based on this analysis, frequency intervals were defined as follows: absence (0), low frequency (1 to <10), medium frequency (10 to <50), high frequency (50 to <150), and very high frequency (≥150). An individual analysis was conducted for each company, comparing the number of occurrences of the word "climate" across two periods, using the ratio xn/xn-1. A value greater than one (>1) indicates an increase, less than one (<1) indicates a decrease, and equal to one (=1) indicates stability.

Drawing on the supplement to the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (European Commission, 2019c), the analysis examined how companies report climate-related information, to assess whether such disclosures align with the prescribed guidelines: a) risks of negative impacts on the climate; b) risks of negative impact on the company (physical risks and transition risks); c) dependencies on natural, human and social capital; d) opportunities to adapt to and mitigate climate change; e) climate-related risks and opportunities throughout the value chain; f) disclosure of climate-related information on the business model; policies and due diligence processes; outcomes; principal risks and their management; and key performance indicators.

To complement the analysis, I considered data from the voluntary "Climate Change Questionnaire" by CDP, covering the reference years 2020 and 2022. The assessment encompassed content from Annual Reports and Sustainability Reports (AR+SR), CDP data, and additional corporate climate-related sources grouped under "Other" (O), including GRI standards and climate transition disclosures. This integrated approach — AR+SR+CDP+O — provided a comprehensive overview of corporate climate

reporting. The findings are presented in both absolute and relative terms, comparing the number of companies disclosing information with the total number assessed.

Risks and opportunities with quantified financial impact were also examined, along with CO_2 reduction initiatives disclosed by companies in the CDP Climate Change Questionnaires, including projected investments and anticipated cost savings. As stated previously, this analysis was limited to companies that responded to the CDP Climate Change Questionnaire, specifically 10 in 2020 and 11 in 2022.

The study undertakes a detailed assessment on the relevance of climate-related disclosures by companies in supporting credit decisions and risk monitoring, based on the EBA's guidelines (EBA, 2020b). The evaluation drew upon previously collected data from Annual and Sustainability Reports (AR+SR), CDP Climate Change Questionnaires, and other sources (CDP+O), aligned with the disclosure requirements set out under the NFRD. Key information was identified that banks should consider to ensure compliance with climate-related reporting standards. This key Information includes: 1) the risks of climate change to the borrower's financial performance, with an analysis of physical and transition risks; and 2) climate change impacts, climate change targets, adequacy of mitigation strategies, business model and greenhouse gas emissions, including an analysis of: impacts on the climate and disclosures related to the business model, policies, processes, outcomes, and risk management.

The study also identifies the physical risks, transition risks, and adverse climate impacts, based on the most detailed disclosures available for each category. For acute physical risks, such as temperature fluctuations, rising sea levels, or biodiversity loss, the most comprehensive description provided by each company was used to represent its most significant risk. Other topics were evaluated individually. The quality of climate-related information disclosed was rated on a scale from 0 to 4, adapted from Matuszak and Rózańska (2017), where "0 - None" denotes a lack of essential data, "1-Reduced", "2 - Generic", "3 - Detailed", and "4" reflects the highest level of disclosure.

A weighted score was assigned to companies based on their level of climate-related disclosure, taking into account previously assigned scores. This assessment produced an overall score for each company. Topics with a higher degree of detail were examined to determine how many companies reported them extensively and how such disclosure evolved between 2020 and 2022. This approach enables the identification of companies that best meet banking requirements and provides insight into the improvement of disclosure quality over time.

As part of the challenges posed by the CSRD, the study examines the number of companies that had conducted a financial quantification of climate-related risks and opportunities. This evaluation provided

insight into the extent to which these factors have been integrated into corporate strategies, as well as the organisation's ability to assess and measure them effectively.

CHAPTER IV: Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal

Part of this chapter is based on the published paper: Santos, A. L., & Rodrigues, L. L. (2022). *Investigating the Effectiveness of Banks' Non-financial Reporting in Portugal*. In Corporate Responsibility, Sustainability and Markets (pp. 75-100). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-79660-0_5. Presented at the International Conference "The 8th International Conference on Social Responsibility, Ethics and Sustainable Business", under the title "Banks' Non-Financial Reporting: Empirical evidence from Portugal", University of Minho (Braga), on 25 October 2019.

INVESTIGATING THE EFFECTIVENESS OF BANKS' NON-FINANCIAL REPORTING IN PORTUGAL

The European Union Directive 2014/95/EU, relative to Non-Financial reporting legislation, was transposed to Portugal. The non-financial statement should contain sufficient information to provide an understanding of the impact of the company's activities, comprising at least the following: environmental, social, and labour issues, equality between women and men, non-discrimination, respect for human rights, anti-corruption measures, and efforts to combat bribery attempts. This study aims to evaluate whether banks have complied with the EU Directive in the first year of implementation (2017). Results indicate that the mandatory non-financial reporting regulations were fulfilled mainly, as the main topics are disclosed. However, there are significant differences among banks in terms of the location of information, presentation/communication, and details. Therefore, EU regulations should advance towards non-financial reporting standardization, thereby improving data comparability among banks.

4.1 INTRODUCTION

Governments, consumers, and investors have been gradually pressing companies to be strictly transparent on their business's economic, environmental, and social impact (Maravić, 2019). Non-financial reports have been significant sources of information used in decision-making processes. Thus, they must meet qualitative criteria to ensure comparability and faithful presentation. However, CSR reports have shown that qualitative deficiencies prevent effective comparability (Lament, 2016). Those reports are considered non-comparable and unclear; therefore, introducing sectoral reporting standards is required to improve the clarity and comparability of non-financial information (Lament, 2016).

With Directive 2014/95/EU, sustainable development has gained momentum in non-financial reporting. The directive was published in 2014, amending Directive 2013/34/EU regarding the disclosure of non-financial information by certain large undertakings and groups (European Parliament and the Council of the European Union, 2014). Decree-Law 89/2017 transposed Directive 2014/95/EU into the Portuguese legislation. Decree-Law 89/2017 establishes that all large companies and groups (which are public-interest entities and exceed an average of 500 employees during the year) should include a "non-financial statement" in their management report (República Portuguesa, 2017). Thus, the directive's objective is to improve CSR information that can promote sustainable development. The increase in transparency will enhance market efficiency. Sustainability risks and their impact on society are expected to be disclosed, reinforcing investor and consumer confidence

(European Parliament, 2016; República Portuguesa, 2017). Thus, mandatory non-financial reporting is crucial for a sustainable global economy, as it combines long-term profitability with social justice and environmental protection (European Parliament and the Council of the European Union, 2014).

Non-financial reporting practices have become an integral part of the business operations of most companies (Perrini, 2006). Therefore, social and environmental responsibilities should be integrated into the company's relationships with stakeholders, and simultaneously seek strategic diversification in terms of specific modes of development (Perrini, 2006).

According to Hart (1997, p. 67), "corporations are the only organizations with the resources, the technology, the global reach, and ultimately, the motivation to achieve sustainability". Thus, by taking adequate account of relevant non-financial information, investors can contribute to a more efficient allocation of capital, leading to better longer-term investment outcomes (European Commission, 2011a). Consequently, it contributes to social progress and employment, improves the environment, and helps combat climate change (European Commission, 2011b). The financial sector's role is unquestionably crucial in modern economies (Anagnostopoulos et al., 2018). Thus, it is expected that they contribute to better non-financial reporting.

This chapter aims to evaluate the non-financial reporting of financial institutions operating in Portugal, in the first year of application of the Directive 2014/95/EU (2017). This study addresses three research questions: (i) To what extent did banks comply with the Directive in the first year of adoption (2017)? (ii) How was the non-financial information presented? and (iii) How should regulations be revised to improve the non-financial statement? Legitimacy theory and institutional theory are used to interpret the results.

4.2 MANDATORY NON-FINANCIAL INFORMATION AND GUIDELINES IN THE EU

The Directive 2014/95 is the first European regulation that requires undertakings to provide mandatory non-financial information (Carini et al., 2018). However, there is a concern that this regulation may lead to more reporting, rather than better reporting (Maravić, 2019). The non-financial statement requires information concerning environmental, social, and employee-related matters, including human rights, anti-corruption, and bribery. Additionally, it involves the disclosure of information regarding the diversity policies in relation to the administrative, management, and supervisory bodies (enhancing aspects such as age, gender, educational, and professional backgrounds) (European Parliament and the Council of the European Union, 2014).

The disclosure of non-financial information has been extensively promoted in the EU (Szabó & Sørensen, 2015). Directive 2014/95/EU made non-financial reporting mandatory, bringing CSR disclosure regulation to the level of current best practices (Szabó & Sørensen, 2015). The directive is considered a step forward in non-financial reporting, introducing a more regulated concept to enhance compliance with sustainability needs (Georgiana-Loredana, 2018). The disclosure regime is quite comprehensive, which poses serious obstacles to the implementation of the directive due to its more specific requirements (Szabó & Sørensen, 2015). The new directive may not affect the quantity of information disclosed, but it is expected to increase the consistency and comparability of the CSR report. Thus, to ensure reporting quality, further measures should be taken (Szabó & Sørensen, 2015), namely in terms of guidelines and assurance. According to Decree-Law 89/2017, the auditor must certify whether the non-financial statement is included in the annual management report or in a separate report (República Portuguesa, 2017).

In 2017, a methodology for reporting non-financial information (guidelines) emerged to support non-financial information:

> [T]he aims of these guidelines is to help companies to disclose high quality, relevant, useful, consistent and more comparable non-financial (environmental, social and governance-related) information in a way that fosters resilient and sustainable growth and employment, and provides transparency to stakeholders.
>
> (European Commission, 2017, p. C 215/4)

The content of those guidelines includes business model, policies and due diligence, outcome, principal risks and their management, key performance indicators, and thematic aspects (European Commission, 2017).

As previously mentioned, the Technical Expert Group on Sustainable Finance (TEGSF) was appointed by the European Commission in 2018 and tasked with developing recommendations on climate-related disclosures. This initiative led to the development of guidelines on non-financial reporting. These guidelines include a supplement on reporting climate-related information (2019) and further guidance for banks and insurance companies (European Commission, 2019c). This document states that banks can exacerbate climate-related risks if they support economic activities that contribute to climate change via GHG emissions, including deforestation, forest degradation, or land-use change. Banks can promote the transition to a low-carbon and climate-resilient economy and increase awareness of this transition by integrating an evaluation of the potential climate change impact of their prospective investments, loans, and insurance contracts into their policies and procedures (European Commission, 2019c).

4.2.1 Highlights and Trends

A study in Italy reveals that the EU Directive enhanced the disclosure of non-financial information, confirming the role of EU regulations in improving the quality of non-financial information (Venturelli et al., 2017). However, according to Venturelli et al. (2017), the PIEs pathway towards ESG reporting requires action in sustainability policy, risk assessment, and diversity, as well as in social and environmental accounting, specifically in the context of KPIs. Regarding the non-financial information (NFI) score, the best results were obtained by companies that were already involved in CSR practices prior to the directive and had issued voluntary and assured sustainability reports (Venturelli et al., 2017). There is also a good correlation between these variables: firm size, experience in preparing a sustainability report, adoption of GRI rules, and assurance of the quality of non-financial information. Therefore, firms and countries that are already proactive in CSR reporting will not derive significant benefits from the application of the directive; however, it is expected that those less compliant will have the opportunity to improve the quality of their non-financial information (Venturelli et al., 2017).

CSR reporting has increased worldwide, especially in Europe, in the last few decades (Arraiano & Hategan, 2019). However, preparing and submitting non-financial reports in Central and Eastern European countries is substantially different, primarily due to the varying government policies and cultures (Arraiano & Hategan, 2019). Popescu (2019) studied non-financial reporting in Romania in 2018. The author concludes that there was an improvement in the quality of non-financial reporting. However, more emphasis should be placed on transparency and easy access to information, which could be achieved by introducing this requirement in regulations. Maj (2017) suggests that the diversity of information disclosed by organisations in the Polish energy industries is relatively narrow. Furthermore, organisations generally do not disclose much general information on social issues or information related to human rights. Reporting on labour practices and decent work has been relatively modest (Maj, 2017).

Companies have preferred annual reports to communicate voluntary CSR disclosures, yet they have placed little emphasis on reporting about human rights and anti-corruption measures (Matuszak & Rózańska, 2017). Generally, the new reporting obligation is expected to enhance the scope and quality of non-financial disclosure (Matuszak & Rózańska, 2017). However, the establishment of standard rules for firms that operate in different sectors can impede effective harmonization (Caputo et al., 2019). A case study in the oil and gas sector by Carini et al. (2018) revealed a fair level of completeness of non-financial information. However, some areas (where financial and sustainability reports overlap) have to be improved to achieve the requirements of the directive. The introduction of sectoral reporting

standards has been considered crucial for improving the clarity and comparability of reports (Lament, 2016).

4.2.2 The Directive 2014/95/EU and Banks' Non-financial Reporting

Some large banks appear to follow a trend of issuing annual combined reports that disclose both non-financial and financial information, while other banks report non-financial disclosures as a stand-alone report. The non-financial information disclosed is most often descriptive or descriptive-quantitative. The most transparent way to present data is by disclosing quantitative information (Zabawa, 2018). Bank managers should convince the board to be involved

> in different CSR activities as an important part of their strategic initiatives, and to allocate more resources to those that have significant positive relationships with FP [Financial Performance] and less to others, thereby improving overall stakeholder wellbeing and thus creating positive social change.
>
> (Matuszak & Różańska, 2019, p. 17)

Additionally, regulators should encourage banks to report CSR information, which improves reputation (Branco & Rodrigues, 2006) and consequently increases the safety and soundness of the banking system (Matuszak & Różańska, 2019). Furthermore, engaging in CSR can enhance social welfare by addressing the needs of employees, clients, and communities (Matuszak & Różańska, 2019).

According to the new legislation, the non-financial statement should contain enough information for an understanding of the evolution, performance, position, and impact of the company's activities, with at least environmental, social and worker issues; but also promoting equality between women and men, non-discrimination, respect for human rights, anti-corruption and bribery (República Portuguesa, 2017). Disclosed non-financial information is also required to include: (i) a brief description of the business model of the company; (ii) sustainability policies followed by the company, including due diligence procedures applied; (iii) results of such policies; (iv) associated risks; and, (v) key performance indicators relevant to company's specific activity (República Portuguesa, 2017). Furthermore, Law n.º 148/2015 of the Portuguese Republic classifies credit institutions [Banks] as entities of public interest (República Portuguesa, 2015).

4.2.3 Theoretical Perspective

According to Ihlen (2009), legitimacy is fundamental to the existence of organisations over time, because if society has accurately defined the institution, it can then decide that it should cease to exist. Legitimacy refers to the overall perception that an organisation's actions are acceptable, correct, or timely within a social system based on norms, values, beliefs, and definitions (Suchman, 1995). Branco

& Rodrigues (2008b) state that, according to legitimacy theory, organisations with higher public visibility are expected to show greater concern for corporate image through social responsibility disclosure. They note that size and industry affiliation are the most common indicators of public visibility. They concluded that banks with higher visibility place greater emphasis on social responsibility disclosure as part of their reputation management strategies compared to banks with lower visibility. According to Suchman (1995), in addition to this strategic perspective (looking outside the organisation) of legitimacy theory, there is the institutional perspective in which society looks inside the organisation and demands conditions of legitimacy.

According to Camilleri (2018), institutional theory explains how organisations respond to the environment in which they operate and are influenced by stakeholders (governments, regulators, etc.). Organisations must therefore adapt to the institutional norms and rules that exist in their environment (Camilleri, 2018), and compliance can hence confer legitimacy (Beck et al., 2017).

4.3 BANKS' NON-FINANCIAL REPORTING IN PORTUGAL

4.3.1 Analysis and Evaluation Methodology

According to the Banco de Portugal (Portuguese Central Bank), there are thirty banks and two banking savings institutions in Portugal (Banco de Portugal, 2018); however, only nine entities (eight banks and one savings bank) are required to comply with Directive 2014/95/EU. The data presented in this chapter is the result of a detailed analysis of non-financial reporting disclosed by these nine selected entities. The study aims to evaluate the quality and quantity of the disclosed information for 2017. Data were collected from annual reports and sustainability reports. Research limitations are associated with the sample size, although it accounts for all the banks in Portugal that are required to comply with the directive.

In terms of auditing, all auditors confirm that all banks comply with the non-financial statement. Three banks, which follow the GRI guidelines, present an independent report with limited reliability assurance regarding the information in the sustainability report, prepared by an external entity. Baret and Helfrich (2019) emphasize the importance of social and environmental assurance, stating that the growing pressure from stakeholders requires transparency about CSR practices, which is essential for understanding the reliability of disclosures.

The study aims to verify whether banks comply with the directive and to compare non-financial reports, in terms of location, denomination of the non-financial statement, volume of information, content, topics

covered in the annual report, environmental matters, social and employee matters, equality between women and men and non-discrimination, respect for human rights, fighting corruption and bribery attempts, and some detailed information (where possible). We also present an adapted correspondence table based on the content of the directive, using as a working basis a correspondence table already presented by two banks.

4.3.2 Results

4.3.2.1 Non-financial Statement Location

An exhaustive reading of the available information reveals no uniformity regarding the location of non-financial information. We identified three different places (Fig. 4.1): in the annual report (67%), in the annual report but complemented with the sustainability report (22%), and in the stand-alone sustainability report (one bank). Furthermore, it is remarkable that two banks have prepared integrated reports, one of them following the IIRC. Previous studies have also reached similar conclusions, primarily regarding the location of the non-financial statement (Zabawa, 2018) and the overlap of information (Carini et al., 2018).

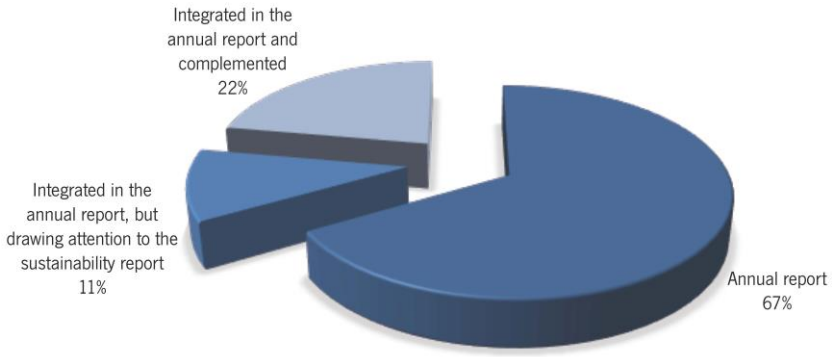

Figure 4.1 Non-financial reporting location (n = 9).

The variety of locations makes it difficult to find non-financial information and compare companies. Matuszak and Rózańska (2019) also found that the different locations of non-financial information were problematic. An integrated or combined report should systematize the location of non-financial information, avoiding the present dispersion. Previous studies have highlighted that more concise and informative reports (Tiron-Tudor et al., 2019) would benefit from the standardization of non-financial information location (Caputo et al., 2019; Carini et al., 2018).

4.3.2.2 Non-financial Information Denomination

Non-financial information was disclosed under five different denominations (Fig. 4.2):

– "Non-financial statement" (56%) - the most common denomination, and:

– "Non-financial indicator table"; "Disclosure of non-financial information in accordance with the Decree-Law No. 89/2017, July 28"; "Sustainability accounts"; and "Non-financial and diversity information".

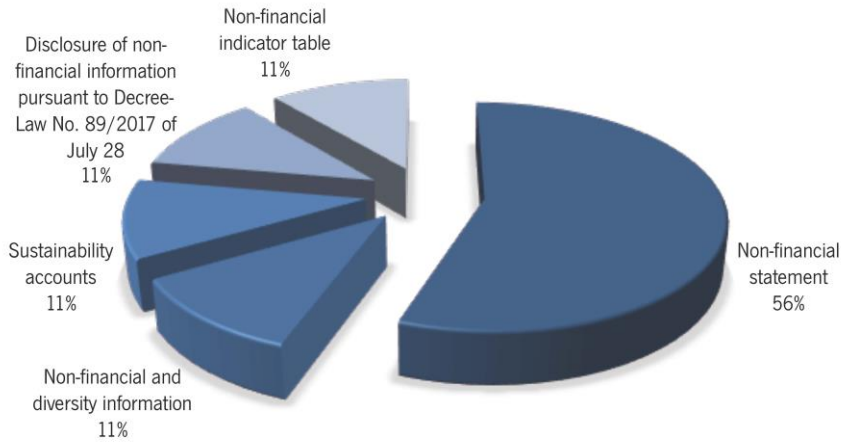

Figure 4.2 Denominations given to the non-financial information (n = 9).

The lack of a systematic approach makes it difficult for the reader to understand whether non-financial information was disclosed. Thus, standardization would help stakeholders. Maravić (2019) states that the gradual development of international non-financial reporting standards will facilitate the comparison of business results.

4.3.2.3 The Volume of Non-financial Information Disclosed

The number of pages dedicated to non-financial reporting was quantified to evaluate the volume of non-financial information, considering: the total number of pages (financial + non-financial) (AR); the number of pages dedicated to non-financial information (either integrated in a chapter of the annual report or dispersed in the annual report) (NF); the number of pages in the sustainability report (SR); and AR-NF, the number of the pages dedicated to financial information. Figure 4.3 illustrates the non-financial information content in relation to the length of the reports, expressed by the number of pages.

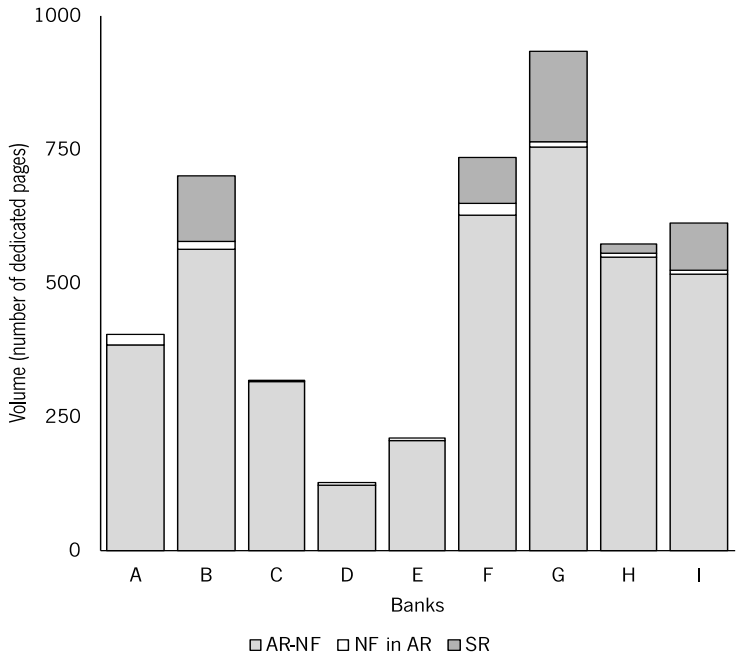

Figure 4.3 Volume (number of pages) of non-financial information disclosed by banks (A to I).

Some annual reports contain only a few sentences, while others provide detailed information. Some banks only mention in the annual report that non-financial information is disclosed in the sustainability report. Figure 4.3 illustrates that non-financial information typically constitutes a small percentage of the total information disclosed. Duplicate information was identified in some banks' annual and sustainability reports. Other authors also found an overlap of information. For example, Carini et al. (2018) noted that the primary challenge is evaluating the relationship between the quantity and quality of disclosure. In this context, "drowning in information" should be avoided, as large volumes of information can hinder accessibility.

4.3.2.4 Non-financial Information Content

Two of the analysed banks presented the correspondence table with Decree-Law No. 89/2017, as an attempt to make the information comparable, indicating its location. Considering the correspondence table presented by those two banks, I evaluate the non-financial information content of our sample (Table V), verifying and quantifying the percentage of entities that have referred to a specific content item (or sub-items) in the disclosed information (in compliance with the Directive and Decree-Law 89/2017).

Table V Compliance with the Directive and Decree-Law N. º 89/2017.

Contents established by the Directive and Decree-Law 89/2017	(%)
Business Model	
Company Business Model	100
Diversity in governing bodies	
Diversity policy applied by the company in relation to its management and supervisory bodies	56
Environmental matters	
Specific policies related to environmental matters	100
Policy implementation results	100
Key associated risks and how these risks are managed	100
Key performance indicators	100
Social and employee matters	
Specific policies related to social and employee matters	100
Policy implementation results	100
Key associated risks and how these risks are managed	100
Key performance indicators	100
Gender equality and non-discrimination	
Specific policies related to gender equality and non-discrimination matters	100
Policy implementation results	100
Key associated risks and how these risks are managed	100
Key performance indicators	100
Respect for human rights	
Specific policies related to respect for human rights	78
Policy implementation results	33
Key associated risks and how these risks are managed	100
Key performance indicators	33
Anti-corruption and bribery matters	
Specific policies related to combating corruption and bribery attempts	89
Policy implementation results	89
Key associated risks and how these risks are managed	100
Key performance indicators	78

Source: Adapted from Santander Totta (2018) and Montepio (2018) (n = 9)

"Diversity in governing bodies" was achieved in only 56% of the banks analysed, which are required to comply with it. "Respect for human rights" was mentioned by all considered entities, referring to the "Key associated risk and how these risks are managed" (100%), but "Policy implementation results" and "Key performance indicators" were sub-items provided by only 33% of the sample. The "Specific policies related to respect for human rights" were mentioned and disclosed by 78% of the entities.

The "Anti-corruption and bribery matters" were disclosed but only briefly mentioned in the analysed reports. A similar study conducted in Poland also reported that companies placed little importance on reporting human rights and anti-corruption matters (Matuszak & Różańska, 2017).

4.3.2.5 Non-financial Information Topics

Data reveal that at least one bank mentions one of the 29 non-financial information topics. Table 4.2 illustrates the heterogeneity observed among banks. "Framework" was mentioned by three banks (A, B,

and I); “Social responsibility”, “Environment”, and “Correspondence Table between the Annual Report and Decree-Law 89/2017” were reported by two entities. Table VI points out the topics addressed by each bank. Data show a large diversity of disclosures, leading to heterogeneity in non-financial information reports, which contradicts the Directive's aim (European Parliament and the Council of the European Union, 2014).

Table VI Diversity of topics addressed.

Non-financial information topics disclosed in the annual reports	Non-financial Information in the annual reports (A, B, ... I)									Number of annual reports where the topic was observed
	A	B	C	D	E	F	G	H	I	
Framework	☐	☐							☐	3
Brief description of the business model	☐									1
Environmental responsibility	☐									1
Social responsibility	☐		☐							2
Total tax contribution	☐									1
Business value creation		☐								1
Value creation for employees		☐								1
Value creation for society		☐								1
Environment			☐		☐					2
Labor issues			☐							1
Equality and diversity			☐							1
Corruption prevention and bribery			☐							1
Overall rating			☐							1
Resources and organization				☐						1
Social and environmental responsibility				☐						1
Risk management				☐						1
Company governance model				☐						1
Deontology and ethics in the exercise of activity					☐					1
Security and health					☐					1
Employee social support policies					☐					1
Talent retention and gender equality					☐					1
Regional development and social responsibility					☐					1
Stakeholder engagement						☐				1
Value created for each stakeholder group						☐				1
Environmental impact						☐				1
Correspondence table between the annual report and Decree-Law 89/2017		☐				☐				2
Other disclosures of non-financial information pu							☐			1
Reading guide for sustainability information								☐		1
Non-Financial indicator table									☐	1
	5	5	6	4	6	4	1	1	2	
	Non-financial information topics observed in bank's annual reports									

4.3.2.6 Non-financial Statement Matters (Items and Sub-Items)

In the non-financial statement, there is a variety of items and sub-items covering themes under Decree-Law 89/2017:

> The non-financial statement [...] shall contain sufficient information for an understanding of the evolution, performance, position and impact of [...] company’s activities concerning, at a minimum, environmental, social and worker issues, equality between women and men, non-discrimination, respect for human rights, the fight against corruption and attempts to bribery.
>
> (República Portuguesa, 2017, p. 4269)

In this study, we assessed the following variety of items and sub-items:

“Environmental matters”, “Social and employee matters”, “Equality between women and men and non-discrimination”, “Respect for human rights”, “Fighting corruption and bribery attempts”.

Environmental matters (Fig. 4.4) - the most discussed topics in the theme were: “paper consumption reduction and paper recycling” (addressed by all banks), closely followed by “energy consumption, energy efficiency renewable energy” and “waste management and treatment” (>85%). The least addressed issues were “volunteering (tree planting)” and “environmental impact studies of funded projects” (<25%), or even “credit-granting process and project finance”, “community environmental projects”, “awareness raising and environmental responsibility practices” (33%). These results reveal a very humble and mostly “inside” bank’s vision concerning environmental matters.

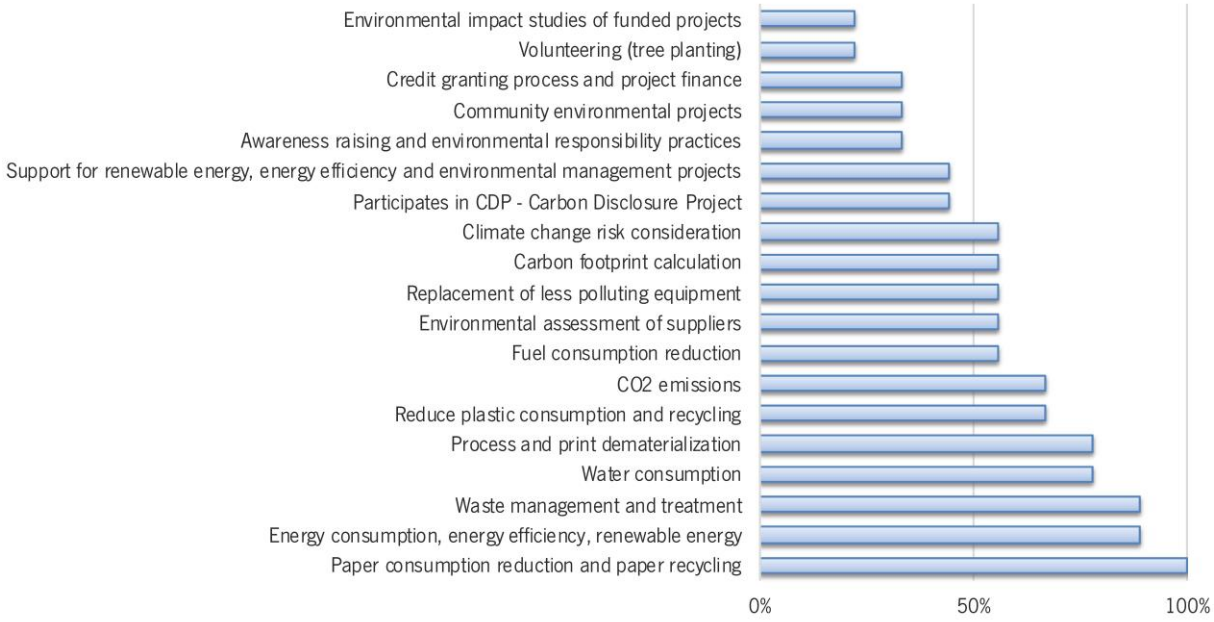

Figure 4.4 Environmental matters (n = 9).

Social and employee matters (Fig. 4.5) - the most discussed topics in this theme were “employee training”, “retention and talent development” and “ethics and integrity”, addressed by all banks (mainly related to self-interests and reputation); while the least addressed were “parenting support”, “social responsibility commission/sustainability committee established” and “tax contribution” (<35%).

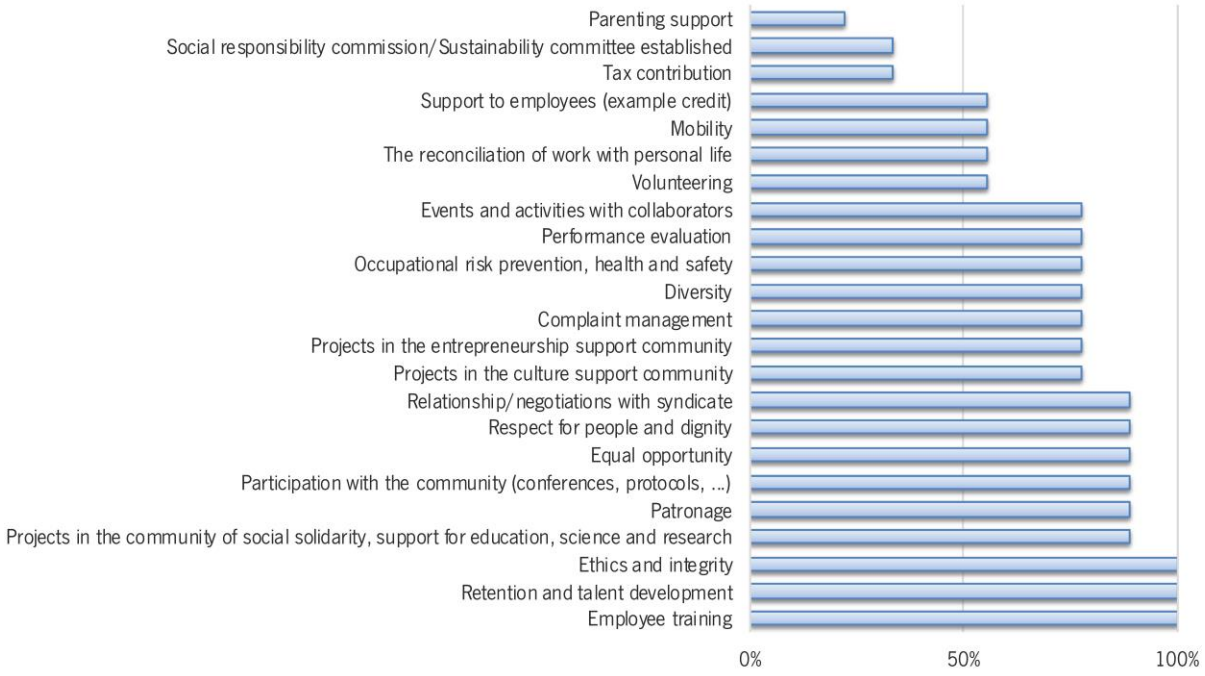

Figure 4.5 Social and employee matters (n = 9).

Equality between women and men and non-discrimination (Fig. 4.6) - "gender equality (male/female)" and "diversity in age" are addressed by all banks, likely due to easy access to this information. In contrast, "non-discrimination based on ancestry, family status, genetic background, and language" (around 10%) is the least disclosed item.

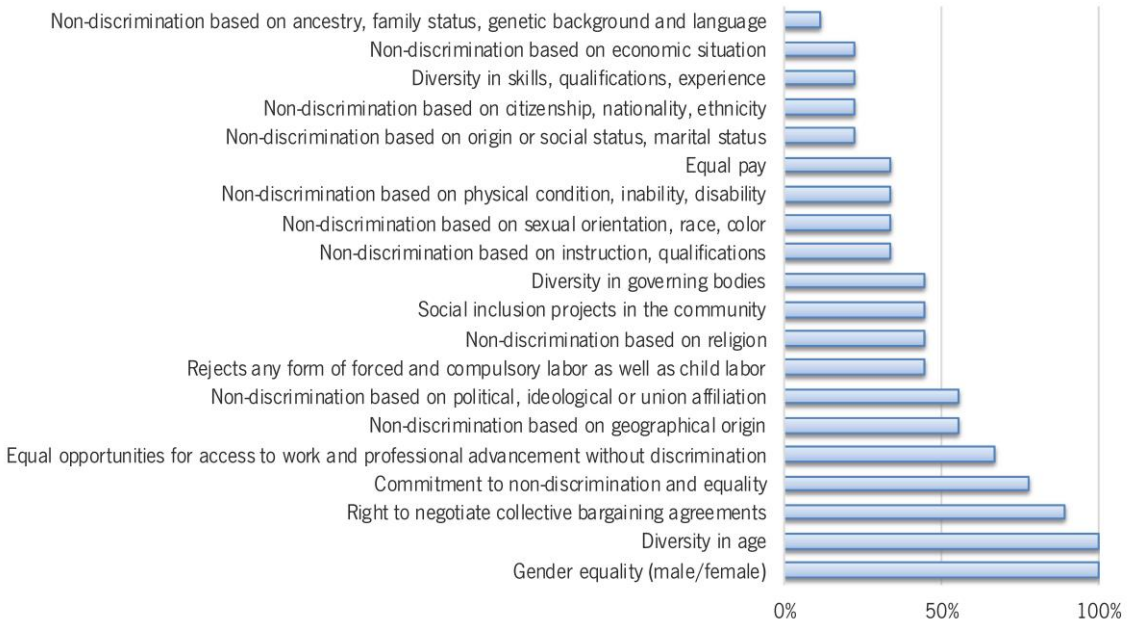

Figure 4.6 Equality between women and men and non-discrimination (n = 9).

Respect for human rights (Fig. 4.7) - the most addressed sub-items were “workers’ rights” and “protection of workers’ health” (100%), probably due to worker unions pressure, while “training in human rights policies and practices”, “integration and development of employees with special needs” (22%), “degree of accessibility to facilities by people with disabilities” and “human rights in supplier contracts” (33%) are the less addressed.



Figure 4.7 Respect for human rights (n = 9).

Fighting corruption and bribery attempts (Fig. 4.8) - the most addressed sub-items were “fighting corruption and bribery attempts” and “training of employees in these areas” (100%), due to additional law enforcement (Directive 2015/849/UE (European Parliament and the Council of the European Union, 2015) and Directive 2016/2258/UE (Council of the European Union, 2016)); while “disciplinary procedures and lawsuits in this area” (around 10%) were the least addressed (probably because it was not applicable in some cases) .

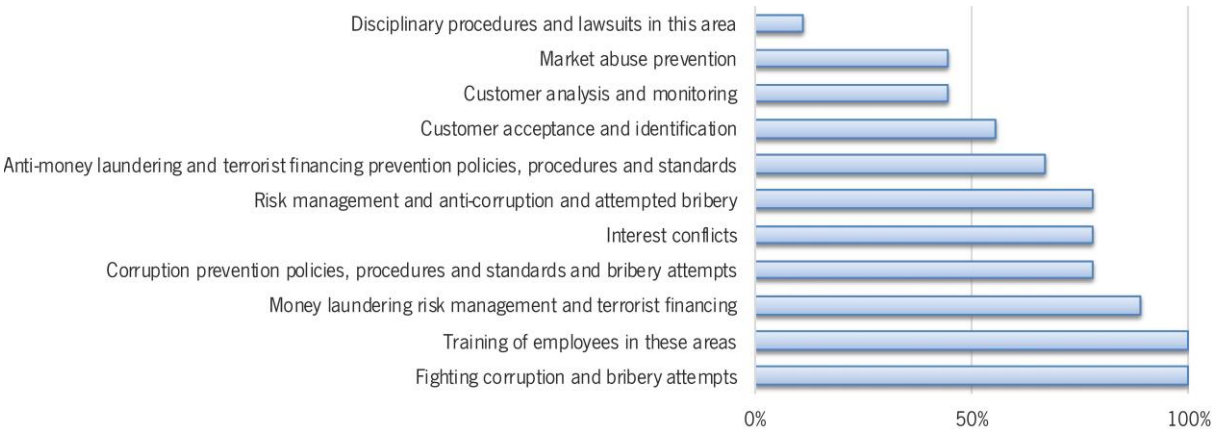

Figure 4.8 Fighting corruption and bribery attempts (n = 9).

Detail of the information - The details of non-financial information varies among banks. Figure 4.9 illustrates the information on environmental matters in the "credit-granting process and project finance" disclosed by three banks. One bank referred to the topic; another disclosed that the bank manages environmental risk in the lending process; only one bank provided a more detailed disclosure.

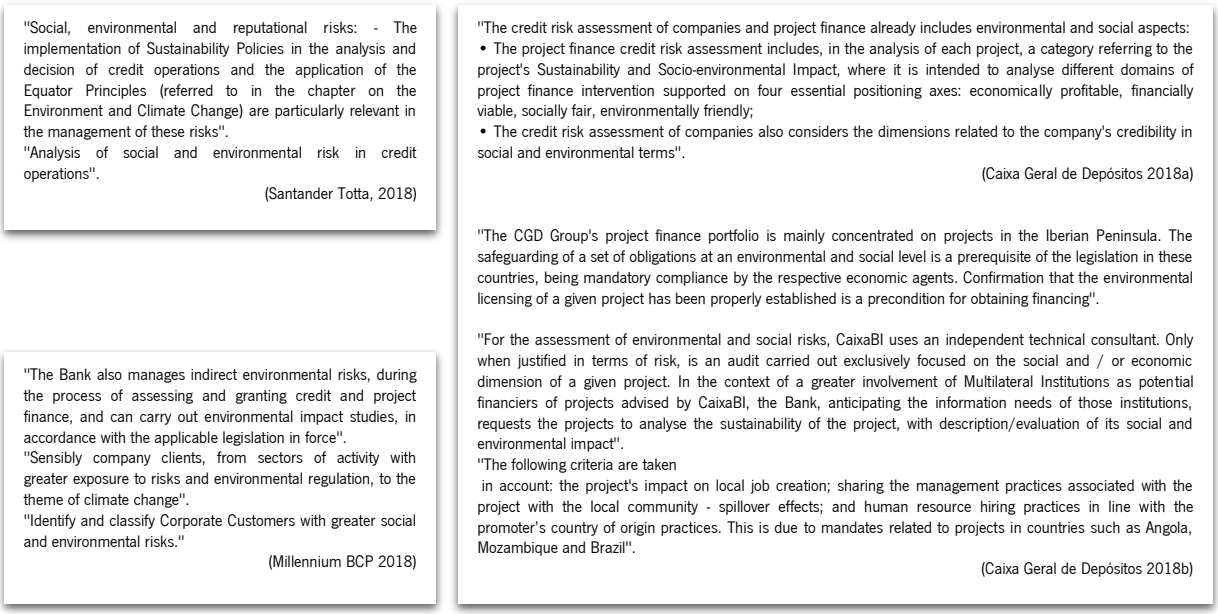

Figure 4.9 Degree of details regarding environmental matters in credit-granting process and project finance (Source adapted from Santander Totta (2018), Millennium BCP (2018), and Caixa Geral de Depósitos (2018a, 2018b)).

4.4 DISCUSSION

In this chapter, the analysis addresses three key questions. Considering the first question: (i) To what extent did banks comply with the Directive, in the first year of adoption (2017)? Data indicates that, in 2017, all banks provided non-financial information and disclosed core requirements. However, some information is less addressed, such as policy implementation results and key performance indicators, both of which are associated with "respect for human rights". Additionally, concerning the more specific information in the reports, disclosures on "environmental impact studies of funded projects" or "integration and development of employees with special needs" are almost not addressed.

Concerning the second question: (ii) How was the non-financial information presented? Data reveal that non-financial information is not comparable, and there are substantial differences in terms of detail among banks. Thus, the comparability of banks' non-financial statements is difficult due to different presentation formats (including varying denominations) and the varying number of pages and topics covered. The annual report is the privileged source for presenting the non-financial statement. Still,

some banks complement this statement with additional information disclosed in their sustainability reports, which often overlap with the original statement. Thus, some banks present a combined report that combines financial and non-financial reporting. Some banks devote a chapter to the "non-financial statement" in the annual report, while others prefer to use other denominations to disclose the non-financial information. Some banks also present a stand-alone sustainability report. There is no uniformity regarding the details: some banks only refer to certain topics, while others provide more detailed information.

Finally, regarding the last question: (iii) How should regulations be revised to improve the non-financial statement? The findings of this study suggest that regulations should advance by standardizing non-financial information to enhance comparability between banks. Thus, it is suggested that regulators should define the specific topics that banks ought to disclose and the required level of detail; it is also emphasised that the indirect effects on the environment should not be ignored (for example, information about how banks assess environmental matters in the credit-granting process and project finance is important). Some banks present tables to make the correspondence between the themes and help identify the topics covered. We believe that this table is useful and should be required. The "non-financial statement" should be a chapter of the annual report or included in the IR, thus avoiding scattered information. Finally, the non-financial statement should consist of an additional theme on climate change, accompanied by a clear and precise definition of policies, risks, results, and indicators.

As several authors have mentioned in previous studies, the legislation will need to provide greater harmonization based on detailed rules and standards to collect and disclose non-financial information (Szabó & Sørensen, 2015), establishing a set of standard rules for firms that operate in similar sectors (Caputo et al., 2019; Lament, 2016). As stated by Romolini et al. (2014), more comparable mandatory rules can improve transparency in CSR reporting. These rules will reveal the corporations' true intentions towards their stakeholders. With greater standardization, there is increased comparability, making it easier to observe the evolution of the company's activities, performance, position, and impact.

Currently, regulations prompt banks to disclose non-financial information; however, comparability is not yet promoted. Data suggest that major differences are related to the diversity of topics and volume of reporting. As Carini et al. (2018) and Lament (2016) also found, this study shows that existing regulations and reporting practices do not ensure the comparability of the non-financial information.

The results suggest the use of legitimacy theory and institutional theory to interpret the findings. The two perspectives of legitimacy theory, strategic and institutional, help to explain the results. Banks disclose non-financial information to strengthen their legitimacy by demonstrating their commitment to

these issues, and some disclose more information than others to improve their legitimacy (strategic perspective). On the other hand, failure to comply with the Directive would jeopardise the banks' reputation and hence their legitimacy (institutional perspective). The institutional theory suggests that all banks adapt to the disclosure of non-financial information under Directive 2014/2014/EU, although banks present the content of this information differently due to the flexibility of the directive, which leads to comparability issues.

4.5 CONCLUSIONS

Banks' non-financial reports aim to address stakeholders' concerns about a better society and a healthier environment. The Directive 2014/95/EU fills a regulatory gap. It aims to contribute to the dissemination and improvement of the quality of CSR reports. Thus, Directive 2014/95/EU contains regulations that aim not only to extend non-financial reporting but also to improve the comparability and usefulness of information presented in non-financial statements.

The directive is a decisive step in reporting non-financial information. The guidelines issued to facilitate the implementation of the directive outline what is necessary to include in the non-financial statement. However, the study reveals that the lack of uniformity prevents the comparison of banks' disclosures. With the directive's issuance, the EU laid out a path for non-financial reporting. However, it is now necessary to issue standards that permit increasing the comparability of this information. The EU needs to continue supporting banks in improving their non-financial reporting. Gradually, the EU should extend mandatory non-financial reporting to all banks.

4.6 LIMITATIONS AND FUTURE RESEARCH

This chapter has several limitations. Firstly, the sample is small, as we only analysed nine banks. But, as mentioned before, only these nine banks are required to adopt the EU Directive. Secondly, we assumed that the information was reliable and faithful. As auditing of non-financial reporting is not necessary in Portugal, the integrity of the non-financial information is not confirmed.

Future research should develop studies that permit: to establish specific topics, items and sub-items that banks could present in the non-financial statement; to evaluate whether banks are making a detailed analysis of the indirect environmental and social risks (such as those that are related to lending and project finance); to analyse the disclosure of information associated with climate change in the non-financial statement in Portugal or other countries. Additionally, since the UE Directive does not require assurance and auditing, studies are necessary to assess the integrity of non-financial reporting. It is

essential to determine whether the disclosed information aligns with the CSR activities of banks, as organisational façades and a lack of transparency may occur (see, for example, (Andrade et al., (2020)).

CHAPTER V: Banks and Climate-Related Information: The Case of Portugal

Part of this chapter is based on the published paper: Santos, Aldina Lopes, and Lúcia Lima Rodrigues. 2021. "Banks and Climate-Related Information: The Case of Portugal", *Sustainability* 13, no. 21: 12215. https://doi.org/10.3390/su132112215. Presented at the International Conference "7th International Conference Corporate Social Responsibility, Sustainability, Ethics & Governance", Politécnico de Lisboa (Lisboa), on 23 June 2021.

BANKS AND CLIMATE-RELATED INFORMATION: THE CASE OF PORTUGAL

In 2014, the EU Directive 2014/95/EU required certain large undertakings and groups to disclose non-financial information from 2017 onwards. In 2017, the EU guidelines on non-financial reporting established that reporting climate-related information is part of the non-financial information. Later, in 2019, the EU reinforced the guidelines to include a supplement that aims to improve climate-related information reporting. Banks can contribute to reducing climate-related risks by supporting investments in economic activities that aim to mitigate the risks associated with climate change. Capital needs should be reoriented towards sustainable investment. Banks must manage financial risks arising from climate change; therefore, they should integrate climate change considerations into their policies and procedures, assessing the potential impact of projects and financing on climate change. This study aims to evaluate how banks in Portugal have been reporting climate-related information and whether the level of information has increased since 2017. Findings indicate that banks already include climate-related information; however, they are still far from meeting the requirements of the new guidelines. Results suggested that banks and regulators still have a long way to go.

5.1 INTRODUCTION

Climate change refers to a long-term shift in weather patterns. It has consequences for the Planet, Society, and Economy (NASA, 2021). Ultimately, there is a broad agreement that climate change is the most significant economic and moral challenge (Bowman, 2010). The demanding challenge should be unquestionable. All sectors of society need to collaborate to avert catastrophe (Bowman, 2010).

The banks' perspective on climate-related information should encompass the double-materiality concept, which considers both the inside-out (how the bank impacts people and the environment) and the outside-in approach (how people and the environment affect the bank). Banks should play a key role in the new conjecture, providing capital for innovation, infrastructure, job creation, and overall prosperity (Cogan, 2008). Under the increasing effects of global warming, banks have never been more crucial in shaping the future; thus, companies that banks decide to finance will be pivotal in slowing Earth's warming and transitioning the world economy to cleaner technologies (Cogan, 2008).

Aware of banks' prominence in the global economy, regulators have established guidelines that will permit banks to play a fundamental and active role in solving climate problems. Regulations have required the need for banks to disclose climate-related information, such as the Directive 2014/95/EU (European Parliament and the Council of the European Union, 2014) and, more recently, guidelines on

non- financial reporting (European Commission, 2017) in 2017, as well as a supplement on reporting climate-related information, in 2019 (European Commission, 2019c).

The study aims to evaluate whether banks in Portugal currently disclose climate-related information and whether this information varies among banks, both before and after the implementation of the directive. Additionally, the study aims to assess the degree of disclosure of climate-related information.

The study begins by addressing the current climate crisis and the importance of banks as an active part of the solution. Additionally, the paper identifies the main guidelines on climate-related information to understand the trend of its content. Data on climate-related information disclosed by banks in Portugal are evaluated and discussed. This study focuses on three research questions: (i) whether banks disclose climate-related information and how disclosure has evolved; (ii) the limitations and restrictions found in terms of climate-related information disclosure; and (iii) what can be improved. The paper comprises a literature review, an analysis of climate-related information by banks, a discussion, a conclusion, limitations, and recommendations for further research.

5.2 LITERATURE REVIEW

5.2.1 The Growing Importance of Banks in Climate Change

Climate change has been noticed since the early 20th century. Human activities, such as burning fossil fuels, primarily drive it. Consequently, increasing levels of heat-trapping greenhouse gases in the atmosphere are observed, raising Earth's average surface temperature (Figure 5.1) in a process commonly referred to as global warming (NASA, 2021).

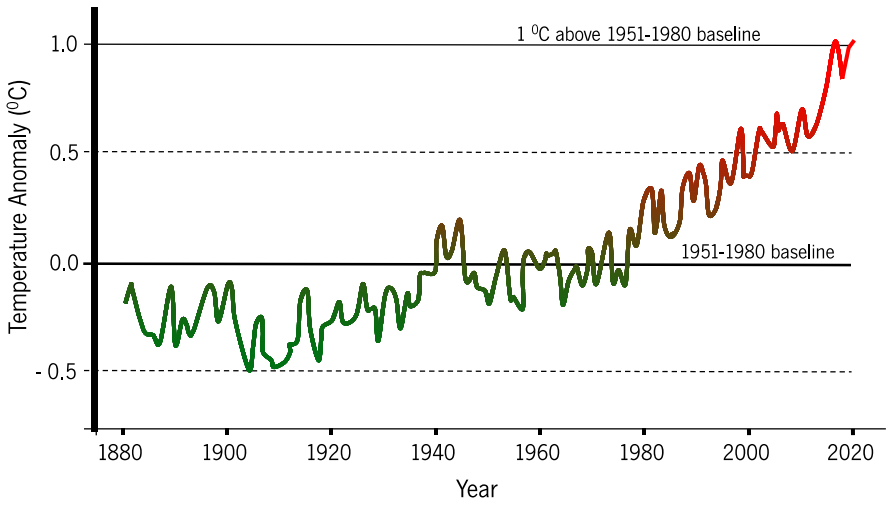

Figure 5.1 Change in global surface temperature (from 1880 until 2020) concerning the temperature baseline (average temperatures measured between 1951 and 1980) (adapted from NASA (2021)).

CO_2 is a significant greenhouse gas that is released through human activities (e.g., deforestation and the burning of fossil fuels) and natural processes (e.g., respiration and volcanic eruptions) (NASA, 2019a). Figure 5.2 shows increasing levels of atmospheric CO2 in recent years (NASA, 2019b).

Climate change has been detected in various aspects, including the warming of the atmosphere and ocean environments, perturbation of the global water cycle, reductions in snow and ice, and mean sea level rise. Indeed, human activities have been the primary cause of the observed warming since the mid-20th century, as noted by the IPCC (2014). Climate change has had significant impacts on both natural and human systems on a global scale, affecting all continents and oceans, regardless of its cause, underscoring the sensitivity of both natural and human systems to a changing climate (IPCC, 2014).

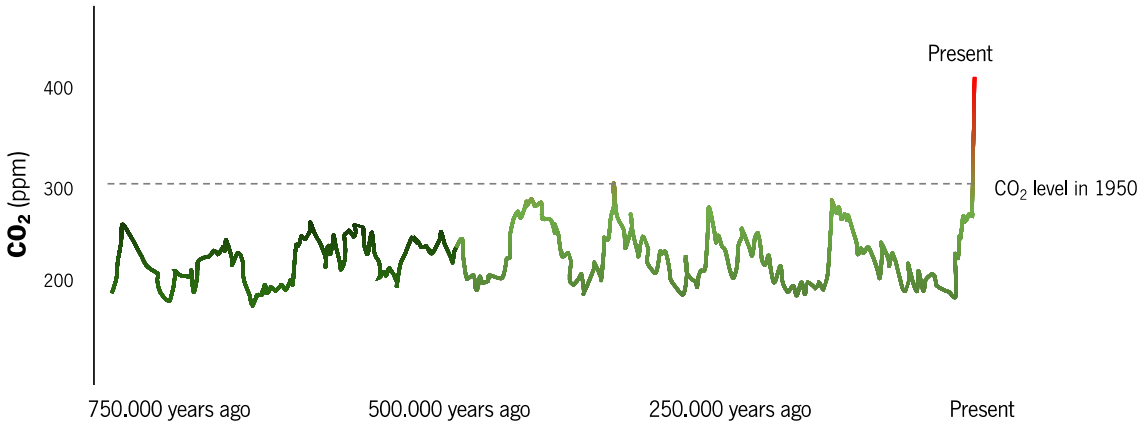

Figure 5.2 Variation of CO_2 concentration (ppm) in the atmosphere during the last 750,000 years, based on comparing atmospheric samples in ice cores and more recent direct measurements. This analysis shows that atmospheric CO_2 has increased since the Industrial Revolution (adapted from NASA (2019b)).

Recently, António Guterres, UN Secretary, argued: "(...) the world is facing a grave climate emergency. Climate disruption is happening now, and it is happening to all of us. (...) We are in a battle for our lives. But it is a battle we can win" (UN, 2019)!

Banks could be engaged in radical changes (Stephens & Skinner, 2013), which would help the current unsustainable use of our environment (Schoenmaker, 2016). There is no time for delays; acting on behalf of the Planet is necessary. According to Stephens and Skinner (2013), we must act urgently to protect the Planet, people, and environment.

In this context, banks will play a fundamental role, beginning to turn down financing opportunities, such as those representative of business-as-usual and carbon-intensive development strategies (Cogan, 2008). This way, financial supervisors and risk managers must be aware of the ecological dimension (Schoenmaker, 2016).

According to Stephens and Skinner (2013), the present international economic crisis derives from three main reasons: (i) a lending and investment culture in the context of widespread speculation and under-regulation at national and international levels; (ii) bank investment in mining and arms industries lobby, and other industries linked to climate change and environmental damage, which have also come under criticism; and (iii) the banking and financial sectors have become the object of widespread public distrust.

Climate change will be a paramount aspect. It will profoundly affect the asset values and credit ratings of corporations, as well as the banks' bottom lines (Cogan, 2008). Banks have divergent interests, programs, and priorities about climate change. Sustain companies through financing (Cogan, 2008). It appears that the banking sector is beginning to respond to the climate challenge. However, "decarbonisation" will require banks to manage their GHG emissions and consider how climate change affects the competitive marketplace, lending and investment strategies, and their financial performance. European banks are at the forefront of integrating climate change into environmental policies, risk management, and product development. Many leading banks in the USA are also working towards better disclosures of climate risks as an essential first step towards embracing a changing regulatory and economic environment. However, banks based in emerging markets have done the least to incorporate climate change considerations into their business practices. Banks should (Cogan, 2008): (i) increase climate-related information disclosure in their annual reports; (ii) report their GHG emissions from operations and define reduction targets, setting specific targets to reduce GHG emissions associated with lending portfolios; (iii) increase the demand for "climate-friendly" financial products and services (e.g., renewable energy); and (iv) take a leading role in supporting emissions-trading mechanisms and introducing new risk-management products.

Therefore, sustainability and climate concerns are changing the role and function of banks (especially their products and services concerning stakeholders) towards a sustainable economy (Ryszawska & Zabawa, 2018).

5.2.2 Regulations, Banks, and Climate Change

In 2014, Directive 2014/95/EU (European Parliament, Council of 22 October 2014, amending Directive 2013/34/EU) served as the starting point for enhancing the dissemination of climate-related information. The directive requires that certain large undertakings prepare a non-financial statement, which should contain information related to environmental matters, social and employee-related matters, respect for human rights, and anti-corruption and bribery matters (European Parliament and

the Council of the European Union, 2014). A non-financial statement should apply only to those large undertakings that are PIE and to those PIE that are parent undertakings of a large group, in each case having an average number of employees above 500 (European Parliament and the Council of the European Union, 2014).

In 2017, a supplement to this Directive was published, presenting guidelines on non-financial reporting (methodology for reporting non-financial information). These guidelines aim to lead companies to disclose high-quality, relevant, useful, consistent, and comparable non-financial information (environmental, social, and governance-related), which can foster resilient and sustainable growth and employment, and provide transparency to stakeholders (European Commission, 2017). These non-binding guidelines aim to help companies prepare relevant, useful, and concise non-financial statements.

Concerning the overall guidelines on environmental issues, including those associated with climate change, the European Commission (2017) advises companies to disclose:

- information about the expected impact of climate change on its strategies and activities;
- relevant governance aspects, including board oversight on matters related to climate change;
- information on who is responsible for setting, implementing, and monitoring a specific policy on climate-related matters. They may also describe the role and responsibility of the board/supervisory board regarding environmental, social, and human rights policies;
- material information on climate-related impacts on their operations and strategy, including appropriate assessments of likelihood and use of scenario analyses; and
- appropriate disclosures on metrics and targets that are used to assess and manage relevant environmental and climate-related matters.

Before this Directive and the Guidelines, banks responded slowly despite growing demands for sustainability and responsibility (Ryszawska & Zabawa, 2018).

The mandatory requirements have been implemented in Portugal with Legislative Decree No. 89/2017 (República Portuguesa, 2017). This decree requires companies to submit a non-financial statement annually, which can be included in the management report or presented in a stand-alone report. The company's management bodies should prepare sufficient non-financial information for an understanding of the evolution, performance, position, and impact of its activities, at least on environmental, social, and governance issues, equality between women and men, non-discrimination, respect for human rights, and the fight against corruption and bribery attempts (República Portuguesa,

2017). Law No. 148/2015 had already defined banks and credit institutions as PIE (República Portuguesa, 2015).

The Technical Expert Group on Sustainable Finance (TEGSF) was presented (June 2018) by the European Commission to promote four key areas of the Action Plan for the development of (European Commission, 2019a):

- unified classification system for sustainable economic activities (taxonomy);
- EU green bond standard;
- benchmarks for low-carbon investment strategies;
- new guidelines on the reporting of climate-related information.

The European Commission (2018c) urged the financial sector to play a crucial role in the fight against climate change. With the new orientations, more investments are expected to be directed to sustainable activities. These rules define the criteria to determine whether an economic activity is environmentally sustainable (European Commission, 2018c).

The potential benefits for banks derived from their climate-related information disclosure are: (i) improved knowledge of loan portfolios' exposure to climate-related risks; (ii) a correct risk evaluation for the calculation of capital charges; (iii) more grounded investment and lending decisions (including asset management); (iv) improved attractiveness to climate-aware clients; (v) evidence of knowledge and experience in climate-related transactions, leading to further climate-related business opportunities; (vi) demonstration of risk control for financial regulators (stress testing) (TEGSF, 2019).

In June 2017, the TCFD (2017b), established by the FSB of the G20, published recommendations to encourage companies to disclose climate-related risks and opportunities. These recommendations have become widely recognized as an international benchmark and have been adopted by several countries. Based on them, the TEGSF (2019) published a report on climate-related disclosures (January 2019) and invited feedback by 1 February 2019. Approximately 70 organisations and individuals submitted comment letters (European Commission, 2019d). Later, in June 2019, the European Commission used that TEGSF report to reinforce the guidelines on non-financial reporting by including a supplement on reporting climate-related information and an annex that provides "further guidance for banks and insurance companies". TEGSF states that banks must look at the "recommended disclosures and further guidance" under its particular perspective of business activities, including lending and investing (European Commission, 2019c).

The guidelines emerged because of (i) the 2015 Paris Agreement on Climate Change, (ii) the United Nations' Sustainable Development Goals, and (iii) the Special Report of the IPCC, from October 2018.

These three initiatives envisage accelerating decisive action to reduce GHG emissions and to create a low-carbon and climate-resilient economy (European Commission, 2019c). The EU has agreed on ambitious targets for 2030 to reduce GHG emissions and increase renewable energy and energy efficiency. The EU defined rules on GHG emissions, namely targets for cars and vans. These rules accord with the long-term strategic vision (published by the EU in 2018) for a prosperous, modern, competitive, and climate-neutral economy by 2050 (European Commission, 2019c).

Banks, risk assessors, lenders, and financiers play a crucial role in the emerging global market for GHG emission reductions by providing specific financial services such as project finance and equity evaluation of GHG-emitting companies, which need to be re-optimized (Janssen, 2000), influencing the business practices and the GHG emissions behaviours (Bowman, 2010). In doing so, banks can influence corporate actors (clients and suppliers) to reduce GHG emissions by applying climate-related decision-making processes and product/market innovations (Bowman, 2010).

Non-financial reporting harmonization will help investors better understand what is considered "green." Financial entities must now inform clients about their impact on the Planet or the local environment. They should provide more choices to investors who wish to invest in the future of our Planet (European Commission, 2018c).

The European Commission believes that increased confidence in climate-related disclosures could promote green financial products and innovation in sustainable investment strategies under a financial ecosystem (Basaglia & Pareglio, 2019). Climate-related disclosure could facilitate a smoother transition to a low-carbon economy, enabling a large number of investors to assess better their financial risk exposures (Batten et al., 2016). Climate-related risks can be converted into opportunities if companies contribute to climate change mitigation or adaptation (European Commission, 2019c).

Figure 5.3 provides a visual representation of banks, companies, and the associated risks and opportunities. Unexpected carbon emission policies can lead to a disorderly re-pricing of carbon-intensive assets and generate a negative supply shock (transition risks), which can cause losses and financial instability; thus, "climate-related disclosure by industries could encourage this re-direction if it enables a wide range of investors to assess their financial risk exposures", helping to understand how a given change in carbon price will affect the value of the firm (Batten et al., 2016, p. 28). Central banks can assess financial stability risks that may arise from the transition to a low-carbon economy (for example, via a stress test). A late or sudden transition to a low-carbon economy can expose banks to high environmental risks (Schoenmaker, 2016).

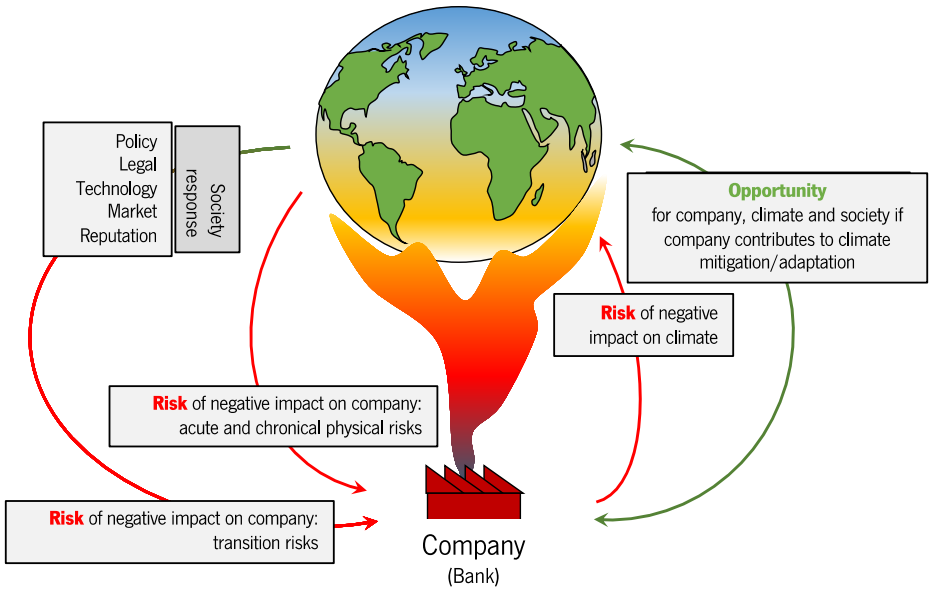

Figure 5.3 Climate-related risks and opportunities (adapted from European Commission (2019c)).

The EU Non-Financial Reporting Directive 2014/95/EU (the Directive) has been implemented at the European level since 2017. The directive only indicates that member states are responsible for implementing procedures to ensure compliance (Jeffery et al., 2017). Since it is not entirely clear, the directive leads to a variety of approaches. Some companies disclose a few topics just to meet compliance requirements, while others disclose detailed non-financial information, including useful climate-related information (Jeffery et al., 2017). However, Matuszak and Rózańska (2017) stated that the new reporting obligation should increase the extent and quality of non-financial disclosure.

Information flows between banks and borrowers should be improved, particularly regarding physical climate-risk assessments and adaptation investments. Companies in climate-sensitive sectors conduct climate change risk assessments, develop adaptation plans, and invest in adaptation measures to mitigate the risks associated with climate change. Disclosure of these data will help banks evaluate the risks in their loan portfolios and identify opportunities to support clients making these investments (UNEP FI & Acclimatise, 2018).

Further progress is still needed to develop robust methodologies that enable comprehensive data collection for evaluating the climate-related risks to which companies and investors are exposed (Campiglio et al., 2018). It is crucial to provide incentives for risk disclosure, develop asset-level databases, and refine climate stress-test techniques.

Recently, the EBA (2020b) defined guidelines for granting and monitoring loans, which will be applied from June 2021 onwards. Those guidelines help banks assess the risks associated with ESG factors in

the financial conditions of borrowers, and in particular, the potential impact of environmental factors and climate change on their appetite, policies, and procedures regarding credit risk. The guidelines highlight the issue of climate change risks concerning the financial performance of borrowers, which can materialize as (2020b):

- physical risks (arising from the physical effects of climate change, including liability risks for contributing to it);
- transition risks (arising from the transition to a low-carbon and climate-resistant economy);
- other risks (for example, market changes, shifts in consumer preferences, and legal risks that may impact the performance of the underlying assets).

Banks are exposed to environmental risks. Therefore, it is necessary to develop methodologies for measuring the carbon intensity of investments (Schoenmaker, 2016). Banks are expected to address climate risk the same way as they address any other financial risk, ensuring that they prudently manage their relevant exposures. Thus, banks need to consider how climate-related risks should be identified and managed in terms of credit risk, operational risk, market risk, reputation risk, and other relevant risks. These considerations will help them understand whether climate risks can impact their balance sheets, strategies, and profits (Feridun & Güngör, 2020).

5.2.3 Theoretical Perspective

An et al. (2011) state that, according to legitimacy theory, organisations must respect society's expectations and ensure that they are perceived as being in line with society's expectations and norms (An et al., 2011). Society creates organisations because it considers them relevant, but it can also decide to end them; therefore, legitimacy is fundamental to their existence over time (Ihlen, 2009). According to Suchman (1995, p. 574), legitimacy "is a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions".

Within the framework of legitimacy theory, two perspectives have been identified: the strategic view and the institutional view. Thus, in the first (strategic) perspective, managers seek to secure legitimacy by looking outside the organisation. In the second (institutional) perspective, society looks inside the organisation and imposes conditions of legitimacy (Suchman, 1995). Maintaining or gaining legitimacy is linked to communicating accounts of the complex and socially valued consequences or structures of banking (Sorour et al., 2021).

Institutions influence the behaviour of organisations through norms, allowing institutional theory to explain disclosure and CSR activities in a similar manner (Coluccia et al., 2018).

5.3 METHODOLOGY

5.3.1 Sample

According to Banco de Portugal (Portuguese Central Bank), in the first year of mandatory application of the Directive, there were thirty banks and two banking savings institutions in Portugal (Banco de Portugal, 2018). Despite that, due to the size, only nine entities (eight banks and one savings bank) were required to comply with Directive 2014/95/EU. Thus, the study sample includes the entire universe in the Portuguese banking system, which was (in 2017) required to disclose non-financial information, composed of nine entities.

5.3.2 Content Analysis and Evaluation Methodology

In this study, we performed a detailed content analysis of the annual and sustainability reports (stand-alone or integrated into the annual report). The paper presents an analysis of climate-related information disclosed by the nine selected entities to evaluate the quality and quantity of reported climate-related information in the period 2014–2019. The study focuses on climate-related information from 2014 to 2016 (the period prior to the implementation of the directive), 2017 (the first year of the directive's enforcement), and the two subsequent years, 2018 and 2019. The study facilitates a deeper understanding of how banks present their climate-related information (in accordance with Directive 2014/95/EU and subsequent guidelines) and how disclosure can contribute to mitigating climate change. Terms such as policies, objectives, emissions, or energy consumption were used to search for climate-related information. The information was classified and categorized under the identified addressed topics and indicators.

The collected climate-related data were then transcribed, entered into the computer, and analysed in terms of absolute or relative numbers. Finally, data were interpreted and discussed in qualitative terms to evaluate how banks in Portugal have been disclosing climate-related information.

This research has limitations associated with the sample size. However, it accounted for all the banks in Portugal that are required to comply with the Directive in the first year of application (2017).

5.4 RESULTS

5.4.1 Evolution of Climate-Related Information

The first approach was to see whether banks reported climate-related information for the period 2014–2019.

Figure 5.4 presents a relevant evolution in the percentage of banks that disclosed climate-related information since 2014. Between 2014 and 2016, only 78% of banks disclosed information related to climate change. From 2017 onwards, all banks presented some information on this topic. Climate-related information is disclosed in the annual report and the stand-alone sustainability report when available. 100% of banks (2017, 2018, and 2019) reported climate-related information in the "non-financial statement". However, some banks designated the "non-financial statement" differently, while others reported that the "non-financial" information was in a stand-alone sustainability report. Sometimes, an overlap occurred between the information included in the annual report and the stand-alone sustainability report, similar to what was reported in another study (Carini et al., 2018). One bank (in 2017 and 2018) and two banks (in 2019) suggested that they used the stand-alone sustainability report to comply with the requirement to present the "non-financial statement", which includes climate-related information.

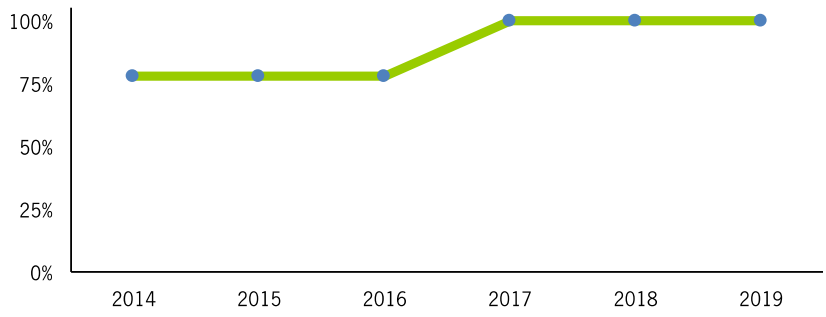

Figure 5.4 Evolution in the percentage of banks disclosing climate-related information.

Two banks presented information related only to energy efficiency or CO2 reduction from 2017 to 2019. Banks should emphasize the importance of climate-related information, such as environmental reports, as it is considered reputational capital that can enhance their financial performance (Branco & Rodrigues, 2006; Kılıç & Kuzey, 2019). Demaria et al. (2019), in a study performed in 2017 (France), also revealed a disclosure increment with the EU Directive. They concluded that companies near consumers tend to disclose additional environmental information to show their ethical practices. This

evidence is consistent with legitimacy theory, which argues that the level of disclosure answers questions of legitimacy related to environmental pressures (Demaria et al., 2019).

To understand the evolution of the theme over time, the content analysis examined the number of times the terms "climate" (including "climate change") or "climatic" were mentioned in annual reports and stand-alone sustainability reports during the analysed period (Figure 5.5).

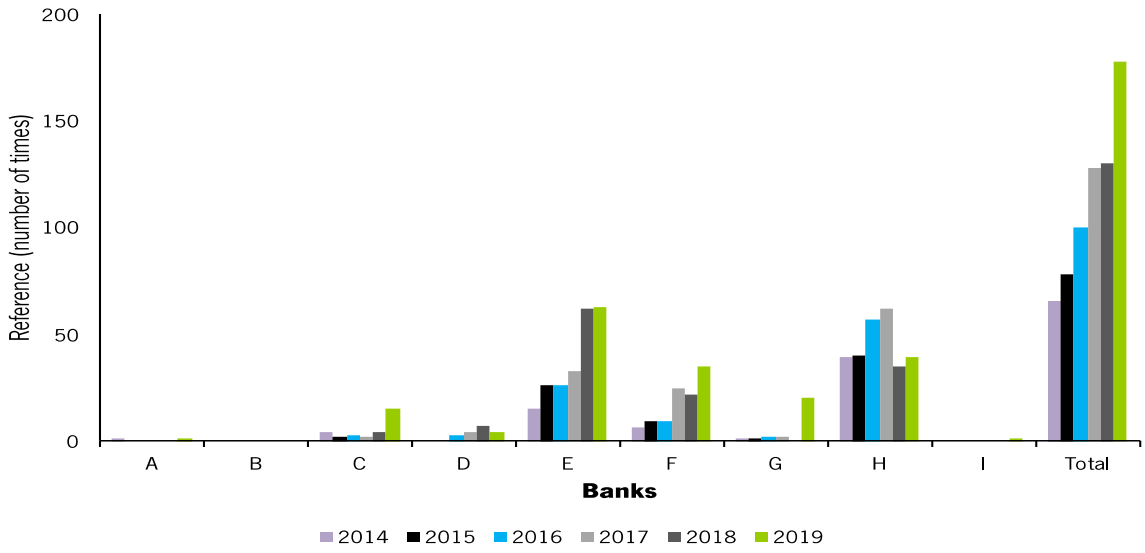

Figure 5.5 Dispersion of the use of the terms "climate" and "climatic" in the annual reports and stand-alone sustainability reports between 2014 and 2019.

Figure 5.5 illustrates that the words "climate" and "climatic" exhibit an evolutionary pattern of repetition in annual reports and standalone sustainability reports. Considering Figure 5.5 overall data (see "Total"), an increase of 47% in the year of the Directive implementation (2017) was observed, followed by a near-maintenance in the next year (2018), and an increase again in 2019 (see "Total"). This increase coincides with the year of the publication: "Guidelines on non-financial reporting: Supplement on reporting climate-related information". It is also likely associated with the global increase in studies on climate change and the media's coverage of the topic. In 2014, only 67% of banks mentioned those terms, whereas in 2019, the figure had increased to 89%. However, diversity among banks was observed, with some hardly using these terms and others using them quite frequently.

The volume of pages with climate-related information (number of pages) has increased since 2014 (Figure 5.6). However, the number of pages still accounts for only around 3% of the total reported pages (annual report and/or stand-alone sustainability report). We also observed dissimilarity among banks regarding the number of pages reporting climate-related information. In the same evaluated year, the

number of reporting pages submitted by each bank varied significantly. For example, in 2019, while one bank reported only two pages, another bank reported about fifty pages.

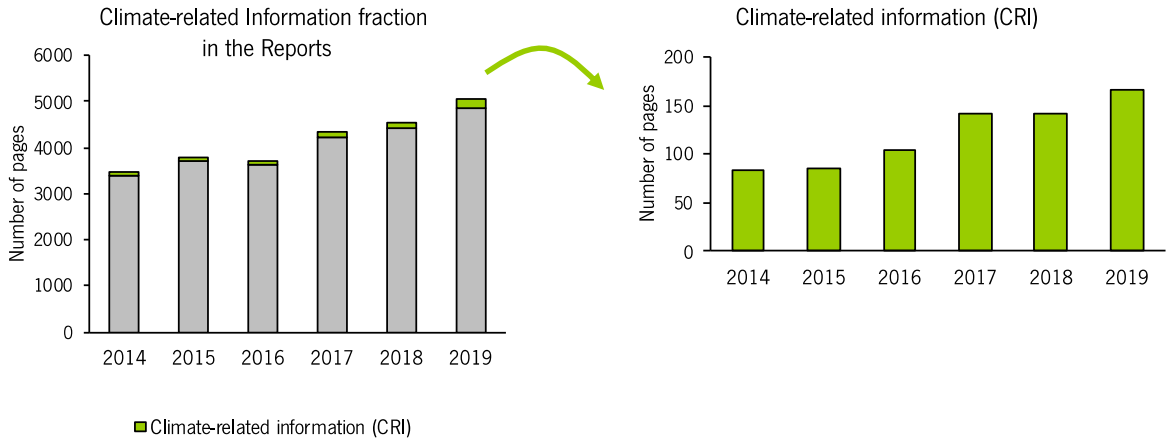

Figure 5.6 Climate-related information observed (green fraction) in the Reports (Annual Report and Separate Sustainability Report) from 2014 to 2019.

Overall data reveal that banks disclosed climate-related information in the first triennium of the Directive, and there has been a positive evolution since 2014. This empirical evidence means that banks in Portugal have enhanced the disclosure of information on climate-related issues. This evolution aligns with Demaria and Rigot's (2020) study, which suggests that more companies are disclosing information about climate risk. Manes-Rossi et al. (2018) found that companies (including banks) demonstrated a collective awareness about the need to provide a comprehensive volume of socio-environmental disclosure to maintain legitimacy.

However, although some companies may disclose ample environmental information, it should not be ignored that this non-financial information is not currently audited. Auditors only verify whether the non-financial statement is published or not (República Portuguesa, 2017). The rhetoric of organisations may not follow their behaviour, reflecting a gap between words and deeds (Demaria & Rigot, 2020).

5.4.2 Approach Adopted by Banks on Climate-Related Information for 2017–2019

After reviewing the annual and sustainability reports for 2017, 2018, and 2019, five headings were identified and further subdivided into more specific topics.

The five headings evaluated in this study, somehow following the "recommended disclosures and further guidance" in the guidelines (European Commission, 2019c), were: (i) Disclosure on the business model; (ii) Disclosure on policies and due diligence processes; (iii) Disclosure on outcomes; (iv) Disclosure on principal risks and their management; and (e) KPIs.

5.4.2.1 Disclosure on Business Model

The business model aims to describe how a bank generates and preserves value through its products and services in the long term (European Commission, 2017). In the analysis, the following information was found (Figure 5.7):



Figure 5.7 Disclosure of the business model.

The information covered by all banks (100%) includes opportunities related to the climate, such as seeking efficiency in the use of resources, energy sources used, and products and/or services in this area; promoting the financing of the low carbon economy with solutions for this purpose, for example, financing the circular economy, renewable energies, among others; and directly or indirectly, banks refer to support their customers for a decarbonized economy. It is not by chance that "*green bonds*" were mentioned by 44% of the banks.

The results showed that 67% of the banks have objectives/strategies for reducing GHG and objectives/strategies for reducing the impact of bank activities (for example, reducing energy consumption, water, plastic, mitigating waste, using renewable energies). In comparison, 67% of the banks participate in national or international working groups, to be aware of the main trends and future factors on sustainable finance, such as the Business Council for Sustainable Development (BCSD)

Portugal, which is part of the Global Network of the WBCSD, Associação Portuguesa de Bancos (APB), or European Banking Federation (EBF).

To mitigate climate-related risk, 67% of banks consider the environmental/climate risks in assessing projects and granting credit. The study found that 33% of banks reported participating in the CDP, which identifies climate change risks and opportunities. Two banks reported that they had disclosed climate-related issues in accordance with the TCFD's recommendations, and another bank indicated that it would implement these recommendations in the future. In fact, these three banks are the ones that most refer to climate/climatic expressions and also dedicate more pages to climate-related information.

Banks are beginning to consider the opportunities and risks associated with climate-related actions, such as their internal performance in terms of resource consumption and use, as well as the financing of clients (e.g., supporting energy efficiency improvements and renewable energy). This empirical evidence suggests that banks are adhering to the directive guidelines.

Despite this, the following were not observed: a clear description of climate-related risks within the existing risk categories, nor were the impacts on strategy and the mitigation measures to be implemented. This evidence also agrees with the ECB (ECB, 2020a) study, which concluded that only a limited number of institutions disclosed that information.

5.4.2.2 Disclosure of Policies and Due Diligence Processes

Considering the disclosure of policies and due diligence processes (Figure 5.8), all banks, either in a summarized version or in detail, presented their environmental policies, including issues related to the environment, and sometimes only referred to the management of material consumption. These findings corroborate the ECB (2020a) conclusions, wherein most of the assessed institutions referred to climate-related policies in some form in their public disclosures, predominantly in their annual report. In this study, all banks demonstrated commitment to continuously improving their performance. However, only 56% of the banks specifically aimed at fighting climate change.

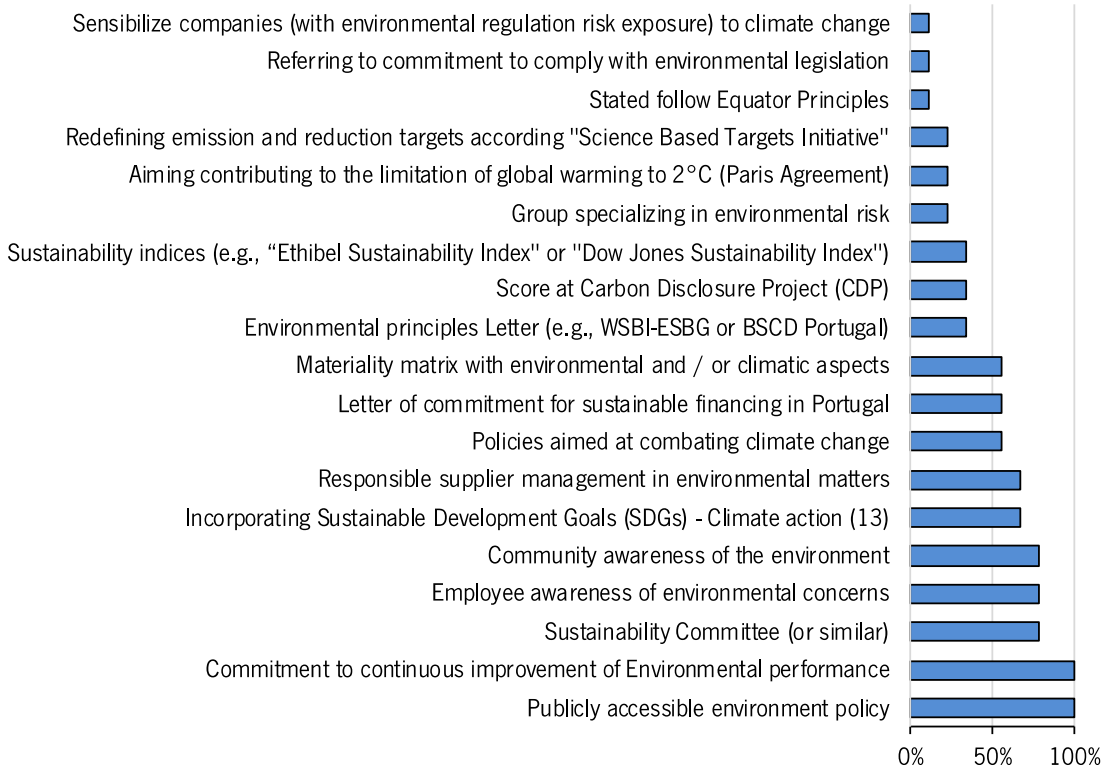

Figure 5.8 Disclosures on policies and due diligence processes.

Most (78%) banks identified the governance bodies responsible for environmental issues, such as the Sustainability Committee. Banks also reported how they promote employees and community awareness through events, volunteering, and awards. In Turkey, Kılıç & Kuzey (2019) found few banks that implemented a board committee responsible for environmental issues, climate change, or GHG emissions. Banks should establish a broader governance structure, ensuring their boards have the appropriate level of oversight with clear reporting lines related to climate and responsibilities (Feridun & Güngör, 2020). According to Furrer et al. (2012), banks with the most advanced climate strategies appear to have top management that addresses climate change consciously and systematically.

Only 22% of banks have a group specialized in environmental risk, but only one specified an internal group on climate finance. On the other hand, 67% of the banks incorporate sustainable development objectives (13 - climate action) from the UN Global Compact, while the other 67% indicated having responsible supplier management in environmental matters. In 2019, 56% of banks reported having signed a letter of voluntary commitment for sustainable financing in Portugal, with climate change as its core focus (Grupo de Reflexão para o Financiamento Sustentável, 2019). Additionally, 56% of banks also presented a materiality matrix that included environmental and/or climatic aspects.

The set of least disclosed information (by only 11% of banks) relates to specific references to compliance with environmental legislation, raising awareness among companies with greater exposure to environmental risks regarding climate change, and stating adherence to the Equator Principles. The Equator Principles outline risk management structures that banks should adopt to determine, assess, and manage environmental and social risks associated with financing projects (Equator Principles, 2020).

5.4.2.3 Disclosure of Outcomes

The outcomes are the actions taken by banks that support the achievement of the goals they define as climate-related (Figure 5.9).

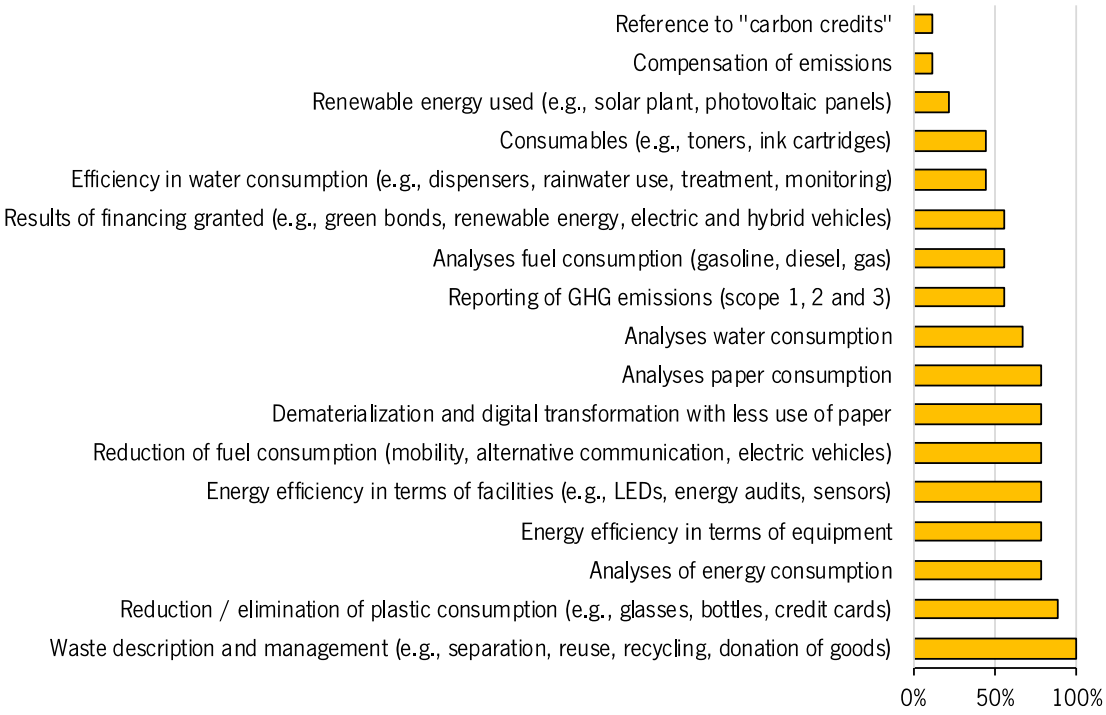

Figure 5.9 Disclosure of outcomes.

All banks (100%) provided information on waste description and management, including the separation, recycling, or donation of goods. Notably, 89% of the banks reported concerns about reducing/eliminating plastic consumption. Additionally, 78% of banks disclosed information about control of energy consumption, energy efficiency in facilities and equipment, reducing fuel consumption, digital transformation (dematerialization) in services and customer interactions, and paper consumption. However, only 56% reported the evolution of GHG emissions.

The least-disclosed information (11%) was offsetting carbon emissions and the reference to carbon credits. This empirical evidence corroborates Cogan (2008), who argued that few banks calculate the carbon risk in their loan portfolios and set specific targets to reduce GHG emissions associated with a part of their loan portfolio. The emissions trading market is growing rapidly. There is a lack of credit registers as tools to perform carbon stress-testing (Nieto, 2019).

However, no disclosure of information was found to follow specific Directive guidelines for banks (European Commission, 2019c), such as the trend in carbon intensity across various portfolios in light of established goals and risks over time.

5.4.2.4 Disclosure of Principal Risks and Their Management

This section presents the primary risks and their corresponding management strategies. Figure 5.10 presents the results.

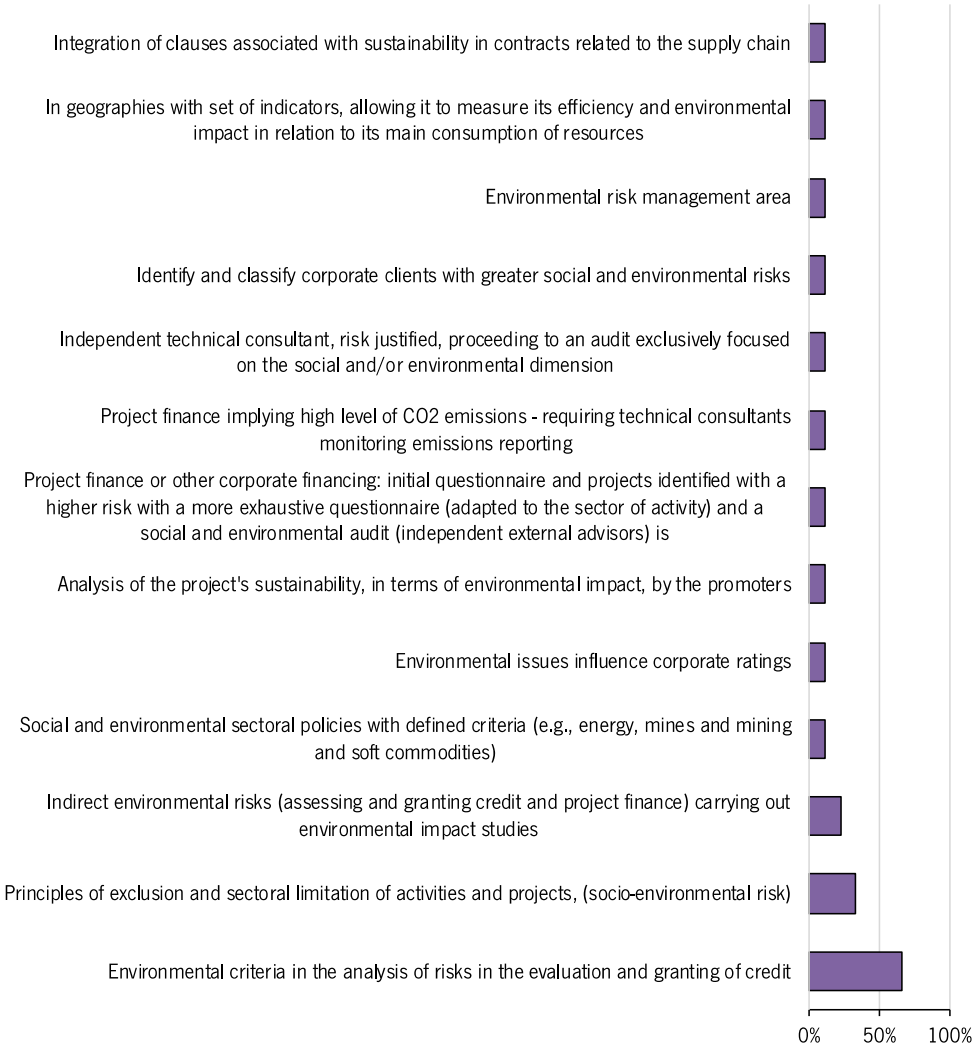

Figure 5.10 Disclosure of information on principal risks and their management.

We observed that 67% of the banks considered environmental criteria when evaluating risks and credit-granting, revealing a similar percentage to what had been observed in the ECB (2020a) study. However, only 33% stated the principles of exclusion and sectoral limitation of activities and projects, considering the potential for socio-environmental risk. Additionally, only 22% evaluated the indirect environmental risks in the process of assessing and granting credit and project finance, thereby carrying out environmental impact studies in accordance with applicable legislation. Some banks also provided a variety of other disclosures, for example, identifying only 11% of monitoring projects with a high level of CO2 emissions and hiring independent technical consultants to audit the environmental aspects of a given project. No bank disclosed climate- related scenarios. In the ECB (2020a) study, there were also a few entities that do so.

The risks associated with climate change are considerable for banks. Thus, decision-makers need to estimate their importance and consider them in credit management and environmental planning (Georgopoulou et al., 2015). Climate-related scenarios offer valuable insights for bank decision-makers to mitigate future risks. They help credit analysts inform customers about potential actions they can take to adapt to climate change (Georgopoulou et al., 2015). Still, concerning the risk analysis in the evaluation of projects and credit-granting, it is crucial to highlight that several approaches to this situation by banks were identified, as seen in 2019.

Considering examples of information provided by banks on risk analysis in project appraisal and credit-granting (Figure 5.11), we observed that climate issues are just starting to be included, thereby marking the first step towards alignment with ECB guidelines. The study highlighted this issue due to its importance and influence in the respective bank area.

General and sectoral exclusions related to activities with a special impact on environmental risk. It has an area responsible for the execution of the internal environmental management plan, mainly with regard to the admission of credit risks, with the objective of minimizing, mitigating and remedying the potential negative impact on the environment.

(Banco BPI, 2020)

Responsible and sustainable credit based on the strong commitment of its employees to the principles of social ethics and the construction of a more "green" planet.

(BNP Paribas, 2020)

Integrate ESG risks into risk management procedures, sensitize company clients, from sectors of activity with greater exposure to risks and environmental regulation, to the topic of climate change and identify and classify corporate clients with greater social and environmental risks. It manages indirect environmental risks, during the process of assessing and granting credit and project finance, being able to carry out environmental impact studies in accordance with the applicable legislation in force.

(Millennium BCP, 2020)

Promote training in sustainable financing aimed at employees at different levels of the organization, including the board of directors, with a focus on the area of credit risk analysis and promote the gradual integration of environmental, social and governance criteria in the analysis of financing and investment.

(Novo Banco, 2020)

Analysis of social and environmental risk in credit operations. Consider and assess the climate change impacts of financing projects and the measures to be taken to eliminate or reduce polluting emissions.
The analysis process for project finance operations or other corporate financing with a known destination is as follows: a) For project financing operations with a value equal to or greater than 10 million dollars, or corporate financing with a known destination, with a value total transaction equal to or greater than 100 million dollars, in which the bank's position is equal to or greater than 50 million dollars, an initial questionnaire designed to establish the risk of the project in socio-environmental matters (according to categories A, B and C, from highest to lowest risk, respectively); b) for projects identified as having a higher risk (A and B), a more exhaustive questionnaire is completed, adapted to the sector of the activity. Likewise, on these projects, a social and environmental audit (carried out by independent external advisors) is carried out. These procedures are associated with the application of the Equator Principles, a process that is periodically audited by external / internal auditors. Sectoral policies extend the scope of the application beyond the criteria collected by the Equator Principles.

(Santander Portugal, 2020)

It has principles of sectorial exclusion and limitation recognizing the existence of sectors of activity or projects that can negatively contribute to sustainable development, thus establishing a list of principles underlying activities and projects that are excluded, or restricted under certain conditions, from its policy of credit.
Sustainability and socio-environmental impact are a risk factor taken into account in the rating assigned, being incorporated into the qualitative assessment of scoring factors such as the business profile, political-legal framework or regulatory environment in which the company and or the project is inserted, influencing the rating underlying the credit granting process.
The project finance portfolio, due to its location, obeys a set of environmental and social obligations provided for in the legislation, and its compliance with the respective economic agents is mandatory. Confirmation that the environmental license for a given project was duly obtained is a precondition for obtaining financing.
For the assessment of the project's risks (including environmental and social risks), it resorts to hiring an independent technical consultant. Only when justified in terms of risk, an audit is carried out exclusively focused on the social and / or environmental dimension of a given project. In the case of the involvement of other institutions as potential funders of the evaluated projects, there is a greater focus on the analysis of the project's sustainability, with description / evaluation of its social and environmental impact.

(Caixa Geral de Depósitos, 2020)

Figure 5.11 Examples of "risk analysis in project appraisal and credit-granting" considering the disclosure of climate-related information, 2019 reporting information provided by banks - summarised and adapted from (Banco BPI, 2020; BNP Paribas, 2020; Caixa Geral de Depósitos, 2020; Millennium BCP, 2020; Novo Banco, 2020; Santander Portugal, 2020).

5.4.2.5 Key Performance Indicators (KPIs)

The study revealed that 89% of banks publish indicators on waste treatment and collection, 78% on energy consumption, and 67% on paper consumption. On the other hand, 56% of banks already have indicators of their CO_2 emissions (scopes 1, 2, and 3). Only 11% of banks reported the number of building audits conducted for energy efficiency and financing for hybrid and electric vehicles. The disclosures on energy efficiency financing volume in companies and financing volume for urban rehabilitation because of energy efficiency/renewable energy criteria represent only 22% (Figure 5.12).

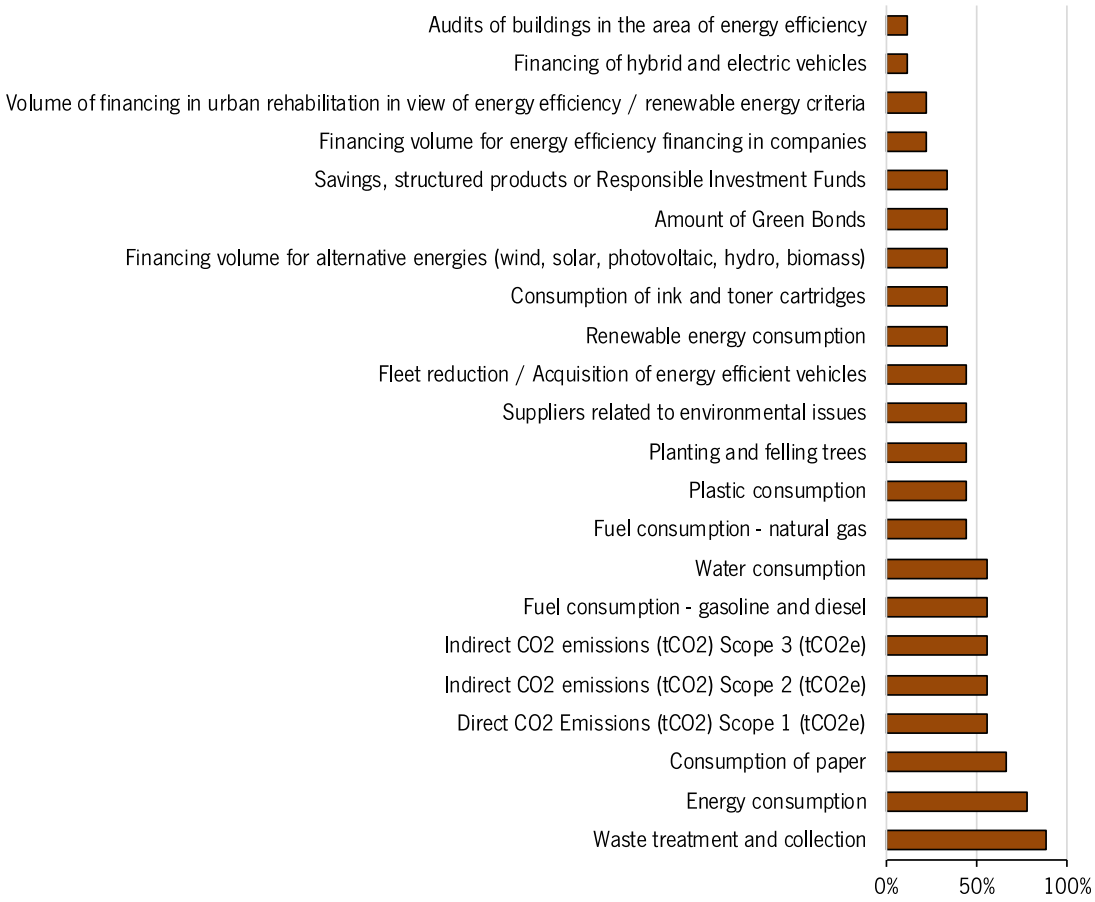

Figure 5.12 Illustration of the KPIs.

These key performance indicators begin to follow the EU guidelines. However, in banks in Portugal, there is no information available about the exposure of the portfolio to sectors affected by climate-related risks and opportunities (in terms of quantity or percentage of assets) or, for example, the volume of collateral related to assets or activities in climate change mitigation sectors.

5.4.2.6 Triennium (2014-2016) in Comparison to (2017-2019)

After considering the information available for the triennium 2017-2019, this sub-chapter analyses the previous triennium 2014-2016, to determine if the Directive impacted the disclosure of climate-related information. It should be noted that some items do not apply to all years, such as "the objective of contributing to limiting global warming to 2°C (Paris Agreement)", which was agreed only in 2015. Figures 5.13 to 5.17 present the content analysis results of the annual reports/sustainability reports from 2014 to 2019.

In the period (2014-2016), 67% of banks presented "objectives/strategies reducing banks' activity impacts (e.g., energy, water, plastic, or waste)", which is the most disclosed item in these three years

and with a similar value in the period (2017-2019) (Fig. 5.13). For example, there is a significant difference in the disclosure of "customers supporting a decarbonised economy" (44% vs. 100%), indicating a shift in the banks' attitude toward customers.

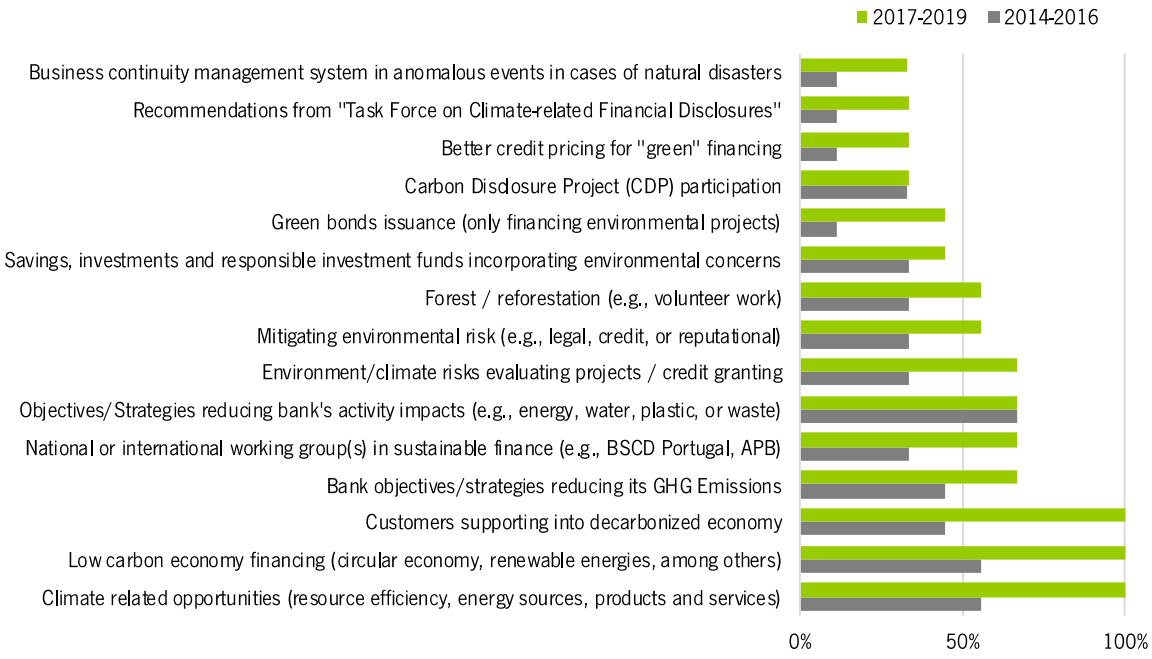

Figure 5.13 Disclosure of the business model (comparing 2014-2016 and 2017-2019).

Comparing disclosure on policies and due diligence processes (see Fig. 5.14), "employee awareness of environmental concerns" and "community awareness of the environment" (both with 67% in the 2014-2016 period, being the most disclosed) show the need to demonstrate concern for these issues to employees and the community, in the search for legitimacy. This situation changed in the following period, demonstrating the banks' commitment to these issues (policies and commitments). The "Letter of Commitment for Sustainable Financing in Portugal" was not published during the 2014-2016 triennium, as it was only released in the middle of 2019.

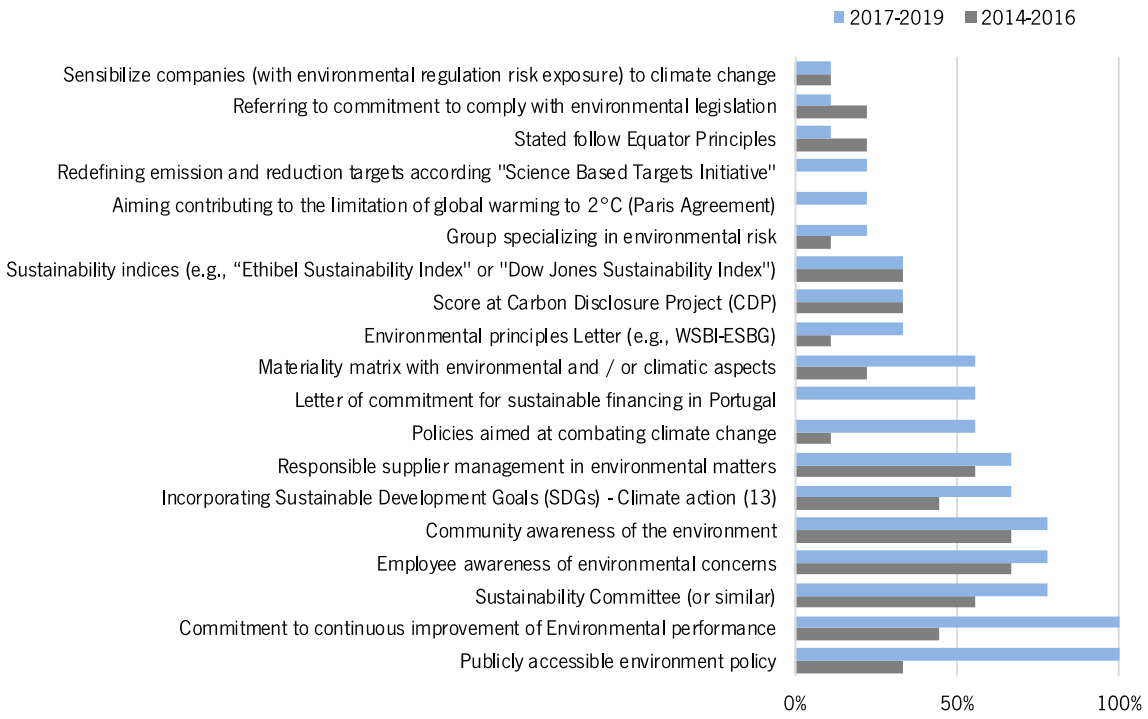

Figure 5.14 Disclosures on policies and due diligence processes (comparing 2014-2016 and 2017-2019).

Comparing outcomes between trienniums 2014-2016 and 2017-2019 (Fig. 5.15), "dematerialisation and digital transformation with less use of paper" (67%) stands out in the 2014-2016 period. Indeed, when banks were associated with the environment, this was the topic that immediately stood out; however, today the reality is quite different.

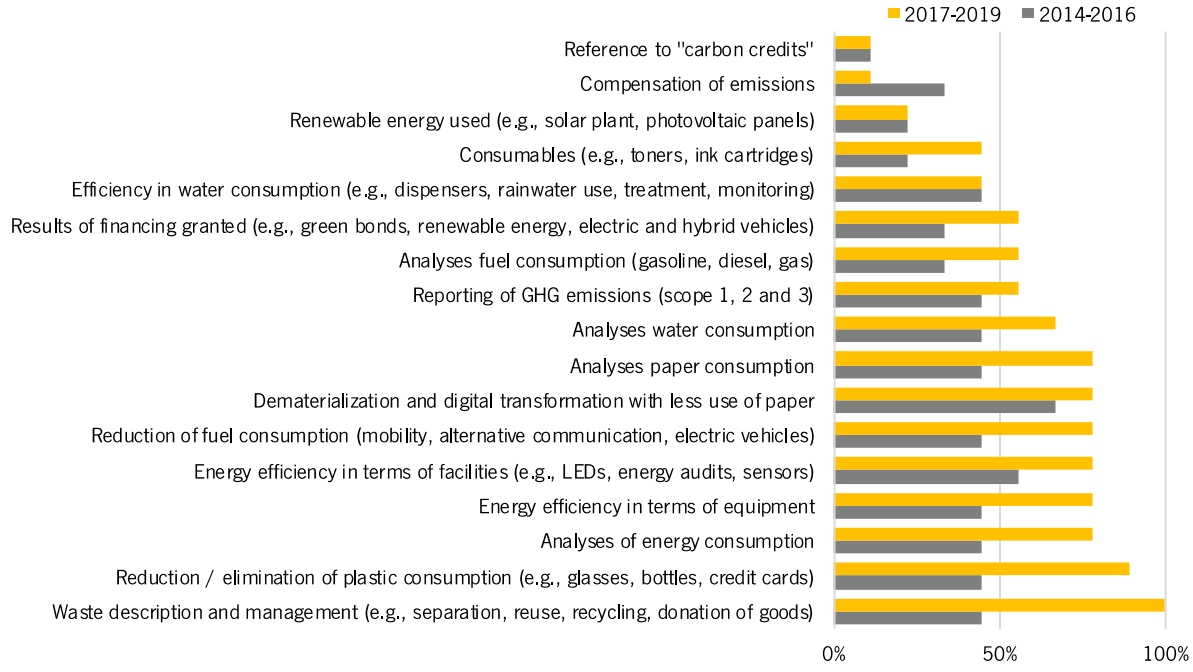

Figure 5.15 Disclosure of outcomes (comparing 2014-2016 and 2017-2019).

Concerning the disclosure of information on key risks and their management (Fig. 5.16), there was very little overall for the 2014-2016 period, similar to the 2017-2019 period. Although the "environmental criterion in the analysis of risks in the evaluation and granting of credit" is emphasised, the indication is that this is an area for further development.

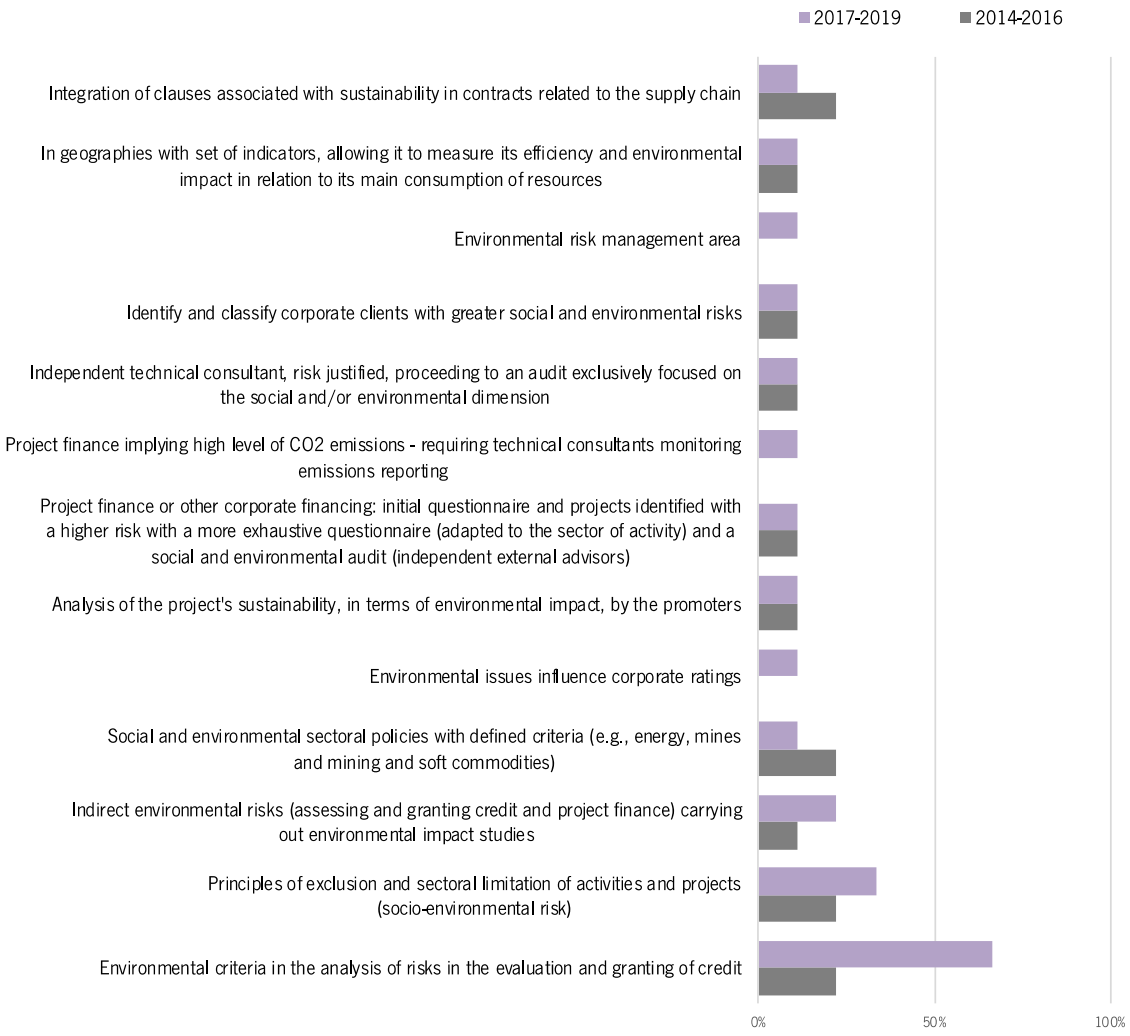

Figure 5.16 Disclosure of information on principal risks and their management (comparing 2014-2016 and 2017-2019).

Finally, comparing the KPIs for the two trienniums (Figure 5.17), even the most publicised issues are covered by less than half of the banks. Still, most indicators show improvement in the subsequent period.

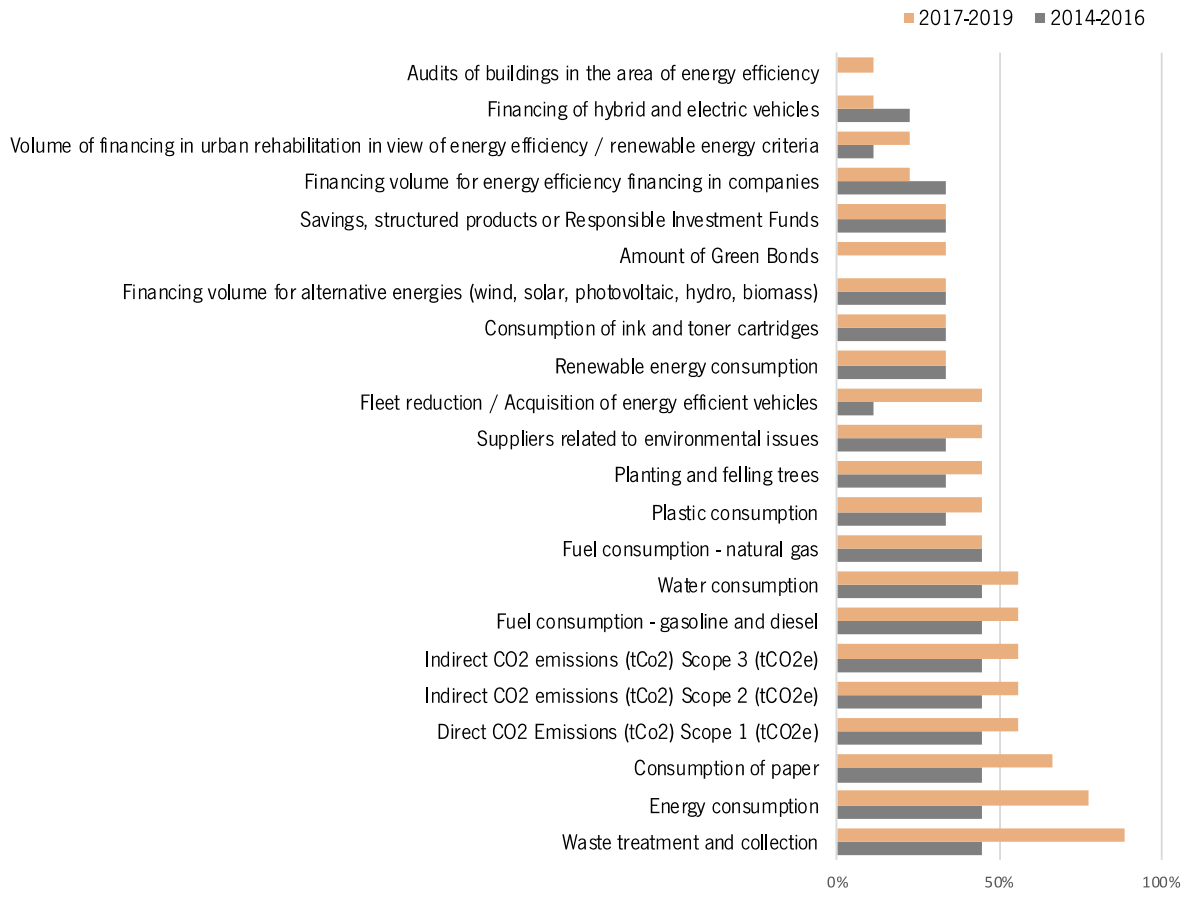

Figure 5.17 Illustration of the Key Performance Indicators (KPI's) (comparing 2014-2016 and 2017-2019).

Overall results suggest an increase in disclosure in the three years following the application of the Directive (2017-2019), demonstrating the impact of the Directive and guidelines on the disclosure of non-financial information, particularly climate-related information.

5.5 DISCUSSION

Companies and banks "must increasingly demonstrate that they are future proof" (Achenbach, 2021, p. 2). Banks, as financial intermediaries, can take exposure to relevant climate-related risks through their borrowers, customers, or counterparties when they grant loans or when trading securities of companies with direct exposure to climate-related risks (TCFD, 2017a). Additionally, markets for low-carbon and energy-efficient alternatives are expanding. Banks can take material exposures in their lending and investment businesses. Additionally, they are subject to litigation related to their financing activities or through parties seeking compensation or other legal remedies (TCFD, 2017a).

The first question of this paper aimed to understand whether banks in Portugal disclose climate-related information and how this disclosure has evolved. The study allows me to conclude that banks reported

climate-related information. Additionally, the level of disclosure has increased since 2017 with the implementation of the Directive. This conclusion aligns with the ECB (2020a), which observed a clear and positive trend in climate-related disclosures. Achenbach (2021) identified the principal factors that positively influence the disclosure of information: policy and legal reforms, the aim of strategy adaptation, the availability of data, and the alignment of other sustainability initiatives with the recommendations of the TCFD.

This empirical study found differences in disclosures between banks, some being more advanced than others. A similar situation was found by Eccles & Krzus (2019) in 2017 concerning 15 oil and gas companies. They found variations among companies, with the majority making very modest disclosures; however, some were more advanced in their application of the TCFD recommendations.

Regarding the second research question on the limitations and restrictions of climate-related information disclosure, I observed that the main limitation found in this study was the dispersion of that information. There is no specific place to disclose the "non-financial statement" and the climate-related information. The main limitation is that environmental and climate-related information is spread over several sections of the report (Demaria & Rigot, 2020). There is a need for a more harmonized presentation to improve environmental disclosures, such as gathering all required climate-related information in a single section (Demaria & Rigot, 2020). Climate-related information appears mainly in non-financial statements. However, this statement sometimes appears under different names. Banks include climate-related information in their sustainability reports or present the information in disparate sections of the annual report. Thus, regulations should be more specific about "where" to publish this information to achieve European comparability. The rule would also reduce the amount of the same information in different documents. Carini et al. (2018) found similar results.

Additionally, the lack of comparability regarding climate-related information occurs mainly because each bank discloses what it considers relevant. Some banks detail the information, while others refer to it only superficially. The guidelines intend to address gaps in current reporting practice. The guidelines were designed to enhance comparability across jurisdictions (Basaglia & Pareglio, 2019). However, the EU was unable to reach this objective. Consequently, the EFRAG was tasked to prepare sustainability standards that promote the EU's comparability objective (European Commission, 2021e).

Relevant climate-related information will provide investors with the data necessary for informed portfolio decisions (Monasterolo & Ulrich, 2020). In recent years, climate change has been identified as a risk. Managers need to measure and communicate climate risks. However, disclosure is currently highly

fragmented and lacks the oversight to adequately measure and communicate the impacts of climate change on financial markets (Thistlethwaite, 2015).

Another limitation is that most banks are focused on their direct impact on the environment, climate change, and other related topics. Only a few are concerned with how financing can impact the environment, clearly minimizing (or not considering) the indirect impact caused by the bank's activities. Furrer et al. (2012) also stated that banks often implement a climate strategy that is disengaged from their main value-creation processes, such as lending and investments.

Therefore, banks in Portugal are starting to show signs of wanting to disclose information related to climate change. One of the banks is closer to the guidelines, another is following in its footsteps, another seeks to approach the guidelines, and the rest are further away. There is a lack of articulation between climate-related topics. Quantitative information rarely supports the disclosure. These findings are similar to those reported in the ECB (2020a) study. In another study in Italy, Bernardi et al. (2019) also identified significant and evident gaps in the information disclosed by non-financial companies. The provided information was limited and, in some cases, had been reported superficially and distant from the TCFD recommendations.

The third research question explores what can be improved in this trade-off involving regulators, banks, and climate change. The results suggested that there is still a long way to go in reporting climate-related information.

A higher standardisation on specific topics and their contents is desired and needed to allow comparability between banks. Regulators and the EU play a key role. Guidelines or sustainability standards should become mandatory. According to Strano & Kabli (2018), corporate compulsory reporting enhances the quality and comparability of non-financial information disclosure. Voluntary disclosure may lack integrity, accuracy, and neutrality. Johnston (2018) argued that the TCFD recommendations are likely to lead to changes in investor behaviour and, in turn, in business models only if national and supranational regulators require them. In 2021, the New Zealand government was the first to introduce legislation to mandatory climate-related disclosures for some organisations (publicly listed companies, large insurers, banks, non-bank deposit takers, and investment managers) (Ministry of Business, 2021).

CSR practices and their measurement, reporting, and auditing should be as clear and understandable as possible (Camilleri, 2015). A monitoring system also seems to be necessary. According to Krasodomska et al.(2020), the external guarantee would add credibility to non-financial disclosures, thus improving reporting quality (Jackson et al., 2020).

It is crucial to properly assess prospective climate risks for loan and investment decisions (Monasterolo & Ulrich, 2020). Investors are actively considering specific types of climate-related information in their decision-making processes. They want to know how companies are estimating the future costs of climate policies, how climate change projections affect corporate project planning, and how companies are prepared to adapt to the physical impacts of climate change (Vizcarra, 2020). UNEP FI and Acclimatise (2018) outlines a vision for the future generation of transition risk analysis using four ideas:

- building models of climate scenarios to support financial risk analysis;
- developing data and analysis for climate risk analysis at the level of borrowers;
- improving the methodology for the impact assessment of the portfolio; and
- integrating transition risk assessment in the organisation.

Thus, developing robust methodologies, collecting comprehensive data to assess climate-related risks, developing asset databases, and refining climate stress testing techniques are necessary (Campiglio et al., 2018). Therefore, it will help companies to disclose climate-related risks comparably, and central banks and financial regulators to assess the exposure of banks, individually, and of the financial system as a whole more effectively (Campiglio et al., 2018). According to Weber & Kholodova (2017), assessing risks related to climate change in Canada is complex, as the information required for these assessments is often fragmented, incomplete, or not yet available, necessitating the development of strategies and tools that do not yet exist. They also concluded that there is uncertainty about how well-prepared banks are for disclosure requirements related to climate change.

As stated in the TCFD (2020), the success of the recommendations about climate-related information disclosure will depend on companies' continuous and widespread implementation in financial and non-financial sectors.

Legitimacy theory and institutional theory can help explain our findings. We analyse the period after the approval of the directive (2014-2016) and the moment when the directive becomes mandatory (2017-2019). The growing impact of the directive on the disclosure of climate-related non-financial information since its approval is evident. The results point to the theory of legitimacy as an explanation based on the two perspectives (strategic and institutional) that allow us to demonstrate that banks disclose climate-related information to maintain and strengthen their legitimacy (strategic), being organisations, whose reputation is fundamental, namely because of their proximity to customers (Demaria et al., 2019). Banks demonstrate an increasing volume of disclosure (Manes-Rossi et al., 2018) over time, related to climate change, in order to maintain/increase their legitimacy. Additionally, considering how

they are perceived by society in their adaptation to the directives and guidelines related to climate change (institutional).

Directive 2014/95/EU is mandatory; the guidelines are not. It should be noted that the guidelines on the disclosure of non-financial information were published in 2017, and the guidelines on climate-related information were published in 2019. Thus, the results suggest that institutional theory is applicable because banks have begun to disclose climate-related information in response to the directive and guidelines. However, some banks disclose only minimal information.

5.6 CONCLUSIONS, LIMITATIONS, AND FURTHER RESEARCH

Directive 2014/95/EU is a milestone in the social and environmental area. It requires non-financial information that was often missing in corporate reporting. It aims to enhance disclosure of social and environmental responsibility, making the information presented in non-financial statements comparable and useful. These guidelines were designed to facilitate the implementation of non-financial information disclosure. The guidelines highlight that banks have a fundamental role in the climate area, either by not supporting projects or industries that contribute unfavourably to climate change or by directing support to sustainable investments.

In this sense, this study revealed an increase in climate-related information disclosure. However, that disclosure varies among banks. It is not yet uniform. This situation makes it challenging to compare climate-related information. Additionally, the level of disclosure remains far from what the guidelines recommend.

The Directive has opened up new paths to disclosure. However, guidelines will be necessary to allow for increased comparability of climate-related information. This comparison would only be possible if the information were mandatory for all banks. This study aimed to contribute to a better understanding of banks in Portugal, disclosing climate-related information. The study's conclusions have practical implications, providing data and documented information to help European and national regulators understand the shortcomings of the present sustainability reporting on climate-related information.

A significant limitation of this study may be related to its small sample size. However, as explained, in Portugal, only the nine analysed banks were required (in 2017) to adopt the NFRD and follow the guidelines. Furthermore, since the non-financial reporting is not audited in Portugal, the integrity of the non-financial information cannot be guaranteed.

The study evaluates the disclosure of climate-related information for the period 2014–2019. Future research should continue to analyse subsequent periods to understand whether non-financial reporting

is improving over time. It is crucial to continue following the information released by Europe's largest banks. Future research could also help develop global indicators that promote comparability among banks. Additionally, we need to study climate-related information disclosed by companies to determine whether this information is helpful to banks in their credit risk analysis. The development of a common taxonomy that sets minimum standards for accurately classifying climate-related activities can also be a target for research. Another interesting topic is the new developments that sustainability reporting is causing in Europe. EFRAG received support from the EU in preparing sustainability standards. The IFRS Foundation will also be involved in preparing the global sustainability standards. Finally, future research should also analyse the comment letters and the support related to sustainability standards that the IFRS Foundation has been receiving.

CHAPTER VI: The Impact of Climate-related Information on Bank Lending

Article prepared in collaboration with Filomena Antunes Brás.
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THE IMPACT OF CLIMATE-RELATED INFORMATION ON BANK LENDING

The Non-Financial Reporting Directive (NFRD) from the European Union (EU) requires listed companies to disclose, within specific requirements, their non-financial practices and actions related to Corporate Social Responsibility (CSR), including climate-related information, as addressed in recent EU regulations. Companies and banks are encouraged to recognise how their business activities can harm the environment and contribute to climate change, as well as how climate change may negatively impact them.

Granting credit to companies to support their investments and activities is one of the bank's fundamental roles in the economy. Following climate reporting guidelines, banks must collect climate-related data from companies when assessing and monitoring loans to evaluate climate-related risks and their associated financial impacts. Banks and companies need in-depth, continuous knowledge and information sharing on climate change adaptation and mitigation.

The aims of this study are first to determine whether listed companies are disclosing climate-related information in accordance with the NFRD and the Guidelines, and whether this information is relevant to banks for credit analysis and monitoring. Additionally, the study aims to assess the anticipated changes in disclosing climate-related information in the context of the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS).

Overall, the results indicate that companies include climate-related information in their non-financial information disclosures, despite some of these disclosures falling short of what the guidelines call for. Consequently, greater efforts should be made regarding standardisation, content, and detail to assist banks in obtaining climate-related information for informed lending decisions. The CSRD and ESRS hold promise for driving these improvements. Nevertheless, companies, banks, and regulators will continue to face significant challenges. Higher challenges require closer collaboration between banks and companies, as climate-related information disclosure plays a crucial role in banks' decision-making processes.

6.1 INTRODUCTION

Our planet is showing signs of needing a profound shift to halt climate change. The harsh and striking speech given by UN Secretary-General António Guterres at the 26th Conference of the Parties is an excellent example of this concern: "Enough of brutalizing biodiversity, killing ourselves with carbon, treating nature like a toilet, burning, and drilling and mining our way deeper (...) We are digging our own graves" (Guterres, 2021, p. 1). Our planet is undergoing significant changes, from melting glaciers to

increasingly extreme weather events. Sea levels are rising at twice the rate of 30 years ago, oceans are hotter than ever, and parts of the Amazon rainforest are now emitting more carbon than they absorb (Guterres, 2021).

Companies and banks play a crucial role in transitioning to a low-carbon, climate-resilient economy. Working together can actively reduce, mitigate, and eliminate activities that may harm the climate. Banks could take a step further by requiring companies to disclose climate-related information, enabling them to make informed decisions about climate change when granting and monitoring loans (European Commission, 2019c).

In October 2014, the European Union (EU) issued Directive 2014/95/EU of the European Parliament and of the Council, commonly referred to as the Non-Financial Reporting Directive (NFRD) (European Parliament and the Council of the European Union, 2014). Later, in 2017, the Guidelines on Non-Financial Reporting were published (European Commission, 2017), and in 2019, the supplement on reporting climate-related information was published (European Commission, 2019c). The issuance of the supplement illustrates the importance of climate change in the EU.

According to the EBA (2020b), banks should consider the risks associated with Environmental, Social, and Governance (ESG) factors in relation to the financial conditions of borrowers, with a particular emphasis on the potential impact of environmental and climate change factors, when assessing their credit risk appetite, policies, and procedures. As capital providers to companies, banks must collect relevant information to analyse the risks associated with the borrowers when granting and monitoring loans. They need to obtain climate-related information to assess the potential "climate" risk.

In December 2022, the EU published Directive 2022/2464 of the European Parliament and of the Council, known as the Corporate Sustainability Reporting Directive (CSRD). It comes into force in January 2024 and amends the NFRD by introducing stricter requirements for disclosing non-financial information, aiming to increase the transparency, comparability, reliability, and relevance of sustainability information to help stakeholders make more informed and sustainable decisions (European Commission, 2022d). The CSRD covers sustainability more broadly, applies to a larger number of companies than the NFRD, requires more data and information from companies, and requires assurance of the reliability of sustainability reporting from an external auditor (European Commission, 2022d).

In July 2023, Delegated Regulation 2023/2772 was published, introducing the European Sustainability Reporting Standards (ESRS), which aim to specify the sustainability information to be disclosed (European Commission, 2023d).

This study aims to gain a deeper understanding of how the NFRD and its guidelines have influenced the behaviour of listed companies regarding climate-related information, whether the information is sufficiently detailed to support banks' credit decisions, and what changes can be expected with the CSRD and ESRS.

The study aims to analyse the evolution of climate information disclosure regarding two important timelines: 2020 (following the issuance of the NFRD guidelines on climate-related information) and 2022 (marked by the launch of the CSRD). Also, it seeks to identify the requirements for the years ahead.

The study seeks to address the following research questions: (i) Are listed companies disclosing climate-related information? (ii) Does the disclosed information comply with the NFRD climate-related information guidelines? (iii) Are companies providing banks with sufficiently detailed climate-related information to support informed decision-making in credit-granting and monitoring? (iv) Considering the CSRD and ESRS, what changes are expected in companies' disclosure of climate-related information to assist banks in better making their lending decisions?

This study contributes to a better understanding of how listed companies disclose climate-related information and the level of detail provided to support banks in lending decisions. This essay begins with a brief section discussing climate change, its risks, and related climate information, followed by the methodology, results, and subsequent discussion. It concludes with conclusions, limitations, and suggestions for future research.

6.2 CLIMATE CHANGE, RISK, CLIMATE-RELATED INFORMATION, AND THEORETICAL PERSPECTIVE

6.2.1 Climate Change, Risk, Banks, and Companies

Human activities are releasing carbon into the atmosphere at an unprecedented rate and scale, increasing global temperature (Attenborough, 2021; Tiseo, 2021). Working together is crucial (Attenborough, 2021). The Paris Agreement, adopted in 2015, marked a historic milestone, with its primary objectives being to slow the increase in the global average temperature, limit the global warming increase to well below 2°C, and pursue efforts to restrict it to 1.5°C (UNFCCC, 2015). The risks of climate change, which are both certain (World Economic Forum, 2016) and unpredictable (Jaworska, 2018), are widely regarded as the defining issue of our times (Hurst & Taylor, 2014). Since the mid-20th century, the speed of climate change has accelerated to an unprecedented level, exceeding any recorded shifts over millennia. "There is unequivocal evidence that Earth is warming at

an unprecedented rate'', with human activities recognized as the primary driver of this phenomenon (NASA, 2024, p. 1). According to the Copernicus Climate Change Service (2025), 2024 went down in history as the hottest year ever recorded on the planet. For the first time, the global average temperature exceeded 1.5°C above pre-industrial levels—an alarming milestone that threatens the Earth's climate stability.

Socially responsible companies are often more economically successful (Cini & Ricci, 2020). Due to the possibility of losses derived from borrowers defaulting on their financial obligations (Razak et al., 2020), banks need to analyse the relationship between their borrowers' sustainability risks and financial performance, as when a company demonstrates sustainability, it influences its creditworthiness as part of its financial performance (Weber et al., 2010). Companies with high environmental performance tend to also exhibit higher financial performance (Secinaro et al., 2020).

Sustainability is vital for bank lending because banks: a) collect more information about companies, including ESG factors and risks, in originating and monitoring loans; b) can analyse sustainability trends across the industry and discover best practices, and also transfer these practices to companies in their advisory role; c) should consider the full impact of sustainability on a company's business model; and d) should also evaluate its impact on collateral values (FIS Global, 2022). On a global scale, the adverse effects of climate change affect all asset classes, industries, and economies (Oguntuase, 2020).

Banks can decide whether to finance projects or lend to companies, including under what conditions. Banks can act as a kind of gatekeeper by determining whether to provide full or conditional financing, or even refuse to finance projects that create high levels of GHG pollution, while actively favouring and promoting projects that advance the use of renewable energy and innovative low-carbon technologies (Bowman, 2010).

According to the SASB (2023), banks have a significant impact on environmental and social issues through their credit-granting practices. As such, the incorporation of ESG factors has become an essential element in risk assessment, the identification of opportunities, and the analysis of the quality of clients' collateral. In this context, there is growing pressure from investors and regulators for banks to disclose how they are addressing climate-related risks.

The link between climate change and credit risk is growing (Oguntuase, 2020). However, there is also a lack of information and knowledge regarding the appropriate methodologies and adopting a forward-looking approach (González & Núñez, 2021). Defining a probability for these long-term risks is challenging because there is no historical data (Dépoues et al., 2019), and the estimates of these impacts are uncertain (Oguntuase, 2020).

The intensification of extreme weather events and the transition to a low-carbon economy necessitate that the banking sector reassess its risk management practices. Climate change poses both physical and transitional risks that may compromise the stability of credit portfolios, with growing evidence of potential financial losses and increased defaults (Muzuva & Muzuva, 2024).

According to Huang et al. (2022), companies exposed to climate risks are subject to more stringent financing conditions, including higher interest rates, increased collateral requirements, and additional contractual clauses. However, those that adopt robust climate management strategies often mitigate these effects, gaining more favourable credit terms and reducing their risk of default.

Banks play a vital role in advancing sustainability by integrating ESG criteria into their lending practices. This integration entails addressing environmental and social risks, which influence not only conventional financial risk but also the overall structure of the banking system (Marinova, 2023).

The implementation of ESG regulations within the banking sector is reshaping credit portfolios, advancing sustainable finance, and gradually phasing out polluting assets. Exposure to such assets will necessitate additional capital buffers to offset elevated general and sector-specific systemic risks (Kosztowniak, 2024). In response to emerging climate policies, banks are progressively reorienting their operations towards greener business activities (Reghezza et al., 2021).

In 2015, the Group of 20 Financial Stability Board (2015b) established the Task Force on Climate-related Financial Disclosures (TCFD). The TCFD (2017b) classified climate-related risks into two categories: those related to the transition to a lower-carbon economy (transition risks: policy, legal, technology, market, and reputational) and those connected to the physical impacts of climate change (physical risks), which can be acute (when arising from extreme weather events) or chronic (from progressive changes in weather patterns). Physical risks are direct effects of climate change, and transition one's stems from the decarbonization process that aims to prevent or mitigate global warming. Both risks are correlated. The greater the number of transition policies that come into effect, the fewer the physical risks likely to materialize. If the economy is hit by physical risks, the demand for effective transition measures will be more robust (Pointner & Ritzberger-Grünwald, 2019). These risks require financial efforts from companies to adapt their business models to the new economic conditions (Monnin, 2018). That is evident on the equity side of banks, which could incur losses from exposure to companies with business models not built around the low-carbon economy (Grippa et al., 2019). The physical and transition risks manifest as typical banking risks, such as credit, market, operational, reputational, and legal liability (González & Núñez, 2021).

Determining credit risk requires knowledge of the borrower's ability to generate sufficient income to service and repay its debt, as well as the capital and collateral supporting the loan. The higher the cash flows, overall financial wealth, and value of collateral, the lower the credit risk (Monnin, 2018). Climate risks affect these dimensions, increasing the probability of default and the higher loss given default, thus serving as a source of credit risk (Monnin, 2018).

According to the ECB (2020b), banks should consider climate and environmental risks at all relevant stages of the credit-granting process: credit approval, amendment, renewal, and refinancing. Risk management should encompass both on- and off-balance sheet risks, considering both financial and non-financial risks, for both the risks to which banks are currently exposed and those to which they may be exposed in the future ((ECB, 2020b).

Climate change represents a new source of risk to financial stability (Battiston et al., 2021). Faced with climate change challenges, it involves translating climate disclosures into financial metrics that are useful for prudential policy. Due to the interconnectedness of the financial system, climate risks can spread rapidly, affecting businesses, households, and governments (Battiston et al., 2021; European Central Bank & European Systemic Risk Board, 2022).

According to SASB (2023), banks are expected to disclose how they integrate ESG factors into their credit analysis processes, including relevant policies, methodologies, and estimated impacts on credit losses. Institutions should also indicate whether they employ modelling techniques or scenario analysis to assess future risks associated with ESG trends, with particular emphasis on climate-related risks. Disclosure should encompass the geographical exposure of the portfolio, the most vulnerable sectors, and significant risk concentrations, such as carbon-intensive assets or regions facing water scarcity.

6.2.2 Climate-related Information Disclosure

6.2.2.1 Directive 2014/95/EU of the European Parliament and of the Council - NFRD

The NFRD emerged in October 2014 and amended Directive 2013/34/EU regarding the disclosure of non-financial and diversity information by certain large undertakings and groups, designated as public interest entities, that exceed the criterion of the average number of 500 employees during their balance sheet dates. These companies should include, in the management report or presented in a separate report, a non-financial statement containing information to the extent necessary for an understanding of the undertaking's development, performance, position, and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters (European Parliament and the Council of the European Union, 2014). Companies under

the NFRD had to report according to its provisions for the first time in 2018 (covering the 2017 financial year). The NFRD introduced a new element for companies to report both on how sustainability issues affect their performance, position, and development (the "outside-in" perspective), as well as their impact on people and the environment (the "inside-out" perspective), the "double materiality perspective" (European Commission, 2019c).

In 2017, the European Commission published non-binding reporting guidelines for companies, including climate-related disclosures (European Commission, 2017). In 2019, it incorporated the recommendations of the TCFD and published additional guidelines on reporting climate-related information (European Commission, 2019c). However, these guidelines have not sufficiently improved the quality of information companies disclose under the NFRD (European Commission, 2021e).

In April 2021, the European Commission proposed the CSRD, intending to close shortcomings in the existing gaps in the disclosure of non-financial information (European Commission, 2021e).

Odobaša and Marošević (2023) emphasize the crucial role of ESG reporting in promoting sustainable development. These reports strengthen the connection between economic progress, social justice, and environmental preservation, serving a strategic function in addressing the socio-ecological crisis. Their standardization and broadening of application aim to heighten collective awareness of environmental and social risks and impacts, while guiding business and policy decisions based on robust and reliable data.

6.2.2.2 Directive 2022/2464 of the European Parliament and of the Council - CSRD

The CSRD, published in December 2022 (European Commission, 2022d) highlights the following main points: i) extends the scope of the NFRD to all large companies or Small and Medium-sized Enterprises (SMEs), excluding micro-enterprises, that are public interest entities and introduces simplified requirements for SMEs whose securities are admitted to trading on a regulated market in the EU that are public interest entities; ii) introduces more specific sustainability reporting standards, known as the ESRS, developed by the European Financial Reporting Advisory Group (EFRAG), published in December 2023 (European Commission, 2023d), to standardise and detail sustainability information; iii) promotes the integration of sustainability information in a specific section of the annual financial report; iv) reinforces the dual materiality perspective (how sustainability issues affect the business (financial materiality) and how the company's activities affect society and the environment (impact materiality)) (European Commission, 2023d); v) requires the presentation of information in digital format for better

comparability; vi) requires sustainability information to be verified by external auditors; vii) promotes consistency with the Green Deal and the EU Taxonomy.

Subsequently, the first set of 12 standards developed under the CSRD includes two general standards - general requirements (ESRS 1) and general disclosures (ESRS 2) - and 10 thematic standards, organised into three pillars: a) Environment: climate change (ESRS E1); pollution (ESRS E2); water and marine resources (ESRS E3); biodiversity and ecosystems (ESRS E4); resource use and circular economy (ESRS E5); b) Social: own workforce (ESRS S1); workers in the value chain (ESRS S2); affected communities (ESRS S3); consumers and end-users (ESRS S4); and c) Governance: business conduct (ESRS G1) (European Commission, 2023d).

CSRD drives transparency, accountability, and the quality of information, encouraging sustainable practices and the integration of ESG factors into corporate strategy. This integration fosters competitive advantage and highlights sustainable practices (Martinčević et al., 2024). It marks a paradigm shift in EU sustainability reporting, moving from ad hoc and voluntary reports to mandatory and standardised reporting. It addresses the integration of financial and non-financial data, promoting the harmonisation and alignment of environmental and financial information (Martinčević et al., 2024).

However, Baumüller and Grbenic (2021) argue that, although the European Commission aims to enhance the quality of corporate reporting, the requirements introduced by the new regulatory framework may be excessive and conceptually underdeveloped. This regulatory complexity, compounded by time pressure and uncertainty, raises concerns about administrative overload and the practical feasibility of implementation by companies. It underscores the need for a critical assessment of the associated costs and benefits (Baumüller & Grbenic, 2021).

According to Celli et al. (2024), the shift under CSRD towards mandatory ESG reporting poses a significant challenge for poorly prepared SMEs. Iozzelli and Velasco (2023) highlight that the CSRD adopts a hybrid approach to sustainability disclosures, combining mandatory and voluntary elements. This hybrid approach creates difficulties in terms of clarity, consistency, and applicability. It is therefore essential to establish clear and specific guidelines regarding the communication of mandatory requirements and the conduct of materiality assessments, in order to ensure more effective and comparable reporting by companies (Iozzelli & Velasco, 2023). A recent study by Raimo et al. (2025), analysing various companies before the introduction of the CSRS, identifies a relatively low average level of compliance with ESRS requirements. This low average level is particularly evident among larger firms and those operating in sectors with high environmental sensitivity.

6.2.2.3 International Sustainability Standards (ISS): IFRS S1 and IFRS S2

At the same time, the *International Financial Reporting Standards* (IFRS) Foundation (2021b), which develops global accounting standards known as IFRS that became used worldwide in preparing financial statements, adding transparency and comparability to information, established the *International Sustainability Standards Board* (ISSB) to develop global sustainability reporting standards for consistent, comparable and high-quality sustainability reporting, to meet the needs of investors.

The ISSB issued its first two sustainability reporting standards in June 2023. IFRS S1 - General Requirements for Disclosure of Sustainability-related Financial Information (IFRS S1), as a core standard for disclosure of material information about sustainability-related risks and opportunities throughout the value chain (ISSB, 2023a), and IFRS S2 - Climate-related Disclosures (IFRS S2), a standard that sets out requirements for disclosure of information about climate-related risks and opportunities (ISSB, 2023b).

The ISSB and the European Commission, together with EFRAG, worked in tandem during the development of the ESRS and the ISSB standards to achieve a high degree of convergence between the standards, with a particular focus on climate-related disclosures (EFRAG & IFRS Foundation, 2024).

Table VII presents a comparison between ISSB and the EFRAG, to facilitate the understanding of the CSRD disclosure standards (including the ESRS) within the European context (European Commission, 2023d), as well as the international frameworks established by the ISSB (2023a, 2023b), adapted from Hennaux (2023).

Table VII Comparison between the ISSB and EFRAG. (European Commission, 2023d; Hennaux, 2023; International Sustainability Standards Board, 2023a, 2023b).

YEAR	ISSB	CSRD – ESRS
Coverage	General requirements (IFRS S1) and climate disclosure requirements (IFRS S2)	ESRS presents environmental, social, and governance issues in a total of 12 ESRS
Enforceability	Voluntary base	Mandatory reporting elements, regardless of the outcome of the materiality analysis performed by the company.
Materiality	Financial materiality - information likely to be useful to investors	Dual materiality (financial materiality and impact materiality)
Materiality assessment	IFRS S1 and S2 disclosures are entirely dependent on the outcome of the materiality assessment	ESRS has a list of mandatory data points that must always be applied regardless of the outcome of the materiality assessment. The remaining requirements are subject to a materiality assessment.
Design of the standards	TCFD framework	Uses the TCFD framework
Sector-specific disclosures	Sector-specific requirements already exist in ISSB standards	Sector-specific ESRS to be developed from 2024 onwards
Date of application	2024	2024 companies within the scope of NFRD and progressively for other entities
Scope of application	For-profit entities, including public sector entities	Around 49,000 companies
Interested parties	Investors, creditors, and lenders	A broader group of stakeholders, including investors, customers, suppliers, employees, local communities, and regulators
Assurance / Audit	Subject to adoption by jurisdictions and regulators	Mandatory assurance/audit with limited assurance first, and then reasonable assurance

It should be noted that the sector-specific standards of EFRAG (including the draft ESRS SEC1) were never published as final standards. Although EFRAG prepared certain preliminary versions, they did not progress to formal public consultation due to the suspension of the process as a result of the Omnibus Package (EFRAG, 2022j).

The study by Giner and Luque-Vílchez (2022) concludes that EFRAG adopts a broader perspective than the IFRS Foundation on certain key aspects of reporting, particularly regarding audience, materiality, and scope. According to a cover letter, the ultimate goal is for companies compliant with ESRS also to be considered compliant with ISSB standards, thereby avoiding unnecessary duplication of reporting (EFRAG, 2022a). According to Stolowy and Paugam (2023), there is a likelihood of convergence in corporate sustainability reporting. However, "compliance with both sets of sustainability standards seems counterproductive" (Stolowy & Paugam, 2023, p. 160).

The diversity of sustainability standards and the entities involved leads to adverse effects, such as reduced legitimacy, increased costs for investors and auditors, greater complexity in decision-making, and the possibility of regulatory arbitrage. Nevertheless, most climate-related disclosure regulations are based on the TCFD framework, which promotes convergence among organisations (Stolowy & Paugam, 2023) and focuses on financial materiality relevant to banks and investors.

6.2.2.4 EBA and its Guidelines on Loan Origination and Monitoring Related to Climate Change Risks

The EBA (2020b), the EU agency responsible for establishing a set of harmonized rules to regulate and supervise the banking sector across all EU countries, also issued the "Guidelines on loan origination and monitoring", which took effect on June 30, 2021. These guidelines indicate that climate change risks to borrowers' financial performance can materialize in: (i) physical risks, derived from physical effects of climate change, including liability risks for contributing to climate change; (ii) transition risks, arising from the transition to a low-carbon and climate-resilient economy; and (iii) other risks such as changes in the market and consumer preferences and legal risks that may affect the performance of the underlying assets (EBA, 2020b), which is in line with the guidelines on climate-related information.

According to the EBA (2020b), banks should assess the borrower's exposure to ESG factors when lending. In particular, banks should consider environmental factors, their impact on climate change, and mitigation strategies. In the case of loans or borrowers associated with a higher ESG risk, a more intensive analysis of the borrower's actual business model is required, including a review of current and projected GHG emissions, the market environment, supervisory ESG requirements for the company

under consideration, and the likely impacts of ESG regulation on the borrower's financial position (EBA, 2020b).

6.2.2.5 Global Reporting Initiative and the Carbon Disclosure Project

The GRI and the CDP also present guidelines for the company's voluntary disclosure. The GRI provides guidelines that are the world's most widely recognised and used sustainability reporting framework (Herzig & Schaltegger, 2011). EFRAG, responsible for developing the ESRS, and GRI have been collaborating since 2021 to ensure the most excellent possible alignment between these standards and the GRI Standards (GRI, 2025).

CDP operates a global disclosure system that enables investors, companies, cities, states, and regions to manage their environmental impacts. The CDP is the world's largest platform for climate risk disclosure (Cohen et al., 2022), and it has aligned its "Climate Change Questionnaire" with the TCFD framework since its launch in 2017 (Bose & Hossain, 2021). Data released by CDP can be used to meet the requirements of the ESRS, which operationalizes the CSRD and promotes transparency and compliance in sustainability reporting. As the only independent global platform, CDP provides standardised and comparable data, ensuring key decision-makers have direct access to essential information (CDP, 2024).

Mitigating climate risk in the financial sector requires accessible and reliable data, coherent disclosure standards, and tools such as climate stress tests and regulatory incentives. These measures aim to strengthen oversight and support financing for the sustainable transition (Redondo & Aracil, 2024).

Herbohn et al. (2019) argue that, given the growing importance of carbon risk to business viability and the reputation of banks, it should be considered a material factor in lending decisions. Financing major emitters, particularly in environmentally sensitive sectors, may jeopardise an institutional reputation. The lack of publicly available carbon risk data hampers rigorous assessments, highlighting the critical role of banks as key intermediaries in producing and disseminating information through their lending practices (Herbohn et al., 2019).

6.2.2.6 Omnibus Package

In February 2025, the EU launched a package of proposals known as the “Omnibus” (European Commission, 2025e) to simplify sustainability-related rules, boost competitiveness, and unlock new investment capacity. The proposals encompass several interconnected legislative areas and introduce significant simplifications in the fields of sustainable financial reporting, sustainability due diligence, the EU Taxonomy (European Commission, 2025a), the carbon border adjustment mechanism, and

European investment programs (European Commission, 2025e). “These proposals will reduce complexity of EU requirements for all businesses, notably SMEs and small mid-caps, focus our regulatory framework on the largest companies” (European Commission, 2025e, p. 1).

In light of the CSRD, a “stop the clock” proposal has been made to postpone the implementation of the CSRD requirements by two years for large companies that have not yet started reporting, as well as for listed SMEs. Regarding the content and simplification of the CSRD, the initiative aims to: modify the scope of the Directive; adjust the value chain boundary; revise the reasonable assurance requirements; and update the ESRS standards (European Commission, 2025f, 2025g).

The reduction in reporting obligations will apply exclusively to large companies with more than 1,000 employees, a turnover exceeding € 50 million, or a balance sheet total in excess of € 25 million (European Commission, 2025f).

At the value chain level, the Commission will adopt a voluntary reporting standard based on EFRAG's *Voluntary Sustainability Reporting Standards for non-listed SMEs* (VSME) for entities with fewer than 1,000 employees, serving as a safeguard to limit the reporting requirements imposed by entities and banks covered by the CSRD (EFRAG, 2024; European Commission, 2025g). This standard will act as a protective measure, limiting the information that companies or banks within the scope of the CSRD could request from companies in their value chain with fewer than 1,000 employees (European Commission, 2025d, 2025e). Although not considered in the scope of the CSRD, all other companies can still choose to report on a VSME (EFRAG, 2024; European Commission, 2025f, 2025g).

The possibility of transitioning to reasonable assurance would be eliminated, as would the obligation to issue sectoral standards. The ESRS would be revised to reduce the reporting burden by substantially decreasing the number of mandatory data points, clarifying ambiguous provisions, and improving consistency with other EU legislative acts, such as the CSDDD and the CBAM (European Commission, 2025f, 2025g).

It is essential to emphasize that certain key aspects of the ESRS reporting requirements remain unchanged, including the obligation for entities to identify impacts, risks, and opportunities using a dual materiality assessment approach (European Commission, 2025g).

Appendix I outlines the main differences between the NFRD and the CSRD, as well as the current plans for the “Omnibus Package”. In Portugal, at the end of 2024, the CSRD had not yet been transposed (Comissão do Mercado de Valores Mobiliários, 2024).

6.2.3 Theoretical Perspective

Legitimacy theory and institutional theory provide support for this study. It should be understood that legitimacy is the assumption that an organisation's actions are useful, correct, or relevant in a social system structured around norms, values, beliefs, and definitions (Suchman, 1995). Under the lens of the theory of legitimacy, organisations should not only seek to meet society's expectations but also strive to be perceived as meeting these expectations and standards from a variety of stakeholders (An et al., 2011).

"Organizations seek legitimacy for many reasons, and conclusions about the importance, difficulty, and effectiveness of legitimation efforts may depend on the objectives against which these efforts are measured" (Suchman, 1995, p. 574). Suchman (1995) highlights two dimensions in the search for legitimacy: the distinction between seeking continuity versus credibility, and the distinction between seeking passive (low threshold of legitimacy) versus active (prolonged public intervention with strict legitimacy requirements) support.

Legitimacy improves the stability and comprehensibility of organisational activities. It affects the way people act and understand organisations. Thus, a legitimate organisation will be perceived as more worthy, meaningful, predictable, and reliable (Suchman, 1995).

According to Elsbach (1994) and Suchman (1995), organisational legitimacy can be approached from two perspectives: strategic (managers looking out - securing legitimacy) and institutional (society looking in - imposing conditions of legitimacy). The institutional view of legitimacy theory "predicts that companies will adapt their reporting practices to comply with legislation to maintain their legitimacy" (Chelli et al., 2014, p. 293).

Dumay et al. (2015, p. 2) present a model called "material legitimacy", which is described as "the form of legitimacy that enables organisations to blend what is important to the organisation (strategic legitimacy) with the primary concerns of its major stakeholders (institutional legitimacy)".

"Institutional theory is a theoretical framework for analysing social (particularly organisational) phenomena, which views the social world as significantly comprised of institutions – enduring rules, practices, and structures that set conditions on action" (Lawrence, 2008, p. 1).

According to Cortés et al. (2025), several studies have employed legitimacy theory to explain the rising climate-related commitments undertaken by companies, as well as the disclosure of GHG emissions (Chithambo et al., 2020). Communication plays a pivotal role in this process, as failures in this domain may undermine institutional legitimacy (Kouloukoui et al., 2018). Accordingly, corporate social disclosure should encompass both financial and non-financial information that reflects the

organisation's relationship with its physical and social environments (Kouloukoui et al., 2018). Stakeholders place value on ethical corporate conduct, namely 'doing the right thing' in alignment with societal expectations (Akhter et al., 2023). Although non-financial reporting has become mandatory, its standardisation reinforces demands for transparency in ESG matters, thereby strengthening its function as a legitimacy tool in the corporate sphere (Tyvonchuk, 2025).

Based on the focus of this study, legitimacy theory sheds light on how companies are pressured to disclose non-financial information to be perceived as legitimate. The NFRD (and the CSRD) formalises this need by requiring covered companies to disclose non-financial information, including specific requirements related to climate-related data. Disclosure of this information is a strategy to strengthen the legitimacy of companies in the eyes of different stakeholders and to align with their expectations. Failure to disclose this information can have negative consequences, including sanctions, investor distrust, and loss of customers. From the institutional theory perspective, which argues that the norms of the environment in which companies operate shape them, the NFRD (as well as the CSRD) imposes behaviour on companies that leads them to disclose non-financial information to avoid sanctions and demonstrate compliance. In this way, companies strive to conform to the norms, thereby reinforcing their legitimacy within their business context.

Next, we present the methodology followed in this study.

6.3 METHODOLOGY

Against the backdrop of evolving regulatory expectations and the increasing relevance of climate-related disclosures, this study aims to examine the following research questions: (i) Are listed companies disclosing climate-related information? (ii) Does the disclosed information comply with the NFRD climate-related information guidelines? (iii) Are companies providing banks with sufficiently detailed climate-related information to support informed decision-making in credit-granting and monitoring? (iv) Considering the CSRD and ESRS, what changes are expected in companies' disclosure of climate-related information to assist banks in better making their lending decisions?

To achieve these aims, the study considers the non-financial disclosed information regarding climate-related issues of the Portuguese listed companies' universe on Euronext Lisbon. Decree-Law No. 89/2017 of July 28th transposed the NFRD into the internal Portuguese legal order (República Portuguesa, 2017).

6.3.1 Sample Universe: Portuguese-listed Companies

Among the Portuguese companies listed on the regulated market (Euronext Lisbon), there were 37 listed companies as of December 31, 2020 (Euronext, 2021). These companies play a crucial role in the Portuguese economy, spanning a diverse range of sectors.

From this initial sample, we excluded nine companies because the reporting period did not correspond to January 1 to December 31, the 2020 annual report was not available, they did not meet the required number of employees, or they were financial organisations. Subsequently, when analysing the evolution of climate-related information in the context of the NFRD in 2022, it became necessary to exclude two more companies because one was no longer listed and the other no longer met the average number of employees' criteria. Therefore, 26 companies compose the sample of this study. The selected companies (randomly designated from A to Z) were classified according to NACE (Eurostat, 2008), and the distribution of the listed companies according to main activity(ies) is presented in the "Findings of the study" chapter, Table VIII. The small sample size stems from the structure of the Portuguese business sector, where 99.9% of companies are SMEs (PORDATA, 2023).

For certain parts of the study, we considered only the 26 listed companies that completed the CDP "Climate Change Questionnaire". As a result, in those sections, we analysed 10 companies in 2020 and 11 in 2022, as they were the only ones to complete the CDP questionnaire.

6.3.2 Data Collection Seeking Climate-related Information

Data was primarily collected through document review and content analysis by searching for the company's climate-related information and categorising the relevant topics among non-financial disclosed information. Data obtained from annual and/or sustainability reports, which were either integrated within the annual report or presented as standalone documents for 2020 and 2022.

The study also considers the CDP "Climate Change Questionnaire" that companies voluntarily answered, referred to as "Climate Change 2021" (CDP, 2021c) and "Climate Change 2023" (CDP, 2023b), which includes data for the years 2020 (January 1 to December 31) and 2022 (January 1 to December 31).

This study provides a characterisation of the companies' business according to the Statistical Classification of Economic Activities in the European Community – Nomenclature of Economic Activities (NACE) Rev. 2 (Eurostat, 2008). Then, the economic sectors with the greatest impact on climate change were identified, using the European Commission (2020) as a reference and considering the number of sample companies operating within those sectors.

Afterwards, the climate change information was identified within the reports, and the frequency of the word "climate" was quantified. Based on this approach, frequency intervals were constructed for the number of mentions of the word “climate”: absence (0), low frequency (1 to <10), medium frequency (10 to <50), high frequency (50 to <150), and very high frequency (≥150). The ranges were established by considering the dispersion of the observed values, which allowed for coherent and balanced segmentation of the data. The categorisation reflects distinct patterns of mention of the term “climate”, ensuring that each range represents a significant frequency level. Additionally, the limits were adjusted to enable practical comparative analysis and to avoid distortions resulting from the concentration of values in certain segments.

Subsequently, a detailed analysis was carried out for each company, comparing the number of occurrences of the word “climate” (x) using the x_n/x_{n-1} ratio. An outcome higher than one (>1) means the company increased the citation of the word “climate”, an outcome lower than one (<1) means a decrease, and an outcome equal to one (=1) means there was no change in the number of citations.

6.3.3 Companies’ Climate-related Information: Guidelines on Reporting Climate-related Information within the NFRD

Based on the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (European Commission, 2019c), the companies' climate-related information disclosure is examined to verify whether it follows the guidelines:

a) Risks of negative impacts on the climate;
b) Risks of negative impact on the company (physical risks and transition risks);
c) Dependencies on natural, human, and social capital;
d) Opportunities to adapt to and mitigate climate change;
e) Climate-related risks and opportunities throughout the value chain;
f) Disclosure of climate-related information on the business model, policies and due diligence processes, outcomes, principal risks and their management, and key performance indicators.

Complementarily, data analysis was extended by assessing the CDP “Climate Change Questionnaire” (voluntary) information available on the CDP website covering the reference years 2020 and 2022 (CDP, 2021c, 2023b).

The information provided in the Annual Report (AR) and the Sustainability Report (SR), collectively referred to as "*AR+SR*", was evaluated. This analysis was complemented this analysis by collecting data from the CDP “Climate Change Questionnaire” ("CDP"). Additionally, other sources of climate-related information published by the companies were identified, grouped under separate documents labelled

"*Other*" *("O")*, including GRI standards and data on climate transition, among others. This approach provided a comprehensive view of corporate climate information "*AR + SR + CDP + O"*. The outcomes of this task are presented in absolute and relative terms in this study, with the total number of companies disclosing the information being compared to the total number of analysed companies.

6.3.4 CDP and the Financial Impacts Disclosed by Companies

In addition, the study analysed the risks and opportunities for which the potential financial impact was quantified, as well as the CO_2 emission reduction initiatives disclosed by the companies in the CDP questionnaires (considering the necessary investments and expected monetary savings). The number of companies that provided these quantifications was counted. This analysis only considered the companies that responded to the CDP "Climate Change Questionnaire": 10 companies in 2020 and 11 in 2022.

6.3.5 Climate Change and the EBA Guidelines on Loan Origination and Monitoring

The study conducted a detailed analysis of the relevance of disclosed information for lending and monitoring, considering various climate issues identified in the EBA's (2020b) "Guidelines on loan origination and monitoring". This analysis was based on the previous data on the content of the annual report and/or the sustainability report (*AR + SR*), the *CDP* questionnaires, and other documents (*CDP + O*) assessed in the context of the climate guidelines established under the NFRD.

Based on the EBA (2020b) guidelines, the study identified key information that banks should consider when assessing companies for credit and monitoring climate-related risks, ensuring compliance with the climate-related information guidelines. This key Information includes:

1) The risks of climate change to the borrower's financial performance, with an analysis of physical and transition risks;
2) Climate change impacts, climate change targets, adequacy of mitigation strategies, business models, and greenhouse gas emissions, including an analysis of the impacts on the climate and disclosures related to the business model, policies, processes, outcomes, and risk management.

Regarding physical risks, transition risks, and negative climate impacts, the best available disclosure for each risk subset was taken into account. For example, regarding *acute physical risks*, the company's most detailed disclosure among various potential risks - such as temperature variation, sea level rise, and biodiversity loss – was selected. It is assumed that the most detailed risk represents the most relevant risk for the organisation. The remaining topics individually are assessed individually.

The degree of climate-related information disclosed by a company was then scored on a scale of 0 to 4 (Table VIII), following the numerical classification adapted from Matuszak and Rózańska (2017). The score “0" represents the absence of key Information, while the score "4" represents the most comprehensive disclosure.

Table VIII Scoring scale of the analysis.

Scoring	Description	Explanation
0	None	Lack of information on the issue: lack of data prevents proper and informed analysis.
1	Reduced	Limited information on the issue: the data is limited and only covers superficial aspects.
2	Generic	Information that facilitates a simplified understanding of the content analysed: providing a basic overview but lacking details that would enrich the analysis.
3	Detailed	Information that provides a clear and consistent understanding of the content being analysed: the necessary elements to understand the main concepts and relationships are present.
4	Very Detailed	Information that provides a deep and detailed understanding of the topic presents a comprehensive analysis, exploring all relevant aspects and nuances, including financial quantification.

A weighted numerical score was developed to rank companies according to the extent and quality of their climate-related disclosures, thereby facilitating comparisons to identify those that best meet banks' information requirements.

The weighted ranking indicates the extent to which climate information is made available to banks during the loan-granting and monitoring processes. This level of disclosure is built on the previously assigned scores, resulting in an "overall score" for each company.

The topics assessed as "detailed" and "very detailed" were analysed to understand their dimensions, i.e., the number of companies disclosing them in more detail and their evolution between 2020 and 2022.

6.3.6 CSRD: New challenges to Climate-related Information

Additionally, in the context of the CSRD challenges, the number of companies that have conducted financial quantification of climate-related risks and opportunities was analysed and recorded. This assessment provided insights into the extent to which companies have incorporated these factors into their economic strategies and their capacity to evaluate and measure them effectively.

6.4 FINDINGS OF THE STUDY

6.4.1 Activity and Risk Sectors of the Sample

A brief characterization of the universe of companies considered in the study reveals a diverse range of activities and risk sectors. Table IX presents the characterization (following NACE Rev. 2) (Eurostat, 2008) and distribution by main activity or segment size, based on the segment with the highest turnover or underlying main activity.

Table IX Characterization of the sample according to the main activity (NACE (Eurostat, 2008)).

Section	Broad Structure of NACE Rev. 2	Companies Reporting		Description NACE	Companies Reporting	
C	Manufacturing	7	27%	Manufacture of pulp, paper, and paperboard	3	(A, U, X)
				Manufacture of products of wood, cork, straw, and plaiting materials	1	(C)
				Manufacture of structural metal products	1	(N)
				Manufacture of other porcelain and ceramic products	1	(Z)
				Forging, pressing, stamping, and roll-forming of metal; powder metallurgy	1	(R)
D	Electricity, gas, steam, and air conditioning supply	2	8%	Electric power generation, transmission, and distribution	2	(E, T)
F	Construction	2	8%	Construction of roads and railways	1	(O)
				Construction of other civil engineering projects	1	(W)
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	5	19%	Retail sale of automotive fuel in specialised stores	1	(G)
				Retail sales in non-specialised stores	2	(M, V)
				Other specialised wholesale	1	(L)
				Sale of motor vehicles	1	(Y)
H	Transportation and storage	1	4%	Other postal and courier activities	1	(D)
I	Accommodation and food service activities	1	4%	Restaurants and mobile food service activities	1	(J)
J	Information and communication	7	27%	Publishing of books, periodicals, and other publishing activities	1	(B)
				Computer programming, consultancy, and related activities	3	(H, Q, S)
				Television programming and broadcasting activities	2	(I, K)
				Wired telecommunications activities	1	(P)
R	Arts, entertainment, and recreation	1	3%	Gambling and betting activities	1	(F)
	Total of companies	26		Total of companies	26	

The majority of the companies belong to the "manufacturing" and "information and communication-related activities" sector (both 27%), and "wholesale and retail trade" (19%), with a smaller representation. Data collection also reveals that 69% of the companies (18 out of 26) are in sectors that significantly contribute to climate change (European Commission, 2020).

6.4.2 Climate-related Information: Location and Disclosure

Companies are required to disclose climate-related information in their non-financial statements, as defined by the NFRD. However, the format and location of this information vary across companies (Table X).

Table X Source of data collection: location of climate-related information disclosure.

Primary documents where the information is presented	*Number of Companies*		
	2020	2022	
Annual report			
Specific section on Non-Financial Information or in the Sustainability Report section	17	18	
Non-financial information is complemented by the Sustainability Report (Stand-alone Report)	2	1	
Integrated Reporting (IR) Framework	3	5	
Sustainability Report			
Stand-alone Report	4	2	(26)
Supplementary Sources			
CDP (formerly known as the Carbon Disclosure Project) "Climate Change Questionnaire"	10	11	
Other separate documents	3	5	

There is no uniformity regarding where (i.e., in which document or place) the non-financial statement is presented/disclosed, and much less regarding the climate-related information disclosure, or even uniformity in the name of the report (e.g., “Non-Financial Information Report”, “Sustainability Report”,

“Corporate Responsibility in Value Creation”). Sometimes, the climate-related information may be scattered or redirected to other documents.

From 2020 to 2022, a growing trend towards the inclusion of non-financial (and climate-related) information in the annual reports, from 85% to 92% of the companies, is in line with the CSRD requirements. In 2022, 19% of companies adopted the integrated report based on the Integrated Reporting (IR) Framework (IFRS Foundation, 2021). In addition, in 2022, 11 companies (42%) also voluntarily responded to the CDP questionnaire, an increase of one company compared to 2020, complementing their non-financial statements with climate-related information, demonstrating an increased awareness of climate-related information.

In 2022, the use of supplementary sources to disclose non-financial information outside the annual report and/or sustainability report has increased, in particular GRI standards (1 company), TCFD information (1), European taxonomy (1), Climate Transition (1), Reporting Practices (1), and ESG report (2).

Overall, the data collection (document reviews) indicates that the "non-financial statement" is included in the "annual report", which is the primary place for disclosing non-financial information (Table IX). Similar studies have also identified that climate change-related information is often scattered among the different ways of disclosing non-financial details (De Bernardi et al., 2019; Demaria & Rigot, 2020), but that there is a preference for including this information in non-financial reports, sustainability reports, or the CDP questionnaire (Nelson, 2019). The CSRD requires sustainability information to be included in the annual report (European Commission, 2022d), while the ESRS defines the template of information disclosure according to the disclosure requirements, which may include one or more different points (European Commission, 2023d).

In 2022, about half (12) of the companies provided an independent limited assurance report, an increase from 33% in 2020. The IFAC et al. (2022) study found a similar situation. In addition, 73% of companies followed the GRI guidelines in 2022, representing a 19% increase from 2020, which confirms the findings of a KPMG (2022) study that highlights the growing trend towards GRI adoption.

In the same year (2022), 10 companies reported information in line with the TCFD recommendations, representing a significant increase from 3 companies (12%) in 2020.

6.4.3 Frequency of the Term “Climate” in the Reports

In analysing the evolution of companies over the specified periods, the extent of climate-related disclosure was quantified. To do this, the occurrences of the word "climate" and its related terms - such

as “clima”, "climático(a)," "climáticos(as)," and "climatéricos(as)" - were counted in the companies' annual and sustainability reports (which are written in Portuguese). For simplicity, all these terms are collectively referred to as "climate" in English.

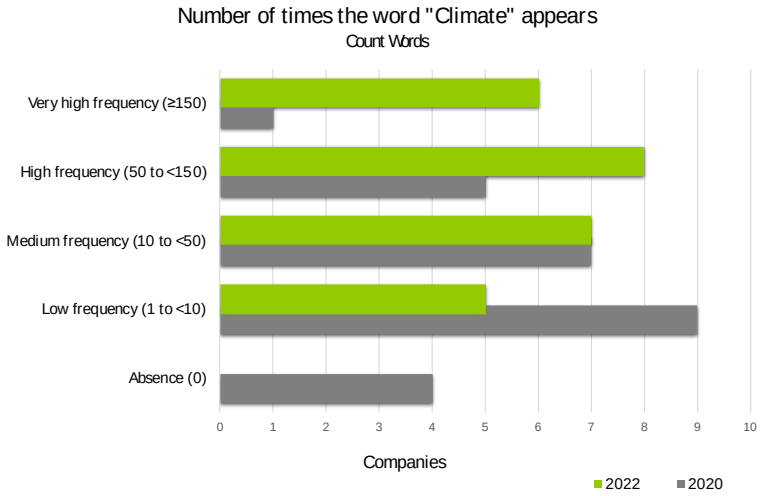

Figure 6.1 Frequency of the word “climate” in companies' annual and/or sustainability reports, by interval.

Figure 6.1 illustrates an increase in the number of references to the term “climate”. However, it is crucial to acknowledge that some of these increases highlight the need for more in-depth studies on the subject.

The results indicate that in 2020, four companies did not reference the term “climate” at all, as they presented no related information (the number of times “climate” appeared was zero). This lack of information can be attributed to several factors: the difficulty or cost of producing climate-related information; a low awareness on the part of the company regarding the importance of communicating climate-related performance or negative results to stakeholders; a lack of necessary information within the analysed business; and an early stage in meeting EU Guidelines (Lombardi et al., 2022).

However, this was not the case in 2022, indicating that by incorporating non-financial, climate-related information in their annual and sustainability reports, companies are acknowledging the increasing significance of the issue and the necessity to comply with regulations.

The CSRD aims to address the previous lack of emphasis on climate by aligning with the ESRS. These standards require companies to thoroughly justify determining that climate change is not material (European Commission, 2023a). If companies opt to omit the disclosure requirements of ESRS E1, a detailed explanation of their materiality assessment should be provided, including a forward-looking analysis of factors that could render climate change material in the future (European Commission, 2023a).

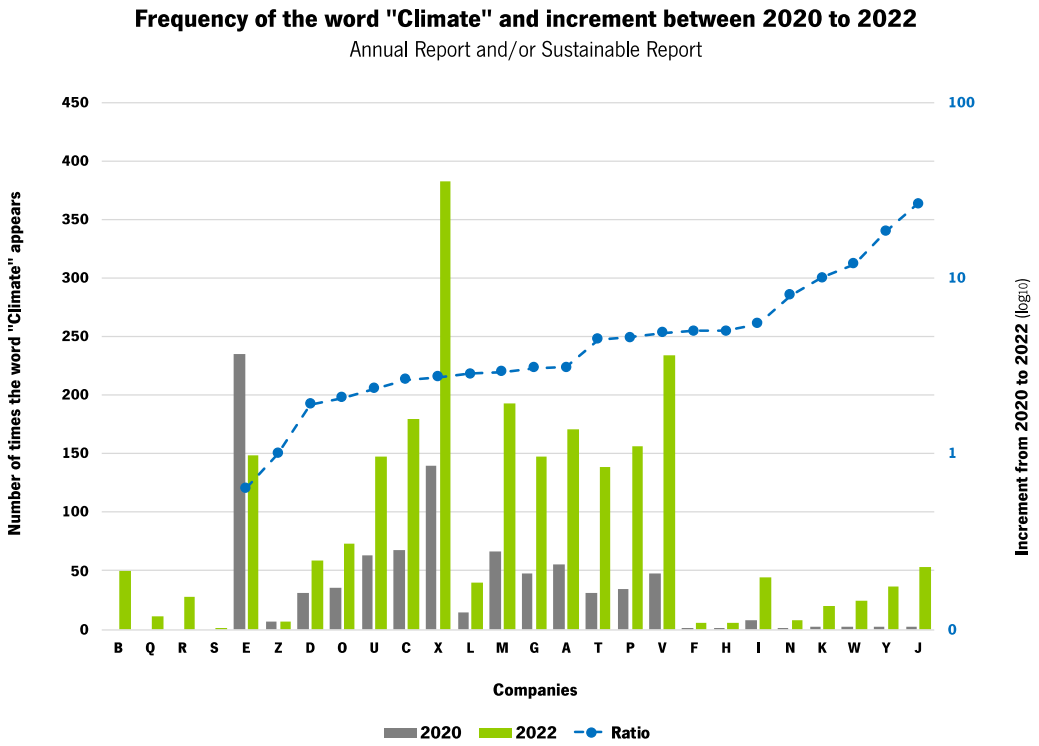

Figure 6.2 Frequency of the word “climate” in the companies analysed and its increment from 2020 to 2022.

Comparing climate-related information disclosure in 2020 and 2022 (Fig. 6.2), we can observe that companies that made little reference to the word “climate” generally referred to climate-related information more superficially. This empirical evidence is similar to that obtained by Lombardi et al. (2022), who found that climate-related information from these companies is scarce and presented in brief sentences rather than in-depth analysis.

In 2020, the companies that most frequently used the word “climate” were Company E and Company X, which are primarily involved in the electricity production sector and the paper industry, respectively. By 2022, the company X (paper industry) continued to lead in this regard, and it was now joined by a retail company that operates in non-specialized stores (V). While one company (E) experienced a decrease in the number of times it mentioned the word "climate” when comparing 2020 to 2022, the overall count in 2022 remained high, indicating an increase in reference numbers. This evolution is due to the transition from a separate sustainability report disclosure in 2020 to an integrated report in 2022. It is also noteworthy that 4% of companies in 2020 and 23% in 2022 mentioned the word "climate" (≥ 150) more often than their peers. Conversely, companies in the information technology consultancy and gambling sectors use the term the least.

6.4.4 Companies' Climate-related Information: Guidelines on Reporting Climate-related Information within the NFRD

6.4.4.1. Companies' Climate Risks and Opportunities Disclosed

Using the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (European Commission, 2019c), the study analysed the risks, dependencies on natural, human, and social capital, opportunities, and the climate-related risks and opportunities across the value chain that are recommended for disclosure by companies in the sample.

Table XI presents the risks of climate change to a company's financial performance.

Table XI Climate-related risks: disclosures recommended by the "Guidelines on non-financial reporting: Supplement on reporting climate-related information".

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
(1) RISKS OF NEGATIVE IMPACTS ON THE CLIMATE												
GHG emissions directly into the atmosphere	19	73%	20	77%	20	77%	22	85%	22	85%	22	85%
Energy purchased for operations is derived from fossil fuels	20	77%	20	77%	20	77%	21	81%	21	81%	21	81%
The company's product or service requires the use of fossil fuels	3	12%	9	35%	9	35%	9	35%	11	42%	11	42%
The materials (and transport) used by the company may cause GHG emissions upstream in the value chain	10	38%	12	46%	12	46%	14	54%	14	54%	14	54%
(2) RISKS OF NEGATIVE IMPACT ON THE COMPANY												
(A) PHYSICAL RISKS												
Acute (resulting from specific phenomena)												
Specific events, especially weather-related events such as storms, floods, fires or heat waves	14	54%	14	54%	14	54%	20	77%	20	77%	20	77%
Chronic (long-term changes in climate)												
Reduced water availability	6	23%	6	23%	6	23%	11	42%	11	42%	11	42%
Temperature changes	7	27%	11	42%	11	42%	13	50%	13	50%	13	50%
Rising sea levels	5	19%	8	31%	8	31%	4	15%	11	42%	11	42%
Biodiversity loss	4	15%	4	15%	4	15%	2	8%	10	38%	10	38%
Changes in land and soil productivity	1	4%	1	4%	1	4%	1	4%	3	12%	3	12%
(B) TRANSITION RISKS												
Policy												
Energy efficiency requirements	15	58%	16	62%	16	62%	19	73%	19	73%	19	73%
Carbon pricing mechanisms	8	31%	12	46%	12	46%	11	42%	15	58%	15	58%
Increased obligation to report emissions	21	81%	21	81%	21	81%	23	88%	23	88%	23	88%
Mandates and regulations on products and services	13	50%	16	62%	16	62%	15	58%	17	65%	17	65%
Promoting sustainable land use	5	19%	5	19%	5	19%	6	23%	7	27%	7	27%
Legal												
Risk of litigation due to failure to avoid or mitigate adverse impacts on the climate, or due to failure to adapt to climate change	8	31%	15	58%	15	58%	9	35%	15	58%	15	58%
Technology												
Substitution of existing products and services with lower emissions options	16	62%	17	65%	17	65%	19	73%	19	73%	19	73%
Unsuccessful investment in new technologies	0	0%	0	0%	0	0%	1	4%	1	4%	1	4%
Costs of transition to lower emissions technology	21	81%	21	81%	21	81%	24	92%	24	92%	24	92%
Market												
Changing in customer behaviour (preferring less climate-damaging products/services)	15	58%	15	58%	15	58%	17	65%	17	65%	17	65%
Uncertainty in market signals	3	12%	8	31%	8	31%	7	27%	8	31%	8	31%
Rising raw material costs	9	35%	14	54%	14	54%	18	69%	19	73%	19	73%
Reputational												
Changes in the preferences of customers, employees, business partners, investors, etc. (climate-friendly companies)	14	54%	15	58%	15	58%	14	54%	16	62%	16	62%
Stigmatisation of the sector	3	12%	5	19%	5	19%	3	12%	4	15%	4	15%
Increased concern or negative feedback from stakeholders	18	69%	19	73%	19	73%	21	81%	21	81%	21	81%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR). / AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP). / AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

Table XI indicates that the risks reported by companies have increased from 2020 to 2022. It also shows that the CDP questionnaire reinforces the information provided in the annual and sustainability reports. It is also noteworthy that other separate documents tend to replicate data already included in the AR, SR, or CDP.

There has been a growing trend among companies to disclose information regarding GHG emissions and fossil fuel usage, particularly in relation to the risks of negative impacts on the climate. In 2020, 73% of companies reported their direct GHG emissions, which increased to 85% by 2022. Likewise, the percentage of companies reporting fossil fuel use rose from 77% in 2020 to 81% in 2022.

In terms of risks that can negatively impact companies, fewer than half of companies currently disclose the risks associated with chronic physical threats. In contrast, acute physical risks had been reported by 54% of companies as of 2020; however, in 2022, there was a notable improvement, with 77% of companies beginning to acknowledge these types of risks. According to Nelson (2019), physical risks are often overlooked in assessment models and frequently omitted from strategic and risk management disclosures. Regarding transition risks, many companies have identified these risks as directly affecting their industry or the supply chains on which they rely. This impact may be due to their perception that the consequences of transition risks are more immediate (Nelson, 2019).

The results of this study indicate that an increasing number of companies are recognizing the need to disclose their GHG emissions. In 2020, 81% acknowledged this need, and by 2022, the figure had risen to 88%. This trend aligns with the EU's climate neutrality targets set for 2050, which include a 55% reduction in net greenhouse gas emissions by 2030, as outlined in the Fit for 55 Package (European Parliament and the Council of the European Union, 2021). The requirement is further supported by the NFRD guidelines (European Commission, 2019c) and is reinforced by the CSRD regulatory standards ((European Commission, 2022c), particularly the ESRS E1 standards (European Commission, 2023d).

The disclosure of risks related to the "cost of transitioning to lower emissions technology" for reducing GHG emissions reveals that 81% of companies provided information on this topic in 2020. This percentage rises to 92% in 2022, underscoring the urgent need for investment in low-carbon technologies (European Parliament and the Council of the European Union, 2018).

Reputational risk is characterized by "increased concern or negative feedback from stakeholders". In 2020, 69% of companies identified this issue; by 2022, that number rose to 81%. Companies are consistently working to enhance their legitimacy and manage their reputation. They do this by demonstrating alignment with societal concerns and maintaining transparent communication with their stakeholders (Clarke & Gibson-Sweet, 1999).

The additional information, primarily provided by CDP, greatly improves data collection. Legal risks are particularly noteworthy, with 31% reported in 2020 and 35% in 2022, identified in the Annual Report (AR) and Sustainability Report (SR). In contrast, 58% of legal risks were highlighted in the CDP questionnaire.

According to Andersson (2023), while companies generally map and communicate climate risks, they have differences. However, managing these risks is typically a low priority, with little involvement from management or the board of directors. The ESRS emphasizes the importance of disclosing impacts, risks, and opportunities, and establishes specific requirements to ensure the transparency and comparability of sustainability information (European Commission, 2023d).

The disclosure of natural capital dependencies has grown, primarily due to reliance on natural resources. While relevant, dependency on social and human capital has received less attention (see Table XII).

Table XII Dependences on natural, human, and social capital: disclosures recommended by the "Guidelines on non-financial reporting: Supplement on reporting climate-related information".

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
DEPENDENCIES ON NATURAL, HUMAN, AND SOCIAL CAPITAL												
Dependence on natural capital	9	35%	9	35%	9	35%	11	42%	12	46%	12	46%
Dependence on human and social capital	0	0%	0	0%	0	0%	1	4%	1	4%	1	4%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

Also, ESRS 1 states that impact and dependencies can be sources of risk or opportunity for companies (European Commission, 2023d). Considering the opportunities related to climate change adaptation and mitigation that may impact companies' financial performance, the study identified several disclosures made by the companies analysed (see Table XIII).

Table XIII Climate-related opportunities: disclosures recommended by the "Guidelines on non-financial reporting: Supplement on reporting climate-related information".

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
(1) CLIMATE-RELATED OPPORTUNITIES												
(A) Resource Efficiency												
The use of more efficient means of transport	18	69%	18	69%	18	69%	20	77%	21	81%	21	81%
The use of more efficient processes in production (services) and distribution	22	85%	22	85%	22	85%	21	81%	21	81%	21	81%
Waste use and recycling	24	92%	24	92%	24	92%	25	96%	25	96%	25	96%
Move to (or adapt to) a more energy-efficient building	20	77%	21	81%	21	81%	23	88%	23	88%	23	88%
New technologies for more efficient use of scarce water resources	15	58%	15	58%	15	58%	21	81%	22	85%	22	85%
(B) Energy Source												
Use of lower-emission energy sources	19	73%	19	73%	19	73%	22	85%	22	85%	22	85%
The use of supportive policy incentives	5	19%	7	27%	7	27%	9	35%	10	38%	10	38%
The use of new technologies	18	69%	18	69%	18	69%	21	81%	21	81%	21	81%
Participation in the carbon market	6	23%	10	38%	10	38%	10	38%	13	50%	13	50%
Shift to decentralised energy generation	16	62%	16	62%	16	62%	20	77%	20	77%	20	77%
(C) Products and Services												
The development and/or expansion of goods and services with low emissions	16	62%	16	62%	16	62%	20	77%	20	77%	20	77%
Development of solutions for adaptation to climate change and insurance risks	8	31%	11	42%	11	42%	6	23%	9	35%	9	35%
Development of new products or services through R&D and innovation	15	58%	16	62%	16	62%	18	69%	18	69%	18	69%
The ability to diversify business activities	16	62%	17	65%	17	65%	17	65%	17	65%	17	65%
Changes in consumer preferences	16	62%	17	65%	17	65%	17	65%	17	65%	17	65%
(D) Markets												
Access to new markets	10	38%	12	46%	12	46%	12	46%	14	54%	14	54%
Use of incentives from the public sector	5	19%	6	23%	6	23%	8	31%	8	31%	8	31%
Access to new assets and locations requiring insurance coverage	0	0%	0	0%	-	0%	0	0%	0	0%	0	0%
(E) Resilience												
Participation in renewable energy programmes and adoption of energy efficiency measures	20	77%	20	77%	20	77%	22	85%	22	85%	22	85%
Substitution/diversification of resources	13	50%	13	50%	13	50%	15	58%	15	58%	15	58%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

Of particular note is the “resource efficiency” group in Table XIII, where the most observed item (92% in 2020 and 96% in 2022) is “waste use and recycling”, showing a growing awareness of the importance of recycling, such as the use of biomass for fuel, steel made from scrap metal, and cork waste, among others.

In this context of opportunities, many companies will assess existing and future green tax measures to drive strategic change. These measures include adopting more efficient vehicles, such as electric or hydrogen-powered models, introducing carbon taxes, offering subsidies for sustainable practices - such as using recyclable materials or innovative technologies - providing incentives for the adoption of renewable energy, and encouraging improvements in building energy efficiency. These initiatives will enhance climate responsibility across the business sector.

The difference between CDP and other sources is less pronounced for climate-related opportunities. There is also an increase in disclosure in 2022 compared to 2020.

Comparing disclosed information related to risks and opportunities (Table XI and Table XIII), more companies generally disclose opportunities, which is understandable given the expected positive impact on information users.

Disclosure of climate-related risks and opportunities in the value chain is also noteworthy, with many companies (65% in 2022) addressing this issue, given the global and interdependent nature of climate issues (Table XIV).

Table XIV Climate-related risks and opportunities throughout the value chain: disclosures recommended by the "Guidelines on non-financial reporting: Supplement on reporting climate-related information"

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
CLIMATE-RELATED RISKS AND OPPORTUNITIES THROUGHOUT THE VALUE CHAIN												
Climate-related risks and opportunities throughout the value chain	13	50%	16	62%	16	62%	17	65%	17	65%	17	65%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP “Climate Change Questionnaire” (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP “Climate Change Questionnaire” (CDP) and/or other separate documents (O).

In this context, ESRS 1 also emphasises the importance of identifying and evaluating impacts, risks, and opportunities within companies' value chains (European Commission, 2023d), including those related to climate change.

6.4.4.2 Recommended Climate-related Disclosures

Based on the "Guidelines on non-financial reporting: Supplement on reporting climate-related information" (European Commission, 2019c), Table XV presents the companies' climate-related disclosures, covering aspects such as the business model, due diligence policies and processes, results achieved, key risks and their management, and key performance indicators.

Table XV Disclosures made by the companies under the scope of the "Guidelines on non-financial reporting: Supplement on reporting climate-related information".

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
BUSINESS MODEL												
Describe the impact of climate-related risks and opportunities on the company's business model, strategy, and financial planning	16	62%	17	65%	17	65%	19	73%	19	73%	19	73%
Describe how the company's business model can impact the climate, both positively and negatively	16	62%	16	62%	16	62%	21	81%	21	81%	21	81%
Describe the resilience of the company's business model and strategy, taking into consideration different climate-related scenarios over different time horizons, including at least a 2 °C or lower scenario and a greater than 2°C scenario	2	8%	10	38%	10	38%	7	27%	12	46%	12	46%
POLICIES AND DUE DILIGENCE PROCESSES												
Describe any company policies related to climate, including any climate change mitigation or adaptation policy	22	85%	22	85%	22	85%	23	88%	23	88%	23	88%
Describe any climate-related targets the company has set as part of its policies, especially any GHG emissions targets, and how the company's targets relate to national and international targets and to the Paris Agreement in particular	11	42%	12	46%	12	46%	15	58%	15	58%	15	58%
Describe the board's oversight of climate-related risks and opportunities	3	12%	11	42%	11	42%	10	38%	12	46%	12	46%
Describe management's role in assessing and managing climate-related risks and opportunities and explain the rationale for the approach	5	19%	11	42%	11	42%	9	35%	11	42%	11	42%
OUTCOMES												
Describe the outcomes of the company's policy on climate change, including the performance of the company against the indicators used and targets set to manage climate-related risks and opportunities	12	46%	13	50%	13	50%	13	50%	14	54%	14	54%
Describe the development of GHG emissions against the targets set and the related risks over time	11	42%	12	46%	12	46%	13	50%	14	54%	14	54%
PRINCIPAL RISKS AND THEIR MANAGEMENT												
Describe the company's processes for identifying and assessing climate-related risks over the short, medium, and long term, and disclose how the company defines short, medium, and long-term	1	4%	10	38%	10	38%	2	8%	11	42%	11	42%
Describe the principal climate-related risks the company has identified over the short, medium, and long term throughout the value chain, and any assumptions that have been made when identifying these risks	1	4%	10	38%	10	38%	3	12%	12	46%	12	46%
Describe processes for managing climate-related risks (if applicable), how they make decisions to mitigate, transfer, accept, or control those risks, and how the company is managing the particular climate-related risks that it has identified	11	42%	14	54%	14	54%	14	54%	14	54%	14	54%
Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management	5	19%	11	42%	11	42%	9	35%	11	42%	11	42%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in the Annual Report (AR) and/or on the Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

(Table XV continued)

	2020						2022					
	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%	AR+SR	%	AR+SR + CDP	%	AR+SR + CDP+O	%
KEY PERFORMANCE INDICATORS												
GHG emissions (Scope 1, Scope 2 and Scope 3)												
Direct GHG emissions from sources owned or controlled by the company (Scope 1)	14	54%	15	58%	15	58%	19	73%	19	73%	19	73%
Indirect GHG emissions from the generation of acquired and consumed electricity, steam, heat, or cooling (collectively referred to as "electricity") (Scope 2)	14	54%	16	62%	16	62%	19	73%	19	73%	19	73%
All indirect GHG emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions (Scope 3)	12	46%	14	54%	14	54%	17	65%	17	65%	17	65%
Absolute GHG emissions target (tonnes CO2e or % reduction compared to baseline)	5	19%	10	38%	10	38%	12	46%	13	50%	13	50%
Energy												
Total energy consumption and/or production from renewable and non-renewable sources	13	50%	14	54%	14	54%	18	69%	18	69%	18	69%
Energy efficiency target	4	15%	7	27%	7	27%	5	19%	7	27%	7	27%
Renewable energy consumption and/or production target	9	35%	11	42%	11	42%	10	38%	11	42%	11	42%
Physical risks												
Assets committed in regions likely to become more exposed to acute or chronic physical climate risks	0	0%	2	8%	2	8%	1	4%	2	8%	2	8%
Products and services												
Percent turnover in the reporting year from products or services associated with activities that meet the criteria for substantially contributing to mitigation of or adaptation to climate change, as set out in the Regulation on the establishment of a framework to facilitate sustainable investment (EU Taxonomy)	0	0%	0	0%	0	0%	24	92%	24	92%	24	92%
Percent investment (Capex) and/or expenditures (Opex) in the reporting year for assets or processes associated with activities that meet the criteria for substantially contributing to mitigation of or adaptation to climate change, as set out in the Regulation on the establishment of a framework to facilitate sustainable investment (EU Taxonomy)	0	0%	0	0%	0	0%	24	92%	24	92%	24	92%
Green Finance												
Climate-related Green Bond Ratio	0	0%	0	0%	0	0%	1	4%	2	8%	2	8%
Climate-related Green Debt Ratio	0	0%	0	0%	0	0%	1	4%	2	8%	2	8%

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

The most disclosed items (85% in 2020 and 88% in 2022) are associated with “describe any company climate policies related to climate, including any climate change mitigation or adaptation policy” (policies and due diligence processes). The topic of “products and services” is associated with the EU taxonomy, which mandates disclosures based on the financial year 2022 (European Commission, 2021c). This empirical evidence indicates that in 2020, no companies made these disclosures, whereas in 2022, only two companies, representing 8%, did not comply.

In 2020, more than half of the companies had already disclosed key performance indicators related to "GHG emissions (scopes 1, 2, and 3)", and there was an increase in the number of companies making these disclosures in 2022. Comparing both years, scopes 1 and 2 stand out as the most disclosed, consistent with similar studies (Nelson, 2019). According to Tang and Demeritt (2018), companies disclose their emissions in response to financial incentives, public pressure, and regulatory requirements.

For example, the least common key performance indicator in 2020 was the "GHG absolute emissions target" (referring to GHG emissions in Scope 1, Scope 2, and Scope 3), with only 19% of companies disclosing it, compared to 38% when considering the CDP. By 2022, the proportion of companies reporting this indicator had increased to 46%, or 50% when including the CDP. An analysis of the E1-4 disclosure requirements in ESRS E1 shows a more detailed approach compared to the NFRD Guidelines. Where applicable, ESRS E1-4 stipulates the definitions of absolute and relative targets, the scope of emissions (scopes 1, 2, and 3), deadlines, and action plans, as well as alignment with the Paris Agreement and progress indicators for monitoring environmental commitments (European Commission, 2023d). According to Jung et al. (2018), the historical profile of carbon emissions is highly relevant, but information about the future profile also plays a crucial role.

In the “Business Model”, under the heading "consideration climate-related scenarios over different time horizons", it states that, based on climate-related uncertainties, only 8% of companies considered various climate scenarios across different time horizons in 2020 (38% when including CDP). By 2022, this disclosure had increased significantly to 27% (46% when we include CDP). According to Monnin (2018), climate risk assessment necessitates forward-looking scenarios that incorporate complex cause-and-effect relationships. In this way, companies can access new corporate strategy and planning inputs, improving capacity and internal processes (Nelson, 2019). The ESRS E1 emphasises the importance of developing climate scenarios for a comprehensive assessment of physical and transition risks, taking into account various time

horizons and ensuring alignment with decarbonisation targets and the Paris Agreement. It also highlights the importance of analysing the resilience of the business model, ensuring that companies are prepared for future climate impacts (European Commission, 2023d).

6.4.5 CDP and the Financial Impacts Disclosed by Companies

Some annual and/or sustainability reports present information on the financial impact of climate change. These documents identify the following climate-related financial quantifications: a) investments in Research and Development (R&D), representing 12% of the analysed companies in 2020, increasing to 19% in 2022; b) investments in Capital Expenditures (Capex), rising from 19% in 2020 to 77% in 2022. Additionally, limited information was found regarding the influence of climate issues on key financial aspects: c) changes in revenues, observed in 4% of companies in 2020 and 8% in 2022; d) changes in expenditures, whether increases or decreases, which stayed at 12% in both years.

Banks, in order to conduct a comprehensive assessment of companies, will have to (and it is crucial to do so!) examine the future financial impact on the income statement (revenues and expenses), the balance sheet (assets, liabilities, equity, and financing), and the cash flow statement (TCFD, 2017b).

The detailed analysis of the CDP "Climate Change Questionnaire" (Table XVI) provides a reasoned examination of the risks that companies may face and their potential financial impact.

Table XVI Risks: Examples of the likely financial impact disclosed in CDP "Climate Change Questionnaire".

PART OF THE VALUE	RISK TYPE	PRIMARY CLIMATE-RELATED RISK DRIVER	PRIMARY POTENTIAL FINANCIAL IMPACT	2020	2022
UPSTREAM	Acute Physical	Cold wave/frost	Decreased revenues due to reduced production capacity	0	1
		Flood (coastal, fluvial, pluvial, groundwater)	Decreased revenues due to reduced production capacity	0	1
		Increased likelihood and severity of wildfires	Increased indirect (operating) costs	1	0
		Increased severity and frequency of extreme weather events such as cyclones and floods	Decreased revenues due to reduced production capacity	3	0
		Other - Increase in frequency and severity of extreme weather events	Increased indirect (operating) costs	0	1
	Chronic Physical	Changing precipitation patterns and types (rain, hail, snow/ice)	Decreased revenues due to reduced production capacity	1	2
	Current Regulation	Mandates on and regulation of existing products and services	Decreased asset value or asset useful life leading to write-offs, asset impairment, or early retirement of existing assets	1	0
	Emerging Regulation	Carbon prices mechanisms	Increased direct costs	1	0
	Legal	Exposure to litigation	Other - Policy and legal: Increased costs and/or reduced demand for products and services resulting from fines and judgments; Increased operating costs (e.g., higher compliance costs, increased insurance premiums)	1	0
DIRECT OPERATIONS	Acute Physical	Cyclone, hurricane, typhoon	Increased capital expenditures	0	1
			Increased direct costs	0	1
		Flood (coastal, fluvial, pluvial, groundwater)	Increased capital expenditures	0	1
			Increased indirect (operating) costs	0	1
		Heat wave	Increased capital expenditures	0	1
		Increased likelihood and severity of wildfires	Increased capital expenditures	1	1
			Decreased asset value or asset useful life leading to write-offs, asset impairment or early retirement of existing assets	1	0
		Increased severity and frequency of extreme weather events such as cyclones and floods	Increased capital expenditures	1	0
			Increased indirect (operating) costs	1	0
			Other - Increased capital costs (e.g., damage to facilities) and Increased insurance premiums and potential for reduced availability of insurance on assets in "high-risk" locations)	1	1
		Other - Changes in precipitation patterns and extreme variability in weather patterns	Decreased revenues due to reduced production capacity	0	1
		Other - Extreme wind events	Decreased revenues due to reduced production capacity	1	0
		Other - Increased likelihood of extreme hot weather events	Decreased revenues due to reduced production capacity	1	0
		Wildfire	Decreased revenues due to reduced production capacity	0	1
			Increased direct costs	0	1
		Changes in precipitation patterns and extreme variability in weather patterns	Other - Reduced revenues due to lower sales/output	1	1
		Changing temperature (air, freshwater, marine water)	Increased indirect (operating) costs	0	1
		Heat stress	Decreased revenues due to reduced production capacity	0	1
			Increased indirect (operating) costs	0	1
		Rising mean temperatures	Increased capital expenditures	1	0
			Increased indirect (operating) costs	3	0
	Current Regulation	Carbon pricing mechanisms	Increased direct costs	1	2
			Increased indirect (operating) costs	1	2
		Mandates on and regulation of existing products and services	Decreased asset value or asset useful life leading to write-offs, asset impairment or early retirement of existing assets	1	1
			Increased capital expenditures	0	1
			Increased indirect (operating) costs	2	1
	Emerging Regulation	Carbon prices mechanisms	Increased direct costs	1	1
			Increased indirect (operating) costs	2	3
		Mandates on and regulation of existing products and services	Increased indirect (operating) costs	1	1
	Legal	Exposure to litigation	Other - Increased costs and/or reduced demand for products and services resulting from fines and judgments; Increased operating costs (e.g., higher compliance costs, increased insurance premiums)	0	1
	Technology	Transitioning to lower emissions technology	Increased capital expenditures	1	1
	Market	Changing customer behaviour	Decreased revenues due to reduced demand for products and services	1	0
		Shifts in consumer preferences	Decreased revenues due to reduced demand for products and services	1	1

Data collected from CDP questionnaires from the CDP website or companies' websites (CDP, 2021, 2023).

(Table XVI continued)

PART OF THE VALUE	RISK TYPE	PRIMARY CLIMATE-RELATED RISK DRIVER	PRIMARY POTENTIAL FINANCIAL IMPACT	2020	2022
DOWNSTREAM	Current Regulation	Mandates on and regulation of existing products and services	Increased indirect (operating) costs	0	1
			Other - Increased costs associated with fuel economy regulations	0	1
	Market	Other	Other - Decreased revenues due to new competitors	1	1
	Reputation	Increased stakeholder concern or negative stakeholder feedback	Other - Brand depreciation and reduction of revenues	1	0
			Other - Decrease in brand value and revenues	1	1
		Shifts in consumer preferences	Decreased revenues due to reduced demand for products and services	1	1
		Stigmatization of the sector	Other - Brand depreciation and reduction of revenues	1	2

Data collected from CDP questionnaires on the CDP website or companies' websites (CDP, 2021, 2023).

The analysis regarding the risks of the likely financial impact, as disclosed in CDP's "Climate Change Questionnaire," involved questionnaires from 10 companies in 2020 and 11 companies in 2022. Some examples of the likely financial impact disclosed in the CDP (Table XVI) provide valuable information for understanding risks and their associated financial impact, considering both probabilities and measures.

In addition to the items listed in Table XVI, the CDP questionnaire provides other key parameters for assessing the potential financial impact, such as the probability (e.g., likely or more likely than not), the magnitude of impact (medium or high), and a financial estimate with minimum and maximum values. It also identifies the time horizon (short, medium, and long term), the costs associated with responding to the risks, a description of the response, and the cost calculation, as well as space for additional comments (CDP, 2021b, 2023b).

In 2020, “direct operations” (see Table XVI) presented the highest level of disclosure. Within this scope, the most prominent elements regarding risk type and key climate risk factors were “rising mean temperatures” (an acute physical risk) and “carbon price mechanisms” (an emerging regulatory risk). Therefore, in 2022, “direct operations” remain a key area of focus, with “carbon pricing mechanisms” taking centre stage. These mechanisms continue to play a significant role in “emerging regulation”. They are now increasingly relevant in “current legislation”, reinforcing the growing importance of carbon pricing and its potential financial impact on companies.

The ESRS E1 requires companies to disclose how they apply internal carbon pricing schemes. The planning and disclosure matter provides insight to enable companies to anticipate and manage the financial impact of future emissions regulations (European Commission, 2023d). By acting in this manner, companies are encouraged to proactively adapt to regulatory requirements, thereby strengthening their ability to manage climate risks and associated costs more efficiently.

On the other hand, disclosing opportunities may potentially provide an advantage when

interacting with banks. Table XVII shows several examples of the likely financial impact (monetary value) disclosed by companies as opportunities.

Table XVII Opportunities: Examples of the likely financial impact disclosed in the CDP "Climate Change Questionnaire".

PART OF THE VALUE CHAIN	OPPORTUNITY TYPE	PRIMARY CLIMATE-RELATED OPPORTUNITY DRIVER	PRIMARY POTENTIAL FINANCIAL IMPACT	2020	2022
Upstream	Resource Efficiency	Other - Increase in the value of fixed assets	Increased revenues resulting from increased demand for products and services	1	1
		Use of more efficient modes of transport	Increased revenues resulting from increased demand for products and services	1	1
Direct Operations	Resource Efficiency	Move to more efficient buildings	Reduced indirect (operating) costs	1	1
		Use of more efficient production and distribution processes	Increased revenues resulting from increased production capacity	1	2
			Increased value of fixed assets	1	1
			Reduced indirect (operating) costs	2	3
	Energy Source	Use of lower-emission sources of energy	Reduced direct costs	0	1
			Reduced indirect (operating) costs	2	1
			Returns on investment in low-emission technology	0	1
		Use of new technologies	Reduced indirect (operating) costs	0	1
			Returns on investment in low-emission technology	1	0
	Market	Other - Participation in carbon markets	Returns on investment in low-emission technology	0	1
	Products and Services	Development and/or expansion of low-emission goods and services	Increased revenues resulting from increased demand for products and services	3	4
			Increased revenues through access to new and emerging markets	1	1
		Development of climate adaptation, resilience and insurance risk solutions	Increased revenues through access to new and emerging markets	1	2
		Development of new products or services through R&D and innovation	Increased revenues through access to new and emerging markets	0	1
		Ability to diversify business activities	Increased revenues resulting from increased demand for products and services	1	1
			Increased revenues through access to new and emerging markets	1	1
			Other - Increased revenue through demand for lower emissions products and services	0	1
	Resilience	Participation in renewable energy programs and adoption of energy-efficiency measures	Returns on investment in low-emission technology	1	0
Downstream	Products and Services	Development and/or expansion of low-emission goods and services	Increased revenues resulting from increased demand for products and services	1	1
		Other - Access to new markets	Increased revenues through access to new and emerging markets	1	1
		Other - Increase in electric power demand	Other - Increased revenues resulting from increased electric power demand	1	1
		Shift in consumer preferences	Increased access to capital	1	1
			Increased revenues resulting from increased demand for products and services	1	0
			Other - Brand valuation and increased revenue	1	1
			Other - Increase brand value and revenues	1	0
			Other - Increased reputation and brand value	1	1

Data collected from CDP questionnaires from the CDP website or companies' websites (CDP, 2021, 2023).

The analysis regarding the risks of the likely financial impact, as disclosed in CDP's "Climate Change Questionnaire," involved questionnaires from 10 companies in 2020 and 11 companies in 2022. Some examples of the likely financial impact disclosed in the CDP (Table XVII) provide valuable information for understanding risks and their associated financial impact, considering both probabilities and measures.

In addition to the elements listed in Table XVII, the CDP requests that companies also provide information on specific opportunities, including a description of the opportunity, its time horizon, likelihood, magnitude of impact, and the ability to estimate a minimum and maximum financial

value for the impact. Also considered are the cost of realising the opportunity, the implementation strategy, the cost calculation explanation, and space for additional comments. This approach enables a more realistic assessment of uncertainties, utilizing methods such as sensitivity analyses, scenario simulations, and other evaluation techniques. These elements provide standardisation tools to better understand the likelihood and estimated cost of climate-related opportunities (CDP, 2021b, 2023b).

In both years, "direct operations" stood out as the area with the highest number of opportunities. Within this context, initiatives focused on enhancing “resource efficiency” opportunities gained prominence, particularly those aimed at the “use of more efficient production and distribution processes”, which were identified as key drivers of opportunity. The ESRS E1 recognises this same approach, emphasising resource efficiency, as transitioning to more efficient services and processes that require fewer resources is seen as an opportunity (European Commission, 2023d).

Table XVIII presents the different initiatives towards CO_2 reduction (2020 and 2022) found. The CDP in the "Climate Change Questionnaire" requests: for detailing the initiative category and type; estimated GHG reduction; emission scope; whether the initiative is voluntary or mandatory; the annual monetary savings (in currency); the investment required (in currency); the payback period of investment; the estimated lifetime of the initiative; and additional comments. These elements are crucial for assessing the financial and environmental impacts of such actions (CDP, 2021b, 2023b).

Table XVIII Information on CO2 reduction initiatives comparing 2020 and 2022 (CDP "Climate Change Questionnaire").

INITIATIVE CATEGORY	INITIATIVE TYPE	2020	2022
Company policy or behavioural change	Resource efficiency	1	1
	Site consolidation/closure		1
Energy efficiency in buildings	Building Energy Management Systems	1	1
	Heating, Ventilation and Air Conditioning	1	2
	Lighting	5	4
	Maintenance program		1
Energy efficiency in production processes	Compressed air		1
	Cooling technology	1	1
	Electrification		1
	Fuel switch	1	1
	Machine/equipment replacement	1	2
	Motors and drives	1	2
	Other - Distribution losses and power plant self-processes consumption reduction	1	1
	Process optimization	4	6
	Smart control system		2
	Waste heat recovery	1	2
Fugitive emissions reductions	Oil/natural gas methane leak capture/prevention		1
	Other - Forest creation	1	0
	Other - Sales promotion of hybrids and plug-ins	1	0
	Other - Tree Project	1	0
	Refrigerant leakage reduction	1	0
Low-carbon energy consumption	Low-carbon electricity mix		3
	Solid biofuels	1	0
Low-carbon energy generation	Other - Cogeneration power plant	1	0
	Solar Photovoltaic	2	4
	Wind	1	1
Other	Distribution power loss reduction; power plant self-consumption reduction; Photovoltaic self-consumption in office buildings		1
Transportation	Company fleet vehicle efficiency	1	0
	Company fleet vehicle replacement	1	3
	Employee commuting	1	0
Waste reduction and material circularity	Remanufacturing		1

Data collected from CDP questionnaires from the CDP website or companies' websites (CDP, 2021b, 2023b).

Among the initiatives analysed in 2020 and 2022, “energy efficiency in production processes” stood out, with particular emphasis on “process optimisation”. Overall, there was a significant increase in the number of initiatives from 2020 to 2022. The ESRS E1 (European Commission, 2023d) does not have a specific topic dedicated to this detail, although it is possible to detail these initiatives under other headings.

These energy efficiency initiatives demonstrate that companies are taking a proactive approach to addressing this issue. Taking action to curb climate change requires companies to play an active role, which involves progressively internalising carbon costs (Bento & Gianfrate, 2020). According to the European Central Bank (ECB) and European Systemic Risk Board (ESRB) (2022), the price of carbon can impact corporate default and bank credit losses. Additionally, transition risks may increase due to the economic and financial links between banks and companies. An increase in carbon prices could make it more likely that one company's default would lead to another's default (i.e., correlation of defaults between companies) (ECB & ESRB, 2022).

Overall, the risks, opportunities, and initiatives vary between companies, even within the same sector. It can also be observed that risks, opportunities, and initiatives can change over time for the same company, as illustrated by the comparison between 2020 and 2022. For risks, opportunities, and CO_2 reduction initiatives, there is an increase in disclosure between 2020 and 2022, in line with the upward trend observed earlier. Accordingly, a TCFD (2023) study also found an increase in the number of listed companies communicating their climate-related risks and opportunities between financial years 2020 and 2022. The evolution indicates a growing appreciation of non-financial information, especially climate-related information.

Detailed information and the financial quantification of risks, opportunities, and investments provide a more comprehensive view of company development, which is particularly useful for banks when originating and monitoring loans granted to their customers.

6.4.6 Climate Change and the EBA Guidelines on Loan Origination and Monitoring

In this study, an endeavour was made to reconcile the EBA (2020b) “Guidelines on loan origination and monitoring” with the “Guidelines on non-financial reporting: Supplement on climate-related reporting” (European Commission, 2019c) issued under the NFRD (European Parliament and the Council of the European Union, 2014). According to the analysis conducted, the EBA's expectations regarding the climate-related data required for the origination and monitoring of corporate lending are consistent with these guidelines on climate-related information.

This approach addresses banks' need for relevant climate information, enabling them to make more informed decisions when granting credit to borrowers (Table XIX). The investigation conducted a detailed analysis, comparison, and evaluation of the disclosed information on the identified topics and scored the data accordingly.

Table XIX Classification of companies' information in relation to topics essential for loan origination and monitoring.

Classification of information disclosure		2020						2022					
		Very detailed	Detailed	Generic	Reduced	None	Very detailed + Detailed (%)	Very detailed	Detailed	Generic	Reduced	None	Very detailed + Detailed (%)
	Ponderation ->	**4**	**3**	**2**	**1**	**0**		**4**	**3**	**2**	**1**	**0**	
Risks of climate change to the borrower's financial performance													
Physical risks													
Physical effects of climate change – Acute	AR+SR	**0**	**5**	8	1	12	**19**	**0**	**10**	5	5	6	**38**
	AR+SR+CDP+O	**8**	**3**	2	1	12	**42**	**10**	**3**	3	4	6	**50**
Physical effects of climate change – Chronic	AR+SR	**0**	**3**	7	0	16	**12**	**0**	**8**	4	2	12	**31**
	AR+SR+CDP+O	**5**	**5**	2	0	14	**38**	**7**	**6**	0	1	12	**50**
Climate risks: responsibility, transition to a low-carbon economy, market/consumer changes and legal impacts													
Political risks (likely impact of current and emerging regulation)	AR+SR	**1**	**13**	6	2	4	**54**	**1**	**15**	6	2	2	**62**
	AR+SR+CDP+O	**8**	**7**	5	2	4	**58**	**9**	**8**	5	2	2	**65**
Legal (juridical risks)	AR+SR	**0**	**0**	3	4	19	**0**	**0**	**1**	4	4	17	**4**
	AR+SR+CDP+O	**1**	**5**	3	6	11	**23**	**1**	**7**	4	3	11	**31**
Technology (transition to a low-carbon economy)	AR+SR	**0**	**14**	7	1	4	**54**	**0**	**17**	7	0	2	**65**
	AR+SR+CDP+O	**1**	**15**	5	1	4	**62**	**1**	**16**	7	0	2	**65**
Market (market and consumer preferences, uncertainties in market signals and rising raw material prices)	AR+SR	**0**	**9**	7	3	7	**35**	**0**	**15**	5	1	5	**58**
	AR+SR+CDP+O	**2**	**10**	5	1	8	**46**	**1**	**16**	3	1	5	**65**
Reputational	AR+SR	**0**	**6**	12	0	8	**23**	**0**	**9**	11	1	5	**35**
	AR+SR+CDP+O	**4**	**9**	6	0	7	**50**	**4**	**10**	6	1	5	**54**
Impact on climate change, climate targets, adequacy of mitigation strategies, business model, and greenhouse gas emissions													
Impacts on the climate													
Risks of negative impacts on the climate	AR+SR	**12**	**3**	0	5	6	**58**	**16**	**2**	1	3	4	**69**
	AR+SR+CDP+O	**14**	**2**	0	4	6	**62**	**16**	**2**	1	3	4	**69**
Disclosures related to the business model, policies, processes, outcomes and risk management													
Analysis of the borrower's business model													
Describe the impact of climate-related risks and opportunities on the company's business model, strategy and financial planning	AR+SR	**0**	**2**	13	1	10	**8**	**0**	**8**	10	1	7	**31**
	AR+SR+CDP+O	**0**	**11**	5	1	9	**42**	**0**	**14**	4	1	7	**54**
Describe the ways in which the company's business model can impact the climate, both positively and negatively	AR+SR	**0**	**3**	13	0	10	**12**	**0**	**9**	10	2	5	**35**
	AR+SR+CDP+O	**0**	**9**	7	0	10	**35**	**0**	**15**	4	2	5	**58**
Describe the resilience of the company's business model and strategy, taking into consideration different climate-related scenarios over different time horizons, including at least a 2 °C or lower scenario and a greater than 2°C scenario	AR+SR	**0**	**1**	1	0	24	**4**	**0**	**2**	4	1	19	**8**
	AR+SR+CDP+O	**1**	**4**	2	3	16	**19**	**4**	**2**	3	3	14	**23**
Policies and due diligence processes													
Describe any company policies related to climate, including any climate change mitigation or adaptation policy	AR+SR	**2**	**4**	13	3	4	**23**	**2**	**6**	13	2	3	**31**
	AR+SR+CDP+O	**1**	**7**	12	2	4	**31**	**3**	**5**	13	2	3	**31**
Describe any climate-related targets the company has set as part of its policies, especially any GHG emissions targets, and how company targets relate to national and international targets and to the Paris Agreement in particular	AR+SR	**1**	**8**	2	0	15	**35**	**6**	**7**	2	0	11	**50**
	AR+SR+CDP+O	**7**	**4**	1	0	14	**42**	**7**	**6**	2	0	11	**50**
Describe the board's oversight of climate-related risks and opportunities	AR+SR	**1**	**0**	2	0	23	**4**	**3**	**2**	5	0	16	**19**
	AR+SR+CDP+O	**3**	**6**	2	0	15	**35**	**3**	**8**	1	0	14	**42**
Describe management's role in assessing and managing climate-related risks and opportunities and explain the rationale for the approach	AR+SR	**1**	**1**	3	0	21	**8**	**2**	**2**	4	1	17	**15**
	AR+SR+CDP+O	**2**	**7**	2	0	15	**35**	**6**	**5**	0	0	15	**42**

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

(Table XIX continued)

Classification of information disclosure (continued)		2020						2022					
		Very detailed	**Detailed**	**Generic**	**Reduced**	**None**	**Very detailed + Detailed (%)**	**Very detailed**	**Detailed**	**Generic**	**Reduced**	**None**	**Very detailed + Detailed (%)**
	Ponderation ->	**4**	**3**	**2**	**1**	**0**		**4**	**3**	**2**	**1**	**0**	
Disclosures related to the business model, policies, processes, outcomes and risk management (continued)													
Outcomes													
Describe the outcomes of the company's policy on climate change, including the performance of the company against the indicators used and targets set to manage climate-related risks and opportunities	AR+SR	**3**	**5**	4	0	14	**31**	**4**	**6**	3	0	13	**38**
	AR+SR+CDP+O	**10**	**2**	1	0	13	**46**	**11**	**1**	2	0	12	**46**
Describe the development of GHG emissions against the targets set and the related risks over time	AR+SR	**3**	**5**	3	0	15	**31**	**3**	**9**	1	0	13	**46**
	AR+SR+CDP+O	**10**	**1**	1	0	14	**42**	**11**	**3**	0	0	12	**54**
Principal risks and their management													
Describe the company's processes for identifying and assessing climate-related risks over the short, medium, and long term and disclose how the company define short, medium, and long term	AR+SR	**0**	**1**	0	0	25	**4**	**2**	**0**	0	0	24	**8**
	AR+SR+CDP+O	**9**	**1**	0	0	16	**38**	**11**	**0**	0	0	15	**42**
Describe the principal climate-related risks the company has identified over the short, medium, and long term through- out the value chain, and any assumptions that have been made when identifying these risks	AR+SR	**0**	**1**	0	0	25	**4**	**2**	**0**	1	0	23	**8**
	AR+SR+CDP+O	**10**	**0**	0	0	16	**38**	**11**	**0**	1	0	14	**42**
Describe processes for managing climate-related risks (if applicable how they make decisions to mitigate, transfer, accept, or control those risks), and how the company is managing the particular climate-related risks that it has identified	AR+SR	**1**	**3**	7	0	15	**15**	**1**	**8**	5	0	12	**35**
	AR+SR+CDP+O	**10**	**0**	4	0	12	**38**	**11**	**0**	3	0	12	**42**
Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the company's overall risk management	AR+SR	**0**	**0**	5	0	21	**0**	**0**	**3**	6	0	17	**12**
	AR+SR+CDP+O	**9**	**1**	1	0	15	**38**	**10**	**1**	0	0	15	**42**
Key Performance Indicators													
GHG emissions (Scope 1, Scope 2 and Scope 3)													
Direct GHG emissions from sources owned or controlled by the company (Scope 1)	AR+SR	**13**	**1**	0	0	12	**54**	**13**	**4**	2	0	7	**65**
	AR+SR+CDP+O	**14**	**1**	0	0	11	**58**	**13**	**4**	2	0	7	**65**
Indirect GHG emissions from the generation of acquired and consumed electricity, steam, heat, or cooling (collectively referred to as "electricity") (Scope 2)	AR+SR	**12**	**1**	1	0	12	**50**	**13**	**4**	2	0	7	**65**
	AR+SR+CDP+O	**14**	**1**	1	0	10	**58**	**13**	**4**	2	0	7	**65**
All indirect GHG emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions (Scope 3)	AR+SR	**10**	**0**	2	0	14	**38**	**13**	**2**	2	0	9	**58**
	AR+SR+CDP+O	**12**	**0**	2	0	12	**46**	**13**	**2**	2	0	9	**58**
Absolute GHG emissions target (tonnes CO2e or % reduction compared to baseline)	AR+SR	**5**	**0**	0	0	21	**19**	**12**	**0**	0	0	14	**46**
	AR+SR+CDP+O	**10**	**0**	0	0	16	**38**	**13**	**0**	0	0	13	**50**
Energy													
Total energy consumption and/or production from renewable and non-renewable sources	AR+SR	**11**	**0**	2	0	13	**42**	**13**	**2**	2	1	8	**58**
	AR+SR+CDP+O	**13**	**0**	1	0	12	**50**	**14**	**2**	1	1	8	**62**
Energy efficiency target	AR+SR	**3**	**0**	1	0	22	**12**	**5**	**0**	0	0	21	**19**
	AR+SR+CDP+O	**6**	**0**	1	0	19	**23**	**6**	**0**	0	0	20	**23**
Renewable energy consumption and/or production target	AR+SR	**8**	**0**	1	0	17	**31**	**9**	**1**	0	0	16	**38**
	AR+SR+CDP+O	**10**	**0**	1	0	15	**38**	**10**	**1**	0	0	15	**42**
Green Finance													-
Climate-related Green Bond and/or Green Loan (Ratio)	AR+SR	**0**	**0**	0	0	26	**0**	**0**	**1**	0	1	24	**4**
	AR+SR+CDP+O	**0**	**0**	0	0	26	**0**	**0**	**2**	1	1	22	**8**

AR + SR Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR).
AR + SR + CDP Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP).
AR + SR + CDP + O Number of companies disclosing in Annual Report (AR) and/or on Sustainability Report (SR) and/or in the CDP "Climate Change Questionnaire" (CDP) and/or other separate documents (O).

Considering the long list of topics to disclose, this study finds that the absence of information ("None") is predominant in both 2020 and 2022.

Based on the annual and/or sustainability reports, more than half of the companies did not provide "detailed" or "very detailed" information on the topics to be considered, mostly in 2020. In 2020, the disclosure of more detailed data primarily focused on risks associated with negative climate impacts (58%), current and emerging regulations, technology risks, and direct GHG emissions (Scope 1), with around 54% of companies reporting on these topics. In 2022, companies improved the disclosure of "detailed" or "very detailed" information. Alongside risks of negative impacts on the climate (69%), technological risks (65%), political risks (62%), and GHG emissions (scope 1 and scope 2 with 65%) were also notable. The findings are similar to those of Yébenes (2024), who also observed that the quality and quantity of disclosed information have progressively improved over the years. Despite the increasing availability of data, there remains a need to enhance quality and quantity. A key challenge with voluntary disclosure is that it enables companies to emphasize positive aspects while minimizing or omitting negative information, potentially skewing ESG analysis. It proves particularly relevant in a context where, despite the mandatory nature of the NFRD, the guidelines remain merely indicative, favouring disclosure over actual performance (Yébenes, 2024).

In general, the analysis of the CDP questionnaires indicates that it has significantly improved the dissemination of information. Notably, most companies responding to the CDP's climate questionnaires provide financial quantification of various risks and opportunities.

For each company, the disclosure of the 29 items presented in Table XIX was assessed, following a scoring system ranging from "None - 0" to "Very detailed - 4". Figure 6.3 presents the output of the assessment for the 29 items.

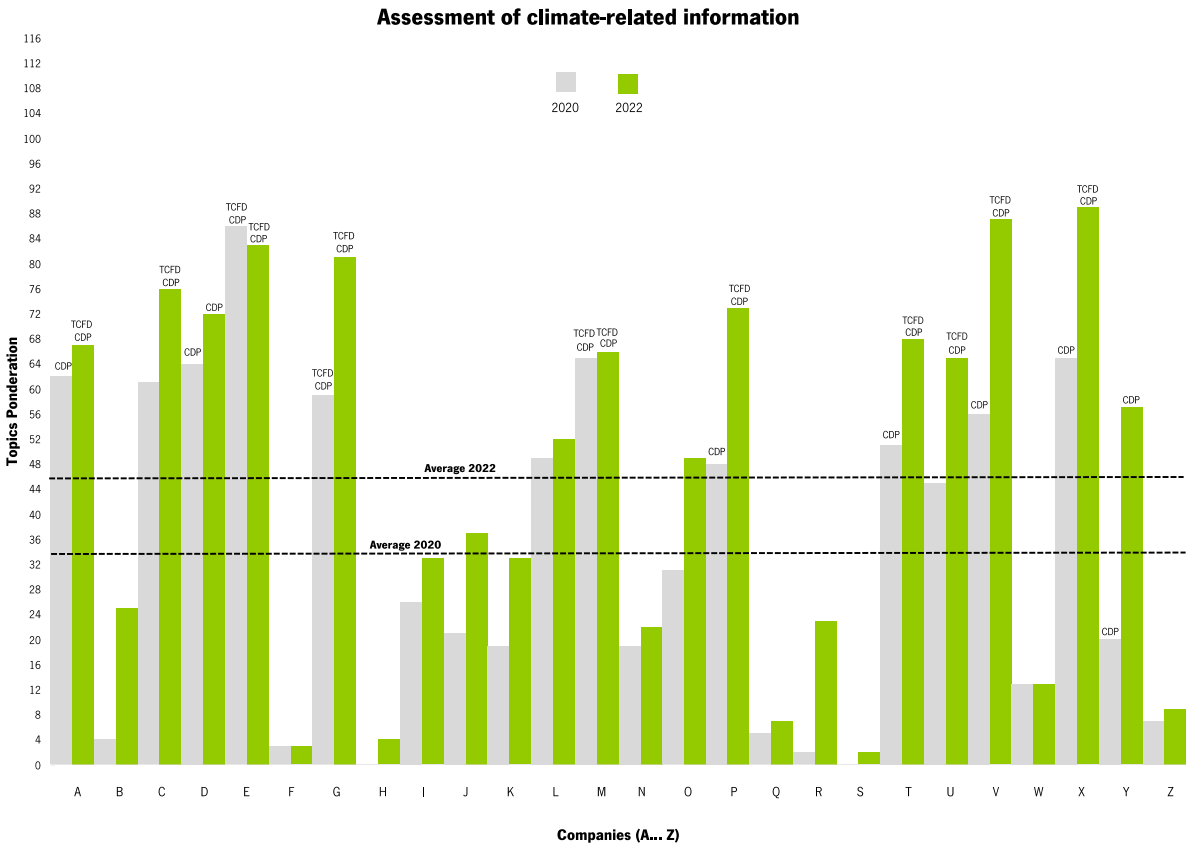

Figure 6.3 Assessment of climate-related information in the annual report and/or sustainability.

The maximum possible assessment is 116 points (29 items × 4 points), and there has been a positive trend in the average evaluation of climate-related information between 2020 and 2022. However, despite this improvement, the value remains below the theoretical midpoint, indicating a general tendency for results to fall short of the central value of the scale.

Despite the progress made, there is still significant room for improvement in the disclosure of climate-related information, regardless of the company's sector of activity.

In 2020, the company with the highest level of disclosure was in the electricity production sector (represented by the letter E). Overall, there was an improvement in disclosure in 2022, with the highest level of disclosure being achieved by companies in the pulp, paper and cardboard sector (X); the non-specialised retail sector (V); the electricity production, transport and distribution sector (E); the sale of vehicle fuels sector (G); and the manufacture of wood, cork, straw and basketry products sector (C). This finding can be justified by the fact that these companies operate in sectors recognised for significantly contributing to climate change (European Commission, 2020).

The sectors with the lowest level of disclosure are gambling and betting, as well as computer programming, consultancy, and related activities.

According to Andersson (2023), larger companies and carbon-intensive sectors, such as the materials industry, are more likely to consider and communicate climate risks. Meanwhile, basic consumer goods companies also map these risks due to consumer pressure.

Undoubtedly, companies that disclose information within the scope of the TCFD and respond to the CDP questionnaire provide the most comprehensive climate-related information in their annual and/or sustainability reports. I reasonably predict that these companies will be the best prepared to meet the requirements of the CSRD, namely with the ESRS E1 standard. Aelst (2023) concludes that listed companies that have used the CDP questionnaire demonstrate greater compliance with the CSRD's climate standards, particularly in terms of alignment with the ESRS E1 standard. It also highlights that the effective and timely communication of required information is associated with factors such as profitability, company size, and correspondence between CDP disclosures and CSRD requirements (Aelst, 2023).

In addition, we have analysed the companies about the topics disclosed as "Detail" or "Very Detail" (see Fig. 6.4).

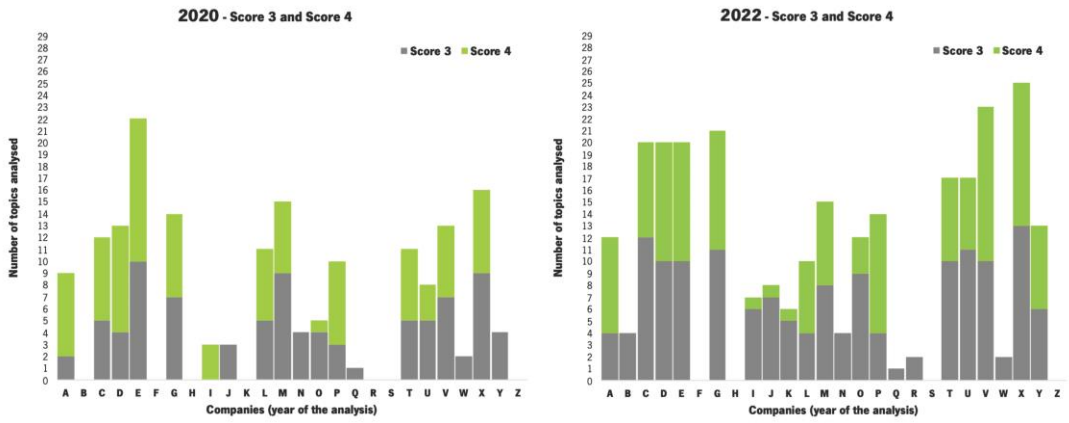

Figure 6.4 Topics related to climate information rated as "detailed" or "very detailed".

With only a few companies disclosing information classified as "detailed" or "very detailed", it is clear that only a select group of companies provides such levels of detail. It is worth noting that in 2020, the company with the highest level of disclosure, classified as "very detailed," belongs to the energy sector (E). In 2022, companies in the pulp, paper, and cardboard sector, as well as non-specialised retail sectors (V and X), stood out. The empirical evidence revealed a high discrepancy in the quality of information disclosed across the diverse range of companies.

Figure 6.4 illustrates that only a small number of companies disclose relevant climate-related information that covers the majority of topics. It is, therefore, essential to enhance the quality of climate-related information presented in annual and/or sustainability reports to provide banks with useful data for informed decision-making, particularly in terms of detail, financial quantification, and projection of a future-oriented vision. This information is supplemented by data from the CDP, which only a few companies voluntarily disclose. Despite the existence of this information, many detailed and relevant pieces of information are not included in the annual and/or sustainability reports. When included in annual and/or sustainability reports, this information would enable companies to provide a significantly higher level of detail, bringing them closer to complying with the requirements of the CSRD. This detailed Information would include forecasts of financial impacts of material physical and transition risks, as well as potential climate-related opportunities. It would be complemented by data from the CDP, which is currently disclosed voluntarily by only a few companies.

6.4.7 CSRD: New Challenges to Climate-related Information

The CSRD aims to address the limitations of the NFRD, specifically in terms of the comparability of corporate disclosures on climate issues (European Commission, 2022c). It requires

companies to report on the impact of environmental factors on their financial performance and the effect of their activities on society and the environment. This requirement enables a more comprehensive assessment of climate-related risks and opportunities. The CSRD expands the number of companies required to disclose climate data and introduces mandatory auditing to ensure credibility. The CSRD also establishes 12 EFRAG standards, including the Climate Change standard (European Commission, 2023d).

This study demonstrates that the quality of climate-related information requires improvement. If banks only consider the annual report and/or the sustainability report, they will struggle to assess their clients' climate risk.

Based on the analysis conducted, the CSRD is expected to significantly enhance the quality of information disclosed by companies, addressing the gaps found in the NFRD. However, these improvements may still prove to be insufficient.

Table XX provides a summary of the expected improvements and anticipated difficulties. The aim is to provide banks with access to more detailed, reliable, and comparable information about their customers, enabling them to assess climate risk more accurately.

The anticipated enhancements will provide clearer insights into the economic and financial effects of climate change on companies, as well as the impact of companies on climate change. It is essential to cover as many companies as possible, given their interconnectedness.

Scenarios will be crucial for assessing future impacts. Financial analysis of risks and opportunities will help banks make informed decisions about granting credit. This improvement will allow them to identify the principal risks and opportunities, their likelihood, time horizon, and financial impact. At the same time, companies will be able to adjust their strategies and action plans to mitigate risks. However, the ESRS may prove too complex for small companies because they often have limited resources.

Table XX Challenges and planned improvements in the context of CSRD (ESRS)

	CSRD - ESRS: Planned improvements	CSRD - ESRS: Challenges to overcome
Scope	It will cover a greater number of companies that are required to disclose information, particularly regarding climate issues.	The majority of companies in Portugal are unlisted SMEs, meaning many will remain outside the scope of the CSRD.
Location	The CSRD stipulates that this information must be included in the management report, making it easier to identify climate-related information.	Although the ESRS set out requirements for the organisation of information, there is flexibility in how it is presented.
Mandatory	Disclosure standards will become mandatory, no longer voluntary, promoting greater comparability.	Companies face difficulties with disclosure due to the required complexity.
Materiality	The CSRS reinforces the concept of dual materiality, which encompasses both impact and financial materiality.	Although materiality requirements exist, companies may interpret them differently, potentially leading to inconsistencies in disclosures across reports.
Specific standard	A specific disclosure standard for climate change sets out the reporting requirements in this area.	The requirements are complex and require a deep understanding of the subject, while the time available for adaptation remains limited.
Details	The CSRD requires reporting financial impacts arising from physical and transition risks. It presents tables, formulas, clarifications, calculation methodologies, and guidelines.	The information could be clearer and supplemented with examples.
Scenarios	It requires the realisation of multiple scenarios to assess future financial impacts.	The construction of scenarios is complex and assessing physical and transition risks requires sophisticated modelling, which makes quantifying them challenging. Providing greater methodological detail can contribute to a more rigorous assessment of impacts.
Internal carbon price	The importance of adopting internal carbon pricing is recognised.	Inconsistent analyses can result from the absence of a standardised methodology for quantification.
Value chain	There is an emphasis on the value chain, with indirect impacts (e.g., GHG scope 3).	There are difficulties in obtaining reliable information, since reporting requirements vary between companies.
PME's	It covers the listed SMEs.	The VSME, developed by EFRAG, is a simplified reporting model that requires less information from non-listed entities while offering less detailed disclosures.
Taxonomy	Alignment with the taxonomy comprising the aligned activities.	Certain criteria are difficult to interpret, making it challenging to meet the requirements, such as the criterion of doing no significant harm.
Financial Assessment	Companies should disclose the estimated financial impact of material physical and transition risks, as well as any potential climate-related opportunities.	Improving the link between climate risks and financial impacts is essential to ensure a more accurate assessment of the effects of climate change on companies. How to do it, with practical examples included.
Sectors	The CSRS provides for the establishment of sector-specific standards, taking into account the risks, characteristics, and regulations of each sector.	To achieve a more accurate and relevant analysis, it is crucial to compare companies within the same sector and ensure consistency in their disclosures.
Audit	It meets the minimum warranty requirements and has the potential to evolve into a comprehensive warranty, helping to mitigate the risk of greenwashing.	It encounters challenges such as limited data availability, complexity, and differing interpretations of the requirements.

Drawing on data collection, relevant regulations, and insights from various authors, a synthesis of ideas was developed (Aelst, 2023); (European Commission, 2022d); (European Commission, 2023d); ((Hostert, 2023); (Iozzelli & Velasco, 2023); (Lombardi et al., 2022); (PORDATA, 2023); (Yébenes, 2024).

Figure 6.5 presents companies that have systematically evaluated the risks and opportunities outlined in the CDP "Climate Change Questionnaire", demonstrating their understanding despite these issues' complexities. The data were obtained from CDP questionnaires available on the CDP website (CDP, 2021b, 2023b) or directly from companies.

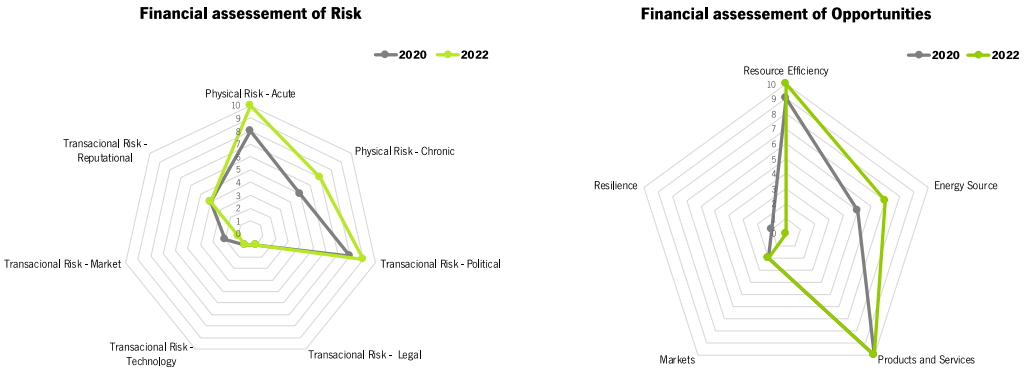

Figure 6.5 Financial quantification of risks and opportunities.

The risks and opportunities are not static; some companies have adjusted them, probably in response to changes in the regulatory context, physical hazards, and other external factors. A brief analysis shows that acute physical and political transition risks have received the most attention in risk management in both years. In terms of opportunities, the most frequently reported topics are the efficient use of resources and the development of new products and services.

According to Andersson and Arvidsson (2023), analysing and communicating climate-related financial risks has become standard practice. However, the information disclosed externally is often general and lacks detail. While many companies report mapping climate risks, few are fully committed to the process due to a lack of experience with the necessary methodologies. However, gradual progress is being made, particularly among companies that adopt the TCFD recommendations (Andersson & Arvidsson, 2023). According to the same authors, the most significant gap in CSRD climate disclosure relates to the quantification of financial risks and opportunities, which companies identify as the main challenge (Aelst, 2023). While some companies demonstrate a high level of compliance, many still struggle to meet the various requirements, particularly when it comes to estimating the financial impact of climate risks and opportunities on revenues, costs, and assets (Aelst, 2023).

The scope of information to support lending and monitoring in the context of the CSRD is broader than that of the "Guidelines on Non-Financial Reporting: Supplement on Reporting Climate-Related Information". Appendix 2 identifies the elements deemed relevant for analysing the information required by the EBA from banking institutions in the context of credit granting and monitoring, as established by the ESRS E1 standard.

6.5 DISCUSSION

This study aimed to evaluate the climate-related disclosures of listed companies, assessing their alignment with the climate-related guidelines published in 2019 (under the NFRD). It also examined whether the disclosed information is sufficiently detailed to support banks in making credit decisions, as outlined in the EBA guidelines on credit allocation and monitoring. Furthermore, the study explores the potential of the CSRD and ESRS to enhance information quality.

Overall, the findings confirm the need for further advancements in climate-related disclosures under the NFRD. Disclosures must become more standardised, comprehensive, and detailed to enable banks to make more sustainable and well-informed decisions. While climate-related disclosure remains in its early stages, it is noteworthy that some companies in Portugal are making efforts to align with the guidelines. Similar trends were identified by Lombardi et al. (2022) in large Italian companies. Banks rely on customer data to manage and report on indirect impacts, and such data collection is very demanding (EFRAG, 2021c).

At the outset of this study, four fundamental questions were posed, which will now addressed. The first question was: “Are listed companies disclosing climate-related information?” Companies are indeed disclosing climate-related information. Between 2020 and 2022, there was an increase in the level of detail and comprehensiveness of these disclosures, which may be attributable to an escalation in awareness of climate change and the introduction of the CSRD.

Companies do not follow a uniform pattern in disclosing climate-related information, varying in format and presentation. There is still a lack of consistency in the location of climate-related information, though the annual report remains the most common place. The location of the "non-financial statement" will be solved by the CSRD. As suggested by Demaria and Rigot (2020), greater standardisation and uniformity could be achieved by consolidating all relevant information into a dedicated "Environment and Climate Change" section.

Companies disclose climate-related information in varying degrees—some subtly, while others provide in-depth disclosures. This difference may be due to sector-specific transition risks or company size. In a previous study, Nelson (2019) found that companies facing higher transition risks generally demonstrate better disclosure practices. The lack of standardisation in the presentation of this information, particularly concerning content and level of detail, makes it challenging to compare companies.

Beyond the annual and/or sustainability report, about one-third of companies also voluntarily answered the CDP “Climate Change Questionnaire”. This document provides detailed climate-related information, including additional details not disclosed or detailed elsewhere. Probably, it occurs because CDP sets specific parameters that companies voluntarily seek to answer, establishing a kind of roadmap that is easy to follow.

According to Armour et al. (2021), the framework of NFRD, due to allowing companies broad discretion over what to disclose about climate-related risks, is insufficient. More consistent, complete, comparable, and verifiable information is needed, including consistent metrics and standardised qualitative disclosures (ISSB, 2023b). It is expected that the CSRD will address these gaps.

The second research question asks: “Does the disclosed information comply with the NFRD climate-related information guidelines?” The analysis of the climate-related information disclosed by companies reveals significant variations in compliance with the NFRD guidelines, which are still far from full implementation. While some organisations face substantial gaps in meeting the disclosure requirements, a growing number have been making progress in adopting practices that better align with the NFRD’s recommendations on climate-related information. The analysis of both the 2020 and 2022 reporting periods revealed a general improvement in the quality and comprehensiveness of disclosures, reflecting companies' ongoing efforts to meet regulatory demands and stakeholder expectations. However, despite this progress, challenges persist in ensuring consistent and rigorous communication regarding climate impact and mitigation strategies. Thus, while substantial advances have been made, further improvements are needed, particularly in standardising and enhancing the depth of disclosed information to achieve greater alignment with NFRD guidelines.

A similar study was conducted in Italy involving listed companies. De Bernardi et al. (2019) also conclude that in Italy, information already held or disclosed by companies often needs labelling or cross-referencing to highlight its relevance in assessing climate-related risks. In contrast, comprehensive reports on climate risks had not yet been produced in line with the TCFD recommendation, which was the basis for the Guidelines on non-financial reporting: Supplement on reporting climate-related information" (De Bernardi et al., 2019). According to De Bernardi et al. (2019), more efforts should be made to integrate climate risk disclosure into annual reports better while providing more information and evidence on the financial implications. The examined companies exhibit significant and clear gaps in their disclosures, particularly regarding the

financial impact of climate risks, as reported in their annual and/or sustainability reports. The CSRD is expected to address these gaps.

Moreover, Leicht and Leicht (2022), studying the changes in the climate-related disclosure of German listed companies during the first years of the new reporting standard (2018-2020), also indicate that further development of reporting is needed, in particular, legal requirements have to be more detailed so that preparers of financial statements and non-financial statement can have more explicit guidance and expectations - an objective that the ESRS within the CSRD aims to achieve. Furthermore, Lombardi et al. ((2022) underscore deficiencies in climate disclosure, revealing that alignment with the European Commission's guidelines is still in its early stages. Climate reporting primarily focuses on four key areas: corporate risks associated with negative impacts, GHG emissions policies, energy consumption, and energy efficiency targets. Additionally, the study analysed companies that failed to fully adhere to the European Commission's 2019 guidelines, frequently presenting climate information that lacked depth and completeness, thereby compromising the transparency essential for investors and stakeholders (Lombardi et al., 2022).

The third question is: "Are companies providing banks with sufficiently detailed climate-related information to support informed decision-making in credit granting and monitoring?" Regarding annual and/or sustainability reports, companies do not provide enough information about climate-related issues to help banks decide whether to grant or monitor credit. One aspect supporting this conclusion is the absence of references in annual and/or sustainability reports to the potential financial impacts of climate-related risks and opportunities, including their quantification, likelihood of occurrence, and underlying rationale. However, overall, the level of detail in the disclosed information improved significantly between 2020 and 2022.

Disclosure needs to evolve to provide more climate-related valuable information to the banks' decision-making process when originating and monitoring credit. Additionally, companies that respond to the CDP's "Climate Change Questionnaire" strongly complement this type of information. There is additional support from the information contained in the CDP questionnaire (CDP, 2021b, 2023b), particularly in relation to both the details and potential financial impacts of climate-related risks and opportunities, which complements the information in the annual report and/or sustainability reports. The emphasis was placed on considering the financial quantification of some climate-related risks and opportunities, as well as CO2 emission reduction initiatives, in a situation that favours compliance with the EBA's request to banks.

Mandatory disclosure of climate-related financial information strengthens the quality and consistency of reporting, facilitates the definition of emission-reduction plans and sustainability targets, and enables companies and investors to assess climate impacts and risks with greater accuracy (Aversa, 2023). At the same time, it promotes long-term strategies, enhances transparency, comparability, and accountability, and ensures clearer and more useful information for investors, lenders, and regulators (Aversa, 2023).

Additionally, non-financial and climate-related information is currently dispersed and lacks aggregation, which prevents a clear measurement of sustainability performance and highlights the absence of a synthetic indicator equivalent to profit or equity in financial accounting (Wagenhofer, 2024). As a result, aggregation is ultimately carried out by external entities, such as users or rating agencies, each employing distinct methodologies, thereby undermining the comparability of assessments (Wagenhofer, 2024).

Based on the findings of this study, it is concluded that the climate-related information disclosed in the annual and/or sustainability reports must evolve to better support banks in making informed decisions about corporate lending. The evolution must be endorsed by seeking standardisation for better comparability between companies in the same or different sectors; forward-looking information; quantifying the potential financial effects; mandatory disclosure for all companies (can be adapted to take account of size and sector); strengthened requirements for banks in the granting and monitoring of loans; and information sharing between companies and banks.

Climate-related information disclosure requires a process of standardization, enabling companies to be better evaluated, monitored, and compared. In earlier studies on non-financial information (Santos & Rodrigues, 2021b) and climate-related information disclosed by banks (Santos & Rodrigues, 2021a), the authors noted a lack of uniformity in the disclosed information, thereby hindering comparability. CSRD considers that sectors of activity are varied, and for better peer comparability, it states that disclosures should be detailed (European Commission, 2021e).

Forward-looking information will enable users of climate-related information to assess the future evolution of companies and their relationship with climate. In its guidelines, the EBA (2020b) mentions, whenever relevant, the combination of retrospective and prospective indicators. CSRD also specifies that companies must report both qualitative and quantitative information, as well as forward-looking and retrospective information (European Commission, 2021e). Historical financial data does not reveal everything necessary to know about a business and its likelihood of

default, and it has never been more important to understand the credit risks it faces, nor more challenging to predict how those risks may evolve (FIS Global, 2021).

For banks, quantifying the potential financial effects of the companies' risks and opportunities is fundamental for granting and monitoring loans. The ESRS E1 refers to the need to disclose the likely financial impacts of material physical risks, the potential financial effects of material transition risks, and the potential financial effects of climate-related opportunities (EFRAG, 2022g). In line with the findings of this study and according to Yébenes (2024), ESG indicators can significantly impact companies' financial performance, raising concerns among stakeholders regarding risk management. Transparent disclosure of ESG data is crucial for assessing corporate and investor commitment to sustainability and the transition to a carbon-neutral economy, necessitating careful analysis of the disclosed information. Companies are expected to enhance the quality of sustainability data swiftly. Despite ongoing challenges, this process is likely to accelerate as organisations recognize the financial impact of inadequate environmental policies (Yébenes, 2024).

Regarding the final question: “Considering the CSRD and ESRS, what changes are expected in companies’ disclosure of climate-related information to assist banks in better making their lending decisions?"

Due to the implementation of the CSRD and ESRS, companies are expected to disclose climate-related information in a more detailed, standardised, and audited manner, enabling banks to assess the impacts, risks, and opportunities related to climate more effectively when granting credit. Key aspects include the reporting model, increased level of detail in the information provided, inclusion of scenario analyses, assessment of financial impacts and strategies, as well as mandatory audits. These data will contribute to a more accurate evaluation of companies' exposure to climate risks, enabling banks to make more informed decisions regarding credit granting.

Implementing the CSRD and the ESRS seeks to improve the quality and quantity of corporate disclosures, enabling banks to make more informed lending decisions. However, in agreement with Iozzelli et al. (2023), challenges persist in interpreting and applying these requirements due to the coexistence of mandatory and voluntary standards. While EFRAG's dual materiality approach provides companies with flexibility in selecting which ESG topics to report, the lack of specific guidelines hinders data comparability. Companies covered by the CSRD independently evaluate and decide which ESG topics to report, providing thorough explanations for any

exclusions (Iozzelli & Velasco, 2023). Additionally, Bossut et al. (2021) emphasize that developing sector-specific regulations aligned with the EU taxonomy and inspired by the SASB materiality matrix is crucial to addressing these challenges.

The evolution from the NFRD's voluntary guidelines to the mandatory framework established by the CSRD and ESRS reflects the EU's strengthened commitment to corporate transparency and climate alignment. The ESRS operationalizes the CSRD's requirements by introducing specific standards. By reinforcing dual materiality and imposing binding obligations, these developments aim to improve disclosure practices, ensuring that companies align more closely with sustainability objectives (European Commission, 2023d). According to Yébenes (2024), CSRD highlights the growing recognition of environmental and social risks, underscoring the financial significance of sustainability information. By replacing the term "non-financial information" with expressions such as "sustainability issues" and "sustainability reports", it emphasises that sustainability data holds financial relevance and should not be underestimated.

Overall, it is suggested that the analysis of climate-related disclosures by listed companies in Portugal highlights the limited number of entities covered by Directive 2014/95/EU. While this number is expected to increase with the CSRD, it still seems insufficient. The analysis suggests that disclosure requirements should be extended to all companies irrespective of their size, public or private status, or listing status. Climate-related information should be tailored to each company's size and sector, but it should not be excluded from disclosure.

Mésonnier (2019) emphasizes that, in France, SMEs are arguably responsible for a significant share of value-added and greenhouse gas emissions, a trend also observed in Portugal (European Commission, 2021a). Moreover, considering the correlation of defaults among companies (ECB & ESRB, 2022), the evidence underscores the interconnectedness of small, medium, and large businesses, all of which may rely on bank financing. Notably, the environmental impact of a group of smaller companies can be greater than that of a single large corporation.

When analysing financial information, we recognise fundamental components such as the balance sheet, income statement, and cash flow statement, supplemented by notes that provide further detail. Similarly, when applying this approach to climate and sustainability information, it is crucial to structure core tables with relevant data and include notes that offer additional explanations and details. These tables will ensure that climate-related information is readily identifiable and standardised across companies, enhancing comparability. Furthermore, the

process and methodologies used to identify and calculate figures should be harmonized to ensure that all organisations follow a consistent basis when preparing the information.

Climate data disclosure is crucial for companies to maintain legitimacy and secure long-term competitive advantages, as emphasised by legitimacy and stakeholder theories (Lombardi et al., 2022). However, reporting gaps may result from organisational challenges, high costs, reluctance to disclose unfavourable findings, insufficient relevant data, and gradual adaptation to evolving EU directives.

Society assesses companies based on their adherence to the NFRD and associated climate-related guidelines, reflecting an institutional perspective, which aligns with Dumay et al.'s (2015) material legitimacy model. The institutional theory further explains that companies disclose non-financial information to comply with the directive while also endeavouring to meet its guidelines on climate-related reporting, albeit to varying degrees.

Strengthening the requirements imposed on banks in origination and monitoring credit, reviewing minimum capital requirements, and addressing the risks of bank concentration in certain activities are more controversial points, but they would certainly underscore the importance of climate-related issues and require better practices by both banks and customer companies. According to Alogoskoufis et al. (2021), based on stress testing, climate change is considered a significant source of systemic risk, particularly for banks with portfolios concentrated in specific economic sectors and geographical areas. Thus, in companies and banks more exposed to climate risk, the impact would be potentially very significant, especially in the absence of further climate mitigation actions. Bank regulators are likely preparing to increase the amount of capital required by lenders, who are showing high levels of climate risk on their balance sheets (FIS Global, 2022).

The credit assessment process needs to improve both the quality and quantity of climate-related information included in companies' annual and/or sustainability reports. Banks will need to collaborate with companies to gather and fill data gaps (FIS Global, 2022). Banks will have to play an important role by requiring companies to provide additional climate-related information, as they must assess whether their counterparties take climate-related risks and opportunities into account, directing and being consultants (European Commission, 2019c).

Banks can transfer best practices to companies in their advisory role and help companies transition to sustainable business models (FIS Global, 2022), facilitating knowledge transfer and learning on climate-related topics, and demanding disclosure of climate-related information when

it is not provided, thereby reinforcing the need for transparency. “The road is long, and we have no time to lose” (González & Núñez, 2021, p. 64)!

The Omnibus Package introduces changes to the CSRD and ESRS to simplify regulations and reduce administrative burdens. It decreases the number of companies’ subject to reporting requirements, easing regulatory compliance, particularly for SMEs. However, this may compromise the transparency and comparability of sustainability data, including climate-related information.

In Portugal, this situation will make it more difficult for banks to access detailed company information, particularly from SMEs, through annual reports. As a result, banks may need to take a more active role in guiding their clients on how to provide the necessary data when originating and monitoring loans.

The Omnibus Package introduces changes to the CSRD, which may create regulatory uncertainty and impact economic actors before full implementation. The ideal approach would be to focus on supporting companies in effectively applying the standards, ensuring a solid and predictable reporting framework that is essential for a sustainable and competitive European financial system (PRI 2025).

The disclosure of climate-related information by companies is essential for banks to assess the associated financial risks adequately. A lack of such information can lead to poorly calibrated credit decisions with systemic implications (Battiston et al., 2021; European Central Bank & European Systemic Risk Board, 2022). In the event of extreme events, the frequency of which tends to rise with climate change, governments are often pressured to intervene using public resources, thereby influencing economic policy (ECB & ESRB, 2022). Enhancing the quality of climate-related information thus contributes to financial stability and supports more effective and preventive economic policymaking (Adão et al., 2022).

6.6 CONCLUSIONS, LIMITATIONS, AND FURTHER RESEARCH

The disclosure of climate-related information has become a key focus, driven by the development of standards from EFRAG (CSRD - ESRS) and the IFRS Foundation. Under specific requirements, the NFRD requires listed companies to disclose non-financial information and adhere to relevant guidelines, including those related to climate change. The CSRD revised and expanded the scope of the NFRD, with support from the ESRS, particularly regarding Climate Change (ESRS E1).

Additionally, the EBA (the EU's banking regulatory authority) has issued guidelines to facilitate the integration of various climate-related factors into the credit origination and monitoring processes.

It is imperative to involve banks, corporations, and regulatory bodies in the critical analysis of business activities and in addressing the underlying drivers of climate change, given their central role in shaping the economic and financial dynamics of their operations. The study highlights the need for greater standardisation of disclosure practices to ensure improved comparability of climate-related information. These highlights include the adoption of forward-looking approaches and the financial quantification of potential impacts, risks, and opportunities. Although some companies have already made progress in climate-related disclosures, the overall landscape remains fragmented, indicating that significant efforts are still required to achieve consistent and comprehensive reporting standards.

Climate-related information remains at an early stage and requires ongoing progress toward its standardisation. The data disclosed should be presented with an appropriate level of detail, accompanied by clear and accessible guidelines. It is essential to emphasise the importance of simplicity and clarity in what must be disclosed, the format or template in which the information should be presented, the required content, the applicable methodologies, the support mechanisms for calculation and understanding of the regulatory requirements, and the provision of concrete examples to guide disclosure practices. The CSRD Directive and the ESRS standards are expected to make a positive contribution to this process, despite the ongoing challenges in these areas.

The standardisation of climate-related information disclosed by companies to support credit-granting and monitoring will enhance comparability across firms, improve forward-looking assessments, and enable more rigorous quantification of potential financial impacts. Such information should be required from all companies that are also subject to financial information disclosure, regardless of their size, to ensure a minimum level of disclosure. The requirements should be adjusted according to the size and sector of each company, acknowledging that climate change can impact any economic activity and that all companies, to varying degrees, have an influence on the climate. Additionally, the criteria used by banks to assess companies in relation to climate factors, within the context of loan granting and monitoring, should be strengthened. At the same time, it is essential to actively promote information exchange and cooperation between companies and banks, aiming for strategic alignment in climate risk management and improved quality of financial decision-making.

This study advances knowledge and understanding of the disclosure of climate-related information by companies, which is then made available to banks involved in lending and monitoring as part of a financial system designed to ensure stability. It provides insight into the current dissemination of climate-related information and outlines a framework for its development, helping companies, banks, and regulators improve their approach. The study's findings have practical implications, providing data and documented insights to help regulators (and their respective working groups) identify shortcomings, drive necessary developments in existing climate-related information sources, and reinforce the need for banks to require such disclosures.

The main limitation of this study is the small sample size. Nevertheless, all listed companies required to adopt the NFRD in 2020 were considered and analysed in the present study. It is worth noting that non-financial reports are not subject to audit in Portugal, which means the integrity of non-financial information cannot be guaranteed.

Future research should continue to examine subsequent periods to assess whether the disclosure of climate-related information evolves, particularly with the implementation of the CSRD and ESRS standards. Another important line of inquiry will be the sectoral analysis of the largest listed companies in Europe, evaluating the content of climate-related disclosures and analysing the impact of the Omnibus Package on the dissemination of climate-related information.

In light of growing challenges, it is essential to strengthen collaboration between banks and companies, as transparency in climate-related disclosures is fundamental to informed and responsible financial decision-making. After all, the future is increasingly uncertain in the face of complex and unpredictable climate dynamics, whose effects may profoundly reshape business on a global scale. Confronting this scenario demands vision, courage, and commitment, and it begins with transparency and cooperation among all financial and corporate stakeholders.

APPENDIX:

Appendix 1: Analysis of NFRD, CSRD, and "Omnibus".

	NFRD and Guidelines	CSRD and ESRS	"Omnibus"
Cover	Public Interest Entity (PIE) with more than 500 employees (e.g. listed companies, banks and insurance companies)	Extending the scope to other companies, with mandatory reporting for listed SMEs (with 10 or more employees) and large listed companies (with 250 or more employees).	The scope of the CSRD will be reduced to cover only companies with more than 1,000 employees.
Location	In the management report or in the separate report (online or pdf)	Integrate sustainability reports into the annual report and make them machine-readable in electronic format.	—
Application	Financial year 2017	Financial year 2024	A measure has been proposed to postpone the reporting requirement for two years for companies that have not yet started to comply with the CSRD. This will allow for an additional adjustment period before the new requirements take effect.
Content	Non-financial statement with information on environmental matters, social and employee-related matters, respect for human rights, anti-corruption, and bribery matters	Communication of information on governance, strategy, management of impacts, risks, and opportunities (including materiality, policies, and actions), and metrics and targets. ESRS E1 specifically addresses climate change, encompassing sub-topics such as climate change adaptation, climate change mitigation, and energy.	Simplified reporting templates will reduce the number of required data points by nearly 70%.
Materiality	The NFRD does not mention it. Guidelines (Supplement on reporting climate-related information) present a dual perspective on materiality (financial and environmental and social)	Concept of dual materiality, with two main perspectives: impact materiality (significant impacts the company has on the environment, society and people, e.g. carbon emissions) and financial materiality (sustainability risks and opportunities that can affect the company's financial performance, e.g. climate change impacts).	The CSRD maintains the dual materiality principle.
Standardisation	Guidelines are not binding	Binding standards for sustainability reporting in terms of scope and content (quantitative and qualitative), with data aligned to the taxonomy.	—
Comparability	Limited, as companies can choose between different reporting standards (e.g., GRI, SASB), leading to inconsistent information in the analysis across companies and sectors.	The ESRS are mandatory and standardised to improve consistency and comparability of data between companies, regardless of sector or location.	For entities with fewer than 1,000 employees, it is proposed to introduce a Voluntary Reporting Standard for SMEs (VSME) to be developed by EFRAG. The preliminary proposal issued by EFRAG will need to be reviewed before adoption.
Complexity	Interpretation difficulties	Disclosure requirements and calculation guidelines have been developed (ESRS 1). Can be difficult to implement in smaller companies or those with limited resources	Listed SMEs will be completely excluded from the scope of the CSRD.
Sectors	Supplementary guidelines for banks and insurance companies	Sectoral standards are planned. These sectoral standards will be developed in stages and will cover some 41 different sectors.	Proposal to officially abandon the adoption of sectoral standards.
Audit	Ensure that the non-financial statement or separate report has been submitted	Requirements for limited assurance on sustainability information, evolving towards reasonable assurance	The reports would maintain a limited guarantee, but the possibility of transitioning to an adequate guarantee from 2028 would be eliminated.

Based on the regulation and insights from various authors: (Aelst, 2023; European Commission, 2017, 2019c, 2022d, 2023d, 2025f, 2025g; European Parliament and the Council of the European Union, 2014; Hostert, 2023; Iozzelli & Velasco, 2023; Lombardi et al., 2022; PORDATA, 2023; Yébenes, 2024).

Appendix 2: Analysis of EBA-Required Information based on ESRS E1

Risks of climate change for the financial performance of borrowers
Physical and transition risks
Anticipated financial effects from material physical and transition risks and potential climate-related opportunities
Anticipated financial effects from material physical risks
Climate-related hazards – Chronic
Climate-related hazards – Acute
Anticipated financial effects from material transition risks
Climate-related transition events - Policy and legal
Climate-related transition events – Technology
Climate-related transition events – Market
Climate-related transition events – Reputation
Impact on climate change, climate targets, adequacy of mitigation strategies, business model, greenhouse gas emissions
Governance
Integration of sustainability-related performance in incentive schemes
Considerations are factored into the remuneration of members of the administrative, management and supervisory bodies (including their
performance has been assessed against the GHG emission reduction targets)
Strategy
Transition plan for climate change mitigation
GHG emission reduction targets
Climate change mitigation actions and explanation of identified decarbonisation levers
Explanation and quantification of the undertaking's investments and funding supporting the implementation of its transition plan
Qualitative assessment of the potential locked-in GHG emissions from the undertaking's key assets and products (how these emissions may
jeopardise the achievement of the undertaking's GHG emission reduction targets and drive transition risk)
Companies with economic activities covered by delegated regulations on climate change adaptation or mitigation, in accordance with the Taxonomy
Regulation, an explanation of any objective or plans to align these economic activities.
Significant Capital Expenditure (Capex) amounts invested during the reporting period related to coal, oil and gas-related economic activities
Whether or not the company is excluded from the EU aligned benchmarks
Explain how the transition plan is embedded in and aligned with the company's overall business strategy and financial planning, whether it has been
approved by the company's administrative, management and supervisory bodies, and the company's progress in implementing the transition plan
Material impacts, risks and opportunities and their interaction with strategy and business model
Explain for each material climate-related risk it has identified, whether the entity considers the risk to be a climate-related physical risk or climate-
-related transition risk
Describe the resilience of its strategy and business model in relation to climate change (scope, climate scenario analysis, results)
Impact, risk and opportunity management
Description of the processes to identify and assess material climate- related impacts, risks and opportunities
Impacts on climate change, in particular, the undertaking's GHG emissions
climate-related physical risks in own operations and along the upstream and downstream value chain (climate-related hazards, considering at least
high emission climate scenarios and how its assets and business activities may be exposed and are sensitive to these climate-related hazards)
Climate-related transition risks and opportunities in own operations and along the upstream and downstream value chain
How it has used climate-related scenario analysis, including a range of climate scenarios, to inform the identification and assessment of physical risks
and transition risks and opportunities over the short-, medium- and long-term
Policies related to climate change mitigation and adaptation
Policies adopted to manage its material impacts, risks and opportunities related to climate change mitigation and adaptation
Indicate whether and how its policies address the climate change mitigation, climate change adaptation, energy efficiency, renewable energy
deployment, others
Actions and resources in relation to climate change policies
Climate change mitigation and adaptation actions and the resources allocated for their implementation
Key actions taken in the reporting year and planned for the future, present the climate change mitigation actions by decarbonisation lever including
the nature- based solutions
In the outcome of the actions for climate change mitigation, include the achieved and expected GHG emission reductions
Relate significant monetary amounts of Capex and Operating Expense (OpenX) required to implement the actions taken or planned (financial
statements, key performance indicators and the Capex plan required by Commission Delegated Regulation (EU) 2021/2178

Based on the regulation (European Banking Authority, 2020b; European Commission, 2023d).

(Appendix 2 continued)

Impact on climate change, climate targets, adequacy of mitigation strategies, business model, greenhouse gas emissions
Metrics and targets
Targets related to climate change mitigation and adaptation
GHG emissions reduction targets
Targets to manage material climate-related impacts, risks and opportunities (e. g. renewable energy deployment, energy efficiency, climate change adaptation, and physical or transition risk mitigation)
Energy consumption and mix
Total energy consumption in MWh related to own operations (from fossil sources, nuclear sources, renewable sources)
The undertaking with operations in high climate impact sectors shall further disaggregate their total energy consumption from fossil sources
Disaggregate and disclose separately its non-renewable energy production and renewable energy production in MWh
Energy intensity based on net revenue
Information on the energy intensity (total energy consumption per net revenue) associated with activities in high climate impact sectors
Specify the high climate impact sectors that are used to determine the energy intensity
Reconciliation to the relevant line item or notes in the financial statements of the net revenue amount from activities in high climate impact sectors
Gross Scopes 1, 2, 3 and Total GHG emissions
Gross Scope1 GHG emissions in metric tonnes of CO2eq and the percentage of Scope1 GHG emissions from regulated emission trading schemes
Gross location-based Scope2 GHG emissions and the gross market-based Scope2 GHG emissions in metric tonnes of CO2eq
Gross Scope 3 GHG emissions shall include GHG emissions in metric tonnes of CO2eq from each significant Scope 3 category
Total GHG emissions (scope 1, 2 and 3 GHG emissions) with a disaggregation emission derived from the underlying Scope 2 GHG emissions being measured using the location-based method and the market- based method
GHG Intensity based on net revenue
GHG emissions intensity (total GHG emissions per net revenue)
GHG removals and GHG mitigation projects financed through carbon credits
GHG removals and storage in metric tonnes of CO2eq resulting from projects it may have developed in its own operations, or contributed to in its upstream and downstream value chain
The amount of GHG emission reductions or removals from climate change mitigation projects outside its value chain it has financed or intends to finance through any purchase of carbon credits
Total amount of carbon credits outside the undertaking's value chain in metric tonnes of CO2eq that are verified against recognised quality standards and cancelled and planned to be cancelled in the future
Internal carbon pricing
Disclose whether it applies internal carbon pricing schemes, and if so, how they support its decision making and incentivise the implementation of climate-related policies and targets

Based on the regulation (European Banking Authority, 2020b; European Commission, 2023d).

CHAPTER VII: Final Considerations

7.1 FINAL CONSIDERATIONS

This thesis examined the adaptation of banks and companies to new regulatory requirements concerning non-financial information, with a particular emphasis on climate-related disclosures, and outlined pathways for future development. The analysis highlights the positive contribution of the NFRD, its associated guidelines, and, more recently, the CSRD in strengthening the relationship between banks, companies, and regulators, particularly regarding climate-related reporting. The provision of more comparable and detailed information will enable sustainable decision-making with positive impacts for banks, businesses, society, and the climate, considering their interdependencies - particularly in the context of climate-related issues linked to credit origination and monitoring. The conceptual model below presents the main findings and contributions of this research in a structured manner (see Figure 7.1).

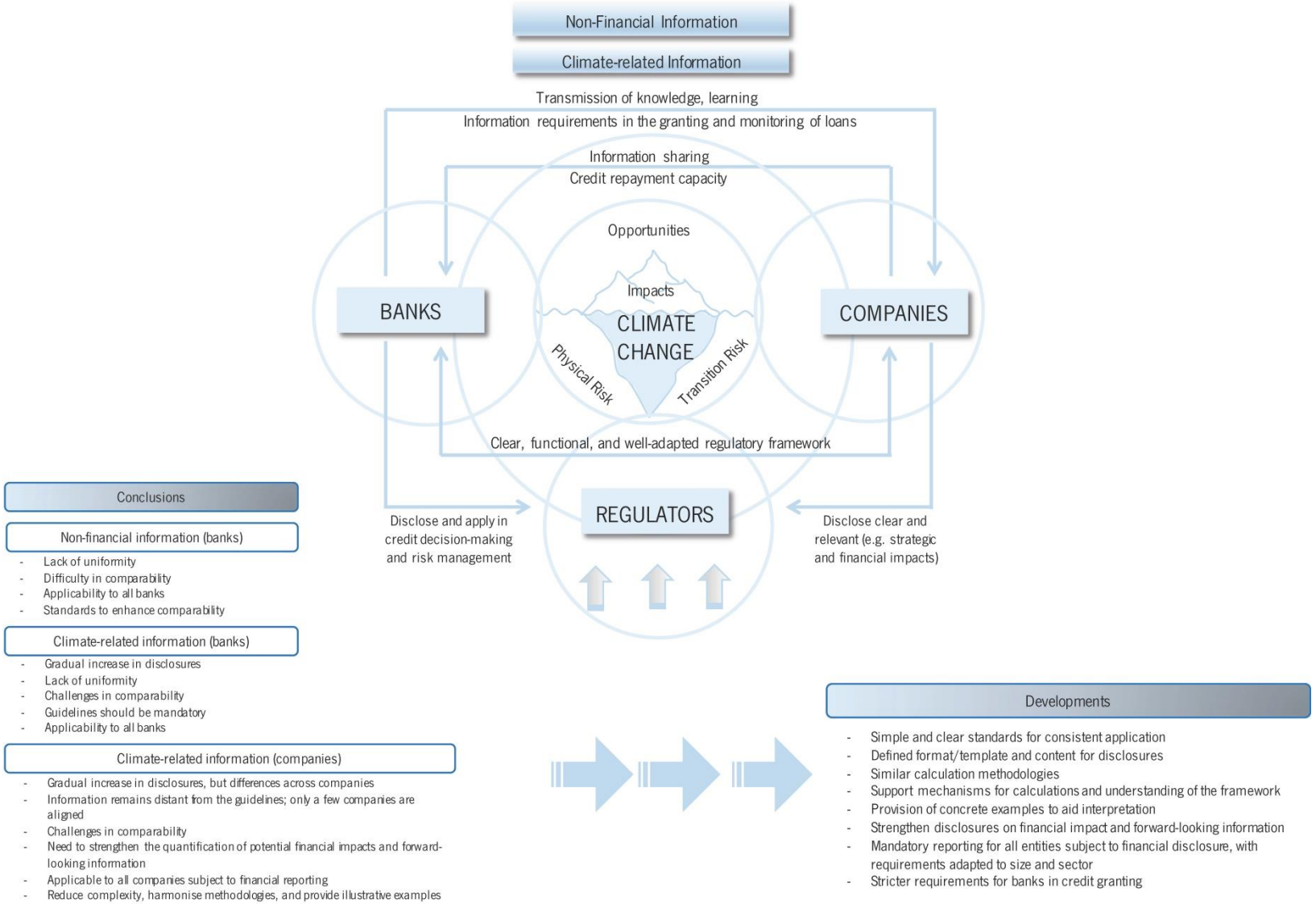

Figure 7.1. Banks and the importance of the evolution of non-financial information and climate-related information – Conceptual Model.

7.1.1 Mains Findings

This thesis is the outcome of work conducted over several years and should be interpreted within the broader evolution of non-financial disclosure, particularly in relation to climate-related information. The trajectory of this research enabled close engagement with both scientific developments and regulatory advances in this field, as reflected in presentations delivered at international conferences and by the subsequent publication of the topics explored in the three essays that compose this study. Taken together, these essays provide a critical and integrated examination of the evolution of non-financial disclosure requirements, with particular emphasis on the climate dimension.

Throughout the study, a significant evolution in CSR disclosure has been observed, alongside a growing recognition of its relevance. For stakeholders to gain a comprehensive view of organisations in all their dimensions, it becomes evident that it is essential for companies to report non-financial and climate-related information, ensuring transparency regarding the impacts they generate and the strategic approaches they adopt to anticipate, mitigate, and manage climate challenges - particularly in a context in which climate change represents one of the greatest threats to the planet's stability.

The research analyses how banks and companies have adapted to the requirements of the NFRD and its associated guidelines, as well as to the developments introduced by the CSRD, identifying emerging challenges and future trends in the field of transparency and climate-related disclosure. The research adopts a holistic approach that combines an examination of banks' non-financial disclosure with an assessment of climate-related information disclosed by both banks and companies, reflecting the interdependence between these economic agents and the growing need for reliable, consistent, and comparable information.

Banks, as financial intermediaries and providers of capital, play a strategic role in the collection and use of climate-related information, which is essential for assessing physical and transition risks, impacts, and opportunities within credit origination and monitoring processes. In this context, banks must obtain from companies a structured set of non-financial and climate-related information, thereby enabling the sharing of knowledge throughout the financing relationship. This function requires a deep understanding of the business models and corporate strategies adopt by companies in response to environmental challenges.

Figure 7.1 presents a conceptual model that synthesises this dynamic, highlighting the relationship between banks, regulators, and companies, and illustrating how non-financial disclosure - particularly climate-related information - is expected to evolve in the future. The model emphasises the importance

of comparability, transparency, and the sharing of relevant information to strengthen stakeholder trust and support the development of a more informed and sustainable society.

The integration of resilient climate practices into organisational strategies is essential for ensuring the sustainability of business models, compliance with international regulatory frameworks, and the creation of long-term value. Climate action should therefore be understood not only as an ethical responsibility but also as a structuring factor for competitiveness, innovation, and systemic stability, capable of aligning economic interests with global objectives of carbon neutrality and intergenerational responsibility.

Banks simultaneously act as issuers and users of non-financial and climate-related information. The EBA guidelines reinforce the role of banks by establishing orientations for the integration of ESG factors, including climate risks, into credit-granting and credit-monitoring processes. The information provided by companies is therefore indispensable for assessing performance, impacts, emerging risks, and the opportunities associated with the transition to a sustainable economy.

Companies must provide reliable climate-related data that enables banks to adequately assess financing requests and anticipate potential future impacts. This exchange of information contributes to more robust credit decisions, strengthens debt-repayment capacity, and supports the alignment of the financial sector with sustainability objectives, fostering a more resilient economy that is better prepared to address the challenges posed by climate change.

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Regulators, by establishing a clear, functional, and well-adapted regulatory framework, seek to ensure that banks disclose non-financial and climate-related information and integrate the information obtained from companies into credit-granting and credit-monitoring processes, using it consistently in risk management.

At the regulatory level, particular attention is given to the legal framework governing the disclosure of non-financial information, notably Directive 2014/95/EU (NFRD), which has become a decisive reference for the communication of non-financial information across social, environmental, and governance dimensions. By promoting this directive, the EU sought to strengthen the social

responsibility of organisations, ensuring the comparability, relevance, and usefulness of the information made available to various stakeholders.

The NFRD marked the transition towards mandatory reporting requirements, strengthening transparency and corporate accountability. It was subsequently complemented by specific guidelines — particularly those related to climate — and was reinforced and expanded by Directive 2022/2464 (CSRD), which broadened the scope, deepened reporting obligations, and introduced the ESRS, including ESRS E1 dedicated to climate change. Recent developments, including the Omnibus Package, highlight the need for simplification, phased implementation, and greater technical support for reporting organisations, as well as for regulatory processes that are better adapted to the practical challenges of implementation.

Taken together, the three essays presented were developed by articulating the perspectives of banks, companies, and regulatory bodies, tracing the evolution of the regulatory framework and how these organisations have adapted to successive reporting requirements. The aim was to identify the positive developments arising from the implementation of sustainability-related directives and guidelines, as well as the aspects that require improvement, in order to strengthen the effectiveness of regulation and ensure greater consistency in reporting and climate-management practices.

The first essay focused on 2017, the year in which Directive 2014/95/EU (NFRD) was applied for the first time. The empirical evidence revealed significant heterogeneity in the disclosure practices adopted by banks, undermining the comparability of the information provided and limiting its usefulness to different stakeholders.

The second essay focused on the analysis of climate-related information disclosed by banks between 2014 and 2019, with the latter year being particularly relevant due to the issuance of specific guidelines on the disclosure of climate-related financial information. The results revealed a progressive upward trend in the disclosure of such data, although a marked heterogeneity among banks persisted, undermining comparability and indicating that disclosure levels remained below the expectations set by regulatory parameters — especially with regard to the information reported in 2019. In this context, the study anticipated the need to make these guidelines mandatory.

The third essay examined the disclosure of climate-related information by listed companies subject to Directive 2014/95/EU (NFRD), with particular attention to the years 2020 (following the publication of specific guidance on climate-related non-financial information) and 2022 (marked by the publication of Directive (EU) 2022/2464). The findings indicate that companies covered by the NFRD and by climate-related disclosure guidelines have already begun to incorporate climate-related elements into

their reports, showing a gradual increase between 2020 and 2022. However, the lack of uniformity in reporting practices undermines the comparability of information across companies, thereby limiting its usefulness for various users, including investors, regulators, and other stakeholders assessing performance and exposure to climate risks.

Overall, the three essays highlight the need to broaden the scope of entities subject to non-financial and climate-related disclosure requirements, as well as to improve the comparability of the information disclosed. Climate-related information has been increasingly reported by all covered banks and companies, representing a positive sign of progress in this domain in recent years. This empirical evidence suggests that regulatory instruments are beginning to take effect. However, the level of detail and depth of the information disclosed continues to vary significantly across entities and remains far from the standards set out in the Non-Financial Reporting Guidelines: Supplement on Reporting Climate-Related Information, reflecting different degrees of maturity, technical capacity, and commitment. Consequently, it is necessary to strengthen and standardise the content of disclosure requirements and expand their scope — particularly with regard to banks and companies — to ensure that a wider range of entities, irrespective of their size or sector, are covered, thereby promoting more coherent, comparable, and useful climate-related reporting.

Additionally, it is important to ensure that disclosure is mandatory for all entities subject to financial reporting, with requirements proportionate to their size and sector.

The research highlighted the need for a simple, clear, and precise regulatory framework regarding disclosure requirements, including explicit guidance on the procedures to be adopted, the definition of applicable methodologies, and the provision of practical examples. The adoption of similar calculation methodologies, accompanied by predefined disclosure formats and templates, is essential to ensure consistency and comparability. It should be noted that, in financial reporting, when analysing a balance sheet or an income statement, we know that these follow a uniform reporting standard, which enables the key variables to be identified quickly. The same principle should apply to non-financial and climate-related information, ensuring consistency, comparability, and practical usefulness in its interpretation. The regulatory clarity is crucial to securing a uniform interpretation and coherent application by reporting entities.

In parallel, national institutions — namely public authorities, the CMVM, sectoral associations, higher education institutions, among others — should play an active role in promoting specialised training and in developing technological solutions that facilitate the execution of calculations and the understanding of the reporting structure. This institutional support is vital for strengthening disclosures on financial

impact and encouraging the inclusion of forward-looking information, both of which are central to assessing organisations' exposure to climate-related risks and opportunities.

The credit-origination and credit-monitoring requirements established by banking regulators, with regard to climate-related matters, should be reinforced so as to incorporate a more rigorous assessment of environmental impacts, risks, and opportunities — particularly from a financial perspective. In this context, more stringent requirements must be adopted for banks when granting credit, ensuring that climate risks are properly integrated into analysis, decision-making, and monitoring processes.

As foreseen in the CSRD (European Commission, 2022d) and reiterated throughout this research, the term "non-financial information" in practice encompasses elements of increasing financial relevance for organisations. In this context, the terminological shift towards "sustainability information" is fully justified, as it more accurately reflects the strategic nature and economic impact of environmental (including climate-related), social, and governance matters on organisational performance, resilience, and value creation. This semantic evolution deepens the understanding of the structural role these issues play in contemporary corporate management and in the informed decision-making of various stakeholders.

In conclusion, this research has been — and continues to be —particularly relevant for the future of sustainability information, with a specific focus on climate-related disclosure. The findings reinforce the need for a robust regulatory and normative framework that promotes standardisation, comparability, and the practical usefulness of the information disclosed, thereby contributing to more informed and effective decision-making. The initial objectives have been achieved, and it is expected that the contributions of this thesis will support the continuous improvement of the quality of non-financial and climate-related information — that is, sustainability information. The strategic role of banks in this domain is also underscored, as they act as central facilitators of the sustainable transition and drivers of more rigorous and transparent reporting practices.

In sum, organisations should be assessed in an integrated manner, simultaneously considering economic and financial, environmental, social, and governance dimensions. Their value lies in their ability to generate sustainable outcomes, contributing positively to societal well-being and to the preservation and advancement of the planet.

7.1.2 Research Contributions

This thesis contributes to the advancement of knowledge and understanding of non-financial disclosure practices, with particular emphasis on climate-related information made available by banks. In parallel, it deepens the analysis of climate-related disclosures by listed companies, whose reporting is especially relevant in the context of bank decision-making, notably in credit origination and monitoring processes. By exploring these dynamics, the research underscores the importance of information transparency as a crucial component in integrating climate impacts, risks, and opportunities into the financial system.

This investigation presents significant practical implications by providing empirical data and documented evidence that may support European and national regulators in identifying existing gaps in the disclosure of non-financial and climate-related information by banks. Additionally, it highlights the limitations of currently available sources of climate-related data, underscoring the urgent need for banks to access reliable, consistent, and comparable information to adequately integrate climate impacts, risks, and opportunities into their financing decisions.

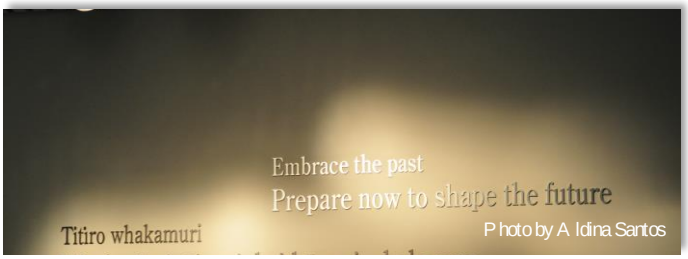
7.1.3 Research Limitations and Suggestions for Future Research

This study presents several limitations. Firstly, the samples analysed are relatively small, comprising nine banks and 26 listed companies selected based on their obligation to comply with Directive 2014/95/EU (NFRD). Although representative of the universe covered by the directive, the limited sample size may constrain the generalisability of the findings. Secondly, it is important to note that non-financial reports are not subject to mandatory audit in Portugal, which undermines the reliability and integrity of the disclosed information, complicating the validation of reported data and, consequently, its usefulness for various stakeholders.

Future research may extend the study of non-financial disclosure practices, with particular emphasis on the climate change dimension. It would be pertinent to assess the extent to which banks incorporate detailed climate risk analysis into credit origination and monitoring processes, as well as to examine the evolution of climate-related disclosure by banks and companies in Portugal and across Europe in light of the CSRD and the implications of the Omnibus Package. Ideally, such analyses should include interjurisdictional comparisons, enabling the identification of patterns, strengths, and limitations across different regulatory contexts. The integrity and reliability of non-financial reports also constitute a relevant area of investigation, given their influence on the credibility of reporting practices.

In addition, studies exploring the development of climate risk and performance indicators that enhance comparability among banks could contribute to improving the quality and usefulness of disclosed information. A sectoral analysis of climate-related disclosures by the largest listed companies in Europe

would help identify the specificities and challenges inherent to each industry. Finally, to investigate the level of technical knowledge among professionals responsible for preparing non-financial information, particularly within SMEs, and to identify gaps in resources, data availability, and training needs that could enhance the quality and consistency of non-financial and climate-related disclosure.



(Sentence inscribed on the Museum of New Zealand Te Papa Tongarewa, in Wellington, 2012)

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