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GRINS FOUNDATION

Survey among Italian firms on sustainability strategies and their determinants:

Background for research, literary review, areas of investigation and structure

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Executive summary

This report illustrates the rationale and structure of a survey aimed at investigating the resilience of Italian firms to climate change. The survey aligns with the main objectives of the 'Growing Resilient, Inclusive and Sustainable (GRINS)' project, specifically Work Package 1.4, 'Migliorare la produzione di valore dei territori supportando la sostenibilità del business' ('Improving territories' value creation by supporting business sustainability').

The questionnaire aims to collect data on the readiness level of Italian SMEs to address climate change risks across the following areas of investigation: Risk perception; Green investment; Emissions; Sustainability reporting, committee and remuneration; Green finance; Environmental programs; Ownership and legal form; Biodiversity.

Data from the questionnaire will allow the identification of different strategic postures among Italian SMEs, which will be further investigated for firm-level determinants in the second phase of the project.

This report serves as a theoretical background to the themes explored in the questionnaire. First, it presents the research context, framework, and conceptual framework. Next, the methodology is described. The subsequent sections focus on each area of investigation. The full questionnaire and its glossary are included in the Appendix.

TABLE OF CONTENTS

1. Introduction[1]

Sustainability issues, and in particular climate change, are increasingly affecting organisation activities and performances. According to the World Economic Forum Global Risks Report 2024, the environmental risks continue to dominate the risks landscape. The most severe global environmental risks include extreme weather events, critical change to Earth systems, biodiversity loss and ecosystem collapse, natural resource shortages, and pollution.

The severity of environmental risks has made clear that companies have to enhance their resilience, which is typically understood as the capability of organizations to "retaining shape and maintaining core functionality" in face of shocks and adversities (Verreynne et al., 2023, p.1342).

Then, resilient organizations are those that effectively anticipate, prepare for, respond to, and adapt to challenging conditions, such as environmental risks, thereby ensuring their long-term sustainability and success. These organizations proactively identify and address shocks, challenges or disasters, in order to positively react, adjust and maintain functioning prior to, during, and following adversities.

This report illustrates the rationale and structure of a survey aimed at investigating the resilience of Italian firms to climate change. The survey aligns with the main objectives of the 'Growing Resilient, Inclusive and Sustainable (GRINS)' project, specifically Work Package 1.4, 'Migliorare la produzione di valore dei territori supportando la sostenibilità del business' ('Improving territories' value creation by supporting business sustainability').

The questionnaire aims to collect data on the readiness level of Italian firms for climate change across the following areas of investigation: Risk perception; Green investment; Emissions; Sustainability reporting, committee and remuneration; Green finance; Environmental programs; Ownership and legal form; Biodiversity.

This questionnaire will allow us to assess the prevalence of different strategic postures among Italian SMEs and to identify trends in business sustainability within the pilot territories (Emilia Romagna, Piemonte, Veneto, Toscana, Lazio, Puglia). To this end, we will cluster SMEs' responses to climate risks, distinguishing among "wait-and-see," "cautious," "planner," and "proactive" strategic behaviors. The second phase of the project will investigate firm-level attributes associated with the adoption of these distinct strategic behaviors.

The report is organized as follows: First, we will present the research context, framework, and conceptual framework. Next, we will describe the methodology. The subsequent sections will focus on each area of investigation. The full questionnaire and its glossary are included in the Appendix.

[1]Section 1 is written by Francesco Scarpa, Ca' Foscari University of Venice.

2. Context of the research[2]

Following the adoption of the *European Green Deal* in 2019, that set the ambitious target for the EU of becoming the first carbon-neutral continent by 2050, environmental policy has become mainstream in European politics. Indeed, with the European Green Deal the Commission has delineated a new growth strategy to respond to the challenges represented by climate change and environmental degradation, with the aim of transforming the economy for a sustainable future and becoming a global leader in the green and energy transition. To reach this ambitious goal, and guide the economy towards a sustainable path, the European Union has delineated intermediate targets by 2030 and 2040: first, with the adoption of the *Fit for 55* policy package, which has set the objective of reducing greenhouse gas emissions at least by 55% by 2030, compared to 1990, through a series of legislative proposals, such as the reform of the EU emissions trading system[3]. Second, with the communication "*Securing our future. Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society*" (European Commission, 2024). This recent Communication, in particular, sets: the objective of reducing greenhouse gas emissions of 90% by 2040, thanks to a series of enabling conditions such as the full implementation of the *Fit for 55* package; the decarbonization of the industrial sector (based on renewable energies) and the scale of production capacity of growing sectors (batteries, electric vehicles, heat pumps, etc); the price setting of carbon and the access to funds for the green transition. Complementary to it, the European Commission has also published the communication "*Managing climate risks - protecting people and prosperity* " (European Commission, 2024), in which four main categories of actions are identified to help EU and its Member States manage these type of risks, which fall into: the improvement of governance at the state level; the predisposition of instruments for risk management; the exploitation of the full potential of structural policies; the setting of the right conditions for the financing of climate resilience.

Beyond these strategies and transition pathways, the European Union has also intervened with the instrument of industrial policy, specifically with the adoption of the *Green Deal Industrial Plan for the Net Zero Age* (European Commission, 2023) and the related legislative acts. Among these, the *Net Zero Industrial Act* (European Commission, 2023) represents the central piece to stimulate investments and the scale up of net-zero technologies manufacturing[4], to provide at least 40% of the EU's annual deployment needs for these technologies by 2030. In addition, with the adoption of the *New circular economy action plan* (European Commission, 2020), the European Union has renewed its efforts to transform the predominant business model from the linear "take-make-consume-throw away" to a more sustainable one, based on circularity and ESG standards. For this reason, a series of legislative and non-legislative measures have been put forward to make sustainable products the norm in the EU, empower consumers and public buyers and address the most resource-intensive sectors, such as: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients.

At firm level, to drive the change in this direction, the European Commission has committed to implement the main recommendations of the *Action Plan on Sustainable Finance* (European Commission, 2018), that includes the establishment of a common taxonomy for the definition of sustainable activities, the creation of EU standards and labels for green financial products and the strengthening of sustainability disclosure and accounting rulemaking. The Plan, which ultimately aims at facilitating finance for the green transition of

[2] Section 2 is written by Lucrezia Macigno, Centro Studi delle Camere di Commercio Guglielmo Tagliacarne.
[3] The proposal to reform the EU emission trading system has been adopted in 2023 by the European Parliament and Member States in the Council of the EU. It represents the first and largest carbon market in the world.
[4] The list of strategic net-zero technologies is delineated in the Act and covers the following categories: solar photovoltaic, wind energy, heat pumps, batteries, electrolyzers, advanced biofuels, CCUS.

businesses, has the objective of creating the conditions for the financial system to support the transition. For this reason, following the publication of the *Action Plan on Sustainable Finance,* the European Union has adopted different meaningful legislative acts. First, the EU Taxonomy of sustainable activities (European Parliament and European Council, 2020), that responds to the need of defining the criteria that allow to determine when an economic activity is environmentally sustainable, to facilitate ESG investments and avoid the phenomenon known as greenwashing[5]. Second, two milestones' Directives - the *Corporate Sustainability Reporting Directive* (CSRD) (European Parliament and European Council, 2023) and the *Corporate Sustainability Due Diligence Directive* (CSDDD) (European Commission, 2024), that aim at harmonizing sustainability reporting and extending ESG responsibility to all the subjects of the value chain. In particular, the CSRD has the benefit of making sustainability reporting mandatory for different categories of enterprises[6], while defining harmonized ESG standards to be disclosed according to a double materiality approach. The CSDDD, instead, has the merit of extending environmental and social responsibility to all the entities belonging to a value chain, despite their obligation to compile the sustainability report, thus covering SMEs too. Finally, with the *Regulation on the transparency and integrity of Environmental, Social and Governance rating activities* (European Commission, 2023), the Commission has introduced a common regulatory approach and transparency requirements for ESG rating providers, to enhance the integrity and quality of ESG ratings.

Finally, to achieve its environmental and climate objectives, and "to support and strengthen an integrated policy and implementation approach, building upon the European Green Deal", the EU has established the 8th Environmental Action program (or 8th EAP) (European Parliament and European Council, 2022) for the period up to December 2030. In this way, the priority objectives and the enabling conditions to obtain them are defined, and progress towards their realization are monitored on an annual basis, with the support of the European Environmental Agency. According to the latest report of 2023 (European Environment Agency, 2023), the outlook for meeting the targets by 2030 appears to be very likely for the following indicators: premature deaths due to exposure to fine particulate matter; environmental protection expenditure; eco-innovation index; employment in the environmental goods and services sector; increase the share of green employment in the whole economy; gross value added of the environmental goods and services sector. Instead, the targets related to GHG emissions from LULUCF (land use, land-use change and forestry), energy consumption; circular material use rate; area under organic farming; consumption footprint seems to be very unlikely to be reached by the end of the decade.

Since small and medium-sized enterprises represent 99% of European businesses and provide jobs to more than 85 million European citizens[7], their contribution is necessary to successfully drive the green transition. For this reason, the present research focuses on their level of preparedness with respect to climate change adaptation and mitigation, by investigating on the following topics: risk perception; green investment; emissions; reporting and workforce policies; green finance; environmental programs; corporate governance; expectations; biodiversity.

[5] Other directives, such as the one on Green claims, have been put forward to fight against this practice.
[6] Specifically, large companies, listed SMEs, non-EU companies if they generate over EUR 150 million on the EU market.
[7] See https://single-market-economy.ec.europa.eu/smes_en

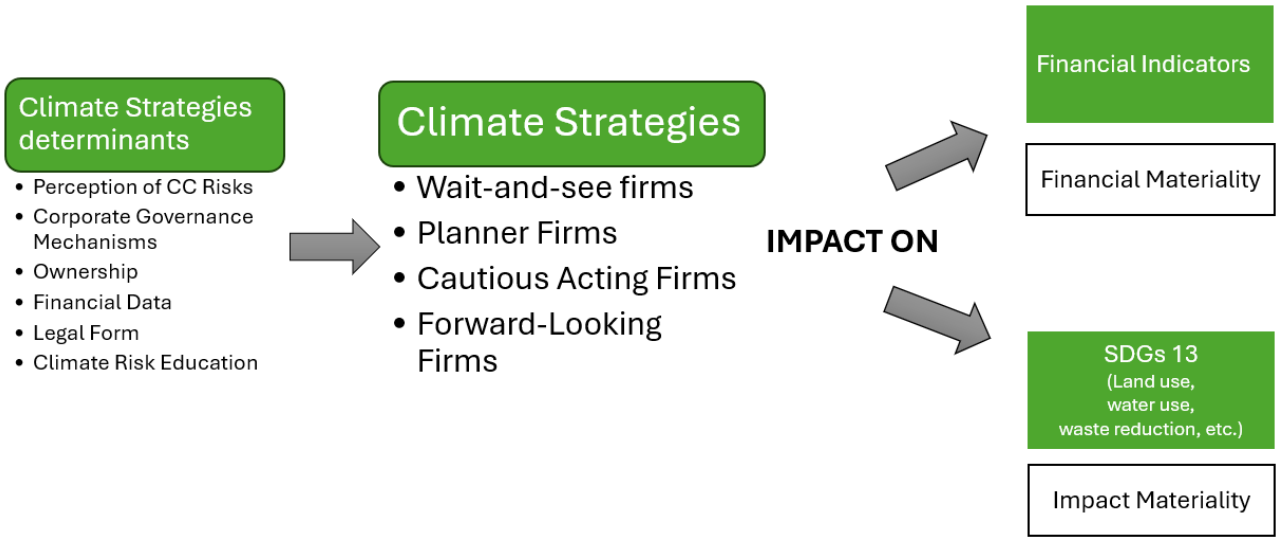
3. Aim of the project[8]

The first objective of our survey is to assess the degree of readiness to climate change of Italian SMEs and to derive trends in business sustainability of pilot territories (Emilia Romagna, Piemonte, Veneto, Toscana, Lazio, Puglia). To this aim, we will perform a clustering of SMEs' responses to climate risks, by distinguishing among "wait-and-see", "cautious", "planner", and "proactive" strategic behaviors of firms, as defined in Section 4. Subsequently, we will map territories and their industrial sectors to assess their overall readiness to climate risks change.

The second objective is to identify competencies and internal organizational aspects that effectively support firm strategies to address climate change risks. Hence, we will examine the firm-level attributes associated with the adoption of distinct strategic behaviors. Specifically, we will consider a comprehensive set of variables drawn from the literature, including firms' perception of risks, CG mechanisms, ownership, financial data, legal form, and climate risk education. Furthermore, we will identify weaknesses and obstacles to climate strategies for evaluating subsequent policy initiatives.

Finally, the third objective of the project is to examine the outcomes that the adoption of distinct climate strategies has on firms' financial performance (financial materiality) and environmental sustainability (impact materiality), in order to highlight effective responses to climate risks. Figure 1 portrays our conceptual framework.

Figure 1. Conceptual framework



Source: Own elaboration

[8] Section 3 is written by Silvia Gordano, Giulio Caldarelli and Vera Palea, University of Torino.

4. Research framework[9]

To remain resilient against the growing incidence of climate risks, it is crucial for companies to integrate both physical and transition risks into their investment decisions. Physical risks are associated with the physical impacts of natural hazards (e.g., hurricanes, floods, droughts) or chronic climate conditions (e.g., abnormal seasonal temperatures) that directly affect firms, especially those located in vulnerable regions, by exposing them to asset damages, reduced productive capacity, supply chain disruptions, and increased relocation and insurance costs. Transition risks, instead, are those stemming from the transition towards a low-carbon economy, including policy (e.g., carbon pricing), legal (e.g., litigation), technological (e.g., introduction of clean technologies), market (e.g., changes in consumer preferences) and reputational risks, which will lead to increased business costs, stranded assets and reduced market capitalization. Mitigation policies at the EU level are based on the introduction of carbon pricing (EC, 2021), which will require businesses to modify their business models. This approach aims to incentivize companies to reduce their carbon emissions.

SMEs can be dramatically impacted by both physical and transition risks. SMEs typically operate in local markets and are less able to diversify their customer base geographically (EIB, 2021). In addition, they have limited resources and capacity (Johnson & Schaltegger, 2016) to adapt to the transition towards a net-zero emissions future. Nonetheless, the regulation on corporate climate action has become more stringent due to the EU taxonomy (Regulation 2020/852), which defines criteria for assessing sustainable economic activities in line with a net-zero trajectory by 2050 and other broader environmental goals. Although SMEs are not covered by the regulation, they will be indirectly affected through their supply chains. It is therefore vital for SMEs to take a proactive approach to climate risk management.

4.1 Firms' responses to climate risks

To address climate risks, companies may adopt two broad types of responses: mitigation and adaptation. Mitigation actions aim at preventing further climatic change. For instance, companies can mitigate transition risks through greenhouse gas emission compensation and reduction (Cadez & Czerny, 2016; Palea & Drogo, 2020; Weinhofer & Hoffmann, 2010). On the other hand, business adaptation responses involve building adaptive capacity to effectively face actual or expected extreme weather events and other climate-related impacts (Adger et al., 2005). Adaptation responses include product and geographic diversification, operational flexibility and long-term innovation (Linnenluecke et al., 2013). The timing of responses to climate change (i.e., mitigation and/or adaptation measures) can vary across firms (EIB, 2022). Smit et al. (2000), for instance, categorize climate actions as "reactive", "concurrent" or "anticipatory", depending on whether they are implemented by firms after, during or before climate stimuli are experienced, respectively. Similarly, Gasbarro & Pinkse (2016) identify four adaptation behaviors, namely "pre-emptive", "reactive", "continuous" and "deferred", that firms may adopt based on their awareness of and vulnerability to climate risks.

In this research project, our first objective is to examine the degree of readiness of SMEs. In this vein, firms' responses to climate risks can be clustered based on investments made and plans to invest in climate actions (EIB, 2022). Therefore, we aim to categorize companies according to the following clusters:

[9] Section 4.1 is written by Silvia Gordano, Giulio Caldarelli and Vera Palea, University of Torino. Sections 4.2 and 4.3 are written by Silvia Gordano and Giulio Caldarelli.

- *Wait-and-see* companies: They have not invested in the past and do not intend to invest in the future. These companies adopt a passive approach to climate risks.
- *Cautious* companies: They have invested in the past, but do not intend to do so in the future. These firms are seen as short-term thinkers, lacking plans for future climate investments.
- *Planner* companies: They have not invested in the past but plan to do so in the future. This group is preparing to set climate targets and start investing in the coming years.
- *Proactive* companies: They have invested in the past and will continue to do so. These firms are characterized by a long-term vision in their climate strategy.

4.2 Determinants of climate investment decisions

Several factors can influence the decision of firms to invest in climate-related measures. A core element is the perception of risk (EIB, 2021; Pinkse & Gasbarro, 2019). Firms' perception of climate risks affect how benefits and costs are evaluated, which is at the basis of investment decisions (EIB, 2021, 2022). For instance, firms that perceive climate risk as more severe are likely to evaluate the investment benefits more positively and the investment costs more negatively (EIB, 2021), thus showing a higher propensity to invest. Consistently, Hoffmann et al. (2009) found that a heightened perception of physical risks positively impacts the extent of firms' adaptation strategies. Another crucial aspect for climate investments is the availability of sufficient financial resources. While climate risk awareness is essential for prompting action, firms must be able to bear the costs associated with climate investments. For example, limited access to credit can constrain investments (EIB, 2022).

Investing in climate change mitigation and adaptation also requires a climate risk education. Despite acknowledging the impacts and potential opportunities stemming from climate change, companies may still lack the expertise (e.g., skilled labor and technical capacity) to properly address these issues (Alam et al., 2022). Related to this, a body of literature suggests that the implementation of corporate governance (CG) mechanisms expressing a sustainability orientation can foster firm responses to sustainability issues, such as climate change. The appointment of a sustainability manager, for instance, can steer companies towards sustainability performance improvements (Peters et al., 2019). Similarly, the presence of an environmental management team can lead to the adoption of more advanced environmental management practices (Jabbour et al., 2013; Palea et al., 2024). Companies may also use compensation systems anchored to sustainability or carbon targets (Velte, 2024). Sustainable compensation policies can encourage a long-term orientation (Flammer et al., 2019) and lead to the implementation of environmental initiatives (Flammer et al., 2019; Haque, 2017). The adoption of sustainability reporting is another key mechanism able to enhance managers' responsiveness to societal issues (Tang & Higgins, 2022), by incorporating sustainability information in decision-making (Massa et al., 2015), and, thus, leading to the adoption of more sophisticated green strategies (Palea et al., 2024). Furthermore, some studies show that joining sustainability multi-stakeholder initiatives, such as the United Nations Global Compact (Berliner & Prakash, 2015) and the Science Based Targets initiative (Romito et al., 2024), can promote environmental improvements.

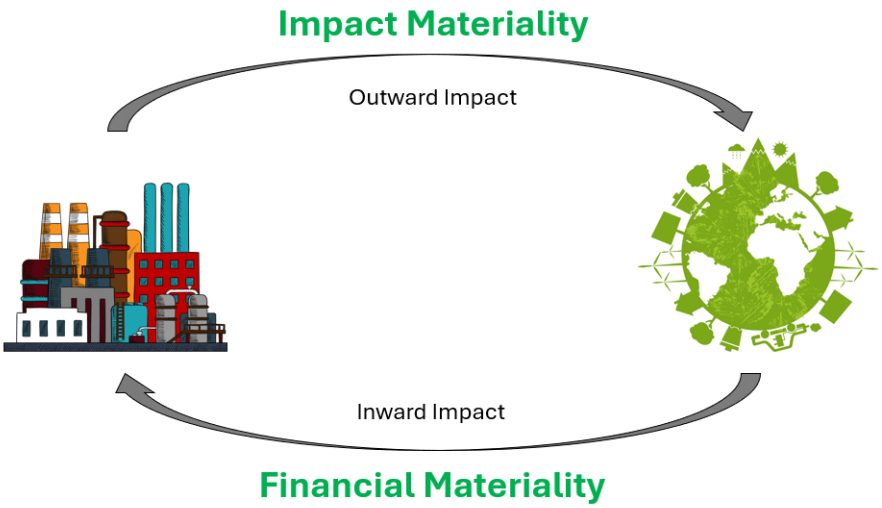
Extant studies also suggest that other firm attributes can affect firms' climate change responses. For instance, a higher percentage of institutional ownership is found to be associated with lower GHG emissions (Benlemlih et al., 2023). Furthermore, adopting the legal form of benefit corporations can effectively enhance social responsibility, as it provides legal protection for directors to act for the common good (Kirst et al., 2021).

In light of the above, the present research project investigates a comprehensive set of internal (e.g., governance, sustainability, and financial) determinants of strategic responses to climate change.

4.3 The impacts of climate risks: the notion of "double materiality"

In 2019, the European Commission formally introduced "double materiality" as the approach that organizations must adopt to disclose information on sustainability matters, including climate-related issues (EC, 2019). The double materiality concept acknowledges that sustainability risks and opportunities can be material from both a financial and non-financial perspective. Specifically, double materiality combines financial materiality and impact materiality (Figure 2).

Figure 2. The double materiality in climate change risks



Source: Own elaboration.

Financial materiality (the inside-in perspective) focuses on the impact of sustainability factors (e.g., climate risks) on an entity's financial position, performance, or cash flows (EU, 2022). Hence, organizations must assess, measure, and report risks and opportunities that could substantially affect their operations, earnings, physical assets, and other aspects that contribute to their enterprise value. Studies provide evidence that climate risk exposure negatively affects firm financial performance, by means of higher earnings volatility (Huang et al., 2018), higher cost of debt (Palea & Drogo, 2020), lower profitability (Palea & Santhia, 2022), and lower market evaluations (Palea & Santhia, 2022; Zhang, 2022). However, the implementation of certain corporate mitigation/adaptation strategies can attenuate negative impacts (Cadez et al., 2019; Palea & Drogo, 2020; Palea & Santhia, 2022). Considering the financial implications of climate risks is not only a prerequisite for companies to address broader social and environmental issues (Biondi et al., 2023), but also relevant to financial institutions for managing financial risks stemming from climate change (Mähönen & Palea, 2024). Impact materiality (the outside-in perspective), on the other hand, entails assessing the impacts of business activities on sustainability factors (EU, 2022). This is essential to inform corporate stakeholders on how a business entity affects the environment and society (GRI, 2022), and to evaluate its alignment with planetary boundaries (Mähönen & Palea, 2024).

Taken the above together, corporate management of climate risks requires recognizing that the organization contributes to, and is affected by, climate change. Therefore, in this research project, we consider the outcomes of firms' strategic responses to climate change under a double materiality perspective.

5. Methodology[10]

To address the purpose of our research, we conduct a statistical survey.

According to the definition provided by ISTAT, a statistical survey is a process articulated into different phases, whose purpose is to guarantee the quality of the statistics produced and made available to the public. The main steps of the process are the following:

a) Definition of the objectives of the survey
b) Definition of the survey design
c) Data acquisition
d) Registration
e) Revision and validation
f) Methodological elaboration
g) Presentation and use of the results
h) Diffusion.

To illustrate the characteristics and the methodology implemented to conduct the survey in object, in what follows attention will be given to the first two stages of the surveying procedure, namely the *definition of the objectives* and the *design of the investigation*.

5.1 Definition of the objectives of the survey

This phase started with the punctual definition of the purpose of the survey, here identified with the analysis of the level of preparedness of firms in terms of sustainability. Then, the phenomena of interest were delimited, at the same time as the informational needs and the expected use of the results were established. To study firms' environmental sustainability, the following phenomena have been taken into consideration: risk perception related to climate change, green investment, emissions, sustainability reporting, committee and remuneration, green finance, environmental programs, ownership and legal form, and biodiversity.

A subsequent step was the identification of the population that represents the objective of the survey, its statistical units, their characteristics and the relative classifications. For this work, the population has been identified with the group of active undertakings registered in ASIA[11] by the end of the 31st of December 2021, selected according to these criteria:

a) a minimum of 10 employees on average per year
b) all sectors of economic activity except for *Agriculture forestry and fishing* and *Financial and insurance activities.*

Finally, the phenomena to investigate must be circumscribed in space and time, with the definition of the geographical area of observation, the reference period, the length of the phenomena and their static or dynamic components. Accordingly, the present survey has restricted the area of interest to the enterprises located in the following Italian Regions (NUTS 2) Piemonte, Veneto, Emilia-Romagna, Toscana, Lazio and the Southern Italy (including Sicilia, Sardegna, Abruzzo, Molise, Campania, Puglia, Calabria and Basilicata) that are active and registered in ASIA by the end of 2021.

[10] Section 5 is written by Lucrezia Macigno, Centro Studi delle Camere di Commercio Guglielmo Tagliacarne.
[11] The statistical register of Italian enterprises of ISTAT.

5.2 Definition of the design of the survey

The second phase of the surveying process aims at finding the methodology that best suits the purpose of the investigation. Specifically, during this step, one must define which technique is more appropriate to produce the desired statistics (*direct* or *indirect investigation*) and choose the modality and instruments for the data collection. For the case in object, the preferred approach consisted of a direct investigation on a sample of enterprises, selected according to the criteria defined above. Then, the sampling strategy must be defined, along with the sample design and the estimators for projecting sample statistics to the target population, which for this work has led to the following procedure.

For every region (NUTS 2 level) subject to the survey, the nominatives of the undertakings operating in that territory (that overall constitute the statistical universe) have been divided into n-blocks, resulting from the combination of the following variables: province, class of employee (from 10 to 49 employees, from 50 to 249 or more than 250) and sector[12]. This methodology has been implemented since it is able to guarantee, at the same time, homogeneity within every block and heterogeneity between different blocks, allowing to capture the existing differences between the phenomena observed. Furthermore, every block was designed to achieve an already established sample numerosity, that guarantees statistical relevance to the variables of interest[13]. For what matters the sectors of economic activity, it is important to underline that their identification has resulted from a reclassification of the codes of classification ATECO 2007, based on the EU Taxonomy of sustainable activities (European Parliament and European Council, 2019), which has led to the following eligible/ non eligible sectors: Food and beverages; Other manufacturing; Energy; Water supply, sewerage, waste management and remediation; Construction and real estate activities; Transport; Information and communication; Professional, scientific and technical activities; Non eligible.

Finally, regarding the design of the questionnaire, the interview techniques available (methods of questionnaire administration), the following decisions have been taken. The questionnaire has been administered via a mix of CATI/ CAWI methodology[14], especially when requested by the interviewed, and consisted largely of close-ended questions, predominantly with a single answer possible, even though multiple answers and priority orders were also allowed for some questions. Our expectation is to reach out around 10.000 enterprises.

[12] For example, in a region with five provinces, three classes of employees and six economic sectors, 5x3x6 blocks have been realized.

[13] Therefore, statistical relevance is not achieved for every single block, due to the predetermined number of interviews established for each region.

[14] CATI - Computer Assisted Telephone Interviewing; CAWI – Computer Assisted Web Interviewing.

6. Areas of investigation

The aim of the questionnaire is to understand business readiness level for climate change. Based on project objectives, 10 core areas of investigation were identified as relevant to gain information about the readiness level of companies: risk perception; green investment; emissions; reporting and workforce policies; green finance; environmental programs; corporate governance; expectations; biodiversity.

On an overall level, 34 questions were produced to measure the key dimensions. Table 1 reports the correspondence between the areas of investigation and the associated questions of the questionnaire (Appendix). In the following sections, the areas of investigations are presented and the survey introduced.

Table 1. Areas of investigation and associated questions in the survey.

Area of investigation	**Question(s)**
Risk perception	1), 2)
Green investment	3), 4), 5), 6), 7), 8), 9), 10)
Emissions	11), 12A), 12B), 13)
Sustainability reporting, committee and remuneration	14), 14A), 15), 15A), 16), 16A), 17)
Green finance	18), 18A), 19), 20)
Environmental programs	21), 22), 23)
Ownership and legal form	24), 25)
Expectations	26)
Biodiversity	27), 28), 29)

6.1 Risk perception[15]

Risk perception is the subjective assessment that people give about the characteristics and severity of a risk (Slovic, 2000; Slovic, 2016). While the concept of risk refers to the probability of suffering harm or facing a dangerous situation, its perception often differs from its statistical evaluation and varies from one individual to another. According to Godovykh, Pizam, & Frida (2021) risk perception is influenced by a wide range of cognitive, affective, contextual and individual factors. Cognitive factors are related to gravity of the risk event, media coverage, information accessibility and risk-mitigating measures. Affective factors, such as feelings, moods, emotions influence individuals' ability to deal with negative and dangerous situations. Contextual factors include framing of information on risks and availability of alternative information. Finally, individual factors, like previous experiences, gender, age, and cultural characteristics have a significant impact on the individual perception of risk.

[15] Section 6.1 is written by Gian Luca Tassinari, University of Bologna.

Although the climate change risk constitutes an objective threat, the perceptual evaluation of this threat is subjective. As noted by Van der Linden (2017), climate change is perceived as a very serious problem in the UK, Australia and much of continental Europe while the perception of this risk is lower in countries such as the US, China and Russia. At the same time, awareness of the risk of climate change is generally higher in developing countries than in more developed countries (see Van der Linden (2017) and reference therein). Although general concerns about climate change have generally increased around the world over the last quarter-century, much of the public still considers climate change a low priority compared to many other social issues like terrorism, health care, and the economy (see Van der Linden (2017) and reference therein).

All this emphasizes the difference between the existence of an objective real-world threat, such as climate change risk, and the subjective evaluation of this threat. Therefore, to understand the reactions of individuals, governments, institutions and firms to the risks posed by climate change, it is necessary to try to measure their subjective perception of such risk. Given these premises, it should be highlighted that although climate risk perception and awareness has been investigated at the level of the general population through surveys, at the level of sovereigns through participation in climate initiatives and net zero commitments, at the level of investors through surveys and study of investment choices, climate risk awareness of firms is largely unexplored, except for large (mostly listed) firms, where it is still predominantly proxied by indirect measures such as participation to climate initiatives, environmental performance which are difficult to replicate in SMEs. Additionally, it is hard to identify what explains differences in awareness levels across firms beyond obvious observables like business sector and geographic location.

Several studies refer to awareness of climate change as a key factor of corporate responses to climate change. Mazutis & Eckardt (2017) argue that managerial interpretations and perceptions of climate change risk affect decision-making on climate issues and shape companies' stance on climate change. They state that, despite the consensus that climate change will have huge consequences not just for the planet but also on corporate operations, firms continue to fail to adjust their strategic decision-making processes to become more sustainable and that a significant factor in this inertia lies in the cognitive biases at play in corporate decision-making. Berkhout, Hertin, & Gann (2006) argue that the company's perception of the deleterious effects of climate change favors the process of organizational change necessary for adaptation to changes in the external environment, i.e. that the perception of vulnerability pushes the company to act. Arnell & Delaney (2006) state that before an organization undertakes a process of adaptation to climate change, it must first be aware of its potential threat and, secondly, concerned about the potential impacts on its business. According to them, sensitivity to climate change risk depends on the perceived exposure of assets and operations to the impact of climate change in the near future, both in terms of physical impacts and indirect impacts on supply and demand. Also, they argue that without awareness there would be no worry, and without worry there would be no adaptation except when businesses are forced to adapt by a higher authority. According to Brekke & Johansson-Stenman (2008), the perception of climate risk and the adoption of measures related to climate change depend to a large extent on the individual definition of risk and risk aversion. Gasbarro & Pinkse (2016) describe four types of adaptation behavior to climate-induced physical change – pre-emptive, reactive, continuous, and deferred adaptation – that correspond with different degrees of awareness and vulnerability. According to Gasbarro, Rizzi, & Frey (2016), negative perceptions of the effects of climate change are more likely to generate adaptive responses, while positive perceptions could induce a proactive stance on climate action and foster innovation. Todaro et al. (2021) analyze the influence of managers' awareness of climate change, perceived climate risk exposure and risk tolerance on the adoption of corporate responses to climate change. They analyze the climate change awareness and perceived exposure to climate risks as antecedents of corporate responses to climate change, through a survey of managers of Italian manufacturing companies. Even if Todaro et al. (2021) operate a distinction between climate change awareness and perception, their study highlights the existence of a positive relationship between climate change awareness and perceived exposure to climate risks, which in turn is positively correlated with both internally oriented and supply chain managerial climate actions. In addition,

Todaro et al. (2021) test the moderation of risk tolerance on the relationship between perceived climate risk exposure and climate action, suggesting that risk attitude is a significant factor of decision-making under climate uncertainty. Investigating the climate change awareness and mitigation efforts and their associated motivating and limiting factors to pro-environmental behavior in Swiss SMEs through a survey, Fuchs, Preeya, & Strobl (2023) have identified the existence of a positive association between climate change awareness and mitigation in small and medium firms.

Given the importance of climate change risk perception/awareness as one of the climate strategies determinants, it is essential to understand how companies feel exposed to different types of climate risks. Three fundamental types of climate risk on business activity can be identified: acute physical risk, i.e. the risk caused by extreme events such as drought, floods, heat waves; chronic physical risk, i.e. the risk caused by progressive changes such as increases in temperatures, rise in sea levels, loss of biodiversity, etc.; transition risk, i.e. the risk of suffering economic losses following the process of adjusting the economy towards low carbon emissions and greater environmental sustainability (for example, the losses due to the adoption of climate and environmental policies, changing market preferences, etc.).

The questions concerning companies' perception of climate risk are presented in section A of the survey in the Appendix. We would like to collect the following information on the risk perception of SMEs:

- Whether the company believes that carrying out its activities is made more difficult by climate change and to what extent (question 1).
- To what extent each of the three climate risk categories (acute physical risk, chronic physical risk, transition risk) influence the company's activity (question 2).

The next section will consider the types of green investments that firms can undertake to reduce their exposure to climate change risk.

6.2 Green investment[16]

There is a broad consensus that the production of greenhouse gases primarily causes climate change due to human activities. Climate change presents substantial risks, including the potential to cause severe negative consequences and significant macroeconomic repercussions. Tol (2024) emphasizes that the effects of high global temperatures, rising sea levels, and extreme weather events can significantly hinder economic output and productivity. International regulations have been instrumental in reducing emissions and pushing companies to embed sustainability strategies in their production processes and business strategies. This approach has been adopted at the international level (with the Kyoto Protocol) and in Europe (with the Emissions Trading System -ETS). The ETS, in particular, has played a key role in efficiently reducing greenhouse gas emissions, by pricing climate-change inducing emissions. It relies on a cap-and-trade approach which sets a maximum limit for emissions from regulated installations in Europe. This limit is covered by emission allowances (EU Allowances or EUAs), each of which permits the emission of one ton of CO2 equivalent (CO2eq). Companies must offset their emissions by surrendering the appropriate allowances each year. These allowances can be purchased on the EU carbon market, although some may also be allocated to companies for free.

Since the power produced via fossil-fuels is more expensive through the ETS, companies have been required to increasingly decarbonize their production processes while embedding sustainability objectives. Both at

[16] Section 6.2 is written by Emanuele Doronzo, Tor Vergata University of Rome.

international level, we have witnessed how regulation has spurred what we call green innovation (Zhang et al., 2023; Ma et al., 2024) through green investments.

GIs are defined as capital expenditures required to reduce greenhouse gas emissions and air pollutants while minimizing the impact on the production and consumption of non-energy elements. The literature assesses GIs as the additional investments required to achieve a specific climate target compared to a scenario without action.

Green Investments are clustered according to the strategies aimed at reducing emissions and can be classified based on their intermediate objectives. Most Green Investment (GI) initiatives target mitigating the environmental impact of energy production and minimizing energy consumption. Furthermore, GIs encompass technologies that effectively capture and store carbon, as deforestation and agriculture significantly contribute to carbon emissions (Eyraud et al., 2013; Chen et al., 2023; Zheng & Jin, 2023). The primary components of GIs include:

1. Low-Emission Energy Supply: Green investments are focused on transitioning energy production from fossil fuels to cleaner alternatives, such as wind, solar, and hydroelectric power. The European Commission has called for proposals under the LIFE-Environment program, which aims to promote biofuels and biogases for electricity generation and direct energy sources. GI includes emerging environmental technologies like wind and solar photovoltaics and well-established technologies such as hydroelectric power.
2. Energy Efficiency: Investments in GI aim to reduce energy use in the production of goods and services. In the electricity industry, there is potential to enhance the efficiency of energy generation, transmission, and distribution. Transportation efficiency can be improved by adopting hybrid and fuel-efficient vehicles and increasing the use of public transportation. Industrial equipment efficiency can be achieved by employing energy-saving devices and improving waste management practices. Enhancements in insulation and cooling systems can increase building efficiency.
3. Carbon Sequestration: Deforestation is the second most significant contributor to carbon emissions globally after fossil fuel combustion. As Cevik noted in 2024, it accounts for a substantial portion of total emissions. To effectively reduce carbon emissions, it is essential to halt deforestation, reforest areas, and increase carbon capture in soils by implementing innovative agricultural techniques.
4. Circular Economy: The circular economy is an economic model focused on eliminating waste and continuously using resources through regenerative cycles. It contrasts with the traditional linear economy, which follows a 'take, make, dispose' model. GIs aiming to implement a circular economy system focus on projects prioritizing sustainable resource management.

This survey aims to investigate which green investments have been undertaken by Italian companies and which types of interventions they focus on. Section B of our survey includes the questions related to green investments. We aim to gather the following information:

- Investment in Climate Change Risk Reduction (2021-2023): has the company made investments to mitigate climate change risks during the period 2021-2023 (Question 3)? If so, what investments were made to reduce physical risks (Question 4) and/or transitional risks (Question 5)?
- Planned Investments in Climate Change Risk Reduction (2024-2026): does the company plan to invest in mitigating climate change risks for 2024-2026 (Question 6)? If so, what types of investments are intended to reduce physical risks (Question 7) and/or transitional risks (Question 8)?
- Motivations for Green Investments: the motivations behind investing in reducing exposure to climate change risks (Question 9).
- Barriers to Green Investment: What obstacles limit green investment (Question 10)?

6.3 Emissions[17]

Since the industrial era began, human activities have led to the release of dangerous levels of greenhouse gases (GHGs), causing global warming and climate change. The Intergovernmental Panel on Climate Change stated in "Climate Change 2021: The Physical Science Basis" that the increase in the average global temperature is unequivocally due to human influence (IPCC, 2021). The main greenhouse gases released by human activities are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and trace gases such as the group of F-gases. Carbon dioxide emissions generally come from fossil fuel consumption, agriculture, deforestation, production processes, and refrigerant gas usage. Methane emissions are linked to agriculture, fossil fuel production, and the management of waste. Nitrous oxide emissions typically come from agriculture when nitrogen fertilizers are applied to soil. F-gases (fluorinated greenhouse gases) are used in common products, equipment and processes such as refrigeration, air conditioning, heat pumps, insulation, fire protection, power lines, and aerosol propellants as well as in industrial processes.

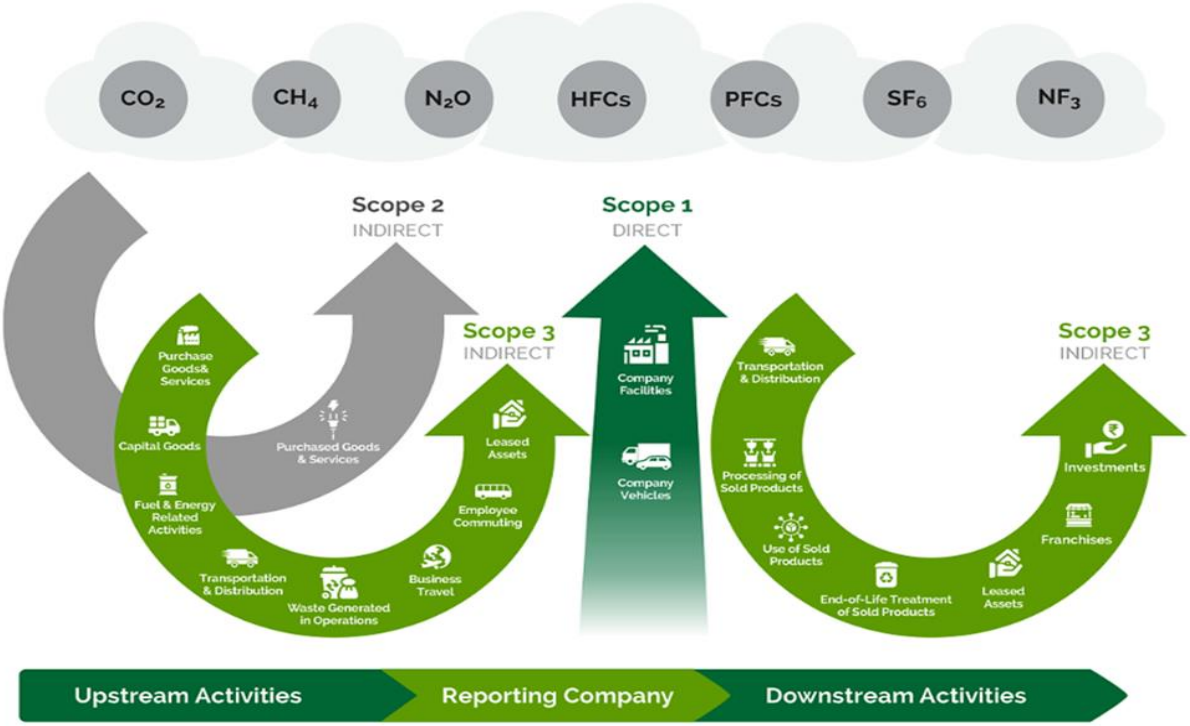
Aware of the urgency posed by global warming, in December 2015 at COP 21 in France, representatives of 195 nations signed the Paris Agreement and committed to limiting global warming by trying to keep global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to continue efforts to also limit the increase in temperature further to 1.5 degrees Celsius (UN, 2015). Thus, the dimension of future climate change depends on net greenhouse gas (GHG) emissions, which in turn are influenced by factors such as policy actions, social and economic processes, and technology. In addition, the EU has set the task of reducing GHG emissions by 55% compared to its 1990 levels by 2030 (European Commission, 2019). This target is an intermediate step towards achieving the legally binding net zero GHG emissions target by 2050. Naturally, companies' GHG emissions play an extremely important role in achieving these goals. To meet the net-zero emissions target, companies must reduce their carbon footprint and, consequently, they first must identify and measure the emissions associated with carrying out their activities.

The Greenhouse Gas Protocol (Bhatia & Ranganathan, 2004) provides comprehensive standardized global frameworks to quantify and manage GHG emissions from public and private sector operations and value chains. Under the Greenhouse Gas Protocol, firms' GHG emissions are divided into direct emissions and indirect emissions based on firms' operations and economic activities. The former originate from sources owned or controlled by the company, while the latter arise from the company's activities but occur from sources owned or controlled by another company. The Greenhouse Gas Protocol defines three "Scopes" for GHG emissions accounting and reporting purposes, to improve transparency and provide utility for different types of organizations and different types of climate policies and business goals. Specifically, in the Greenhouse Gas Protocol, companies' carbon emissions are classified into Scope 1, i.e. direct emissions, and into Scope 2 and Scope 3, corresponding to two different types of indirect emissions. More precisely, Scope 1 emissions are associated with the combustion of fossil fuels or the processing of chemicals and materials from sources owned or controlled by the company. Scope 2 refers to emissions from purchased electricity, heat, or steam and are considered indirect emissions since they physically occur at the facility where electricity is generated. Scope 3 refers to other indirect emissions not covered in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions. Scope 3 emissions could include: the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g., transmission and distribution losses), outsourced activities, and waste disposal. Measuring emissions helps the company obtain useful information to draw up a plan to manage and reduce the company's carbon footprint. Furthermore, once the company has quantified its carbon footprint, it can report it internally and/or externally to the company. It is important to note that accounting for indirect emissions is exposed

[17] Section 6.3 is written by Gian Luca Tassinari, University of Bologna.

to the risk of double counting when two different companies include the same emissions in their respective inventories. Figure 3 schematizes the relationship between the Scopes and the activities that directly and indirectly generate emissions along the value chain of a company.

Figure 3: Scope 1, Scope 2 and Scope 3 emissions.



Source: https://www.mitconindia.com/CarbonFootprint/.

While emissions data are generally available from existing databases for large enterprises, we want to understand whether SMEs are addressing the issue of measurement and, if so, how they are addressing it. The main problem of adopting a carbon footprint measurement system for small and medium-sized businesses is its complexity which requires significant time and resources to implement. According to Ruževičius & Dapkus (2018) the key factors that influence the determination of carbon footprint in small organizations are the misunderstanding of the general functioning of the organization from the point of view of environmental, employee engagement, manager leadership and key public sector drivers such as education and advertising, lack of information, ecoculture education, green procurement, tax exemption. Ruževičius & Dapkus (2018) developed a methodology for calculating the carbon footprint and prepared an algorithm for its application, adapted to small organizations.

From a practical point of view, to quantify Scope 1 and 2 emissions, the necessary information can usually be obtained through corporate resource planning systems, existing documentation or energy bills, while to estimate Scope 3, more advanced approaches such as life cycle, input-output methods or hybrid models are required (Matthews et al., 2008; Weidema, et al., 2008; Wiedmann, 2009; Minx, et al., 2009; Huang et al., 2009). Some information relating to Scope 3 emissions may be obtained from companies within the supply chain that may have started publishing their carbon footprints and employee commuting may be based on general assumptions regarding the individual SME (Hendrichs & Busch, 2012). The quantification of emissions deriving from individual production processes within small and medium-sized enterprises can be carried out following the same measurement methods as those of an entire large company but with a narrower focus (Hendrichs & Busch, 2012). The product's carbon footprint can also be estimated (see for example BSI (2011)).

According to Hendrichs & Busch (2012) the management of a SME should at least get a snapshot of the firm's life-cycle wide emissions by evaluating the complete value chain, including the products and services usage phase conducted by consumers.

The questions concerning the measurement of emissions by companies are presented in section C of the survey in the Appendix. We would like to collect the following information on the emissions of SMEs:

- Whether the company has specific objectives in terms of reducing emissions (question 11).
- If the company has implemented in the three-year period 2021-23 or if it intends to implement in the three-year period 2024-25 investments aimed at reducing emissions by 55% by 2030 and/or reaching the objective of zero net emissions for 2050 (questions 12A and 12B).
- If the company has a system for measuring Scope 1, Scope 2 and Scope 3 emissions (question 13).

6.4 Sustainability reporting, committee and remuneration[18]

6.4.1 Sustainability reporting and SMEs

Sustainability reporting refers to the practice through which companies publicly communicate their sustainability performance. There is no single interpretation of the role and content of the sustainability report. Different perspectives can be placed on a continuum, with the holistic perspective and the strategic perspective at its extremes (Deegan and Unerman, 2011).

The holistic perspective regards sustainability reporting as a process to make business practices more socially and environmentally sustainable. This perspective is based on the assumption that companies have the responsibility (mainly ethical in nature) to care about their social and environmental impacts and contribute to sustainable development. From this perspective, sustainability reporting should aim to hold organizations accountable for all their significant economic, social, and environmental impacts on all stakeholders, irrespective of their financial relevance to the organization.

The strategic perspective highlights that sustainability reports can be strategically used as a marketing tool to contribute to the achievement of an organization's goals. Sustainability reporting is thus seen as driven by economic and profit motives, based on the assumption that the company has a single responsibility: to create economic value for its shareholders. Various theoretical perspectives emphasize how sustainability reporting can help companies maximize their profits by improving relationships and support from economically powerful stakeholders, gaining and maintaining legitimacy, or enhancing corporate reputation.

Traditionally, few SMEs publish a sustainability report, given its voluntary nature (Johnson and Schaltegger, 2016). The financial burden of preparing a sustainability report can be significant for SMEs, which often operate with tighter budgets than larger corporations. The process involves data collection, analysis, and potentially hiring external consultants, all of which can be costly.

Moreover, SMEs typically have fewer human resources dedicated to sustainability compared to larger firms. This lack of dedicated personnel can make it difficult to gather and analyze the necessary data for comprehensive reporting. Furthermore, many SMEs lack the specialized knowledge required to effectively measure and report on sustainability metrics. This expertise gap can lead to incomplete or inaccurate reports,

[18] Section 6.4 is written by Francesco Scarpa, Ca' Foscari University of Venice.

reducing their usefulness and credibility. Finally, without a clear understanding of the potential advantages, many SMEs may not see the immediate value of sustainability reporting. The benefits, such as enhanced reputation, improved stakeholder relationships, and potential cost savings, may seem too abstract or long-term.

The new CSRD (Corporate Sustainability Reporting Directive) does not extend the obligation to publish a sustainability statement to SMEs, as only listed SMEs fall within its scope. However, SMEs are increasingly under pressure from their business partners to report on sustainability information. These business partners include large corporate clients, who are required to provide sustainability information in the value chain and thus request social and environmental information from SMEs along the value chain. Additionally, banks and other financial institutions are starting to incorporate ESG (Environmental, Social, and Governance) criteria into their creditworthiness assessments (Inserire una reference). SMEs that can demonstrate strong sustainability practices may find it easier to secure financing and may benefit from more favorable lending terms (e.g., Palea and Drogo, 2020).

Despite the lack of a legal obligation, it is becoming increasingly important for SMEs to start reporting sustainability information. As sustainability becomes a critical factor in business relationships and financial assessments, SMEs that do not engage in sustainability reporting risk being left behind. By proactively adopting sustainability reporting practices, SMEs can:

- Strengthen business relationships: Providing transparent sustainability information helps build trust and meet the expectations of large corporate clients and other business partners.
- Gain access to capital: Demonstrating strong sustainability practices can improve access to financing and attract investment from institutions prioritizing ESG criteria.
- Enhance market competitiveness: A solid sustainability report can serve as a marketing tool, highlighting the SME's commitment to responsible business practices and appealing to a growing base of environmentally conscious consumers.
- Improve ESG risk management: Sustainability reporting can help SMEs identify and mitigate environmental and social risks that could impact their business operations and long-term viability.
- Drive innovation: The process of collecting and analyzing sustainability data can spur innovation, leading to new products, services, and business models that address environmental and social challenges.

By embracing sustainability reporting, SMEs can not only meet the evolving demands of their stakeholders but also secure a more sustainable and competitive future.

In our questionnaire, we would like to gather information on the firm's engagement with sustainability reporting. Specifically, we are interested in knowing:

- Whether the SME publishes a sustainability report (question 14)
- The first year the SME began publishing its sustainability report, if applicable (question 14A).

6.4.2 Sustainability committee

In our questionnaire, we focus on the task and responsibility to manage environmental issues. The presence of an individual or a designated committee responsible for the firm's environmental strategy indicates a structured approach towards integrating sustainability into the firm's core operations. This could include roles such as a sustainability officer, a sustainability committee a dedicated sustainability team, or an external consultant. Knowing when this responsibility was assigned can provide insights into the firm's long-term commitment to sustainability.

Literature provides evidence of a positive relationship between the presence of a sustainability committee and the firm's environmental performance (Li et al., 2023), indicating the active role that the composition and function of the sustainability committee plays in enhancing environmental performance. Three components of committee effectiveness, namely, composition, authority and resources, are found to be significant (Li et al., 2023). This suggests that committees with more resources and authority and having more expertise in sustainability and independent directors lead to higher environmental performance.

Through our questionnaire, we would like to gather the following information about whether there is an individual or body responsible for the environmental/sustainability strategy (question 15), and if so, since what year (question 15A)

6.4.3 Sustainability remuneration

ESG-related remuneration system link employee compensation to the achievement of ESG targets, such as climate-related targets. Implementing ESG-related compensation systems involves defining clear ESG targets. These include reducing carbon emissions, enhancing social responsibility, and maintaining high governance standards, ensuring they are specific and measurable. Then, ESG targets become part of performance evaluations, showing employees how their actions contribute to sustainability goals. Rewards can vary from financial bonuses to non-financial incentives like career development opportunities, based on achieving ESG targets. The applicability can be across different levels: from executives to operational staff, each level's targets are tailored to their role in impacting sustainability outcomes. Finally, regular assessment and transparent reporting of ESG performance ensure targets are met and adjustments made as needed.

The main benefits of ESG-related compensation systems is enhanced engagement and motivation: Employees feel more engaged when their efforts toward sustainability are rewarded. Moreover, literature provides consistent evidence that sustainability-related remuneration significantly promotes corporate sustainability performance, Indeed, this remuneration can guarantee incentive alignment between firms and related stakeholders, leading to increased stakeholder trust and firm reputation

As anticipated, through our questionnaire, we would like to gather information about whether the company has adopted or plans to adopt a remuneration system for workers linked to achieving climate targets (question 16), and if so, since what year (question 16A) and for which professional level (question 17).

6.5 Green finance[19]

Green finance is essential for achieving green growth by connecting the financial industry with environmental improvement and economic prosperity. Green finance refers to allocating capital to projects and initiatives with positive environmental impacts, such as reducing carbon emissions, promoting renewable energy, and supporting biodiversity conservation. It encompasses various financial products and services, including green bonds, loans, and sustainable investment funds. By directing capital to environmentally-friendly projects, green finance plays a crucial role in mitigating climate change, reducing environmental risks, and promoting sustainable economic growth at the same time (Berrou et al., 2019; Desalegn & Tangl, 2022; Ozili, 2022).

The role of regulation is crucial to promote green finance as a key instrument to achieve broader decarbonization objectives, as the recent EU legislation has shown (Wang et al., 2021; Ye & Dela, 2023). The EU Sustainable Finance Legislation is a comprehensive framework designed to align the EU's financial system

[19] Section 6.5 is written by Emanuele Doronzo, Tor Vergata University of Rome.

with its overarching sustainability objectives, particularly in addressing climate change and promoting environmental protection. This legislative framework is an integral part of the broader European Green Deal, which aspires to make the EU climate-neutral by 2050.

The EU Sustainable Finance Legislation encompasses several key regulations and directives, each targeting different aspects of the sector.

We describe, in brief, the main EU Sustainable Finance Legislation:

- The EU Taxonomy is a classification system that establishes a list of environmentally sustainable economic activities. It serves as a common language for investors, companies, and policymakers to identify and qualify investments as sustainable. The taxonomy focuses on six specific environmental objectives: Climate Change Mitigation, Climate Change Adaptation, 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. For an economic activity to be classified as sustainable, it must substantially contribute to at least one of these objectives without significantly harming others. Additionally, the activity must comply with minimum social safeguards.
- The Sustainable Finance Disclosure Regulation (SFDR) aims to enhance transparency within the financial sector by mandating that financial market participants and financial advisors disclose how they integrate Environmental, Social, and Governance (ESG) factors into their investment decision-making processes. This regulation applies to Asset Managers, Institutional Investors, Insurance Companies and Pension Funds. The SFDR is founded on the following pillars: Entity-Level Disclosures[20], Product-Level Disclosures [21] and Principal Adverse Impact (PAI) Statements[22]: Entities must report any negative impacts their investments may have on sustainability factors.
- The Corporate Sustainability Reporting Directive (CSRD) replaces the previous Non-Financial Reporting Directive (NFRD) and significantly extends the scope and depth of sustainability reporting requirements for companies. The CSRD mandates detailed disclosures on sustainability in management reports. The CSRD applies to a broader range of companies, including: All Large Companies, Listed Small and Medium-Sized Enterprises (SMEs) and Private Enterprise no-SMEs.
- The EU Green Bond Standard (EU GBS) provides a voluntary framework for the issuance of green bonds in alignment with the EU Taxonomy. Its primary objective is to establish a credible and reliable market for green bonds by ensuring that funds raised are directed toward projects with clear environmental benefits.
- The Benchmarks Regulation introduces two new categories of benchmarks designed to provide investors with enhanced information regarding the carbon footprint of their investments:
    - EU Climate Transition Benchmarks: These benchmarks aim to reduce the carbon footprint of a standard investment portfolio.
    - EU Paris-Aligned Benchmarks: These target investments are aligned with the Paris Agreement's objective of limiting global warming to 1.5°C above pre-industrial levels. This regulation requires benchmark administrators to disclose the ESG factors considered in their methodology and provide investors with clear and transparent information.
- The Corporate Sustainability Due Diligence Directive (CSDDD) is a proposed EU legislative framework designed to ensure that companies operating in Europe incorporate environmental and human rights

[20] Entity-Level Disclosures: Firms must provide detailed information regarding their policies on the integration of sustainability risks into their investment processes

[21] Product-Level Disclosures: Financial products must disclose how sustainability risks and potential adverse impacts are considered in their offerings.

[22] Principal Adverse Impact (PAI) Statements: Entities must report any negative impacts their investments may have on sustainability factors

considerations into their operations and supply chains. The directive is part of the EU's broader strategy to achieve sustainable economic growth and promote responsible business practices.

These regulations facilitate the development of green finance in various aspects, specifically by identifying eligible investments, ensuring a high degree of transparency and reliability of environmental information, and establishing metrics that enable an analysis of the company's ESG performance both cross-sectionally and over time (Brühl, 2021). For our research, it is crucial to determine whether the interviewed Italian companies are aware of the EU Sustainable Finance legislation (question 18).

However, these regulations have not identified specific green finance instruments, allowing the market to determine the most suitable instruments.

Green Finance offers a range of financial products tailored to different needs, including retail finance for individual consumers, green investment funds for asset managers, and green loans and bonds for corporate finance. Green insurance products also help manage risks associated with climate change and environmental damage.

Types of Green Investments:

- Green Equities: Investments in companies whose activities align with environmental goals, including those focusing on sustainable products and resource efficiency.
- Green Bonds: Bonds specifically designed to fund projects with environmental benefits, such as renewable energy installations or pollution control measures.
- Green Private Equity and Infrastructure: Investment in private companies or infrastructure projects contributing to environmental sustainability and low-carbon technologies.

Investment Approaches:

- ESG Integration: Incorporating Environmental, Social, and Governance (ESG) factors into investment analysis and decision-making processes align with circular economy goals by evaluating investments' long-term environmental impact.
- Thematic Investing: This involves focusing on specific themes, such as climate change, resource efficiency, and sustainable agriculture, which are directly linked to circular economy objectives.

Then, Green finance operates as a market-driven mechanism for investment and lending, integrating environmental factors into risk assessments and relying on environmental incentives to influence business decisions.

For our research, it is crucial to determine whether the interviewed Italian companies have participated in training activities on sustainable finance (question 18A)

The final aspect to consider is the cost of green finance instruments. Specifically, assessing whether it is more advantageous for companies to finance using green finance instruments than traditional ones is important. The literature indicates that companies that are more proactive about sustainability and, consequently, eligible to issue green finance instruments face a lower cost of debt (Cochu et al., 2016; Ehlers & Packer, 2017; Fatica et al., 2021; Flammer, 2021; Palea & Santhià, 2022; Palea et al., 2023). Therefore, in the survey, we ask whether the Italian company benefited from green finance in 2021-2023 (question 19) and whether the interest rate has been more favorable than non-green financing (question 20).

6.6 Environmental programs[23]

Consumers increasingly seek businesses committed to sustainability in today's environmentally conscious world. This puts pressure on companies, especially Small and Medium-sized Enterprises (SMEs), to demonstrate their eco-friendly practices. Sustainable certifications and participation in programs and/or initiatives offer a way for SMEs to showcase their commitment and reap potential benefits. Moreover, increasing awareness of greenwashing puts companies under greater pressure to adopt credible sustainability practices, sparking interest in sustainable certifications (Nygaard, 2023).

These certifications enhance credibility (van der Lugt, 2017; Romito et al., 2024); obtaining a recognized sustainability certification demonstrates a company's commitment to environmental and social responsibility, boosting trust with stakeholders like consumers, investors, and business partners. Furthermore, the certifications can differentiate an SME from competitors in a crowded marketplace (Kafel & Nowicki, 2022). Consumers are willing to pay a premium for sustainable products and services, offering a potential financial advantage. Finally, the certifications might be prerequisites for entering specific markets or participating in green tenders (Wei et al.,2024).

There are many sustainable certifications that SMEs have to select according to different variables, such as industry relevance, financial resources, complexity, and consumer recognition (Lin & Ma, 2023)

The report focuses on:

- UN Global Compact
- Science Based Targets initiative (SBTi)
- ISO Certifications

6.6.7 UN Global Compact

The United Nations Global Compact (UNGC) stands as a beacon of responsible corporate behavior in a world facing pressing environmental and social challenges. This voluntary initiative, launched in 2000, brings together over 20,000 companies and other stakeholders from 167 countries to promote sustainable business practices and advance global goals.

At the heart of the UNGC lies ten principles that serve as a guiding framework for participating companies. These principles encompass various sustainability concerns, spanning human rights, labor standards, environmental protection, and anti-corruption.

1. Respect human rights: Businesses should support and respect the protection of human rights within their sphere of influence and ensure they are not complicit in human rights abuses.
2. Ensure non-discrimination: Businesses should eliminate all forms of discrimination in employment and occupation.
3. Uphold the freedom of association and the right to collective bargaining: Businesses should respect the right of their employees to join or not join a union and to engage in collective bargaining.
4. Eliminate forced and compulsory labor: Businesses should not use forced or compulsory labor.

[23] Section 6.6 is written by Gian Luca Tassinari, University of Bologna, and Emanuele Doronzo, Tor Vergata University of Rome.

5. Abolish child labor: Businesses should not employ children under the minimum age or in hazardous work.
6. Promote safe and healthy working conditions: Businesses should provide their employees a safe and healthy working environment.
7. Adopt environmentally friendly practices: Businesses should adopt a precautionary approach to environmental challenges, promote environmental responsibility, and encourage the development and diffusion of environmentally friendly technologies.
8. Support and promote the development and diffusion of environmentally friendly technologies: Businesses should support and promote the development and diffusion of environmentally friendly technologies.
9. Work against corruption in all forms: Businesses should work against it, including bribery and extortion.
10. Promote the development and diffusion of environmentally friendly technologies: Businesses should support and promote the development and diffusion of environmentally friendly technologies.

Nicolò et al. (2024) and Ribeiro et al. (2024) underline the numerous benefits to companies to join to the UN Global Compact, including:

- Enhanced Reputation and Brand Value: A company's commitment to sustainability can strengthen its reputation and attract socially conscious consumers and investors.
- Improved Risk Management: By adhering to the UNGC principles, companies can proactively address potential social and environmental risks, reducing reputational damage and legal liabilities.
- Access to a Global Network: The UNGC provides a platform for collaboration with other sustainability-minded companies, sharing best practices and fostering innovation.
- Contribution to Global Goals: By aligning business strategies with the UNGC principles, companies can contribute to achieving the United Nations Sustainable Development Goals (SDGs).

Any company or organization can join the UNGC by submitting an online application and committing to the ten principles. Upon acceptance, participants must submit an annual Communication on Progress (CoP) report on their sustainability performance.

The UN Global Compact is a powerful catalyst for corporate sustainability, encouraging businesses to integrate environmental and social responsibility into their core operations. By embracing the UNGC principles, companies can enhance their reputation and financial performance and contribute to a more sustainable and equitable future for all (Nicolo' et al.,2024; Ribeiro et al.,2024).

In our survey, we are interested to know whether the company has joined the UN Global Compact (question 21).

6.6.8 Science-Based Targets Initiative

Climate change is an undeniable threat, and businesses have a critical role in mitigating its impact. The Science Based Targets initiative (SBTi) empowers companies to set ambitious yet achievable greenhouse gas (GHG) emission reduction targets aligned with the latest climate science.

The Science Behind the Initiative is built on the following pillars (Romito et al.,2024):

- Paris Agreement Goals: SBTi targets are aligned with the ambitious goals of the Paris Agreement, aiming to limit global warming well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.

- Scientific Foundation: Targets are based on the latest scientific research and assessments by the Intergovernmental Panel on Climate Change (IPCC).
- Ambitious and Actionable: SBTi goes beyond "business as usual" emission reductions, encouraging companies to set aggressive, achievable targets for a low-carbon future.

Benefits of Science-Based Targets:

- Reduced Climate Risk: Lower emissions contribute to mitigating climate change, safeguarding business operations from future disruptions and extreme weather events.
- Enhanced Reputation and Brand Value: Demonstrating a commitment to sustainability strengthens a company's reputation and attracts environmentally conscious consumers and investors.
- Improved Resource Efficiency: Reducing emissions often goes hand-in-hand with increased operational efficiency, leading to cost savings and improved resource management.
- Competitive Advantage: Early adopters of science-based targets gain a competitive edge in a market increasingly focused on sustainability.

The SBTi Process involves technical indications to reduce the GHG emission:

- Commitment: Companies publicly commit to setting a science-based target by submitting a letter of intent.
- Target Development: With guidance from the SBTi, companies develop ambitious emission reduction targets across their value chain (Scope 1, 2, and 3 emissions).
- Target Validation: SBTi rigorously assesses submitted targets against scientific criteria to ensure alignment with climate goals.
- Communication and Implementation: Companies transparently communicate their validated targets and implement strategies to achieve them upon approval.

Challenges and Considerations:

- Long-Term Commitment: Setting and achieving science-based targets requires a long-term vision, strategic planning, and ongoing investment.
- Shifting Business Models: Some companies may need to adapt business models and operations to achieve their goals.
- Transparency and Reporting: Regular and transparent reporting on progress towards targets is crucial for maintaining stakeholder trust.

The Road Ahead for SBTi:

- Expanding Scope: The SBTi continuously refine its methodologies to encompass new sectors and emerging environmental challenges.
- Collaboration for Change: The initiative fosters collaboration within industries and with governments to accelerate the transition to a low-carbon economy.
- Scaling Up Ambition: As climate science evolves, SBTi targets may become even more ambitious, encouraging companies to push the boundaries of sustainability.
- Taking Action with SBTi:
- Learn about the SBTi: The SBTi website provides detailed information on target-setting methods, resources, and frequently asked questions (FAQs).
- Assess Your Company's Fit: Evaluate if your company is ready to commit to the long-term journey of setting and achieving science-based targets.
- Engage Stakeholders: Generate internal buy-in and seek support from employees, investors, and other stakeholders for your sustainability goals.

By adopting science-based targets through the SBTi framework, companies can become leaders in the fight against climate change. This initiative empowers businesses to act urgently, reduce their environmental impact, and contribute to a more sustainable future for all.

In our survey, we are interested to know whether the company has joined to any Science-Based Targets Initiative (question 22).

6.6.9 ISO

ISO 14000 is a family of environmental management standards developed by the International Standards Organization's Technical Committee ISO/TC 207. They include principles and guidelines to help organizations to reduce their impact on the environment, to comply with relevant legislation and regulations, and to encourage continuous improvement in their environmental management practices. ISO 14001 is a voluntary and certifiable environment management systems standard that specifies the requirements for an effective environmental management system. This standard encourages organizations to

- continuously improve their organizational processes to minimize their impact on the environment (Kitazawa & Sarkis, 2000; Klassen & Vachon., 2003)
- integrate environmental management aspects into their strategic planning processes (Delmas & Toffel, 2008; Eltayeb, Zailani, & Ramayah, 2011)
- implement sustainable initiatives to protect the environment (Bravi et al., 2020; Chiarini, 2019).

Camilleri (2022) conducted a systematic review of the academic literature on ISO 14001, identifying the main benefits and costs deriving from the adoption of this standard. In particular, the benefits include: the awareness of compliance requirements with relevant legislations; the facilitation of planning, organization, leadership and control of environmental management systems; the monitoring and reduction of externalities including pollution and emissions; the establishment and maintenance of ongoing communications with stakeholders; the increase of the legitimacy of practitioners in society; the creation of shared value to corporate financial performance and to the environment. The costs related to ISO 14001 certification comprise: the need for significant investments in time and money; there lack of information on the difference between certified and non-certified organizations; stakeholder pressure on corporate businesses and organizations to adopt environmental management practices; the need for ongoing commitment from management and employees; the lack of consensus on the actual effectiveness of ISO 14001. For a detailed review of the literature linked to the benefits and costs arising from ISO 14001 certification see Camilleri (2022) and references therein. According to Johnstone (2020) SMEs can use ISO 14001 as a strategic tool to improve all aspects of performance. Particularly, she suggests that ISO 14001 can entail both substantive performance improvements in terms of environmentally efficient and effective operations, but also yield symbolic performance benefits in the form of gained business.

There are other ISO standards focused on specific aspects of the environment like, for example, ISO 4226 regarding air quality, ISO 6107 water quality, and ISO 50001 for energy management systems. Specifically, ISO 50001 is an international energy management systems standard that provides a framework for the implementation of a structured energy management system for the purpose of continuously improving energy performance (ISO, 2018). It provides guidance for industrial, commercial, or institutional facilities, or entire companies, to integrate energy efficiency into their management practices, including fine-tuning production processes and improving the energy efficiency of industrial systems (McKane, 2009). The standard gives organizations and companies technical and management strategies to reduce energy, carbon intensity, costs, and improve environmental performance. According to (Marimon & Casadesús, 2017) is an

effective instrument for organizations to continuously improve their energy performance. All types and sizes of businesses that provide goods or services involving energy production, use or distribution can obtain benefits from the implementation of this standard (Dzene et al., 2015; Yücel & Halis, 2016). Ferrari, Bruni, & Bramonti (2020) showed that this standard can reduce the consumption of energy. Additionally, ISO 50001 implementation can decrease costs and satisfy external stakeholder's expectations (Zimon, Jurgilewicz, & Ruszel, 2021). The reasons for implementing ISO 50001 include reducing operating costs while promoting competitiveness and resilience, a commitment to sustainability, alignment with government regulations and/or incentives, and improved corporate image (Fuchs, Aghajanzadeh, & Therkelsen, 2020; Fitzgerald et al., 2023). For a non-exhaustive list of other ISO environmental standards, refer to Camilleri (2022)

Since we want to know what position SMEs have towards environmental certifications, in the questionnaire the interviewed company is asked if it has one or more certifications and, in the case of an affirmative answer, to indicate which ones (question 23).

6.7 Ownership and legal form[24]

In the last few decades there has been a slow yet steady shift towards considering companies as having duties not only towards their shareholders, but also to other stakeholders.

The so-called 'shareholder capitalism', as Friedman (1970) argues in his influential article in the New York Times, maintains that the only responsibility managers and executives have is to answer to their shareholders and maximize their profits in any legal and ethically viable way. Any other social responsibility that executives pursue, e.g. eliminating discrimination or reducing pollution, is seen as "preaching pure and unadulterated socialism". The shareholder primacy model has been - and still is - the mainstream approach on how a company should be managed. In fact, even if such a model has been widely debated and criticized over the years (Davis, 2021), it is still influencing the sustainability and voluntary disclosure debate (Pigatto et al., 2023).

Attempting to go beyond the investor-centric approach that the shareholder primacy purports, Freeman et al. (2007) proposes a broader version of multi-capitalism: the stakeholder model. The stakeholder model goes beyond "naïve self-interest [and] the separation of business and morality" (Freeman et al., 2007, p. 312) therefore recognising that stakeholders - and not just shareholders - as essential for a company's value creation process rather than trying to put the rights of one group beyond discussion. It follows that managers should not put the interests and rights of one group of people above all the others, but try to accommodate and engage with a multitude of different interests and viewpoints.

The two competing views - and the shades of gray that lies between them - on whom a company should be accountable to can be found also in the most recurring ownership and legal frameworks that companies adopt in practice.

Legal frameworks are the most formal drivers of corporate accountability (Carnegie and Napier, 2023). Specifically, two predominant legal systems can be distinguished: the Civil Law system, prevalent in Western European countries, Latin America, Québec, China, and Japan, and the Common Law system, found in English-speaking countries such as the United States and Australia. Consequently, it becomes clear that the ownership structure and legal form of a company are often the result of a complex process of interaction between businesses and their specific political and institutional contexts, which are shaped by laws, practices, customs, as well as cultural, social, and political values that influence the development of enterprises (De Falco, 2014). The three predominant models are Anglo-Saxon, German, and Latin. Such models vary based

[24] Section 6.7 is written by Annalisa Pancani e Sarfraz Nazir, Sant'Anna School of Advanced Studies Pisa.

on the ownership structure of companies, contractual relationships between firms, the composition of the board of directors and the interests represented therein, the role and functioning of capital markets, and methods for resolving corporate crises.

In Italy, a series of legislative reforms and initiatives promoted by regulatory bodies and trade associations allows companies to broaden their legal form to include a multi-stakeholder approach. One key step in this cultural revolution was the introduction of the "Società Benefit" (Benefit Corporation) with Law No. 208 of December 28, 2015. Italy was the first European state to adopt this innovative legal instrument, enabling companies to pursue stakeholder-oriented governance practices. The "Società Benefit"' is not a new legal form of company, but a "status" that can be added to one of the traditional legal forms (e.g., Società Responsabilità Limitata, Società Per Azioni). In our questionnaire for Italian SMEs, we included an additional question to determine how many Italian SMEs have chosen to incorporate the designation of "Società Benefit" into their company names. This helps us understand, as defined by the abovementioned law, those companies "which, in conducting economic activities, in addition to the purpose of profit distribution, pursue one or more common benefit goals and operate responsibly, sustainably, and transparently towards individuals, communities, territories, and the environment, cultural and social assets and activities, entities and associations, and other stakeholders"[25]. The lack of fiscal benefits, tax relief, or other direct financial advantages attached to "Società Benefit" makes this "label" a reliable proxy for companies' depth of accountability to their stakeholders.

- Is the business a benefit corporation? (Question 24)

The ownership structure has attracted the attention of many scholars (e.g. Aguilera and Crespi-Cladera, 2015; Liu et al., 2011; Cuomo et al., 2013), leading to the identification of two contrasting phenomena: shareholders concentration and shareholders dispersion. Generally, although the reality of corporate structures is highly diverse even within individual countries, Anglo-Saxon cases typically exhibit particularly fragmented ownership and a strong presence of institutional investors. In contrast, companies in countries such as Germany, France, and Italy show a high shareholder concentration, high influence of the banking system, control exercised primarily by families, and a limited role of institutional investors. In our questionnaire for Italian SMEs, we decided to include a question on the share capital structure, specifically targeting different typologies of investors holding more than a 20% stake. By analyzing these responses, we aim to uncover the possible correlations between ownership concentration, typology of shareholders, the time horizon of strategic decisions, and the company's objectives related to the sustainability matters highlighted in the other parts of the questionnaire.

- Who are the shareholders owning more than 20% of the company? (Question 25)

The questionnaire does not include all the other general information about the legal form of the entity and the features of the boards that can be retrieved by official institutional databases.

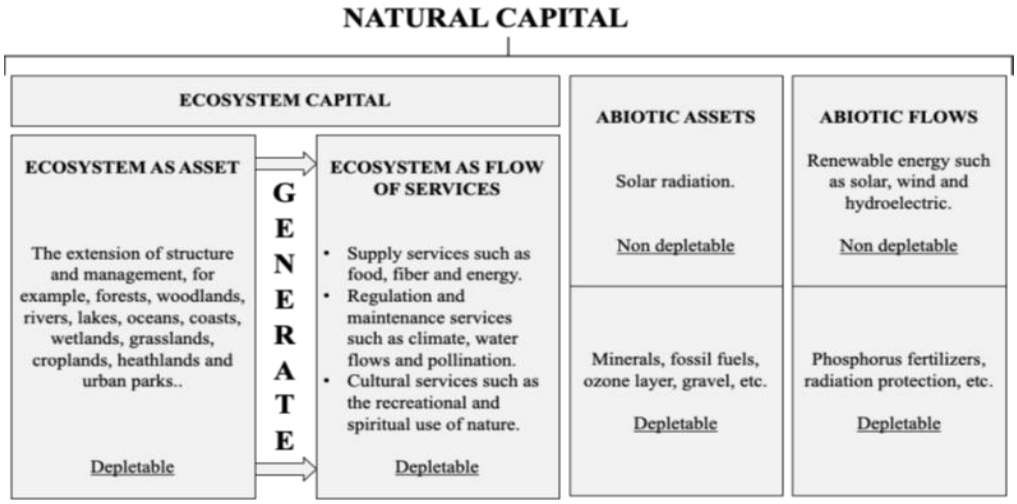
6.8 Biodiversity[26]

Biodiversity is the variety of life in all its forms and is often identified with the number of species that inhabit planet Earth. Biodiversity is first and foremost an essential part of the so-called "natural capital" (Figure 4), which includes all living and non-living resources such as soil, vegetation, animals, and water (Fleming et al., 2022; Haines-Young & Potschin, 2018). In practical terms, biodiversity combines with non-living (abiotic) elements to form ecosystems such as forests, farmlands, coasts, oceans, and urban parks. Therefore, there

[25] Paragraph 376 of Law No. 208 of December 28, 2015.
[26] Section 6.8 is written by Lino Cinquini, Gianmaria Ontano e Giacomo Pigatto, Sant'Anna School of Advanced Studies Pisa.

is a causal relationship between the health status of biodiversity and the productivity - that is considered as the ability to generate biomass - of ecosystems and natural capital (Dasgupta, 2021; UN, 2021) which, through ecosystem services, are critical to ensuring a good quality of life for humans (IPBES, 2019). Ecosystems are functional to humans and provide various services to humans, businesses, and society at large: provisioning services such as food, clean water, and energy; regulating and maintaining services such as climate regulation, pollination, and soil fertility; and cultural services with spiritual, aesthetic, religious and recreational value (Dasgupta, 2021; Haines-Young & Potschin, 2018). In general, ecosystem services are "benefits that we receive from nature and that are the basis of our economies and well-being" (Maes et al., 2020, p. 360).

Figure 4. Main components of Natural Capital



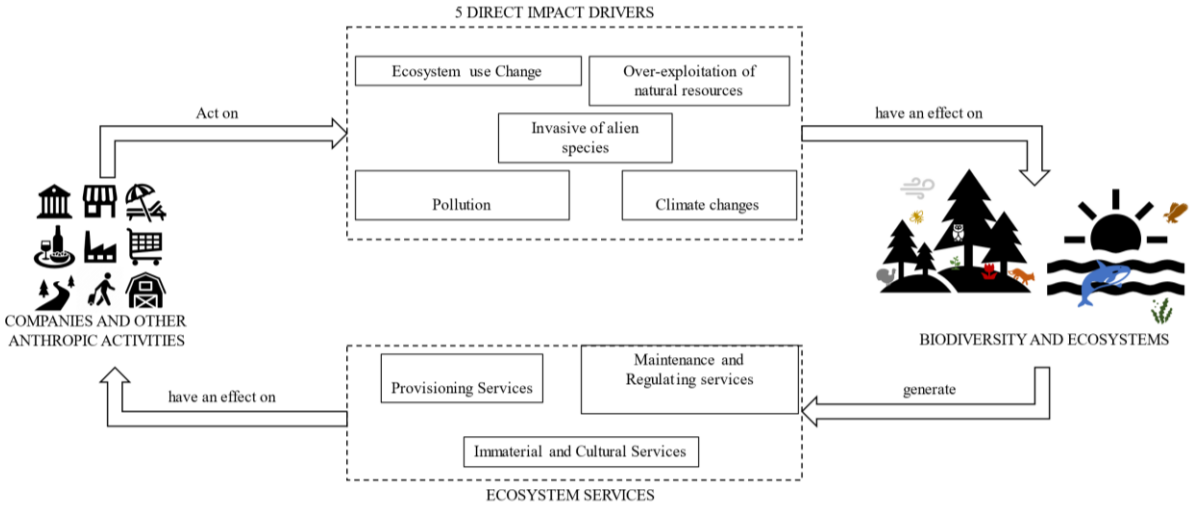
Source: Adapted from Haines-Young and Potschin (2018, p. 6)

In recent decades, there has been a deterioration of biodiversity and ecosystems at a global level symbolized by the increase in animal and plant species at risk of global extinction (IUCN, 2023; Atkins & Maroun, 2018) and the destruction of natural habitats (IPBES, 2019; Jaureguiberry et al., 2022). Such a deterioration – the sixth mass extinction (Laine et al., 2022) – is also a consequence of anthropic economic and corporate activities that lead to negative socio-economic repercussions (IPBES, 2019; Sun et al., 2022). In fact, the World Economic Forum ranks biodiversity loss and ecosystem collapse as the third most serious risk that businesses and society will face in the coming years (WEF, 2024). Furthermore, more than half of the world's economic output depends on ecosystems and their services and some sectors such as forestry and agri-food are highly dependent on such services (WEF, 2020, 2024; Vysna et al., 2021).

Understanding the relationship between companies, biodiversity, and ecosystems is a crucial issue since it addresses the possibility of the world's future life. On the one hand, companies affect biodiversity by exploiting natural resources or polluting, therefore generating "impacts". On the other hand, companies receive "services" from biodiversity and ecosystems such as the service of supplying raw materials and fertile land therefore creating "dependencies" (Carvalho et al., 2022; Sun et al., 2022). The impact-dependency relationship between business and biodiversity can be further broken down (Figure 5). On the impact side, there are five primary direct drivers of impact on biodiversity and ecosystems: sea/land use change, overexploitation, introduction of invasive alien species, pollution, and climate change (IPBES, 2019; Jaureguiberry et al., 2022). On the dependency side, there are three main categories: provisioning services, maintenance and regulating services, and immaterial and cultural services (Haines-Young & Potschin, 2018; Dasgupta, 2021). From a business perspective, it is particularly complex to assess and disclose the value of biodiversity and ecosystems as well as the impact on biodiversity, the functioning of ecosystems, and species

extinctions (Atkins & Maroun, 2018). However, these topics are essential for the development of corporate sustainability strategies and organizational resilience.

Figure 5. The basic relationship between companies and biodiversity.



Source: Cinquini et al. (2024)

Despite the complexity, many national and international institutions have started to require companies to consider their specific impacts on biodiversity (CBD, 2022; GAA, 2022; TNFD, 2023; UNEP-WCMC et al., 2022; Natural Capital Committee, 2022). Furthermore, it is reasonable to expect that legislative efforts on this issue will increase in the coming years especially in the Western world and in particular in Europe (see, for example, the Align projects (UNEP-WCMC et al., 2022), the CSRD and the Nature Restoration Law).

The questionnaire is designed to preliminary assess whether Italian SMEs possess some knowledge on the topic of biodiversity loss, their perception about where the responsibility for impacts lies – whether in the company or in its supply chain – and which of the 5 impact drivers are the most recurring. Specifically, we are interested in understanding:

- Is the topic of biodiversity known by the company? (Question 27)
- Is biodiversity formally included in the company's sustainability policies (e.g., the topic is included in the sustainability report)? (Question 28)
- Is biodiversity part of the company's strategy or investment plans to (1) limit biodiversity impacts and associated risks and/or (2) pursue opportunities for growth? (Question 29)

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8. Appendix

8.1 Questionnarie

A. RISK PERCEPTION

1)	TO WHAT EXTENT DO YOU BELIEVE THAT CLIMATE CHANGE IS OVERALL MAKING BUSINESS ACTIVITIES MORE COMPLEX (E.G., INCREASED WORKLOAD, REGULATORY CHALLENGES, ETC.)?	
1)	Not at all	□
2)	A little	□
3)	Quite a bit	□
4)	A lot	□

2)	HOW MUCH DO THE FOLLOWING TYPES OF RISK IMPACT YOUR COMPANY'S ACTIVITIES? *(ONE RESPONSE PER ROW)*				
		Not at all	**A little**	**Quite a bit**	**A lot**
1)	**Acute physical risk** (caused by extreme events such as droughts, floods, heatwaves)	□	□	□	□
2)	**Chronic physical risk** (caused by gradual changes such as rising temperatures, sea level rise, loss of biodiversity, etc.)	□	□	□	□
3)	**Transition risk** (economic loss that a company may incur as a result of the adjustment process of the economy towards low carbon emissions and greater environmental sustainability. For example, due to the adoption of climate and environmental policies, changing market preferences, etc.)	□	□	□	□

B. GREEN INVESTMENT

3)	IN THE THREE-YEAR PERIOD 2021-2023, HAS YOUR COMPANY MADE INVESTMENTS TO REDUCE ANY OF THE FOLLOWING RISKS?	
1)	**Acute physical risk** (caused by extreme events such as droughts, floods, heatwaves)	□ Yes □ No
2)	**Chronic physical risk** (caused by gradual changes such as rising temperatures, sea level rise, loss of biodiversity, etc.)	□ Yes □ No
3)	**Transition risk** (economic loss that a company may incur as a result of the adjustment process of the economy towards low carbon emissions and greater environmental sustainability. For example, due to the adoption of climate and environmental policies, changing market preferences, etc.)	□ Yes □ No

(IF YOU ANSWERED "YES" TO Q3.1 OR Q3.2)

4)	WHAT TYPES OF INVESTMENTS HAS YOUR COMPANY MADE IN THE THREE-YEAR PERIOD 2021-2023 TO REDUCE ACUTE AND/OR CHRONIC PHYSICAL RISKS? *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Insurance contracts (to cover risks from extreme events like droughts, floods, etc.)	□	□	□
2)	Protection against physical damage (e.g., flood barriers, hail nets)	□	□	□
3)	Water waste reduction (e.g., through the installation of water-saving devices, reuse and recycling of wastewater, optimization of irrigation, etc.)	□	□	□
4)	Relocation of production (to other geographical areas)	□	□	□
5)	Diversification of production (different types of products)	□	□	□
6)	Change in business model (redefining strategies, operations, business processes, methods of engaging with customers and suppliers)	□	□	□
7)	Other (please specify_____)	□	□	□

(IF YOU ANSWERED "YES" TO Q3.3)

5)	**HAT TYPES OF INVESTMENTS HAS YOUR COMPANY MADE IN THE THREE-YEAR PERIOD 2021-2023 TO REDUCE TRANSITION RISK?** *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Increase in the share of energy consumed from renewable sources	☐	☐	☐
2)	Reduction of direct CO2 emissions	☐	☐	☐
3)	Waste reduction/management	☐	☐	☐
4)	Introduction or strengthening of sustainable mobility	☐	☐	☐
5)	Tree planting (commitment to reforestation projects or tree planting to mitigate climate impact or restore degraded ecosystems)	☐	☐	☐
6)	Carbon credits (purchase of certificates related to projects that contribute to reducing greenhouse gas emissions or absorbing CO2)	☐	☐	☐
7)	Other (please specify_____)	☐	☐	☐

6)	**IN THE THREE-YEAR PERIOD 2024-2026, WILL YOUR COMPANY MAKE INVESTMENTS TO REDUCE ANY OF THE FOLLOWING RISKS?**	
1)	**Acute physical risk** (caused by extreme events such as droughts, floods, heatwaves)	☐ Yes ☐ No
2)	**Chronic physical risk** (caused by gradual changes such as rising temperatures, sea level rise, loss of biodiversity, etc.)	☐ Yes ☐ No
3)	**Transition risk** (economic loss that a company may incur as a result of the adjustment process of the economy towards low carbon emissions and greater environmental sustainability. For example, due to the adoption of climate and environmental policies, changing market preferences, etc.)	☐ Yes ☐ No

(IF YOU ANSWERED "YES" TO Q6.1 OR TO Q6.2)

7)	**WHAT TYPES OF INVESTMENTS DOES YOUR COMPANY INTEND TO MAKE IN THE THREE-YEAR PERIOD 2024-2026 TO REDUCE ACUTE AND/OR CHRONIC PHYSICAL RISKS?** *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Insurance contracts (to cover risks from extreme events like droughts, floods, etc.)	☐	☐	☐
2)	Protection against physical damage (e.g., flood barriers, hail nets)	☐	☐	☐
3)	Water waste reduction (e.g., through the installation of water-saving devices, reuse and recycling of wastewater, optimization of irrigation, etc.)	☐	☐	☐
4)	Relocation of production (to other geographical areas)	☐	☐	☐
5)	Diversification of production (different types of products)	☐	☐	☐
6)	Change in business model (redefining strategies, operations, business processes, methods of engaging with customers and suppliers)	☐	☐	☐
7)	Other (Please specify_____)	☐	☐	☐
8)	Still uncertain (EXCLUSIVE)	☐	☐	☐

(IF YOU ANSWERED "YES" TO Q6.3)

8)	**QUALI TIPOLOGIE DI INVESTIMENTO LA SUA IMPRESA INTENDE EFFETTUARE NEL TRIENNIO 2024-2026 PER RIDURRE IL RISCHIO DI TRANSIZIONE?** *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Increase in the share of energy consumed from renewable sources	☐	☐	☐
2)	Reduction of direct CO2 emissions	☐	☐	☐
3)	Waste reduction/management	☐	☐	☐
4)	Introduction or strengthening of sustainable mobility	☐	☐	☐
5)	Tree planting (commitment to reforestation projects or tree planting to mitigate climate impact or restore degraded ecosystems)	☐	☐	☐
6)	Carbon credits (purchase of certificates related to projects that contribute to reducing greenhouse gas emissions or absorbing CO2)	☐	☐	☐
7)	Other (please specify_____)	☐	☐	☐
8)	Still uncertain (EXCLUSIVE)	☐	☐	☐

(IF YOU ANSWERED AT LEAST ONE CODE 1 "YES" TO Q3 OR Q6)

9)	**THE DECISION OF YOUR COMPANY TO INVEST IN REDUCING EXPOSURE TO CLIMATE RISK (PHYSICAL OR TRANSITION) IS DUE TO:** *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Request from financing banks	☐	☐	☐
2)	Pressure from other financiers (shareholders, bondholders)	☐	☐	☐
3)	Pressure from suppliers to be more green	☐	☐	☐
4)	Pressure from customers to be more green	☐	☐	☐
5)	Regulatory pressure (e.g., standards, regulations, etc.)	☐	☐	☐
6)	Individual sensitivity of the company/management to the issue	☐	☐	☐
7)	Previous experience of losses suffered by the company (or other companies in the same sector) due to extreme events	☐	☐	☐
8)	Increase in energy prices	☐	☐	☐
9)	Pursuit of competitive advantage	☐	☐	☐
10)	Other (please specify_____)	☐	☐	☐

10)	**WHAT DO YOU CONSIDER TO BE THE MAIN OBSTACLES TO GREEN ("SUSTAINABLE") INVESTMENTS IN YOUR COMPANY?** *(MAX 3 RESPONSES IN ORDER OF IMPORTANCE)*			
		First	**Second**	**Third**
1)	Insufficient financial resources within the company	☐	☐	☐
2)	High costs of green investments	☐	☐	☐
3)	Current energy costs are too high	☐	☐	☐
4)	Insufficient or absent external financing or lack of knowledge about it	☐	☐	☐
5)	General uncertainty about the future/difficulty in planning	☐	☐	☐
6)	Lack of internal or external expertise (e.g., employees, consultants, etc.)	☐	☐	☐
7)	Lack of interest in the issue/limited knowledge of the positive effects of environmental sustainability investments	☐	☐	☐
8)	Other difficulty (please specify_____)	☐	☐	☐
9)	No difficulty (EXCLUSIVE)	☐	☐	☐

C. EMISSIONS

11)	HAS YOUR COMPANY FORMALLY SET SPECIFIC OBJECTIVES FOR REDUCING CO2 EMISSIONS?	
1)	Yes	☐
2)	No	☐

(IF YOU ANSWERED "YES" TO Q11)

12A)	IN THE LAST THREE-YEAR PERIOD 2021-2023, WHICH OF THE FOLLOWING MEASURES HAS YOUR COMPANY IMPLEMENTED?	
1)	An investment plan for mitigation towards a target of reducing net CO2 emissions by less than 55% by 2030	☐
2)	An investment plan for mitigation towards a target of reducing net CO2 emissions by between 55% and 75% by 2030	☐
3)	An investment plan for mitigation towards a target of reducing net CO2 emissions by more than 75% but not total reduction by 2030	☐
4)	An investment plan for total (100%) reduction of net CO2 emissions by 2050	☐
5)	Other (please specify _____)	☐

(IF YOU ANSWERED "YES" TO Q11)

12B)	IN THE UPCOMING THREE-YEAR PERIOD 2024-2026, IS THE INVESTMENT PLAN FOR REDUCING NET CO2 EMISSIONS IMPLEMENTED BETWEEN 2021 AND 2023 CONFIRMED?	
1)	Yes, and it has also been increased (for investments and/or CO2 reduction targets) *(NOT VISIBLE IF D12A=4)*	☐
2)	Yes, it has been fully confirmed (for investments and/or CO2 reduction targets)	☐
3)	Yes, but it has been decreased (for investments and/or CO2 reduction targets)	☐
4)	No, it has not been confirmed (investments and CO2 reduction targets have been zeroed out)	☐

13)	**DOES YOUR COMPANY HAVE A CO2 EMISSIONS MEASUREMENT SYSTEM?** *(ONE RESPONSE PER ROW)*			
		Yes	**No, but intends to adopt it in the next three-year period 2024-2026**	**No / Will possibly do it after 2026**
1)	**Direct emissions** (Scope 1 - i.e., from resources owned or directly controlled by the company, such as emissions from industrial processes and production)	☐	☐	☐
2)	**Indirect emissions**, but controllable by the company (Scope 2 - i.e., emissions from purchased energy, typically electricity from renewable sources)	☐	☐	☐
3)	**Indirect emissions** and not controllable by the company (Scope 3 - i.e., all indirect emissions that occur in the value chain of the company, such as during the transportation and distribution or disposal of goods or services after they have reached the consumer, the end-use of sold products and services, etc.)	☐	☐	☐

D. SUSTAINABILITY REPORTING, COMMITTEE AND REMUNERATION

14)	**DOES YOUR COMPANY PREPARE A SUSTAINABILITY REPORT?** *(SINGLE RESPONSE)*	
1)	Yes, subject to assurance (compliance check by external auditors)	☐
2)	Yes, not subject to assurance	☐
3)	No	☐

(IF YOU ANSWERED 1) or 2) to Q14)

14A)	**SPECIFICALLY, SINCE WHICH YEAR HAS YOUR COMPANY BEEN PREPARING THE SUSTAINABILITY REPORT?**
	|__|__|__|__| Year

15)	**DOES YOUR COMPANY HAVE A PERSON OR BODY RESPONSIBLE FOR THE ENVIRONMENTAL/SUSTAINABILITY STRATEGY?**	
1)	Yes	☐
2)	No, but intends to introduce one	☐
3)	No, and does not intend to introduce one	☐

(IF YOU ANSWERED 1 TO Q15)

15A)	**SPECIFICALLY, SINCE WHICH YEAR HAS YOUR COMPANY HAD A PERSON OR BODY RESPONSIBLE FOR THE ENVIRONMENTAL/SUSTAINABILITY STRATEGY?**
	|__|__|__|__| Year

16)	**DOES YOUR COMPANY HAVE A REMUNERATION SYSTEM FOR EMPLOYEES LINKED TO ACHIEVING CLIMATE TARGETS?**	
1)	Yes	☐
2)	No, but intends to introduce one	☐
3)	No, and does not intend to introduce one	☐

(IF YOU ANSWERED 1 TO Q16)

16A)	**SPECIFICALLY, SINCE WHICH YEAR HAS YOUR COMPANY HAD A REMUNERATION SYSTEM FOR EMPLOYEES LINKED TO ACHIEVING CLIMATE TARGETS?**
	|__|__|__|__| YEAR

(IF YOU ANSWERED 1 OR 2 TO Q16)

17)	**FOR WHICH PROFESSIONAL LEVELS HAS YOUR COMPANY IMPLEMENTED OR PLANS TO IMPLEMENT A REMUNERATION SYSTEM LINKED TO CLIMATE TARGETS?** *(POSSIBLE MULTIPLE RESPONSES)*	
1)	Executives	☐
2)	Managers	☐
3)	Employees	☐
4)	Workers	☐
5)	Interns/Apprentices	☐
6)	Still uncertain (VISIBLE IF D16=2) (EXCLUSIVE)	☐

E. GREEN FINANCE

18)	IS YOUR COMPANY AWARE OF THE RECENT LEGISLATIVE DEVELOPMENTS IN SUSTAINABLE FINANCE (I.E., CONSIDERING ENVIRONMENTAL, SOCIAL, AND GOVERNANCE FACTORS IN INVESTMENT DECISIONS) ADOPTED BY THE EUROPEAN UNION (CSRD, CSDDD, EUROPEAN TAXONOMY, ETC.)?	
1)	Yes	☐
2)	No	☐

(IF YOU ANSWERED 1 TO Q18)

18A)	AND, SPECIFICALLY, HAVE YOU PARTICIPATED IN TRAINING ACTIVITIES RELATED TO SUSTAINABLE FINANCE?	
1)	Yes	☐
2)	No	☐

If you answered at least one "Yes" to Q3, meaning you made investments in the three-year period 2021-2023

19)	HAS YOUR COMPANY BENEFITED IN THE LAST THREE YEARS (2021-2023) FROM GREEN FINANCING MEASURES (E.G., GREEN LOANS, GREEN BONDS, GREEN LOANS, ETC.)? *(POSSIBLE MULTIPLE RESPONSES)*	
1)	Yes, to reduce physical risk	☐
2)	Yes, to reduce transition risk	☐
3)	Yes, for other purposes (please specify_____)	☐
4)	No (EXCLUSIVE)	☐

(IF YOU ANSWERED 1) or 2) or 3) to Q19)

20)	WAS THE INTEREST RATE APPLIED ADVANTAGEOUS COMPARED TO AN EQUIVALENT CONVENTIONAL (NON-GREEN) LOAN?	
1)	Yes	☐
2)	No	☐

F. ENVIRONMENTAL PROGRAMS

21)	**HAS YOUR COMPANY JOINED THE UN GLOBAL COMPACT?** **(IF YES) SINCE WHICH YEAR?**	
1)	Yes	□_____ Year
2)	No, but plans to join	□
3)	No, although aware of it	□
4)	No, not aware of it	□

22)	**HAS YOUR COMPANY JOINED THE SCIENCE BASED TARGETS INITIATIVE (SBTI) (THE SCIENTIFICALLY SUPPORTED EMISSIONS REDUCTION PROGRAM)?** **(IF YES) SINCE WHICH YEAR?**	
1)	Yes	□_____ Year
2)	No, but plans to join	□
3)	No, although aware of it	□
4)	No, not aware of it	□

23)	**DOES YOUR COMPANY HOLD ANY OF THE FOLLOWING ENVIRONMENTAL CERTIFICATIONS?** **(IF YES) SINCE WHICH YEAR?** *(POSSIBLE MULTIPLE RESPONSES)*	
1)	UNI EN ISO 14001 Environmental Management	□ Year |__|__|__|__|
2)	ISO 50001 Energy Management Systems	□ Year |__|__|__|__|
4)	Other (Please specify_____)	□ Year |__|__|__|__|
5)	No, none (EXCLUSIVE)	□

G. OWNERSHIP AND LEGAL FORM

24)	IS YOUR COMPANY LEGALLY CONSTITUTED AS A BENEFIT CORPORATION?	
1)	Yes	☐
2)	No	☐

25)	WHO ARE THE SHAREHOLDERS HOLDING MORE THAN 20% OF THE COMPANY? *(POSSIBLE MULTIPLE RESPONSES)*	
1)	Family members, including through companies	☐
2)	Private investors (individuals) not from the same family	☐
3)	Investment funds (including Venture Capital, Private Equity, etc.)	☐
4)	Corporations, other than those potentially linked to a family owner	☐
5)	Multinationals	☐
6)	Publicly controlled companies (e.g., municipalities, public entities, other territorial entities, etc.)	
7)	Other (please specify_____)	☐

H. EXPECTATIONS

26)	IN LIGHT OF THE RISING ENERGY COSTS, HOW DO YOU EVALUATE THE PERFORMANCE OF YOUR REVENUES IN 2023 COMPARED TO 2022?	
1)	Extremely negative, jeopardizing the survival of the company	☐
2)	Moderately negative	☐
3)	Unchanged	☐
4)	Moderately positive	☐
5)	Extremely positive	☐

I. BIODIVERSITY

27)	**IS THE TOPIC OF BIODIVERSITY KNOWN WITHIN YOUR COMPANY?** *(SINGLE RESPONSE)*	
1)	Yes, we are aware of it	☐
2)	Yes, we are exploring the topic further	☐
3)	No, we are not familiar with it	☐

(IF YOU ANSWERED 1 OR 2 TO Q27)

28)	**IS BIODIVERSITY FORMALLY INCLUDED IN YOUR COMPANY'S SUSTAINABILITY POLICIES (E.G., MENTIONED IN THE SUSTAINABILITY REPORT)?**	
1)	Yes	☐
2)	No	☐

(IF YOU ANSWERED 1 TO Q28)

29)	**AND SPECIFICALLY, IS THE TOPIC OF BIODIVERSITY A SPECIFIC SUBJECT OF…**	
1)	Strategic guidelines and/or investment plans aimed at limiting impacts on biodiversity and risks from its deterioration?	☐ YES ☐ No
2)	Strategic guidelines and/or investment plans aimed at pursuing new business growth opportunities (e.g., differentiation and innovation)?	☐ YES ☐ No

8.2 Glossary of the questionnaire

Term	Definition	Reference to the questionnaire (question number/s)
Benefit Corporation	A Benefit Corporation is a legal form of business in Italy that allows companies, in addition to the goal of profit-sharing, to pursue one or more public benefit purposes in a responsible, sustainable, and transparent manner toward people, communities, territories and environment, cultural and social assets and activities, entities, and associations, and other stakeholders. This orientation is included in the company's articles of incorporation.	21
Biodiversity	The variability of life forms at the genetic, species, and ecosystem levels; often identified with the number of species inhabiting the Earth. Biodiversity combines with non-living resources to form ecosystems (forests, farmlands, coasts, oceans, and urban parks). These ecosystems are essential for the well-being of humans and businesses as they provide provisioning services (e.g., food, fuel, fibers); regulating and maintenance services (e.g., climate regulation, pollination, soil fertility, water quality, mitigation of extreme adverse events); and cultural services of spiritual, aesthetic, religious, tourism, and recreational value (e.g., natural parks, eco-tourism, psychological and physical well-being).	3,4,24,25
Business Model	A business model is the logical structure that describes how a company creates value, identifies customers, offers products/services, and earns profits through operational and financial strategies.	4
Climate Risk	Climate risk refers to the potential impacts on an organization resulting from climate change.	25
Climate Targets	Corporate goals of reducing emissions and eventually achieving net zero, which illustrate three important dimensions: (1) the range of emission sources and activities included; (2) the timeline; and (3) how companies plan to achieve these goals.	13
Competitive Advantage	Competitive advantage represents the set of characteristics, resources, or strategies that allow a company to differentiate itself	6
CSDDD (Corporate Sustainability Due Diligence Directive)	The Corporate Sustainability Due Diligence Directive aims to make sustainability due diligence mandatory for companies operating in the European Union. The goal is to promote responsible and sustainable business practices, protect human rights, preserve the environment, and improve transparency within business activities.	15
CSRD (Corporate Sustainability Reporting Directive)	The Corporate Sustainability Reporting Directive focuses on the communication of non-financial and sustainability information by companies. This directive aims to improve the transparency and consistency of information disclosed by companies regarding environmental, social, and governance (ESG) issues, integrating them into their financial reports.	15
Environmental and Sustainability Strategy	An environmental and sustainability strategy is a programmatic document prepared by an organization to achieve specific sustainability goals within a defined timeframe. A sustainability	12

	strategy should include objectives, actions, dates, and available resources.	
European Taxonomy	The European Taxonomy refers to a classification system that identifies sustainable economic activities for investment purposes. This classification helps investors identify and select investments that promote environmental sustainability, providing transparency and consistency in economic activities considered "green" or sustainable.	15
Exposure to Climate Risk	Exposure to climate risk refers to the possibility that people, assets, and ecosystems may be affected by climate change	6
Greenhouse Gases (GHG)	Greenhouse gases are atmospheric compounds like carbon dioxide, methane, and water vapor that trap heat in the planet's atmosphere, causing the greenhouse effect, a global warming phenomenon that affects Earth's climate.	10
Mitigation	Mitigation refers to any action taken by governments, businesses, or individuals to reduce or prevent the emission of greenhouse gases.	9
Physical Risk	Physical climate risk refers to potential negative effects caused by acute climate events (such as floods and wildfires) or chronic events (such as sea level rise, chronic drought).	2,3,4,16
Renewable Energy Sources	Renewable energy sources derive from natural resources such as the sun, wind, water, and biomass, which are harnessed to produce clean and sustainable energy, helping to reduce the environmental impact of energy activities.	5
SBTi (Science Based Targets Initiative)	The Science Based Targets Initiative is a collaborative initiative aimed at helping businesses set greenhouse gas emission reduction targets in line with global efforts to limit the rise in average global temperature.	19
Sustainability Report	A Sustainability Report is a document prepared by an organization that provides information on the organization's economic, environmental, social, and governance performance and impacts over recent years.	11
Sustainable Finance/Green Financial Instruments	Sustainable finance focuses on responsible investments that support sustainable development and aim to reduce or mitigate negative impacts on the environment and society. This approach can include investments in renewable energy, energy efficiency projects, socially responsible enterprises, and more.	15
Sustainable Mobility	Sustainable mobility refers to a transportation system that minimizes environmental, social, and economic impact. It is based on using transportation modes that consume fewer resources, produce fewer polluting emissions, and foster a better impact on the environment and quality of life.	5
Transition risk	Transition risks are the possible effects associated with the transition to a low-carbon global economy. They may involve policy and legal actions (such as implementing a carbon tax), technological changes, market responses, and reputational implications for companies.	2,3,5,16
UN Global Compact	Since 2000, the Global Compact has been a voluntary initiative inviting businesses to adopt universal principles and fundamental values in the areas of human rights, labor, environment, and anti-corruption. This includes respecting human rights, ensuring decent working conditions, adopting sustainable practices to protect the environment, and fighting corruption.	18