

Sustainability Certifications and their impact on market shaping

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Abstract

Inside the market shaping literature, sustainability certifications have become a key instrument in regulating it. This thesis aims to explore how certifications influence the construction and the transformation of markets rather than merely reflecting existing practices in market-shaping perspective. By using a qualitative, interpretivist approach based on document analysis about international certification systems, this study helps with a classification of the meain scope and actors on this field. Four core mechanism are identified through which certifications act as market shapers: legitimacy and trust creation, standardization, regulating market access, and fostering innovation. The findings highlight the performative role of certifications as proactive player and institutional tools that stabilize and transform market structures. The thesis contribution falls under the market shaping theory literature. By linking performativity and institutional perspective it presents managerial implications for firms seeking to understand the impact certifications can have once strategically implemented.

All'interno della letteratura sul *market shaping*, le certificazioni di sostenibilità sono diventate uno strumento chiave nella regolazione dei mercati. Questa tesi mira a esplorare in che modo le certificazioni influenzino la costruzione e la trasformazione dei mercati, piuttosto che limitarsi a riflettere pratiche già esistenti, in una prospettiva di market shaping. Attraverso un approccio qualitativo e interpretivista basato sull'analisi documentale di sistemi di certificazione internazionali, lo studio contribuisce a classificare l'ambito principale e gli attori coinvolti in questo campo. Vengono individuati quattro meccanismi fondamentali attraverso cui le certificazioni agiscono come strumenti di market shaping: creazione di legittimità e fiducia, standardizzazione, regolazione dell'accesso al mercato e promozione dell'innovazione. I

risultati evidenziano il ruolo performativo delle certificazioni come attori proattivi e strumenti istituzionali in grado di stabilizzare e trasformare le strutture di mercato. Il contributo della tesi si colloca all'interno della letteratura sulla market shaping theory. Collegando la performatività e la prospettiva istituzionale, essa offre inoltre implicazioni manageriali per le imprese che vogliono comprendere l'impatto che le certificazioni possono avere quando vengono implementate in modo strategico.

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1. Introduction

During the last recent years, sustainability has moved up to the center of many businesses strategy, regulations as well as consumer awareness. The rise of urgency among themes like environmental and social concerns, turned sustainability certifications from well-known eco-labels to complex governance standard. By doing so companies can give a clear signal of responsibility towards every stakeholder while align with rising expectation. These tools are normally considered as a measuring instrument for compliance or performance, but they actually play a much broader role by shaping the markets they're meant to monitor. An interesting effect is also linked to the creation and help in the creation of new markets and business.

In recent years, a growing number of companies have emerged whose main business is to develop and sell sustainability certification systems. These firms don't just respond to market trends; they actively participate in constructing what sustainability means in different sectors, and in some cases, they open up entirely new areas of economic activity. Sustainability certifications serve many different purposes and market shaping is probably an indirect consequence of it. Looking closely at the voluntary certifications specifically are these who are building trust among large group of stakeholders such as consumers, investors, and supply chain partners; all of this happening thanks to the offer of a recognizable signal of practices (Potoski & Prakas, 2005).

It is common for organizations to often use certifications to reassure that they are meeting certain environmental or social standards, but this proliferation of labels has led to concerns about greenwashing. This is the unwanted scenario where companies may exploit loosely

defined criteria or selectively disclose information just to appear "sustainable" without substantive change. The whole sustainability movements mirrored also in the financial markets with the launch of exchange-traded funds (ETFs) designed into selected sustainable companies even though from times to time these criteria was based more on marketing rather than on rigorous impact assessment.

Sustainability is a broad theme to analyze with many areas of focus, within this broad view in this elaborate the goal will be to assess how certifications are able to shape markets. This is a focus area relatively underexplored compared to others in the same field. The thesis looks at sustainability certifications not just as neutral actors but as active forces that can influence market shape. Exploring how these certifications influenced the structure of markets by the role played depending on the actor whether institutional or private. To do so, this work takes a constructionist and interpretivist perspective, a view that sees markets as social arenas, shaped by meaning, negotiation, and interaction, rather than as fixed systems governed by mathematical rules or universal economic laws (Berger & Luckmann, 1967; Guba & Lincoln, 2008). By saying that it means I will refer to scholars such as Callon (1998) and Kjellberg & Helgesson (2006) who have shown that markets are not simply objects to analyze but they are actively performed. To borrow from Abolafia (1998), who contributes to Callon's volume The Laws of the Markets, markets are best seen as systems of interconnected social relationships and shared cultural meanings, continually constructed through the everyday interactions of those who participate in them.

The main question driving this research will try to understand if and how certification tools shape the market they measure. Trying to give a broad overview of this theme and to understand the power of these instruments I will divide the elaborate into five main sections. Each section

has a different scope, and it is divided following a funnel structure in order to reach this broad starting view about the overall topic.

The structure of the thesis will follow, first a short literature review to better understand the state of research and understand how markets are shaped and with what kinds of mechanisms do they work. Then, I will map out and categorize different types of sustainability certifications to see how they vary across sectors and levels (from products to entire supply chains). Once that foundation is set, I will analyze how these certification schemes have influenced the behavior and strategies of companies that use them, whether by changing their products, shifting internal processes, or helping them enter new market segments. My goal is to identify recurring patterns or themes using a Grounded Theory method (Glaser & Strauss, 1967), paying particular attention to how certifications contribute to things like legitimacy, market access, and competitive positioning.

My personal interest into the field of sustainability made me write a thesis about this specific topic. Knowing that it is a hot trend at the moment I hope that this work can be helpfulf for future research and for small medium sized businesses that can’t have the resources to have access to these themes. It is quite small compared to other theme in the academic literature but in recent years it is growing very fast. This growth can induct to confusion and the risk of being left behind. That’s why I decided to write following this wide structure at first to then dive more into details once the text goes on.

2. Market shaping literature review

2.1 From static to Constructed markets

Over the past two decades, the concept of market shaping has gained significant traction in the fields of marketing, management, and economic sociology. A critical consideration is about how we consider markets themselves. The different lenses that we put on will substantially change the way we treat them. The first way of looking at markets is as static, pre-existing entities governed solely by impersonal forces of supply and demand. Today, an opposite idea driven by contemporary scholarship increasingly recognizes markets as dynamic, socially constructed systems that are continuously influenced, constructed, and reshaped by the strategic actions of various market actors. These two different ways of looking at markets have influenced the literature accordingly. I will refer to market shaping as the active and strategic efforts by firms and market actors to influence, construct, and reshape market systems, structures, and relationships. If we stick to this perspective, then we will look at markets not as transactional static spaces but as socially constructed, adaptive, and complex systems with the ability to transform through actor interactions and institutional change (Nenonen & Storbacka, 2021; Vargo & Lusch, 2017). When we start looking at markets from this new lens, then we need to acknowledge that they are not simply "out there" waiting to be discovered or entered; but rather, markets are constantly being created and modeled through the actions of a broad number of stakeholders such as organizations, consumers, and regulators. Historically speaking, for much of the twentieth century, mainstream economic and management theories have always conceptualized markets as something objective, made of given structures where supply and demand met, and where firms could only adapt to existing conditions. This view treated markets as pre-existing realities, largely immune to deliberate intervention by market

actors (Callon, 1998; Fligstein, 2001). In this spectrum of ideas the possibility that markets could be actively constructed or shaped was, at best, peripheral to the dominant paradigm.

2.2 Actor-Network Theory and Performativity

The important switching point arrived in the late 1990s with the work of Michel Callon, who introduced the concept of the performativity of markets. The introduction of a novel way of thinking about markets that radically departs from traditional economic representations marked an important shift. In his seminal volume, The Laws of the Markets, Callon (1998) argued that markets are not pre-existing entities but are continuously constructed and performed through the practices, devices, and interactions of both human and non-human actors. As we said this was a revolutionary view on markets that completely turned upside the previous concepts. The theory that has followed next was developed in the 1980s by Michel Callon, Bruno Latour, and John Law as a framework within science and technology studies to explore how scientific facts and technologies are socially constructed through networks of relationships.

This argument was supported in his work thanks to the developed through the years of a framework called the Actor-Network Theory (ANT), which challenges the idea that markets, technologies, and institutions exist as static entities. Foundational works include Callon's "Some Elements of a Sociology of Translation" (1986), Latour's Science in Action (1987), and Law's Technology and Heterogeneous Engineering (1987). It is interesting to highlights that initially the theory was focused on laboratories, innovation, and scientific practices. Only later was applied to economic life, most notably in the volume The Laws of the Markets (Callon, ed., 1998). Diving into it we see that at the core of ANT is the principle that all actors, whether people, organizations, documents, or technologies, gain their identities and capacities not in isolation but through their relationships within a network. One of the most important processes described by ANT is "translation," which refers to the way actors seek to align interests,

mobilize allies, and stabilize networks. It also introduces the idea of "performativity," a concept that overlaps with Callon's (1998) claim that economics, and the tools derived from economic logic, does not merely describe markets but actively shapes them. To understand the concept of Performativity in this context we have to refer again to the idea that theories, models, or systems do not merely describe a reality but actively participate in shaping it. For example, a model of economic behavior, once widely adopted, can structure the way firms operate and make decisions, thus bringing about the very behavior it predicted. Once a network or a series of practices becomes stable and its inner foundations are no longer a topic to be questioned, ANT describes it as having become "blackboxed." So, a blackbox is a system whose inputs and outputs are accepted without scrutiny of the processes within. When time passes everything comprehending Technologies, metrics, standards, or even ideologies can become blackboxed. Once it reaches this status it will be treated as self-evident or natural, and their associated networks will be stabilized and embedded into everyday practices. It is still important to point out that it is true that ANT provided a powerful lens for understanding the distributed agency of markets, but it has been criticized for its ontological flatness. That's due to the treatment of all actors (human and non-human) equally, which may obscure power asymmetries and the role of intentionality in market shaping. Strategic actors in markets, such as firms or policymakers, often operate with explicit goals, which ANT underplays.

2.3 Market-Shaping Theories

In the years following Michel Callon's foundational work on the performativity of markets, the literature on market shaping evolved into several different important directions, with scholars both building upon and critically engaging with Callon's ideas and others developing new theories. The performativity perspective view was extended and studied also by other researchers such as Kjellberg and Helgesson (2006, 2007) by emphasizing the role of "market

practices" in the construction of markets. Remarking on the previous theory, they argued that markets are assembled through a variety of practices, these practices vary from exchange to representational and normalizing. Since each practices have a different influence that lead to a different outcome, this can be seen as a way to shape a market since each practices has a different influence that lead to a different outcome.

When all practices are put together, they produce and stabilize what we recognize as a market. The two authors wrote an influential paper named "Multiple Versions of Markets: Multiplicity and Performativity in Market Practice" (2006), in which they remarked the idea previously explored in the literature that markets are not singular stable entities but are instead continuously enacted and re-enacted through the practices of various actors. The emphasis was on the developed idea that markets are always multiple, with different actors, such as firms, regulators, and consumers. Each actor is producing, overlapping and sometimes competing inside different versions of the same market through their activities and interactions (Kjellberg & Helgesson, 2006). So, depending on the actors and different circumstances the market takes a different shape, this means that different versions of the same market coexist and are almost individually tailored.

So, following this reasoning the introduction of a new regulation can be the reason behind the shaping of a market. Inside this view there are several possible actors and practices that can have an impact, but the three core identified types that together constitute and have the biggest impact on market shaping are: exchanging, representational and normalizing practices.

Exchanging practices involve the concrete activities that fulfill economic transactions, including presenting products, setting prices, and negotiating terms of payment and delivery. These are those that stabilize the conditions necessary in an environment for exchange to occur.

Second, representational practices refer to how markets are depicted and understood, such as through market segmentation, sales statistics, and consumer research reports, which make markets more manageable and interpretable.

Third, normalizing practices, they establish the rules, standards, and expectations that govern market behavior, including formal or informal contracts that define what can be offered, who can participate, and how exchanges should take place. Especially this third segment of practices are the ones that can already justify the possible impact of sustainability certifications as a market shaper actor. A new service-dominant logic perspective is adopted by Kjellberg and Helgesson who emphasize resource integrations and value-cocreation as a central point in market practices. This form of performativity is a translation process in which theories, classifications and theoretical standards are moved from conceptual framework into market realities. In their 2007 paper, "The Mode of Exchange and Shaping of Markets," Kjellberg and Helgesson further explore how the organization of exchanges influences market configurations. In the paper they use the historical case of the Swedish post-war food industry as an example, they show that by introducing centralized warehousing and standardized pricing from distributors, the relationships between producers, retailers, and consumers were altered in a way that reshaped markets. In this case we can see how market boundaries were redefined and how various actors changed their role illustrating that market shaping involves usually the reconfiguration of the entire system of exchange, not just individual projects or firms (Kjellberg & Helgesson, 2007).

2.4 Market-Shaping Theories

Following studies built on these insights come from Strobacka and Nenonen (2001, 2015) who developed a strategic approach perspective on market shaping. The two authors argued that firms can deliberately modify market configurations. In their piece of work a new concept was

introduced: marketness. It refers to the degree of stability and institutionalization presence in a market and actor clout, which is the actual power that actors have to proactively influence market structures. A core finding in their research is that market shaping is more feasible in unstable or emerging markets where the institutional agreements are fluid and this allows companies to install new configuration through coordinated activities (Storbacka & Nenonen, 2011; Nenonen & Storbacka, 2018). The impact and relevance of the different stakeholder involved in this is well analyzed in these papers. Either a proactive strategy operated by a group a group of coordinated companies or a more normal structured evolution of the market caused by technological advance, market shaping has always different degree of changes. Storbacka and Nenonen, together with Windahl, have delineated four generic market-shaping strategies that lead to substantial different outcomes: market disruption, market widening, market maintenance, and market reduction (Nenonen, Storbacka, & Windahl, 2019). Each one of this 4 strategies show a different level of impact that actors or regulation can have in defining and shaping a market. In some case the action of an actor has a substantial impact on changing the business model of all companies operating in the same market, resulting in a great expansion or literally by creating a completely new one. Market disruption is by far the most radical way of market shaping, several actors can be the cause of this especially technological advance. For example, the emergence of digital platforms such as Amazon, Airbnb, and Uber is cited as a classic case of market disruption; these firms did not merely enter existing markets but redefined the very nature of retail, accommodation, and transportation by introducing new actors, activities, and value propositions (Nenonen, Storbacka, & Windahl, 2019; Nenonen, Storbacka, & Windahl, 2019). Market widening, by contrast, involves expanding the market to include new participants or uses. They justify this division by providing practical examples. The case of Gasum developing the infrastructure for liquefied natural gas in Sweden is a concrete one: by a concrete action of the company, investing in infrastructure, Gasum enabled

new actors to join the market, thereby increasing adoption and market size (Ottosson, Magnusson, & Andersson, 2020 in Nenonen, Storbacka, & Windahl, 2019). Sometimes more market shaping outcomes can be seen combined at once, like for example Uber's strategy of reducing prices to undercut incumbent taxi companies, which not only attracted more customers but also brought new drivers into the ride-hailing market, effectively widening the market's boundaries (Christensen et al., 2015 in Nenonen, Storbacka, & Windahl, 2019). When talking about market maintenance we refer to all the strategies used and aimed at preserving or improve incrementally the existing market configurations. This often happens by reinforcing established norms, standards or relationships. The phenomenon is particularly relevant in highly institutionalized market where stability holds a great value, and big radical changes are avoided. Finally, market reduction entails contracting the market or delegitimizing certain segments, which can occur in response to societal or regulatory pressures. For instance, regulatory actions that phase out certain technologies or business models, such as the gradual elimination of coal-based power in favor of renewables, are examples of market reduction strategies at work. These 4 strategies have different impacts and different outcomes but each one of them helps understand how a market is shaped by the different actions implemented from various stakeholders. It remarks the idea that markets can be shaped internally by companies or externally by other institutions that might not even operate as business in that sector but through regulations and requirements they have an impact on market shaping. Storbacka and Nenonen's work argue also that successful market shapers must articulate a compelling market vision and mobilize a coalition of actors around that vision, often by offering system-level incentives and demonstrating the benefits of the new configuration (Storbacka & Nenonen, 2011). The literature on market shaping got expanded by other scholars right after laying out this strategic and configurational perspective. The expansion, which led into a broader debate involving multiple theoretical streams, was driven by scholars such as Fligstein (2001) and Scott (2008).

In this new view the role of institutional power and legitimacy was emphasized, while arguing that market shaping is always embedded in, and constrained by existing social and regulatory structures. By highlighting the constitutive role of calculative devices and material arrangements in market formation, Callon's performativity thesis is continuing to strongly influence the field of research of market shaping. In some more recent works market shaping is framed as a contest over value definitions and category creation, while at the same time other critical voices like Miller (2002) warn the public that practice-based and performative approaches can sometimes overlook power dynamics and institutional inertia. However, these perspectives on market shaping have been both complemented and challenged by a range of other influential contributions. In regard of that, the literature identifies three pioneering streams: proactive market orientation (Narver, Slater, & MacLachlan, 2004), market-driving strategies (Jaworski, Kohli, & Sahay, 2000), and the already mentioned performativity in markets (Kjellberg & Helgesson, 2006). Proactive market orientation focuses on firms' ability to anticipate and shape latent customer needs, while market-driving strategies emphasize the capacity of firms to alter market structures and rules, often by redefining value propositions or creating new categories (Jaworski et al., 2000; Narver et al., 2004). Talking about the current state of recent research, then we see a steam of authors that have also adopted a configurational perspective by using methods like fuzzy-set qualitative comparative analysis (fsQCA) to illuminate the complex, multi-causal pathways through which market-shaping strategies lead to market-level changes (Fiss, 2011; Ragin, 2008). By using this broad approach it's easier to reveal how market shaping is not deterministic but involves multiple and several alternative pathways with configurations, that each combine changes in offering, pricing, customer-side features, supply-side features, representations, and norms (Nenonen, Storbacka, & Windahl, 2019; Flaig et al., 2021). As a real example of the fsQCA method, with the analysis of 21 case firms, it was confirmed the non-redundancy of these six elements and identified six distinct

configurations for effective market shaping. Thanks to this analysis we can see that all six strategic elements: offering, pricing, customer-side features, supply-side features, representations, and norms, are non-redundant; each plays a distinct and necessary role in the market-shaping process. This model is complex and takes into account different factors that try to influence the shape of a market which cannot easily be studied individually. The problem with this configurational approach is that it can underscore the important role of systematic thinking in market shaping theories. Because it shifts the analytical focus from isolated firm actions to the big and broad ecosystem of interconnected actors who are contributing and affecting the shapin process (Nenone, Strobacka & Windahl, 2019). It is clear that this consideration still aligns with the most predominant views in the literature that market is seen as complex adaptative system in which deliberate interventions interact with emergent processes. In this scenario, outcomes are a result of both intentional design and spontaneous emergence (Vargo & Lush, 2016).

2.5 Institutional Perspectives

Another important further study in the market shaping theory field is the institutional perspective. This examines the way markets gain legitimacy and how actors' part of these markets can influence this institutionalized aspects of systematic markets. Examples of these aspects are product categories boundaries (Rosa et al., 1999), and shared meanings (Humphreys, 2010). This literature highlights the role of institutional work (Lawrence & Suddaby, 2006) and the recursive, co-created nature of market change, as seen in studies on the emergence of new market categories (Dolbec & Fischer, 2015; Ertimur & Coskuner-Balli, 2015). Legitimacy holds a central role in in this new perspective, it is seen as a prerequisite for the formation, maintenance and transformation of markets. The way legitimacy is achieved is when a market or a product perception is seen as appropriate, desirable and aligned with the

prevailing norms set by a broad set of stakeholders (Scott, 2008; Humphreys, 2010). Rosa et al. (1999) remarks this concept by showing that the emergence of new product categories is a collective process, where producers, consumers, and intermediaries negotiate and agree upon a prototypical identity for the category. This is not an automatic process, but in order to legitimate it in the eyes of the market and society, it requires the mobilization of economic, cultural, and sociopolitical resources (Rosa et al., 1999; Humphreys, 2010; Navis & Glynn, 2010). A wide range of institutional work mechanisms that actors can employ in market shaping has been identified in recent research, including advocacy, defining, constructing identities, changing normative associations, and altering boundaries (Lawrence & Suddaby, 2006; Kaartemo et al., 2020). For example, in his research Kaartemo et al. (2020) identify how public actors in three different market-shaping contexts use 20 granular mechanisms of institutional work, showing that public actors are not homogeneous and may support competing institutional logics even within the same market. It was defined then that institutional work can also be proactive and span regulative, normative, and cultural-cognitive dimensions. This extends the normal traditional view of reactive roles usually attributed to public actors (kaartemo er al., 2020). As man example, the deinstitutionalization of markets is something that acan occur when the regulatory, normative, or cultural-cognitive pillars are undermined. THis leads to a decline or a transformation of established markets (Scott, 2010; Dacin & Dacin, 2007). As scholars keep seeking to deep and broader the understanding of how markets evolve and are influenced new areas of interests keep emerging in the market shaping field. A relevant advancement is carried on by the development of meta-analytical and processual perspectives. These new points of view provide a structured view of markets shaping as a phased process. This allowed to have a bigger and more comprehensive picture of the state-of-the-art. Flaig, Kindström, and Ottosson (2021) wrote a paper about a a qualitative meta-analysis of 79 case studies. They identified 20 generalized market-shaping activities which were organized into three distinct main phases:

infusion, formation, and retention. First, the infusion phase, is the one that involves introducing new ideas, practices, or technologies into the market context. Secondly the formation phase comes, this consists in the alignment and coordination of actors around these innovations, leading to the emergence of new market structures and routines. Retention phase is the last one who focuses on stabilizing and institutionalizing the new configurations in order to ensure stability under the form of durability and legitimacy. This phased framework developed by the authors offers a practical tool for both researchers and practitioners to analyze and design market-shaping strategies (Flaig, Kindström, & Ottosson, 2021). Scholars such as Nenonen, Storbacka, and Windahl (2019) have focused more on the capabilities required for an effective market shaping. In this regard they have distinguished between triggering capabilities and facilitating capabilities. Those capabilities that initiate market change are the triggering ones, they sense opportunities and mobilize stakeholders. Facilitating capabilities instead support change through coalition building, resistance management and institutionalization. The literature also revisits foundational concepts from proactive market orientation and market-driving strategies. Foundational concepts such as proactive market orientation and market driving strategies were revisits from scholars. Rather than merely responding to existing condition, market-driving as a firm's capacity to proactively shape the market was introduced by the scholars Jaworski, Kohli, and Sahay (2000). The willingness to challenge established norms is carried out by these complementary perspectives. Part of this is due to a more proactive approach in the literature, where the role of companies seen as the key actor in market shaping dynamics is emphasized. Moreover, building on these insights, contemporary research increasingly adopts a multi-actor and systemic view of market shaping. Since markets are recognized as complex ecosystems shaped by a constellation of actors, it is more common for the new branches of literature to support the proactive view of market shaping. In this broad view the actors taken into consideration are firms, suppliers, regulators, NGOs, activists,

journalists, and the public. In more recent conceptual works such as the one carried out by Kindström et al. (2023), we can see how market shaping is considered as a joint of different strategies that integrate market and non-market environments. The focus here was about highlighting the importance of coalition-building with stakeholder alignment and the need for flexible adaptive strategies that are responsive to evolving system dynamics (Kindström et al., 2023). In a recent meta-analysis that included some conceptual reviews carried out by different authors including Flaig et al. (2021), some recurring patterns in market shaping literature were identified and synthetized for future research directions. The attest fell onto unexplored areas such as the consequences of market shaping, power imbalances and the operationalization as well as measurement of market-shaping activities and outcomes (Flaig, Kindström, & Ottosson, 2021). The identification of generalized market-shaping activities organized into different phases provide a practical framework for researcher. This approach clarifies market-shaping activities making it more understandable and accessible for both scholars and practitioners (Flaig, Kindström, & Ottosson, 2021). The focus of existing literature relies is usually on case studies from highly institutionalized or mature markets. The problem here is that focusing on this may neglect emerging markets impact in the market shaping theories, especially those in sustainability and social innovation, where shaping mechanisms may differ significantly. It is very likely to expect the strongest effects of market shaping practices in markets that are not yet mature. Usually, it has been seen those startups play an important role in market shaping thanks to their disruptive innovation. In summary, these emerging areas of interest enrich the market shaping literature by providing a comprehensive and nuanced understanding of market shaping as a complex, multi-actor, and multi-phase phenomenon,that counts the role of many players of strategy, institutions, power, and collaboration in market evolution.

3. Certification classification

3.1 Role and evolution of certifications

Sustainability certifications have evolved from niche eco-labels into central instruments for guiding and reshaping markets. From a market-shaping perspective, certifications are not passive measures but active devices that construct the institutional frameworks, competitive logics, and value definitions underpinning entire sectors. In this elaborate a good classification of the main scope and actors involved can help in order to analyze and study how these tools impact the theories just reviewed, by testing whether, and in what ways, they function as true market-shaping mechanisms in practice. The landscape of sustainability certifications has grown quite fast and now it is very diverse, its complexity can be more easily understood if approached through a funnel-like taxonomy. I divided certifications into five broad categories to have a clear and general overview that allows for a deeper and detailed research.

3.2 Typology by scope

Starting the funnel from broad, cross-sectoral frameworks and gradually moving toward narrow, niche certifications, the goal is to trace how sustainability governance moves from global norm-setting to highly specific market instruments. This structure reflects the layered nature of institutional arrangements in sustainability governance, where general frameworks provide overarching principles, sectoral and commodity schemes operationalize them in concrete industries, and thematic or niche certifications address targeted concerns or audiences. In this sense, certifications are not only compliance mechanisms but institutional devices that embed sustainability into markets at multiple scales (Cashore, Auld, & Newsom, 2004; Ponte, 2019).

If we start looking from the broadest level, sustainability certifications can be classified as global, cross-sectoral frameworks. Their role in sustainability governance is not merely technical but deeply normative: they establish a common vocabulary and a set of principles that different organizations, investors, regulators, and consumers can recognize and use as reference points. Such schemes are particularly significant because they help to reduce fragmentation and providing legitimacy for sustainability as a shared global concern (Abbott & Snidal, 2009). The most cited example is ISO 14001, part of the International Organization for Standardization's suite of environmental management standards. It is a special certification that sets a series of requirements for organizations with a focus on maintaining focus on continuous improvement instead of absolute performance levels. It has been adopted in more than 170 countries, cutting across industries from heavy manufacturing to services. To understand the importance of this certification, Delmas (2001) argue that the role played by ISO 14001 is so impactful that organizations are aligning to it not only for efficiency but in order to get legitimacy in the international market's environment. It is already possible to see notice how these certifications have an impact by setting standards replicated by many businesses across industries and countries. Another good example of a more recent but increasingly influential player is the already previously cited B Corp certification, developed by the nonprofit organization B Lab. This is a holistic certification which applies to companies regardless of industry, making it a powerful identity marker for firms positioning themselves as leaders in sustainability (Stubbs, 2017). Global cross-sectoral frameworks are a strong benchmark because they provide the institutional scaffolding on which more details and specialized certifications are built.

Moving into the second macro category analyzed we are looking at sector-specific certifications. These group of certifications usually emerge in response to a particular environment or some social challenges which are present in a specific industry sector. Unlike

cross-sectoral frameworks, these certifications target systemic issues within defined sectors, shaping how sustainability is understood and operationalized in industries such as forestry, fisheries, textiles, and tourism. The archetypal example of a sector-specific scheme is the Forest Stewardship Council (FSC) established in 1993, FSC created performance-based standards for responsible forest management, covering issues such as biodiversity protection, indigenous rights, and sustainable harvesting. A study to show how certification can create authority outside of regulation by setting an authority and influencing other supply chains and consumer behaviors was conducted by Cashore et al. (2004). As a similar example, the Marine Stewardship Council (MSC) was established to address overfishing and the degradation of marine ecosystems. This certification reshaped industry norms and procurement practices as shown in the study conducted by Gulbrandsen (2009). In all these examples, sector-specific certifications act as mechanisms of industry-wide governance, defining competitive standards and embedding sustainability into core practices.

A third deeper layer consists of commodity- and value-chain-specific certifications, which apply to the production and trade of specific goods across global supply chains. These certifications are very sectorial because they focus on particular specific identified commodities, yet their influence is often very wide due to the ubiquity of those commodities. Fairtrade is perhaps the most prominent example. The power of this tool resides in the fact that it certifies commodities with a worldwide presence, such as bananas or cocoa. Murray, and Heller (2007) argue that Fairtrade has reshaped the politics of commodity chains by embedding principles of social justice into global trade, something that was usually not the first priority for businesses. Value-chain governance is reconfigured by this strong commodity-based certifications. If certifications are required to have access to markets, then it's then when

downstream actors such as retailers and brand expert pressure upstream producers for creating sustainability improvements across the entire supply chain (Giovannucci & Ponte, 2005).

Getting close to the narrowest classification we can distinguish a fourth macro category in made up of issue-specific or thematic certifications, which respond to focused sustainability challenges such as carbon emissions, animal welfare, or gender equity. These certifications reflect the increasing specialization of sustainability governance, whereby stakeholders demand accountability on discrete aspects of corporate behavior rather than broad ESG performance. A good illustration of this trend comes from carbon neutral certification. Programs such as The Carbon Trust Standard or Climate Neutral Certification provide companies with a means to calculate, reduce, and offset greenhouse gas emissions. In the context of climate, as Doda (2016) notes, these schemes are particularly important in an area that is increasingly subject to both consumer and regulatory scrutiny. Even if usually third part stakeholder are those issuing the certifications, companies still use this instrument to show commitments in areas of growing public concern, even if their overall sustainability performance is less developed.

Reaching the very narrowest level we find certifications that includes niche or market-segment schemes. Those are tailored to very specific consumer audiences, geographic regions, or product types. While their scope and recognition may be limited, these certifications play an important role as laboratories for innovation in sustainability governance. The best examples in this case are all those regional or eco-labels for boutiques that aim ot preserve cultural heritage alongside sustainability principles. By appealing to a very niche of highly conscious customers, Ponte (2019) notes that even if these certifications do not influence a broadside of the market, they can still set examples for governance innovations that may later diffuse into the mainstream certification system.

The true significance of niche certifications lies not really in their commercial value but in their symbolic role for the relevant stakeholders. In this funnel, by moving from broad to narrow, it is easier to see how sustainability is institutionalized across different levels of market governance. At the top, universal frameworks establish legitimacy and global norms. At the middle, sectoral and commodity certifications operationalize sustainability in concrete industries and supply chains. At the bottom, issue-specific and niche certifications provide targeted accountability and innovation. This funnel structure shows that sustainability certifications are not merely evaluative instruments but complex governance devices that reconfigure market practices at multiple scales.

Table 1: Certifications overview

Category	**Description**	**Example of certification / Frameworks**
1. Global, Cross-Sectoral Frameworks	Broad systems applicable across industries and geographies. They set universal benchmarks and establish shared norms for sustainability governance.	ISO 14001 (Environmental Management Systems); United Nations Global Compact (Principles-based initiative); B Corp Certification (Holistic business impact standards); GRI Standards (Global Reporting Initiative for sustainability reporting); SA8000 (Social Accountability International standard).
2. Sector specific frameworks	Target specific industries, addressing systemic environmental and social challenges within a defined sector .	FSC (Forest Stewardship Council – responsible forestry); MSC (Marine Stewardship Council – sustainable fisheries); GOTS (Global Organic Textile Standard – textiles); Green Globe (Sustainable tourism & hospitality); LEED (Leadership in

		Energy and Environmental Design – buildings & construction).
3. Commodity and Value chain specific certifications	Focus on particular commodities, embedding sustainability into global supply chains.	Fairtrade (Coffee, cocoa, bananas, sugar, etc.); Rainforest Alliance (Agricultural commodities & forestry); UTZ Certified (Coffee, cocoa, tea, hazelnuts); RSPO (Roundtable on Sustainable Palm Oil); 4C Association (Common Code for the Coffee Community).
4. Issue specific/ Thematic certifications	Address targeted sustainability issues such as climate, carbon, animal welfare, or social equity	Carbon Trust Standard (Carbon emissions reduction); Climate Neutral Certification (GHG emissions accountability); Certified Humane (Animal welfare); Animal Welfare Approved (High animal welfare standards); EDGE Certification (Workplace gender equity & diversity); Fair Wear Foundation (Labor rights in textiles)
5. Niche/market segment certifications	Very specific to consumer niches, regions, or product types. Limited in scope but innovative and trend-setting.	Demeter Biodynamic Certification (Biodynamic agriculture, wines); EU Organic Wine Certification (Organic viticulture); EcoBoutique / EcoHotel Labels (Small-scale sustainable hospitality); Slow Food Presidia (Traditional, artisanal food products); FairWild (Sustainable wild plant harvesting)

Source: own illustration

Source: own illustration

3.3 Typology by Object of Assurance

After seeing how the landscape of the certification is built, going from broad wide industry ones to more specific sectorial certifications, another better filter to understand the potential influence that they might have on market shaping is by looking at what dimension are being certified. With this second classification the goal is to what's the object of assurance and the actors who issue the certification.

Six major categories can be distinguished among the most certified ones. The first one concerning organizational practices. "Organizational practices are the shared routines of behavior, including traditions, norms, and procedures for thinking, acting, and using 'things,' through which organizational life is produced and reproduced." (Whittington, 2006, p. 619). These certifications are those that evaluate how a company manages its internal processes and impacts, rather than assessing the performance of any specific product. For instance, multinational firms in the automotive sector such as Toyota and Ford have long adopted ISO 14001 across their production plants as a means of standardizing environmental management practices globally. By doing so, they ensure a common framework for monitoring energy use, waste management, and emissions across geographically dispersed facilities (Delmas, 2001). However, critics note that these certifications do not impose specific environmental performance thresholds. Therefore, a company can be certified without necessarily reducing its absolute environmental footprint, provided it demonstrates continual improvement relative to its own baseline (Delmas & Montes-Sancho, 2011).

A second category's dimension comprises certifications focusing on products and material attributes. In the context of sustainability certifications, material attributes such as recyclability, biodegradability, and resource efficiency are often considered central product characteristics because they influence environmental performance (Testa et al., 2015). These certifications

assess what goes into a good and what environmental impacts it embodies across its life cycle. A relevant example is the EU Ecolabel, established under Regulation (EC) No 66/2010 and administered by national competent authorities in each Member State. Some certifications in this landscape are self-declared, the problem here is that the methodological distinction between pass/fail eco-labels and disclosure-based declarations fundamentally alters the meaning of a certification logo or document. In this sense, the object of certification is not only the product itself, but also the type of environmental information communicated to markets.

A third category worth to mention is the one who addresses supply-chain integrity, typically operationalized through chain-of-custody (CoC) certification models. A supply chain can be understood as the network of organizations, activities, resources, and technologies involved in creating and delivering a product or service from suppliers to end customers (Christopher, 2016). These schemes are designed to ensure that sustainability claims attached to a final product are credible by verifying the flow of certified material through complex supply chains. They respond to the reality that global production often involves multiple tiers of suppliers and intermediaries, making it difficult to trace whether raw materials labeled as "sustainable" actually originate from certified sources. The Forest Stewardship Council (FSC) offers a paradigmatic example of how CoC certification functions. It requires all actors involved downstream, sawmills, pulp and paper mills, printers, and traders, to hold CoC certification. By defining how claims about certified inputs can be translated into outputs, chain-of-custody standards are central to the institutional credibility of sustainability certification. They determine whether certification functions primarily as a physical traceability mechanism or as a market-based accounting system, and in doing so they shape both business practices and consumer expectations.

A fourth category of sustainability certification objects focuses on sites, assets, or projects rather than organizations or supply chains. Particularly prominent in the built environment, these schemes, evaluate projects across multiple categories, including energy efficiency, water use, materials selection, waste management, transportation, and indoor environmental quality, and assign an overall rating (BRE, 2023; USGBC, 2023). Rating systems such as Leadership in Energy and Environmental Design (LEED), developed by the U.S. Green Building Council, and the Building Research Establishment Environmental Assessment Method (BREEAM), managed by BRE Global in the United Kingdom, exemplify this approach. Both systems for example, a new office building might achieve LEED Gold certification if it demonstrates high levels of performance across categories such as reduced energy demand through efficient heating and cooling, optimized water usage through low-flow fixtures, and enhanced indoor air quality through improved ventilation systems. It should also include low-emitting materials. The rating signals to tenants, investors, and regulators that the building aligns with internationally recognized sustainability standards, thereby increasing its market value and attractiveness. For instance, DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen) in Germany apply similar frameworks to the local context, emphasizing lifecycle performance and health-related indicators (Haapio & Viitaniemi, 2008). By combining performance benchmarks, market incentives, and professional accreditation systems, they contribute to reshaping the construction sector and related industries, encouraging systemic improvements in resource efficiency and environmental quality.

Going closer to a correlation with the environmental impact of certifications we find emissions and climate-related claims as the main object of many certifications. These certifications focus either on greenhouse gas (GHG) inventories, product-level carbon footprints, or mitigation

projects. Beyond reporting frameworks, emissions-related certification plays a pivotal role in the functioning of voluntary carbon markets.

Programs such as Verra's Verified Carbon Standard (VCS) and the Gold Standard certify emission reduction or removal projects ranging from reforestation and improved forest management to renewable energy, energy efficiency, and carbon capture initiatives. These projects undergo third-party validation prior to implementation, as well as periodic verification of actual emission reductions achieved, before they can issue tradable carbon credits. The financialization of verified emission reductions underscores the hybrid nature of this certification field: verified outcomes become commodified as tradable units within both voluntary and compliance-oriented carbon markets. Companies such as Microsoft and Shell have publicly committed to purchasing large volumes of carbon credits, often favoring those certified by high-profile programs like VCS or the Gold Standard, to complement internal emission reductions (Newell, Pizer, & Raimi, 2013).

Yet, the integrity of these markets depends critically on the robustness of certification methodologies, particularly regarding issues such as additionality (whether the project would have happened without carbon finance), permanence (whether carbon reductions are maintained over time), and the avoidance of double counting. Taken together, emissions and climate-related certifications demonstrate how sustainability assurance extends beyond organizational systems and products to quantified environmental outcomes. By transforming verified emission reductions into commodified assets, these certifications bridge the domains of sustainability governance and financial markets, further institutionalizing carbon as a measurable and tradable unit within global economic systems (Bernstein & Cashore, 2007).

Finally, a distinct category of sustainability certification focuses on personnel competence. Unlike certifications that apply to organizations, products, or projects, these schemes evaluate

the qualifications of individuals to perform specific professional roles within sustainability governance. In practice, this means that candidates must demonstrate formal training, examinations, and relevant work experience, and in many cases are required to engage in continuing professional development to maintain their credential. Examples include auditor certifications offered under IRCA or Exemplar Global, where professionals must prove competence in assessing management systems such as ISO 14001 or ISO 45001 (Exemplar Global, 2022). Although personnel certifications do not directly guarantee sustainability outcomes, they are vital to the reliability of the certification ecosystem. By ensuring that auditors, verifiers, and consultants are properly qualified, they provide an additional layer of credibility to organizational, product, and project-level certifications.

3.4 Typology by Actors

The second last way to filter the sustainability certifications sector is by actors involved in the issuing. In this regard, we're looking at who establishes and oversees the scheme, and this institutional dimension is crucial for understanding how credibility and authority are constructed.

Starting with the category who holds the most influential power of all: public authorities. This includes both national governments and supranational institutions such as the European Union. These actors are extremely relevant because mandate certification as part of binding regulation or establish voluntary schemes administered under public law or issuing themself. A clear example is the EU Ecolabel, created by Regulation (EC) No 66/2010, which is coordinated by the European Commission but implemented by national competent bodies in each Member State. This illustrates the way that public authorities have to leverage on certification, not only as a tool of consumer information but also as a mechanism of regulatory steering. The influence

in many situations is more indirect, in a sense that the regulation impose a series of standard to be complied with by businesses across EU for example, and then third actors issue those certifications to provide a tool for those businesses that need to prove themselves under the lens of authorities. For those big authorities it would require too many resources to issue the certifications themselves, that's why they can rely on third parties.

A second set of actors includes intergovernmental and standardization organizations. This can somehow overlap with public authorities, but they usually are not part of governmental entities. What they do is providing the technical and procedural frameworks that underpin much of the global certification landscape. The most prominent example is still the International Organization for Standardization (ISO). There's an overlapping with the previous group because intergovernmental organizations frequently acquire binding force when incorporated into national legislation, regional regulations, or public procurement requirements. This means that the effect and impact is strictly related to other organizations that have to set and standardize these standards in the same way as these organizations to make them binding. That being said, standards often become quasi-mandatory only once adopted into legal frameworks or market norms. This incorporation effectively transforms what began as a voluntary technical framework into a quasi-mandatory requirement for firms seeking to access public tenders or comply with product-specific legislation (Blind, 2008). The goal of many organizations here is to set a standard via certifications. When they issue certifications alone they can't create binding conditions. Only once the certifications are adopted and accredited through international multilateral arrangements, then they can create a harmonized global framework mutually recognized across jurisdictions (ISO, 2017). By providing authoritative technical and normative frameworks, intergovernmental and standardization organizations contribute in a strong indirect way to the market shaping movement via sustainability certifications.

Moving into the next relevant group of actors we can find the non-governmental organizations (NGOs) and multi-stakeholder initiatives. They have played a central role into the expansion of sustainability certification since the 1990s thanks to their propaganda. The main difference between NGOs and state-based intergovernmental actors is that these actors do not get authority from law but through the mobilization of inclusive governance, stakeholder representation and, very important, their credibility in monitoring. We're talking about initiatives that are typically organized as independent with governance structures that usually incorporate environmental NGOs. The authority claim resides in their opluralist and deliberative process of standard-setting, rather than a unilateral corporate declaration (Bartley, 2007). A good illustration of this is given by the already mentioned FSC certification, that wide spreading through Europe illustrates how these NGO-driven schemes become standard market requirements, especially when large retailers or public policies stipulated FSC-certified materials as a condition for the whole supply chain (Cashore, Auld, & Newsom, 2004). These initiatives lack of formal public authority, contractual governance is the one who enforce compliance. Licensing agreements bind firms and producers to adopt these standards, so they commit themselves to comply with those requirements. Public complaint procedures, grievance mechanism, and the suspension or withdrawal of certifications rights. Oversight mechanisms include public complaints procedures, grievance mechanisms, and, where necessary, the suspension or withdrawal of certification rights. By establishing independent, rule-based systems outside the direct authority of governments, NGOs and multi-stakeholder initiatives have pioneered what some scholars call "non-state market-driven governance" (Cashore, 2002). Their influence in Europe is evident not only in consumer markets but also in public procurement and corporate sourcing strategies, where NGO-led certifications increasingly serve as recognized proxies for sustainability performance. In this way, they have effectively institutionalized private authority alongside, and sometimes in advance of, public regulatory frameworks.

Codes of conduct, proprietary standards, and sustainability assessment tools are usually developed by another important category of stakeholder, consisting of industry associations consortia. Even though their enforcement might be weaker compared to governments or multi-stakeholder NGOs. The way they operate is by relying on peer pressure and market incentives that can shape industry-wide norms also with the creations of shared metrics and benchmarks that buyers and suppliers adopt in practice (Potoski & Prakash, 2009). This not formal certification lies in the spectrum of second-party governance. It still operates in the same similar way as the traditional schemes: audits, compliance checks, and reporting systems that determine whether suppliers are eligible to participate in global value chains (Bartley, 2007).

In this regard, a relevant group is also made up by conglomerate of private buyers and retailers. By controlling access to consumers and leveraging over suppliers, these actors still can exercise authority and establish themselves as powerful market intermediaries. These actors still exercise authority through their position as powerful market intermediaries, controlling access to consumers and exerting leverage over suppliers. Even if these buyer-driven schemes are not framed as proper certification, they impose schemes and requirements that suppliers have to meet in order to retain contract. In practice, they function as a gate keep mechanism similar to mandatory certifications labels. This kind of governance is highly influential because of the asymmetry of power between buyers and suppliers. The impact of this influence is extremely tangible for medium-sized suppliers, in this case not meeting the standard imposed by large European retailers can mean the complete exclusion from very lucrative export markets. The final outcome is then quite powerful and in certain cases comparable to more formal NGO- or state-driven labels (Gereffi, Garcia-Johnson, & Sasser, 2001. There are some critics to this form of governance, scholars argue that these buyer-imposed auditing system can sometimes be

duplicative and repetitive leading to confusion and audit fatigue among suppliers that can't comply with multiple overlapping codes (Locke, Amengual, & Mangla, 2009).

Another relevant actor that ensures the credibility of certification system is made up by accreditations agencies. They basically verify the competence of the certifiers themselves; examples are the International Accreditation Forum (IAF) and the European co-operation for Accreditation (EA) who oversee national accreditation systems and establish rules for mutual recognition. The relevance of these entities is crucial when it comes to coordinating different national accreditation bodies, as an example the EA plays a particularly important role by coordinating national accreditation bodies, such as the United Kingdom Accreditation Service (UKAS) or Germany's DAkkS. All these entities together created a chain of trust that enable companies to demonstrate compliance across different borders without undergoing multiple audits. Accredited bodies issue certifications that are recognized internally through multilateral agreements. This structure does provide an institutional framework that consequentially sustains confidence in certification markets. This layered system of assurance creates a chain of trust: certificates issued by accredited bodies are recognized internationally through multilateral agreements, thereby enabling companies to demonstrate compliance across borders without undergoing multiple audits. In this way, accreditation does not directly certify sustainability performance but provides the institutional infrastructure that sustains confidence in certification markets.

Coming all the way down at the weakest end of the spectrum we find first-party, self-declared claims made directly by companies about their products, services, or practices. These certifications are not subject to external validation, and instead they rely on consumer trust. Some typical examples include very generic labels such as "eco-friendly," "green," "biodegradable," or "climate neutral,". The problem is that there is a lack of clear

methodological definitions, and it can also vary depending on the scope and rigor across companies. The credibility of these claims resides on the transparency provided by these firms. Research showed that in many cases these assessments were absent or insufficiently communicated (Delmas & Burbano, 2011). To contrast these tendencies of misleading self-claims

The risks of misleading environmental self-claims were spotted in Europe, that's why the European Commission has identified vague and unsubstantiated environmental marketing as a key driver of "greenwashing". As a consequence, a legislation was proposed under the Green Claims Initiative to require companies to substantiate environmental claims with verifiable data before communicating them to consumers (European Commission, 2021). In absence of a third-party certification, public law becomes the only safeguard against deceptive practices. The main issue here is that, besides being unreliable and questionable, these self-declare claims are flexible, inexpensive and allow companies to market theme self as sustainable without undergoing the long procedures and high costs associated with traditional certification. As a result, many scholars argue that first-party claims, unless regulated or backed by credible evidence, contribute more to reputational signaling than to substantive sustainability improvements (Testa et al., 2015)

Taken together, this taxonomy of actors—ranging from public authorities and intergovernmental bodies to NGOs, industry associations, retailers, accreditation systems, and self-declaring firms—illustrates the institutional diversity underpinning sustainability certification. Bindingness varies significantly across this spectrum: while public authorities can impose legally enforceable requirements, NGOs and industry consortia rely on contractual and reputational enforcement, and self-declared claims remain largely voluntary. This actor-based

differentiation complements the analysis of certification objects by clarifying how authority, legitimacy, and trust are constructed in the certification landscape.

Table 2: Certifications classification

Actor Type	Authority based	Bindingness /Enforcement	Examples	Key Characteristics
Public authorities (national and supranational)	Legal authority through law, regulation, or delegated administration	Binding when mandated; voluntary schemes gain strength via procurement and regulatory recognition	EU Ecolabel (Reg. (EC) No 66/2010); U.S. ENERGY STAR	Can transform voluntary schemes into de facto mandatory requirements; embed certifications into procurement and product legislation (Blind, 2008; OECD, 2016)
Intergovernmental & standardization organizations	Technical authoritv and global consensus among member states	Voluntary, but often incorporated into national/regional regulation (becoming quasi-mandatory)	ISO 14040/44 (LCA); ISO 14001; ISO/IEC 17021/17065/17024; UNFCCC CDM	Provide technical frameworks rather than certificates; create harmonized methods and accreditation systems that governments adopt (Blind, 2008; ISO, 2017)
NGOs & multi-stakeholder initiatives	Legitimacy via inclusiveness, stakeholder governance, and credibility of independent audits	Contractual: licensing agreements, independent audits, grievance mechanisms suspension of rights	FSC, Fairtrade International, RSPO	"Non-state market-driven governance" (Cashore, 2002); highly influential in Europe via procurement and consumer demand (Bartley, 2007; Raynolds, 2009)
Industry associations & consortia	Voluntary membership and sectoral cooperation	Peer oressure reputational sanctions, and buyer/supplier adoption	ResponsibleSteel, Sustainable Apparel Coalition (Higg Index)	Set sectoral norms, benchmarks, and tools; weaker enforcement but shape industry-wide practices (Potoski & Prakash, 2009)
Private buyers & retailers	Market power and control over supoiv chains	Contractual: supplier codes, audits, buyer acceptance lists	Tesco, Carrefour, Lidl (GlobalG.A.P.); H&M, Zara (ETI, Bangladesh Accord); Nokia, Philips (RBA)	Highly influential second-party governance; function as de facto certification systems; criticized for audit fatigue and fragmented requirements (Bartley, 2007; Locke, 2013)
Accreditation bodies	Meta-governance authority under ISO/IEC 17011; international recognition	Oversight of certification bodies; recognition via multilateral agreements	European co-operation for Accreditation (EA); UKAS; DAKKS; IAF	Do not certify sustainability directly; ensure competence of certification bodies, enabling cross-border recognition (ISO, 2017)
Self-declared / first-party claims	Company reputation consumer trust, and advertising law	Weak enforcement; only regulated by consumer protection and contion authorities	"Eco-friendly" "green," "biodegradable," "climate neutral"	Flexible and cheap but prone to greenwashing; addressed in EU Green Claims Directive and UK CMA guidance (Delmas & Burbano, 2011; European Commission, 2021; Testa et al., 2015)

Source: own illustration

4. Grounded Analysis: Sustainability Certifications as Market Shapers

4.1 Methodological Note

In this section of the thesis, I will make an analysis of the recurring patterns that emerged during this literature review and classification. As mentioned in the beginning, I will follow a Grounded Theory analytical framework, the one developed by Glaser and Strauss (1967). I choose to follow this approach in ordered to avoid any pre-existing models to deductively impose any previous theory even if the topic treated is quite recent among the literature. The good aspect of a grounded theory approach is that social phenomena are dynamic and continuously constructed through interaction. Secondly, this setup was fitting particularly well with the interpretivism perspective that sees markets as evolving social system entities that are constantly changing shape by the actions and meanings of their participants (Berger & Luckmann, 1967; Guba & Lincoln, 2008). This was applied in our specific case with the analysis of secondary data sources, including academic literature, policy documents, and institutional reports. The method for this analysis was always to follow the logic of iterative comparison. This basically means coding data fragments, group them, and refine them all through successive analytical cycles. Once everything was set, this open coding had first been used to identify recurring references to the role of sustainability certifications in influencing market behavior. The organization of these fragments was made through axial coding into broader conceptual categories that reflected relationships among actors, institutions, and market outcomes. Finally, selective coding allowed the identification of a central analytical structure explaining how certification systems function as market-shaping mechanisms.

The purpose of this analytical approach was, of course, not to measure the quantitative impact of certification on firm performance, but rather to uncover the qualitative patterns that reveal how such instruments shape the institutional and normative architecture of markets. What

emerged from this process are four main recurrent themes. They capture the main mechanisms through which sustainability certification actually have tangible influence. These themes can be named as: legitimacy and trust-building, standardization and normalization, market access and competitive differentiation, and lastly innovation and organizational transformation.

4.2 Theme 1 – Legitimacy and Trust building

The first theme that emerged concerns the capacity of certification systems to construct legitimacy and trust across diverse stakeholder networks. The way this happens is by acting as symbolic and procedural guarantees for those big audience of stakeholders. Usually, all these different actors find themselves in a chaotic environment full of uncertainty derived from producers, consumers, investors, and regulators. Inside this landscape, certifications can set some recurring standard practices that serve not only from technical verification but also from their ability to produce shared social meaning. From a performative perspective (Callon, 1998), certification does not merely describe sustainable practices but helps bring them into existence by defining what counts as legitimate behavior. As an example of this, we analyised the FSC certification. Its standards have redefined forestry practices globally, embedding environmental and social concerns into procurement and trading routines (Cashore, Auld, & Newsom, 2004). In this case, legitimacy operates on two levels. On one hand, moral legitimacy is derived from alignment with widely shared ethical expectations concerning environmental and social responsibility (Suchman, 1995).

On the other hand, cognitive legitimacy emerges when the presence of certification becomes taken for granted as the “normal” or expected condition for market participation. Every time that this occurs then certification acts as a strong stabilizing force that help reducing informational asymmetries in a specific market by creating a set of standards and shared language of trust among the different stakeholders involved. This aspect of legitimacy creation

is particularly relevant in all those market that are characterized by intangibility and complexity, which sometimes is exactly the case of sustainability-oriented industries. Potoski and Prakash (2005) explained how certifications are capable to provide the so called “club goods”, they simply are collective benefits that derive from the voluntary participation in these programs that symbolize and signal compliance and good reputation. Consumer are used to use certification marks as a visible representation of shortcuts to identify the best trustworthy producers (Hatanaka, Bain, & Busch, 2005). Looking at the other spectrum of stakeholders we notice that investors and policymakers increasingly interpret a certified status as a proxy for lower social and environmental risk (Delmas & Montes-Sancho, 2011)

4.3 Theme 2 – Standardization and normalization

Moving into the second theme identified we can take a look at the process of standardization and normalization inducted by certifications. They’re main effect is to transform ambiguous ideas of sustainability into a measurable, auditable and comparable set of standards. Without this step, it would be impossible to see and calculate the actual impact they may have on markets. This process is described by Kjellberg and Helgesson (2006) as a process of “normalizing market practice”, basically institutions establish routines and benchmarks that aim to control and govern exchange and participation in a market. The example saw previously that can represent well this theme is given by the ISO 14001. This certification instead of just prescribing specific environmental outcomes, requires organizations to set their own systematic management processes for continuous improvement (Delmas, 2001). If a process is standardized, then it can become a global framework for corporate governance and environmental accountability. Another consequence of this process of normalization is that the extend is far beyond compliance concerns. When these frameworks are standardized and adopted widely, they allow all the actors in a market to be comparable under these same

indicators (Abbot & Snidal, 2009). This is when certifications terminate, they are solely voluntary adoption basis, and they become institutional prerequisites for participation in global supply chains. This is shown by Callon (1998) in his black boxed system. Methodological assumptions become naturalized as objective technical benchmarks.

4.4 Theme 3 – Market access and competitive differentiation

The third theme emerged is a natural logical consequence of the previous one, it derives from data concerning market access and competitive differentiation. In this view certifications function as an instrument that regulate entry and participation in markets, regardless of their competitive structure characteristics. This is the case in which a certification is seen as a license to operate (Bartley, 2007). The fairtrade system is a good example of this dynamic. Thanks to the establishment of verified conditions regarding transparency in comedy chain, Fairtrade has reshaped global trade relationship and value distribution (Murray & Heller, 2007). There is a clear gap between certified producers that gain access to niche markets and price premiums, while the non-certified actors are usually excluded. This is an example of how certifications can reconstruct existing hierarchies by embedding new rules of participation. From a different perspective, in markets saturated with similar products, sustainability certifications offer a strategic tool for competitive differentiation, helping firms with signaling their environmental performance (Delmas & Burbano, 2011). They create and generate reputational advantages that translate into a stronger customer loyalty and an improved brand equity. It is fair to point out that usually for bigger companies it is easier to meet certification requirements due to economies of scale. Smaller businesses struggle to navigate into the requirements that might also imply a bigger financial availability to follow the relative compliance. The result of this is that a certification system can promote inclusivity but also reinforce existing inequality between different players. This paradox highlights the dual nature of what Cashore (2002) defines as

“non-state market-driven governance”: certification schemes expand regulatory capacity beyond the state but rely on market-based mechanisms that reproduce economic asymmetries.

4.5 Theme 4 – Innovation and Organizational transformation

The fourth and last theme identified during the analysis is about innovation and organizational transformation. Looking outside the perspective of certification as a sign of pure compliance, they also produce deep internal effects on the structure of organizations. Abolafia (1998) describes this as the performative interplay between rules and behavior, in which the very existence of rules creates new patterns of organizational conduct. The easy example and representation of this effect it can still be seen with the ISO 14001 or the B Cortp certification. Both certifications imply companies to develop environmental management system in order to maintain compliance. This means create dedicated sustainability teams and the introduction of measurable performance indicators. This way innovation is stimulated through radical internal organizational changes that are related to the introduction of sustainability certifications. It is noticeable to see how over time, certification-driven innovations can shape markets expectations by setting higher performance threshold that competitors and business must meet to remain legitimate and competitive. The other side of the story is analyzed by scholars such as Ponte (2029) who caution that this dynamic can also entrench incrementalism: when focusing on measurable improvements certification may prefer procedural compliance over a systematic change. Anyway, regardless of this limitation, certification function as a catalyst of learning and institutional adaptation, confirming their role as both regulatory and developmental instrument.

Taken together, these four main themes map onto the framework of market-shaping proposed by Neonen, Strobacka and Windahl (2019). Certifications can contribute to market disruption when they redefine categories or introduce novel governance logics. Lastly, this analysis supports the conclusion that sustainability certifications are not neutral instruments of

compliance but proactive agents of market formation and transformation. The performative effect of certifications transforms ethical aspirations into economic conventions, in this way sustainability become bot a condition of legitimacy and a strategic resource. In doing so, they blur the distinction between governance and commerce, showing that sustainability has become an organizing principle of market activity rather than an external constraint upon it.

5. Discussion and conclusion

The goal of this seminar paper was to have a general understanding and overview of the state of research and theories in the field of sustainability certifications. Analyze to what extent they can shape the markets they're supposed to measure, and thanks to the use of a grounded theory approach applied to secondary data, the analysis identified four recurring mechanisms. The four mechanisms mentioned in the previous section as well reveal the degree of impact these certifications have. By evaluating them, it becomes possible to draw some theoretical conclusions about their role under a market-shaping process view. To summarize briefly we have seen how among different actors, certifications can be playing an important and proactive role. The overall meaning confirm what Callon (1998) explained about the performativity of markets, that by codifying sustainability as a measurable and tradable attribute they become active participants in the landscape of market shaping theories.

This way, the traditional market logic governed by public regulation and social norms it's extended and integrated with a moral concern into economic exchange. From the perspective of market shaping theory, the findings provide substantial empirical support regarding the idea of market as evolving systems redefined through continuous interaction (Storbacka & Nenonen, 2011:`; Nenonen, Strobacka, & Windahl, 2019). The way certifications are contributing to shape a new market setup are several, with a disruptive new governance model or by widening markets enabling smaller players to be part of it. Thank to predictable and recognized standards, certifications help provide a strong benchmark who stabilize internal behavior in chaotic markets. Rather than direct control, certifications serve as a distributed resource of governance that shape markets through institutionalized expectations rather than direct control.

Some considerations have to be taken into account when approaching this topic. The extent to which certifications can be considered successful in shaping markets depend on how market shaping itself is conceptualized. If we consider market shaping as the capacity to influence the organization and evolution of economic activity, then certifications have proven to be very high effective. The way they did that is by redefine the boundaries of a legitimate market participation and with the creation of a new sector devoted to auditing, consulting and compliance. Also, certifications helped to transform the normalization of sustainability into a form of voluntary value that became also a market requirement to maintain a competitive position. But still, when the effectiveness is measured in terms of transformative impact then the results may appear more ambiguous.

One of the main contributions and point emerged from this paper is that the grounded analysis revel in this double performative role of certifications: institutionalize sustainability within market structures, but in doing so they also block and constrain its transformative potential. The success of certifications lies in the ability to create comparable standards and legitimacy achieved through standardization. It was interesting to realize and see that the same mechanism who make the certification so strong and relevant is at the same time limiting its capacity for a radical change. Certifications stabilize markets rather than transform them, reinforcing what Ponte (2019) describes as “sustainability-as-management” rather than “sustainability-as-politics”. This conclusion aligns with the critiques of non-state market driven governance (Cashore, 2002; Bartley, 2007), which argue that private standards operate effectively inside an existing economic framework rather than challenging their underlying assumptions. Not always certifications have led to a disruptive or a substantial change, they have illustrated the evolution of governance and capitalism in a way where moral and environmental concerns are absorbed into market as a way of legitimacy and differentiation. From this perspective, the success of

certification was mainly in creating more transparency and accountability, but not necessarily in creating a more equal structure. Their market shaping function is both productive and conservative, it extends the moral reach of markets in themes like sustainability while preserving their competitive capitalistic logic.

The state of research suggests that for understanding the performative nature of market institutions, performativity as conceptualized by Callon (1988) and Kjellberg and Helgesson (2006) is focused on the moral dimension. The scope of certification as mentioned previously is often to codify collective expectations about responsibility and fairness. Studies described this as “moral performativity”, a way in which ethical norms are inscribed into economic routines. Thank to this transformation of the moral expectations into operational procedures, certifications can make sustainability actionable but also governable. This insight matters when we consider the enforcement of interpretivist understanding that markets are both social and normative construct. The proliferation of certification schemes over the past two decade is a representation of the institutionalization of morality within the market order. At the same time the problem that emerge is that this institutionalization process creates contradictions. Their credibility depends on the measurement and verification, that necessitate abstraction and simplification. The result of this is that moral complexity is often reduced to procedural compliance. MacKenzie’s (2006) critique of performative instruments in financial markets is a representation of this complexity. These instruments, once codified into norms, they become technologies that operate autonomously, sometimes detached from the value that they were once meant to express. Sustainability certifications follow a similar path. They make sustainability operable, but by making it a technical condition rather than a continuous ethical commitment. So, looking at this topic from this angle, seem like certifications are emblematic of the broader paradox of governance in the age of sustainability. They respond to the social

demands for more moral accountability by all the stakeholders in the market, but simultaneously they translate those demands into managerial procedures that can reinforce the existing rigid structure of economic markets.

This reasoning brought myself into a direction in which I realized how sustainability certifications should be understood always as complementary, rather than alternative, to formal regulation. The power to mobilize private actors and establish voluntary norms it's extremely helpful to fill regulatory gaps in global markets where state authority is limited (Abbot & Snidal, 2009). Nevertheless, their relevance on a voluntary compliance and reputational legitimacy basis, makes them inherently fragile. For an effective sustainability governance, it is required a hybrid arrangement that can combine the flexibility of private standards with the accountability of public oversight. Policies are emerging in recent times, such as the European Commission's (2021) Green claims Directive, whose final goal is to harmonize certification practices and enhance consumer protection. With this being said, certifications will still play an important role, but their credibility will still depend on clear transparency and coherence with the integration into broader policy goals.

From the organization's point of view, this research points out mainly to the importance of adopting certification as a complete process to internalize rather than a symbolic sign to the outside stakeholders. When certifications are used as a reputational shield, then they lose their meaning and contribute to the dilution of their actual purpose. The companies who are able to embed these certifications into their principles and operational routines are usually better positioned to benefit from the innovation and trust that comes with the adoption of those standards. The transformative capacity still relies on the ability to of the organization to engage with it as a continuous process of reflection instead of a static compliance exercise. Some last considerations about the topic and the role of sustainability certification in market shaping

markets are about their final impact and usefulness. Their role still remains bounded to the market logic they operationalize. Certifications are a perfect tool to make markets more accountable and to bring sustainability in the realm of governance. Not always they are able to bring it into the realm of transformation, the contribution they bring to the market shaping scene is on two fronts: by showing how moral norms can be institutionalized within markets, and by revealing the limits of institutionalization as a driver of systemic change. Sustainability certification have represented one of the most significant institutional innovations in the moral economy of contemporary capitalism. Thanks to them, it was possible to embed, ethical criteria, that were left behind into the functioning of global markets, confirming again that markets are not value-neutral but socially and normatively constructed.

To close and summarize what analyzed in the thesis we can affirm that sustainability certifications represent one of the most important institutional innovations in the moral new economy of contemporary capitalism. The drive is strong especially when it comes from a consumer perspective, so it was interesting to see how niche certifications and self-voluntary ones are extremely more relevant in certain situations to some other big ones that are usually a requirement from external regulations.

Following the development of the text we also have seen how successfully embedded are now the ethical criteria into the functioning of global markets. All this to confirm that the nature of market as social construct is valid.

The interesting point about the paradox that these certifications create, by making more rigid and strict the same market they sometimes intent to dilute and expand to other small businesses. Small players can suffer from the same certifications that could have theoretically helped them grow and prosper thanks to recognition and legitimacy. This way shown that markets are still subordinated to global economics and contradiction of this moralization.

It is worth then to point out the true value that these certification add which is the capacity to make sustainability visible, comparable and actionable. The true main goal of the research was to assess the impact a certification might have on market shaping, it was found out that the stronger impact is always a correlation between those certifications and a strong action by the institutions and the player of the market itself. Only once a certification is widely adopted and recognized then it can be institutionalized, otherwise its value is intact but the impact is inexistent in a perspective of market shape effectiveness'.

6. Introduction to the integration

Before proceeding to the concluding section of this dissertation, it is necessary to introduce an additional integrative chapter. As part of a double degree student I had a requirement to extend the first elaborate that I have made for the University of Bamberg. This following integration has been developed following the rules and the request of my Italian University involved in the academic evaluation process. This required an extra integration to the main elaboration that goes beyond the initial topic.I would like to point out that the very first part of the dissertation was structure and finalized already as a self-contained work that followed a clear theoretical progression starting from the literature review until reaching the analytical framework and final discussion.The additional integration presented in the following section was therefore not part of the initial research design, nor of the original logical architecture upon which the thesis was developed. For this reason, its placement immediately prior to the conclusion may appear to partially disrupt the linear flow of argumentation established in the preceding chapters.Also to make it clear, to comply with the institutional requirements set by my Italian academic authority, this secondary supplementary section is to be intended as an additive end extra complementary extension rather than a restructure of the original work. The integration does not alter the foundational research question, theoretical orientation, or methodological approach of the dissertation. The idea was to build on top of the previous work by offering an extra elaboration and reflection that keep consistency with interpretivist and the constructivist framework adopted throughout the German thesis. It is therefore important to clarify that the original dissertation was completed independently and in its entirety prior to the request for this additional material. The present integration has been developed ex post, in accordance with the explicit instruction to preserve the original structure of the thesis while expanding its analytical scope through a dedicated supplementary section.

The only aim to pint this distinction out is to ensure transparency regarding the original structure of the work and helping the reader to understand the structure of the work. Connecting the two-part starting with this small explanation hopes to allow a clear understanding of the relationship between the original text and this integration. The end structure and chapter still remain conceptually anchored in the core thesis, while also considering the new insight introduced in this supplementary section.

6.1 Scope and Structure of the Additional Integration

After clarifying regarding the academic requirements for this supplementary integration, in this section I will define the scope, focus and internal structure of this part of the elaborate. As previously mentioned, this integration will not revise or reframe the original research question, it will keep the same methodological foundations of the thesis as well as the same approach view. The goal is to introduce a limited target extension that builds on the conceptual framework already established. This integration is therefore intentionally concise and made of two complement analytical components. The first part of the integration will cover a brief history overview of the sustainability movement, its progressive rise in relevance within economics, regulatory and organizational contexts. This will enrich the first part of this dissertation that was more focused on the impact that these certifications have on market shaping theory. The historical background is not intended to be seen and considered as a detailed reconstruction but rather as a contextual framing exercise. Highlight the conditions under which this topic of sustainability moved from a marginal environmental concern to a central organizing principle in markets, internal company governance and corporate strategy. Focus will be placed on the dual evolution of sustainability seen both as a mandatory compliance requirement driven by public regulation; and the different form of voluntary self-accountability, increasingly adopted

by all kinds of stakeholders and businesses. This distinction is relevant to understand the emergence of sustainability certifications and they're way of operating as a intersection between regulatory constraints and voluntary market based governance compliance. All of this is relevant to consolidate the interpretivist perspective adopted in the thesis according to which markets are constantly evolving thanks to a cumulative process rather than a disruptive structural break.

After this first historical background a second section will follow, this time the goal will be to connect the dots of the conceptual discussion about sustainability certifications and the way they relate to an external classificatory or evaluative framework. In particular this section will examine if and to what extent some of the sustainability certifications discussed in the core chapter of the thesis are also applicable and present in an external index or benchmark. The selected index for this research is the EURO STOXX 50 index. The idea of this integration part is not to evaluate the performance nor the ranking logic of the index, but the idea is to observe in a selected group of companies, if some patterns overlap, align or are absent between the certification landscape. This comparison will serve as an empirical exercise that will help to illustrate the way certain certifications reached a broader institutional recognition across different sectors and thematic domains.

The methodology used in this integration part remains deliberately descriptive as well as illustrative. It is not a new way of data collection technic nor alter the previously set qualitative orientation of the original abstract. Instead, it relies on a cross structured reference between the certifications previously mentioned and identified and the one that can be found in companies that are part of the EURO STOXX 50 Index. All the data will be taken from public available documentation. The idea that was developed was to analyze the ten largest constituent companies by free-float market capitalization based on the original EURO STOXX 50 Index

factsheet published by STOXX Ltd. The choice of market capitalization as an indicator has to been considered as a pragmatic and transparent criterion for limiting the number of companies that otherwise would have need to be analyzed. The analysis does not attribute analytical significance to firm size, nor does it seek to compare companies on the basis of market value. The selected companies served only as an illustrative function that help explain how the big players are adopting these certifications considering that market leaders are able then to mobilized large share of markets.

The EURO STOXX 50 also represent an impartial and general European equity index, it does not apply extra ESG or sustainability criteria's as condition for inclusion. That represent the perfect ideal scenario to observe in a specific date and time if the certifications analyzed and mentioned in the first section. In order to maintain methodological coherence with the qualitative and interpretivist orientation of the dissertation, the analysis does not address the index as a population, nor does it attribute analytical significance to its ranking logic.

The first ten companies listed in the index at the time of observation are well distributed in different industries and sectors making a good sample for an empirical representation of the European business landscape. As said multiple times, the goal was not to move into a statistically significant analysis, but rather as an exploratory observation. The focus remains on the qualitative role of certifications as legitimacy mechanisms and market-shaping devices. As for the geographical area Europe was chose since the regulatory pressure on business is among the highest and most demanding especially in areas such as sustainability that it does not mean only environmental but in every aspect of a business. To summarize the integration scope the idea is to combine and taken together, these two components, the historical contextualization and the index-based exploratory comparison. This will allow to extend and enrich the original part of the dissertation with a temporal evolution of the general sustainability movement and not only focusing on market shaping theories. It will bridge the theory discussed with the

practical empirical observation in the broader ecosystem in which sustainability certifications currently operate. I would like to point out again the delimitation about the primary ten companies of the INDEX, this delimitation reflects the fact that the integration constitutes a minor extension of a broader research project whose primary focus lies elsewhere, namely in the conceptual and theoretical analysis of sustainability certifications as market-shaping devices. That's why a complete systematic analysis of the whole index would have required a substantive methodological shift toward statistical analysis at this stage. Also, the observation of these companies was not intended as a way to create and look for generalizable finding nor to establish correlations between firm size and certification adoption. Limiting the number of companies in this integration is intended to keep coherence with the interpretivist and qualitative orientation of the original dissertation. Otherwise, the introduction of quantitative expectations would have been incompatible with its theoretical framework and structural design.

6.2 Early Environmental Awareness and the Emergence of Ecological Concern (1960s)

The contemporary sustainability movement has its intellectual and social roots in the environmental awareness that emerged during the 1960s. This period marked a decisive rupture with the post-war optimism that had characterized industrial development in Western economies. For several decades following World War II, rapid economic growth, technological innovation, and mass production were largely equated with social progress and improved living standards. Environmental degradation was either overlooked or treated as an unavoidable by-product of modernization. It was exactly in this context on the 60s that the effects of the heavy industrial activity began to manifest and be visible in ways that were also measurable and therefore often socially contested. Public concern focused on areas such as air and water

pollution, chemical contamination and natural ecosystem degradation. All this was linked to the increased health risks related to the increase over time of these industrial practices. Urban smog episodes, contaminated rivers, declining wildlife populations, and rising incidences of pollution-related illnesses made it difficult to sustain the assumption that nature could indefinitely absorb the externalities of economic expansion. The way environment started to change was no more perceived as a distant or abstract threat to human health and well-being but as a direct correlation. This is when things switched and shifted in perception for a reassessment of the relationship between economic activity and environmental impact. Looking into details we find Rachel Carson's Silent Spring (1962) work that contributed to raise public consciousness around this topic. In her work the author introduces a systematic documentation about the ecological and health impact of widespread pesticide use, with particular emphasis on dichlorodiphenyltrichloroethane (DDT). Carson demonstrated that environmental damaged was not isolated nor accidental but rather a predictable outcome. She traced how synthetic chemicals accumulated in food chains and disrupted ecosystem. The outcome was linked directly to industrial practices oriented toward efficiency and productivity without putting an adequate consideration of long-term ecological consequences. This analysis put environmental degradation under a new lens, it will be treated from now on as a systemic issue, challenging the predominant logic of technological progress as inherently beneficial. Apart from the scientific findings itself, Carsons's work contributed to an epistemological shift about how environment and nature was understood in modern society. This served to cross the line about the concept that the environment was no longer an infinite sink capable of provide resources and absorb waste and pollution without consequences. It was then taken more into consideration and treated as a fragile system with clear finite limits. The strong reconsideration that occurred opened space for a critical reflection on growth-oriented economic models. Ecological disasters and visible signs of environmental decline throughout

the 1960s amplified the concerns about sustainable business practices. Severe air pollution episodes in major industrial cities, widespread water contamination, deforestation, and biodiversity loss reinforced the perception that environmental damage was structurally embedded in modern economic systems rather than the result of isolated failures (McNeill, 2000). Also to add on top, as media coverage started to expand the public debate to mass of people. This played a crucial role in fostering a sense of urgency and collective responsibility. All this increase in awareness lead to the emergence of environmental activism and the formation of early environmental organizations. As a consequence, these organizations have increasingly pressured governments and industries to address ecological harms. Even with the raising awareness it is important to point out that sustainability as a coherent and integrated concept had not yet fully emerged during this period. The focus was still put on pollution control and conservation rather than understanding which systematic transformation could be put in place. The economic growth remained for a large part unquestioned and often conceived as external constraints. The core takeaway from this time lies into the cultural foundation necessary later for further sustainable discourse development.

This link between economic development activities and human health outcomes introduced a critical insight that would underpin subsequent developments in sustainability. Environmental issues cannot be separated from economic organization and technological choices. By recognizing this, the first step toward the more comprehensive sustainability frameworks was done, it would emerge in later decades.

6.3 Environmental Regulation and the Rise of State-Led Protection (1970s)

The environmental awareness that emerged during the 1960s translated into concrete institutional action throughout the 1970s, a decade characterized by the rapid expansion of state-led environmental regulation. As ecological concerns gained political legitimacy, governments

in North America and Europe increasingly recognized that market mechanisms alone were incapable of addressing environmental externalities. The change here occurred when phenomena's such as pollution, resource depletion and, most importantly, public health risks were no longer perceived as market failures. This phenomena's started to be seen and treated as systemic outcomes that were coming from the way industrial production was structured and that led also to a coordinated public intervention. The key takeaway from this recognition was a fundamental shift in the governance of economic activity, this positioned the state as the main central actor responsible for taking decisive action in environmental protection. When looking at the world and the way these perspectives changes had an impact, it is worth noting the creation of the United States Environmental Protection Agency (EPA) in 1970. This marked a landmark moment in environmental governance because it consolidated the regulatory authority and scientific expertise in a single federal body. Following this American agency many more emerged as well across European countries, reflecting a broader international trend toward the institutionalization of environmental oversight. The main goal of these agencies were to focus on monitoring environmental quality, enforce standards and coordinate policy responses. Up to this moment there was not a mandatory regulation but more of a raising concern into a structured domain of public administration. These agencies were tasked with monitoring environmental quality, enforcing standards, and coordinating policy responses, thereby transforming environmental protection from an ad hoc concern into a structured domain of public administration. Only later legislative action started to reinforce this transformation. Comprehensive environmental laws started to be introduced by governments to control air and water pollution, managing hazardous substances and protecting natural resources. These acts established limits on emissions and effluents, creating legal obligations for firms that had to start to comply with environmental standards. This was the beginning of the early regulatory architecture that evolved into mandatory compliance in sustainability governance. From a

voluntary discretion, environmental performance was now subject to legal scrutiny, sanctions and control. By doing so, a part of environmental externalities was starting to be internalized. 1973 was a year that intensified these developments triggered by the oil crisis. The sudden interruption of oil supplies clearly exposed the vulnerability of industrial economics and line of businesses that were highly dependent on fossil fuels. Governments and industries were forced now to confront and deal with the hard reality of the finite nature of natural resources. The crisis stimulated debates about energy efficiency, diversification, and long-term resource planning, linking environmental concerns to broader questions of economic stability and national security (Yergin, 1991). This movement started to put environmental protection with strategic economic interests rather than being framed solely as a moral or ecological issue. Even if the first signs of regulatory movement in the area of environmental sustainability were seen, during the 1970s sustainability governance remained largely reactive in nature. The regulation that came out from this time was primarily focused on mitigating the damaged on the environment after it occurred rather than preventing it through fundamental changes. Pollution control and compliance monitoring dominated policy approaches, but the true deep structural questions concerning how to handle the growth of these models and way industrial organization were structured was barely addressed. The view on environmental regulation was still often perceived by firms as an external constraint imposed by the state, rather than as an integral component of business strategy or innovation. Nevertheless, the significance of this period lies in its institutional legacy. This legacy would profoundly shape subsequent sustainability models, the same models upon which later voluntary initiatives were constructed. By institutionalizing environmental responsibility within public policy, the 1970s laid the groundwork for the later expansion of sustainability into corporate governance, financial markets, and transnational regulatory regimes.

6.4 The Limits to Growth and the Structural Critique of Economic Expansion (1970s)

While the expansion of the regulation regarding environmental topics during the 1970s, a more intellectual critique was starting to actively shape economic growth paradigms. A growing body of scholars began to question whether continues economic expansion itself was compatible with ecological stability. The critique marked a decisive shift and change of perspective from protection been considered as damage control towards sustainability seen as a challenge that must be faced in the structure of modern economies.

A central contribution to this debate was the publication of *The Limits to Growth* by Meadows et al. (1972), a report commissioned by the Club of Rome. Employing systems dynamics modelling, the authors examined the interactions between population growth, industrial production, resource consumption, and environmental pollution. In the paper they suggested that exponential growth would soon eventually exceed the earth natural resource carry's capacity. This was a hard take that would have led to resource depletion, ecological collapse and also economic instability. Even if the assumption in the report were widely discussed and debated, the analytical framework itself introduced a very powerful conceptual innovation for the time: economic growth and systems operate in a finite planetary earth boundary. The significance of *The Limits to Growth* lay less in the precision of its forecasts than in its reframing of the sustainability problem. Environmental degradation was presented not as an accidental by-product of industrialization but as a structural outcome of growth-oriented economic systems. This perspective challenged the dominant belief that technological progress and market efficiency would automatically resolve environmental constraints. In fact the view introduced in the text was that without fundamental changes to the consumption patterns, production processes and population dynamics, environmental damage would continue to accumulate and getting worse.

With the adoption of a systems-based approach, the report emphasized the interdependence of economic, social, and ecological variables. Population growth, industrial output, pollution, and resource depletion were shown to be mutually reinforcing processes rather than independent phenomena. The great influence that came from this holistic perspective was that policymakers and scholars were encouraged to move beyond sector-specific interventions and consider long-term systemic dynamics. Thanks to that, intellectual foundations for later sustainability frameworks was laid and later on integrated environmental, social, and economic dimensions. Continuing the effects that came from *The Limits to Growth* it was observed a raising awareness into international policy debates and public discourse. Of course, the report did not come without critics, several economists have pointed out that the paper was underestimating technological innovation and the adaptive capacity of economies. Later empirical assessments shown that several core trends, such as resource depletion and environmental stress, aligned closely with the observation made in the following decade (Turner 2008). The critique that was carried on about *The Limits to Growth* complemented regulatory approaches to environmental protection. If state-led regulation was addressing immediate environmental harms, the systems critique highlighted of limited were the reactive policy measures in absence of a structural change. The combination of this perspectives together contributed to a growing recognition that sustainability not only needed regulatory reinforcement but also a general realignment of economics goals, development trajectories and practices while keeping in consideration social priorities. Looking at this timeframe it is clear how the 1970s represented a turning point in sustainability discourse. From these years on, environmental governance started to expand beyond pollution control into a deeper interrogation of the relationship between growth, resource use and ecological resilience. This intellectual shift would later on in time inform the concept of a sustainable development and also provide a critical reference point for debates in the long-term viability of market-based economic systems.

6.5 Sustainable Development and the Conceptual Consolidation of Sustainability (1980s)

In the 1980s we can see and observe a consolidation of sustainability awareness, culminating with the publication of the World Commission on Environment and Development's report *Our Common Future*, commonly referred to as the Brundtland Report, in 1987. The documented represented a key moment and paper in the evolution of sustainability discourse. It provided a new unified conceptual framework that was capable of unify environmental protection and economic development together with social equity. While doing so, it addressed also the limitations of the approaches that were carried on earlier and that had framed environmental issues primarily as regulatory constraints or as critiques of economic growth detached from development concerns. This report introduced the widely cited definition of sustainable development. The definition described a sustainable development as a kind of development that meets the needs of the present without compromising the possibility for future generation to face and meet their own needs (World Commission on Environment and Development, 1987). With this new definition a new mark was put as a fundamental shift of how sustainability was understood and taken into consideration. For the first time, sustainability was not put as in opposition to economic progress, but it was put as a condition for a long-term beneficial development. Economic growth was not rejected outright; instead, it was subjected to ethical and temporal constraints that emphasized responsibility, equity, and long-term viability. The Brundtland Report explicit integrated the environmental, economic, and social dimensions into a single analytical framework. When looking particularly in the area of Global South, issues such as poverty, inequality, and uneven development were linked to environmental degradation. The report argued that environmental protection could not be achieved without addressing social and economic disparities. This multi perspective expanded the normative reach of

sustainability discourse and increased its relevance for policymakers, development institutions, and economic actors.

Another introduction made in the report is a strong intergenerational perspective. It highlighted the ethical obligation of present societies toward future generations. Sustainability was framed as a matter of intergenerational justice, the Brundtland Report extended responsibility beyond immediate economic interests and electoral cycles. The impact that this had was strong, it challenged short-term decision-making practices in both public policy and business. When encouraging a longer-term orientation in planning, investment, and governance; The emphasis on future generations would arise. This became later a core element of sustainability reporting and long-term risk assessment frameworks. Also a very important key factor was that the Brundtland Report recognized the leading role of businesses and markets as central players to achieve this new form of sustainable development. Firms were no longer portrayed solely as sources of environmental harm but as potential agents of innovation and transformation. This perspective laid groundwork for future later expansion of sustainability initiatives from businesses as well as voluntary standards and the introduction of internal governance mechanisms.

Also on this occasion, the concept of sustainable development did not come without criticism. Conceptual ambiguity was carried out from different scholar's perspectives allowing sustainability to be interpreted in ways that accommodate existing growth-oriented economic models without fundamentally challenging them (Redclift, 2005). Even with critiques, this report stayed as a reference point in sustainability discourse for the years to come.

6.6 Global Environmental Governance and the Institutionalization of Sustainability (1990s)

In the next decade progressive steps were taken into a new defining phase of institutionalization of sustainability at a global level. The 1990s represented the transition from predominantly national environmental policies to coordinated international governance frameworks. The concept of a international policy coordination arose when there was a clear recognition from different nations that environmental challenges such as climate change, biodiversity loss, and resource depletion transcend national borders and cannot be effectively addressed through isolated policy interventions. The rise of sustainability as a global responsibility emerged, also it was clear that there was a requirement for cooperation among sates, international organizations, business and civil society. The commonly known Rio Earth Summit was the landmark moment in this evolution process, it was hosted and organized by the 1992 United Nations Conference on Environment and Development. During the conference, 170 representatives from different countries alongside non-governmental organizations and private-sector actors were brought together, signaling an unprecedented level of global engagement with sustainability issues. The most significant outcome of the conference was the adoption of Agenda 21. Agenda 21 is a comprehensive action plan that put foundation on strategies and guiding principles for a sustainable development on a local, national and global level (United Nations, 1992). The agenda also emphasized the public participation into economic planning and institutional reform. The most relevant and important outcome from the Rio Summit was the legally binding agreements that were signed. This includes the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity. This is a key factor into the process of institutionalize sustainable development because the agreement established formal mechanisms for international cooperation and laid the

foundations for subsequent climate negotiations. A new principle was introduced in the summit, the “common but differentiated responsibilities”, basically an acknowledgment that even if all nations are responsible for environmental protection, their capacities and historical contributions to environmental degradation differ. This principle continues to shape global sustainability governance and climate policy debates. The multi-stakeholder approach to sustainability was equally significant. What a multi-stakeholder approach meant is that actors as businesses, non-governmental organizations, and local communities were all recognized as essential players in reaching a sustainable development. This recognition boosted and gave space to voluntary initiatives, private standards, and market-based instruments. This is when sustainability started to become an hybrid character that combined public authority with private initiatives. All these takeaways and the institutional momentum generated during the 1990s put sustainability as a central feature of international governance. There were a series of subsequent initiatives that built upon the Rio framework, such as the Johannesburg World Summit on Sustainable Development and later the Sustainable Development Goals. Collectively, these developments contributed to its diffusion into corporate governance and market practices.

6.7 Corporate Social Responsibility and the Expansion of Voluntary Self-Accountability (Late 1990s)

Before the end of the 20th century, sustainability became more institutionalized at global level by increasing its influence on corporate governance with the rise of Corporate Social Responsibility (CSR). CSR emerged during the late 90s as a benchmark framework through which businesses and firms structured their ethical, social and environmental responsibilities. It differs from the earlier regulatory approach because CSR put emphasis on voluntary engagement and self-regulation. This new framework gave firms a proactive role and responsibility to social well-being rather than passive recipients of regulatory constraints. CSR

frameworks argued that corporate responsibility encompasses economic, legal, ethical, and philanthropic dimensions (Carroll, 1999).

This conceptualization expanded the scope of corporate accountability beyond compliance with laws and regulations, encouraging firms to consider the broader social and environmental impacts of their activities. This was put into practice with the inclusion of codes of conduct, philanthropic programs, stakeholder engagement processes, and voluntary sustainability disclosures in the CSR framework.

As every major change, the introduction of CSR was often criticized from different stakeholders. The main critique was its lack of enforceability and susceptibility to symbolic adoption, the takeaway is that even if the adoption looked symbolic, it still played a crucial role in familiarizing firms with sustainability practices and reporting. By encouraging voluntary disclosure and stakeholder dialogue, CSR contributed to the normalization of sustainability within organizational routines. Firms increasingly recognized that social and environmental performance could influence reputation, consumer trust, and employee engagement.

This period also witnessed the emergence of early sustainability standards and certifications, such as ISO 14001 and SA8000, which provided formalized tools for demonstrating responsible behaviors. These instruments introduced key governance mechanisms, standardization, external verification, and comparability, that would later become central to ESG frameworks.

6.8 The Formalization of Sustainability Reporting and Standardization (2000s)

Moving into the new decade we can observe how sustainability governance entered a phase of formalization. Many companies started to create a structure around what had previously been a voluntary and narrative-driven reporting structure. This change occurred also thanks to the growing stakeholder pressure and demand for better and more transparency, comparability and especially accountability regarding corporate environmental and social performance. The

developments of reporting standards such as the Global Reporting Initiative (GRI) played a central role in this transformation. The importance of these were the way they helped standardize and facilitate the sustainability reports across industries and regions (Global Reporting Initiative, 2006). This was important because it helped stakeholder from different companies and industries to compare firm's performance more systematically.

Different type of sustainability was now taken into consideration, these reports were often linked to risk management and strategic decision-making. Financial implications were tied to environmental and social issues, affecting supply chains, regulatory exposure, and reputational capital. The result was that reporting practices moved from a symbolic act to an accurate data driven disclosure shifting sustainability into governance mechanism rather than a simple communication exercise. Still, in the early 2000s, reporting sustainability was mainly a voluntary process rather than a law directive. New expectations were set towards Investors, consumers, and civil society organizations that began to expect regular sustainability reports. This is part of the process of institutionalization, transforming voluntary reporting into a quasi-mandatory practice. A strong example of how market forces can institutionalize sustainability norms even in the absence of binding regulation.

6.9 ESG and the Financialization of Sustainability (2000s–2010s)

The last decisive transformation occurred with the emergence and adoption of Environmental, Social and Governance criteria's (ESG). This became the central framework for financial markets as well, investors started to recognize how environmental risks, social practices, and governance structures could influence long-term returns and risk exposure. ESG introduced a new financial dimension of corporate governance and performance.

ESG was strongly influenced and supported by many initiatives such as the United Nations report *Who Cares Wins* and the establishment of the Principles for Responsible Investment, which encouraged institutional investors to integrate ESG considerations into investment analysis (UN Global Compact, 2004). Thanks to this new reporting structure and practice there were many more data about the quantification and benchmarking of sustainability, all done thanks to new metrics, ratings, and indices. The problem that occurred here was about the nature and the quality of these data's. From now on sustainability was also a subject of interests for investors with the involvement of new challenges such as methodological consistency and risk of oversimplification. When looking at voluntary sustainability practices some limitations emerged especially around themes such as greenwashing and information asymmetry. That's when entities, such as the European Union, started to introduce binding regulatory frameworks that aimed to standardize ESG reporting and put emphasis on accountability. The adoption of the Non-Financial Reporting Directive marked a turning point by requiring large companies to disclose information on environmental, social, and governance matters (European Commission, 2014). As a consequence of the firsts binding regulations, other initiatives, including the EU Taxonomy and the Corporate Sustainability Reporting Directive, strengthened regulatory oversight and expanded the scope and detail of reporting obligations.

From early awareness to these regulatory developments, sustainability moved from a voluntary commitment to a legal binding requirement. Mandatory ESG reporting institutionalized sustainability within corporate compliance systems and reinforced its role as a core component of governance and risk management. Certifications and reporting frameworks are the intermediary institutions that helps translate the principle set by organizations into practices. The level of accountability reached by many companies now is usually higher than the normal requirements asked by government entities, combining a mix of self-accountability and mandatory compliance that reflects the layered historical evolution of sustainability

governance. This is crucial to understand the importance of certifications as a tool like the frameworks, to translate and put into visible practice the commitment of a company to respect certain standards. Under this perspective, certifications are not merely technical tools but structures that shape market behaviors, organizational strategies, and stakeholder expectations.

7. Companies and their certifications

After the first section about the historical introduction about the sustainability movement, in the following part the focus will be placed on the observation aimed at verifying whether some of the sustainability certifications discussed in the preceding parts of the dissertation are identifiable within the selected group of companies. The attention will be on certifications and standards as market shaping devices that were mentioned in the first part of the dissertation. More specifically these are environmental management systems such as ISO 14001, occupational health and safety standards such as ISO 45001, social accountability frameworks such as SA8000, and sector-specific supply-chain and sourcing certifications such as FSC and PEFC. The analysis will be conducted on the ten largest companies by free-float market capitalization within the EURO STOXX 50 Index. The whole point of this observation is not to analyze and study accurate data's but rather to have and conduct an empirical observation on large companies that can have a strong influence on competitors and smaller players in their industry. For each of these 10 companies publicly available sustainability documentation is examined in order to observe whether, and in what form, certifications are referenced or adopted. The goal is not to see the impact or the effectiveness of the implementation but rather to see if they are implemented and in what way the reports are written.

The reference point for this observation is set at 31 August 2023, corresponding to the composition of the EURO STOXX 50 Index as reported in the official factsheet published by STOXX Ltd. This date is situated within a broader five-year period following the COVID-19

pandemic, during which corporate sustainability practices, disclosure frameworks, and governance mechanisms underwent significant consolidation and standardization. The reports analyzed are from recent, mainly from 2024. This divergence between the reference point of observation and the data collection time is to be intended as a simple way to provide better and updated data. The biggest largest companies on the 31st August 2023 are symbolic in a sense that their reports can be still studied even if from one year later, because their sizing is still perfectly relevant also in 2024 and 2025 for the type of analysis that was conducted. The goal is to create a small reference limited in time to capture a consolidated snapshot of sustainability-related practices that can eventually serve as a reference point for future research. Subsequent studies may use this observation as a comparative benchmark for more recent analyses, thereby situating later developments within a coherent temporal trajectory. This assumption is advanced in a descriptive and illustrative manner and does not imply any claim of temporal optimality or exhaustiveness

7.1 The top 10 companies

Now diving into the list of companies that will be analyzed a brief introduction will follow each one of them. These firms offer a perfect view on multiple industries within the European market. From technology to energy, consumer goods, and financial services, they provide a suitable and diverse set of cases for an exploratory observation of sustainability-related certifications.

The companies are briefly introduced below in order to contextualize their core activities and sectoral positioning, with a preliminary but non-exhaustive reference to their engagement with sustainability-related initiatives. After the brief general introduction of all ten companies a more in detail one on one analysis take place. The data are taken from the public sustainability reports published by each one of the companies on their website portals. The companies included in this exploratory analysis are ASML Holding N.V., LVMH Moët Hennessy Louis Vuitton SE,

SAP SE, TotalEnergies SE, Sanofi, Siemens AG, Schneider Electric SE, Airbus SE, Allianz SE, and L'Oréal SA.

Starting from the top one, ASML is a Dutch-based technology company specializing in the development and production of advanced lithography systems used in semiconductor manufacturing. It plays a critical role in global value chains related to microchips and advanced electronics, operating in a highly capital-intensive and innovation-driven industrial context. The company operates in the B2B sectors so it can result in less public pressure on accountability and sustainability practices. Anyway, ASML posts its report about objectives related to energy efficiency, responsible innovation, and emissions reduction within its operations. These initiatives are primarily framed around operational performance, supply-chain collaboration, and long-term technological development. Second place is populated by LVMH, a French multinational conglomerate operating in the luxury goods sector. This company operates in B2C retail goods, its portfolio includes fashion and leather goods, wines and spirits, perfumes and cosmetics, watches, and jewelry. The group manages a complex global supply chain involving diverse raw materials and artisanal production processes, making it also interesting under a sustainability perspective lens. Nevertheless, when it comes down to sustainability initiatives within the group, those are usually linked to responsible sourcing, environmental stewardship, and social conditions along the supply chain. Due to the huge nature of the group that contains different brands, these efforts are often articulated through group-wide programs. Third place is taken by a German company: SAP. SAP is a German multinational software corporation focused on enterprise application software. SAP's activities are primarily digital and service-oriented, with a strong international footprint. Sustainability was taken as a cross-cutting theme within its corporate strategy, with a focus specifically on climate targets, digital efficiency, and responsible business conduct. The software that they provide to other businesses is facilitating the way other companies operate in areas such as management and sustainability reporting. It

follows TotalEnergies a French energy company operating across the energy value chain, including oil and gas exploration, refining, distribution, electricity generation, and renewable energy. This company thanks to its size and its core business is a perfect example to study in this dissertation. Its business model involves activities that are characterized by significant environmental and safety concerns due to the scale and nature of its industrial operations. In the last years, the company has pushed towards an energy transition by incorporating investments in renewable energy, low-carbon technologies and emission reduction initiatives. Another French company on the list is Sanofi. It is a pharmaceutical company with a strong focus on research, development, manufacturing, and distribution of medicines and vaccines. The company operates regulated production environments and global supply networks, with particular attention to health, safety, and compliance standards. Sustainability reporting in Sanofi, is usually related with initiatives that are generally framed around environmental performance of manufacturing sites, and responsible supply-chain management. As per the other companies, everything is integrated into corporate policies and public disclosures related to long-term value creation. Following on the list is Siemens. Siemens is a German industrial conglomerate active in many different sectors such as automation, digitalization, energy systems, infrastructure, and mobility. Siemens is another B2B company that in its business model involves a large-scale industrial and infrastructure project. Siemens has put sustainability as a strategic pillar in their development, particularly in relation to energy efficiency, industrial decarbonization, and digital solutions supporting sustainable infrastructure. All these initiatives are closely linked to the nature of its technological and engineering activities. After Siemens we find Schneider Electric on the list. Schneider Electric is a French multinational company, direct competitor of Siemens, it is also specialized in energy management and automation solutions. Also, its business model combines industrial manufacturing with digital technologies, the aim is to improving energy efficiency,

sustainability, and resource management across various sectors. The was sustainability is treated is in structured programs targeting both internal practices and customer-facing solutions. A different industry that appears on the list is represented by Airbus, an European aerospace corporation engaged in the design, manufacturing, and servicing of commercial aircraft, helicopters, and defense systems. Also, in this case the business model involves complex industrial processes, and stringent safety and regulatory requirements. The focus about sustainability-related initiatives here it's primarily associated with emissions reduction, fuel efficiency, and the development of alternative propulsion technologies. These efforts reflect broader sectoral pressures that come from many internal and external stakeholders. The second last spot is taken by Allianz. The well-known German multinational financial services company provides insurance and asset management services to numerous clients. In this case, the main activities provided are service based, therefore sustainability is taken into account primarily relating to governance practices, responsible investment, and operational environmental management. The company is active also on a public environment when it comes down to sustainability investment policies. Sustainability is treated as a component of long-term risk management and corporate governance. Last place is for another French company: L'Oréal. It is a multinational company operating in the cosmetics and personal care sector. The business operates in the B2C sector, its main core activities are product development, manufacturing, marketing, and global distribution, with particular relevance for sourcing, packaging, and supply-chain management practices. As many companies producing and selling goods the sustainability initiatives revolves around footprint reduction, responsible sourcing of raw materials, and social standards within the supply chain.

This small recap was intended to simply have a general overview about what the companies do and are, leaving space for a detailed one of one analysis of each company in the section that follows.

7.2 ASML Holding N.V.: Sustainability Frameworks and Certification Practices

Starting from the first company on the list, ASML Holding N.V., it approaches sustainability as part of a bigger integrated ESG framework that is part of the general overall corporate strategy. It is good to see that for the company sustainability is framed as a structured area of corporate responsibility and disclosure rather than being treated only as a matter of regulatory compliance. We can see evidence of this approach when looking at the company's public sustainability disclosures that are found in the Annual Report through a dedicated "Sustainability statements" section (ASML, 2024). From an environmental perspective, ASML explicitly refers to the implementation of a structured Environmental Management System (EMS) within its overall Environmental, Health and Safety (EHS) management framework. More in detail, ASML confirms that their public disclosure, rather than a purely declarative and descriptive activity, is considered as a systematic management activity. ASML confirms that its EHS management system is certified according to ISO 14001 standards showing a concrete organizational and governance tool that supports standardization, continuous improvement, and corporate accountability across sites (ASML, 2024). In this regard, ISO 14001 functions as a foundational certification that strengthens the credibility and operational consistency of the company's environmental strategy. ASML also reports the adoption os health and safety management practices that are consistent with ISO 45001 standards putting safety as an integral part of operational governance rather than a merely compliance function. One matter to point out is that ASML's alignment with ISO 45001 is assessed internally and not externally certified or audited, which suggests that ISO 45001 is used more as an internal governance benchmark than as a formal external certification mechanism (ASML, 2024). In parallel, ASML reports the adoption of occupational health and safety management practices consistent with ISO 45001,

positioning health and safety as an integrated dimension of operational governance rather than an isolated compliance function (ASML, 2024). However, the Annual Report also clarifies that while ASML's global health and safety management system is aligned with ISO 45001 requirements, it is assessed internally and not externally certified or audited, which suggests that ISO 45001 is used more as an internal governance benchmark than as a formal external certification mechanism (ASML, 2024). Apart from this ISO certification, ASML's sustainability governance is supported by a bigger set of commitments. An example is the alignment of greenhouse gas measurement and emissions reporting with the GHG Reporting Protocol. It reports alignment of machinery design and safety processes with ISO 12100, and it also refers to compliance with SEMI S2, which is a widely used industry guideline addressing environmental, health, and safety requirements in semiconductor manufacturing equipment (ASML, 2024). These standards complement ISO-based management systems by reinforcing the operational and product-level dimension of sustainability governance. With regard to social sustainability, ASML does not systematically reference SA8000 certification in its Annual Report. To notice is the assessment practices used by ASML, that consist of emphasize specifically on value-chain management, are recognized through mechanisms such as the Responsible Business Alliance (RBA) self-assessment questionnaire (SAQ). Even if there is no formal affiliation, these practices still align with the principles of SA8000 standards, particularly regarding labor standards and ethical sourcing. The way sustainability disclosure is framed is with alignment to the European Sustainability Reporting Standards (ESRS) and treated always as a part of a broader governance architecture. Overall, for ASML ISO 14001 certification plays a central role in structuring environmental management, and ISO 45001 is used as a key reference standard for occupational safety governance without external certification.

7.3 LVMH Moët Hennessy Louis Vuitton SE: Sustainability Governance and Certification Practices

LVMH Moët Hennessy Louis Vuitton represents a paradigmatic case of sustainability governance in the luxury sector, where environmental and social certifications are embedded within a highly diversified and globally extended value chain. Due to the big structural complexity that the group have, they decided to adopt a multi-layered certification and audit strategy rather than reliance on a single, uniform standard (LVMH, 2024). Starting by looking at the environmental management systems, LVMH explicitly put ISO 14001 into their operational framework. The trajectory of the group regarding certifications adoption goes back to the early 2000s, when Hennessy became the first wine and spirits producer globally to obtain ISO 14001 certification, signaling early institutionalization of environmental management practices (LVMH, 2024). After this first adoption, the standard has been progressively extended to all production sites, logistics centers, and selected suppliers. As seen before, the ISO 14001 is used more as a mechanism for standardizing internal processes rather than a simple compliance tool. Paralleling to this, LVMH as a group has formalized a policy aimed at certifying strategic raw materials, ensuring that all adopted standards incorporate traceability requirements throughout the supply chain (LVMH, 2024). Evidence of this approach can be found in the evident use of FSC and PEFC-certified paper and wood-based packaging, by systematic monitoring certified versus non-certified materials, LVMH can operationalize sustainability certifications as measurable governance tools rather than symbolic commitments.

Moving into the spectrum of social accountability and labor standards, LVMH does not adopt SA800 uniformly as a standalone certification across all the different departments and operations. The group implemented different mechanism with their Supplier Code of Conduct extensive audit programs, and participation in third-party evaluation platforms such as

EcoVadis. Every supplier that is identified as a high-risk subject must undergo enhanced assessments, on-site audits, and corrective action plans, reflecting the logic of social certification through continuous monitoring rather than single-point accreditation (LVMH, 2024). This is an example of how multinational organizations often play a crucial role into substitute formal social audit systems with this form hybrid governance that involves contractual clauses and reputational incentives. All the governance in the group is reinforced by its LIFE 360 strategy that integrates ESG and product related objectives into a long-term map to 2030. In this framework certifications are a central component seen as tools for an actual organizational transformation. ISO 14001-related training is provided across production sites (LVMH, 2024), this reflects dynamics described in the thesis where certifications increasingly shape internal routines, supplier relationships, and innovation processes. Overall the approach of LVMH try to operate as a group even with clear distinction between all the division that they have, not all certifications discussed in the thesis are adopted in their formalized versions, but their functional equivalents are part of the group strategy. This confirms the role of certifications as market-shaping devices that structure accountability, comparability, and legitimacy in global value chains, particularly among large, diversified firms.

7.4 SAP SE: Sustainability Certifications and Digital Governance Frameworks

The next company is a tech giant in Europe: SAP SE. Its approach to sustainability topics is very deeply embedded in its corporate strategy and structure. SAP find itself in an interesting position, it has a dual role of a multinational enterprise and a provider of digital solutions that enable sustainability management for other organizations In the Integrated Report 2024, SAP present sustainability as a cross-cutting governance dimension that comprehend environmental performance, social responsibility, ethical conduct, and long-term value creation (SAP, 2024). As seen for other companies, SAP intent is to position sustainability not as a marginal activity

but as an integral component of corporate governance and decision-making. Now looking at the environmental management perspective, in its reports SAP claim the adoption of structured management systems that are aligned with ISO 14001 across all their global operations. The locations involved the most on this are the development and data centers infrastructures that are responsible for most of the SAP's operational footprint. ISO 14001-aligned practices are used to manage energy consumption, greenhouse gas emissions, water use, and waste generation, with particular attention to the growing environmental impact of cloud computing and digital infrastructure. Within this context, ISO 14001 functions as a standardizing mechanism that enables consistent environmental management across geographically dispersed sites operating under diverse regulatory regimes (SAP, 2024). The global broader SAP's climate strategy includes long-term emissions reduction targets and commitments related to renewable energy procurement and energy efficiency. The structural backbone in this is still the ISO 14001 that provides an anchor that help translate the environmental policies into a measurable commitment with monitoring routines, and continuous improvement cycles. In this sense, the certification operates as an institutional anchor that stabilizes environmental governance within a rapidly evolving digital business model. Besides this, SAP reports as well the implementation of health and safety measures that are consistent with ISO 45001. Considering the service-oriented nature of SAP's business model, ISO 45001 does not address high-risk industrial hazards, but it functions more as a governance instrument that aim to ensure organizational resilience, employee protection, and continuity of operations.

Now regarding social accountability SAP does not report the systematic adoption of SA8000 all across its operation or supply chain. These themes are addressed with internal policies and supplier governance mechanisms. In detail these are a global Code of Conduct, a Supplier Code of Conduct, and structured due diligence processes. The scope is to address human rights, labor

standards, diversity, and ethical business practices in a way that are aligned with broader international recognized frameworks such as the UN Global Compact and ILO conventions. In practice, by aligning with these standards, SAP reaches a compliance level that is equivalent to the principles underlying SA8000 without reliance on formal third-party certification (SAP, 2024). This approach can be found as part of a broader pattern among large and big service-oriented multinational enterprises that manage social accountability with continuous monitoring rather than using discrete certification schemes. In SAP's situation the supplier's assessment and the risk based audits are used to create patterns and operational schemes that help manage social responsibility across different departments. The absence of SA8000 limits its external comparability with other companies. It is noticeable to point out that SAP's sustainability schemes include also a bigger range of additional certifications standards that goes beyond the mere environmental and social certifications ones that have been discussed in the thesis. Worth to mention is the compliance of SAP with ISO 27001, that governs information security management system. Even if this ISO certification is not directly related to environmental or social sustainability it still shows the company commitment to adopt internationally recognized standards. The coexistence of ISO 14001, ISO 45001, and ISO 27001 illustrates how sustainability-related certifications are embedded within a broader ecosystem of corporate standardization. Unlike manufacturing-intensive firms, SAP does not make systematic reference to FSC or PEFC certifications, as forest-based raw materials and physical packaging play a marginal role in its core activities. This absence further highlights the sector-specific relevance of certain sustainability certifications and reinforces the argument developed earlier in the dissertation that certification adoption is shaped by materiality, operational footprint, and value-chain configuration rather than by uniform corporate behaviors across industries. Overall, SAP represents a distinctive case in which sustainability

certifications function as components of an integrated digital governance infrastructure rather than as isolated compliance instruments.

7.5 TotalEnergies SE: Sustainability Certifications and Industrial Governance in the Energy Transition

The next company on the list is TotalEnergies SE, a very interesting company to analyze especially on these terms since its one of the most expose in environmentally and socially sensitive industrial sectors. The company business is all about energy production, transformation, and distribution. Sustainability governance is then a central aspect that can't be ignored, according to its Sustainability & Climate 2025 Progress Report, the company puts and frames sustainability as a multidimensional challenge that encompasses climate change mitigation, industrial safety, social responsibility, and long-term energy system transformation (TotalEnergies,2025).

Diving into the environmental management operations, TotalEnergies accounts for the implementation of management systems that are aligned with ISO 14001 across all its industrial sites. The industrial sites that are considered are all the facilities where all the main activities of the company are carried out, including oil and gas production, refining, petrochemicals, biofuels, and renewable energy operations. ISO 14001 functions as a core governance instrument for managing emissions, waste, water use, biodiversity impacts, and environmental risks associated with complex and high-impact industrial processes. The way ISO certifications are used also in this scenario is always as a common framework that helps monitoring and improving all the company's heterogeneous assets (TotalEnergies, 2025). Environmental certifications are closely seen as part of the company's broader climate strategy, that comprehend significant investment and resources allocation in low-carbon electricity, biofuels, biogas, and sustainable aviation fuels. Of course, the initiatives themselves are not considerable

as certifications per se, but thanks to ISO 14001 the operational management system can keep track on the way through these objectives are implemented, audited, and reported. This way, environmental certifications are a way to institutionalize the environmental risk management in a sector where there is a high regulatory scrutiny and public visibility. On the other hand, in terms of occupational health and safety, TotalEnergies is relying heavily on systems such as ISO 45001. This reflects the high-risk nature of many of its industrial activities, specific programs aim to reduce serious accidents and improving safety culture across subsidiaries and contractors during the everyday operations of the company. Inside its report, TotalEnergy shows the commitment to reduce serious work accidents, supported by systematic risk identification, training programs, and technological prevention measures (TotalEnergies, 2025). ISO 45001 plays a crucial role in a company where risk has to be considered as a structural issue rather than an exceptional incidental case. Lastly, regarding social accountability, TotalEnergy does not report the systematic adoption of SA8000 certification. Also in this case, social sustainability is governed within internal company frameworks such as the Care Together by TotalEnergies initiative and extensive social dialogue mechanisms. The main goal of this initiatives is to align as many internal standards as possible to the principles of the International Labor Organization. The themes mentioned are all issues related to decent wages, employee health, social protection, training, and labor relations. It is interesting to see that when it comes down to internal social governance system usually the approach is to not rely over external social certification, especially in context characterized by diverse and complex industrial relations (TotalEnergies, 2025). Other than ISO certifications, TotalEnergy refers to a large number of additional standards in its report. These standards are related to process safety and operational integrity, such as API and IOGP guidelines. Even if these are not part of larger and broader cross-sectoral certification schemes, they still show how sustainability governance in the energy sector often relies on specialized technical frameworks. As opposed to B2C

companies that rely systematically on certifications such as FSC or PEFC, TotalEnergy does not report them in its core value chain. This supports the thesis that certification adoption is strongly shaped by sectoral materiality and operational context.

Overall, TotalEnergies represents a case in which sustainability certifications are embedded within a highly formalized and industrially grounded governance architecture. The company uses many sector-specific standards that reinforce the analytical distinction between cross-sectoral and sector-specific sustainability governance mechanisms.

7.6 Siemens AG: Sustainability Certifications and Integrated Industrial Governance

Moving on into the lists we can find Siemens AG, another industrial giant in the European landscape that combine large-scale manufacturing, infrastructure development, and digital solutions. In their fiscal sustainability statement for 2025, Siemens presents sustainability as a clear central core strategic priority embedded in the company's business model also as a long-term value creation logic (Siemens AG, 2025).

On a governance perspective, Siemens operates under a two-tier governance model, the Managing Board and the Supervisory Board. This last Board is the one responsible for sustainability objectives. Inside the report it is also presented some dedicated sustainability-focused governance bodies, the Siemens Sustainability Board and the Sustainability Executive Committee. Both are responsible for coordinating sustainability priorities, and monitoring performance ensuring a coherent company's portfolio development (Siemens AG, 2025). In the Sustainability Statement Siemens organizes its agenda into different thematic areas that include both internal responsibility and external potential impact. Some key factors were identified such as foundational condition for credible sustainability management: decarbonization and energy efficiency, resource efficiency and circularity, and people centricity

and society. The document highlights the importance of a clear material assessment as an instrument to determine which sustainability impacts, risks, and opportunities are most relevant. Such mechanism are the ones that demonstrates the attempt to address sustainability via measurable and prioritized governance structures, that can be traced and disclose to stakeholders (Siemens AG, 2025).

With regard to environmental management approach, Siemens' sustainability governance architecture relies on internationally recognized standards such as ISO-oriented systems as operational tools that enable harmonized management practices across sites and business units (Siemens AG, 2025). Siemens makes explicit reference to ISO 50001 when it comes down to energy management considering also the mandatory implementation of it imposed by the German authorities and subject to periodic energy audits. More broadly Siemens' approach is following the ISO-style management helping once again to ensure consistency across diverse operational contexts. Occupational health and safety management are also a very important matters for Siemens considering its high-risk industrial and project-based environments. The reports usually does not use certifications labels as the primary focus bur the governance logic is aligned with the structure of ISO 45001 including risk identification, preventive measures, safety training, and continuous improvement mechanisms (Siemens AG, 2025). Sustainability id for Siemens a central topic to be intended not only with an environmental approach but also as a human-centered operational risk mitigation, acknowledging that workplace health and safety is essential for long-term organizational resilience and responsible industrial development (Siemens AG, 2025). Siemens does not present SA8000 certification in relation to social accountability, instead it relies again on internal policy framework and governance arrangements. Social sustainability is addressed with structured corporate standards, ethics systems, and supply-chain oversight mechanisms (Siemens AG, 2025). All these instruments

are self-reported so once again the approach is that sustainability is controlled primarily through internal corporate systems rather than using external certifications. Comparing the certifications listed in the first part of the dissertation we can spot the use of FSC-certified materials by Siemens mainly in relation to packaging, paper products, and auxiliary materials, rather than core industrial inputs. This shows how usually this selective adoption is often shaped by sector-specific materiality considerations instead of a uniform application. To summarize, Siemens is a good example of integration between sustainability governance and institutionalized instruments that support coordination, accountability, and legitimacy. The ISO-oriented approach provides a stable foundation thanks to which environmental protection, energy efficiency improvement, and occupational health and safety risk management can be systematically implemented across global operations (Siemens AG, 2025). Also, Siemens remark the fact that not every sustainability dimensions is controlled and handled with certification schemes; social accountability is addressed primarily through internal governance. There is also in this case a clear dualism approach between internal auditing and the adoption of external standards and certifications to standardize processes across the organization.

7.7 Schneider Electric SE: Sustainability Certifications and Integrated Energy Governance

Schneider Electric SE represents one of the most advanced corporate cases of sustainability integration within the European industrial landscape. The business operates in a global market by providing energy management, automation, and digital solutions for buildings, data centers and their infrastructure. Schneider Electric positions sustainability as a core strategic driver of its business model and not merely as a supporting function. In its 2024 sustainability documentation, they explicitly present sustainability as an inseparable aspect from their operation as a long-term value creation tool (Schneider Electric, 2024).

Under the environmental management perspective, Schneider Electric reports its adoption of management systems certified and aligned with ISO 14001. This certification applies to all manufacturing sites, the logistics facilities and the service locations, enabling a structured management across departments and resource efficiency. ISO 14001 is always use also here to standardize environmental practices across their global operation sites while ensuring compliance with local regulatory frameworks. Schneider Electric's broader climate and energy strategy is closely linked with environmental certification. The company focus is on energy efficiency and decarbonization, both for its own operations and for the solutions provided to the customers. In this context, ISO 14001 is complemented by the extensive adoption of ISO 50001 (energy management systems), which, while not a core certification discussed in the previous section of the dissertation, represents a relevant complementary standard. ISO 50001 helps to optimize and monitor performance systematically. Besides the environmental management approach, Schneider Electric reports the adoption of occupational health and safety management systems aligned with ISO 45001. The company business model and structure are embedded with a large industrial footprint, so safety governance constitutes a critical dimension of sustainability management. ISO 45001-certified systems are employed to structure risk assessments, accident prevention measures, employee training, and contractor safety requirements across sites. The use of systems like this helps to create consistency in risk management practices in a context full of heterogeneous regulatory conditions (Schneider Electric, 2024).

With respect to social accountability Schneider Electric faces it through a comprehensive set of internal policies without adopting the SA8000 standard certification. These policies include a global Code of Conduct, a Supplier Code of Conduct, and structured human rights due diligence processes aligned with international frameworks such as the UN Guiding Principles on

Business and Human Rights and International Labor Organization conventions. Thanks to its supplier audits, monitoring mechanisms and action plans, Schneider Electric is aligned with the objectives described in the SA8000 certification without formally having it recognized (Schneider Electric, 2024). In its report, Schneider Electric, shows how it relies on a broad ecosystem of additional standards, frameworks, and external assessments to structure its sustainability governance. The company has been for a long time a signatory of the United Nations Global Compact and aligns its sustainability strategy with the UN Sustainable Development Goals (SDGs). Its greenhouse gas emissions reduction has been validated through the Science Based Targets initiative (SBTi). These frameworks are not technically a certification in a strict sense, but they still play a crucial role in shaping accountability towards an external legitimacy (Schneider Electric, 2024). All the reporting carried out from Schneider regarding sustainability topics is conducted in accordance with recognized standards such as GRI, SASB, and TCFD. The company explicitly expose itself by complying with the forthcoming Corporate Sustainability Reporting Directive (CSRD). Nevertheless, the company is often included in major ESG ratings and indices like the Dow Jones Sustainability Index and CDP Climate assessments. These external evaluations reinforce the reputational governance on sustainability commitment particularly in capital markets and stakeholder communication.

7.8 Airbus SE: Sustainability Strategy and Certification Frameworks

The next company on the list is Airbus SE, when observing different approaches to corporate sustainability among large European industrial groups, Airbus is one of the most representative with an advanced and structured approach. Also in the case of Airbus, sustainability id framed as a core pillar that is integrated into long-term strategic developments plan for governance, innovation and operational decision-making (Airbus, 2025). The central part of Airbus' sustainability strategy is the commitment to reach climate neutrality, it is aligned with the

aviation sector's collective objective of reaching a net-zero carbon emissions by 2050. In concrete terms Airbus has put in action measurable targets with the adoption of Science Based Targets initiative (SBTi)-validated goals. In details, the commitment is to reduce absolute Scope 1 and Scope 2 greenhouse gas emissions by 63% by 2030, and Scope 3 emissions intensity by 46% by 2035, using 2015 as the baseline year (Airbus, 2025). Thanks to these targets set by SBTi and the direct link of Airbus to them, it positions the company as one of the most internationally recognized climate governance frameworks. In the environmental management perspective, Airbus adopts ISO 14001-certified Environmental Management Systems across all its sites. This certification as we keep seeing is always largely adopted to ensure structured monitoring, continuous improvement, and regulatory compliance across different industrial sites. In this case, Airbus implements also an internal program called high5+ environmental, which consolidates environmental targets related to energy use, water withdrawal, waste generation, and volatile organic compound (VOC) emissions, reinforcing a logic of continuous improvement consistent with ISO-based governance models (Airbus, 2025). Regarding social sustainability, Airbus aligns all its practices with explicit references to the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprises, and the International Labor Organization (ILO) core conventions. Airbus has also a Code of Conduct and a Supplier Code of Conduct that extend the sustainability requirements beyond the direct operation of the company. This reflects the approach discussed in the thesis of many companies that are aligning and extending their sustainability standards also on their supply chain by making it accountable, in particular with a relation to ESG governance frameworks. Airbus also holds ISO 45001 certification for occupational health and safety management systems. The company's emphasis on workplace safety is considered an integral dimension of sustainability, rather than a standalone compliance obligation (Airbus, 2025). ESG expectations, particularly under the "Social" pillar, require an alignment to the principle

described in the ISO 45001, so the adoption of it is a clear sign of commitment from Airbus. Due to its relevance in the industry it operates in, Airbus plays a leading role in sector-specific sustainability initiatives, such as the development and certification of Sustainable Aviation Fuels (SAF). SAF itself is not a certification but Airbus contributes to its processes and infrastructure development to ensure that all the aircrafts are compatible with up to 100% SAF by 2030. Airbus position itself as a proactive actor in sustainability rather than limiting its actions to just internal emissions reductions (Airbus, 2025). Airbus also adopts a clear and extensive non-financial reporting and transparency practices that is consistent with European regulatory developments such as the Corporate Sustainability Reporting Directive (CSRD). Airbus SE demonstrates a multi-layered sustainability architecture, combining internationally recognized certifications (such as SBTi validation, ISO 14001, and ISO 45001) with sector-specific initiatives and strong alignment with global governance frameworks. Among all the companies analyzed so far, Airbus reflects a mature sustainability model, illustrating how large European industrial firms operationalize sustainability commitments in high-impact sectors.

7.9 Sanofi: Sustainability Certifications and Governance in a Regulated Pharmaceutical Context

Sanofi is a pharmaceutical that operates in a highly regulated environment, sustainability governance is strictly related to a strong compliance, risk management, and quality assurance across research, manufacturing, and global supply chains. Sanofi reports a Universal Registration Document, in the version of 2024 it reports and frames sustainability as a structured governance system (Sanofi, 2024). This context makes internationally recognized management system certifications particularly relevant as instruments for standardization, auditability, and institutional accountability.

On the environmental management perspective, Sanofi comply with ISO 14001:2015 requirements in its global Health, Safety and Environment (HSE). Only in 2024 the certification has covered 35 industrial and operational sites as well as relevant global functions (Sanofi, 2024). ISO 14001 is used as the foundation for setting a common governance framework on environmental impacts associated with pharmaceutical production, such as waste generation, emissions, chemical handling, and regulatory compliance. The certification supports a harmonized approach to environmental risk management across geographically dispersed and operationally diverse sites, consistent with the logic of continuous improvement embedded in ISO-based governance frameworks. Environmental certification is embedded within Sanofi's broader Planet Care program, which defines environmental targets across climate change, pollution prevention, biodiversity, eco-design, and waste management. While Planet Care itself is not a certification scheme, ISO 14001 provides the operational infrastructure through which environmental policies and targets are implemented, monitored, and audited. Also in this case, ISO standards are used to establish mechanism between complex sustainability architectures (Sanofi, 2024). Sanofi complements ISO 14001 with the certification of its energy management system under ISO 50001:2018, covering 33 sites representing a significant share of the company's total energy consumption. ISO 50001 is not among the certifications discussed in the earlier theoretical section of the dissertation, but its adoption is still relevant as a tool for energy performance monitoring and efficiency improvements. In the pharmaceutical sector, ISO 50001 reinforces the environmental governance framework established through ISO 14001 (Sanofi, 2024). In relation to occupational health and safety, Sanofi reports that selected sites are certified in accordance with ISO 45001, depending on local regulatory requirements and operational applicability. ISO 45001-aligned systems are used to structure risk assessments, incident prevention measures, employee training, and emergency preparedness across manufacturing and research environments. In a sector where employee safety intersects with

product quality and regulatory compliance, health and safety management constitutes a core dimension of sustainability governance rather than a standalone compliance obligation (Sanofi, 2024). Social accountability is address by Sanofi without the adoption of SA8000 certification across its operation or supply chain. Now a clear pattern, also Sanofi addresses social sustainability through a comprehensive internal framework comprising a global Code of Conduct, human rights commitments, and a Supplier Code of Conduct. The Supplier Code aligns suppliers with the principles of the United Nations Global Compact, covering labor standards, human rights, environmental responsibility, and business integrity. Supplier compliance is monitored through contractual requirements, assessments, and due diligence processes, reflecting a governance approach that pursues the objectives associated with SA8000 through internal standards and oversight mechanisms rather than through formal third-party certification (Sanofi, 2024). Sanofi's sustainability governance is reinforced through the evolving European regulatory frameworks, including the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS). It is to mention that the information disclosed are subject to a limited external assurance; while reporting standards are not certifications in a strict sense, they contribute to the institutional environment in which certifications operate by formalizing disclosure practices and governance accountability. Overall, Sanofi illustrates how sustainability certifications function as institutionalized governance instruments within a regulated pharmaceutical context. ISO 14001 and ISO 45001 provide structured frameworks for managing environmental and occupational risks, while ISO 50001 enhances energy governance in energy-intensive operations. Social accountability is addressed primarily through internal codes, supplier standards, and due diligence mechanisms rather than through SA8000 certification.

7.10 Allianz SE: Sustainability Governance and Framework-Based ESG Integration in the Financial Sector

In the last places we can find Allianz SE, due to the nature of its business sustainability governance is structurally different from that of manufacturing- or infrastructure-intensive companies. Rather than being centered on site-level environmental impacts or industrial processes, sustainability at Allianz is primarily articulated through governance frameworks, risk management systems, and capital allocation strategies. Allianz like the other companies publishes its report to be freely accessible to every stakeholder and it frames ESG integration as a core component of long-term value creation, within both insurance underwriting and investment activities (Allianz, 2024). From an environmental management perspective, Allianz does not rely on operational certifications such as ISO 14001 at the group level. This absence reflects the limited material relevance of site-based environmental management systems in a service-oriented organization with a comparatively low direct environmental footprint. The way Allianz addresses environmental responsibility is by focusing on emissions reduction targets, climate risk management, and sustainable finance. A commitment of the company is to reach net-zero greenhouse gas emissions by 2050 across its all portfolio of operations in order to align with the international climate objectives (Allianz, 2024).

Allianz's sustainability architecture is carried out also with recognized voluntary sustainability frameworks, that substitutes for traditional certification schemes. Allianz is a long-standing signatory of the United Nations Global Compact, committing to its ten principles covering human rights, labor standards, environmental protection, and anti-corruption. In addition, Allianz is a founding member of the Net-Zero Asset Owner Alliance and the Net-Zero Insurance Alliance, through which it commits to science-based intermediate targets for emissions reductions in investment and underwriting portfolios. While these initiatives are not

certifications in a strict technical sense, they perform a similar governance function by establishing externally recognized commitments, monitoring mechanisms, and accountability expectations (Allianz, 2024). Allianz is not adopting ISO 45001 certification standards, but it created internal policies, employee wellbeing programs and compliance with local labor regulations due to its great geographical extension in many different locations and states. This approach of relying on internal audit is consistent with the organizational structure of a multinational financial services group. Occupational risks are largely non-industrial and are better addressed through human resources policies and flexible working arrangements, risk management is adapted to each circumstance rather than formalized (Allianz, 2024). In fact, also for social accountability, Allianz does not adopt SA8000 certification. Again, also in this case as well it is regulated with a combination of internal rules and standards. A Group Code of Conduct addresses ethical behaviors, labor standards, diversity and inclusion, and human rights. Being practical, this represents a functional alternative to SA8000 without officially report it. The company is aligning itself with different disclosure frameworks such as GRI standards, TCFD recommendations, and emerging European regulatory requirements under the Corporate Sustainability Reporting Directive (CSRD). ESG considerations are taken into account through adherence to the Principles for Responsible Investment (PRI). These frameworks' objective is to mainly structure transparency, comparability, and accountability. In contrast to industrial firms analyzed earlier in this integration, Allianz's sustainability model is characterized by a framework-based governance style rather than a certification-driven operational approach. Environmental and social responsibility are addressed through strategic commitments, financial instruments, and risk management processes rather than through site-level ISO certifications.

7.11 L'Oréal SA: Sustainability Reporting Style and Certification-Based Governance

The last company on the list is L'Oréal SA, it reports its sustainability strategy mainly in the chapter number 4 of its Universal Registration Document 2024. The document represents a strong structured and governance-oriented narrative. Sustainability is seen and framed as a long-term transformation process that goes through the entire value chain and operations, from raw material sourcing to product design, manufacturing, and distribution, reflecting a mature and institutionalized sustainability governance model (L'Oréal, 2024).

Sustainability is treated as a serious matter and it is reported in a way that traceability, comparability, and auditability are clear and visible. Within this framework, sustainability certifications play a central role in operationalizing L'Oréal's environmental and social commitments. The company makes extensive and explicit reference to internationally recognized certification schemes. ISO certifications are presented as concrete governance tools that support operational control, standardization, and risk management across global industrial activities (L'Oréal, 2024). In details the report shows the adoption of ISO 9001 as a certification for the plants used by L'Oréal, it reports also that 100% of its plants are ISO 22716 certified, and this relates to Cosmetics Good Manufacturing Practices (GMP). The mix of ISO and internal practices reinforces the company's focus on product safety and manufacturing quality in a globally harmonized way (L'Oréal, 2024). Another certification mentioned in the report is the forest management, which is systematically applied to paper and cardboard packaging, with Forest Stewardship Council and Programme for the Endorsement of Forest Certification standards. L'Oréal's sustainability governance is reinforced internally with the development of assessment tools and indices that evaluate environmental and social performance. The combination of internal audit with third-party certifications creates a hybrid governance model that combines external validation with internal monitoring and continuous improvement

processes. The report explicitly situates these mechanisms within a broader commitment to science-based measurement, life-cycle assessment, and value-chain decarbonization, emphasizing reduction at source rather than reliance on compensatory mechanisms such as offsetting (L'Oréal, 2024).

Overall, L'Oréal exemplifies a sustainability governance model in which certifications are deeply embedded within corporate strategy and operational processes. The reporting style reflects a high level of institutional maturity, characterized by regulatory alignment, methodological transparency, and systematic use of third-party standards to manage environmental and social risks. Rather than relying on a small set of cross-sectoral certifications, L'Oréal adopts a diversified portfolio of sector- and commodity-specific certification schemes, confirming the argument developed earlier in this dissertation that the role and form of sustainability certifications are shaped by industry characteristics, value-chain complexity, and materiality considerations.

8. Final considerations

With L'Oréal this analysis comes to an end, these two chapters provided a coherent bridge between the original dissertation and the supplementary analytical extension required for the double-degree framework. As stated briefly in the introduction of the integration, the goal of this extra part was not to revise or redesign the original research, but it served as an enrichment that helped expand the scope while preserving the interpretivist and constructivist foundations of the core thesis. This clarification is important because it also explains why the integration looks a bit detached from the natural flow of the first part of the thesis. Drawing to conclusion we can see a pattern emerging across the company just analyzed. ISO based management systems are the most dominant infrastructure for operational sustainability governance, especially in those sectors where there is a high level of complex and international high-impact activities. The most recurrent one is the ISO 14001, it appears across all industrial, technological, energy, and manufacturing-intensive firms as a foundational tool for environmental governance. In the cases of ASML, TotalEnergies, Siemens, Schneider Electric, Airbus, and Sanofi, ISO 14001 is repeatedly positioned as an organizing framework that supports continuous improvement, regulatory alignment, and standardization across sites and business units. The recurrent adoption shows that sustainability is strongly anchored in management logics, thanks to standardization and routines aligned on internal structures ESG frameworks are treated as guidelines for long-term strategies. ISO are used as tools to standardize and align broad sustainability ambitions into measurable, auditable, and internally comparable processes.

The second visible pattern is the adoption of ISO 45001 (or ISO 45001-aligned governance structures) to standardize occupational health and safety sustainability. At the same time, ISO 45001 is not adopted with the same level of external certification. ASML for example reports

that its standards are aligned with ISO 45001 but assessed internally instead of relying on external certification. In this sense ISO standards are both used as legitimacy instruments, when formally certified, and as internal governance benchmarks when used as reference for internal policies.

A third pattern that emerged is related to the governance of social accountability standards. SA8000 is systematically not adopted and its absence looks more consistent rather than accidental. Social sustainability is managed through internal governance architectures such as Codes of Conduct, Supplier Codes of Conduct, human rights policies, and structured due diligence and monitoring mechanisms. This approach is visible in companies such as ASML, LVMH, SAP that address labor rights and supply-chain accountability through internal auditing, supplier evaluation programs and risk-based assessments. This brings us to a conclusion where we can think that the logic in which social sustainability is handled is more dynamic rather than single-point certification. By doing so, companies are more flexible in favor of the different requests that arise from different areas of business, this structural mechanism is usually enriched with references to international frameworks such as ILO conventions and the UN Guiding Principles. The last pattern identified was about the selective and materiality-driven adoption of sourcing certifications such as FSC and PEFC. This adoption appears mainly in those companies where packaging and forest-based materials are part of their operations. This integration is very clear in luxury and consumer goods-oriented companies such as LCMH or L'Oréal.

Overall the analysis carried out can be considered as a first step into a broader topic and potential analytical research about the approach of smaller companies and players. Certifications' influence has become clear either when directly adopted or when referred to as frameworks. It is reasonable to imagine a further development of this work into a more detailed and precise analysis also for smaller businesses or in different geographic areas.

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