



# Sustainable practices implemented in the supply chain of multinational companies

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## Abstract

This master thesis aims to examine the strategies that multinational companies are implementing to become more sustainable in their supply chain, to create more value and be more competitive in the market. Through a qualitative approach, I conducted a comparative case study of three multinational companies that have sustainability as part of their corporate objectives. The findings suggest that even though every multinational company is applying different practices, the main strategy of all is to highly invest in new technologies and innovate their processes to reduce their carbon footprint and switch to a more circular economy. Additionally, companies are also paying attention to the source of their raw materials and how to create final products that can be recycled for future use.

**Dissertation Title:** How can multinational companies implement sustainable supply chain practices?

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**Keywords:** supply chain management, multinational companies, sustainable practices, green logistics, sustainable procurement, GHG emissions.

## Resumo

Esta tese de mestrado tem como objetivo examinar as estratégias que as empresas multinacionais estão a implementar para se tornarem mais sustentáveis na sua cadeia de suprimentos, para criarem mais valor e serem mais competitivas no mercado. Por meio de uma abordagem qualitativa, realizei um estudo de caso comparativo em três empresas multinacionais que têm a sustentabilidade como parte de seus objetivos corporativos. Os resultados sugerem que, embora cada empresa multinacional esteja a aplicar práticas diferentes, a principal estratégia de todas é investir fortemente em novas tecnologias e inovar os seus processos para reduzir sua pegada de carbono e mudar para uma economia mais circular. Além disso, todas as empresas também estão atentas à origem de suas matérias-primas e a como criar produtos finais que possam ser reciclados para uso futuro.

**Título da Dissertação:** Como as empresas multinacionais podem implementar práticas de cadeia de suprimentos sustentáveis?

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**Palavras-chave:** gestão da cadeia de suprimentos, empresas multinacionais, práticas sustentáveis, logística verde, compra sustentável, emissões GEE

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## **1. Introduction**

The 2023 report from the Intergovernmental Panel on Climate Change suggests that approximately 78% of carbon emissions can be attributed to the burning of fossil fuels and the activities of firms. It is further reported that close to 22% of harmful carbon dioxide emissions which negatively affect humans and the environment can be traced to logistics transportation (Afum et al., 2022, p. 18). In addition, it is an interesting reality that more than 20% of global greenhouse gas emissions are made by about 2,5000 largest global companies, and mainly their supply chain are responsible for emissions resulting from corporate operations (Movahedipour et al., 2017, p. 17).

Rapid change in climate and irresponsible consumption behaviors of human have led to natural resources scarcity and frequent natural disasters (Gunasekaran et al., 2016, p.8). As stakeholders become aware of ascending environmental concerns, business enterprises face pressure from their customers in adopting green practices in their process. Furthermore, legislation concerning the mitigation of environmental degradation is being enacted, thus governments' rigorous policies urge firms to embrace sustainable practices in their logistics process (Hernandez et al., p. 17, 2022).

According to Imane Tronnebati, the manufacturing and distribution of the product from the initial supplier to the final customer is controlled by supply chain management, which is defined as the management of the value chain that includes both the movements and tasks of physical and information flows. Expectations for supply chain management have moved beyond basic economic concerns to include topics such as fair working conditions and sustainable ecological growth (2023, p. 10).

Consequently, multinational companies with traditional linear economies are in search of circular models, structures, and practices to move to the path of Circular Economy (CE) practices. Although the definition of CE still lacks consensus, the majority of countries have agreed that the existing business models, approaches and operational activities have to re-plan, rethink and redesign to reduce waste and environmental degradation. (M. Sharma et al., 2022, p.10).

Even though sustainable practices in the supply chain have gained attention from business enterprises because of their significant impact on environmental mitigation, there is still a gap on how to properly do it.

Therefore, I propose to answer the following research question:  
How can multinational companies implement sustainable supply chain practices?

To answer my research question, I utilized a qualitative explorative approach. I conducted a comparative case study on three multinational companies: Airbus, Nespresso and Sanofi.

The thesis is organized in six chapters. I begin with a literature review consisting of an overview of the impact of non-sustainable practices in our environment and the struggles that managers constantly face when making decisions related to sustainability. Subsequently, I present important terms related to sustainability in the supply chain and some practices implemented by multinational companies. After identifying the gap, I presented the methodology section utilized to collect and analyze primary and secondary data to adequately answer my research question. Next, the empirical setting introduces the companies that I used as business cases, the role of sustainability for them and the sustainable practices implemented. Afterwards, the findings chapter is structured to answer my research question. Later, in the discussion chapter, the articles analyzed in the literature review are compared with my findings. Finally, the conclusion summarizes my findings, and provides limitations and future directions of research.

## **2. Literature Review**

During the last decades, multinational companies are being highly pressure by their stakeholders to become more and more sustainable in their supply chain. Nevertheless, research shows that managers feel overloaded with the number of options that can be implemented for companies to be more sustainable and eco-friendlier.

First, I'll explain what is a multinational company and the importance of sustainability for them. Subsequently, I'll give an overview of how non-sustainable practices implemented by multinational companies affect the environment and the consequences left for the planet. Then, I'll explain the blocking points for top managements to implement sustainable practices. Finally, I'll review some sustainable practices and important terms already used by multinational companies in the different stages of the supply chain: procurement, production and logistics.

### **2.1 Multinational companies towards sustainability**

Globalization and internationalization are not new concepts. During the last decades, people have been interacting with different cultures and nations (Oosthuizen & Grobbelaar, 2022, p.53). Trade investments that cross borders and require coordination in research, manufacturing, marketing and finance areas configured in multiple national environments are considered as multinational companies (Boddewyn et al., 1999, p.23).

To review the sustainable practices applied in the supply chain of multinational companies, it is important to understand the consequences and negative impact of non-sustainable practices on the environment. On the other hand, even though it is important to include and implement more sustainable practices, top managements face daily pressures and experience blocking points during this transition process.

#### ***2.1.1. Multinational companies***

In recent times, the trend of globalization and industrialization has demonstrated that world economies are interdependent and interconnected (Balcilar et al., 2023, p.10). As firms around the globe continue to seek new sources for market competitiveness, outsourcing and

offshoring of upstream and downstream value-chain activities have become common strategies (Lartey et al., 2021, p.6).

Many multinational companies from advanced countries and newly emerging countries have subsidiaries in less developed countries. That is why multinational companies have been recognized nowadays as the main source of industrial growth and transfer of foreign based technologies in the host country (Balcilar et al., 2023, p.8). Since the formal adoption of the United Nation's Sustainable Development Goals (SDGs) (United Nations, 2015), research on sustainability earned more attention with the results showing that global issues are extremely linked with firms. The SDGs has shifted the corporate sustainability discourse from a reactive to proactive focus where corporations are actively and strategically involved in influencing sustainable development. In addition, many firms are starting to emphasize strategic competence by adopting an international sustainability framework toward creating functional linkages between performance and targets, competitiveness and the common good (Lartey et al., 2021, p.20).

Businesses are increasingly relying on strategic partnerships to address social, economic, and environmental issues, given the enormous uncertainties and complexities involved in these issues. Partnerships with nonprofit organizations can be a source of information and knowledge about creative ways to address corporate social responsibility (CSR), sustainability issues and to restructure operational activities in the host markets (Yin, 2021, p.20). In addition, multinational companies are required to comply with countless socio-environmental regulations and standards across various regions and operations. Any failures in meeting the demands of key stakeholders tend to damage the company's reputation (Lartey et al., 2021, p.25).

Multinational companies face even more challenges than other enterprises in terms of knowledge management because they have to deal with multiple knowledge transfers on global scale between headquarters (HQs), subsidiaries, and local agents (Castro & Moreira, 2023, p.20). Managers now need improved transparency around supplier sustainability practices and processes to better manage the risks, while stakeholders expect to be informed of compliance levels and of any problems encountered (McGrath et al., 2021, p.30)

### *2.1.2. Impact of non-sustainable practices*

The increasing worry about the environment, which poses a threat to humanity, has brought attention to the importance of preserving it. According to Movahedipour, it is an interesting reality that more than 20 percent of global greenhouse gas emissions (GHG) are made by about 2,500 largest global companies, and mainly their supply chains are responsible for emissions resulting from corporate operations; also, developing nations generally lack the implementation of technologies that promote lower pollution as well as measure to cut down emission resulting from industrial activities (2017, p. 8).

The transportation and distribution activities within the supply chain result in significant environmental pollution and the depletion of resources on a large scale (Bin et al., 2020, p.55). From long-haul heavy-duty logistics to intracity distribution, road-based freight transportation systems generate tremendous negative externalities in daily operations, including pollutant emissions, congestion, traffic accidents, noise, visual interference, infrastructure failure and resource waste. Moreover, these negative externalities, together with the disadvantages of the logistics system itself, further lead to the downgrade of supply chain performance at both enterprise level and regional level (Ren et al., 2019, p.50).

The 2023 reports from the Intergovernmental Panel on Climate Change suggest that “approximately 78% of carbon emissions can be attributed to the burning of fossil fuels and the activities of firms. It is further reported that close to 22% of harmful carbon dioxide emissions which negatively affect humans and the environment can be traced to logistics transportation”. To eliminate non-sustainable behaviors and practices, academic communities and businesses have investigated or adopted a number of Green Supply Chain Management (GSCM) projects, such as green purchasing, sustainable production and green transportation. The main goal of these concept is to decrease harmful materials and collect all trash inside the industrial system itself. (Imane Tronnebati, p. 20, 2023).

### *2.1.3. Struggle to transition to sustainable practices*

Even though research demonstrates the immediate and urgent change companies need to do in their operations because of the damage to the environment, top managers have long struggled to effectively mitigate the negative impacts on the serious problems of climate change. Customers and governments are pressuring companies to become more sustainable.

The global context of modern economy forces companies to achieve excellence in terms of efficiency in their logistics operations, in particular, when customer satisfaction is directly affected. However, the lack of research on how to incorporate these issues makes this a challenging task (Mota et al., 2015, p.21). With increasing awareness of environmental protection worldwide, the sustainability trend of conserving the earth's resources and protecting the environment is overwhelming, thereby exerting pressure on corporations (Movahedipour et al., 2017, p.15).

The proposed solutions are now so numerous that decision makers are likely to be affected by choice overload. Decision makers have struggled with the best way to reach environmental sustainability and how best to determine the most appropriate environmental-sustainability solutions from among myriad workable ones. (Wu & Yang, 2021, p.35). Companies develop sustainability strategies and initiatives in response to increasing pressures from legal constraints and customer preferences, global competition, or requirements from various stakeholders (Arampantzi & Minis, 2017, p.277). Without a clear method to decide external costs, such as the risk of climate change to society, companies cannot factor these "expenses" into their traditional decision making. Companies may find that they are not fully cognizant of the real costs and risks associated with their investments over time (Movahedipour et al., 2017, p.7).

It is often the case that supply chain operations optimization models only have one objective function, minimizing overall costs. However, multi-criteria approaches are needed to jointly optimize economic, environmental and social costs. The concept of the sustainable or green supply chain has emerged and has very quickly evolved from being viewed as a constraint to being viewed as an objective for maximization. Integrating economic decisions and sustainable development can improve overall organizational and supply chain performance (Allaoui et al., 2019, p.43). It means that sustainability or protecting the environment is one of the reasons why organizations exist. A good mission statement with a sustainability focus keeps the company on track during adverse times and helps in fighting the eternal battle between commercialization and values (Movahedipour et al., 2017, p.25).

Users tend to accept and use new technology when they believe it is easy to use. If an enterprise implements an innovation that requires a lot of effort and changes in its processes to adapt, the company will tend not to implement it. Crowd logistics is an innovative business

mode grounded on the strength of the network community and involves various participants, such as managers, platform providers, crowd workers, and mass groups. Business coordination is complex. Hence, if the process of adapting to crowd logistics is complex, enterprises may abandon its innovative model (Bin et al., 2020, p.50). However, it takes a lot of time for some innovative technologies that can fundamentally improve the negative effects of logistics to move from laboratory to application. Applications such as the electric vehicle (EV) took decades to implement. Although the technology is constantly updated and improved, more management lag (Ren et al., 2019, p.35).

According to Ren, different types of environmentally friendly supply chain modes, activities, and practices have been suggested and implemented, ranging from government regulations to technological advancements, including green logistics networks, reverse logistics, emission reduction strategies, electric cargo vehicles, collaboration, outsourcing, and more. However, despite these advances, these practices are still in its early stages and faces considerable challenges in terms of internal cooperation and external market uncertainties (2019, p.20)

Unlike emergent countries where the environmental awakening and research on green logistics practices seem limited and in a promising stage, the green theme keeps flourishing in developed countries (e.g., USA & Germany) and other fast-developing countries such as China (Afum et al., 2022, p. 25). European countries made great efforts in rebuilding the integration of green logistics. However, the lack of international cooperation and universal solutions hinders the dissemination and deepening of knowledge, and the current achievements are far from enough to promote the globalization of G&SL, which is reflected in the imbalance of global G&SL practice (Ren et al., 2019, p.32).

According to Afum, another important factor is the link between green practices in the supply chain and value-based competitiveness. For instance, massive investment in green practices tends to negatively influence firms' value and reduces their competitiveness. Accordingly, some industrial leaders find themselves in a state of dilemma when it comes to investing in green logistics practices. To these managers, it is perceived that even though green initiatives may boost environmental performance, it is likely to affect their value-based competitiveness, especially in the short term (2022, p. 8),

## 2.2. Sustainability in the supply chain

The manufacturing and distribution of the product from the initial supplier to the final customer is controlled by supply chain management, which is defined as the management of the value chain that includes both the movements and tasks of physical and information flows (Imane Tronnebati, 2023, p.30). According to Mota, Sustainable Supply Chain Management (SSCM) was defined as “the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements” (2015, p.20).

The “green” component of the supply chain represents the connection between supply chains and the environment. (Imane Tronnebati, 2023, p.10). The contribution of information regarding green attributes, saving energy, saving material and emission reduction, plays an important role in influencing consumer perceptions (Movahedipour et al., 2017, p.43). In addition, poor practices in the supply chain, particularly in the environmental and social sphere, can pose a significant threat to brand reputation and ultimately to shareholder value (McGrath et al., 2021, p.32).

### 2.2.1. Sustainable Procurement

Interest in sustainable supply chain is not new, but evidence suggests that retail and brand-driven sustainable procurement standards have proliferated in recent years (Ricketts et al., 2023, p.15). Sustainable Procurement (SP), first part of the supply chain, is the activity of purchasing goods or services with the most positive impact throughout the life cycle of a product (Oliveira & Souza, 2023, p. 11). SP has emerged as a vitally important strategy for addressing various corporate ethical and social responsibility concerns including sweatshop and labor, workplace safety, human rights abuse, diversity and equal opportunity, and environmental responsibility (Etse et al., 2023, p.13).

The practice of SP is associated with a number of beneficial corporate outcomes, including enhanced corporate reputation, lower recruitment and labor turnover cost, improved environmental outcomes, reduced health and safety costs, shorter time and improved product quality, proactive shaping of sustainability regulations and competitive economic advantage (Etse et al., 2022, p.8). For instance, SP and related practices aid organizations to stay away

from ethical scandals and other practices that could tarnish corporate image, thereby protecting and enhancing corporate reputation (Etse et al., 2023, p.13). SP strategy is to ensure compliance with corporate sustainability standards in the supply chain usually focusing on suppliers. Frequently, unsustainability problems occur upstream at different sub-supplier levels (Movahedipour et al., 2017, p. 20).

According to KPMG (2022), 80% of the top 100 companies worldwide now report on sustainability. The importance of adopting effective tools, policies, and assessments models to promote sustainable consumption comes from its primary objective for global sustainability, as well as handling its cultural and operational barriers (Oliveira & Souza, 2023, p.8). The procurement standards may exist alongside or be embedded within supplier codes of conduct and standards may differ between, for example, primary producers or intermediaries. A company may require suppliers to demonstrate continuous sustainability improvement or require meeting a specific quality or supply chain target (Ricketts et al., 2023, p.20).

Regulations and policies remain one of the key tools being deployed to implement and mainstream SP practices across the globe (Etse et al., 2022, p.18). In addition, assessment of sustainability criteria in procurement processes needs to observe a life cycle perspective. Life Cycle Thinking (LCT) is a systematic approach that provides an evaluation of products and services considering cumulative impacts associated with the flows of energy, substances and materials in all stages of a products or service's life cycle, from extraction of raw material to final disposal (Oliveira & Souza, 2023, p.10). The European Commission's Product Environmental Footprint Guide (PEF) established a life cycle-based multi-criteria calculation of the environmental footprint of goods or services (Oliveira & Souza, 2023, p.7).

However, there are obstacles to enhance sustainability in procurement. The main obstacle is that there are productive activities outside the control of organizations, across supply chains (Oliveira & Souza, 2023, p.10). Sustainability changes must go beyond reporting and disclosure and effectively influence internal practices, processes and organizational values (Ricketts et al., 2023, p.18).

### *2.2.2. Sustainable production processes*

Human population is growing and expected to grow until the middle of this century. This growth is accompanied by increasing consumption of natural resources and also an increase in the rate of consumption (Shrivastava & Berger, 2010, p.8). A growing number of companies are considering that a sustainable strategy is necessary to acquire competitive advantages. Reducing the adverse environmental and social industrial activities is no longer a luxury, but an all-important necessity (Ganjavi & Fazlollahtabar, 2023, p.11).

Previous studies have indicated that recycling, proactive waste reduction, remanufacturing, environmental design, and market surveillance for environmental issues are the environmental sustainability practices that most strongly affect company performance (Alayón et al., 2017, p.5). Some principles and certification initiatives are prompted by the increasing consumer demand for certified products and better product labeling. Consumers are becoming more educated about the energy, resource, waste, and public safety consequences of product and process technologies (Shrivastava & Berger, 2010, p.5).

Any company aiming to be sustainable must develop a performance measurement system to ensure that measure is aligned to sustainable strategy, and a system is working effectively in driving sustainable performance. Such a system may be useful to provide pertinent information for decision makers before they make a decision, to promote organizational learning and encourage stakeholder engagement (Ganjavi & Fazlollahtabar, 2023, p.8). In the case of energy saving, measure and track energy consumption contributes to energy saving goals, supported in most cases by environmental management systems. Employee training to increase awareness on energy saving constituted a common practice (Alayón et al., 2017, p.3).

According to Alayón, product safety was associated with using materials approved by the European Union legislation REACH (registration, evaluation, authorization and restriction of chemicals) and ROHS (Restriction of Hazardous Substances Directive). Life-cycle-approaches during product design were highlighted as a way to design safe and ecologically sound products only in large companies (2017, p.6)

Traditional industrial approaches such as the linear economic model (take–make–dispose) or cradle-to-grave approach are not strongly aligned with sustainability strategies. These traditional approaches do not address environmental pollution such as waste generation,

natural resource depletion, and impact on economic and social performance. The circular economy (CE) emerged as a sustainable strategy to tackle these issues (Lahane et al., 2020, p.8), and this emergence calls for more circular business models in which businesses can create supply chains that recover or recycle the resources to produce products or services (Atasu et al., 2021, p.10). Previous scholars' argument of CE as an economic strategy more than an environmental strategy (M. Sharma et al., 2022, p.12).

Finally, Lean is a corporate management strategy that focuses on waste reduction, improving the efficiency, reducing operation costs, and acquiring sustained constantly improvement in the processes of an organization. Six Sigma is a data-driven method based on the increase in performance and decrease in the process variation which leads to reduce defect and enhance profit (Ganjavi & Fazlollahtabar, 2023, p.10). As a result of connecting different systems, new daily production and business metrics become available in real-time which provide the necessary information to change and adjust processes or resources without delay through sustainable production (Shrivastava & Berger, 2010, p.8).

### *2.2.3. Green and Sustainable Logistics Practices (GSLP)*

Green and Sustainable Logistics Practices (GSLP) is defined as the planning, control, management, and implementation of logistics system through the advanced logistics technologies and environmental management, aiming to reduce pollutant emissions and improve logistics efficiency. GSLP isn't only concerned with providing customers with green products or services, but also with sustainability of the entire logistics process lifecycle (Ren et al., 2019, p.38). In addition, these concern impact material production, ranging from extraction and manufacture, to sourcing and delivery. Demand keeps rising and expects at the same time affordable products with minimal environmental and social burden. Organizations are wary of these issues along their supply chains, many times these issues are hidden from their visibility (Allaoui et al., 2019, p.6).

According to M. Sharma, since the last decade, studies have focused on logistics to uncover GSLP and their linkage with reverse logistics, sustainability and distribution etc. With support from sustainable transportation, firms are using cleaner production through alternative fuels, reduced pollution, and less emissions. Reverse logistics have been a solution to the concerns raised over the environment and have highlighted the significance of reuse of

materials. This involves return of recyclable products to manufacturers and improves waste management. Firms are more conscious of the environment and are now seeing logistics service providers, expecting their partners to follow their environmental practices (2022, p.13).

Compared with traditional logistics modes, crowd logistics has the advantage of improving distribution efficiency and reducing logistics costs. It refers to the outsourcing of goods distribution by enterprises (or retailers) into public groups that are not fixed, have free time, and have transportation resources. In addition, since crowd logistics promotes the sharing and use of passenger and freight resources, it also has the advantage of efficiency and sustainability, making the distribution process more convenient and flexible and provides an effective method to alleviate the “last mile” distribution problem (Bin et al., 2020, p.8).

A company’s image is no longer related to the old paradigm of being sustainable in its own activities, but instead is associated with a strong collaboration between all supply chain stakeholders towards a sustainable activity. It is then critical to create new methods and tools to account for the three pillars of sustainability: economic, environmental and social, in a multi-stakeholder chain (Barbosa-Póvoa et al., 2018, p.10). Coordination is a strategic response to the challenge posed by supply chain partner interdependence. Coordination is the act of managing entity dependencies with joint effort to work together towards mutually defined goals (Xu. et.al, 2006, p.5). The benefits of coordination include better use of resources, reduced operating costs, increased profits, improved customer satisfaction and increased efficiency in product development (Allaoui et al., 2019, p.12).

GSLP also contribute to social benefits and have a positive influence to improve the welfare of both employees and other stakeholders such as customers, suppliers and society (Jayarathna et al., 2023, p.10). In addition, some scholars are even mentioning that sustainability may be the reason why some organizations are leading the markets. “It means that sustainability or protecting the environment is one of the reasons why organizations exist. A good mission statement with a sustainability focus keeps the company on track during adverse times and helps in fighting the eternal battle between commercialization and values” (Movahedipour et al., 2017, p. 8).

Even though SSCM has gained attention from business enterprises because of its significant impact on environmental mitigation, there is a lack of ideas on how companies

effectively implement these practices. To contribute to fulfil this gap, I propose the following research question:

How can multinational companies implement sustainable supply chain practices?

### **3. Methodology Chapter**

This chapter discusses the methodology used to answer my research question “*How can multinational companies implement sustainable supply chain practices?*”. I’ll present the design of my research and all the process I went through to collect the data and to analyze it.

#### **3.1 Research Design**

I decided to use a qualitative approach to answer my research question. Qualitative research is particularly suited to “unpacking” phenomena of interest because it encompasses a diverse set of “interpretive techniques” that can provide a deeper and richer understanding of the issues under investigation (Birkinshaw et al., 2011, p.5). In addition, it addresses questions about how social experience is created and given meaning and produces representations of the world that make the world visible (Rynes & Jr., 2004, p.10).

Qualitative research gathers participants' experiences, perceptions, and behaviors. It answers the how's and whys instead of how many or how much (Tenny et al., 2022, p.7). This approach can provide thick, detailed descriptions of actual actions in real-life contexts that recover and preserve the actual meaning that actors ascribe to these actions and settings. It can also provide memorable examples of important management issues and concepts that enrich the field (Rynes & Jr., 2004, p.11). Moreover, the orientation aligned well as the study aims to analyze how multinational companies sustainably manage their supply chain, thus understanding organizational events experienced by individuals. In this way, a qualitative approach is appropriate to capture what individuals are thinking, feeling, and experiencing at a certain time or during an event of interest (Tenny et al., 2022, p.8).

I decided to conduct a multiple case study, which is a fitting approach for investigating “how” questions and is adequate for capturing pertinent contextual factors that relate to the phenomenon being examined. In addition, the choice allowed me to understand the “how” by comparing the experiences of multinational companies in the industry that have undertaken processes in the implementation of sustainable practices in their supply chain. To select the cases I targeted multinational companies because their supply chains are responsible for more than 20 percent of global greenhouse gas emissions resulting from corporate operations (Movahedipour et al., 2017, p.7). Also, the supply chain of multinational companies is more

complex and therefore there's more opportunity to apply various sustainable practices. The criteria were also firms that have sustainability at the core of their objectives. While researching, I used a combination of keywords such as “multinational companies”, “sustainability”, “green logistics”, “sustainable practices”, “circular economy”. The process filtered availability of data including media publications which led me to a new range of alternatives. After contacting employees through LinkedIn and people in common, I ended up with three multinational companies open to help me with my research. These three companies were suitable to what I was looking for because their work in sustainability was really an important part of their corporate objectives. I confirmed this later with the interviews conducted. Accordingly, I focused on three companies named Airbus, Nespresso & Sanofi.

### 3.2 Data Collection

I collected both primary and secondary data for this research. To collect primary data, I conducted five semi-structured interviews with managers from all companies studied. Interviewees were selected based on contact information available in their LinkedIn profiles, considering their job position related to the subject studied.

For Airbus, I conducted three interviews with the Sustainability Communications Manager, HO People Transformation and HO Industrial Roadmap. Everyone shared with me their experience working at Airbus and, as a common factor, all of them had more than 10 years working at the firm. The Sustainability Communications Manager shared with me a more generic view regarding all the big milestones in sustainability that Airbus has been doing for the last 20 years and all the goals related to the subject. The HO People Transformation provided deeper information related to all the sustainable initiatives applied in their procurement processes. Finally, the HO Industrial Roadmap, in-charge of the annual “Non-Financial Report”, shared the insights about the company’s sustainability strategy and the efforts that they are during in their industrial processes towards a net-zero emissions goal. In the case of Nespresso, I conducted two interviews with the Supply Chain Manager and the Environmental & Sustainability Specialist. The Supply Chain Manager shared some sustainable practices that Nespresso is applying in their demand, supply, delivery services and physical logistics. His expertise provided a detailed context on the current process and improvements. Finally, for Sanofi, I interviewed the Global Demand Planning & IBP Lead. Even though he

was the only person from the company that I managed to interview to, his valuable expertise provided details on the solutions and challenges in the process to implement circular initiatives and shared some important sustainable milestones in the future for the firm. At the end, all these interviews allowed me to go beyond publicly disclosed data collections such as information at websites, and company reports. Find bellow the primary data collected.

<b>AIRBUS - Primary Data</b>					
Type of data	Name of the interviewee	Organization	Position	Date	Length
Primary data	Sara Ricci	Airbus	Manager of Communications in Sustainability	17/03	45 minutes
Primary data	Yohan Allouche	Airbus	HO Industrial Roadmap	13/04	35 minutes
Primary data	Nathalie Bertona	Airbus	HO People Transformation	19/04	40 minutes

*Table 1: Primary data collected on Airbus*

<b>NESPRESSO - Primary Data</b>					
Type of data	Name of the interviewee	Organization	Position	Date	Length
Primary data	António Martins	Nespresso Portugal	Supply Chain Manager (Nespresso Portugal)	10/04	45 minutes

*Table 2: Primary Data collected on Nespresso*

<b>SANOFI - Primary Data</b>					
Type of data	Name of the interviewee	Organization	Position	Date	Length
Primary data	Raul Celis	Sanofi	Global Demand Planning & IBP Lead of Sanofi’s Supply Chain Center of Excellence	24/04	45 minutes

*Table 3: Primary Data collected on Sanofi*

Even though the primary sources were pervasive, limitations arise. In terms of potential biases, the employees might be subjective thus not representing all employees’ experiences at the company. Also, in terms of confidentiality, some employees didn’t share in detail some strategies or future partnerships planned that would have been interesting to collect as data. Another concern is the fact that the number of participants per company was narrow, thus it would have been interesting to receive answers from more employees per company. On the other hand, after I interviewed six individuals from different companies & different industries,

I was able to establish recurring patterns and responses thus sufficient sample size was achieved, even though it might not be considered generalizable.

The interviews were semi-structured and the questions were related to practices in procurement, operations and logistics departments by the multinational companies. In addition, questions were also about the benefits and challenges of implementing those practices. Interviews lasted approximately 30 minutes and half of them were conducted through recorded video meetings and then transcribed. The other half, because of lack of availability, were done via email. Initially, key themes and questions were formulated with an open-ended approach to facilitate participants in providing detailed and unrestrained responses. Subsequently, this led to an open discussion where I could include improvised questions that came to the conversation and weren't originally planned. The purpose of the interview was to have a kind of conversation without a strict structure to let the interviewee open-up and feel free to talk more about the subject.

I also collected secondary sources. Sources for archival data included companies' official websites, reports, media articles, case studies and NGO's websites. This was important to triangulate the primary data. Sources were evaluated and compared with primary data to retain sufficient data and exclude irrelevant data for my study. This was valuable to select sufficient data from known sources to gather data for my investigation. I selected sources based on keywords "sustainable supply chain practices", "procurement", "operations", "logistics", "circular practices", and firm name. The secondary data collected can be found in Appendix 1.

### 3.3. Data Analysis

I analyzed the data through a coding method where I assigned data to twenty-one first order codes, then clustered in seven second order themes, and finally ordered in three aggregated dimensions, as shown in Appendix No. 2. All my codes were created based on my data from the research, I didn't use pre-defined codes.

My main idea was to create the aggregated dimensions based on the steps of the supply chain of a multinational company. "A supply chain is the network of all the individuals, organizations, resources, activities and technology involved in the creation and sale of a

product. A supply chain encompasses everything from the delivery of source materials from the supplier to the manufacturer through to its eventual delivery to the end user” (Xu. et.al, 2006, p.21). Based on this, I created the aggregated dimensions based on the three main parts of the supply chain in its chronological order: procurement, production (in-house operations) & logistics.

First, I generated first order codes based on activities related to procurement that I found relevant from my primary and secondary data, and that could be related to improve the overall practices of the company in terms of sustainability, such as “risk management related to suppliers”, “supplier assessments (audits), etc. Then I clustered, depending on the type of procurement activities, the first order codes into second order themes giving a further clarification and generalizing it into two wide groups, such as “Supplier’s assessments & collaboration” and “Keys towards circular economy. And finally, as mentioned before, the second order themes were divided into three mains aggregated dimensions based on the three parts of the supply chain of a multinational company but from a sustainable point of view. The table below shows an example of the coding tree in the form of a table. The full table can be found in Appendix No. 3

Quotations	First Order code	Second order themes	Aggregated Dimensions
<i>“We require our suppliers to meet the same environmental and social responsibility standards that we set for ourselves. These standards are clearly outlined in our Supplier Code of Conduct.”</i>	Risk management related to suppliers	Supplier’s assessments & collaboration	Sourcing sustainable raw material
<i>“Suppliers are answering this assessment to show us that they have the good processes, competences and organization to answer sustainable behavior.”</i>	Supplier assessments (audits)		
<i>“We need to be together to ensure that we can reach our common target: zero emissions. Also, we are working with our key players, to have the same ambitions by sharing the best practices all together to speed up our approach and to reach our ambition quicker.”</i>	Work in partnership with suppliers		

Table 4: Coding Tree example

## **4. Empirical Setting Chapter**

To answer my research question, I selected three business cases that I'll present in the following chapter. The objective was to understand how these companies were applying sustainable practices in their supply chain and what was the result of these practices for the environment. All the cases are multinational companies; therefore, their operations are on a global scale. I chose these three companies because even though their operative objectives are totally different, they all identify as companies that care about the environment. The companies that I'll mention are Airbus, Nespresso & Sanofi.

### **4.1 Airbus**

Airbus S.A.S. is a European multinational aerospace corporation that designs, manufactures, and sells commercial and military aircraft, helicopters, and space-related products. Airbus is the world's second largest maker of commercial aircraft. In 1970, a group of aerospace companies from France and Germany came together to establish Airbus as a consortium. Over time, Spanish and British firms also became part of the consortium. The purpose was to address the demand for high-capacity jetliners with short- to medium-range capabilities, and to provide competition to the well-established American aircraft manufacturers. Airbus' initial offer, the A300, was launched in 1972 and entered service in 1974. Its headquarters is in Toulouse (France) and employs over 130,000 people and more than 100 nationalities, in 180 locations worldwide with 120,000 direct suppliers globally. Reflecting this multinational origin, the company operates major offices and assembly plants in France, Germany, Spain, and the United Kingdom, along with more recent additions in Canada, China and the United States.

For half a century, Airbus has been at the forefront of innovation, achieving numerous technological breakthroughs and significant accomplishments within the aerospace industry. The company is widely recognized as a leader in the design, production, and delivery of aerospace products, services, and solutions to customers around the world. With operations that span commercial aircraft, helicopters, defense, space, and security, Airbus has established itself as a major player in the industry by delivering by May 2019 its 12,000<sup>th</sup> aircraft. In 2022, the

company's revenue was 58.8€ bn and they delivered 661 commercial aircraft, increasing 8% compared to 2021, to 84 customers and registered 1,078 gross new orders.

Airbus is known for producing a line of passenger aircraft that prioritizes comfort, affordability, and flexibility, while also striving towards a more sustainable aviation industry by reducing emissions. The A320 Family is recognized as the top performer in the single-aisle category, and the A220 Family has also joined the category. The A330 Family is a twin-engine aircraft that is capable of meeting long-range requirements. In addition, the A380 is the biggest Airbus aircraft and has introduced several groundbreaking innovations that are now incorporated into the latest generation of aircraft.

Airbus has been working for many years on the reduction of its environmental footprint, not only by tracking and measuring the environmental impact of its sites, products and services, but also working in cooperation with its worldwide supply chain to drive more effective environmental management, decarbonize its industry and foster circularity by optimizing resource utilization (*Non-Financial Annual Report - Airbus, 2021*). In 2008, Airbus committed with Air Transport Action Group (ATAG), which is a professional association that provides a platform for the commercial aviation sector to work together on long-term sustainability issues, to a bold target on sustainability to reduce 50% in CO<sub>2</sub> emissions by 2050. In 2019, there was a shifting point when Airbus created a function named "Sustainability & Environment" to lead and drive the sustainability topic for the company. In the following year (2020), Airbus publicly shared that sustainability was defined at the core of Airbus's purpose and strategy and launched the famous ZEROe Aircraft concept with the objective of delivering the first hydrogen powered aircraft in 2035. "For the first time, we put sustainability as part of the top company objectives, meaning having sustainability as part of the objectives of each employee within Airbus to onboard the company" (*Interview with Manager of Communications on Sustainability Airbus*).

Since 2019, SAF (Sustainable Aviation Fuel), is used in the operation of Airbus' Beluga transport aircraft for the purpose of internal logistics. Also, in 2022, flight test activities were also starting to use SAF as part of the Company's revised GHG emissions reduction plan. The share of SAF used in these activities will progressively increase to 50% by 2030. Airbus also promotes the development of a circular economy model, and is proactive in seeking ways to recover, reuse and recycle materials beyond their initial life. Not only do they send around 50%

of its waste to be recycled, but already, through the TARMAC Aerosave joint venture, more than 90% of an aircraft's weight is recycled or reused through a selective dismantling (reverse manufacturing) process (*Non-Financial Annual Report - Airbus, 2021*). Regarding waste management, a multifunctional team is currently working to meet the "High 5+" ambition, gathering skills across the organization such as engineering, information management, procurement, industrial operations and facility management. The program is built on a set of ambitious reduction targets covering the five most material environmental impacts for the company to reduce energy consumption, CO2 emissions, water withdrawal, Volatile Organic Compounds (VOCs) emissions and waste production. "If you look at the main industrial sites, there are 84 across Airbus Commercial, Airbus Helicopters and Airbus Defense and Space. On those 84 sites, we apply the "High 5+" plan, including energy reduction, decarbonation, waste reduction, purchase better and ultimately GHG emissions with a specific objective for each to reach by 2030. For each industrial site they have their own operative objectives, and they must review their way of operating to reach these objectives" (*Interview with HO Industrial Roadmap Airbus*).

## 4.2 Nespresso

Nespresso is an operating unit of the Nestlé Group, being a producer and seller of portion coffee (Nespresso capsules) and machines. Over 30 years ago, the story of Nespresso started with a basic concept of allowing everyone to make an excellent cup of espresso coffee, similar to a professional barista. Nespresso has changed and transformed the method of how millions of individuals relish their espresso coffee and has played a crucial role in shaping the worldwide coffee culture since its establishment in 1986. Taking inspiration from Luigi Bezzera's previous efforts in creating the espresso machine in the early 1900s, a novel approach was created to enable anyone to make and savor a flawless Italian espresso. After several attempts, Nestlé Group achieved a significant milestone in 1986 when Nespresso was introduced to the world. This marked the launch of their primary coffee machine, the C-100, and four distinct segmented coffee blends: Capriccio, Così, Bolero (currently known as Volluto), and Decaffeinato.

Nespresso is an international brand with Swiss roots that operates in 81 countries. Their headquarters is in Switzerland, and they have a network of 802 boutiques in 515 cities. Every

single Nespresso capsule sold in the world is produced at one of their three factories based in Switzerland. With a team of 1300 production experts, the highest quality sustainable coffee beans are carefully transformed into capsules that are exported worldwide. As part of their AAA Sustainable Quality™ Program, Nespresso works directly with more than 120,000 farmers in 15 countries to promote the production of high-quality sustainable coffee. The company employs over 13,000 people, of whom more than 60% are in direct contact with their customers (*Facts & Figures - Nestlé Nespresso, n.d.*).

In 2003, the AAA Sustainable Quality™ Program was developed with the NGO “The Rainforest Alliance” to create a sustainable supply of the highest quality coffee, while protecting the environment and improving the lives of the coffee farmers they worked with and their communities. The goal was to help them improve their farming practices, increase their productivity and manage their farms in a more sustainable way. More than 93% of their coffee is sourced sustainably through the AAA Sustainable Quality™ Program (*DISCOVER THE AAA SUSTAINABLE QUALITY™ PROGRAM, n.d.*).

In Switzerland, Nespresso is endorsing a new type of emissions-free transportation by adopting hydrogen-powered vehicles for delivering their products locally. As part of their objective to decrease the carbon footprint of logistics operations by 50% before 2025, Nespresso has acquired one of Europe’s initial specialized hydrogen-powered trucks, which is utilized to supply their factories to numerous stores across Switzerland. “This is our focus, always looking for more sustainable practices. Reducing their carbon footprint is one of the greatest objectives we have. In general, we’re committed to addressing climate change and reaching Net Zero by 2050 at the latest, making every cup of Nespresso coffee carbon neutral in 2022. Changing logistics practices is part of our plan to reduce carbon footprint overall” (*Interview with Supply Chain Manager Nespresso Portugal*).

Making capsule recycling as convenient as possible for consumers is an important part of Nespresso’s objective and a journey they began 25 years ago, with the set-up of their first recycling program. Today, 88% of the capsules they sell can be collected for recycling via dedicated collection services, Nespresso boutiques, participating collection points and municipal recovery systems (*THE VALUE CHAIN OF THE FUTURE IS CIRCULAR, n.d.*). “Recycling capsules has a cost for us but we do it and we also use the coffee from recycled

capsules to produce rice that we offer to the “Banco Alimentar” here in Portugal” (*Interview with Supply Chain Manager Nespresso Portugal*).

### 4.3 Sanofi

Sanofi S.A. is a French multinational pharmaceutical and healthcare company, originally formed by four different companies: Sanofi, Synthélabo, Hoechst, Rhône-Poulenc Rorer. Sanofi is involved in the research and development, manufacturing, and marketing of pharmaceutical products, with a primary focus on the prescription market. However, the company also produces non-prescription drugs. The company operates in seven major therapeutic areas: cardiovascular, central nervous system, diabetes, internal medicine, oncology, thrombosis, and vaccines, with Sanofi Pasteur, its subsidiary, being the world’s leading manufacturer of vaccines. Today, Sanofi employees 100,000 employees present in 66 countries with a revenue of nearly 43 billion euros in 2022, the highest in recent years (*Sanofi Revenue 2006-2022 | Statista, n.d.*). Every day, approximately 15 million medications are distributed worldwide. “Our supply chain is designed to deliver treatment while ensuring product quality. Aware of the impact that its medicine distribution activities can have on the climate, Sanofi has been providing solutions for over ten years” (*Carbon Footprint-GHG Emissions (Scope 1,2 & 3), Sanofi, 2022*).

In terms of sustainability, Sanofi has incorporated this subject into its procurement processes and supplier relationship management, in line with the company’s corporate social responsibility goals. The objective is to establish sustainable practices across the entire Sanofi Supply Chain. In addition, Sanofi is working to minimize the impacts of its activities and medicines on the environment through its Planet Care environment sustainability program, an approach that engages everyone at Sanofi. Their goals are to achieve Carbon Neutrality by 2030, net zero emissions by 2045, limit environmental footprint, and adopt circular solutions. Specifically in the logistics area, they are implementing 100% renewable electricity across all global operations by 2030 (62% of electricity supplied on sites worldwide is renewable) (*“How Sanofi is building a sustainable environment?”*, Sanofi, 2022). In 2021, Sanofi collaborated with nine other major pharmaceutical firms to initiate the ENERGIZE program, which intends to facilitate the adoption of 100% renewable electricity and reduction of greenhouse gas emissions within their common supply chains. This opportunity enables suppliers, who may lack the necessary internal resources or knowledge, to participate in the power purchase

agreements (PPAs) market (*Carbon Footprint-GHG Emissions (Scope 1,2 & 3), Sanofi, 2022*). “Partnership with vendors is key to ensure we bring cutting-edge technology on renewable to our entire value chain (packaging, plant and DC sites, transportation, administrative offices, etc.)” (*Interview with Global Demand Planner, Sanofi*).

Finally, in the procurement area, Sanofi is implementing different strategies to keep its objective of carbon footprint and achieve their net zero emissions by 2045. For purchasing categories considered as risky from a sustainability standpoint, suppliers are either audited (most critical vendors), or subject to thorough due diligence questionnaires. Supplier audits, focusing primarily on Health, Safety and Environment (HSE) performance, are conducted by Sanofi HSE department or subcontracted to external auditors. Action plans are continuously monitored to ensure remediation of issues. Since 2022, suppliers participating to Sanofi tenders need to go through a compulsory sustainability assessment, encompassing the following dimensions: social responsibility, environmental policies, CO2 emissions and product/service traceability (*Sustainable Procurement, Sanofi, 2022*).

## **5. Findings Chapter**

In this section, I will answer my research question by analyzing the sustainable practices in the supply chain of three different multinational companies. The chapter is divided into three main sections, representing the three main parts of the supply chain of a multinational company: procurement, production & logistics. In addition, each section has three sub-sections where I explain my findings in more detail.

### **5.1 Sourcing sustainable raw materials**

Multinational companies are organizations that have business offices and operations in two or more countries in the world. When companies include sustainability at the core of their objectives, one of their challenges is to maintain the same level of sustainable practices in all their facilities. Specifically, in the case of procurement, each subsidiary can have different weaknesses than others, therefore it's important to create general procedures to implement in all the facilities and rules for all the suppliers to follow.

#### *5.1.1. Engaging, training and auditing the suppliers*

A big part of being sustainable is to make sure that raw materials sourced from the suppliers, were originally created in a sustainable way. The results show that to ensure that, it's important that between both parties (company and supplier) there is total transparency of the creation process and substances used. One way of doing this is to create a "Supplier code of conduct" to help suppliers meet the same sustainable standards in their processes and to mitigate possible risks. This can be seen in how Airbus engages with their suppliers globally:

*"We have a "supplier code of conduct" that the supplier commits to. They commit to applying this same kind of conduct to their own suppliers. So, finally, we are sure that all our supply chain is committed to our goals" (Interview with HO People Transformation Airbus).*

*"We need to be sure that we have at any moment data transparency of what is happening in the whole supply chain. And this is what I would call a challenge. What we are currently doing is a big project called "Next Era" which is a new digital platform that was launched last year, to be able to connect all the stakeholders contributing to the aerospace sector. It's a big hub of connectivity for all suppliers so that we can easily exchange all the data that we need to exchange to be sure that we are sustainable." (Interview with HO People Transformation Airbus).*

Subsequently, the results shows that companies also need to implement a constant follow-up of their supplier's processes to be aware of any discrepancy from their code of conduct and detect any non-sustainable practices on time. Supplier assessments and audits help them meet this objective as the following quotations indicates:

*"To be effective, Sanofi Sustainable Procurement policy is primarily risk-based to maximize positive impact on the environment and society. In that sense, sustainability requirements have been systematically embedded in the different steps of our Procurement processes: supplier onboarding, tenders, continuous assessment (audits and inquiries)" (Sustainable Procurement, Sanofi").*

*"Suppliers are answering this assessment to show us that they have the good processes, competences and organization to answer sustainable behavior" (Interview with HO People Transformation Airbus).*

Finally, the results show that to maintain sustainability in their procurement activities, companies must work together with their suppliers to reach their common sustainable target. In this way, and by having the same ambition, companies in alliance with their suppliers can speed up their approach and reach their common ambition quicker. We can see this in the following quotations from the cases:

*"We developed the AAA Sustainable Quality™ Program in 2003 with the internationally recognized NGO The Rainforest Alliance to create a sustainable supply of the highest quality coffee, while protecting the environment and improving the lives of the coffee farmers we work with and their communities. The goal is to help them improve their farming practices, increase their productivity and manage their farms – and their futures – in a more sustainable way. More than 93% of our coffee is sourced sustainably through the AAA Sustainable Quality™ Program" (Nespresso Official Webpage).*

### *5.1.2. Avoiding toxic substances and implementing eco-design of the products.*

Another important aspect where companies can also be more sustainable is in the way they design their products by avoiding toxic substances and operational processes that may increase their carbon footprint. The results shows that to implement this eco-design practice, suppliers have a huge responsibility because raw materials come from them. Some multinational companies are following this practice in their transformation to a more circular economy, instead of a linear one. This is what Sanofi is doing:

*"We have pledged that by 2025 all new products we bring to market will have been eco-designed. By 2030, this will be extended to the top selling products" ("SANOFI Shareholder Report 2022, Sanofi).*

In addition, to eliminate and identify these toxic substances, the results shows that companies need to highly invest in research to find and develop the perfect substitutes for these substances. Nevertheless, to do this, collaboration with the suppliers is key. Also, international certifications regulate this usage and for companies, it's important to have them to improve their reputation and satisfy their stakeholders. We can see what Airbus comment about this:

*"The Company has put in place a portfolio of activities and projects, working with suppliers to identify, develop, qualify and deploy new technologies and solutions that avoid the use of substances classified as posing a risk to human health or the environment, whilst satisfying airworthiness, certification and performance requirements" (Non-Financial Annual Report 2021, Airbus).*

### 5.1.3. Supporting suppliers towards a circular economy

Circular economy (CE) is an emerging concept across the world. The results shows that CE practices are crucial for all businesses in their path of achieving sustainable outcomes for all industries. Nevertheless, to obtain this common goal, the supplier's commitment is a fundamental factor. In addition, results shows that companies need to work in cooperation with suppliers to source clean raw materials that eventually will be used to create their final products. Without this cooperation, companies won't succeed in their transition to a circular economy. Nespresso & Airbus are implementing the following strategies:

*"By collaborating with the International Union for the Conservation of Nature to establish the Aluminum Stewardship Initiative (ASI) in 2012, we began a journey to source virgin aluminum from suppliers respecting the highest environmental standards. The ASI promotes the use of production scraps while steering upstream aluminum suppliers to reduce their carbon emissions" ("Nespresso: Towards a circular Value Chain", Nespresso Official webpage).*

*"The Company works in cooperation with its worldwide supply chain to drive more effective environmental management, decarbonize its industry and foster circularity by optimizing resource utilization" (Non-Financial Annual Report 2021, Airbus).*

## 5.2 Producing sustainable products (in-house operational processes)

The second part of the supply chain is production, including all the operational processes that go with that. During this part, we can say that companies are totally responsible for being sustainable because most of their processes occur in their facilities and under their supervision.

### 5.2.1. Reducing GHG emissions in-site

GHG stands for greenhouse gas emissions, which are gases that trap heat in the Earth's atmosphere, contributing to global warming. The most common GHG are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases. In-site GHG emissions, which are generated directly from a company's operations, can be a significant contributor to a company's overall carbon footprint. The results shows that adopting sustainable practices to reduce in-site emissions can help companies mitigate the negative impacts of climate change, improve their environmental reputation, and reduce operational costs.

The manufacturing processes account for a big part of the GHG emissions, therefore, to reduce them, companies need to implement ways to measure them and action plans to follow. Airbus stated the following:

*“Stationary sources (e.g., heating, cooling, manufacturing processes etc.) account for 70% of GHG emissions at the Company's sites and mobile sources (ground vehicles, “Beluga” air transport operations, flight tests, etc.) for 30%. Action plans for reducing emissions mainly rely on increasing energy efficiency, using low carbon energy sources, switching to lower emission vehicles where possible and avoiding emissions through better planning of flights by using lower carbon fuels (SAF)” (Non-Financial Annual Report 2021, Airbus).*

To reduce these emissions, results shows that companies need to make big investments in technology, infrastructure, and employee training. In addition, companies should implement internal initiatives and compare the results of them per year to see if the results are indeed positive. When companies put sustainability at the core of their objectives, these initiatives must be a priority. We can see the case of Sanofi:

*“Reduce GHG emissions from Sanofi activities by 55% from 2019 to 2030. -29% GHG emissions from Sanofi activities since 2019. (How Sanofi is building a sustainable environment? (Sanofi Official Webpage).*

In the case of Airbus, they created a plan called “High5+” which was built on a set of ambitious reduction targets covering the five most material environmental impacts for the Company, including CO<sub>2</sub> emissions:

*“We have a plan which is called “High 5+” which is determinizing for each aspect and there's a specific objective for each to reach by 2030. Then for each industrial site they have their own operative objectives, and they must review their way of operating to reach these objectives” (Interview, HO Industrial Roadmap Airbus).*

### 5.2.2. *Recycling in-house & waste management*

Waste management and recycling are important issues for multinational companies. As organizations that operate across multiple countries and regions, these companies generate large amounts of waste that can have significant environmental impacts if not managed properly. The results shows that adopting sustainable waste management and recycling practices can help these companies reduce their environmental footprint, conserve resources, and demonstrate their commitment to sustainability.

Results also shows that in-house waste management and recycling programs can help multinational companies reduce their waste generation, promote recycling and composting, and implement sustainable practices throughout their operations. These programs can include measures such as waste reduction and segregation, material recovery and recycling, and the use of renewable energy sources. By adopting these practices, results shows that companies can reduce their environmental impact, lower their costs, and improve their reputation among customers, stakeholders, and investors. In the following statement, we can see what Sanofi is doing:

*“Sanofi has set two complementary targets for 2025: to achieve a recovery rate (reuse, recycle, recover) of over 90% and to reduce the landfill rate to 1%. During 2022, our waste recovery rate (materials and energy) rose from 84% to 86%. Progress on the program has been such that we expect to meet our 90% target in 2023/24, two years ahead of schedule. By the end of 2022, our landfill disposal rate had fallen to 5%, versus 7% in 2019, with a 35% reduction in volumes.” (Sanofi Shareholder Report 2022, Sanofi)*

Implementing effective waste management and recycling programs requires a multi-disciplinary approach that involves collaboration between different departments, including procurement, facilities management, and sustainability. It also requires investment in infrastructure and technology, as well as employee engagement and training to promote sustainable behaviors and practices. The results shows that when companies do not prioritize these practices, their reputation can also be harmed as stakeholders increasingly expect businesses to prioritize environmental responsibility. In the case of Nespresso, we found the following statement:

*“Single-serve coffee as a product seems incompatible with a vision for business that’s good for people and the planet, as B Corp certification promotes, given the huge*

*amount of waste created.” (Nespresso: Known for Human Rights Violations, Now B Corp Certified “, Fear World Project)*

### *5.2.3. Implementing renewable energy*

Implementing renewable energy in the production process is another important step towards reducing their carbon footprint and mitigating climate change. As energy-intensive operations are a major contributor to GHG emissions, results shows that transitioning to renewable energy sources can help multinational companies reduce their environmental impact and improve their sustainability. Renewable energy sources such as solar, wind and hydropower can provide a reliable and cost-effective alternative to fossil fuels, while also helping to mitigate the risks of climate change. Nespresso is currently implementing the following practices:

*“At our three production centers in Switzerland, 100% of the electricity is procured from certified renewable sources and we continue to innovate for greater resource efficiency by recovering heat from the roasters, using gravity to channel beans through the production system, generating electricity through solar photovoltaic panels on the roof, and collecting rainwater and rinsing water for use in on-site washroom facilities” (Nespresso: Towards a circular Value Chain”, Nespresso Official webpage).*

In addition to reducing GHG emissions, results also shows that it can also help companies meet sustainability goals and demonstrate their commitment to environmental responsibility to stakeholders. For example, Sanofi’s initiatives:

*“We have publicly committed to sourcing 100% renewable electricity across all our operations by 2030. Its already the case for all our French sites!” (Building the Road to Net Zero, Sanofi Official Webpage).*

Finally, results shows that implementing renewable energy can also provide financial benefits to multinational companies, including lower energy costs and improved energy security. These companies can make a positive contribution to the environment and society, while also improving their financial performance and competitiveness. Manager at Airbus commented the following:

*“Investing cleverly in our capacity to produce power will maybe mean more money up front. But it will trigger some gain and saving over the next two decades. That’s the way we look at it. It’s mindful: the more investments, means more benefits at the end of the line. You see that in your balance sheet” (Interview, HO Industrial Roadmap Airbus).*

### 5.3 Delivering in a sustainable way (Logistics)

The last part of the supply chain is all the logistic processes involved in delivering the final product to the customers. As multinational companies often operate in diverse markets with different regulations, logistics management can be complex and requires a sophisticated approach. Implementing effective logistics with sustainable practices can help multinational companies streamline their operations, reduce costs, and improve customer satisfaction, while also ensuring compliance with regulatory requirements and meeting sustainability goals.

#### 5.3.1. Implementing Green Mobility

Green logistics practices are a set of ecologically principles, strategies and practices that are incorporated into a firm's logistics activities to minimize environmental impact and improve firm's performance and competitiveness (Afum et al., 2022, p. 7.). The results shows that multinational companies can implement sustainable practices such as delivering their products with electrical vehicles and using alternative fuels. Thanks to the last innovations, companies have the possibility to acquire zero-emission mobility options to distribute their products locally or internationally. We can take the explain of Nespresso's initiative in this topic:

*"In Switzerland, the company is supporting a new form of zero-emission mobility, turning to hydrogen-powered vehicles to make product deliveries in the country. In fact, Nespresso now has one of the very first dedicated hydrogen-powered trucks in Europe, which is being used to make deliveries from factories to many stores across Switzerland, supporting its target to reduce the carbon impact of logistics operations by 50% by 2025" (Nespresso Official Webpage).*

In addition, results shows that multinational companies can also invest in alternative fuels to reduce the carbon emissions from all the processes involved in delivering the products. In the case of Airbus, they are highly investing in SAF (Sustainable Aviation Fuel) not only in their operations but also as part of the fuel used during commercial flights:

*"Since 2019, SAF is used in the operation of the Company's Beluga transport aircraft for the purpose of internal logistics. In 2022, flight test activities will also start using SAF as part of the Company's revised GHG emissions reduction plan. The share of SAF used in these activities will progressively increase to 50% by 2030."*

*"The Company also focuses on developing fuel saving procedures for airports and ground operations to minimize the use of engine power while the aircraft is on the ground."*

Nevertheless, there's always challenges in implementing this type of initiative, such as cost. However, results shows that managers shouldn't view this as a cost, and instead as a long-term investment that will eventually represent savings for the company. Nespresso's Supply Chain Manager commented the following:

*"I must refer that one of the challenges is cost. Presently, the cost is higher, comparing the deliveries done by "conventional mode" versus electrical mode or bike. However, this is not a blocking point for us because we have fully decided to improve in terms of sustainability within our Supply Chain." (Interview with Supply Chain Manager, Nespresso Portugal)*

### *5.3.2. Reverse Logistics (Recycling the final product)*

Multinational companies should also establish a reverse logistics system which involves the movement of the product in the opposite direction of the supply chain operations, from the customer back to the manufacturer or distributor. By implementing this, results shows that companies can support their customers in adopting sustainable practices in their daily lives, and in addition, it will help the company recover value from returned products or materials that can eventually be used to produce new products.

In this topic, from my three business cases, Nespresso is the one with established initiatives such as: *"Nespresso has a recycling program that offers its customers the ability to recycle used coffee pods. After filling your recycling bag with used capsules, you can either give it to your postman, or return it to your Nespresso boutique, or its partner. After the aluminum pods are recycled, they can be used for home electronics, bikes, computers, or become another coffee capsule"* (*"The Sustainability Problems Percolating In The Coffee Supply Chain", Forbes, 2022*). Thanks to this initiative, today 88% of the capsules sold by Nespresso can be collected for recycling via dedicated collection services, Nespresso boutiques, collection points and municipal recovery system (*"Nespresso: Towards a circular Value Chain", Nespresso Official webpage*).

Nevertheless, to plan an effective reverse logistic strategy, results shows that multinational companies which main core isn't logistics, should partner with logistics providers to improve this part of the supply chain. We can see the example of Nespresso, who strategically partnered with DHL for this purpose:

*” Building on a relationship dating back to 2014, DHL will now also provide logistics and fulfilment services in the UK and Republic of Ireland (ROI). The existing partnerships between DHL and Nespresso in Italy, Brazil, Malaysia and Taiwan will continue” (“DHL EXTENDS NESTLÉ NESPRESSO PARTNERSHIP”, Insider Media).*

### 5.3.3. Optimization of the shipments & deliveries.

Another initiative is to optimize the shipments and deliveries. By doing that, results shows that companies can improve their operational efficiency, promote sustainability by reducing carbon emissions, reduce transportation costs and identify the most efficient and cost-effective routes. Sanofi is implementing the following strategies:

*“Increase the fill levels of trucks and sea containers; group product shipments and pool transport to reduce the number of trucks on the road; and design packaging to reduce volume and optimize transport” (Carbon Footprint-GHG Emissions (Scope 1,2 & 3), SANOFI Official Webpage).*

In addition, the results shows that multinational companies can also consolidate the deliveries in a single location, which is particularly beneficial when they operate in multiple markets and need to optimize their transportation network. By doing this, companies can also reduce the risk of damage or theft during the delivery, because customers are the ones that collect their purchases in person. Also, this gives the customer the flexibility to decide when and in which location he wants to collect his order.

*"Promoting the Pick-up Point delivery mode. We know that this is the most sustainable delivery mode, since at one stop the carrier can deliver an important number of volumes, avoiding the kilometers to each address (comparing with a standard mode home delivery)" (Interview of Supply Chain Manager, Nespresso Portugal).*

The following table summarizes the main conclusions covered from the findings, which subsequently answers my research question and discusses the result.

Aggregated dimensions	Second order themes	Main Findings
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Sourcing sustainable raw material	Supplier's assessments & collaboration	Businesses must work in collaboration with their suppliers to have transparent and constant communication to make sure they are following the correct procedures regarding sustainability. In addition, companies can implement training, audits, and assessments as sustainable practices. Also, supporting the suppliers with investments to develop sustainable raw materials or implementing new procedures is beneficial for the company in their sustainable path.
	Keys towards circular economy	The origin of the raw material and the substances used to create the product is key for the company. Businesses with the help of suppliers should implement eco-design in their products by avoiding toxic substances and finding ways of recycling the product at the end of its life cycle. In this way, in collaboration with suppliers, companies can start their path towards a circular economy.
Producing sustainable products (in-house operational processes)	Containment of Greenhouse Gas (GHG) emissions	Reducing the GHG emissions produced by internal processes should be a priority for businesses because multinational companies are one of the main ones responsible for a big percentage of GHG emissions which are highly corrosive to the environment. To reduce them, companies should implement measuring systems to control emissions and have action plans when needed.
	Implementation Industrial processes	Implementing initiatives related to waste management, sourcing renewable electricity in-house, and including recycling systems in their industrial processes will help multinational companies in their path toward sustainability. Companies should establish sustainable targets with specific actions to implement these initiatives and at the same, help motivate their employees by participating in these important goals.
Delivering via green & sustainable logistics	Green mobility	Businesses should implement zero-emission mobility for internal logistic purposes to reduce their carbon footprint. In addition, companies should also invest in the development of fuel saving procedures, as well as using alternative fuels to be more responsible with the environment.

	Keys towards circular economy	Investing in dedicated recycling systems to enable consumers everywhere to recycle their products should be also a priority for multinational companies. Creating a reverse logistic network to facilitate the recycling process will be an added value that customers will take into consideration when buying a product. In addition, subcontracting the distribution activities for certain products can also be convenient because not every company is specialized in these processes, and therefore it's important to have these collaborations.
	Shipment sustainable practices	Consolidating the shipments by reducing the number of deliveries will result in reducing the number of trucks on the road, as well as containers to fill in, decreasing the overall carbon footprint from these logistic processes. Also, optimizing transportation by reducing the volume of the product is beneficial to conquer the company's sustainable corporate objectives

*Table 5: Conclusions of main findings*

Subsequently, the following table includes the identified sustainable practices within the three studied cases.

<b>Second order themes</b>	<b>First order codes</b>	<b>Airbus</b>	<b>Nespresso</b>	<b>Sanofi</b>
Supplier's assessments & collaboration	Risk management related to suppliers	X		X
	Supplier assessments (audits)	X	X	X
	Work in partnership with suppliers	X	X	X
	Trainings & awareness for suppliers	X		X
	High investments related to R&D for sustainable products.	X		
Keys towards circular economy	Standards to avoid using toxic materials or chemical substances to produce goods (eco-design)	X	X	X
	Management of resources (source virgin & clean materials)	X	X	X
	Sustainability at the core of procurement activities.	X	X	X
	Resource recovery (recycling)	X	X	X
Containment of Greenhouse gas (GHG) emissions	Measuring GHG emissions	X		X

	Plan to reduce GHG emission produced by industrial in-house operations.	X	X	X
Implementation Industrial processes	Waste management & recycling in-house	X	X	X
	Implementing new renewable energy in-house.	X	X	X
	Investments to produce sustainable products	X		
Green mobility	Zero emission mobility to reduce carbon footprint.		X	X
	Usage of alternative fuel	X	X	X
	Investment in the development of green logistics solutions		X	
Keys towards circular economy	Implement options to ease the recycling process for customers (reverse logistics)		X	
	Partnering with third parties' companies for logistic purpose		X	X
Shipment sustainable practices	Consolidation shipment		X	X
	Cube optimization			X

*Table 6: Identified sustainable practices among codes within studied cases.*

## **6. Discussion**

The purpose of this research was to review and understand how multinational companies were implementing sustainable practices in their supply chain. Based on the findings presented of interviews with managers of three multinational companies, the result shows some accordance with existing literature, but also deviates in some ideas.

For instance, some scholars pointed that corporations are actively and strategically involved in influencing sustainable development by adopting an international sustainability framework towards creating functional linkages between performance and targets (Lartey et al., 2021). Indeed, the results shows that managers are prioritizing sustainability in their corporate strategies by creating sustainable targets based on their performance. Therefore, there's a link between performance and corporate targets.

Businesses are increasingly relying on strategic partnerships, like non-profit organizations, to address social, economic, and environmental issues, that can help them gather information and knowledge about creative ways to address corporate social responsibility, sustainability issues and to restructure operational activities in the host markets (Yin, 2021). My results shows that indeed companies are partnering with non-profit organizations, like the case of Nestlé with NGO "The Rainforest Alliance" to create sustainable supply of the highest quality coffee, while protecting the environment and improving the lives of the coffee farmers and their communities.

Some scholars stated that managers need to improve the transparency around supplier sustainability practices and processes to better manage the risks (McGrath et al., 2021). Indeed, my results shows that transparency is a key point for companies to implement in order to control all the raw materials, processes and substances involved in the product's creation. However, my results also shows that this is a current challenge that companies face because of the extent supply chain and the amount of supplier involved.

Massive investments in green practices tends to negatively influence firm's value and reduces their competitiveness. To some managers, it is perceived that even though green initiatives may boost environmental performance, it is likely to affect their value-based competitiveness (Afum et al., 2022). Nevertheless, my result shows the contrary. All the

companies interviewed agreed that prioritizing sustainability as part of their corporate objectives gives them a competitive advantage in the market and increases their value.

In addition, CE emerged as a sustainable strategy to create supply chains that recover or recycle the resources to produce products or services (Atasu et al., 2021). However, other scholars stated that CE is used as an economic strategy more than an environmental strategy (M. Sharma et al., 2022). Nevertheless, my results show that multinational companies include CE practices and strategies to reduce their carbon footprint because they are more conscious of the products and services they are selling, and also because this increases their overall brand reputation.

Also, a company's image is no longer related to the old paradigm of being sustainable in its own activities, but instead is associated with a strong collaboration between all supply chain stakeholders towards a sustainable activity (Barbosa-Póvoa et al., 2018). My results shows that multinational companies can implement sustainable practices by themselves, but if the entire ecosystem doesn't follow these behaviors, the effort will be useless because the impact will be null. Therefore, the collaboration between stakeholders is key.

Next, based on the literature review, customers and governments are pressuring companies to become more sustainable (Mota et al., 2015, p.20). This comes as a result that consumers are demanding "greener", eco-friendlier products (Urata et al., 2023, p.50). My results shows that indeed experience big pressure from investors, customers and employees regarding sustainability because now days people are more educated regarding the subject. Markets are constantly changing because of this, therefore, seeking new initiatives and improvement is a priority for firms. In addition, the relevance of NGOs is increasing the pressure on companies to constantly verify their processes and make sure that every sustainable practice is implemented correctly and with positive results.

Finally, some scholars also stated that managers struggle to decide which sustainable practices to implement because of the choice overload (Wu & Yang, 2021). Nevertheless, my results show that even though there are so many options available, companies are creating sustainable departments that focus in finding and implementing specific sustainable practices that improve their operations and products, and therefore helps them achieve their global sustainable targets.

## **7. Conclusion**

The qualitative study presented in this paper allowed me to answer my research questions on how multinational companies can be more sustainable in their supply chain. Subsequently, I compared three multinational companies that have sustainability at the core of their corporate objectives and analyzed how their practices are consistent with existing literature.

Supply Chain is viewed as a combination of processes aimed at fulfilling customers' requests, that include all possible network entities such as suppliers, manufacturers, transporters, warehouses, retailers and customers, whose main purpose is the customers' satisfaction at a minimum cost (Barbosa-Póvoa et al., 2018, p.11). Sustainable Supply Chain has become a critical issue to foster companies' activities towards sustainability. Since the design of supply chain network design involves selecting partnering firms or suppliers, flexibility and responsiveness should be given due consideration for sustainable supply chain network design (Gunasekaran et al., 2016, p.9). In addition, multinational companies have a large number of customers geographically dispersed and deal with a large number of products and transportation modes. With such a complex supply chain, it is important to ensure that conscious decisions are made at the design and planning levels (Mota et al., 2015, p.10).

My findings suggest that multinational companies now include sustainability at the core of their corporate objectives because this gives them more value in the market and increases the competitiveness of their products. In addition, results show that investing in new technologies, prioritizing eco-design and innovating their operation processes is viewed as something essential to keep growing in their path of reducing their overall carbon footprint. Subsequently, my findings show that working together with suppliers, partnering with association and collaborating with competitors is key because to make a meaningful environmental change, the entire ecosystem must be involved.

Despite the contributions, my research also has limitations. First, my study followed a qualitative approach based on a limited amount of case studies that can result in generalizing all my data. In addition, the limited access to primary data was influenced by the time constraint and the difficulty in getting replies from the companies. Also, managers can't speak openly

about the company's operational processes in detail because of confidentiality, therefore my findings couldn't be too specific.

Even though important aspects have been studied in this paper, there is still a lot of work to be done to answer in more detail the proposed research question. Therefore, future researchers should address how managers should determine the criteria for selecting suitable suppliers or partnering firms, suitable techniques to design an optimal sustainable supply chain network and specific logistic strategies to achieve sustainable performance goals.

## 8. References

- Afum, E., Agyabeng-Mensah, Y., Baah, C., Asamoah, G., & Kusi, L. Y. (2022). Eco-market orientation in the logistics industry: A conveyor belt for achieving organizational outcomes via green logistics practices. *The International Journal of Logistics Management*, 33(2), 712-734. <https://doi.org/10.1108/IJLM-07-2021-0383>
- Alayón, C., Säfssten, K., & Johansson, G. (2017). Conceptual sustainable production principles in practice: Do they reflect what companies do? *Journal of Cleaner Production*, 141, 693–701. <https://doi.org/10.1016/j.jclepro.2016.09.079>
- Allaoui, H., Guo, Y., & Sarkis, J. (2019). Decision support for collaboration planning in sustainable supply chains. *Journal of Cleaner Production*, 229, 761–774. <https://doi.org/10.1016/j.jclepro.2019.04.367>
- Arampantzi, C., & Minis, I. (2017). A new model for designing sustainable supply chain networks and its application to a global manufacturer. *Journal of Cleaner Production*, 156, 276–292. <https://doi.org/10.1016/j.jclepro.2017.03.164>
- Atasu, A., Dumas, C., & Van Wassenhove, L. N. (2021). The circular business models. *Harvard Business Review*. <https://hbr.org/2021/07/thecircular-business-model>
- Balcilar, M., Usman, O., & Ike, G. N. (2023). Operational behaviours of multinational corporations, renewable energy transition, and environmental sustainability in Africa: Does the level of natural resource rents matter? *Resources Policy*, 81, 103344. <https://doi.org/10.1016/j.resourpol.2023.103344>
- Barbosa-Póvoa, A. P., da Silva, C., & Carvalho, A. (2018). Opportunities and challenges in sustainable supply chain: An operations research perspective. *European Journal of Operational Research*, 268(2), 399–431. <https://doi.org/10.1016/j.ejor.2017.10.036>
- Bin, H., Zhao, F., Xie, G., Huang, L., Wang, H., Zhu, R., & Jiang, L. (2020). Crowd-Sourcing a Way to Sustainable Urban Logistics: What Factors Influence Enterprises' Willingness to

Implement Crowd Logistics? *IEEE Access*, 8, 225064–225075.  
<https://doi.org/10.1109/ACCESS.2020.3044921>

Birkinshaw, J., Brannen, M. Y., & Tung, R. L. (2011). From a distance and generalizable to up close and grounded: Reclaiming a place for qualitative methods in international business research. *Journal of International Business Studies*, 42(5), 573–581.  
<https://doi.org/10.1057/jibs.2011.19>

Boddewyn, J.J., & Iyer, G. (1999). “Evolution and Revolution in International Management: A Topic and a Discipline in Transition,”. <https://www.jstor.org/stable/40835824>

Castro, R., & Moreira, A. C. (2023). Mapping Internal Knowledge Transfers in Multinational Corporations. *Administrative Sciences*, 13(1), 16. <https://doi.org/10.3390/admsci13010016>

Etse, D., McMurray, A., & Muenjohn, N. (2022). The Effect of Regulation on Sustainable Procurement: Organisational Leadership and Culture as Mediators. *Journal of Business Ethics*, 177(2), 305–325. <https://doi.org/10.1007/s10551-021-04752-0>

Etse, D., McMurray, A., & Muenjohn, N. (2023). Sustainable Procurement Practice: The Effect of Procurement Officers’ Perceptions. *Journal of Business Ethics*, 184(2), 525-548.  
<https://doi.org/10.1007/s10551-022-05150-w>

FACTS & FIGURES | Nestlé Nespresso. (n.d.). FACTS & FIGURES | Nestlé Nespresso.  
[https://nestle-nespresso.com/our\\_company/facts\\_figures](https://nestle-nespresso.com/our_company/facts_figures)

Ganjavi, N., & Fazlollahtabar, H. (2023). Integrated Sustainable Production Value Measurement Model Based on Lean and Six Sigma in Industry 4.0 Context. *IEEE Transactions on Engineering Management*, 70(6), 2320–2333. <https://doi.org/10.1109/TEM.2021.3078169>

Gunasekaran, A., Dubey, R., & Singh, S. P. (2016). Flexible Sustainable Supply Chain Network Design: Current Trends, Opportunities and Future. *Global Journal of Flexible Systems Management*, 17(2), 109–112. <https://doi.org/10.1007/s40171-016-0131-7>

Hernandez, A. A., Escolano, V. J. C., Juanatas, R. A., & Elvambuena, Ma. D. E. (2022). Green Logistics in Small and Medium Enterprises for Sustainable Development: A Developing Country Perspective. *2022 7th International Conference on Business and Industrial Research (ICBIR)*, 401–405. <https://doi.org/10.1109/ICBIR54589.2022.9786461>

Imane Tronnebati (2023). Green and Sustainable Supply Chain Management: A Comparative Literature Review. *Jordan Journal of Mechanical and Industrial Engineering*, *17(01)*, 115-126. <https://doi.org/10.59038/jjmie/170109>

Jayarathna, C. P., Agdas, D., & Dawes, L. (2023). Exploring sustainable logistics practices toward a circular economy: A value creation perspective. *Business Strategy and the Environment*, *32(1)*, 704-720. <https://doi.org/10.1002/bse.3170>

KMPG (2022), Survey of Sustainability Reporting 2022.

Lahane, S., Kant, R., & Shankar, R. (2020). Circular supply chain management: A state-of-art review and future opportunities. *Journal of Cleaner Production*, *258*, 120859. <https://doi.org/10.1016/j.jclepro.2020.120859>

Lartey, T. A., Amankwah-Amoah, J., Danso, A., Adomako, S., Khan, Z., & Tarba, S. Y. (2021). Environmental sustainability practices and offshoring activities of multinational corporations across emerging and developed markets. *International Business Review*, *30(5)*, 101789. <https://doi.org/10.1016/j.ibusrev.2020.101789>

McGrath, P., McCarthy, L., Marshall, D., & Rehme, J. (2021). Tools and Technologies of Transparency in Sustainable Global Supply Chains. *California Management Review*, *64(1)*, 67-89. <https://doi.org/10.1177/00081256211045993>

Mota, B., Gomes, M. I., Carvalho, A., & Barbosa-Povoa, A. P. (2015). Towards supply chain sustainability: Economic, environmental and social design and planning. *Journal of Cleaner Production*, *105*, 14-27. <https://doi.org/10.1016/j.jclepro.2014.07.052>

Movahedipour, M., Zeng, J., Yang, M., & Wu, X. (2017). An ISM approach for the barrier analysis in implementing sustainable supply chain management: An empirical study. *Management Decision*, 55(8), 1824-1850. <https://doi.org/10.1108/MD-12-2016-0898>

Oliveira, D. F. D., & Souza, R. G. D. (2023). Life cycle sustainability impact categories for sustainable procurement. *Journal of Cleaner Production*, 383, 135448. <https://doi.org/10.1016/j.jclepro.2022.135448>

Oosthuizen, C., & Grobbelaar, S. S. (2022). Exploring the Themes of Focus for Change Management Applied to Multinational Corporations: A Scoping Review. 2022 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), 0985-0989. <https://doi.org/10.1109/IEEM55944.2022.9989761>

Ren, R., Hu, W., Dong, J., Sun, B., Chen, Y., & Chen, Z. (2019). A Systematic Literature Review of Green and Sustainable Logistics: Bibliometric Analysis, Research Trend and Knowledge Taxonomy. *International Journal of Environmental Research and Public Health*, 17(1), 261. <https://doi.org/10.3390/ijerph17010261>

Ricketts, K. D., Palmer, J., Navarro-Garcia, J., Lee, C., Dominik, S., Barlow, R., Ridoutt, B., & Richards, A. (2023). Bridging organisational discourse and practice change: Exploring sustainable procurement portfolios for Australian beef. *Sustainability Accounting, Management and Policy Journal*, 14(2), 265-288. <https://doi.org/10.1108/SAMPJ-10-2022-0530>

Rynes, S., & Jr., R. P. G. (2004). From the Editors: Qualitative Research and the “Academy of Management Journal.” *The Academy of Management Journal*, 47(4), 454–462.

Sharma, M., Luthra, S., Joshi, S., sh, A., & Jain, A. (2022). Green logistics driven circular practices adoption in industry 4.0 Era: A moderating effect of institution pressure and supply chain flexibility. *Journal of Cleaner Production*, 383, 135284. <https://doi.org/10.1016/j.jclepro.2022.135284>

Shrivastava, P., & Berger, S. (2010). Sustainability principles: A review and directions. *Organization Management Journal*, 7(4), 246-261. <https://doi.org/10.1057/omj.2010.35>

Tenny, S., Brannan, J. M., & Brannan, G. D. (2022, September 18). *Qualitative Study - StatPearls - NCBI Bookshelf*. Qualitative Study - StatPearls - NCBI Bookshelf. [https://www.ncbi.nlm.nih.gov/books/NBK470395/#\\_article-28135\\_s6](https://www.ncbi.nlm.nih.gov/books/NBK470395/#_article-28135_s6)

Urata, S., Akao, K.-I., & Washizu, A. (Eds.). (2023). *Sustainable Development Disciplines for Society: Breaking Down the 5Ps—People, Planet, Prosperity, Peace, and Partnerships*. Springer Nature Singapore. <https://doi.org/10.1007/978-981-19-5145-9>

Xu, L., Beamon, B.M., (2006). Supply chain coordination and cooperation mechanisms: an attribute-based approach. *J. Supply Chain Manag.* 4e12. Winter. . <https://www.techtarget.com/whatis/definition/supply-chain>

Wu, P., & Yang, C. (2021). Sustainable development in aviation logistics: Successful drivers and business strategies. *Business Strategy and the Environment*, 30(8), 3763-3771. <https://doi.org/10.1002/bse.2838>

Yin, R. K. (2009). *Case Study Research: Design and Methods*. SAGE.

## 9. Appendices

### Appendix 1: Secondary data collected

<b>AIRBUS- Secondary Data</b>				
Type of data	Title	Name of Author	Organization	Date
Internal Document	Airbus' most popular aircraft takes to the skies with 100% sustainable aviation fuel	Airbus	Airbus	2023
Internal Document	Sustainable Supply Chain	Airbus	Airbus	N/A
Internal Document	Non-Financial Information Annual Report	Airbus	Airbus	2021
Newspaper article	Opinion: Why Airbus Needs To Update Its Supply Chain Model	Kevin Michaels	Aviation Week Network	2023
Newspaper article	Jet planes and sugar cane: Qantas and Airbus get on board biofuel factory in Queensland	Elias Visontay	The Guardian	2023
NGO webpage	EU investment rules will greenwash 90% of Airbus' polluting planes	Transport & Environment	Transport & Environment	2023
Newspaper article	Airbus CEO Warns Sustainability Progress Is Not Coming Fast Enough	Thierry Dubois	Aviation Week Network	2022
Newspaper article	NGOs criticize impact of new aircraft fuel efficiency standards	Jorge Valero	EUROACTIV	2016
Newspaper article	Supply chain issues hamper Airbus deliveries as Boeing recovers	Charlie Barlett	The Load Star	2023
Newspaper article	Airbus Group pledges to expand supply chains in Vietnam	Vietnam Net Global	Vietnam Net Global	2023
Newspaper article	Airbus and Neste collaborate on SAF production	Airport Technology	Airport Technology	2022
Newspaper article	Airbus Survey Shows Sustainability Interest	Curt Estein	AIN online	2022

*Table 7: Secondary data collected on Airbus*

<b>NESPRESSO - Secondary Data</b>				
Type of data	Title	Name of author	Organization	Date
Internal Document	Facts & Figures	Nespresso	Nespresso	N/A
Newspaper article	the good, the bad and the ugly: sustainability at Nespresso	Marc Gunther	The guardian	2015
Case Study	Supply Chain and Stakeholder Engagement Case Study: Nespresso	NYU	Carly Fink	2016
Internal Document	Nespresso: Towards a circular Value Chain	Nespresso	Nespresso	N/A
Newspaper article	The Sustainability Problems Percolating In The Coffee Supply Chain	Öykü Ilgar	Forbes	2022
Newspaper article	DHL EXTENDS NESTLÉ NESPRESSO PARTNERSHIP	Adam Beech	Insider Media Limited	2022
Newspaper article	B Corp’s sustainability status slides as Nespresso joins the ranks	Karin Kloosterman	The Green Prophet	2022
NGO	Nespresso: Known for Human Rights Violations, Now B Corp Certified	Anna Canning	Fair World Project	2022
Newspaper article	Nespresso launches new innovation and reassures commitment to sustainability	The Jakarta Post	The Jakarta Post	2023

*Table 8: Secondary Data collected on Nespresso*

<b>SANOFI - Secondary Data</b>				
Type of data	Title	Name of the author	Organization	Date
Internal Document	How Sanofi is building a sustainable environment?	Sanofi	Sanofi	N/A
Internal Document	Building the Road to Net Zero	Sanofi	Sanofi	N/A
Internal Document	Carbon Footprint-GHG Emissions (Scope 1,2 & 3)	Sanofi	Sanofi	N/A
Internal Document	Sustainable Procurement	Sanofi	Sanofi	N/A
Newspaper Article	Sanofi: The arrival of the ‘haute couture’ supply chain	Sustainability	Sustainability	2023

Newspaper Article	Sustainability and tech at the forefront of clinical trial supply chains	Urtė Fultinavičiūtė	Clinical Trials Arena	2023
Newspaper Article	Pharma drama: supply chain challenges and sustainability concerns	Annie Kovacevic	Trade Finance Global	2022
Internal Document	Sanofi Shareholder Report 2022	Sanofi	Sanofi	2022

Table 9: Secondary Data collected on Sanofi

## Appendix 2: Coding Tree

Aggregated dimensions	Second order themes	First order codes
Sourcing sustainable raw material	Supplier's assessments & collaboration	Risk management related to suppliers
		Supplier assessments (audits)
		Work in partnership with suppliers
		Trainings & awareness for suppliers
		High investments related to R&D for sustainable products.
	Keys towards circular economy	Standards to avoid using toxic materials or chemical substances to produce goods (eco-design)
		Management of resources (source virgin & clean materials)
		Sustainability at the core of procurement activities.
Resource recovery (recycling)		
Producing sustainable products (in-house operational processes)	Containment of Greenhouse gas (GHG) emissions	Measuring GHG emissions
		Plan to reduce GHG emission produced by industrial in-house operations.
	Implementation Industrial processes	Waste management & recycling in-house
		Implementing new renewable energy in-house.
		Investments to produce sustainable products
Delivering via green & sustainable logistics	Green mobility	Zero emission mobility to reduce carbon footprint.
		Usage of alternative fuel
		Investment in the development of green logistics solutions
	Keys towards circular economy	Implement options to ease the recycling process for customers (reverse logistics)

		Partnering with third parties' companies for logistic purpose
	Shipment sustainable practices	Consolidation shipment
		Cube optimization

Table 10: Coding Tree

### Appendix 3: Coding Table

Quotations	Codes
<p>"Sanofi Sustainable Procurement policy is primarily risk-based to maximize positive impact on the environment and society. In that sense, sustainability requirements have been systematically embedded in the different steps of our Procurement processes: supplier onboarding, tenders, continuous assessment (audits and inquiries)."</p> <p>"We require our suppliers to meet the same environmental and social responsibility standards that we set for ourselves. These standards are clearly outlined in our Supplier Code of Conduct."</p>	Risk management related to suppliers
<p>"Supplier audits, focusing primarily on Health, Safety and Environment (HSE) performance, are conducted by Sanofi HSE department or subcontracted to external auditors. These supplier audits are mainly targeted on high-risk critical raw materials Sanofi manufacturing subcontractors. Action plans are continuously monitored to ensure remediation of issues."</p> <p>"Suppliers are answering this assessment to show us that they have the good processes, competences and organization to answer sustainable behavior."</p>	Supplier assessments (audits)
<p>"Having partnerships with the right competences as a service is ultimately necessary. To mitigate a collective objective, you need to partner with specific partners. That's the solution. It's absolutely necessary."</p> <p>"We developed the AAA Sustainable Quality™ Program in 2003 with the internationally recognized NGO The Rainforest Alliance to create a sustainable supply of the highest quality coffee, while protecting the environment and improving the lives of the coffee farmers we work with and their communities. The goal is to help them improve their farming practices, increase their productivity and manage their farms – and their futures – in a more sustainable way. More than 93% of our coffee is sourced sustainably through the AAA Sustainable Quality™ Program."</p>	Work in partnership with suppliers
<p>"Some of the suppliers we work with may not have this level of maturity on sustainability, so we have be there and kind of guide them and support them in their sustainability journey."</p> <p>"The analysis showed what kind of assistance was needed and for which suppliers. Some needed help with water management, others with seasonal labor treatment. Nespresso, the Rainforest Alliance, and agronomists designed performance improvement strategies and partnered with other NGOs to provide training and technical assistance for improving the sustainability of coffee production."</p> <p>"In 2021, Sanofi, along with nine other global pharmaceutical companies, launched the ENERGIZE program, aiming to help our pharmaceutical suppliers to learn more about renewable energy adoption and contracting."</p>	Trainings & awareness for suppliers

<p><i>"We spent around 2 billion euros yearly on research and technology which are really dedicated almost 100% to improving our aircraft. We know this will pay off in the long term by delivering more efficient products."</i></p> <p><i>"The company invests substantial time and resources in research and development for technologies that use alternatives to regulated substances. When it can be demonstrated that these technologies meet the strict safety and reliability criteria required for aviation, the Company seeks to implement them in its aircraft design and manufacturing."</i></p>	<p>High investments related to R&amp;D for sustainable products.</p>
<p><i>"In addition, this holistic approach is used to provide a framework for projects to make environmentally conscious design choices to reduce projects footprint and optimize aspects such as product end-of-life management and critical raw materials usage."</i></p> <p><i>"We have redesigned our capsules to use less material and accept a wider range of aluminum alloys – leading to the 2020 roll-out of the first ever coffee capsules made using 80% recycled aluminum. By the end of 2022, we aim to have the full Original Line and Vertuo ranges of capsules made using recycled aluminum."</i></p> <p><i>"We are working with our packaging suppliers to reduce the resources and energy used in manufacturing, use materials and resources with the minimum impact on the environment, limit emissions, pollution, and the ecological impact (climate, biodiversity), facilitate the reuse or recycling of the product, and improve waste management in our supply chain."</i></p>	<p>Standards to avoid using toxic materials or chemical substances to produce goods (eco-design)</p>
<p><i>"If you want to anticipate all the substances which are going to be banned in the future, you need to know in detail all the parts that we have in the aircraft so we can identify easily the substance banned. We need full transparency to make sure that we don't have banned substances in our products."</i></p> <p><i>"We seek to protect biodiversity and ensure that natural resources are used fairly and sustainably. We adapt our practices to comply with international frameworks and the local regulations. We also work towards elimination of the use of endangered natural resources and their derivatives."</i></p>	<p>Management of resources (source virgin &amp; clean materials)</p>
<p><i>"The Company strives to make environmental and social responsibility a core element of its procurement strategy. This includes managing the relationships with suppliers throughout the sourcing strategy, supplier selection, contract management, supplier monitoring and development."</i></p> <p><i>"Sustainability has been an integral piece of Nespresso's business model since 2003. Their comprehensive approach to solving social and environmental challenges through stakeholder engagement can serve as a model for others on the path to sustainability."</i></p> <p><i>"Sanofi wants to partner with the best-in-class suppliers, be inspired by best practices and create a new dynamic among our supply chain to support fair and sustainable economic growth to deliver social benefits through procurement. We plan to achieve this ambition by including sustainability needs at the core of procurement activities."</i></p>	<p>Sustainability at the core of procurement activities.</p>
<p><i>"The Company promotes the development of a circular economy model, and is proactive in seeking ways to recover, reuse and recycle materials beyond their initial life."</i></p>	<p>Resource recovery (recycling)</p>

<p><i>"In addition, in 2018, we announced the opening of our recycling scheme to other portioned coffee manufacturers, offering a global solution for the whole category to improve accessibility and convenience of aluminum capsule recycling."</i></p>	
<p><i>"Having established a reduction footprint plan gave us the performance measuring system to understand whether we will have options, establish different scenarios, analyze the plan globally and give us the best option to make a decision."</i></p> <p><i>"Considering GHG emissions allows us to assess the order of magnitude of CO2e emissions generated by the Company throughout its value chain. The calculation is based on a large dataset, which generates a significant level of uncertainty."</i></p>	<p>Measuring GHG emissions</p>
<p><i>"In 2021, GHG emissions have decreased by around 6% (7% on TCO scope), primarily due to oversized transportation efficiency and operation improvements, reduced flight tests activities and European emission factors improvement that more than offset production ramp-up impact."</i></p> <p><i>"Inset 100% of our operational carbon footprint ensuring greenhouse gas emissions are equivalent to the global volume of capsules sold."</i></p> <p><i>"Monitor, manage and reduce emissions on 100% of manufacturing sites by 2025. (Specific programs engaged on 72% of manufacturing sites and on 100% priority sites.)"</i></p>	<p>Plan to reduce GHG emission produced by industrial in-house operations.</p>
<p><i>"Not only does the Company send around 50% of its waste to be recycled, but already, through the TARMAC Aerosave joint venture, more than 90% of an aircraft's weight is recycled or reused through a selective dismantling (reverse manufacturing) process."</i></p>	<p>Waste management &amp; recycling in-house</p>
<p><i>"Investing cleverly in our capacity to produce power will maybe mean more money up front. But it will trigger some gain and saving over the next two decades. That's the way we look at it. It's mindful: the more investments, means more benefits at the end of the line. You see that in your balance sheet."</i></p> <p><i>"We have publicly committed to sourcing 100% renewable electricity across all our operations by 2030. Its already the case for all our French sites!"</i></p>	<p>Implementing new renewable energy in-house.</p>
<p><i>"If you have an ambition, you must put the money where the margins are, and if you want to be truly sustainable you know it will have a cost, it's going to be an investment, maybe not in the short term, but in the longer-term type. Today at Airbus we spent around 2 billion euros yearly on research and technology which are really dedicated almost 100% to improving our aircraft."</i></p>	<p>Investments to produce sustainable products</p>
<p><i>"In Switzerland, the company is supporting a new form of zero-emission mobility, turning to hydrogen-powered vehicles to make product deliveries in the country."</i></p> <p><i>"Foster in eco-fleet by 2030. (34% of our car fleet is an eco-fleet)."</i></p> <p><i>"Green deliveries by electrical vehicles (in Porto and Lisbon cities), deliveries by Bike (in a range of zip codes in Lisbon and soon in Porto)."</i></p>	<p>Zero emission mobility to reduce carbon footprint.</p>

<p><i>"The Company also focuses on developing fuel saving procedures for airports and ground operations to minimize the use of engine power while the aircraft is on the ground."</i></p> <p><i>"Since 2019, SAF is used in the operation of the Company's Beluga transport aircraft for the purpose of internal logistics. In 2022, flight test activities will also start using SAF as part of the Company's revised GHG emissions reduction plan. The share of SAF used in these activities will progressively increase to 50% by 2030."</i></p>	Usage of alternative fuel
<p><i>"I must refer that one of the challenges is cost. Presently, the cost is higher, comparing the deliveries done by "conventional mode" versus electrical mode or bike. However, this is not a blocking point for us because we have fully decided to improve in terms of sustainability within our Supply Chain."</i></p>	Investment in the development of green logistics solutions
<p><i>"Today, 88% of the capsules we sell can be collected for recycling via dedicated collection services, Nespresso boutiques, participating collection points and municipal recovery systems."</i></p> <p><i>"Nespresso has a recycling program that offers its customers the ability to recycle used coffee pods. After filling your recycling bag with used capsules, you can either give it to your postman, or return it to your Nespresso boutique, or its partner."</i></p>	Implement options to ease the recycling process for customers (reverse logistics)
<p><i>"Partnership with vendors is key to ensure we bring cutting-edge technology on renewable to our entire value chain (packaging, plant and DC sites, transportation, administrative offices, etc.)."</i></p> <p><i>"Building on a relationship dating back to 2014, DHL will now also provide logistics and fulfillment services in the UK and Republic of Ireland (ROI). The existing partnerships between DHL and Nespresso in Italy, Brazil, Malaysia, and Taiwan will continue."</i></p>	Partnering with third parties' companies for logistic purpose
<p><i>"Promoting the Pickup Point delivery mode. We know that this is the most sustainable delivery mode since in one stop the carrier can deliver an important number of volumes, avoiding the kilometers to each address (compared with a standard mode home delivery)."</i></p> <p><i>"Increase the fill levels of trucks and sea containers; group product shipments and pool transport to reduce the number of trucks on the road."</i></p>	Consolidation shipment
<p><i>"Design packaging to reduce volume and optimize transport."</i></p>	Cube optimization

Table 11: Coding Table