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The role of importance and urgency in prioritising Green Supply Chain Practices (GSCPs)

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ABSTRACT

Although companies often proclaim that Green Supply Chain Practices (GSCPs) are essential to their strategy, it is easy to put initiatives on hold and postpone action. Therefore, a better understanding of the prioritisation process is needed from both a theoretical and practical perspective. The purpose of this study is to provide insight into how GSCP implementations are prioritised in operations management. Utilising the urgency and importance matrices, we collected multiple case studies based on information from 50 GSCPs. For each case, we conducted qualitative interviews with some quantified measurement checks. The results show that urgency, in addition to importance, is a critical antecedent for GSCP implementation. The research also shows that different sets of motivators work differently to pursue GSCPs, particularly in terms of urgency. This paper provides both managers and policy makers with a unique perspective on the prioritisation of GSCPs across a range of operations management strategies.

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KEYWORDS

Green supply chain practices; prioritisation; motivation; importance-urgency; responsible consumption and production

1. Introduction

In order to meet the sustainable demands of various stakeholders, many companies have declared that Green Supply Chain Management (GSCM) is strategically important (Kovács et al. 2020; Melander and Pazi-randeh 2019; Miemczyk and Luzzini 2019; Walker et al. 2014). Due to the increasing complexity of supply chains, the number of Green Supply Chain Practices (GSCPs) has increased significantly in recent years (Akın Ateş et al. 2022). However, companies that emphasise sustainable goals and plans are often slow to implement these measures and, in some cases, do not even begin to do so until there is a hard call. For example, Volkswagen put corporate social responsibility (CSR) and sustainability at the heart of its strategic agenda in 2018, using CSR-focused marketing as a pre-emptive strategy to gain a competitive advantage. However, the operations did not follow the same sustainable strategy, until a scandal ('Dieselgate') suddenly erupted and Volkswagen admitted that its engines were not as climate-friendly as the company claimed (Zhang, Atwal, and Kaiser 2021). Similarly, it is not uncommon for companies to postpone or downplay their GSCPs, until they are forced to take action (Kumar et al. 2019). To gain a clearer understanding of

this phenomenon, it is crucial to examine how companies prioritise their GSCPs.

Companies have a range of GSCPs to implement (Geng, Mansouri, and Aktas 2017), from the collaboration with upstream suppliers, the production, to the downstream customers. There are numerous sustainable practices, which companies can adopt to improve their supply chain sustainability. For instance, they may consider incorporating supplier selection and the adoption of eco-friendly logistics and packaging solutions. Alternatively, they may pursue internal improvements, such as the integration of green design and environmental management systems, as ways to drive sustainable supply chain development (Mitchell, Agle, and Wood 1997; Stern 2015). However, resources are inherently limited, necessitating deliberate choices and prioritisation to ensure they are allocated effectively. This constraint creates a direct link between resource availability and the need to rank initiatives based on factors such as urgency, importance, and potential impact, guiding decision-makers to maximise value and address critical goals. Greening the supply chain spans the entire production process, beginning with product design and extending through green production to the implementation of

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green reverse supply chain recycling. Given the limited resources available, prioritisation becomes essential for the effective implementation of these initiatives. Firms must strategically allocate resources to areas that align with both immediate operational demands and long-term sustainability objectives, balancing urgency and importance to achieve the greatest impact.

Previous studies have shown that different GSCPs have different effects on environmental performance. For instance, customer collaboration on green issues had a more significant impact than green supplier integration on the environmental performance of market-oriented firms, while non-market-oriented firms showed no such results (Geng, Mansouri, and Aktas 2017; Guoyou et al. 2013). As a result, scholars have increasingly turned their attention to studying the effectiveness of different GSCPs. Yildiz Çankaya and Sezen (2019) identified five types of GSCPs that significantly contribute to environmental performance: green manufacturing, green distribution, green marketing, international environmental management, investment recovery. According to Yildiz Çankaya and Sezen (2019), green packaging and distribution practices were found to be highly effective for enhancing environmental performance. While Zhu, Sarkis, and Lai (2019) acknowledged the relevance of selecting the appropriate practices for green supply chains, there is a lack of research on the prioritising of multiple GSCPs (Zhu, Sarkis, and Lai 2019). Therefore, understanding how the prioritisation is carried out in these GSCPs proves to be crucial for improving their implementation efficiency (Zhu, Sarkis, and Lai 2019). To effectively and efficiently implement GSCPs, the mechanism of prioritisation provides insights into the role of priority intentions in decision-making and pre-implementation planning (Slack 1994).

Companies typically begin implementing GSCPs with a focus on environmental concerns (Hoejmos, Brammer, and Millington 2012). Based on their motivations, companies may choose to adopt a specific set of green practices (Bansal and Roth 2000; González-Benito and González-Benito 2006), which can have an impact on their environmental performance. For example, firms may be motivated by eco-responsiveness to improve their environmental performance, while survival motivations may trigger performance related to legitimacy (Vandouwecq, Quintens, and Van Engelshoven 2016). Previous research has linked motivators to GSCPs. For example, researchers found that domestic regulatory motivators, such as emission laws and automobile take-back legislations influence eco-design and investment recovery practices in the automotive supply chain, whereas supply chain and market pressures rather influence cooperative efforts and green purchasing practices (Zhu, Sarkis,

and Lai 2007a, 2007b). Researchers also tried to identify key drivers/factors for specific GSCPs (Chuang and Yang 2013). However, among the various of GSCPs, the literature rarely clarifies the mechanisms of how and when motivators trigger specific practices. Understanding how these motivations influence the pathway, i.e. prioritisation process of GSCPs, is vital for several managerial practices, including strategic alignment, resource allocation, and achieving sustainability goals. The prioritisation of GSCPs can be highly complex as motivations can not only stimulate but also create dilemmas in terms of timing, changing the original intended plans during the implementation of GSCPs (Zehendner et al. 2021). Consequently, companies may prioritise their practices based on both value (importance) and timing (urgency), making it challenging to connect diverse motivations to the prioritisation process.

This study is a direct response to Zhu's (2019) call for further investigation into the prioritisation of GSCPs and how these priorities are influenced by firm motivations. Resource allocation addresses the 'how' by determining how resources like time, budget, personnel, and materials are assigned to meet priorities, while prioritisation defines the 'what,' identifying which tasks, projects, or initiatives should come first. This process is critical for guiding the distribution of limited resources effectively. In production research, much attention is given to how firms allocate resources to achieve operational efficiency. Understanding how urgency and importance shape resource allocation for GSCPs offers valuable insights into balancing short-term demands with long-term strategic goals in production. Additionally, the study explores how urgency influences production strategy and operational decisions concerning resource allocation, such as determining when to prioritise specific sustainable production processes over other investments in sustainable operations.

By understanding how motivations influence prioritisation, companies can better align their supply chain practices with their broader operations management strategy. This should enable companies to invest in the infrastructural and structural elements supporting their overall operations strategy. Furthermore, it helps to integrate the environmental practices with the overall business goals, stakeholder expectations, and societal values for resource allocation. This study aims to (1) demonstrate the discrepancy in the link between motivation and environmental practices in supply chains, (2) clarify how prioritisation is carried out based on considerations of importance and urgency, and (3) explores contingencies that influence the GSCP implementation. Specifically, we seek to address the following research questions:

RQ1: How do firms prioritise Green Supply Chain Practices (GSCPs)?

RQ2: How does motivation influence the GSCP prioritisation process?

Three main contributions are made: First, this research adopts a prioritisation perspective to elucidate how resources are allocated among GSCPs, highlighting the central role of urgency in the prioritisation process alongside importance. This perspective provides a nuanced understanding of the dynamics of GSCP implementation. Second, the study provides deeper insights into the prioritisation of GSCP implementation from an operations management perspective by specifying seven practical motivators within the original three categories: legitimacy, competitiveness, and eco-response. Third, the research provides practical guidance for managers to tailor their GSCP prioritisation strategies to align with their company's specific market position and different sets of motivators. Our findings are particularly valuable for managers and policymakers seeking to increase the effectiveness of GSCPs through aligned operations management strategies.

2. Literature and theoretical background

2.1. GSCPs

Green Supply Chain Practices (GSCPs) are actions within the context of GSCM (Sellitto et al. 2019), with the objective of maximising resource utilisation throughout the entire supply chain while minimising its environmental impact (Gimenez and Tachizawa 2012; Li et al. 2019; Yildiz Çankaya and Sezen 2019). Upstream and downstream expansion of GSCPs (Vachon and Klassen 2006) encompasses every process and involves internal and external stakeholders associated with products and/or services. To minimise repetition from internal and external perspectives and categorise GSCPs, Yildiz Çankaya and Sezen (2019) summarised GSCPs from a product/service life cycle process perspective. This includes green manufacturing, green purchasing, green marketing, green packaging, green distribution, internal environmental management, and investment recovery. To illustrate, the implementation of green packaging involves working with suppliers to choose materials that are environmentally friendly (Geng et al. 2019), as well as partnering with customers to minimise and reuse packaging materials (Gualandris and Kalchschmidt 2014).

2.2. Operations management strategy: prioritisation of GSCPs

Operations management refers to activities, decisions and responsibilities of managing resources, which are

dedicated to the production and the delivery of products and services (Kumar 2022; Slack, Chambers, and Johnston 2010). One of the objectives of operations management is resource utilisation, which enables a firm to obtain a competitive advantage (Barney 1991; Wernerfelt 1984). Various technological and organisational resources could enable firms to achieve and sustain an edge in competitive markets (Blome, Schoenherr, and Rexhausen 2013). Specifically, diverse GSCPs, such as sustainable product design, green procurement, reducing, reusing, and recycling materials during production, and using environmentally friendly logistics, all play a role in improving the overall performance of the supply chain. However, the resources are limited (Blome, Schoenherr, and Rexhausen 2013; Narasimhan and Schoenherr 2012). In the supply chain context, therefore, prioritisation is an approach fundamentally concerned with the efficiency of resource allocation for operations management. In line with the resource-based view (Barney 1991; Sarkis, Zhu, and Lai 2011), prioritisation of GSCPs suggests that companies should integrate resources such as assets, capabilities, organisational processes, firm attributes, information, and knowledge to improve the efficiency of resource allocation for transformations towards more sustainable operations.

Gilb and Maier (2005) provide a definition of 'priority' as 'the relative right of a requirement to the utilisation of limited (or scarce) resources' (Gilb and Maier 2005). Prioritisation necessitates a well-considered and strategic approach to defining the focal areas of a firm's efforts in operations management. It is considered a facilitator for enhancing a company's efficiency and effectiveness while distinguishing it from other firms (Barney 1991; Liu, Zhu, and Seuring 2017). Although Zhu, Sarkis, and Lai (2019) presents a framework for transforming a company's GSCM strategy through selecting critical GSCPs, the prioritisation process is still ambiguous. Research has investigated strategies for prioritising within the bioelectricity supply chain (Martín-Gamboa, Dias, and Iribarren 2022). Kumar et al. (2019) suggest that the adoption of green supply chain initiatives may aid in prioritising risks that require attention, while Lenort, Wicher, and Zapletal (2023) argue that companies easily prioritise sustainable practices when they represent the most obvious link to business (Lenort, Wicher, and Zapletal 2023).

Companies may have prioritised GSCPs based on their impact on environmental performance. For instance, sustainable design might require significant focus during early stages because the life cycle of a product is difficult to alter at this point, but is readily influenced by design decisions (Geng, Mansouri, and Aktas 2017). While green design may have a significant impact on the environmental performance of many supply chains, other Green Supply Chain Practices (GSCPs) may be more

profitable depending on the particular situation and conditions (Kuei et al. 2013). For instance, earlier research suggests that the efficiency of GSCPs varies across different supply chain contexts depending on the characteristics of the company (Govindan et al. 2015). For firms operating downstream, green supply chain practices that pertain to collaborate with customers tend to exert a more pronounced influence on environmental performance than green supply chain practices associated with the integration of suppliers (Geng, Mansouri, and Aktas 2017).

2.3. Importance and urgency

To prioritise management actions, decision makers often use the Eisenhower matrix. This decision support tool identifies priority intentions and outlines short-, medium-, and long-term strategies (Batra 2017; Bratterud et al. 2020). We adopt the notions of importance and urgency inherent in the Eisenhower matrix. The first criterion, 'importance', refers to something being of significant worth or value. This is similar to Kotter's (2008) interpretation of 'critical importance', which refers to challenges that are integral to triumph or survival, i.e. success or failure. This explanation aligns 'importance' with the outcome-oriented terminology that supports long-term goals. From a stakeholder perspective, importance can be linked to ownership, sentiment, expectations, and exposure, as these concepts strongly influence the gain or loss of value (Mitchell, Agle, and Wood 1997).

The second criterion of the Eisenhower matrix relates to urgency. Scholars have explored the influence of urgency on decision-making, leading to the idea that prioritising management practices based on importance alone does not fully elucidate the decision-making process (Stern 2015; Zhu, Yang, and Hsee 2018). Nevertheless, there is a lack of consistent definitions of urgency. While urgency is defined by Kotter (2008) as being of pressing importance, it can also be interpreted as demanding immediate attention or being of importance that requires swift action (Cambridge Dictionary 2022). In our study, we follow the definition of urgency as a type of importance in a situation requiring immediate action. According to Mitchell, Agle, and Wood (1997), who extended this definition, urgency exists only when two conditions are met: when a relationship or claim is (1) of a time-sensitive nature and (2) critical. According to Mitchell, Agle, and Wood (1997) and Zhu (2018), urgent tasks are characterised by both 'significant outcomes' and 'short deadlines'.

In summary, this paper examines how firms leverage their resources to prioritise Green Supply Chain Practices

(GSCPs) with operations management strategy. The literature agrees that when making prioritisation decisions, two dimensions should be considered: importance (refers to significance, benefit, and value), and urgency (refers to time sensitivity). To address RQ1, this study will examine the prioritisation of GSCPs in operations management for implementation, including the interplay between the importance and urgency of these priorities.

2.4. Motivation theory

Previous research has identified three motivations for pursuing GSCM: legitimisation, competitiveness, and eco-response (Bansal and Roth 2000; Lindenberg and Steg 2007; Vanpoucke, Quintens, and Van Engelshoven 2016). These motivations can impact various aspects of supply chain performance, including survival, profit, and environmental performance (Vanpoucke, Quintens, and Van Engelshoven 2016). It is difficult to determine whether companies are pursuing GSCPs solely for their environmental, survival, or competitive performance. Prior research has noted that these motivations may come from a variety of stakeholders in GSCM (Hoejmoose, Brammer, and Millington 2013; Vanpoucke, Quintens, and Van Engelshoven 2016; Walker, Di Sisto, and McBain 2008; Zhu and Sarkis 2006; Zhu, Sarkis, and Lai 2007b), but the specific ways in which these motivations are manifested and contribute to the prioritisation of GSCPs remain unclear.

2.4.1. Legitimisation

Firstly, governments and industry associations seek to legitimise the pursuit of GSCPs through regulations, norms, values, and beliefs. This approach is consistent with the concept of normative motivation, as proposed by Lindenberg and Steg (2007). Legitimisation is not a proactive endeavour, but rather a reaction to external constraints designed to avoid sanctions (Bansal and Roth 2000). However, this motivation can give rise to a variety of specific drivers. Firms may seek to avoid potential urgent consequences that may arise if they do not adhere to the predetermined criteria, including sanctions, fines, penalties, negative publicity, punitive damages, avoiding environmental clean-ups and workforce disconnection. This motivation may impact the priority of GSCPs by compelling businesses to align their supply chain practices, especially with legal standards and ethical norms and pressure (Zhu, Sarkis, and Lai 2007a). This can result in the prioritising of practices that ensure compliance with international labour laws, environmental regulations, and corporate governance standards. For instance, a company may prioritise ethical sourcing and transparency in its supply chain in order to maintain a

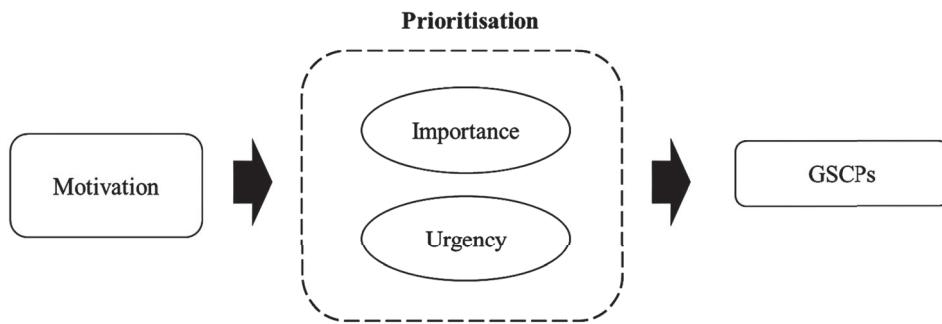


Figure 1. Theoretical framework. The influence of motivation, importance, and urgency on GSC prioritisation based on research.

legitimate status among stakeholders and avoid legal and reputational risks.

2.4.2. Competitiveness

Secondly, the competitive imperative could serve as a significant motivator for companies to implement GSCPs. This motivation is driven by the need and desire to enhance a company's competitive edge (Hart 1995; Walker, Di Sisto, and McBain 2008). A number of motivational factors can result in the prioritisation of GSCPs, including the desire to gain a competitive edge through improved reputation, increased efficiency, or rapid market capture. This phenomenon is referred to as 'gain motivation' (Lindenberg 2008). Consequently, the prioritisation of GSCPs may be influenced by their association with the high demand for competitiveness. The pursuit of competitiveness may influence the prioritisation of GSCPs by prompting companies to concentrate on practices that enhance their market position and operational efficiency. This could result in the prioritisation of investments in technologies that streamline logistics, improve inventory management, or enhance product quality. Furthermore, competitiveness may prompts the prioritisation of practices that facilitate a more expedient response to market shifts or customer demands. Examples of such practices include flexible manufacturing systems and agile supply chain configurations (Rao and Holt 2005).

2.4.3. Eco-response

Thirdly, internal managers may be driven by an aspiration to be environmentally responsible (Frey 1992). For instance, an organisation's awareness is frequently stimulated by a manager's aspiration to be environmentally friendly. This heightened awareness may result in an inclination to peruse GSCPs (Frey 1992; Steg and Vlek 2009). The evidence available suggests that a company's drive towards sustainability may not necessarily result in the implementation of sustainable supply management unless there is significant progress in internal

awareness of environmental and social issues. This is corroborated by research conducted by Carter and Jennings (2004) and Gualandris and Kalchschmidt (2014). The motivation of eco-response may direct the prioritisation towards sustainable and environmentally friendly supply chain practices, either as a result of internal manager awareness or external environmental urgency calls (Murillo-Luna, Garcés-Ayerbe, and Rivera-Torres 2008). This could entail giving precedence to certain GSCPs, such as carbon emissions reduction, wastewater management, or the incorporation of renewable energy sources within the supply chain, due to a manager's orientation towards eco-response or commitment to environmental issues. In the current era, this motivation is becoming increasingly significant in the context of mounting environmental concerns and the drive towards sustainability (Murillo-Luna, Garcés-Ayerbe, and Rivera-Torres 2008).

In conclusion, it can be argued that the prioritisation process, which is initiated by numerous motivations, can be significantly influenced by urgency, not solely by importance (see Figure 1). In order to address the research query, we will evaluate the impact of how motivation theory-based legitimisation, competitiveness and eco-response on the prioritisation of GSCPs.

3. Method

To elucidate the GSCP prioritisation procedures, a multi-case study approach was implemented. This approach allows for both 'why' and 'how' questions to be answered and offers comprehensive analyses of our research inquiries (Eisenhardt 1989). Our selection of an abductive reasoning technique aimed to refine existing theories, identify gaps in current practices, and establish theoretical connections among emerging facts (Ketokivi and Choi 2014), which motivated the prioritisation process. In accordance with Ketokivi and Choi's (2014) research, the general logic of motivation theory is expanded by linking it to contextual idiosyncrasies in prioritisation, thereby establishing an intermediate process that links

motivation with practice. Our qualitative research was carefully crafted using semi-structured interviews, which were augmented by pre-surveys administered to each participating manager. The qualitative data we gathered provides insight into how GSCPs implementations occur, shedding light on the motivating factors involved and bridging the gap between abstract concepts and real-life practices. To ensure comprehensibility, we employed the Eisenhower matrix for confirmation, which allowed us to quantify interview feedback and minimise any potential misunderstandings.

3.1. Data collection

The case selection process was conducted in accordance with the guidelines proposed by Barratt, Choi, and Li (2011), which enabled us to ensure the data's validity (Barratt, Choi, and Li 2011). The methodology employed for selection was guided by criteria: firstly, the cases had to be part of a product supply chain, with the company acting as either a manufacturer (producer) or a logistics partner (e.g. logistics service providers). Companies that provide services unrelated to the physical flow of the product, such as financial institutions or consultancy firms, were considered ineligible. Secondly, the company must demonstrate a clear commitment towards sustainability. We used public information available on the websites of the companies. More specifically, we only selected companies that provided a sustainability statement in their overall operations strategy, as provided on their website and their official documentation. In addition, only cases were selected with more than 25 employees and a geographically target market in Europe. Third, in order to gain a comprehensive understanding of GSCPs, a multi-industry design was utilised which took into account contextual and industry disparities (Zhu and Sarkis 2006). Cases were meticulously categorised to ensure a comprehensive coverage of the broad spectrum GSCPs within different sectors and operational contexts. The representativeness of these cases is grounded in the diversity of green practices, including green design, management, purchasing, production, packaging, logistics, recovery, and investment/resale. The selection of cases from a diverse range of industries (i.e. computer and electronics, food, logistics, Material & equipment) ensured that the research covered all eight categories with 50 GSCPs (Appendix 1). Finally, we also wanted to have variety in our cases in terms of market position. As such, we selected cases from leading companies in their market, but also companies who rather tend to follow the market.

To enhance reliability, we gathered information from various respondents from a specific company using two research methods: structured pre-tested surveys

(Appendix 2) and semi-structured interviews (Appendix 3) (Villena and Gioia 2018). When the participants received the pre-tested survey, they also received a comprehensive overview of all the GSCPs to guarantee their familiarity with the list of practices and related theoretical terms. Afterwards, respondents were invited to the semi-structured interview. These managers were closely involved in sustainable supply chain practices within their company. Following the initial round of interviews with each company, we requested the first interviewee to provide one or two recommendations of colleagues who could provide valuable insights or address our questions for our research. In all instances, at least two managers with topic related positions in the firm, such as supply chain manager, sustainability manager, or other relevant managers recommended by their respective companies, were interviewed separately. We interviewed a total of 19 respondents from eight company cases, as detailed in Table 1. We use the product or core concept of the company as the name of the case. For example, we label the case 'LAPTOP' for the company that produces personal computer.

3.2. Measurement

After identifying essential details such as the company background, sustainability strategy, and market position, we identified three themes in line with our research questions: GSCP, prioritisation and motivations for GSCM.

First, in order to identify and categorise practices in the prioritisation process, we identified 45 articles (GSCP research) published in journals related to operations and supply chain management (for example, the Journal of Operations Management, the International Journal of Production Research, the Journal of Supply Chain Management, and the International Journal of Operations & Production Management) between 2004 and 2019. We have identified a total of 50 practices that are related to GSCM (Appendix 1). Based on Yıldız Çankaya and Sezen's (2019) work, we have categorised the 50 specific practices into eight general GSCPs (G-, green): G-purchasing, G-packaging, G-logistics, G-production, G-design, G-management, G-recovery, and G-investment/resale. As these GSCP measures are developed before the data collection, it provided us the basic GSCPs spectrum for our case selection, as mentioned in the previous section.

Secondly, applying the Eisenhower matrix (Eisenhower, Peters, and Woolley 1954), we outlined how the prioritisation of these eight GSCPs was established based on their perceived importance and urgency (see Figure 2). To measure this prioritisation, we invited managers from each of the cases to rate the significance and urgency

Table 1. Case descriptions.

CASE NAME	INDUSTRY	FIRM SIZE (NUMBER OF EMPLOYEES)	JOB TITLE OF MANAGER (LENGTH IN MIN)	WORK EXPERIENCE IN CURRENT POSITION
LAPTOP	Computer and electronics	30,000	Sustainable strategy and supply chain manager (60)	> 3 years
PRINTER	Computer and electronics	56,000	Sustainable strategy manager (20) Supply chain manager (80)	> 3 years > 3 years
LCD	Computer and electronics	90,000	Sustainable strategy manager (20) Product developer 1 (40) Product developer 2 (20)	> 3 years Between 1 and 3 years Between 1 and 3 years
			Sustainable strategy manager and supply chain manager (60)	> 3 years
WAREHOUSE	Logistics	4,000	Sustainable strategy manager (80) Supply chain manager (20)	> 3 years > 3 years
AIR-CARGO	Logistics	90,000	Contract Manager (20) Supply chain manager (70)	> 3 years > 3 years
			Sustainable strategy manager and supply chain manager (40)	> 3 years
WHITEBOARD	Material & equipment	30	Supply chain manager 1 (40) Supply chain manager 2 (40)	Between 1 and 3 years. Between 1 and 3 years
SAFETY	Material & equipment	120	Supply chain manager 1 (40) Supply chain manager 2 (40)	> 3 years > 3 years
CHOCOLATE	Food	12,500	Sustainable strategy manager 1 (80) Sustainable strategy manager 2 (20)	Between 1 and 3 years > 3 years
			Sustainable strategy manager and Supply chain manager (20)	Between 1 and 3 years

of the GSCPs on a 0–100 point scale. During the interviews, several managers identified significant practices, but not all were deemed equally urgent, despite their high level of importance. To distinguish between levels of time sensitivity when GSCPs are crucial, two quadrants were highlighted from quotations: important non-urgent intention practices (INUI) and important urgent intention practices (IUI) (refer to the right-hand side of the vertical axis in Figure 2). The focus in these two quadrants is exclusively on critical or of great significance GSCPs (Kotter 2008). The distinction of urgency should facilitate the examination of its impact on the execution of these practices. Therefore, we derive IUI from two attributes: (1) high criticality within an overall GSCM implementation process and (2) high time sensitivity. INUI is defined as high criticality within an overall GSCM implementation process and alignment with long-term mission statements but with less time sensitivity.

Thirdly, three types of motivations were examined: (1) legitimisation pressures from monitoring institutions, (2) competitive pressures from markets and customers and (3) eco-response from individuals' green awareness in supply chains (Frey 1992; Vanpoucke, Quintens, and Van Engelshoven 2016; Zhu, Sarkis, and Geng 2005). Legitimisation motivators can be created by governments directly, through regulations, or indirectly by industry peers, through certification. Competitiveness involves pressures such as mitigating scandals and protecting reputation, enhancing brand value, reducing costs to compete with peers, and tailoring orders to meet specific customer demands to retain and attract new clients. Eco-responsiveness is driven by stakeholder awareness

of environmental concerns, which can arise from external environmental warnings, in a reactive way (extrinsic awareness) or internal personal awareness, proactively (intrinsic awareness).

3.3. Coding and data analysis

The data was analysed through an iterative process. Initially, the recorded interviews per case were transcribed and added to a database using ATLAS.ti.8.0. In order to organise all ideas and findings derived from the data, initial observations were recorded in ATLAS.ti notes. Subsequently, two researchers independently coded and analysed interviews for a single case in the database. The coded data was subjected to a comparison process to ensure consistency (Wu and Jia 2018). The process of open coding was employed in order to identify the GSCPs and measurements present within the data. The research team engaged in a discussion regarding the discrepancies in the interpretation of events and transcripts. In order to resolve any discrepancies and technical questions, both the interviewees and the archival data were consulted.

In accordance with the aforementioned methodology, we classified each GSCP into a G-practice and recorded its current implementation status. The qualitative data concerning of the GSCP execution enabled us to classify each one as an 'active' or 'passive' practice (see Table 2). In order to facilitate comprehension of the distinction between active and passive practices, we explicit explanation was included. Passive practices are those that have been delayed, restricted, or unclear. In contracts, active practices are those that have been positively described

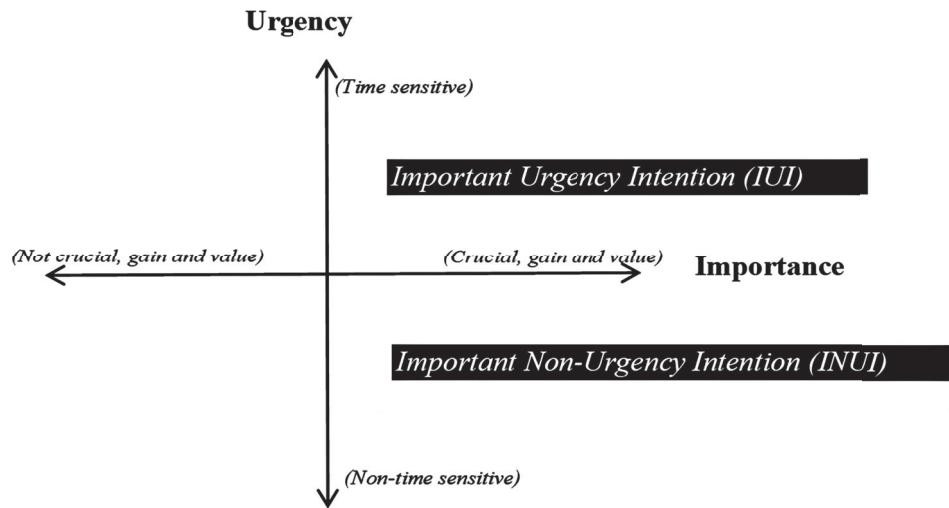


Figure 2. Core concepts and their relationships. The relationship among importance, urgency, and Important Urgency Intention (IUI) and Important Non-Urgency Intention (INUI).

Table 2. Measurement: LAPTOP example of importance-urgency matrix and GSCP implementations^a.

Case	Practice	Importance-urgency matrix			GSCM practice implementation	Explanation of GSCM practice implementation
		Importance	Urgency	Average		
LAPTOP	overall GSCP	76	59	68		
LAPTOP	G-design	90	45		Active	Increase the reuse rate of materials.
LAPTOP	G-purchase	86	39		Active	Help the supplier and upstream factories establish wastewater management system (e.g. waste classification, procedure optimisation).
LAPTOP	G-production	86	54		Active	Improve energy efficiency, water usage and pollution control and chemical waste control. Help the factory reduce the water usage and waste, 90% of the water usage of the supply chain is included in this project.
LAPTOP	G-management	82	47		Active	Have a specific department for sustainable and environment management issues. Responsible business alliance required in the environment management system. Standardised indicators for social responsibility.
LAPTOP	G-packaging	81	61		Passive	
LAPTOP	G-recovery	70	75		Active	Implementing a plan for recycling old products. Recycle an old product if a new product is sold, creating zero landfill waste.
LAPTOP	G-logistics	64	77		Passive	I hope we can raise some of our weak points. So relatively speaking, we will take it as a more urgent thing to do. For example, we now feel urged to work on green logistics and green investments.
LAPTOP	G-investment/resale	50	78		Passive	I hope we can raise some of our weak points. So relatively speaking, we will take it as a more urgent thing to do. For example, we now feel urged to work on green logistics and green investment.

^aNote: For the full appendix, see https://docs.google.com/document/d/1ZE-D5uwfjXDA8nFX_6V2SqpWhIN_ZUK/edit

and implemented. For example, LAPTOP assists suppliers and upstream factories in developing waste management systems, including waste classification, procedure optimisation, and recycling, as opposed to burning or landfilling. This was classified as an active G-purchasing practice. Conversely, the CHOCOLATE case

demonstrates that the G-design practice is passive, as 'no sustainable design is taken into account to define the recipe, as it has limited impact in the end.'

A comprehensive analysis was conducted on the INUI and IUI of each of the eight types of GSCPs for every case. All cases demonstrated the significance of GSCM to their

supply chain management. However, we observed discrepancies in the perceived time-sensitivity of the GSCPs, as not all respondents explicitly mentioned urgency. This led us to categorise intentions as INUI (practices of importance but not urgency) or IUI (practices of both importance and urgency) (see Table 3). For example, statements such as 'I believe that implementing GSCM should be prioritised' (AIR-CARGO) or 'Environmental conservation is necessary at present to benefit everyone' (SAFETY) demonstrate the significance of GSCPs without conveying any sense of urgency or the need for immediate action. These aforementioned sentences were classified as INUI. Quotes were classified as IUI if managers not only emphasised the importance but also addressed the urgency. For example, the Sustainable strategy and supply chain manager of LAPTOP stated that 'The urgency is evaluated from various viewpoints, including social awareness. Strikes and complaints draw public attention to green issues and can create a sense of urgency'. Meanwhile, the representative for PRINTER noted that 'government pressure can also induce a sense of urgency within the company.'

Finally, a recursive, process-driven approach was employed for the purpose of conducting within- and between-case analyses. Inductive quotes were attributed to motivators, and measurements were taken from said motivators. The qualitative data was augmented through the implementation of supplementary quantitative tests, such as paired-sample t-tests. For example, we examined the discrepancy between perceived importance and urgency across all cases and GSCPs. In addition, we conducted an independent t-test to investigate the differences in significance and urgency between the active and passive groups in implementing GSCP.

4. Analysis

The analysis is divided into two sections. The within-case analysis is concerned with the background and sustainable strategies of companies, with examples provided of how a company prioritised GSCPs. In the between-case analysis, the process of prioritisation and motivation is investigated.

4.1. Within-case analysis

This section provides an overview of each case. We illustrate essential information, including the company background and supply chain description and GSCPs, along with their implementations. Furthermore, the report includes the importance and urgency scores of all eight GSCPs for each case (Table 4). For instance, for LAPTOP, G-purchasing (86, 39) illustrates its significance

(86) and immediacy (39). The importance and urgency of the GSCPs in each scenario are depicted in Table 4, in contrast to the average level of importance and urgency of the GSCPs (represented by dotted lines that intersect the x- and y-axes).

LAPTOP

LAPTOP is a personal computer manufacturer that has diversified its business activities to encompass the provision of servers. The original design is the company's core competence. The company has a global supply chain, with 90% of the manufacturing completed within its upstream supply chain. The company has established ten factories worldwide, including locations in North America, Asia and Europe. The company is engaged in outreach to tier two and tier three companies, and some of the raw materials may be traced to tier six suppliers.

In order to ensure compliance with its internal standards of sustainability, LAPTOP requires its suppliers to undergo an RBA (Responsible Business Alliance) audit. In the case of more traditional projects, such as those pertaining to water risk management, the company engages in collaboration with suppliers in G-purchasing (86, 39). With a level of importance above the average and a level of urgency below, this practice encompasses 90% of the water utilisation issues present throughout the entire supply chain. These issues include the identification of potential risks associated with water supply, water saving and water pollution management. The company initiated with the majority of its GSCM projects in 2015, in response to mounting challenges and pressures from social media regarding its supply chains. The company's primary objective is to achieve an average performance in all areas of practice in line with the industry standard. In order to achieve this, the firm is engaged in projects related to G-logistics (64, 77) and G-investment (50, 78). One such project is the start-up of a zero-landfill waste project, which involved more upstream suppliers.

PRINTER

The company's principle business is to offer computers and tailored printer solutions, predominantly distributing its products through wholesalers and retailers who handle approximately 80%–90% of its sales volume. There are few instances of direct transactions with consumers. The majority of its essential suppliers are situated in Asia, thereby ensuring a steady supply chain for its specialised products.

Although the yearly sustainability report addresses the policies of climate change, regulations of Environmental Health, and Safety, PRINTER has no specific environmental or sustainability targets for its supply chain. Some customers, such as government organisations, are seeking more environmentally conscious and sustainable

Table 3. Measurement: examples of motivators for INUI and IUI.

Motivator	Quotations	INUI	IUI
Regulation	'Of course, if the regulations are from the government, we will definitely do, no doubt, because that's the key to implement GSCPs'. (WAREHOUSE)	✓	
Regulation	'The pressure that the government gives will at least provide us with the most urgent action to take within the company. For example, when they (the government) change some regulations on components that we use in our ink'. (PRINTER)		✓
Certification	'You have many certifications to ensure zero risk of deforestation. For example, I want Rainforest Alliance to ensure that biodiversity is preserved in the fields there'. (CHOCOLATE)	✓	
Certification	'I don't see it happening any time soon, unless there are many regulatory steps taken for this certification'. (AIR-CARGO)		✓
Competition	'The year before last year, there was a big deal change about the idea of sustainable development in supply chains. We had a really strong competitor, beating in a project application. price, quality and date as well as market share are similar. However, we finally win in terms of sustainability'. (LAPTOP)	✓	
Competition	'The urgency is considered from a few perspectives. The first is the impact of the whole supply chain of what we are doing. The second is the level of what we are doing in the whole industry'. (LAPTOP)		✓
Reputation	'Well, the concern of the NGO is that it can have really bad publicity for the company, bad or good, but most of the times, depending on the way they mention your name in the documentary or in the news or whatever'. (CHOCOLATE)	✓	
Reputation	'For example, the RCR was taken into critical consideration because of the business scandals in Europe, which happened in supply chains, challenged by our customers. We are required to face these challenges immediately'. (LAPTOP)		✓
Customization	'The urgency is also related to the market conditions. As nobody asked for recycled products, for instance, they will not be developed. Customers are forcing suppliers to change the market'. (WAREHOUSE)	✓	
Customization	'It is the customer's requests that push the company or make our company to feel urged to do this'. (AIR-CARGO)		✓
Extrinsic awareness	'We have a lot of transportations, sometimes by air, by ocean, or by rail. This is how we transport for a couple of years now, with a real price from China. However, we should reduce the number of air flights. That part is also for [the environment's] sake'. (PRINTER)	✓	
Extrinsic awareness	'If for instance we know that we get metal or we get other materials ... really harmful for the environment, this can be a deal breaker for us. Because we have to get an environment friendly product to produce a sustainable product'. (WHITEBOARD)		✓
Intrinsic awareness	'Certainly, a lot of people who work here do as well. And we are starting to change the hearts and minds of the directors. But a lot of it is coming to us because we are now a public company. So, we are now delivering for investors and shareholders. And investors and shareholders want to see these, these green credentials coming along'. (SAFETY)		✓
Intrinsic awareness	'And the importance is how it benefits the three 'P' (People, Profit, Pollution). It has to be something you also have a bit in your DNA. They do it because we tell them what they need to, we convince them that it is good for them. And it is good for them, it is good for the environment, and it is good for every person to do it'. (WAREHOUSE)	✓	

printers. For instance, some customers request a package of services and solutions to re-manufacture old printers into new ones (e.g. by replacing damaged parts and updating software). The reuse of printers is a more environmentally beneficial solution than cost-effective. The results indicate that two GSCPs are of particularly relevance: G-design (90, 63) and G-logistics (66, 86) (See Table 4). Here, customers are offered the option of returning empty toner cartridges free of charge for refilling with ink, thus avoiding the purchase of a new cartridge. Another example is the distribution optimisation of suppliers, which contributes to the reduction of the firm's carbon footprint emissions.

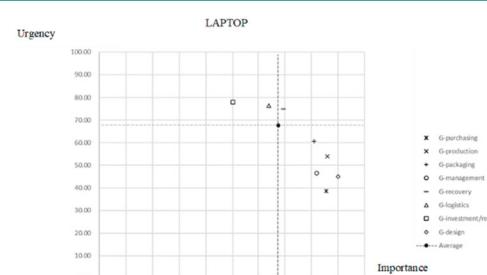
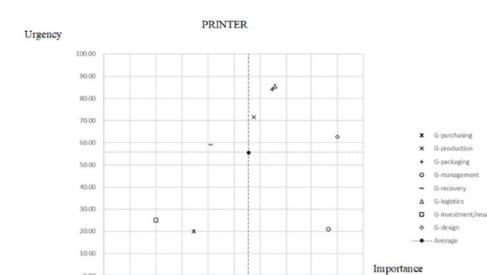
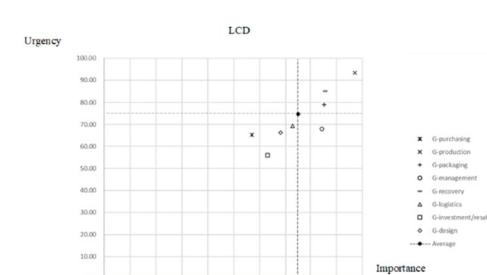
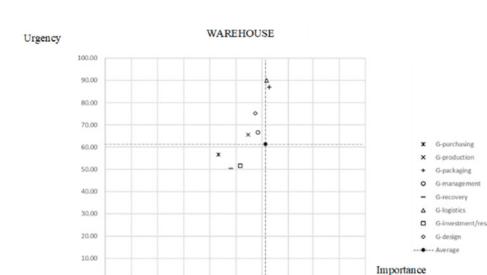
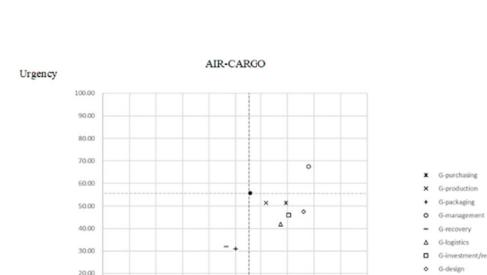
LCD

The company in question is engaged in the business-to-business (B2B) sector, specialising in the production of liquid-crystal displays (LCDs). The company has recently expanded its operations into the Internet of Things

sector. The company maintains approximately 500 suppliers, dispersed across the globe. In order to produce a piece of electric circuitry, they collaborate with electronic chip providers and manufacturers of resistors, capacitors, and inductors from Taiwan, China, and other regions. In terms of the downstream market, the company has fewer than 50 customers.

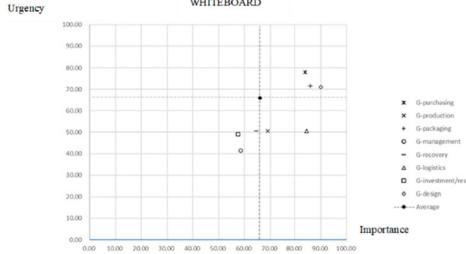
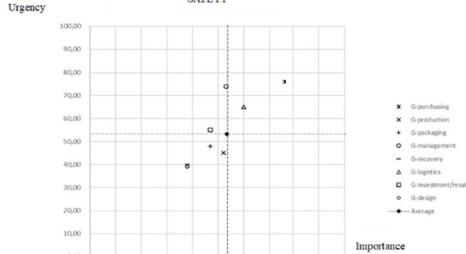
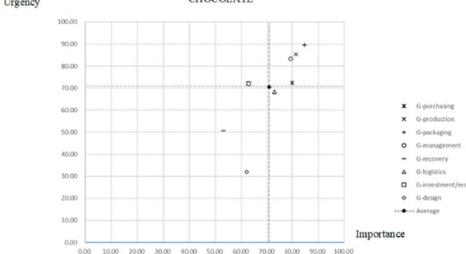
One of the most significant environmental concerns in the manufacturing process is the generation of hazardous waste, including semi-conductor materials and chemical waste. Consequently, the company adheres to rigorous protocols pertaining to the prevention of contamination by medical and toxic materials. During the research and development phase, G-recovery (86, 85) is given particular consideration. As the company lacks clear standards and metrics in the design process, the production of scrap depends heavily on the developer's awareness. Although green partner certification is a contractual obligation for all suppliers, the company could

Table 4. Descriptions of within-case analysis.

Case	Sustainable Strategy	Market Position	Urgency & Importance of GSCPs
LAPTOP	The department responsible for GSCM has grown from 3 to 150 employees since 2015. In 2019, they published a report of their 5- and 10-year-plan, clarifying 40 indicators, including a sustainability index, guiding their GSCM practices.	Strong Companies play a leading role of the market in the industry. 'If it is recognized globally, our market share should now be ranked in top 3'. (Environment strategy and supply chain manager) "Our role in this industry is a leading one". (Sustainable strategy manager)	
PRINTER	In the past few years, the company has been working together with suppliers to simplify supply chain management systems to support its product and order flows with sustainable concerns. The firm's sustainability reports mention addressing efforts on carbon emission, circularity and forest actions for climate change.	Medium Companies do not lead but attempt to lead the market or become top in the future: 'We are aiming to be the biggest printer company in the world' (Supply chain manager) 'We want to be the number one'. (Sustainable strategy manager)	
LCD	The company began posting CSR reports in the last six years. They address environmental management by pursuing green development as one out of their four main pillars.	Medium Companies do not lead but attempt to lead the market or become top in the future: 'So, our company's goal is to become the world's largest panel supplier'. (Product developer 1)	
WAREHOUSE	The company has a department responsible for quality, health and safety, as well as environmental concerns and CSR. The firm's business is organised to meet the requirements of customers from various industry sectors (e.g. automotive, retail, e-commerce, energy, healthcare, industrial). To gain core competitiveness, the firm publishes a clear sustainable strategy, aiming to be a more environmentally friendly partner for their customers.	Medium Companies do not lead but attempt to lead the market or become top in the future: 'We want to be the top of the market. We add more value to our customers'. (Sustainable strategy manager) 'We have processes that are higher than standard processes, in terms of the way we design it and the way we control it'. (Supply chain manager)	
AIR-CARGO	Delivery services can be customised to specific requirements. The firm announced that it is contributing to communities and the environment as part of their CSR.	Weak Companies do not attempt to lead or tend to follow: 'We are not actually pushing our supply chain partners. They can choose activities for us'. (Supply chain manager) 'Our customers are usually further ahead than we are'. (Supply chain manager)	

(continued).

Table 4. Continued.

Case	Sustainable Strategy	Market Position	Urgency & Importance of GSCPs
WHITEBOARD	The firm has two main environmental burdens in its supply chains. On the one hand, its upstream supply chain includes high environmental impact practices (i.e. by producing the metal it needs), which requires great amounts of energy consumption. On the other hand, transportation for long distance shipment contributes to large carbon emissions. However, the firm has no clear sustainable strategy or goal. As such, GSCM practices are more like autonomous implementations than a systematic plan.	Weak Companies do not attempt to lead or tend to follow: 'We just implement, it was posted to us. You have to say OK'. (Supply chain manager1) 'We are following the standard instead of setting the standard'. (Supply chain manager 2)	 <p>Legend: G-purchasing (x), G-production (+), G-packaging (●), G-management (○), G-recovery (▲), G-logistics (□), G-investment/resale (◊), G-design (◊), Average (—●—)</p>
SAFETY	According to the customer requirements, environmental impact is controlled and sustainable responsibility is addressed in the industry.	Weak Companies do not attempt to lead or tend to follow: 'I think for the moment we are certainly not leading. We can change that, but we are currently not at the right moment'. (Supply chain manager 1) 'We just have to wait and see where we go to. The information, and the gathering of knowledge, will help us to prioritize what we need to look at next'. (Supply chain manager 2)	 <p>Legend: G-purchasing (x), G-production (+), G-packaging (●), G-management (○), G-recovery (▲), G-logistics (□), G-investment/resale (◊), G-design (◊), Average (—●—)</p>
CHOCOLATE	The company has an ambitious strategy with four pillars of sustainability. The strategy is consistent among the business units, no matter the size or the location of the business unit. Its sustainable strategy includes aspects of avoiding child labour, reducing carbon footprint, sustainable chocolate, and so on. The company established expertise teams for sustainable development in their supply chains.	Strong Companies play a leading market role in the industry: 'We produce 25% of the coco in the world. Very big player in this market. And I think we are quite advanced in the industry'. (Sustainable strategy manager 1) 'It is a company which is ranking the efforts in terms of sustainability of various companies, I think it's only [one] in the food industry, where we've been ranked number one last year and number two this year'. (Sustainable strategy manager 2)	 <p>Legend: G-purchasing (x), G-production (+), G-packaging (●), G-management (○), G-recovery (▲), G-logistics (□), G-investment/resale (◊), G-design (◊), Average (—●—)</p>

still benefit from reducing the rate of material usage and implementing clearer technical standards.

WAREHOUSE

WAREHOUSE is a logistics company that provides warehouse and transportation services. The company's 25 logistics sites are primarily situated in the Benelux region. The company offers a comprehensive range of services, encompassing both dedicated and multi-user facilities, across a diverse array of industries, including fashion and medical products.

WAREHOUSE is ISO 14001 certified and has developed GSCM as a core competitive advantage (G-management, 58, 67). The company's electricity-neutral plan represents a significant symbolic project within its broader green operations management strategy. The company has warehouses equipped with solar panels and a warehouse with wind turbines (G-production, 55, 66).

The company provides customers with reports on the number of CO₂ emissions. It is possible that some of these GSCPs could result in a reduction in costs, for instance by reducing CO₂ emissions from fuel usage. Consequently, this could result in financial benefits for customers. The company's focus on green practices has attracted customers who are seeking sustainability, as well as employees who are similarly concerned about sustainability.

AIR-CARGO

AIR-CARGO is a business unit of an airline cargo delivery company with a local presence and a global outlook. The airline facilitates the global movement of goods and materials across 80 countries on six continents, with a particular focus on long-haul routes. In addition, their road feeder service solutions extend to direct-warehouse and ex-factory pickups.

Approximately 80% of all environmental practices that AIR CARGO adopts are related to costs. This includes reducing the energy consumption in the firm's buildings (G-management, 78, 68). The reduction of fuel waste and usage is a fundamental and ongoing process that directly affects costs. Consequently, those responsible for decision-making perceive a sense of urgency, as they are implementing numerous initiatives with the objective of 'greening' the supply chain. With regard to other GSCPs, customers are typically more advanced, requesting further information on the environmental impact. In many cases, the company lacks the requisite data. However, recent regulatory requirements for the reporting of emissions in the airline industry are compelling the company to collect and analyse more information.

WHITEBOARD

The company provides interactive whiteboard systems for touchscreen display providers. The company offers solutions for the vertical adjustment of screens for educational, professional audio-visual and industrial (B2B) applications. The company is attempting to integrate supply chain management into its core business operations, rather than relying on external outsourcing.

The company categorises its suppliers into two distinct groups: key suppliers (five to ten) and non-key suppliers (forty to fifty). This classification is based on the number of alternative suppliers. It should be noted that non-key suppliers are not always small companies. The company's primary contribution to G-design (90, 71) is the prolongation of the product's life cycle. The product typically has a lifespan of 10 years, which is longer than the average of 5–8 years observed in competitors. Furthermore, the company designs metal systems with reduced weight and materials to reduce costs. G-packaging (86, 72) is more flexible than is required by the regulations, as the firm reuses boxes from its suppliers as packaging material for its customers.

SAFETY

SAFETY provides subsea protection systems with a range of complementary products and services. In order to become the global partner of choice for subsea protection systems in the offshore energy industry, the company is pursuing a strategy of growth through the enhancement of its core competencies in the areas of design, engineering, and manufacturing.

At present, SAFETY lacks a clearly defined strategy for GSCM. However, senior management has articulated a clear vision that GSCM should contribute to the company's CSR. A top-down implementation plan for GSCPs is proposed, but not yet implemented. Moreover, customers have been requesting increased levels of quality inspection, with over 10% of these requests pertaining

to environmental issues. To reduce transportation and improve G-logistics (60, 65) and G-management (53, 74), SAFETY developed an online test. Potential customers are not required to visit the premises in person, as the company has established an online system through which customers can observe the manner in which SAFETY conducts the inspections and tests.

CHOCOLATE

A food manufacturer specialising in the production of nuts and semi-chocolate products for the business-to-business (B2B) sector. The company has a global manufacturing footprint, with facilities in various countries. The company's specialised factories are responsible for the production of nuts and pistachios. The upstream companies are suppliers of raw materials, which are typically small cooperatives as well as large companies. The majority of the company's footprint is attributable to the sourcing of raw materials, representing in excess of 80% of the total.

The company has two chocolate factories in Spain. Only one of the two factories has obtained ISO 14,000 certification due to a customer requirement. The company attracts significant attention on GSCPs related to the purchasing of specific ingredients, such as sugar (G-purchasing, 80, 72), due to the fact that customers expect more changes based on common bad news and scandals. As a B2B company, the sustainability of the packaging materials is not readily apparent. The majority of packages are composed of multiple materials, rendering them non-recyclable. A significant technical challenge is the lack of a clear code for recycling plastic components of packaging. Since 2016, the company has been engaged in a commitment to achieve carbon neutrality by 2025. Nevertheless, over 80% of the company's carbon footprint is attributable to the use of raw materials and packaging, which is less apparent to customers. For instance, consumers tend to be less aware of the carbon dioxide emissions generated by cows, yet these emissions are considerable during the production process, particularly in the case of milk. Consequently, it would be more beneficial to focus on improving renewable electricity or carbon emission trading than on improving the suppliers of raw materials.

4.2. Cross-case analysis

In conducting the cross-case analysis, we focused on identifying similarities and differences between the cases (Eisenhardt 1989). Our investigation specifically centred on the role of priority in implementing GSCPs and the identification of motivators through the lens of urgency, differentiating between INUI and IUI groups.

Table 5. GSCP implementations of importance and urgency.

Antecedent	GSCP Implementations		$F = 0.041$
	Active Practices N = 31	Passive Practices N = 33	
Importance			
M	72.87	59.64	$T = 3.480$
Standard error M	2.567	2.788	$p < 0.001$
Urgency			
M	69.71	51.55	$F = 0.240$
Standard error M	2.591	2.934	$T = 4.618$
			$p < 0.001$

4.2.1. Importance and urgency: antecedents of GSCP implementation

To investigate why some businesses fail to implement their GSCM strategy as planned, we examined the connection between priority and implementation. We conducted an independent t-test to compare the importance of GSCPs between active and passive groups (see Table 5). The findings indicate that urgency is significantly greater in the active group ($M = 69.71$) than in the passive group ($M = 51.55$, $t = 4.618$, $p < 0.001$). Similarly, the findings demonstrate a significant difference in importance between the active group ($M = 72.87$) and passive group ($M = 59.64$, $t = 3.480$, $p < 0.001$). This result supports our qualitative evidence that GSCPs are more successful in achieving higher levels of implementation when ranked higher on both urgency and importance. For instance, in the case of WAREHOUSE, GSCPs that scored high on both importance and urgency were implemented more frequently. The company introduced sustainable elements to its services by employing environmentally conscious packaging materials (G-packaging, 63, 87) and offering alternative transport options to minimise carbon emissions (G-logistic, 62, 90). LCD, WHITEBOARD and AIR-CARGO exhibited comparable implementation tactics.

However, not all important and urgent practices are effectively implemented and classified as actively performing. The firm's capability limits the implementation of a GSCP in certain cases. An example is CHOCOLATE: while G-packaging had high priority (85, 90), the firm had not yet found a better solution for its performance. This is because chocolate and nuts require packaging with complex layers of different materials to maintain the optimal temperature and humidity to preserve their taste.

The results demonstrate that in numerous cases, importance and urgency are not equally perceived. A paired-samples t-test ($t = 2.416$, $p < 0.019$) confirmed the difference between importance and urgency among all GSCPs (refer to Table 6). This outcome corresponds to the data pattern presented in Table 2, suggesting

Table 6. Disparities between importance and urgency.

Paired	GSCP Implementations	
	Importance N = 64	Urgency N = 64
M	66.05	60.34
Standard error M	2.062	2.261

$T = 2.416$
 $p < 0.019$

that importance does not always coincide with urgency. For instance, in the LAPTOP case, certain practices deemed of high importance were found to have low urgency, including G-design (90, 45), G-purchasing (86, 39) and G-production (86, 54), whilst some low-importance practices were marked as high-urgency practices, such as G-logistics (64, 77) and G-investment/resale (50, 78).

Our analysis demonstrates that, in addition to importance, urgency is a vital antecedent that must be considered when comprehending GSCP implementations. Certain cases indicate that the implementation of GSCPs was affected by high urgency, despite the importance being comparatively low (refer to Table 7). For instance, PRINTER's G-recovery initiative, where the company urges customers to return empty toner cartridges for free. Customers are provided with clear instructions on proper toner cartridge disposal, including collection, recycling, and cleaning, to reduce their environmental impact. G-recovery displays a relatively high urgency but low importance compared to the average, while WAREHOUSE exhibits a similar pattern, but with higher urgency in GSCP implementations. As a logistics service provider, the company's primary focus is not production, resulting in a relatively lower importance of G-production. However, it has been observed that there is a high level of urgency in G-production, which has resulted in active performance in G-production. For example, the company has installed solar panels on its warehouses to achieve electricity neutrality.

On the other hand, it has been noted that when there is a lack of urgency, it can result in passive performance. For instance, PRINTER has acknowledged G-management as having higher importance but lower urgency, which is reflected in the firm's passive performance in G-management. The supply chain manager of PRINTER stated that although they produce a sustainable and environmental report annually, they do not consistently implement these practices within their daily supply chain operations. Table 7 illustrates that similar patterns are present for the practices of G-design in AIR-CARGO, G-logistics in WHITEBOARD, and G-logistics in CHOCOLATE.

Table 7. Example quotes of urgency interventions.

Intervention types	(Importance, Urgency)	Active (A) /Passive (P)	GSCP Description	Case
High urgency intervention	G-recovery (41, 59) (−, +)	A	'Most of our printers are currently being constructed with a resource recycled old products'.	PRINTER
	G-design (57, 75) (−, +)	A	'We have a certain framework forcing design processes, and environmental issues are always included'.	WAREHOUSE
	G-production (55, 66) (−, +)	A	'We established solar panels on the top of our warehouse to reach the goal of net zero electricity. All the energy is supplied to our own warehouse'.	WAREHOUSE
Low urgency intervention	G-management (58, 67) (−, +)	A	'Management system, principles and ISO14000 and other standards'.	WAREHOUSE
	G-management (87, 21) (+, −)	P	'We have a sustainable and environmental report each year, but I don't see it in the daily supply chain'.	PRINTER
	G-design (76, 48) (+, −)	P	'The third-party organization has a program and mandatory program for all airlines, but no sustainable design by their own'.	AIR-CARGO
G-logistics (85, 51) (+, −)	G-logistics (73, 68) (+, −)	P	'CO ₂ emissions mainly focused on transportation. But we are not too good at optimizing the containers, which is also influencing environmental performance'.	WHITEBOARD
	G-logistics (73, 68) (+, −)	P	'That is in line with the emissions, not so much (GSCP) is done on transportation or packaging'.	CHOCOLATE

Notes: + = The importance /urgency of this GSCP is higher than the average of importance and urgency in the case. − = The importance /urgency of this GSCP is lower than the average of importance and urgency in the case.

4.2.2. Motivators for urgency

Following a contingency perspective, we then investigated the motivation mechanisms that underlie GSCPs, with emphasis on the critical role of urgency. Our qualitative analysis identified motivators driving urgency by comparing IUI and INUI groups. For examples and quotes illustrating each motivator's role in facilitating INUI and IUI, we refer to section 3.1 in the paper. We present an overview of three key types of motivations, which we have identified based on our literature review, along with subtypes of motivators (for details see Table 8): legitimisation (i.e. regulation and certification), competitiveness (i.e. reputation, competition and customisation), and eco-response (i.e. intrinsic and extrinsic awareness).

Our analysis demonstrates that regulations and certifications can guide prioritisation. Whilst governments establish environmental policies, companies feel more pressure from government regulations or certifications, which necessitates action. We observe this pressure as high urgency in the PRINTER, LCD, WAREHOUSE, AIR-CARGO, and WHITEBOARD. As stated by supply chain manager 2 at WHITEBOARD, 'Government regulation determines what you have to do first' from a short-term perspective. In most cases, the urgency appears to be driven by regulations. However, AIR-CARGO's urgency in their practices was driven by both regulation and certification. The study reveals that regulation or certification may not always generate a sense of urgency (as observed in the cases of LAPTOP and CHOCOLATE).

Secondly, the findings indicate that different motivators influence a company's prioritisation from a market and customer perspective. Although all cases cited customer motivation, the firms reported being driven by distinct reasons such as reputation, competition, or customisation. The reputation of LAPTOP and CHOCOLATE has motivated a sense of urgency, as these brands receive greater attention from society and customers through word of mouth. Respondents from these companies specifically noted that they are strongly influenced by long-term benefits because of their potential impact on market share in the future. 'Urgency is considered from a few perspectives. One of these is social attention' (LAPTOP). 'The priority is reputational risk. I believe it poses the greatest risk'. The CHOCOLATE case has gained wider media coverage, particularly in newspapers and on the internet, increasing consumer awareness. This raises concerns about the potential for damage to the company's reputation, given the high visibility of such issues. Therefore, urgency increases.

In some instances, customers felt a sense of urgency due to both reputational concerns and competition/customisation factors. Some companies, such as AIR-CARGO, WHITEBOARD, and SAFETY, approach competitive advantage in terms of benefits. For instance, they aim to gain a certain order when GSCPs are requested (customisation) or to outcompete their peers (competition) to prevent future business loss (e.g. PRINTER, WAREHOUSE).

Table 8. Motivators of INUI and IUI.

Concepts	LAPTOP	CHOCOLATE	PRINTER	LCD	WAREHOUSE	AIR-CARGO	WHITEBOARD	SAFETY
Motivators of INUI	(L) Certification (C) Competition Reputation	(L) Certification (C) Reputation	(L) Regulation (C) Competition	(L) Regulation	(L) Certification (C) Competition	(L) Regulation (C) Competition	(L) Regulation	(L) Regulation
Motivators of IUI	(C) Reputation Competition	(E) Extrinsic awareness	(E) Extrinsic awareness	(E) Extrinsic awareness	(E) Extrinsic awareness Intrinsic awareness	(L) Regulation (C) Competition Customization	(E) Extrinsic awareness (L) Regulation (C) Customization	(E) Extrinsic awareness (C) Customization
Market position ^a	Strong	Strong	Medium	Medium	Medium	Medium	Weak	Weak

Note: L = legitimization; C = competitiveness; E = eco-response.

^a Descriptions of 'market position' for each case see Table 4.

Additionally, managers' personal awareness can also motivate companies to implement GSCPs. Extrinsic awareness encompasses knowledge of climate change, forest degradation, and biodiversity loss, and the belief that environmental pollution contributes to a decline in quality of life. The sustainable operations strategy manager at WAREHOUSE illustrated this point, stating that 'climate change is increasingly apparent, particularly evident in the high temperatures experienced during summertime'. Nonetheless, our findings demonstrate that extrinsic awareness generates significance, but fails to induce a sense of urgency. Individuals increase their awareness when they share concerns about environmental consequences. Therefore, intrinsic awareness, particularly that which arises from a manager's personal eco-friendly attitude, plays a significant role in certain companies' prioritisation of urgent matters. This type of insight is not necessarily caused by environmental problems in the supply chain. Both air-cargo and safety managers observed that employees within their organisations were the driving force behind prompt environmental action responses. Due to the absence of a formal sustainability management system, the implementation of GSCPs relied heavily on individual actions rather than systematic decision-making. In such instances, innate awareness proved to be a crucial motivator for urgency, greatly affecting GSCP prioritisation.

5. Discussion

5.1. Theoretical insights

In this section we will discuss the two research questions, i.e. how do firms prioritise Green Supply Chain Practices (GSCPs) and how does motivation influence the GSCP prioritisation process. These two steps are represented in our decision-making process model in Figure 3. The results indicate that motivators influencing the urgency and prioritisation of Green Supply Chain Practices (GSCPs) vary among market positions. Companies with strong market positions are primarily driven by competitiveness, which triggers urgency for GSCP implementation in operations management. Those in medium market positions balance competitiveness and legitimisation as key motivators for prioritisation, while firms with weak market positions experience diverse drivers, with multiple motivators collectively contributing to the urgency of adopting GSCPs in operations management.

5.1.1. Prioritisation in triggering GSCP implementations

Our data indicates that urgency plays a crucial role in prioritisation, which influences the implementation of

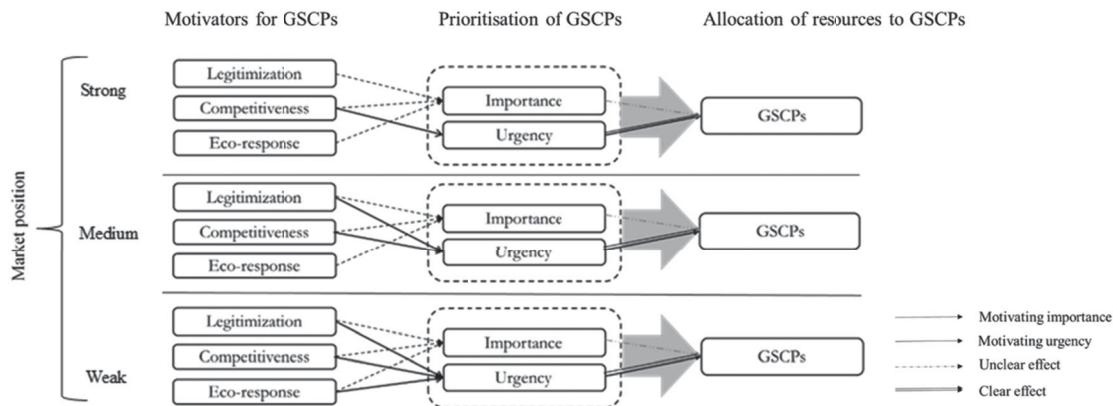


Figure 3. Model of Motivating Prioritisation GSCP implementations. The effect of urgency, importance and different motivators on GSCP decision-making.

GSCPs in operations. This observation aligns with the findings of Zhu, Sarkis, and Lai (2019), who argue that different priorities drive the adoption of GSCM practices in operations management. It is not unexpected that urgent tasks are typically given priority over others, as they are often associated with significant outcomes and shorter completion windows (Zhu, Yang, and Hsee 2018). Previous research emphasises that firms should prioritise initiatives that leverage their valuable, rare, inimitable, structural and infrastructural resources to maximise competitive advantage (Narasimhan and Schoenherr 2012). As green implementations are limited by resources, importance may not always be prioritised in decision-making, particularly in urgent situations. However, from a supply chain perspective, urgency is more complex due to the involvement of multiple tiers and differing stakeholder attitudes. These urgency claims could impact risk management strategies and the ability to compete with peers (Hajmohammad and Vachon 2016; Villena and Gioia 2018). Firms may also need to balance the timing and profitability of tasks, as operations managers commonly choose to carry out tasks with short completion windows rather than those with longer completion times but greater significance (Zhu, Yang, and Hsee 2018). As a result, companies often prioritise well-planned strategies of GSCPs that are urgent rather than important. In summary, we could state that without urgency, only importance is unlikely to prompt the implementation of GSCPs in operations management.

Urgency is not a static condition; instead, it relies on the particular execution of a practice and the level of performance within the industry. Time and change are interconnected concepts in discussions about the urgency and magnitude of required change (Meehan and Pinnington 2021). Firms assess the degree of urgency by evaluating their ability to implement a specific GSCP in comparison

to alternative methods and other industry players. The prioritisation of a GSCP changes dynamically, in comparison to other GSCP implementations within a company, over time as the industry develops. This phenomenon also clarifies why a firm with a dominant market position in the industry may not recognise the need for urgency: a sense of urgency in decision-making is only fostered when firms perceive themselves to be lagging behind their peers in a specific GSCP and implementing it could enhance their market standing (Isaksson 2019; Kotter 2008). Furthermore, our study extends earlier research which suggests that urgency is not a stable attribute, but may differ between stakeholder-manager relationships or even within a singular relationship over time (Mitchell, Agle, and Wood 1997). To accurately measure urgency, a dynamic evaluation is imperative, dependent on the evolving situations and GSCP advancement. Moreover, urgency seems to be dynamically related to the changes of GSCP implementations within a company as well as an industry.

5.1.2. Motivating urgency for GSCPs

Our research indicates that prioritising GSCPs in organisations is a complex process. It involves considering not only the importance of GSCPs, but also a sense of urgency that is often driven by multiple motivators. When considering different sectors, the computer and electronics sectors (LAPTOP, PRINTER and LCD) demonstrated both motivations from legitimisation and competitiveness, yet no eco-response. Certification is common and well developed in these sectors. While regulation is a significant factor in triggering urgency, it is likely that the dynamic changes will occur in the industry in the near future. All types of motivations are evident in triggering logistics and material and equipment. In addition to regulation and certification, customisation plays an important role in triggering urgency in logistics and material and

equipment, indicating that these sectors are closely collaborating with their customers in response to market requirements, despite not being B2C businesses. During the analysis, we present a summary of the motivators derived from different motivations. It should be noted that these motivators are not always similar in all cases, even within the same sector. However, we have observed an emerging pattern that transcends sectors. This pattern can be seen in the grouping and explanation of the motivators, specifically in the grouping of cases according to their market position (see the insights of market position for each case in section 4.1 and Table 4). If cases are classified as having a strong market position (Table 4), it can be observed that only competitiveness motivators are effective for urgency. However, a broader range of motivators can be found in the other two groups, namely medium and weak market positions (see Figure 3, Croom et al. 2018). Companies driven by reputation or competition, and those that monitor standards, contribute little to their urgency, especially in strong market positions. This is because these companies are already much more advanced in GSCPs and therefore do not feel pressure to survive or comply with existing requirements. To further enrich the understanding of why urgency is motivated by different sets of factors, further discussion is required.

5.1.2.1. Competitiveness motivates urgency in prioritisation especially for stronger market positions. Firms recognise that GSCPs are critical to gaining a competitive advantage (Rao and Holt 2005; Walker, Di Sisto, and McBain 2008). Our findings suggest that the reasons for this competitiveness motivation can be diverse, ranging from avoiding scandals and reputational damage, to reducing costs, adding brand value when competing with rivals, and tailoring orders to specific customer requirements in order to retain and attract new customers. However, in line with 'gain motivation' (Rao and Holt 2005), companies show differences in the urgency of creating competitiveness; in particular, those with stronger market positions often feel urged by reputational threats or fear of losing business, as these factors can affect their long-term profit potential (Hart 1995). In contrast, firms with weaker market positions see additional sales through differentiation opportunities (Bansal and Roth 2000) or specific order requests as urgency drivers for implementing green practices (Lindenberg and Steg 2007).

5.1.2.2. Legitimisation motivates urgency in prioritisation in weaker market positions. Legitimisation motivators showed an impressive role in motivating urgency for companies, especially those lagging in GSCM. Companies are motivated to improve their environmental image

by established regulations, norms, values and beliefs. Regulations and certifications reflect a normative motivation (Lindenberg and Steg 2007). These governmental and institutional compliance requirements, as well as pressure from external institutions, create a minimum threshold. Failure to meet these minimum thresholds can therefore lead to business failure or damage to credibility. Priority is often driven by survival motives. For example, companies may need a licence to continue doing business, to avoid fines, or to reduce the risk of penalties (Zhu, Sarkis, and Lai 2007a). Alternatively, as Bansal and Roth (2000) explain, firms motivated by legitimacy may aim to meet rather than exceed established standards. Companies with weaker market positions are primarily concerned with what would happen if they fail to meet established conditions (e.g. sanctions, fines, penalties) (Vanpoucke, Quintens, and Van Engelshoven 2016). Therefore, these companies adopt a more reactive behaviour by imitating successful leaders and adopting a risk-minimising approach (Zhu and Sarkis 2007). Thus, priority, especially urgency for companies with weaker market positions, could be motivated by avoiding the risks of non-compliance (Hoejmose, Brammer, and Millington 2012).

5.1.2.3. Eco-responsiveness motivates urgency in prioritisation in weaker market positions. In line with hedonic behaviours (Lindenberg and Steg 2007), eco-responses play a crucial role, especially with weaker market positions, in respond to GSCP implementations. Both reactive and proactive awareness motivate priority that are based on company values rather than rules (Bansal and Roth 2000). Eco-responses, especially those driven by intrinsic awareness of climate change, forest degradation and biodiversity loss, can trigger importance. However, weakest market position companies find it difficult to scale this awareness, as they lack systematic and robust decision-making tools for GSCM. GSCPs aim to reduce waste for economic rather than environmental reasons, and GSCM could be recognised as an environmental wake-up call (Govindan et al. 2014). This wake-up call for companies with weaker market positions may depend more on the awareness of managers at the individual level. Without a clear internal sustainability management procedure, some firms only pursue GSCP if their decision makers have an innate concern for the environment (Graves, Sarkis, and Gold 2019) and want to take action. Overall, in these companies, top managers are specifically responsible for environmental management leadership, and they idealise rather than rationalise urgency of action (Hoejmose, Brammer, and Millington 2012).



5.2. Managerial implications

This study has four practical implications. First, the notion of priority provides operations managers a template to examine their GSCM implementation and create sustainable business models that include urgency in operations management. As the risks of sustainability management must be addressed in supply chains, Villena and Gioia (2018) suggest that companies should share resources to manage sustainability with these suppliers for risk-control purposes. We further suggest that risk management for sustainability purposes can be assessed using urgency and importance of GSCPs. A dynamic assessment of urgency and importance in GSCP implementation could be an efficient approach to prioritise limited resources. Effective operations management requires recognising that urgency is a dynamic factor, evolving with internal execution capabilities and external industry changes. Managers must ensure that resource allocation in operations remain flexible, allowing for adjustments as new urgent demands from different motivators, such as regulatory changes or competitor actions, emerge. Additionally, the prioritisation of Green Supply Chain Practices (GSCPs) often shifts over time or across different implementations within a company. To address this, managers should design adaptive capacities of reallocating resources dynamically to higher-priority or more urgent sustainability practices as conditions evolve. This proactive approach ensures operational efficiency and responsiveness in a rapidly changing environment.

Second, the idea of urgency can be further developed into the materiality matrix analysis for operations managers. Major companies (e.g. Unilever, Nestlé, EY) are increasingly integrating the materiality matrix as a methodology to identify the potential positive or negative impact of organisational growth, cost or trust on each project and the importance of each of these to stakeholders (Nestlé 2022; Unilever 2020). These companies map material prioritisation issues against environmental, social and governance risks according to the importance of various stakeholders (Buyssse and Verbeke 2003). In alignment with this trend, our findings emphasise including urgency into the materiality matrix rather than solely focusing on importance, addressing how resources can be allocated to meet the time-sensitive sustainable challenges. Moreover, diversifying the set of stakeholders according to how companies position themselves in the market can lead to a clear GSCM strategy and promote the allocation of resources toward areas that enhance sustainability, prioritising those requiring green advancements. Based on the findings of this study, we suggest that operations managers diversify their

operations management strategy in prioritising investments in structural and infrastructural investments to enhance the sustainable effectiveness of their overall operations strategy, given resource limitations and time sensitive concerns.

Third, our finding that strategies differ between firms with different market positions provides policy makers with a unique insight into how to motivate green supply chain performance. Helping firms to implement GSCPs requires a specific and diverse set of motivators in policy design. For example, for firms with strong market positions, motivators of competitiveness, which strongly relate to their reputation and competitiveness in the market, can trigger more urgency, and in turn faster GSCP implementations. Therefore, a series of incentive policies could be better designed for companies with stronger market positions. In addition, we also recommend that policies for oligopolistic and monopolistic companies focus on strengthening supply chain control through a holistic view of the supply chain and increasing the responsibility of focal companies by making public inspection and social monitoring visible. On the contrary, for upstream small and medium-sized enterprises with weaker market positions among upstream small and medium-sized enterprises, operating principles and technical standards are more effective in motivating these companies to implement GSCPs. To shape the boundaries and the bottom line for companies lagging behind, governments should involve NGOs in disseminating information and clarifying boundaries and environmental thresholds (Wu and Pagell 2011).

Fourth, more attention needs to be paid to sustainability awareness in supplier selection and recruitment for procurement managers. As intrinsic awareness of sustainability contributes to urgency differently between stronger and weaker market position. Recruiting employees with individual environmental responsiveness is less crucial for leading companies, as their employees have to follow the green instructions of institutional regulations. On the other hand, for companies with a weaker market position, we recommend paying attention to individual sustainability values when recruiting managers. For these companies, the manager's environmental and sustainability awareness is undoubtedly crucial when selecting supply chain partners, especially to avoid environmental risks and potential supply risks in small and medium-sized enterprises. Not all suppliers have the means to establish GSCM functions and departments; therefore, managers with sustainable awareness could more effectively evaluate suppliers and business partners in terms of GSCPs (Vanpoucke, Quintens, and Van Engelshoven 2016).

6. Limitations and future research

The research sheds light on why companies delay their GSCP implementations. By taking a process-oriented view to provide insights into how GSCPs are prioritised and implemented, the findings provide a better understanding of the role of urgency in prioritisation. In addition, this research shows how motivations contribute to prioritisation with different motivators, discussing strategies in relation to a company's market position. The results show that urgency is not always aligned with importance, while it plays a crucial role in prioritisation. In addition to importance, urgency is a key antecedent for GSCP implementation. Seven specific motivators are identified in this research, under legitimacy, competitiveness and eco-response, which provide details of how importance and urgency are motivated. However, importance and urgency are driven by different motivations. Urgency may arise from the need for companies with a strong market position to remain competitive, while companies with a weaker market position have a more diverse set of GSCM urgency motivators. As such, such differences in motivator sets should be taken into account in policy making to better motivate the prioritisation of GSCP implementation. In order to overcome the postponement of GSCPs, we strongly suggest managers to dynamically map their prioritisation strategy both in terms of urgency and importance, to avoid discrepancies between green operations management strategy and implementation.

This study also identifies areas for future research. First, the urgency of GSCPs may differ depending on a firm's role and position in the supply chain (e.g. upstream, downstream); therefore, future research could examine this role and position as additional factors that may influence GSCPs in multi-tier supply chains (Villena and Gioia 2018). Second, although this research identified eight types of GSCPs by stakeholders from all tiers of the supply chain, it could not address the initial differences in priorities of practices between upstream and downstream members. Future research should deepen the specific circumstances of GSCP priorities and motivations for GSCPs in multi-tier supply chains to provide insights into how to build a successful collaborative relationship in sustainability development (Moshtari and Vanpoucke 2020). This could complement the prioritisation of GSCPs in the extended supply chain. Third, another worthwhile direction for future research is to bridge the gap between non-urgent and urgent green practices. This research illustrates the phenomenon that different levels of importance and urgency can influence the implementation of GSCPs; however, the context and extent of the differences are still worthy of further

investigation. Fourth, we acknowledge the limitation of the small sample size, which constrains the generalizability of our findings. Our research objective was to explore initial insights into the importance and urgency of GS CPs, providing valuable insights in resource allocation for operations management. It shows how resources are allocated by prioritising implementations among GS CPs. Future studies are encouraged to validate and expand upon these results using larger and more diverse datasets, which could provide a more robust understanding of the patterns and dynamics for the implementation of sustainable production practices. Fifth, our study was designed with the intent to explore a broad array of contexts across different sectors to identify diverse environmental practices and motivations of the prioritisation. This approach was chosen to ensure that our findings could be generalised across a wider spectrum of the business environment, providing a foundational understanding upon which more targeted, sector-specific studies could be built. Future studies could benefit from employing more homogeneous samples in quantitative analyses in specific sector or conducting more detailed investigations through single case studies, thereby enhancing the robustness and applicability of our findings.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

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