

Louvain School of Management

Evaluating HoReCa Establishments' Commitment to Green Purchasing in Brussels and Wallonia and Their Perceived Impact on Performance

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1 Introduction

1.1 Motivations

For several years now, environmental issues have been attracting growing interest. Problems such as the depletion of raw material resources, overflowing waste sites, rising pollution levels, and food waste can no longer be ignored. Faced with these challenges, businesses play a crucial role. Organizations must therefore reorient their strategies to address this environmental urgency. While the manufacturing sector is often highlighted in this context, other sectors, such as HoReCa (Hotels, Restaurants, Cafés), also significantly contribute to environmental degradation (Kusa et al., 2023). Establishments in this sector excessively use resources such as water, electricity, gas, and chemicals (Abbas and Hussien, 2021). For example, Perramon et al. (2014) points out that restaurants rank second in the tourism industry in terms of resource consumption and waste production. Given the numerous negative environmental impacts caused by the sector, adopting ecological practices has become essential.

It is in this context of ecological concern and the need to redirect strategies that the concept of Green Supply Chain Management (GSCM) has emerged. This concept aims to integrate environmental considerations into all stages of the supply chain, from procurement to the management of end-of-life products (Al-Aomar and Hussain, 2017). Various GSCM practices exist, among which green procurement is a key element. Green procurement (GP) involves integrating environmental criteria into purchasing decisions, in addition to traditional criteria such as price, quality, and availability (Kozuch et al., 2023). The goal of such practices is to encourage the use of products and services that consume less, generate less waste, and produce fewer emissions. A recent study by Cherele-Bonnemaison et al. (2021) reveals that about two-thirds of the sustainable footprint of an average company comes from its suppliers. Procurement managers thus hold a crucial position to influence companies toward adopting more sustainable and planet-friendly practices.

In addition to addressing ecological urgency, green practices also provide economic and competitive benefits. Studies show that such practices improve business performance by increasing sales, profitability, and market share (Kusa et al., 2023). Perramon et al. (2014) also demonstrated that green practices lead to better operational performance by reducing operational costs and enhancing efficiency (Chiu and Hsieh, 2015). Moreover, these practices offer companies an opportunity to differentiate themselves in the market, improve their image, and enhance customer satisfaction,

thereby strengthening their competitiveness (Bagur-Femenias et al., 2013). However, most of these studies analyse GSCM practices in general, leaving the specific role of green procurement within this context unclear (Abbas and Hussien, 2021). Furthermore, most research has focused on the manufacturing sector, leaving the HoReCa industry largely under-explored.

1.2 Research questions

Given the ecological and financial stakes, it is essential to better understand how HoReCa businesses adopt green procurement in Belgium. The primary objective of this study is to analyse the level of green procurement engagement among HoReCa establishments in Brussels and Wallonia. Additionally, the study aims to examine the influence of factors such as size and age of establishments on this engagement, as these organizational dimensions are highlighted in the literature as determinants of environmental commitment. The second objective of this thesis is to explore how companies perceive the impact of green purchasing on their overall, operational, and competitive performance.

This analysis is therefore structured around two fundamental questions:

What is the level of engagement of HoReCa companies in Brussels and Wallonia in green purchasing, and what factors influence this engagement?

How do companies perceive the impact of green purchasing on their performance?

1.3 Structure of the work

The document is organized into four main sections. The literature review sets the theoretical foundation of the study, providing context and background for the research. The methodology section is divided into three parts: the development of hypotheses, an explanation of the data collection process, and a description of the analytical methods employed. The data analysis section follows, showcasing the results and providing a comprehensive, in-depth discussion of the findings. Lastly, the conclusion summarizes the theoretical and managerial implications, addresses the limitations of the study, and suggests avenues for future research.

2 Literature review

2.1 Green procurement and green supply chain management

Green supply chain management (GSCM) is a broad and dynamic concept that encompasses a wide range of definitions. Integrating the environment into all phases of supply chain operations is at the heart of this concept (Amemba, 2013). Sarkis et al. (2011) notably define GSCM as a concept that aims at "*integrating environmental concerns into the inter-organizational practices of supply chain management including reverse logistics*" (p.3). This integration has a significant influence on every stage of a product's life cycle. From design and procurement to production and final disposal, everything is involved (Amemba, 2013; Srivastava, 2007).

In the context of GSCM, it is crucial to bridge theory with practice. GSCM provides a conceptual framework but its real impact is seen through concrete actions taken within supply chains. These actions, referred to as "GSCM practices" (Tseng et al., 2019). A GSCM practice can be defined as "*any action which is performed across the supply chain to eliminate or reduce any kind of negative environmental impact*" (Azevedo et al., 2011) (p. 851). There are many GSCM practices in the literature. Amemba (2013) cites green procurement, green design, green operations, reverse logistics, green manufacturing, and waste management. Other practices include environmentally friendly packaging, green distribution, and end-of-life practices (defined by the "Re's" of reduction, reuse, re-manufacturing, recycling) (Hervani et al., 2005).

"*Purchasing, also called procurement, is the process by which companies acquire raw materials, components, products, services, or other resources to execute their operations*" (Ghosh, 2019) (p. 1). The purchasing department, which acts as an intermediary between internal functions and suppliers, manages these activities. When an organization needs to make decisions regarding its supply management, it typically considers three different criteria: cost, quality, and delivery (Kozuch et al., 2023). Green purchasing involves adding an environmental factor to these traditional criteria (Ghosh, 2019). Green sourcing can also be defined as a set of principles and methods that fully consider the impact on the environment (Song et al., 2017; Amemba, 2013). Procurement practices with an environmental focus are essential for advancing green supply chain management. They allow organizations to lower their ecological footprint effectively and enables companies to address issues such as reducing waste production or minimizing hazardous waste.

2.1.1 Factors influencing engagement

A company's commitment to the environment can be enhanced by certain factors, but can also be hindered by others. Min and Galle (1997) were the first to study the barriers that prevent companies from buying green. He found that the two biggest barriers were cost and revenue. To this, Rao and Holt (2005) added, the inefficiency of recycling, and the uneconomical nature of re-use. As for drivers, Ghosh (2019) identified that the factors pushing companies towards green purchasing included: internal environmental concern, management support, customer pressures, competitive pressure and collaboration with suppliers. Perramon et al. (2014) also looked into the subject and identified other factors such as: government regulations, the desire to attract new customers or enter new markets and social pressure in the countries where the company exercises its activities.

However, the environmental behaviour of companies can also vary according to their characteristics, notably their size and age. Previous studies have shown that large companies tend to be more environmentally conscious than their smaller counterparts (Gil et al., 2001; Elsayed, 2006; Tatoglu et al., 2014). According to their analysis, larger structures face greater pressure from stakeholders, have more resources available to invest, generally adopt a more formal management style, and, finally, can more easily achieve economies of scale. In addition, their larger purchasing volumes lead to more involvement in green practices (Min and Galle, 2001), and they are more likely to implement environmental audits and certifications such as ISO 14001 (Andonova, 2003).

The influence of company age has been much less studied by researchers. Gil et al. (2001) and Elsayed (2006) nevertheless showed that age had a significant negative impact on the deployment of environmental practices. In their view, environmental issues were still relatively recent, and were therefore becoming more integrated into the standards and practices of newly created or renovated organizations. New infrastructures can facilitate actions such as sorting waste for recycling, or optimizing resources such as energy and water.

2.1.2 Green procurement categories

Green purchasing practices can be divided into two main categories (Song et al., 2017). The first category is product-related green purchasing. This type of practice involves selecting products and materials that meet specific environmental standards. The aim is to buy products that consume fewer resources, generate less waste, cause fewer emissions and are less harmful to the environment (Kozuch et al., 2023). Liu et al. (2024) explains that this involves purchasing materials that

are recycled or can be recycled and reused. Similarly, Amemba (2013) points out that sustainable purchasing involves taking part in activities to reduce, reuse and recycle materials.

The second major category of green procurement is process-related green procurement. This refers to the way in which companies manage their purchasing process and ensure that it is sustainable and environmentally friendly. This includes management activities such as supplier selection, training and evaluation. In supplier selection, the concept is to choose the suppliers you work with on the basis of environmental criteria. For example, companies may decide to choose only suppliers who use environmentally-friendly raw materials, who adopt certain ISO certifications, or who are committed to reducing waste. Other typical criteria may include recycling and reuse practices, eco-labels and quality labels (such as “EU Ecolabel” or “Nordic Swan”) (Kozuch et al., 2023). In addition, the use of non-toxic materials is also a sought-after feature among suppliers (Zhu et al., 2007). In terms of evaluation, green purchasing means that companies regularly review the environmental performance of their suppliers to ensure that the products they buy are inherently green and manufactured using environmentally-friendly processes (Diab et al., 2015; Dubey et al., 2013). This type of practice, however, requires significant collaboration with suppliers and the building of long-term relationships with them (Song et al., 2017). Zhu et al. (2007) specifically define green purchasing as *"referring to the development of collaborative actions with suppliers to create environmentally friendly products and services"* (p. 4). Indeed, for sustainable sourcing practices to be successful, organizations need the support and cooperation of their suppliers (Rao and Holt, 2005).

2.2 HoReCa industry

Since this study focuses on the HoReCa sector, this section of the literature review aims to present the specific features of the industry and to identify the green purchasing practices implemented by the sector.

The HoReCa sector encompasses several types of establishments, broadly divided into three categories:

- Hospitality: Hotels, campgrounds, hostels, and other forms of accommodation.
- Restaurants/Food services: Establishments such as restaurants, brasseries, food trucks, canteens.
- Cafés: Bars, cafés, tea rooms, pubs, and other venues primarily serving beverages.

HoReCa is a specific subcategory of the hospitality industry, focused on food, beverages and accommodation. The supply chain of hospitality businesses is not a traditional supply chain and integrates elements from both manufacturing and service supply chains (Modica et al., 2020). There are six key characteristics specific to hospitality businesses (Modica et al., 2020; Xu and Gursoy, 2015):

- Hospitality products are perishable (e.g., hotel rooms).
- Demand generation is crucial.
- Demand is uncertain due to high competition and external factors like weather.
- Production and consumption of services occur simultaneously, and consumers must be present to consume the product.
- Collaboration among different businesses is essential as services are offered by multiple organizations in a package.
- There are various suppliers providing the hospitality product, with the hospitality supply chain being characterized as a closed-loop one.

The HoReCa sector has a significant environmental footprint by contributing significantly to greenhouse gas emissions and resource wastage. It is especially known for consuming vast quantities of water, energy, and non-sustainable products (Al-Aomar and Hussain, 2017). However, their environmental impact goes beyond just water and electricity use. In the food service sector, establishments generate considerable amounts of waste, especially food waste (Perramon et al., 2014), and rely extensively on plastic bags and disposable items such as take-out containers (Abbas and Hussien, 2021). In the accommodation sector, daily operations also involve heavy use of detergents, further exacerbating environmental harm (Kusa et al., 2023). Al-Aomar and Hussain (2017) emphasizes that accommodation facilities, such as hotels, are among the most energy-intensive building types due to their multi-use functions and 24/7 operation.

However, things are starting to change. Green practices are becoming more common in the sector, helping businesses reduce their environmental footprint. By adopting measures like waste reduction, energy efficiency, and eco-friendly products, companies can address these challenges while meeting the growing demand for sustainable options (Perramon et al., 2014).

2.2.1 Green purchasing in the HoReCa industry

Several studies have closely examined the actions that companies could implement to adopt green purchasing in the HoReCa sector. For example, Al-Aomar and Hussain (2017) conducted a study aimed at identifying the current best practices in the hotels. Other, broader studies have also sought to identify the concrete practices that businesses in this sector can implement. Among these articles, I was able to identify a number of practices, which are listed in the tables below. These practices have been divided into 3 different categories, namely product-related practices (Table 1), process-related practices (Table 2) and practices linked to the supply of water and electricity (Table 3).

Table 1: *Product-related green procurement*

Green products	
Practices	References
Buy environmentally friendly products	Mak and Chang (2019); Xu and Gursoy (2015)
Buy more reusable products and less disposable products (use cloth napkins instead of paper napkins, buy glass bottle for water, use glass instead of Styrofoam)	Abbas and Hussien (2021)
Buy products with less packaging	Al-Aomar and Hussain (2017); Amemba (2013); Migdadi (2023)
Buy products with environmental packaging	Chiu & Hsieh, 2016; Enz and Siguaw, 1999
Buy local products	Mak and Chang (2019); ?); Reis (2017)
Buy organic product	Abbas and Hussien (2021); Migdadi (2023)
Buy green equipment, furniture and materials	Migdadi, 2022
Buy products with green attributes such as recycled/reusable items	Hsu et al. (2013)
Use non-toxic and non-hazardous cleaning chemicals	Abbas and Hussien (2021); Amemba (2013); Enz and Siguaw (1999)

Table 2: *Process-related green procurement*

Green suppliers	
Practices	References
Work with eco-friendly suppliers	Chan (2009); Mak and Chang (2019)
Work with supplier that have an environmental management system	Abbas and Hussien (2021)
Work with certified suppliers (ex: ISO14000)	Al-Aomar and Hussain (2017); Zhu et al. (2007)
Work with suppliers that recycle and/or reuse	Abbas and Hussien (2021); Al-Aomar and Hussain (2017)
Collaborate with suppliers to achieve sustainable objectives	Goodman (2000); Zhu et al. (2007)
Supplier environmental audit program	Chiu and Hsieh (2015); Zhu et al. (2007)

Table 3: *Water and energy procurement*

Water and energy procurement	
Practices	References
Use rainwater harvesting systems	Mak and Chang (2019)
Use solar power	Al-Aomar and Hussain (2017)
Use heat insulation materials	Mak and Chang (2019)

2.3 Green procurement and performance

The relationship between green practices and performance is a subject that has interested a number of researchers and academics. When we examine the literature, we quickly find that most studies agree that there is a significant relationship between this type of practice and different types of firm performance (Ghosh, 2019; Islam et al., 2017; Carter et al., 2000).

2.3.1 Firm performance

In the past, many business leaders believed that increased investment in green purchasing increased total purchasing costs and therefore jeopardized their performance. However, several studies have shown that there is a significant and positive relationship between green purchasing and overall

company performance (Kozuch et al., 2023; Carter et al., 2000; Khan et al., 2017; Rao and Holt, 2005). According to Carter et al. (2000), the adoption of green purchasing practices reduces pollution and resource allocation, thereby improving corporate performance. In addition, Rao and Holt (2005) found that adopting eco-friendly practices reduces pollution, perceived as a form of inefficiency, while encouraging the reuse of materials and the development of recycling initiatives. These actions lead to savings on resources such as raw materials, water and energy, improving both competitiveness and economic performance.

Most of these studies analyse this relationship in a manufacturing context, and green purchasing practices in the hospitality sector have attracted little interest from researchers and academics. Nevertheless, some authors have analysed GSCM practices in general and the impact they have on performance in this sector. Bagur-Femenias et al. (2013), for example, show that environmental practices improve sales and market share while reducing costs, which in turn improves overall corporate performance. In addition, other authors add that greening the supply chain improves profitability (Kusa et al., 2023), reputation and financial performance (Chiu and Hsieh, 2015). Molina-Azorín et al. (2009) has shown that hotels that implement environmental practices perform better than those that do not. Muhammad (2022) is one of the few to have investigated the relationship between various GSCM practices (green procurement, waste management, green design, customer relationship management) and the performance of Pakistani hospitality companies. His study found a weak, significant and positive relationship between green procurement and the performance of hospitality companies.

Other studies (Islam et al., 2017; McMurray et al., 2014) highlight additional benefits that purchasing eco-friendly products could have on organizations. In particular, they identify reduced use of natural resources, achievement of goals and targets, improved working environment, efficiency, transparency and better working conditions.

Although many studies show a positive impact, some have produced different results. Among these, Bin et al. (2008) identified a negative relationship between green purchasing and financial performance, at least in the short term. Another study by Galeazzo et al. (2021) found no relationship between green procurement and corporate performance in the tourism sector.

2.3.2 Operational performance

Several studies have already attempted to understand the relationship between the implementation of green purchasing practices and operational performance in the manufacturing sector. The results of these studies reveal that the relationship tends to be positive (Liu et al., 2024; Song et al., 2017; Bin et al., 2008; Azevedo et al., 2011). Bin et al. (2008) studied this relationship in Chinese manufacturing companies and found that green purchasing could indeed improve companies' operational performance. Song et al. (2017) sought to study the impact of both types of green purchasing, namely product-based green purchasing and process-based green purchasing, and also came up with positive correlations. According to them, green purchasing enables a more efficient use of resources. This type of practice reduces waste, recycles and reuses materials, which not only cuts costs, but also reduces operational inefficiencies. Liu et al. (2024) confirms these findings, pointing out that green practices optimize recycling, reduce pollution at source and therefore improve supply chain efficiency. Another aspect discovered is that green purchasing promotes collaboration and cooperation between suppliers and companies (Liu et al., 2024; Song et al., 2017). Inventory management, quality management, coordination and processes can then be optimized, while transaction and supervision costs can be reduced.

As regards the impact of green purchasing in sectors closer to the HoReCa sector, there are only few studies. Nevertheless, some have identified a positive relationship between GSCM practices and operational performance (Perramon et al., 2014; Bagur-Femenias et al., 2013; Modica et al., 2020). These authors have identified that the adoption of ecological practices is strongly associated with a reduction in operating costs. These results are achieved mainly through more efficient methods of water and energy use, as well as improved waste recycling strategies. Chiu and Hsieh (2015) also points out that GSCM practices improve restaurant efficiency.

2.3.3 Competitiveness

Several studies have demonstrated that GSCM practices have a positive and significant impact on the competitiveness of companies that implement them (Chiu and Hsieh, 2015; Perramon et al., 2014; Bagur-Femenias et al., 2013; Azevedo et al., 2011; Rao and Holt, 2005). Studies show that GSCM tends to enhance company competitiveness due to the increasing demand for environmentally friendly products and services (Al-Aomar and Hussain, 2017). However, the competitive advantage gained by implementing sustainable practices can also be explained by the fact that green supply chain

practices enable hospitality companies to :

- Improve their image (Bagur-Femenias et al., 2013; ?)
- Attract new customers (Chiu and Hsieh, 2015; Perramon et al., 2014)
- Enhance market position (Chiu and Hsieh, 2015; Bagur-Femenias et al., 2013)
- Increase customer satisfaction and loyalty (Bagur-Femenias et al., 2013)
- Improve employees' satisfaction and loyalty (Bagur-Femenias et al., 2013; Abbas and Hussien, 2021; Perramon et al., 2014)
- Differentiate themselves (Bagur-Femenias et al., 2013)

Concerning employee satisfaction, Perramon et al. (2014) explains that when employees are satisfied and engaged with their companies, they tend to provide better experiences and services to customers, which logically has a positive impact on customer satisfaction.

Other authors explain that green purchasing forces their suppliers to innovate further, and that this can be used as a source of competitive advantage Islam et al. (2017); Galeazzo et al. (2021). Indeed, by pressuring suppliers to adopt greener practices and comply with environmental requirements, companies encourage them to develop new skills and innovate. These new skills and innovations can ultimately be a source of competitiveness for companies, particularly hotels and restaurants, which operate in a competitive sector.

In addition, a number of studies have analysed the impact of green purchasing specifically, on competitiveness (Dubey et al., 2013; Islam et al., 2017). According to them, this type of practice increases product quality and corporate image, and encourages innovation.

2.3.4 Mediating effects

Although this is not the central topic of this thesis, it is important to note that the literature review has highlighted that ecological practices can also indirectly influence business performance through improved competitiveness and operational performance.

López-Gamero et al. (2009) demonstrate that a competitive advantage acts as a mediating variable in the positive relationship between environmental protection and financial performance. Indeed,

when customer satisfaction, loyalty, and brand image increase, companies can benefit from improved financial performance. Customers are likely to spend more and recommend the company to others, leading to higher revenues and profits (Jani and Han, 2011; Longart, 2010).

Furthermore, operational performance serves as another key mediator (Song et al., 2017). According to Green Jr et al. (2012), cost savings related to operational performance could lead to an improvement in the overall performance of a company. Indeed, operational performance is linked to savings in consumption, reductions in operational costs, and a general improvement in operating conditions, which lead to an improvement in financial performance (Chan, 2009; Enz and Sigauw, 1999). In addition, Song et al. (2017) aimed to examine how two types of green procurement—product-based and process-based—affect company performance. Their results showed that both categories of practices not only have a direct effect on performance but also an indirect effect through the improvement of operational performance.

3 Methodology

To answer the two research questions and test the hypotheses, a quantitative method was chosen. This method is the most relevant, as it enables the collection of a wide range of data from a large number of participants.

The questionnaire was created using Survey Monkey and distributed through several methods. Associations and organizations working closely with companies in the HoReCa sector were contacted, and the questionnaire was shared within their networks. Emails were also sent to numerous establishments using contact lists found online. To improve the response rate, follow-up emails were sent to non-respondents four weeks after the initial email. Because the response rate remained low (5%), visits were made to establishments in person to present the study and distribute a QR code linking to the questionnaire. These in-person visits yielded a significantly higher response rate of 23%. For establishments visited in person, follow-up emails were sent two weeks after the visit if no response had been received.

3.1 Hypotheses

3.1.1 Factors influencing the level of engagement

Based on past literature, the size of a firm seems to play a significant role in the adoption of green supply chain practices (Gil et al., 2001; Bose and Pal, 2012; Ahmed et al., 1998). According to Ahmed et al. (1998) and Bose and Pal (2012), large firms tend to be more environmentally conscious than their smaller counterparts. Furthermore, another study conducted by Gil et al. (2001) showed that large hotels develop more advanced environmental management practices than small ones. Similarly, Tatoglu et al. (2014) showed that firm size positively influences the adoption of voluntary environmental practices. The following hypotheses is therefore developed:

H1: Larger establishments are more committed to green purchasing.

Concerning the age of establishments, Gil et al. (2001) showed that older hotel implement less advanced environmental programs compared to more recent ones. Furthermore, according to Elsayed (2006), the age of firms is negatively correlated with their environmental responsiveness and performance. This leads us to the following hypothesis:

H2: Age has a negative influence on the implementation of green purchasing

3.1.2 Perceptions of the impact of green purchasing on dimensions of performance

Firm performance

In the manufacturing sector, various research works have proven that green sourcing positively influences business performance (Ghosh, 2019; Desire et al., 2019; Carter et al., 2000). In other sectors, such as tourism, it has been proven that green purchasing leads to increased sales and reduced costs (Galeazzo et al., 2021). Molina-Azorín et al. (2009) further conducted a study showing that hotels that adopt more environmental practices perform better than those that adopt fewer.

Green practices in general are believed to positively influence profitability (Modica et al., 2020), company image and reputation (Bagur-Femenias et al., 2013), market share (Islam et al., 2017), as well as revenue, while also reducing costs (Xu and Gursoy, 2015). Finally, a more recent study by Muhammad (2022) demonstrated a weak but significant positive relationship between green purchasing and the performance of establishments in the HoReCa sector. It is for all these reasons that the following hypothesis has been developed:

H3: Green purchasing is perceived to have a positive impact on firm performance.

Operational performance

Several studies highlight the positive relationship between green sourcing and business operational performance. Liu et al. (2024) conducted a meta-analysis examining the overall impact of green procurement practices on business performance across four dimensions: financial, environmental, operational, and social. The results of this study show that, among the four dimensions, operational performance improves the most significantly.

In particular, in the HoReCa sector, Modica et al. (2020) emphasize that the implementation of ecological practices is positively linked to a reduction in operational costs, notably through more efficient water and energy consumption methods and waste recycling.

Moreover, green purchasing practices are also positively and significantly associated with better operational efficiency across the entire supply chain (Liu et al., 2024) and with waste reduction (Dubey et al., 2013). Therefore, we formulate the following hypothesis:

H4: Green purchasing is perceived to have a positive impact on operational performance.

Competitiveness

It has been demonstrated that green purchasing practices increase customer satisfaction (Kozuch et al., 2023) and improve product image (Anane, 2020). Galeazzo et al. (2021) also conducted a study in the tourism sector and demonstrated that green sourcing also plays a key role in encouraging suppliers to adopt new environmental standards. This stimulates innovation, improves the quality of products, and increases customer satisfaction, thereby strengthening the competitiveness of businesses.

Furthermore, a study by Jang et al. (2011) emphasizes that GSCM practices enable restaurants to differentiate themselves from their competitors. Finally, research across various sectors, including the HoReCa sector (Chiu and Hsieh, 2015; Abbas and Hussien, 2021), confirms that green practices, in general, improve competitiveness. Therefore, I propose the following hypothesis:

H5: Green purchasing is perceived to have a positive impact on competitiveness.

3.2 Data collection method

3.2.1 Questionnaire design

The questionnaire is made of several parts. The first part includes a brief introduction to my study and myself, as well as a definition of the concept of green purchasing. A paragraph is also added to assure the respondents that their answers are used solely for academic purposes.

The next two sections are dedicated to the demographic profile of the respondents and informations about the establishment they own or work in (e.g., the type of establishment, company's age and size, ...). In those sections, participants need to answer either multiple-choice questions or short open-ended questions (1 word or 1 number).

For the following sections, most questions require answers based on a Likert scale. Such a scale is chosen because it enables quantifiable analysis of opinions, and the data can then be analysed statistically. Moreover, they are easy to understand and use by respondents. When choosing to use a Likert scale, it is also necessary to select the number of response options to offer. For this study, we proposed 7 responses for greater precision and to better distinguish the answers given by the

participants (Joshi et al., 2015).

The third section of the questionnaire aims to measure the involvement in green purchasing of the company. Respondents are asked to indicate the extent to which they agree with 15 statements, each corresponding to one of the items chosen to assess green purchasing. The objective is to determine which green purchasing practices are actually implemented by the organization.

The final sections of the questionnaire concern the perceived impact of green purchasing on different forms of performance, namely performance, operational performance, and competitiveness. Respondents have to express their degree of agreement with statements regarding the impact of green purchasing on performance indicators.

3.2.2 Measurement scale

The measurement scales are defined based on scales identified in the literature and are subsequently adapted or combined to align with the objectives of this study. The methodology and rationale behind each measurement scale are detailed in this section.

To evaluate green purchasing, elements from various scales found in scientific articles are combined and adapted to develop a tailored measurement scale. This approach is adopted after identifying, during the literature review, three main categories of green purchasing practices: green product, green supplier and water and energy procurement. These categories encompass a wide range of actions implemented by organizations; however, no scale has been found that accounted for practices across all three areas. By integrating elements from different scales (Hsu et al., 2013; Abbas and Hussien, 2021; Amemba, 2013; Mak and Chang, 2019; Reis, 2017; Van de Giessen, 2018), a more comprehensive and coherent measure is developed, better aligned with the various aspects of green purchasing identified in the literature. The chosen items and the authors who developed them are listed in the table below (Table 4).

Regarding operational performance, the approach is based on the scale developed by Zhu et al. (2005), which was originally designed for manufacturing companies. To make this measurement scale suitable for the study, adaptations are made for the service sector. The original scale consisted of five items: the increase in the quantity of goods delivered on time, inventory levels, scrap rate, product quality, the increase in product range, and capacity utilization. First, the increase in the quantity of goods delivered on time is transformed into service waiting time. The inventory level is retained without changes. Next, the scrap rate is adapted to the quantity of waste, and product

Table 4: *Green purchasing scale*

Items	Authors
Green Product	
No purchasing of disposable products	Abbas & Hussien, 2021
No purchasing of products with hazardous or toxic substances	Hsu et al., 2013
Purchasing of products with green attributes such as recycled/reusable items	Hsu et al., 2013
Reducing packaging	Reis, 2017
Purchasing of local food	Reis, 2017; Abbas & Hussien, 2021
Purchasing organic certified food	Reis, 2017; Abbas & Hussien, 2021
Green Supplier	
Green criteria in procurement procedure	Van de Giessen, 2018
Selection of suppliers with environmental management system	Abbas & Hussien, 2021
Certified suppliers	Hsu et al., 2013
Cooperation with suppliers	Reis, 2017
Environmental auditing	Reis, 2017
Water and Energy Procurement	
Solar power	Amemba, 2013
Rainwater harvesting system	Mak & Chang, 2019
Use heat insulation materials	Mak & Chang, 2019

quality is removed as it was already use for competitiveness. Finally, the increase in product range and capacity utilization are not retained. In addition to these modifications, two elements from Abou Kamar et al. (2023) are integrated: supply chain efficiency and operational expenses.

Table 5: *Operational performance scale*

Items	Authors
Supply chain efficacy	Kamar et al. (2023)
Service waiting time	Zhu et al. (2005)
Reduction of operational expenses	Kamar et al. (2023)
Inventory level	Zhu et al. (2005)
Waste	Zhu et al. (2005)

To assess company performance, the elements of the scale by Mei and Nie (2008), including sales growth, profit growth, and market share growth, are used. To these indicators, two additional elements from the scale by Zeng et al. (2010) are added: profitability and the company's reputation, as

they are deemed relevant.

Table 6: *Firm performance scale*

Items	Authors
Market share	Mei et Nie (2008)
Profitability	Zeng et al. (2010)
Sales	Mei et Nie (2008)
Profit	Mei et Nie (2008)
Corporate reputation	Zeng et al. (2010)

To define the competitiveness measurement scale, a study by Zhao et al. (2015) is used. Several competitiveness indicators such as product quality, innovation improvement, production cost evolution, product image improvement, company image improvement, increased shareholder satisfaction, market share gain, and product differentiation are highlighted. From this list, production costs (with raw material costs added), product image, product differentiation, product quality and innovation are kept. The other indicators are not selected, either because they are already used elsewhere (brand image, market share) or because they do not seem particularly relevant (shareholder satisfaction). To keep the questionnaire concise, the most important criteria are prioritized. Finally, one last criterion, price competitiveness, is added from Mei and Nie (2008), as it is considered significant.

Table 7: *Competitiveness scale*

Items	Authors
Competitive price	Mei et Nie (2008)
Cost advantage (Production costs, Raw material costs)	Zhao et al. (2014)
Product image	Zhao et al. (2014)
Product differentiation	Zhao et al. (2014)
Innovation	Zhao et al. (2014)
Service and product quality	Zhao et al. (2014)

Finally, regarding the age of the establishments, their age is simply asked. As for the size of the company, the number of full-time employees is asked.

3.3 Data analysis method

Once the responses have been obtained, SPSS software is used to analyze and extract the data.

3.3.1 Reliability of the measurement scales

To use the data extracted from the questionnaire and analyse the hypotheses, a Principal Component Analysis (PCA) is conducted on the variables. In the context of this study, the main objective of this analysis is to evaluate the structural validity of the measurement scales and verify whether the variables group together according to the defined theoretical categories (competitiveness, operational performance, etc.).

Before performing a PCA, certain conditions must be met. First, it is necessary to check for minimal correlations between the items of the various variables. This is done using the Kaiser-Meyer-Olkin (KMO) index, which assesses the quality of inter-item correlations. The KMO index ranges from 0 to 1 and can be interpreted as follows: a value above 0.80 is considered excellent, between 0.70 and 0.80 good, between 0.60 and 0.70 satisfying, and below 0.50 inadequate. Additionally, Bartlett's test of sphericity is used to verify whether the correlation matrix is an identity matrix (where all correlations between variables would be zero). A significant result ($p < 0.05$) is necessary to reject the null hypothesis and confirm that the correlations are sufficient to perform PCA. (Université de Sherbrooke, 2024)

Once these two criteria are validated, PCA can be carried out. This method, based on the variance of the variables, extracts a reduced number of factors that explain a maximum proportion of the total variance. To determine the number of factors to retain, the initial eigenvalues are examined: only factors with an eigenvalue greater than 1 are retained. Generally, we aim to retain factors that explain at least 60% of the total variance.(Université de Sherbrooke, 2024)

Finally, as a complement to PCA, the reliability of the measurement scales is verified using Cronbach's alpha. This index measures the internal consistency of items within a scale. Generally, an alpha value above 0.7 is considered satisfactory, indicating good reliability. (Université de Sherbrooke, 2024)

3.3.2 Hypotheses testing

To address the research questions and validate the hypotheses, descriptive statistics, correlation analyses, variance analyses, and Student's t-tests are conducted. The details of these tests and the results obtained will be explained in the following section. Furthermore, in this study, a significance level of 5% ($p < 0.05$) is used to assess the relationships and test the hypotheses.

4 Data analysis

4.1 Analysis of the results

4.1.1 Descriptive statistics

Before performing any statistics, a basic data validation process is performed to ensure the quality of the responses. This included verifying that the questionnaires are complete, checking for duplicates, confirming that respondents belong to the targeted population, and ensuring that the time spent completing the questionnaire is not excessively short.

A total of 83 responses are collected. However, 15 of them are incomplete and are therefore excluded from the analysis. As a result, a total of 68 responses are usable. The characteristics of the different establishments are shown in table 8.

Table 8: *Descriptive statistics*

Variables	Category	Frequency	Percentage
Type of establishment	<i>Hotel</i>	4	6%
	<i>Restaurant</i>	54	79%
	<i>Bar</i>	10	15%
Range	<i>Top of range</i>	8	12%
	<i>Middle range</i>	48	70%
	<i>Bottom range</i>	12	18%
Number of full time employee	<i>0 or 1</i>	15	23%
	<i>Between 2 and 5</i>	26	37%
	<i>More than 5</i>	27	40%
Company age	<i>1-2 years</i>	10	15%
	<i>3-5 years</i>	21	29,5%
	<i>6-10 years</i>	18	29,5%
	<i>More than 10 years</i>	19	26%
Level of involvement	<i>Very involved</i>	21	31%
	<i>Partially involved</i>	34	50%
	<i>Starting to be involved</i>	9	13%
	<i>Not involved</i>	4	6%

The majority of the establishments surveyed are restaurants (79%), but the respondents also include hotels (6%), and bars (15%). Regarding the range of establishments, 70% consider themselves to be

in the "Middle-range" category, compared to 12% and 18% in the "Top of range" and "Bottom range" categories, respectively. Additionally, to get an idea of the size of the establishments, respondents were asked about the number of full-time employees. Based on their responses, three categories are defined: 0 or 1 employee (23%), between 2 and 5 employees (37%), and more than 5 employees (40%). In terms of company age, 15% were created within the last two years, 29,5% between 3 and 5 years ago, 29,5% between 6 and 10 years ago, and 26% over 10 years ago. Finally, businesses were asked to evaluate their level of involvement in green purchasing practices. 31% consider themselves fully involved, half feel partially involved, while 13% and 6% are just starting to get involved or not involved at all, respectively.

Comparing the survey results to the broader statistics of the Belgian Horeca sector reveals several interesting points. While the majority of surveyed establishments are restaurants (80%), this proportion is significantly higher than the sector's overall composition, where restaurants represent 68%. Similarly, bars and cafes account for 14% of respondents, compared to 22% in the general sector. Hotels, on the other hand, represent only 6% of the respondents, slightly under-represented compared to their 10% share in the sector. In terms of size, the survey is in line with the composition of the sector, with 78% of respondents having fewer than 10 employees, compared with 90% for the sector as a whole. This consistency suggests that the survey faithfully reflects the structure of the Belgian hospitality sector, albeit with a higher representation of restaurants and a slightly lower representation of cafés, bars and hotels. (Horeca, nd; Statbel, nd)

4.1.2 Results of PCA

Firm performance

The PCA results indicate the need to separate the scale in two. In fact, variables related to financial performance (Sales, Profit, Profitability, Market Share) load strongly on a first component, while Reputation stands out by loading exclusively on the second component. This distinction reflects two underlying dimensions: economic performance and reputational performance.

Originally, the hypothesis states:

H3: Green purchasing practices are perceived to positively impact overall performance.

Based on the findings, this hypothesis is refined to distinguish between two dimensions of performance:

H3a: Green purchasing practices are perceived to positively impact financial performance.

H3b: Green purchasing practices are perceived to positively impact reputation.

After this separation, the total explained variance decreases from 77% (with two factors) to 72% for the financial performance scale (with a single factor), which is still more than satisfactory. Moreover, this modification significantly improves other indicators: the KMO index increases from 0.7 to 0.8, and Cronbach's alpha rise from 0.7 to 0.9, indicating better internal consistency of the scale. Finally, Bartlett's test of sphericity remains significant in both cases, confirming the relevance of inter-item correlations.

Operational performance

The PCA conducted on the variable "Operational Performance" indicates that a single factor is retained, explaining 53% of the total variance. The desired 60% threshold is therefore not achieved. However, the KMO index is 0.8, and Bartlett's test of sphericity remains significant. Furthermore, Cronbach's alpha reaches 0.8, indicating good reliability of the scale.

Competitiveness

Based on the results of the PCA, the scale is divided into two distinct dimensions due to the clear groupings observed in the component matrix. Variables related to costs (Price, Production Costs, Raw Material Costs) strongly load onto the first component, suggesting a dimension focused on cost-related competitive advantage. Meanwhile, variables such as Differentiation, Innovation, Product/Service Image and Product/Service Quality load onto the second component, indicating a dimension linked to quality-based competitiveness. This division better reflects the underlying structure of the data and ensures a more accurate interpretation of the results.

Originally, the hypothesis states:

H5: Green purchasing practices are perceived to positively impact competitiveness.

Based on the findings, this hypothesis is refined to distinguish between two dimensions of competitiveness:

H5a: Green purchasing practices are perceived to positively impact quality-based competitiveness.

H5b: Green purchasing practices are perceived to positively impact cost-based competitiveness.

Let us now consider the results of the PCA for the two variables, namely "Cost-Based Competitiveness" and "Quality-Based Competitiveness." In both cases, the preliminary conditions are met: the KMO index is 0.7 for the former and 0.6 for the latter, and Bartlett's test of sphericity is significant in both analyses.

The PCA reveals that a single principal component can be retained for each variable, explaining 69% and 53% of the total variance, respectively. Additionally, Cronbach's alpha is also verified and deemed satisfactory, with values of 0.8 for "cost-based competitiveness" and 0.7 for "quality-based competitiveness", confirming the reliability of the scales.

4.1.3 Commitment level of the HoReCa sector toward green procurement

To identify the different levels of engagement, a cluster analysis based on the total score for the level of implementation in green purchasing is conducted. The optimal number of clusters is determined using the elbow curve method, which identifies the "elbow point" where the Within-Cluster Sum of Squares (WCSS) decreases significantly (Figure 1). Afterward, the k-means clustering method is applied to segment the data into clusters. A solution with three groups, as shown in Table 10, is identified.

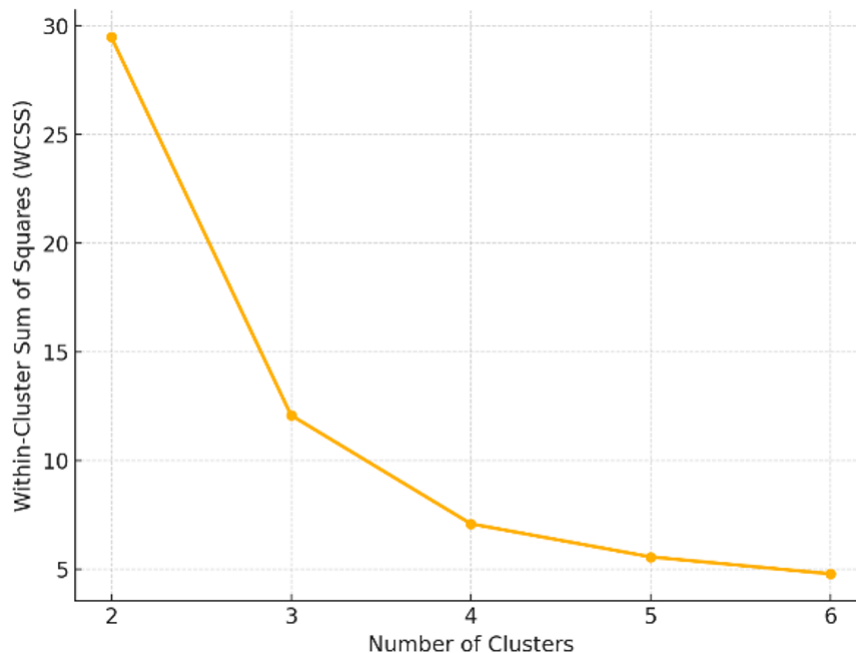


Figure 1: Elbow curve for optimal number of clusters

Additionally, a discriminant analysis is performed to validate this clustering solution. It reveals that 100% of the initially grouped cases are correctly classified. In other words, the two-step clustering

analysis proves to be valid.

Table 9: *Cluster Analysis*

Variables	Cluster 1	Cluster 2	Cluster 3	Means
GPM	3,6	5,3	6,5	5,1
Buy less disposable products	4	5,3	6	5,1
Buy less harmful products	5	5,9	6,9	5,9
Buy more products with ecological attributes	3,6	5,2	6,5	5,1
Buy local products	3,4	5,5	6,6	5,2
Buy bio products	2,2	4,7	6	4,3
Use less packaging	2,9	5,4	6,9	5
GS	2	4,2	5,5	3,9
Ecological criteria into purchasing procedures	2,2	4,7	6,3	5,4
Work with certified suppliers	2	4,5	5,2	3,9
Work with suppliers who have an EMS	2	4,7	6,2	4,3
Suppliers auditing	2	3,7	5	3,6
Cooperation with suppliers	2	3,8	5,1	3,7
WEM	2	3,5	5	3,5
Solar energy	1,3	3,1	3,8	2,7
Rainwater harvesting	1,3	2,1	4,4	2,6
Use of thermal insulation materials	1,6	3,3	4,93	3,3

The identified groups are as follows:

Group 1 includes establishments with low engagement levels, showing very low average scores across all categories: 3.6 for Green Product Management (GPM), 2 for Green Sourcing (GS), and 2 for Waste and Energy Management (WEM). This group consists of 11 establishments, representing 16% of the study's sample.

Group 2 comprises moderately engaged establishments, with average scores of 5.3 for Green Product Management, 4.2 for Green Sourcing, and 3.5 for Waste and Energy Management. These businesses demonstrate notable efforts, particularly in reducing harmful product use (5.9) and buying local (5.5). However, their involvement in practices such as supplier collaboration (3.8), environmental auditing of suppliers (3.7), and most water and electricity procurement practices remains limited. These companies seem to be in a transitional phase. They have already integrated certain practices, but there is still room for improvement. It should also be noted that, with 42 members, this group represents the largest category in the sample.

Group 3 (N=15) represents the leaders in green purchasing, with outstanding scores: 6.5 for Green Product Management, 5.5 for Green Sourcing, and 5 for Waste and Energy Management. These companies achieve almost the highest scores for practices such as reducing packaging (6.9) and using less harmful products (6.8). They are also the only group to place significant importance on water and electricity-related practices.

In addition, the category where companies achieve the highest scores is "Green Product Management," followed by "Green Supplier." Examining the most adopted practices in detail reveals that "Purchasing less environmentally harmful products" ranks first, followed by "Ecological criteria into purchasing procedures" and then "buying locally." Conversely, the least adopted practices are related to solar energy, the use of insulating materials, and water reuse.

Table 10 provides further details on the distribution of establishments across the three clusters but does not reveal significant differences in characteristics such as type, range, size, or company age. Restaurants dominate all clusters, as expected given their strong representation in the sample. Similarly, middle-range establishments remains the most common across clusters, reflecting the overall composition of the surveyed sample. These findings suggest that the level of engagement in green purchasing practices is not necessarily linked to these factors.

Table 10: Descriptives statistics of the clusters

Category	Cluster 1	Cluster 2	Cluster 3	Total
Type				
Hotels	1	2	1	4
Restaurants	8	35	11	54
Bars	2	5	3	10
Range				
Top of range	1	5	2	8
Middle of range	7	29	12	48
Low range	3	8	1	12
Size (employees)				
0-1	3	10	3	16
2-5	2	18	5	25
More than 5	6	14	7	27
Company age				
0-2 years	2	6	2	10
3-5 years	1	14	5	20
6-10 years	5	12	3	20
More than 10 years	3	10	5	18

4.1.4 Company size and involvement in green purchasing

Figure 2 shows the relationship between involvement in green purchasing and company size. A visual examination does not reveal any obvious correlation between these parameters.

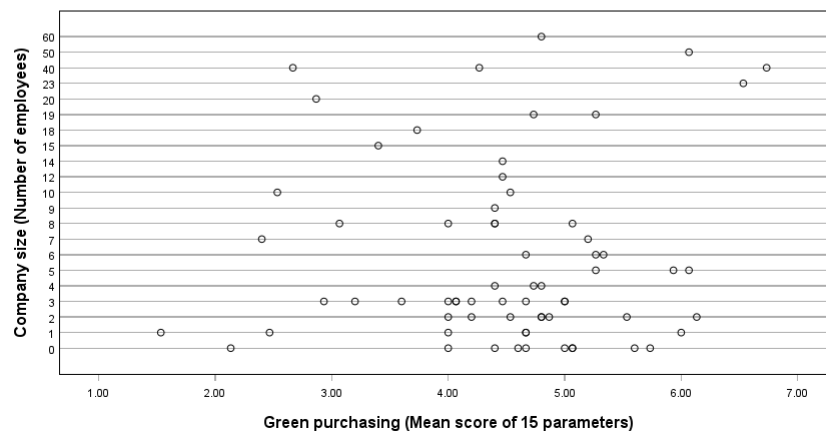


Figure 2: Correlation between green purchasing and company size

The normality of the variables is assessed using the Shapiro-Wilk test and visual inspections (e.g., histograms, Q-Q plots). The results indicate that the variable "Size" (number of employees) is not normally distributed, violating one of the assumptions required for a Pearson correlation. Consequently, a Spearman correlation is performed to examine the relationship between company size and green procurement involvement.

As suggested by Figure 2, the results of the Spearman correlation test show no correlation between the number of employees and the level of involvement in green purchasing practices (Table 11). The hypothesis stating that larger establishments are more committed to green purchasing than smaller ones (H1) can therefore not be validated.

Table 11: *Correlation test between green procurement and company size*

Test	Correlation Coefficient	p-value (Sig.)	N
Spearman	0.001	0.995	68

Whether the type of practices implemented differs depending on company size is also investigated. Two variance tests (ANOVA) are conducted: one on the three main categories of green purchasing practices (GPM, GS, WEM) and another on the specific variables within each of the three main categories. However, no significant differences are observed.

These results suggest that company size does not play a determining role in either the level of adoption of green purchasing or the types of practices implemented.

4.1.5 Company age and involvement in green purchasing

The correlation between green procurement and company age is shown in figure 3. A visual examination of the data does not suggest any correlation between these parameters.

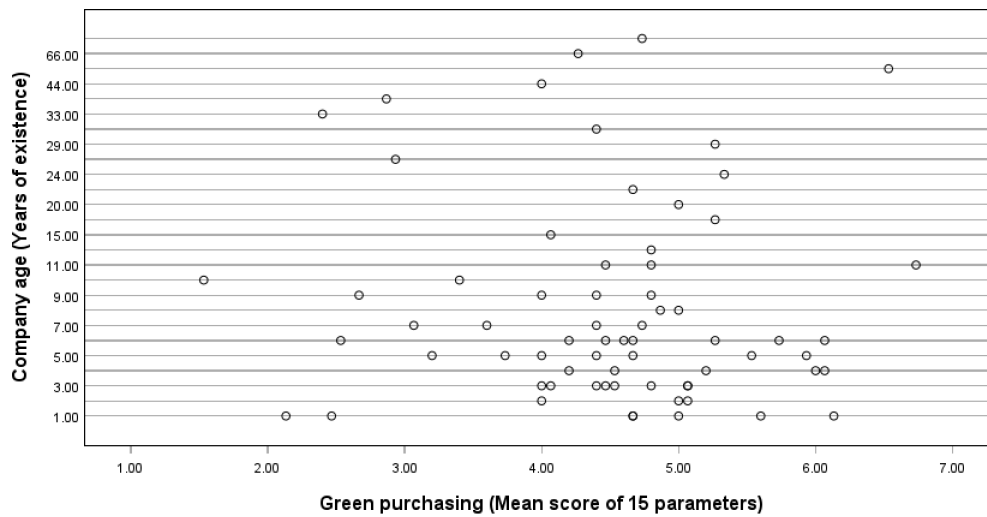


Figure 3: Correlation between green purchasing and company age

The results also indicate that the variable "Age" is not normally distributed. Consequently, a Spearman correlation is also performed to examine the relationship between company age and green procurement involvement.

As suggested by Figure 3, the results of the Pearson correlation test show no correlation between the company's age and their engagement in green purchasing (Table 12). The hypothesis stating that more recent establishments are more committed to green purchasing than older ones (H2) can therefore not be validated.

Table 12: Correlation test between green procurement and company age

Test	Correlation Coefficient	p-value (Sig.)	N
Spearman	-0.102	0.409	68

Furthermore, as with company size, additional tests are conducted to analyse whether the type of practices implemented differs based on company age. The results show no significant differences.

These findings indicate that the age of a company does not significantly influence the extent to which green purchasing is adopted or the specific practices that are implemented.

4.1.6 Perceived impact of green procurement on performance

This section outlines the statistical tests performed to assess the validity of the hypotheses regarding the perceived impact of green purchasing practices on overall, operational, and competitive performance.

To address this question, the Student's t-test is chosen. The test hypotheses are as follows:

- Null hypothesis (H0): The mean of the responses is less than or equal to 4. This implies that companies are either neutral or do not perceive a positive impact of green purchasing.
- Alternative hypothesis (Ha): The mean of the responses is strictly greater than 4. This implies that companies perceive a significant positive impact.

As a reminder, the number 4 corresponds to the neutrality level on the Likert scale used in the questionnaire.

Firm performance

To begin with, the perceived impact on financial performance is analysed. The results of the one-tailed Student's t-test provide a negative test statistic ($t = -1.987$, Table 13). In this case, to verify whether the alternative hypothesis (Ha) is valid, the one-tailed p-value is adjusted using the following formula:

$$P = 1 - (\text{one-sided p-value}) = 1 - 0.026 = 0.974 \quad (1)$$

The obtained p-value ($p = 0.974$) is far greater than 0.05, indicating that the null hypothesis (H0), which states that the mean is less than or equal to 4, cannot be rejected. Consequently, these results do not support validating the alternative hypothesis (H3a).

Table 13: *Results of the Student's t-test for financial performance*

Variable	t	df	One-sided p	Two-sided p	Mean difference
Financial performance	-1.987	67	0.026	0.051	-0.28676

However, when we look in more detail at the financial performance indicators. A positive perceived impact on sales ($p = 0.017$, Table 14) is observed. This means that establishments do perceive a positive impact on performance in terms of sales but not in terms of profit, profitability and market share.

Let us now consider the perceived impact on the company's reputation. The results of the Student's t-test yield a positive test statistic. The p-value of the test is therefore equal to the one-sided p-value,

Table 14: *Results of the Student's t-test for indicators of financial performance*

Variable	t	df	One-sided p	Two-sided p	Mean Difference
Sales	2.161	67	0.017	0.034	0.368
Profit	-3.498	67	<0.001	<0.001	-0.618
Profitability	-5.094	67	<0.001	<0.001	-0.750
Market share	-0.638	67	0.263	0.526	-0.118

which is smaller than 0.05 (Table 15). Thus, we can validate hypothesis H3b, which states that the impact of green purchasing on reputation is perceived positively.

Table 15: *Results of the Student's t-test for reputation*

Variable	t	df	One-sided p	Two-sided p	Mean difference
Reputation	12,33	67	< 0,001	< 0,001	1,632

Operational performance

Regarding operational performance, the test statistic is negative ($t = -2.214$, Table 16). Therefore, the one-sided p-value must be adjusted using the following formula:

$$P = 1 - (\text{One-sided p}) = 1 - 0.015 = 0.085 \quad (2)$$

The p-value of the test is thus greater than 0.05. Consequently, the null hypothesis (H_0), which states that the mean is less than or equal to 4, cannot be rejected. As a result, these findings do not support validating the alternative hypothesis (H_4).

Table 16: *Results of the Student's t-test for operational performance*

Variable	t	df	One-sided p	Two-sided p	Mean difference
Operational performance	-2,21	67	0,015	0,30	-0,279

Quality-based competitiveness

For quality-based competitiveness, the Student's t-test reveals a positive test statistic ($t = 9.325$, Table 17). In this case, the p-value of the test is directly provided by the "One-Sided p" and is therefore

less than 0.001. This allows us to reject the null hypothesis, which states that the mean is less than or equal to 4. Thus, we can confirm the alternative hypothesis (H5a). This indicates that companies perceive a significant positive impact of green purchasing practices on quality-based competitiveness.

Table 17: *Results of the Student's t-test for quality-based competitiveness*

Variable	t	df	One-sided p	Two-sided p	Mean difference
Quality-based competitiveness	9.325	67	< 0.001	< 0.001	1.011

Cost-based competitiveness

The Student's t-test statistic is negative ($t = -6.736$, Table 18). Consequently, the one-sided p-value must be recalculated. Even though the exact one-sided p-value is unknown, we know it is less than 0.001. Therefore, $[1 - (\text{One-Sided } p)]$ will inevitably be greater than 0.05. As a result, the null hypothesis (H0), cannot be rejected. Thus, these findings do not support confirming the alternative hypothesis (H5b).

Table 18: *Results of the Student's t-test for cost-based competitiveness*

Variable	t	df	One-sided p	Two-sided p	Mean difference
Cost-based competitiveness	-6.374	67	< 0.001	< 0.001	-0.94118

4.1.7 Levels of commitment and perceptions

Once these results have been analysed, it is necessary to check whether perceptions differ between groups representing different levels of involvement. The aim is to see whether the conclusions drawn can be assigned to the sample as a whole, or whether there are differences in perception according to involvement.

The table below (Table 19) presents the averages of the perceived impact on different performance dimensions for each cluster.

The table shows:

- For quality-based competitiveness and reputation, all averages are above 4, indicating that all groups perceive a positive impact on these performance dimensions.

Table 19: *Averages of perceived impact on different performance dimensions for each cluster*

Cluster	P	R	OP	CQ	CC
Cluster 1	3,2	5,9	3	4,8	2,4
Cluster 2	3,8	5,5	3,7	5	3,1
Cluster 3	3,8	5,8	4,1	5,1	3,4

- For overall performance and cost-based competitiveness, the averages are below 4, indicating that all groups do not perceive a positive impact on these performance dimensions.
- However, when it comes to operational performance, Group 1 and 2 do not seem to perceive any positive impact, while the opinion of group 3 is not clear.

To verify these results statistically, Student tests are performed for each cluster and for each form of performance. The results indicate that for quality-based competitiveness and reputation, the averages are statistically above 4 for all clusters, demonstrating a shared positive perception among the groups. For all other dimensions, the averages are statistically below 4, reflecting a common lack of perceived positive impact. Despite slight variations in averages between clusters, the overall alignment in perceptions across groups suggests a consensus on these performance dimensions.

4.2 Discussion

The main objective of this thesis is to study the engagement of the HoReCa sector in green purchasing practices. Based on the responses provided by 68 establishments, the level of engagement of businesses, as well as the factors influencing their involvement are evaluated. Additionally, the perceptions of businesses regarding the impact of these practices on various dimensions of performance are also assessed.

The cluster analysis identifies three groups reflecting different levels of establishments' engagement in green purchasing practices. The group with a low level of engagement accounts for only 16% of the sample, highlighting that only a small minority is minimally involved. The group with a moderate level of engagement represents 62% of the sample. Finally, the last group, representing the green leaders, corresponds to 22% of establishments, indicating that currently, only a limited number of establishments are highly engaged. The cluster analysis thus reveals an uneven distribution of establishments based on their level of ecological engagement.

The results also highlight the most and least popular practices among establishments. The most

widely adopted practices are those related to product choices, such as using products that are less harmful to the environment, buying more local products, using reusable products or using items made from recycled materials. The next set of practices focuses on suppliers, such as including environmental criteria in purchasing procedures, working with certified suppliers and working with suppliers that have an environmental management system. Finally, the least implemented practices involve water and electricity procurement. Practices such as solar energy use, insulation materials, and water reuse are among the least popular.

Several factors that might influence businesses' involvement are investigated. One key factor examined is company size. **The test reveals no correlation between the size of establishments, measured by the number of employees, and their level of involvement in green purchasing.** Additionally, no correlation is found with the types of practices adopted. Interestingly, these results diverge from prior research findings (Bose and Pal, 2012; Ahmed et al., 1998; Gil et al., 2001). For instance, in a study by Gil et al. (2001), larger hotels tended to be more environmentally conscious than smaller ones. According to the authors, this difference arises because larger companies face more environmental pressure from stakeholders, have more resources, and benefit from leverage effects. However, it is important to note that the studies by Bose and Pal (2012) and Gil et al. (2001) do not use the number of employees to analyze company size but instead rely on total assets and the number of rooms, respectively, which may influence the results.

Nonetheless, our study is not the only one that failed to establish a significant link between company size and involvement level. Similarly, Rahman et al. (2012) did not confirm that larger hotels more readily adopt green practices than smaller ones. Likewise, Zhu et al. (2008) found that manufacturing companies achieved similar levels of green purchasing implementation regardless of the number of employees.

Another important factor considered is the age of the establishment. **The tests also show that this factor do not significantly influence ecological commitments.** Few data are available in the literature on this relationship in the HoReCa sector. However, unlike our study, Gil et al. (2001) and Elsayed (2006) demonstrated that the company age negatively influences the implementation of environmental management practices. According to Gil et al. (2001), hotels with older facilities adopt fewer environmental management measures compared to their counterparts with newer facilities. This can be explained by the fact that newer facilities can be designed to facilitate certain environmental protection activities, such as waste sorting for recycling or energy and water conservation. Furthermore, according to Elsayed (2006), older companies are often influenced by past decisions,

which makes it difficult for them to adopt new strategies and implement alternative solutions.

These contradictory results, concerning size and age, could be explained by the fact that these studies are outdated and focus on ecological practices in general rather than on green purchasing in particular. It should also be noted that the ecological context has evolved significantly in recent years, and businesses' environmental commitment has progressed accordingly. It is therefore possible that the distinction between older and newer businesses in terms of environmental commitment is less pronounced today.

Let us now analyze the results obtained regarding the impact of green purchasing on the different dimension of performance.

Concerning financial performance, surveyed businesses perceive an improvement in terms of sales but not in profit, profitability, or market share. While some studies, such as Galeazzo et al. (2021), also did not identify a positive and significant relationship between green purchasing and financial performance, the majority of research in the literature suggests a favourable relationship. For example, Ghosh (2019) and Khan et al. (2017) highlighted a positive relationship between green purchasing practices and overall performance. Similarly, Molina-Azorín et al. (2009) demonstrated that environmental practices reduce costs and boost hotel revenues, while Kusa et al. (2023) showed that greening enhances performance by increasing sales, profitability, and market share in the hospitality industry. Additionally, Bagur-Femenias et al. (2013) found that adopting environmental practices improves financial performance in travel agencies by raising sales and market share while simultaneously reducing costs.

The difference between the results of the study and those of the literature could be explained by the fact that those studies are not specifically focused on green purchasing practices in the hospitality sector. Some have examined the hospitality sector, but in the context of GSCM practices more broadly (Kusa et al., 2023; Perramon et al., 2014; Molina-Azorín et al., 2009), while others have studied green purchasing practices specifically but in sectors other than hospitality (Ghosh, 2019; Khan et al., 2017). However, our study relies on businesses' perceptions and we are therefore not able to determine whether these perceptions reflect an objective reality or if there is a gap between perceptions and reality, in which case the actual impacts may not be properly identified, measured, or understood. Further studies are necessary at this stage.

In terms of operational performance, our results indicate that businesses do not perceive a significant impact on aspects such as operational expenses, efficiency, inventory man-

agement, or customer waiting times. However, a positive effect is noted regarding waste reduction which align with prior studies (Min and Galle, 2001; Chiu and Hsieh, 2015).

Concerning operational expenses, these results contrast with several studies, particularly those conducted in the hospitality and restaurant sectors (Abbas and Hussien, 2021; Perramon et al., 2014), which demonstrate that green practices improve operational performance primarily by reducing operational costs and lowering energy and water consumption. It should be noted that the green procurement practices most likely to influence this performance indicator are those related to water and energy procurement. These practices are not widely implemented by the surveyed businesses, which could explain the lack of a perceived positive impact on operational cost reductions.

Regarding efficiency, in contrast with our results, research has shown that green practices can enhance operational efficiency, particularly through improved resource management (Kozuch et al., 2023; Azevedo et al., 2011). Additionally, concerning inventory management and customer waiting times, limited studies have investigated these aspects, making it challenging to compare our findings with previous research.

Following this, **the results show that the perceived impacts on quality-based competitiveness and reputation are significantly positive.** These findings align with the work of Chiu and Hsieh (2015) and Perramon et al. (2014), which demonstrated a positive and significant relationship between applying green supply chain management practices and the competitiveness of restaurants. Moreover, this study's results also agree with those of Dubey et al. (2013), who specifically focused on green purchasing practices. They suggest that adopting green purchasing proactively is a good strategy to remain competitive. These practices help to strengthen the image of the product and the service, differentiate from competitors, and stand out in the market. Furthermore, according to Bagur-Femenias et al. (2013), the impact of green practices on competitiveness is reflected in improved corporate image, increased customer satisfaction, and better employee engagement. Regarding reputation, these same authors emphasize that being positioned as a green leader significantly improves the perception of the company among stakeholders, enhancing its image and credibility.

Concerning cost-based competitiveness, establishments do not perceive a positive impact in terms of competitive price, raw material costs, and production costs. Those results are in line with the studies of Rao and Holt (2005) and Hillary (2004) who found that adopting green purchasing practices entails significant costs, which could compromise cost advantages and the ability to maintain competitive pricing. However, this contrasts with the findings of Molina-Azorín et al. (2009) and Bagur-Femenias et al. (2013), as mentioned in the financial performance section,

which suggest that green practices can lead to cost reductions.

Finally, one might believe that perceptions vary depending on the ecological maturity of companies. It is indeed plausible to think that businesses that have already integrated these practices into their strategies think differently than those still in the implementation phase. This hypothesis is also tested, and the results show no significant difference between the perceptions of the three groups representing different levels of involvement.

5 Conclusion

The cluster analysis reveals that not all businesses are at the same level of implementation in green purchasing. This confirms a general progression but also underscores the need to support transitioning businesses to increase their commitment. Supporting these businesses in their transitions represents a significant challenge for institutions. To motivate these establishments to take the next step or pursue their efforts, it would be advisable to inform them about the environmental and competitive advantages of green purchasing, the impact of their practices on the environment, the various certifications they could obtain, and the funding available to support their initiatives. Some actions, such as limiting disposable products or reducing environmentally harmful products, could be broadly suggested and encouraged, especially for companies that are not at all involved in green purchasing. This would be a simple, quick, and effective way to initiate the ecological process.

It is worth noting, however, that the largest group (62%) exhibits a moderate level of engagement, which is a very encouraging sign for the future. This group should likely be prioritized for support to quickly transition into the leaders' group.

Finally, some establishments are already highly committed to green purchasing practices. These businesses could serve as models or references for those that have not yet started the process.

Interestingly, the study found no correlation between establishment size or age and green purchasing involvement. Instead, factors such as the ethics, values, and environmental awareness of business owners may play a more significant role. In this respect, the study by Tzschentke et al. (2008), had already identified that personal and sociocultural factors could significantly influence businesses' engagement in sustainable practices. Future studies should therefore focus on exploring other factors influencing green purchasing involvement in the HoReCa sector, to better understand the motivations and barriers.

The findings also indicate a perceived positive impact of green purchasing on operational performance in terms of waste reduction. This is a crucial outcome aligning with existing literature and demonstrating that sustainable procurement practices not only support environmental sustainability but also contribute to reducing the ecological footprint of businesses.

Subsequently, a significant gap in the implementation of key green practices, particularly those related to water and energy consumption, is highlighted. Practices such as installing solar panels, insulating buildings, or implementing water reuse systems are much less common, likely due to

their high costs and technical complexity, especially for smaller businesses. This gap may explain why businesses do not perceive reductions in operational costs. Encouraging a broader adoption of these practices, potentially through specific funding or subsidies, could help businesses better align their environmental efforts with tangible cost savings, as suggested by other studies. Future research could focus on businesses that have already implemented these water and energy-related procurement practices to determine whether they achieve significant cost reductions and to identify the conditions under which such initiatives are most effective.

In addition, the study builds on and reinforces existing research demonstrating that GSCM practices enhance business competitiveness across a wide range of sectors, by revealing that the establishments participating in the study indeed perceive a positive impact of green purchasing on quality-based competitiveness and reputation. These establishments believe that green purchasing enhances their reputation, the image of their products and services, and allows them to innovate and differentiate themselves from competitors. Sustainability thus emerges as a strategic lever to stand out in a competitive market. Managers should therefore view green purchasing practices as a strategic opportunity to improve quality-based competitiveness and reputation, provided they effectively communicate their ecological initiatives.

However, the perceived benefits do not extend equally to financial performance. While green purchasing practices appear to have a positive impact on sales, their effect on other dimensions of financial performance, such as profit, profitability, and market share, is not perceived favorably by the surveyed businesses. Similarly, no positive impact is observed on cost-based competitiveness, whether in terms of competitive pricing, raw material costs, or production costs.

The perception of a positive impact on sales, without a corresponding improvement in profit or profitability, raises an important issue related to costs. This could indicate that the additional revenues generated by increased sales are offset, or even surpassed, by higher costs. This observation is directly linked to the findings on cost-based competitiveness, where businesses perceive challenges related to raw material costs, production costs, and the inability to maintain competitive pricing.

Given that this study relies on perception and that the literature on the impact of green purchasing practices on costs remains unclear, it would be valuable to conduct a detailed analysis specifically focused on the hospitality sector. Such a study should break down costs, considering raw materials, production costs, operating costs and other components, to better understand the actual impact of green purchasing practices on these dimensions.

To conclude, it is essential to highlight the methodological and contextual limitations of this research. With 68 usable responses, the sample size and composition are limited. Despite using multiple data collection methods, the response rate is very low, presenting a significant methodological challenge for future studies. Furthermore, the sample is primarily composed of restaurants, which limits the generalisation of the results to the entire sector.

Additionally, the research is based on respondents' perceptions rather than objective quantitative data. These perceptions are informative and interesting but may be influenced by cognitive biases or participants' beliefs.

Further studies would be useful to develop and clarify certain aspects by increasing the sample size and diversity and introducing objective quantitative indicators to validate and deepen the conclusions.

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Abstract :

Environmental sustainability has become a major concern for businesses across all sectors, including the HoReCa industry, known for its significant resource consumption and environmental impact. This study examines the adoption of green procurement practices within HoReCa establishments in Brussels and Wallonia. It explores the influence of organizational characteristics, such as size and age, on the commitment to green procurement. Additionally, it analyses the perceived impacts of these practices on the overall, operational, and competitive performance.

A literature review identified the main dimensions of green procurement: green product, green supplier, and water and energy procurement. The study uses a quantitative approach, employing a questionnaire distributed among HoReCa establishments in Brussels and Wallonia. The data were then analysed using statistical tools in SPSS.

The results reveal three distinct levels of engagement: low, moderate, and high, with most establishments moderately engaged. Company size and age were not found to be significant determinants of green procurement adoption.

The study also uncovers nuanced findings regarding the perceived impact of green procurement on performance. Green procurement is perceived to positively influence quality-based competitiveness and reputation. However, its financial benefits appear limited to sales, with no significant positive perceived impacts on profit, profitability, or market share. Similarly, while waste reduction is a notable operational benefit, no significant improvements are perceived in operational costs, efficiency, inventory management, or customer waiting times. Furthermore, no positive impact is observed on cost-based competitiveness.

By focusing specifically on green purchasing in the HoReCa sector, this study contributes to the existing literature by specifically examining the impact of green purchasing in the HoReCa sector, an industry often under-represented in research. Our study also makes an additional contribution by addressing cost-based competitiveness as a specific dimension, while most studies focus on competitiveness in general, thereby broadening the debate.

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