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**TOWARDS MORE SUSTAINABLE SMALL PURCHASES: ENHANCING  
SUSTAINABILITY IN THE OPERATIONAL PROCUREMENT PROCESS**

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## ABSTRACT

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### **Towards More Sustainable Small Purchases: Enhancing Sustainability in the Operational Procurement Process**

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Operational purchases may not seem important when examined separately but can have significant impacts on the environment and human health. This study focuses on the operational off-contract procurement process. At the case organisation, sustainability considerations are not yet taken into account in operational procurement. The objective is to find ways to make the operational purchasing more environmentally and socially sustainable.

The study employs a case study methodology, allowing for in-depth analysis and interpretation of the topic. A spend analysis based sustainability impact analysis provides a description of the potential sustainability risks associated with operational purchases and presents areas for improvement. Interviews with operational purchasers and a survey to internal customers provide insight into the challenges and opportunities for sustainable procurement.

The findings highlight the challenges of a decentralised purchasing structure where internal customers are given responsibility for making purchases. Traditional strategies for operative purchases are not necessarily suitable for sustainable procurement. Moreover, internal customers lack knowledge to purchase sustainably. To address these challenges, improvement recommendations were formulated. It is recommended to formulate clear sustainability objectives and increase awareness by creating sustainable purchasing guides. Purchasers need to be equipped with the necessary competencies required for sustainable procurement and providing advice to internal customers.

## TIIVISTELMÄ

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Kauppätieteet

Salla Riikonen

### **Kohti kestävämpiä pieniä hankintoja: kestävyuden parantaminen operatiivisessa hankintaprosessissa**

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Avainsanat: kestävät hankinnat, pienet hankinnat, operatiiviset hankinnat, hankintaprosessin kehittäminen, kestävä hankinnan osaaminen

Operatiiviset hankinnat eivät välttämättä vaikuta merkittävältä erikseen tarkasteltuna, mutta niillä voi olla merkittäviä vaikutuksia ympäristöön ja terveyteen. Tämä pro gradu -tutkielma keskittyy operatiiviseen sopimusten ukopuoliseen hankintaprosessiin. Kestävyysnäkökohtia ei vielä oteta huomioon operatiivisissa hankinnoissa case-organisaatiossa. Tavoitteena on löytää keinoja, joilla tehdä operatiivisesta hankinnasta ympäristöllisesti ja sosiaalisesti kestävämpää.

Tutkielma on toteutettu tapaustutkimuksena, joka mahdollistaa aiheen syvällisen analyysin ja tulkinnan. Organisaation operatiivisia ostoja tarkasteltiin spend-analyysin avulla ja valikoiduille kategorioille määriteltiin kestävä kehityksen riskejä. Haastattelut operatiivisten ostajien kanssa ja kysely sisäisille asiakkaille antavat näkemyksen kestävä hankinnan haasteista ja mahdollisuuksista.

Tulokset tuovat esiin hajauteutun hankintarakenteen haasteet, jossa sisäiset asiakkaat ovat vastuussa ostojen tekemisestä. Lisäksi perinteiset operatiivisten hankintojen strategiat eivät välttämättä sovellu kestävä hankintaprosessiin. Näihin haasteisiin vastaamiseksi laadittiin parannusehdotuksia. Organisaation pitäisi muotoilla selkeät kestävä kehityksen tavoitteet ja lisätä tietoisuutta laatimalla kestävä hankinnan oppaita. Ostajilla tulee olla tarvittava osaaminen kestävä hankintaan ja sisäisten asiakkaiden neuvontaan.

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## Table of contents

Abstract

Acknowledgements

1	Introduction .....	10
1.1	Problem definition and research objectives .....	10
1.2	Research questions and methodology .....	12
1.3	Definitions of key concepts.....	14
1.4	Delimitations .....	15
1.5	Structure of the thesis.....	16
2	Literature review .....	17
2.1	Sustainable public procurement .....	17
2.1.1	Dimensions of sustainability.....	17
2.1.2	Sustainability and public procurement .....	19
2.1.3	Sustainability practices in procurement.....	21
2.1.4	Barriers and facilitators in sustainable public procurement.....	24
2.2	Operational procurement and its role in sustainability .....	27
2.2.1	Overview of operational procurement .....	27
2.2.2	The challenges with operational procurement and sustainability.....	31
2.2.3	Operational procurement process development.....	34
2.2.4	Sustainable procurement competencies for operational purchasers .....	37
2.2.5	Operational procurement professionals' role in sustainable procurement.....	40
3	Research methodology .....	43
3.1	Research approach .....	43
3.2	Data collection .....	44
3.3	Data analysis .....	46
3.4	Reliability and validity .....	48
3.5	Case introduction .....	49
4	Empirical study.....	50
4.1	Spend data: Sustainability impacts of operational purchases .....	50

4.1.1	Chemicals.....	52
4.1.2	Laboratory supplies.....	54
4.1.3	Electronic, measuring and control installations.....	55
4.1.4	Engineering and environmental services .....	56
4.1.5	Optics .....	57
4.1.6	Other research equipment .....	59
4.2	Interviews: Procurement process and sustainability .....	60
4.2.1	Operational procurement process at the case organisation.....	61
4.2.2	Sustainability in operational procurement: practices, barriers and opportunities 62	
4.2.3	Giving advice about sustainability.....	64
4.3	Survey: Internal customers' views on sustainable procurement.....	67
4.4	Case analysis .....	74
	Discussion and conclusions .....	78
4.5	Discussion of main findings.....	78
4.6	Answers to the research questions .....	83
4.7	Theoretical implications.....	85
4.8	Implications for the case organisation.....	86
4.8.1	Recommendations for operational purchases .....	86
4.8.2	Managerial implications .....	88
4.9	Limitations and recommendations for future research.....	91
	References.....	93

## Appendices

Appendix 1. Interview frame

Appendix 2. Questionnaire

Appendix 3. Key numbers from spend data

## Figures

Figure 1: The triple bottom line (adapted from Carter & Rogers 2008).

Figure 2: Barriers to sustainable procurement (Guenther et al. 2013).

Figure 3: Procurement process (adapted from van Weele 2014, 8).

Figure 4: Public procurement competence levels (adapted from European Commission 2020).

Figure 5: Research approach.

Figure 6: The analysis of spend (adapted from Bauer 2009, 13).

Figure 7: Distribution of expenditure across the six largest purchasing categories.

Figure 8: Important factors in purchasing decisions for internal customers.

Figure 9: Total expenditure by ten organisational units.

Figure 10: Barriers and challenges in sustainable purchasing for internal customers.

Figure 11: Internal customers' desire to include sustainability considerations into purchases.

Figure 12: Frequency of consulting procurement regarding small value purchases.

Figure 13: Types of advice and support internal customers need in sustainable procurement.

Figure 14: Internal customers' preferred channels or methods of communication about sustainable purchasing.

Figure 15: Internal customers' suggestions for improving sustainability in operational procurement.

Figure 16: Operational procurement process of off-contract purchases (modified from van Weele 2014, 8).

Figure 17: Recommendations for sustainable procurement.

## Tables

Table 1: Interview information.

Table 2: Potential sustainability impacts of chemicals (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 3: Potential sustainability impacts of laboratory supplies (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 4: Potential sustainability impacts of electronic, measuring and control installations (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 5: Potential sustainability impacts of engineering and environmental services (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 6: Potential sustainability impacts of optometry products (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 7: Potential sustainability impacts of other research equipment (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Table 8: Background information about survey respondents.

Table 9: Sustainability practices in operational procurement.



# 1 Introduction

In recent years, the concept of sustainability in procurement has gained popularity. Organisations are realising the value of integrating sustainability practices into their supply chain processes. Organisations see sustainability practices as means to reduce their carbon footprint, achieve cost savings, and gain competitive advantage. (Giunipero et al. 2012) It is especially important for public organisations to include sustainability considerations into their procurement strategies (Amann et al. 2014). Public organisations spend millions of euros on products and services each year, accounting for over 14 per cent of the gross domestic product across the European Union (European Commission 2020). As a result, public procurement has the potential to have a major influence on sustainable development goals. Public procurement has the ability to change production and consumption patterns in favour of products and services that are environmentally and socially responsible. (Brammer & Walker 2011)

Sustainability considerations have been widely adopted in purchases that exceed the national and European public procurement thresholds. Sustainability criteria can be included in tenders and suppliers can be evaluated based on the organisation's sustainability objectives. However, there is lack of recognition of smaller purchases and how they affect sustainability performance. Minor purchases have received less attention in literature (Haake & Seuring 2009; Boström et al. 2015). This research gap becomes especially relevant in light of the fact that operational purchasers can have a significant collective impact on the environment, society, and economy (Haake & Seuring 2009). Current research gaps imply that similar comparisons may be discovered in practice. Therefore, this thesis aims to bridge the existing research gap by exploring how operational procurement can contribute to sustainable procurement.

## 1.1 Problem definition and research objectives

Scholars suggest that different types of purchases may have unique sustainability challenges and these differences need to be taken into account (Pagell et al. 2010; Dabhilkar et al. 2016; Tchokogué et al. 2018). Operative goods and services are often purchased on an ad hoc basis

from a large number of suppliers outside of formal procurement agreements. In addition, the procurement of these kind of goods and services is uncoordinated, and responsibilities are dispersed across many units. (Yu et al. 2015) In the case of many operative purchases, the costs of acquiring the materials are higher than the cost of the material itself (Balaeva et al. 2022). According to Parikh & Joshi (2005), small purchases have a tendency to use a greater amount of purchasing resources than larger purchases. It is not surprising that operative purchases have been regarded as one of the most challenging areas of procurement (Barry et al. 1996).

Sustainable procurement relies heavily on contracts (Young et al. 2017). Sustainability considerations are included in tendering but for purchases under the tendering threshold there are no sustainability considerations. Operational purchases usually deal with purchases under these thresholds. The procurement process of operative goods is often organised in a way that gives autonomy to the internal customer (Johnson et al. 2011, 57). Internal customers have an active role in the procurement process because they request the purchase. The role of the procurement professional in operational procurement has traditionally been of transactional in nature issuing purchase orders, following up on orders, and managing the documentation related to purchases (Sollish & Semanik 2012, 241). This approach does not guarantee that sustainability considerations are taken into account. Sustainable procurement process is complex and requires procurement professionals to take into account a wide range of different factors (Meehan & Bryde 2011). Procurement professionals need to adopt new perspectives and approaches to sustainability challenges (Fisher 2013).

Sustainability should be integrated into all purchases. However, the actions to achieve sustainability goals vary depending on the kind of purchase. (Krause et al. 2009) Organisations need to tailor their sustainability initiatives to the unique characteristics and challenges of each purchase. Additionally, Parikh & Joshi (2005) endorse the idea that small purchases and large purchases should be handled by different processes.

Operational procurement and low-value, small purchases which are purchased off-contract represent an interesting avenue for research as the opportunities for implementing sustainability are different. Therefore, the purpose of this thesis is to explore how the procurement function of the case organisation can include sustainability objectives into their operational procurement. The objective is to find ways to make the operational purchasing

more environmentally and socially sustainable and explore the kind of role the operational function could have in enhancing sustainability performance.

## 1.2 Research questions and methodology

This study's research topic centres around how to make the day-to-day purchasing operations in the case organisation more sustainable. The primary research question concentrates on the study's overarching objective. The main research question is:

- How can sustainability objectives be achieved in operational procurement activities?

The application of sustainability objectives into operational procurement activities is the common theme throughout the study. Two sub-questions are established in order to answer the main question and provide a more focused approach to understanding the implementation of sustainability goals in operational procurement in the case organisation. The sub-questions are:

- How can the operational procurement process be improved to incorporate sustainability objectives?
- What competencies do operational purchasing personnel need to effectively advise on sustainability matters?

The first sub-question deals with the organisational aspect and examines the operational purchasing process of the organisation. This sub-question focuses on identifying improvements that can be implemented within the process to effectively integrate environmental and social sustainability considerations. Ways to align the procurement process with sustainability goals will be explored.

The second sub-question deals with the individual aspect of sustainability implementation. The case organisation is keen to develop their purchasers to advise internal customers in sustainability aspects of their purchases. This question is to define the competencies needed by purchasing staff to offer useful guidance on sustainability-related issues to end-users. By answering this question, the knowledge, abilities, and attitudes needed by the operational procurement professionals to give effective advice on sustainability practices are identified.

With better skills, the procurement staff can influence the purchasing decisions of end-users and guide them to make more sustainable choices.

To answer these research questions, case study research is adopted. The case organisation is a Dutch public university. The case organisation has a significant amount of off-contract spend which makes it an ideal case to study. By focusing on a specific case, valuable insights can be gathered by investigating the phenomenon in its natural setting. Multiple data collection methods will be used.

Data about operational off-contract purchases will be investigated. The spend data will provide more concrete evidence on the sustainability integration needs. The analysis of spend data provides a foundation for understanding the current state of sustainability in operational procurement and guides the selection of specific areas for further investigation. Sustainability impacts of most significant spend categories will be identified.

Interviews with the operational procurement team are performed to gain insights into their experiences, perspectives, and challenges related to sustainability in procurement. The interviews will provide an understanding of the operational procurement process and its alignment with sustainability objectives. In addition, the interviews will also touch upon the competencies required by procurement professionals.

A survey is distributed to a sample of internal customers who make purchases in the categories selected based on sustainability impact assessment. The aim was to uncover valuable insight into their awareness of sustainability, motivations behind their choices, any challenges they encounter, and their expectations regarding the process. The data will contribute to an understanding of the current state of the procurement process and guiding the development of recommendations to improve the integration of sustainability objectives into procurement practices.

Overall, the combination of multiple data collection methods enables a comprehensive examination and understanding of the challenges and opportunities within the context of the case organisation. Together, the quantitative and qualitative evidence informs the analysis and findings of this thesis and leads to recommendations for improving sustainability in the

case organisation's operational procurement activities. The research methodology and process of data collection and analysis will be described more in detail in Chapter 3.

### 1.3 Definitions of key concepts

The main theoretical concepts relevant for this study include sustainability, especially environmental and social sustainability, sustainable procurement, public procurement, and sustainable public procurement. The key concepts are defined below.

**Sustainability:** The Brundtland Report's definition of sustainable development has been widely adopted and is often used to describe the concept of sustainability. The report defines sustainable development as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). The concept of sustainability typically includes three dominant dimensions: environmental, social, and economic (Carter & Rogers 2008). In this thesis, the focus will mainly be on environmental and social dimensions.

**Environmental sustainability:** Environmental sustainability refers to addressing current and future generations' resource and service requirements without jeopardising the health of the ecosystems that support them (Morelli 2011). Environmental sustainability issues include, for example, the reduction of waste, greenhouse gases, and air pollution, management of natural resources, and preservation of biodiversity (UNEP 2019).

**Social sustainability:** Social sustainability can be defined as an ability of a business to maintain their operations in a way that promotes human rights standards, labour rights, health and safety, supportive working environments, and diversity (Carter 2004; Najjar et al. 2020). Social sustainability concerns include issues such as recognising diversity and equality, adhering to fundamental labour standards, increasing employment, and creating benefits for the local community (UNEP 2019).

**Sustainable procurement:** Sustainable procurement considers economic, environmental, and social concerns in the management of an organisation's external resources in a way that the supply of goods, services, capabilities, and knowledge required for carrying out, maintaining, and managing the organisation's activities provides value for the organisation, economy, and society (Miemczyk et al 2012).

**Public procurement:** Public procurement is the process of acquiring products, services, and works by public entities, such as government agencies or local authorities. In the European Union, public purchases are governed by legislation in order to maximise the public sector's value for money while guaranteeing compliance with three fundamental principles of equal treatment, non-discrimination, and transparency. (European Commission 2020)

**Sustainable public procurement:** Sustainable public procurement (SPP) is defined as the act of incorporating a concern for larger social and environmental implications into procurement performed by public sector organisations (Brammer & Walker 2011). Following Amann et al. (2014), in this study SPP refers to both green public procurement (GPP) and socially responsible public procurement (SRPP), therefore encompassing the environmental and social dimensions of sustainability.

**Operational procurement:** In this study, operational or operative procurement refers to the purchasing of low-value products and services required by organisations to function on a day-to-day basis. Operational procurement usually deals with the procurement of low-value products and services. Small purchases represent a group of products and services which are of low-price, low-volume, high variety, and low technical complexity. (Parikh & Joshi 2005) These purchases are usually impulsive and urgent in character. In particular, deals with the purchases of goods and services below EUR 50 000.

## 1.4 Delimitations

As stated earlier, there are three dimensions to sustainability: economic, environmental, and social. This study will focus mainly on environmental and social sustainability which are the most relevant sustainability dimensions for the case organisation.

Furthermore, this thesis concentrates on the case organisation's operational purchasing activities. Therefore, the strategic and tactical functions are not covered in this study and makes the scope limited to the operational function. In addition, this thesis will primarily look at purchases made outside of contracts below EUR 50 000.

Public procurement in the Netherlands is subject to national and EU rules and regulations. The EU regulations have certain thresholds for purchases that are subject to public tendering. The EU tendering regulations have no impact on the scope of this study as the operational

purchases are under threshold values. However, the principles of public procurement need to be considered.

### 1.5 Structure of the thesis

The paper is structured as follows. The next part discusses the literature around sustainable public procurement and links sustainability and operational procurement. The third part explains the methodological approach. The results of the empirical part are presented in the fourth chapter. The results are followed by the discussion which also outlines practical and academical implications and depicts limitations and future research.

## 2 Literature review

This chapter discusses the literature background. The first sub-chapter concentrates of sustainable public procurement and provides an overview of the concept of sustainability, discusses the importance of sustainability in public procurement and discusses the drivers and barriers in sustainable procurement. The second part will focus on more on operational procurement and its role in sustainable procurement.

### 2.1 Sustainable public procurement

In recent years, the concept of sustainability in in supply chain management has gained popularity. Organisations are realising the value of integrating sustainability practices into their supply chain processes. Organisations see sustainability practices as means to reduce their carbon footprint, achieve cost savings, and gain competitive advantage. (Giunipero et al. 2012) Procurement is a key function in implementing sustainability practices and values in a supply chain. With a rising awareness of the environmental and social implications of procurement activities, organisations throughout the world are increasingly adopting sustainable procurement practices in order to align their purchasing power with sustainable development goals (Stritch et al. 2020).

#### 2.1.1 Dimensions of sustainability

In order to explain the concept of sustainable procurement, a definition of sustainability is needed. The Brundtland Report's definition of sustainable development has been widely adopted and is often used to describe the concept of sustainability. The report defines sustainable development as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987). More recently, Zhang & Zhu (2022) argued that a clearer and more specific definition is needed so they proposed a new definition for sustainable development: "Achieving higher and more equally distributed well-being levels within ecological limits". This definition covers the three dimensions of sustainability



typically referenced in literature: environmental, social, and economic. These dimensions are also referred to as the triple bottom line (Elkington 1997). The dimensions are presented in Figure 1.

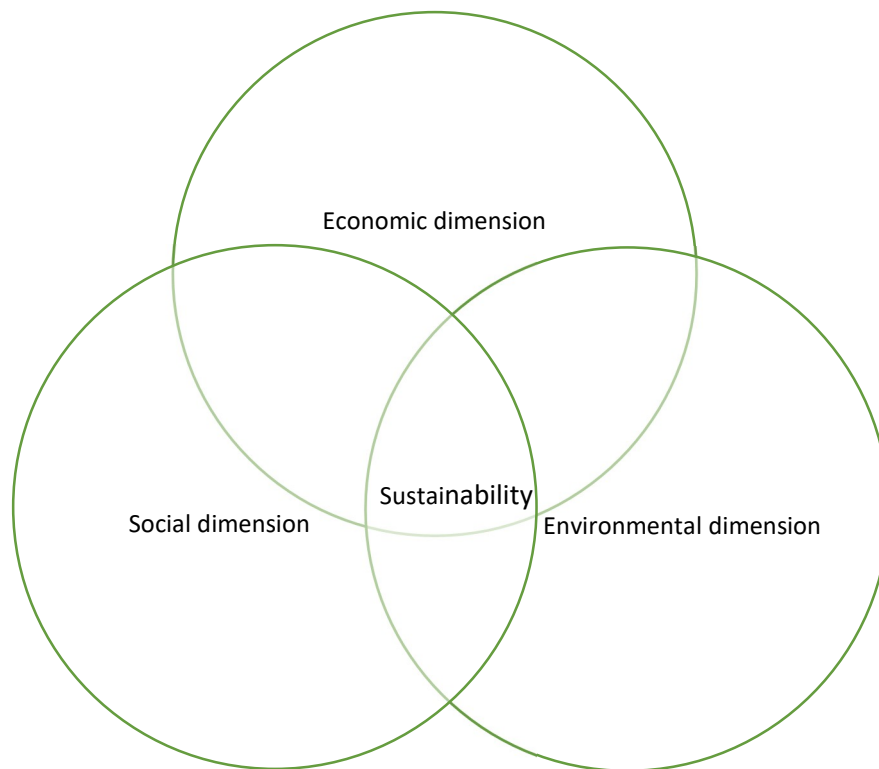


Figure 1. The triple bottom line (adapted from Carter & Rogers 2008).

These dimensions together form the concept of triple bottom line (TBL) (Figure 1). The TBL framework suggests that sustainability should be considered as a multifaceted concept. According to the TBL, sustainability in its truest form emerges when the three dimensions of environment, society and economy come together. It encompasses a range of actions in which organisations consciously and holistically integrate social, environmental, and economic goals in their strategic vision and long-term objectives. (Carter & Rogers 2008)

The **economic** dimension emphasises the traditional financial aspects of business, such as producing goods and services, generating profits, and creating economic value for shareholders (Carroll 1979).

Carroll (1979) suggests that organisations should not solely focus on economic performance but also consider their environmental and social impacts. The **environmental** dimension of sustainability includes actions and behaviours that attempt to conserve natural resources and safeguard ecosystems. Environmental sustainability practices organisations implement include recycling and waste reduction, using renewable energy and using eco-friendly products (McCarthy & Eagle 2021).

**Social** sustainability dimension centres around issues such as diversity, inclusion, equality, poverty, unemployment, and health and well-being (Berry 2011, 33). Social sustainability practices include purchasing from local suppliers, contributing to community projects, considering diversity in recruiting decisions, and having family-friendly policies (McCarthy & Eagle 2021).

Fisher (2013) notes that we live in a dynamic world where new risks to sustainability are always emerging. Therefore, sustainable development is not a static concept. The borders between society and nature are also evolving as a result of science and technology, which challenges the notion that society, the environment, and the economy are the three pillars of sustainable development. (Fisher 2013) In addition, paying attention to the linkages between the sustainability dimensions is essential. According to Rao and Holt (2005), environmental programmes improve both environmental and economic performance. Gimenez et al. (2012) discovered that the implementation of environmental action initiatives leads to improvements in the social dimension as well. The dynamic nature of the dimensions means that changes in a single parameter might affect others and the system as a whole. (Winter & Knemeyer 2013)

### 2.1.2 Sustainability and public procurement

Public procurement refers to the acquisition of goods, services and works by public authorities such as governments and municipalities. Public organisations spend millions of euros on products and services each year, accounting for over 14 per cent of the gross domestic product across the European Union. (European Commission 2020)

Public procurement differs from private sector procurement in many ways. One of the most important differences is the procurement regulation of the public sector (van Weele, 2014).

375) When a purchase represents a value over a predetermined value, EU public procurement directives and regulations have an impact on organisations in EU countries (Thai 2008, 431). Tendering is an important function in public procurement.

In public procurement, a significant number of transactions are small purchases. While the most expenditure is often on high-value, low-volume purchases, most transactions are low-value, high-volume purchases. (Thai 2008, 93) Given that EU procurement regulations only apply to public procurement when the value of tenders exceeds a certain threshold and when tenders are deemed to be cross-border interest, EU countries can decide how to legislate purchases below the thresholds (Jiménez & López 2022).

Sustainable public procurement (SPP) refers to the integration of environmental and social concerns into the procurement process (Brammer & Walker 2011). The ultimate goal of sustainable procurement is to minimise negative impacts in order to provide positive outcomes for the economy, environment, and society (Berry 2011, 4). Public procurement accounts for a significant amount of expenditure, making it a vital tool for driving sustainable development (OECD 2022). Public procurement has the ability to change production and consumption patterns in favour of products and services that are environmentally and socially responsible (Brammer & Walker 2011).

In the sustainable public procurement literature, the environmental dimension of sustainability is often discussed in the context of green public procurement (GPP). GPP is the process of seeking products, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services, and works that serve the same primary function and would otherwise be procured without considering their environmental consequences (European Commission 2016). Sustainable procurement's environmental focus centres around mitigating overexploitation of natural resources by guaranteeing that all items come from verified sustainable origins and that processing and production processes are non-polluting. It also addresses climate change by cutting carbon emissions throughout the whole supply chain and minimising waste by reducing demand, increasing the usage of recycled materials, and reducing material consumption. (Berry 2011, 30)

The social dimension is often discussed in the context of socially responsible procurement. Socially responsible public procurement (SRPP) refers to the integration of social considerations and objectives into the procurement processes of public organisations. It

considers broader social factors such as human rights, labour standards, diversity and inclusion, and support for local communities in addition to merely seeking the lowest price. (European Commission 2021) In today's globalised market, organisations are increasingly realising that they need to take the necessary steps to guarantee socially responsible business practices throughout their supply chains, which can be lengthy and complex. (Berry 2011, 33)

According to the TBL, organisations that want to improve their sustainability performance through sustainable procurement must base their selection of goods and services on the three dimensions of sustainability (Carter & Rogers 2008). They need to consider economic aspects such as best value for money, quality, profitability, and availability, environmental aspects encompassing the products or service's environmental impacts throughout its life cycle, and social aspects which involve evaluating the purchasing decisions' effects on human rights, equitable distribution of resources, labour conditions, and poverty alleviation. (Aktin & Gergin 2016)

### 2.1.3 Sustainability practices in procurement

Sustainability encompasses a broad variety of environmental and socioeconomic concerns. Sustainable procurement practices are based on the concern for the environment, human rights, ethics, philanthropy, and safety (Carter & Jennings 2004). Organisations use many ways to contribute to sustainable goals through procurement processes. Sustainable procurement is not a separate or isolated set of tasks within the procurement process. Instead, all stages and aspects of the procurement process must incorporate sustainability concerns (Tchokogué et al 2018).

Organisations often prioritise sustainability concerns and focus on the ones that are the most relevant to them. UNEP (2022) surveyed public procurement specialists and reports that certain product categories are prioritised for sustainable procurement. According to the survey, these include IT equipment, energy supply and energy services, vehicles, and building design and construction. Similarly, a study by Young et al. (2016) reports that sustainable procurement priorities in UK and Australian universities are in waste, office supplies, building maintenance, IT equipment, food, and transportation.

Organisations leading the implementation of sustainability initiatives have quantifiable and ambitious sustainability goals that are being successfully achieved (Gelderman et al. 2017). Organisations must establish clear sustainability objectives that align with their goals and values. Organisations with a clear and strong sustainability strategy are leading the way in developing sustainable procurement policies. To achieve this, it is important to take a proactive approach to embed sustainability into procurement processes. Organisations can, for example, develop informational material like brochures and guides. (Young et al. 2016) Internal sustainability strategies, policies and guidelines can support the development of a holistic approach and increase awareness of a variety of sustainability concerns (Boström et al. 2015). The most important stakeholders need to be kept up to date with the sustainability policy (Gelderman et al. 2017).

The 3Rs is a popular approach in sustainable procurement. The 3Rs stand for reduce, reuse, and recycle. When procurement integrates the 3Rs in decision making, they assess the potential for products to be reused or recycled at the end of their lifecycle. They consider the environmental impact of the product throughout their entire lifecycle. (Tchokogué et al 2018). Life Cycle Assessment (LCA) is an environmental assessment method that evaluates the environmental impact of a product throughout its life cycle. LCA can be a useful tool in providing information on the product's environmental aspects, meeting customer demands, defining environmental standards for sustainable procurement and assisting in the selection of options. (Nikitchenko et al. 2016) Although LCA can be applied in many different contexts to aid procurement decisions, various resources will be needed in different situations. The purchase's environmental goals, time and budget constraints, and capabilities can have a significant impact on the complexity of the purchase and the extent of LCA implementation. (Jenssen & de Boer 2019)

While the LCA is focused on environmental consideration, Life Cycle Costing (LCC) focuses on economic considerations. LCC is an approach used to assess the total costs associated with a product or service throughout its entire life cycle, from acquisition to disposal. LCC takes into account all costs incurred during the life cycle stages. (European Commission 2016) The LCC approach involves evaluating not only the direct costs but also the indirect and hidden costs associated with a product or service. This includes costs such as installation, operation, energy consumption, maintenance, repairs, replacements, and

disposal. LCC methodology can be used in different stages of the procurement cycle. (OECD 2022).

The evaluation and selection of suppliers based on sustainability criteria is a critical component of sustainable procurement (Cheng et al. 2018; Tchokogué et al. 2018). Organisations can implement this by favouring of suppliers who score highly on sustainability-related criteria during the tendering process (Meehan & Bryde 2011). Supplier evaluation can consider criteria such as environmental performance, safety record, labour rights, capacity to produce eco-friendly products, and accomplishments in lowering carbon emissions related to transportation of goods (Islam et al. 2017).

Many organisations buy from small and local suppliers (Brammer & Walker 2009). This practice entails sourcing goods and services from smaller-scale or regional businesses and promotes social sustainability by supporting local economies and communities. In addition, purchasing from local suppliers often reduces transportation distances which decreases the negative impact on the environment.

Different labels are used to certify environmental and social performance. Eco-labels can be used for creating technical requirements, award criteria, and for ensuring compliance (European Commission 2016). The benefit of eco-labels is that purchasers can rapidly identify products and services that adhere to their organisation's sustainability standards (UNEP 2022). Social labels often address topics like labour rights, human rights, worker rights, fair prices for producers in developing countries, and child labour prohibitions (Nikitchenko et al. 2016).

When implementing sustainability in procurement, the role of suppliers should not be overlooked because as Krause et al. (2009) state, organisations are only as sustainable as their suppliers are. Organisations must cooperate with sustainable suppliers to increase their own level of sustainability. Supplier development is one of the most important practices in achieving sustainability performance (Gimenez & Tachizawa 2012). This involves giving suppliers resources, training, and support to improve their sustainability practices (Gimenez & Sierra 2013).

#### 2.1.4 Barriers and facilitators in sustainable public procurement

There are a number of challenges and barriers to overcome when implementing sustainable procurement, despite the growing awareness of sustainability and the existence of national legal and regulatory structures to ease integration into purchasing. Investigating the barriers to sustainable procurement is necessary in order to understand how to make procurement sustainable (Fisher 2013). Analysis on barriers can be used a starting point for implementing sustainable practices and developing strategies to overcome challenges to making procurement more sustainable (Guenther et al. 2013).

Different categorisations of barriers and facilitators exist in literature. Guenther et al. (2013) categorise different barriers to three levels: individual, organisational, and external barriers. External barriers refer to challenges that exist outside the organisation and are beyond the direct control of procurement professionals. Organisational barriers arise within the procurement organisation itself. Individual barriers pertain to the mindset, attitudes, and skills of the individuals involved in the procurement process. This categorisation and different barriers pertaining to each category are illustrated below in Figure 2. Barriers and facilitators often go hand in hand and under the right circumstances, barriers can evolve into facilitators (Leal Filho et al. 2019).

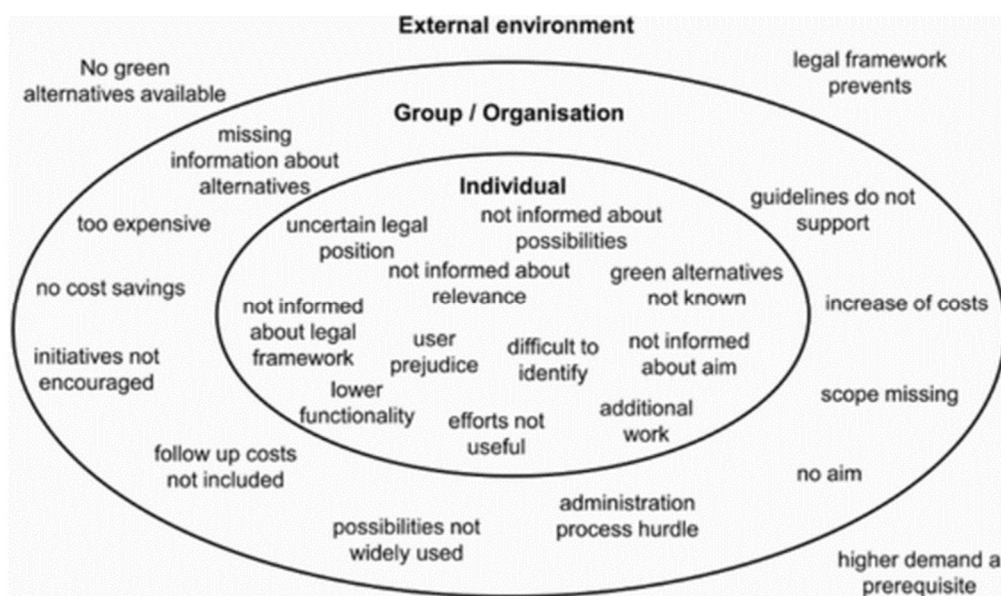


Figure 2. Barriers to sustainable procurement (Guenther et al. 2013).

A fundamental barrier to sustainable procurement is the lack of awareness and understanding of sustainable procurement practices among procurement professionals. The successful integration of sustainable procurement principles and strategies into procurement processes may be affected by a lack of awareness of these concepts. A lack of understanding of sustainable procurement principles and strategies can affect their successful implementation into processes. (McMurray et al. 2014)

Similarly, another key barrier to SPP implementation is a lack of knowledge. Organisations may lack the personnel with the necessary skills and knowledge to implement sustainable procurement effectively (McMurray et al. 2014). Procurement professionals may regard environmental sustainability easier to implement than social sustainability aspects (Young et al. 2016). In addition, end-users may also lack knowledge of sustainable products and services. Therefore, procurement professionals may have challenges in reaching a large audience with useful information about sustainable products. (Bala et al. 2008). To address lack of knowledge and understanding, organisations should implement training programmes (AlNuaimi, & Khan 2019).

Even though the procurement professionals may have knowledge of sustainable procurement practices, lack of proper tools may hinder the implementation. A study by Lukacs de Pereny



Martens & Schwarz (2022) reveals that the lack of an e-procurement system is a notable barrier to sustainable procurement. E-procurement systems can be a valuable tool in supporting sustainable procurement implementation by enabling streamlined communication, data sharing, and collaboration between stakeholders (European Commission 2016).

Without a clear policy and guidelines for sustainable procurement it would be hard to implement sustainable procurement (Leal Filho et al. 2019). To successfully implement sustainable procurement, organisations need to incorporate sustainability into planning, strategy and goal setting, as well as effectively communicate their sustainability policy (AlNuaimi, & Khan 2019; Brammer & Walker 2011).

Cost-related barriers are often cited in the literature. Organisations that are implementing sustainable procurement often struggle to balance financial constraints and sustainability objectives (Lukacs de Pereny Martens & Schwarz 2022). Studies suggest that sustainable products and services are often viewed as more expensive than traditional products and services (Zhang et al. 2022; Brammer & Walker 2009). Lack of financial support prevents organisations from implementing sustainable procurement (Ahsan & Rahman 2017). It is crucial that organisations allocate enough budgets to invest in sustainable procurement that might have long-term economic benefits (Brammer & Walker 2011).

Brammer & Walker (2009) argue that decentralised structure of procurement can hinder the implementation of sustainability. It is more challenging to manage sustainable procurement across a wide variety of products and services when there is a decentralised procurement structure and many suppliers (Leal Filho et al. 2019). However, there is debate over the most advantageous procurement structure. Lukacs de Pereny Martens & Schwarz (2022) report that a centralised structure can inhibit the adoption of sustainable procurement.

One of the most often mentioned barrier is a lack of management support. Top management support can be regarded as one of the most important facilitators for sustainable procurement implementation. (Lukacs de Pereny Martens & Schwarz 2022). Procurement professionals will adopt sustainable procurement if top management is supportive of sustainability (Brammer & Walker 2011).

Another major challenge to sustainable procurement implementation related to the external environment is the lack of availability of sustainable goods and services. Some product

groups may not have sustainable substitutes available. (Brammer & Walker 2009) In addition, the poor quality of greener products may act as a barrier to sustainability adoption (Bala et al. 2008). Procurement professionals may also experience lack of trust in the information on the sustainability of the product provided by suppliers (Zhang et al. 2022).

Gelderman et al. (2017) suggest that sustainability should be developed together with important stakeholders. For increased environmental performance and business sustainability, collaboration with internal and external stakeholders, especially suppliers, is essential (Foo et al. 2019). In addition, as sustainable procurement is implemented, procurement must work systematically and collaborate closely with other business units (Schneider & Wallenburg 2012). Effective communication and coordination between departments facilitate the sourcing of sustainable items and contribute to reaching sustainability objectives (Shaikh & Channa 2022).

## 2.2 Operational procurement and its role in sustainability

This chapter discusses the function of operational procurement and how it can support in reaching sustainability goals. The first part gives an overview of operational procurement and how it sits in the overall procurement process. The second sub-chapter discusses the challenges related to operational procurement and why sustainability might be harder to achieve. The third sub-chapter examines how the operational procurement process can be developed. Finally, the fourth sub-chapter discusses the competencies needed by procurement professionals handling operational purchases and the role they have in sustainable procurement.

### 2.2.1 Overview of operational procurement

In order to examine how sustainability objectives can be implemented into operational procurement, defining the characteristics of operational procurement is in order. In the literature, the term operational procurement is most often used when describing the procurement process. Operational procurement is part of a procurement cycle consisting of strategic procurement, tactical procurement, and operational procurement (van Raaij 2016).

A process model by van Weele (2014, 8) is widely adopted to illustrate the purchasing process. The model is depicted in Figure 3 below.



Figure 3. Procurement process (adapted from van Weele 2014, 8).

The purchasing process is separated into multiple sequential stages and described linearly in the model pictured in Figure 3. In practise, the distinction between the phases is not always sharply defined and phases can overlap or be combined (Thai 2008, 429). In this thesis, the term operational procurement does not refer to a specific phase in the procurement process, but to the purchase of operational goods and services. For the most part, the process follows the traditional process model by van Weele (2014, 8) and it will be used to describe the different procurement stages.

Operational procurement typically involves purchasing goods and services that are required for day-to-day operations and activities. These purchases include expenses related to administrative, facilities, finance and HR, marketing, and information technology. The products and services in these categories are typically purchased one-off and they are low-price. (Payne & Dorn 2012, 3,10). Common types of purchases include office supplies, IT equipment, marketing, transportation and logistics, and professional services. (Thai 2008, 192) Many terms are used to refer to these kind of items and services. In manufacturing companies, the term often used is indirect purchases (Cox et al. 2005a), maintenance, repair and operation (MRO) (Barry et al. 1996), minor procurement (Haake & Seuring 2009) or minor items (Alberg Mosgaard 2015).

The procurement process can be divided into two main phases. The first phase includes the first three stages of the procurement process and primarily deals with technical and commercial aspects of purchasing. The second phase includes the last three stages of the

procurement process and is more focused on logistics and administrative tasks. (van Weele 2014, 30) The first phase can also be called as source-to-contract and the second phase as purchase-to-pay (Schulze et al. 2019). In this thesis, the individuals who perform these processes is referred to as the procurement professional, or more specifically the operational procurement professional when referring to the operational procurement process.

The process starts when an internal customer identifies a need for a product or service and communicate this need to the purchasing department. A purchase requisition is the most common way an internal customer communicates its purchasing needs forward to the procurement department. Organisations can utilise an online requisitioning system which allows for efficient communication and tracking of materials. (Monczka et al. 2009, 46-49)

Once the need has been identified, next phase is supplier selection. Supplier selection involves searching the market for potential solutions and choosing the provider. This phase often takes place at the same time while determining needs and specifications. (Thai 2008, 430) EU directives and regulations do not have an effect on small value purchases, so supplier selection is not dictated by certain specifications. If there is a supplier that has an existing contractual relationship with the organisation, the supplier selection process is quite smooth. Contracted suppliers have been evaluated and prequalified to meet several criteria. The customer may suggest a supplier, but the procurement department has the final say in the selection of a supplier. (Monczka et al. 2009, 46-49) If a supplier is not identified or the internal customer requests a specific supplier of their choosing, the process becomes more difficult (Monczka et al. 2009, 54). The challenges related to operational procurement are explained in the next chapter.

When the procurement department approves the purchasing requisition, a purchase order can be created and submitted to a vendor (Monczka et al. 2009, 46). After the order is submitted to a vendor, procurement monitors the fulfilment of the order. Procurement may have to expedite orders to fulfil the original delivery deadline, deliver ahead of schedule, or to accelerate the delivery of a delayed order. (Johnson et al. 2011, 88)

The last phase in the procurement process is follow-up and evaluation. Procurement professionals need to perform some administrative tasks at the end of the process. For example, procurement may have to deal with warranty claims. Procurement also makes sure all documents related to the purchase are updated and archived. (van Weele 2014, 42)

Finding potential for cost-savings is often the main objective of this process stage but procurement's possible contribution to broader objectives should be considered. (Thai 2008, 437)

All the phases of the purchasing process are rarely passed through each time. The purchasing situation dictates what process steps are necessary. Most purchases are straight rebuys which entails purchasing a known product from a known supplier. New-task situation on the other hand occurs when a completely new product is purchased from an unknown supplier. Modified rebuy describes a situation where a new product is purchased from a previously known supplier. Each purchasing situation represents a varying degree of uncertainty and risk which is reflected in decision-making processes. (van Weele 2014, 30-32)

Purchasing situations can also be categorised based on a taxonomy by Bunn (1993). A casual purchase represents a purchase that is low-value, simple, and routine. These kinds of situations involve no effort to search information about alternative products or suppliers nor analysis of the purchase. Purchases are often made from suppliers with whom purchases have been made in the past. Routine low priority purchases are also low value, frequently purchased items. In comparison to the casual purchase, this type of purchase is more habitual. Information search is limited, and some level of analysis is performed, for example price comparisons. Simple modified rebuy describes situations where the purchased products and services are moderately important to the organisation. There is a focus on proactive issues such as planning for future supply and maintaining long-term relationships with suppliers. The taxonomy also includes three other situations, judgmental new task, complex modified rebuy, and strategic new task, but these are better suited to characterise bigger value purchases. (Bunn 1993)

In addition to carrying out the responsibilities of the procurement process, the procurement function engages in a variety of relationships with stakeholders such as internal customers, suppliers, and other functional groups including finance (Monczka et al. 2009, 40). Public procurement involves a diverse range of actors who play critical roles in the procurement process, influence its outcomes and sustainability implementation (Polonsky et al. 2022). An important actor in the procurement process is the internal customer as the responsibility of operative purchases is often in the hands of the internal customer (Johnson et al. 2011, 57). In public organisations, the purchaser is ultimately serving the end-users and therefore has a responsibility to consider their needs and expectations (Kamann 2007).

### 2.2.2 The challenges with operational procurement and sustainability

As stated earlier, the procurement of operative goods and services has not received enough attention in the literature. However, often a large share of an organisation's expenditure is these kinds of purchases. Operative procurement usually involves purchasing a wide range of materials and services and they are purchased from a large pool of suppliers. In addition, these purchases often lack established purchasing agreements and demand is dispersed across the organisation (Cox et al. 2005a). These characteristics make operational purchases challenging to manage (Moncef & Philipp 2021; Yu et al. 2015) and implement sustainability (Pacheco-Blanco & Bastante-Ceca 2016).

#### **Fragmentation of spend**

Many organisations procure similar products from various suppliers through frequent small quantity orders. This practice often arises from internal customers' individual preferences for specific products and suppliers. (Cox et al. 2005b) Operative goods and services are usually small, low-value purchases. Small purchases represent a group of products and services which are of low-price, low-volume, high variety, and low technical complexity. These purchases are usually impulsive and urgent in character (Parikh & Joshi 2005). In addition, demand is difficult to predict (Gebauer & Segev 2000). Because of the infrequent and urgent nature of the purchases, the procurement department faces difficulties in intervening and influencing the internal customer to choose something more sustainable (Young et al. 2016).

#### **Cost-efficiency**

The costs of processing orders and delivering the products or services might exceed the value of the purchase (Parikh & Joshi 2005). The limited value of each individual transaction increases the price of the goods, and the numerous interactions also raise the price of transactions (Cox et al. 2005b). For this reason, some sustainable procurement practices or tools are not applicable for operative purchases. For example, the LCA approach that is a recommended tool for assessing the environmental impact of products or services is not useful for small value purchases due to cost-efficiency reasons (Haake & Seuring 2009).

#### **Decentralisation**

In the organisational design of public procurement, the degree of centralisation is a crucial component (Patrucco et al. 2021). The process of operative purchasing is often decentralised meaning that purchasing responsibilities are scattered across multiple departments or individuals (Johnson et al. 2011, 57). In a decentralised structure, the internal customer tends to have more responsibility than the procurement department. The procurement department might be in a simply administrative role instead of having decision-making responsibilities which leads to inefficiencies. (Patrucco et al. 2021) In a centralised structure, the central procurement unit is responsible for negotiating frame agreements with selected suppliers and other units are expected to follow these agreements (Kauppi & van Raaij 2015). The aim behind organisation-wide framework agreements is to reduce the number of suppliers, increase purchasing leverage, and reduce purchasing costs (Karjalainen et al. 2009). According to Johnson et al. (2011, 57), the decentralised structure of purchasing results in a fragmented spend, multiple suppliers, different pricing, and various contract terms and conditions. The decentralised structure of operational procurement has also been found to be a barrier for sustainable procurement implementation (Leal Filho et al. 2019). When different departments or units have authority to decide on their own purchases, it becomes more challenging to embed sustainable procurement practices across the organisation (Brammer & Walker 2009).

### **Maverick buying**

When internal customers purchase directly from suppliers outside existing purchasing agreements is referred to as maverick buying (van Weele 2014, 46). Maverick buying is common for operative purchases because they involve a large number of transactions of comparatively low value (Karjalainen et al. 2009). Karjalainen & Raaij (2011) identify three forms of maverick buying that can occur in an organisation:

1. To get better terms and conditions
2. Having an existing relationship with a non-contracted supplier
3. Not being aware of contracts in the purchase category.

The first case occurs when employees compare the terms and conditions of existing contracts with outside alternatives. An employee may find an alternative that is less expensive than the contractual item and believe that they are achieving cost savings for themselves, their

unit, or the organisation. However, this behaviour often does not take into account the total cost of ownership (TCO) or the potential risks associated with such purchases.

The second form of maverick buying occurs when individuals have formed personal relationships with suppliers they have ordered from before. The ordering process has become routine for them, or they are used to specific item or service characteristics provided by that specific supplier and are reluctant to change their usage behaviour.

The third form is due to unawareness of the existence of contracts. Due to the challenge of communicating policies and contract specifics, this behaviour is common for operative goods and services which are bought by multiple individuals within an organisation. (Karjalainen & Raaij 2011)

Monczka et al. (2009, 54) argue that some level of maverick buying is unavoidable. Despite the reasons behind maverick buying, it hinders achieving efficiency and the organisation's ability to meet sustainability objectives (Thai 2008, 434). Sustainable procurement relies heavily on sustainability criteria set in contracts. Without following established contracts with suppliers who have been prequalified against sustainability criteria, an organisation has a harder time guaranteeing the sustainability of purchases made across the organisation.

### **Lack of control**

Internal users often have the main responsibility of making operational purchases (Johnson et al. 2011, 57). Therefore, they have a significant role on the implementation of sustainability. Literature about stakeholder theory and sustainable procurement discuss the influential role stakeholders, such as internal customers, play in sustainability adoption. Stakeholder pressure can act as a motivator for sustainable sourcing (Ambekar et al. 2019). However, stakeholders can also act as a negative pressure and discourage sustainable practices (Meixell & Luoma 2015). Sustainable procurement might be difficult to implement because stakeholders can have conflicting goals. Internal customers often value their autonomy in making purchases which creates a conflict between the internal customers and procurement department which aims for standardisation (Moncef & Philipp 2021). This inter-organisational conflict was observed by Cox et al. (2005a) who report that the procurement department's growing engagement in design and specification can be met with hostility from certain internal users. This is because internal users frequently wish to operate independently and use their own preferred suppliers. The buying habits of the internal



customer may present a challenge for sustainability integration. The end user usually selects goods and services that best suit their need without thinking about cost reductions or demand bundling (Patrucco et al. 2021). Various functions within the organisation lack competence in procurement activities and are often unaware of the associated risks. Lack of control and competence leads to inefficiencies and potential risks. (Cox et al. 2005b)

Furthermore, marketing literature suggests that consumers are placing more value on products that are environmentally friendly as they become more conscious of issues relating to the environment. However, this concern for the environment does not fully show in their buying habits. (Johnstone & Tan 2015) In fact, consumers experience many barriers when considering purchasing sustainable products. (Gleim et al. 2013)

Perceived higher price of sustainable products is a significant barrier for end users considering purchasing greener products. Poor quality of green products is also considered a deterrent from making sustainable purchases. End users may experience they do not have adequate knowledge or expertise in the area of sustainable products. Trust-related barriers may also be experienced. End users may have doubts about the environmental benefits of sustainable products. (Gleim et al. 2013)

### 2.2.3 Operational procurement process development

The strategies for sustainable procurement vary between different purchasing categories (Dabhilkar et al. 2016). Operational goods and services require a different approach than strategic items. The procurement of operative goods and services presents a significant potential for process improvement. The objective is to reduce the acquisition costs while still ensuring availability. Various strategies can be implemented to improve the operational procurement process for small monetary value orders by reducing the acquisition cycle time and administrative costs. (Johnson et al. 2011, 95)

Many organisations spend too much time and other resources managing the ordering of low-value items (Monczka et al. 2009, 74). Small purchases should be managed in an efficient and fast way without any red tape (van Weele 2014, 58). Aboelazm & Afandy (2019) write that a centralised procurement structure should be used for common goods while goods and services that need to be purchased quickly should be procured in a decentralised way. Baily

et al. (2015, 76) write that procurement should take on a more strategic proactive role which entails being responsible for setting overall procurement policies, handling major negotiations, and managing the supply chain. As procurement develops into a more strategic role, day-to-day operative purchasing activities can be delegated to individuals responsible for managing their budgets. Organisations should establish processes and systems that enable the end users to purchase low-value products directly from suppliers without involving procurement (Monczka et al. 2009, 74).

A number of tools are offered to public purchasers with the goal of simplifying the procurement process (Patrucco et al. 2019). One of the best technologies to assist process execution is information technology, such as e-procurement. E-procurement has been shown to have a positive impact on efficiency (Vaidya & Campbell 2016). E-procurement systems have many process improvement benefits. They make ordering simpler, facilitate process standardisation, and more clearer and transparent processes, minimise errors, and provide easier access to information (Panayiotou et al. 2004). According to the European Commission (2016), e-procurement systems can be a valuable tool in supporting sustainable procurement implementation.

One e-procurement tool is electronic catalogues. Electronic catalogues enable the creation, maintenance, and presentation of pricing and quality-related information connected to goods and suppliers (Rai et al. 2009). Users can easily place orders using catalogues, which contain pre-approved items from preferred suppliers. This streamlines the procurement process and discourages maverick buying by letting users to make purchases within established parameters. (Baily et al. 2015, 76; Thai 2008, 435) Catalogues facilitate product standardisation and volume purchases from preferred suppliers (Johnson et al. 2011, 105). Papanagnou & Shchaveleva (2018) link catalogue systems and sustainable procurement writing that catalogue purchasing can provide reductions in lead times, save time for purchasers, and improve the quality of service and this way contribute to sustainability goals.

Another tool for improving the procurement of operative goods is procurement cards. These are essentially credit cards provided to internal customers. When these users need to make lower-value purchases, they can directly contact a supplier and utilise the card for the transaction. Typically, the monetary value of items acquired through procurement cards is relatively low, and involving the formal procurement process or conducting an extensive supplier search would likely be more costly than the item itself. (Monczka et al. 2009, 74)

Johnson et al. (2011, 96) suggest that consolidating purchases is a way to address small value orders. This is also a beneficial method for sustainable procurement. A bulk delivery will have a lower overall impact on the environment than having smaller volumes delivered more frequently. The organisation can for example specify a maximum number of deliveries each week or month. (European Commission 2016)

It is important to have clear rules and guidelines to manage the internal process of purchasing. A policy and procedure manual can play a significant role in enhancing the development of a streamlined procurement process (Johnson et al. 2011, 111). According to Johnson et al. (2011, 57), as the process of operative purchasing is often decentralised, the procurement department might persuade internal users of the benefits of using a structured sourcing process. Procurement professionals can therefore guide the internal customers to products and services for which there are contracts in place. Kauppi & van Raaij (2015) suggest that the procurement department needs to continuously give guidance and mentoring to internal customers who are engaged in operative procurement and inform them of established contracts with preferred suppliers and provide reasoning behind the contracts. This practice guides users towards contracted suppliers with whom sustainability criteria have been set in place according to the organisation's objectives.

Sustainable procurement practices can be applied to all stages of the purchasing process. However, it is suggested that the implementation at the earlier stages of the process is more effective. This deals with the specification or requirements stage where the need is identified. (UNEP 2022) As the procurement process moves forward, a purchaser's potential to impact cost, performance, and sustainability decreases (Berry 2011, 71). A study by Cox (2005b) highlights the need for procurement to engage internal clients early in the procurement process. Therefore, the earlier the procurement department gets involved, the better results can be obtained for sustainability performance.

Getting involved early on in the procurement process at the specification stage necessitates a proactive approach from the purchasers (European Commission 2020). Procurement professionals need to investigate the market, know what is currently available in the market, and what can be achieved in terms of sustainability (Berry 2011, 124). Purchasers need to take the environmental impacts of products and services into account (Alberg Mosgaard 2015). A thorough needs assessment needs to be done at the start of the procurement process. This is done together with the internal customer to consult whether the item is really needed.

(European Commission 2016) In order to achieve sustainability objectives, the internal customer should be encouraged to adopt conscious consumption practices. To do this, procurement professionals should make sure that every purchase is actually necessary and that the demand cannot be made in alternative, more sustainable ways such as sharing a good or service with others, repairing or upgrading existing resources, switching to reusable goods, or hiring or purchasing services instead of products. (Berry 2011, 124)

#### 2.2.4 Sustainable procurement competencies for operational purchasers

Lack of knowledge is cited as one of the most significant barriers to successful sustainable procurement implementation. Many procurement professionals often lack the necessary knowledge and skills to effectively integrate sustainability into procurement processes. However, the significance of training and capacity building in sustainable procurement is increasingly recognised as a critical aspect in promoting sustainable practices within organisations (UNEP 2022). There is a growing acknowledgement that sustainability competencies are becoming more and more important for procurement professionals (Bals et al. 2019; Schulze et al. 2019).

Skills and competencies are frequently used interchangeably. For the purpose of this thesis, competency is defined as the knowledge, skills and abilities that allow people and organisations to function well in a job or situation (European Commission 2020). Competencies encompass a broader range of knowledge and attitudes that are necessary for applying skills effectively (McCarthy & Eagle 2021).

The role of individuals is important in embedding sustainability practices in an organisation. Therefore, it is important to look into the competencies individuals working within procurement require. (Schulze et al. 2022) The needed skill set is dependent on the specific tasks the purchaser needs to perform (Delke et al. 2023). The European Commission has published a framework for public procurement professionals outlining the key competencies and skills required for professionals working in public procurement. It also describes different competence levels ranging from basic to expert. These levels describe the skills and responsibilities purchasers should demonstrate at each level to be able to carry out their roles successfully. (European Commission 2020) Figure 4 depicts the competence levels.

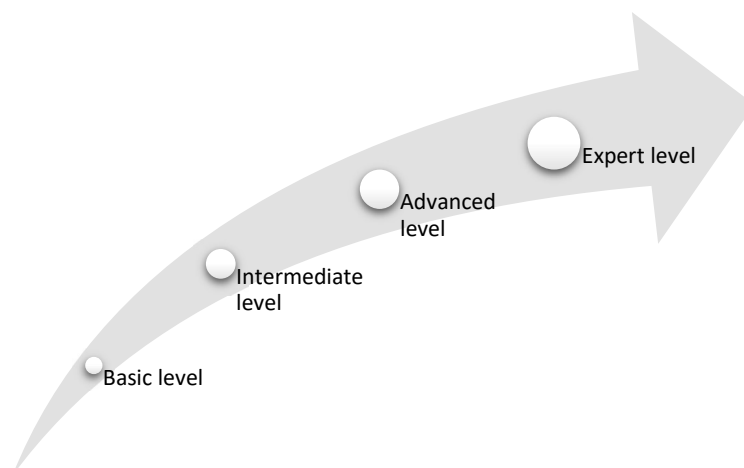


Figure 4. Public procurement competence levels (adapted from European Commission 2020).

At the basic level, public procurement professionals are expected to have foundational knowledge and skills in procurement in order to carry out simple tasks and activities. Procurement professionals at this level work under direct supervision and well-organised framework.

At the intermediate level, procurement professionals are able to carry out procurement processes independently with little supervision. They have a deeper understanding of procurement principles and possess a variety of cognitive and practical skills necessary to carry out recurring procurement tasks.

Professionals at the advanced level demonstrate a range of advanced practical skills needed to handle complex tasks and problems using creative techniques and strategies. They take accountability and leadership in accomplishing procurement tasks, oversee contributions from fellow procurement professionals and make important decisions throughout the procurement process.

At the expert level, procurement professionals have a comprehensive understanding of all procurement aspects and have a wide variety of techniques, methodologies, and skills to tackle complex issues and generate creative resolutions. Professionals take on leadership roles and contribute to shaping their organisation's policy and vision. (European Commission 2020)

Various taxonomies of procurement competencies are presented in literature. A procurement professional requires a combination of procurement specific competencies and competencies that deal with the behavioural and interpersonal skills of the individual, often referred to as soft competencies (Dubey & Gunasekaran 2015). Procurement specific competencies are competencies needed to carry out procurement processes and are the core requirement for a procurement professional (Tassabehji & Moorhouse 2008). On the other hand, soft competencies complement procurement specific competencies and are characterised by their transversal nature (European Commission 2020).

Highlighting procurement's transformation into a more strategic function, Giunipero & Percy (2000) classify seven competence categories: strategic skills, process management skills, team skills, decision making skills, behavioural skills, negotiation skills, and quantitative skills. According to Giunipero & Percy (2000), interpersonal communication skills, ability to make decisions, ability to work in teams, analytical skills, and negotiation skills are the top five skills procurement professional need.

Tassabehji and Moorhouse (2008) classify procurement skills into technical skills, interpersonal skills, internal enterprise skills, external enterprise skills, and strategic business skills. Technical skills are the core administrative competencies that any procurement professional requires. Interpersonal skills are essential for engaging with individuals in team setting and one-on-one basis. Internal enterprise skills

Research on the specific competencies required for sustainable procurement is still in its infancy despite extensive research on procurement competencies (Beske-Janssen et al. 2023). Schulze et al. (2019) proposed a model of sustainable procurement competencies with four dimensions.

Functional-oriented competencies are related to more technical skills needed to carry out the procurement process. Procurement professionals require understanding of procurement processes and practices. In order to implement sustainable procurement practices, procurement professionals require a basic understanding of sustainability concepts. This involves a holistic understanding of sustainability concepts, relevant regulations, familiarity with the organisation's sustainability strategies, and the ability to search for and use sustainability information effectively. (Schulze et al. 2019; Schulze et al. 2022)

Cognition-oriented competencies are general knowledge and a comprehensive understanding of conceptual and systemic thinking. Conscientiousness is the ability to thoroughly analyse sustainability issues in procurement and approaching them in a careful and serious manner. Also, resourcefulness is needed to address sustainability challenges. Resourcefulness entails the capacity to create ideas and find solutions based on sustainable procurement processes. (Schulze et al. 2022)

Social-oriented competencies are related to the ability to effectively interact with others. This category includes many aspects of communication skills. (Schulze et al. 2019; Schulze et al. 2022) The ability to manage relationships is often mentioned as one of the most important competencies in procurement. This deals with both internal and external relationships, namely relationships with internal stakeholders and suppliers (Karttunen 2018). In addition to directly communicating with suppliers, procurement professionals at the intermediate level need to monitor supplier performance and develop robust relationships with them (European Commission 2020). The operational procurement role also requires communicating with other stakeholders, such as internal customers and other internal interfaces. As a sustainable procurement competence, communication skills are the ability to clearly express and convey sustainability issues by applying appropriate communication methods and channels (Schulze et al. 2022).

Meta-oriented competencies are personal competencies that facilitate the acquisition and application of other essential competencies. These are often situated at the intersection of attitude and competence. In this category, commitment to change is an essential competence. (Schulze et al. 2019; Schulze et al. 2022) Other competencies include persistence and confidence. Persistence refers to the willpower and dedication to deal with an issue despite the issue's complexity or the possibility that other members of the organisation may not have the same level of dedication. Confidence is needed in pursuing and achieving sustainability goals. It includes a purchaser having a clear idea of what needs to be done and a willingness to push for the desired outcome. (Schulze et al. 2022)

#### 2.2.5 Operational procurement professionals' role in sustainable procurement

The actions and decisions of individual purchasers or purchaser groups have an impact on the achievement of sustainable procurement objectives. Commitment from procurement

professionals is essential in the adoption of sustainable procurement. (Grandia et al. 2015) A study in the context of circular purchasing by Neessen et al. (2021) found that procurement professionals play different roles in circular purchasing depending on the level of responsibility they take. Purchasers successful in implementing circular purchasing take an active role and feel a joint responsibility with budget holders to reach circularity objectives. On the contrary, purchasers less successful in circular procurement adoption have a more passive and advisory role. Purchasers in an advisory role believe that it is not their obligation to take the lead in the adoption of circular economy but the budget holders. (Neessen et al. 2021)

A study by Grandia (2015) discusses the role of change agents in sustainable procurement. Change agents can for instance offer advice, facilitate processes, solve problems, or arrange workshops. They have an important role in eliminating resistance and assisting individuals or project teams in moving closer to committing to sustainable procurement implementation. Behravesht et al. (2022) recognise the role of champions in sustainable procurement adoption. Champions are internal stakeholders that have a central role in influencing, advocating, and driving the adoption of sustainable procurement. Also, Tchokogué et al. (2018) discuss the importance of transformational leaders in implementation of sustainable procurement practices. These leaders are characterised by their energy, enthusiasm, and charisma.

According to Giunipero & Percy (2000), managing internal customers is one of the most important skills in procurement. Competencies to managing internal relationships have received less attention in literature than competencies for managing relationships with suppliers (Karttunen 2018). However, as the internal customer is very involved in the procurement process (Johnson et al. 2011, 57), and the best chances to influence the sustainability of purchases is at the very beginning in the process (Berry 2011, 71), internal stakeholder-related skills should not be overlooked.

According to Tassabehji & Moorhouse (2008) challenges that might affect procurement involvement in the decision-making process, getting “buy-in” to procurement strategy, and cultural barriers and resistance to change.

The first challenge describes a situation where procurement professionals find it challenging to gain recognition from other departments within the organisation. Therefore, a core skill is



influencing to get buy in internally. (Tassabehji & Moorhouse 2008) It might be difficult for operational procurement professionals to get their sustainability advice taken seriously if they have challenges being recognised by other departments.

Procurement professionals might experience that they are not brought into the decision-making process early enough to contribute value. (Tassabehji & Moorhouse 2008) This suggests that operational procurement professionals need to be early involved in the procurement process in order effectively integrate sustainability (Berry 2011, 71). However, internal customers might not respond positively to procurement's involvement in their purchases (Cox et al. 2005a). Therefore, procurement professionals need to communicate in a meaningful and collaborative manner about sustainability issues with stakeholders (Schulze et al. 2022). According to Cox et al. (2005b), if a persuasive style fails, procurement needs adopt a more coercive approach involving a top-down measure to ensure compliance with desired procurement processes.

Procurement professionals might face challenges in gaining acceptance for their strategies within the organisation and getting other members of the organisation to support procurement strategies (Tassabehji & Moorhouse 2008). Procurement needs to set policies for sustainable procurement. Maverick buying is very common with operative purchases and harmful for sustainability (Thai 2008, 434). According to Kauppi & van Raaij (2015) procurement must provide guidance and information to people involved in operational procurement about existing procurement contracts and the justification for them.

Procurement professionals might encounter resistance to change within the organisation (Tassabehji & Moorhouse 2008). Procurement professionals work closely with various departments and stakeholders. Overcoming resistance to change is important for implementing sustainable procurement practices (Shaikh & Channa 2022). In order to implement new sustainable procurement practices, internal customers and everyone who is part of the process needs to recognise the significance of sustainability and their respective roles in achieving it (Mendonça et al. 2021).

## 3 Research methodology

This chapter explains the research methodology used in this thesis study. This chapter starts with an explanation of the research approach. Next, the data collection process is explained followed by the description of data analysis. Then, reliability and validity are discussed. At the end of this chapter, a short case description is provided.

### 3.1 Research approach

In order to gain in-depth understanding of the research topic, a mixed method study was conducted. A mixed method approach provides a comprehensive understanding of the research problem (Hurmerinta-Peltomäki & Nummela 2006). The case organisation will provide a specific event that will be investigated in its actual setting. The advantage of studying a case organisation is that rich empirical data can be collected which allows for a thorough understanding of the event under consideration. (Kähkönen 2011) In this study, the event is the integration of sustainability objectives in operational procurement activities. The case study approach enables a holistic understanding of the challenges and opportunities associated with embedding sustainability into operational procurement.

A case study approach has been chosen for this research because the topic is less researched and exploration of the topic through a case allows for an in-depth and holistic understanding, providing important contributions to both academic and the practise. It provides practical insights into challenges and opportunities related to sustainable procurement of operational goods.

Case studies usually involve different data collection methods including interviews, secondary data, direct observations or participant observation (Yin 2014, 105). In this study, data is collected through spend data, interviews, and a survey. Figure 5 illustrates the data sources used in this study and how they contribute to the broader analysis of the case. The data collection methods used in this study are specified in section 3.2.

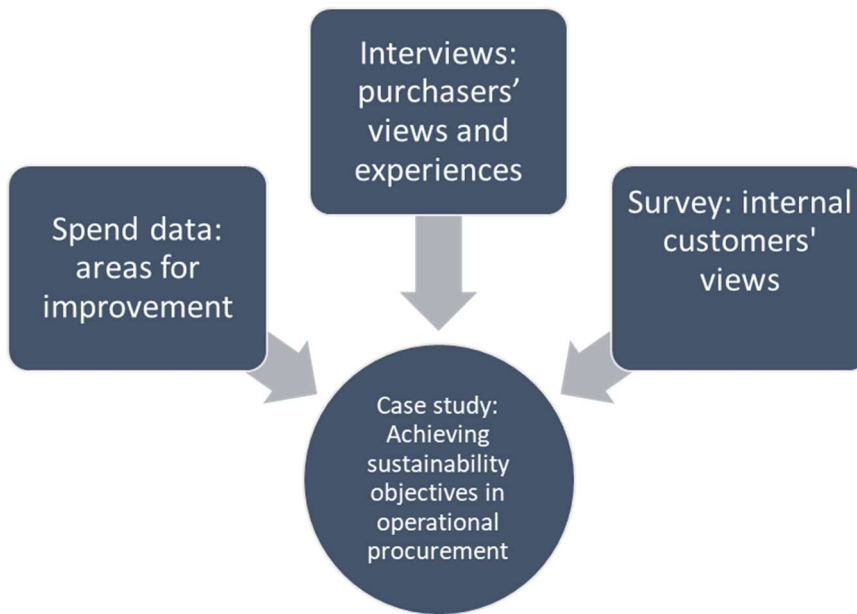


Figure 5. Research approach.

Through the analysis of the spend data and determining potential sustainability impacts for significant categories, key impact areas and areas for improvement can be identified. Interviews with key personnel working with the operational procurement process, together with the survey to internal customers, will provide a picture of the current practices, challenges, and opportunities through two different stakeholders who experience the process in different ways.

Together, the different data collection methods provide a holistic understanding of the case. This study focused on University of Twente's operational off-contract procurement. The research was commissioned by the procurement department. This provided an easy access to internal data. The case organisation is expected to be a representative case within the public procurement domain. The case organisation is described more in chapter 4.1.

### 3.2 Data collection

The data collection of this thesis included multiple methods. The first step in the data collection process was to obtain spending information of operational off-contract purchases. The data was collected from the organisation's P2P system. Initially, the data set included

basic information about purchases made in 2022 such as order numbers, order dated, purchasing organisation, invoice numbers, invoice dates, ledger account numbers, supplier names, purchase category groups, and invoice descriptions. The data set required some cleaning and enhancing. Supplier locations were added to the data set. All negative and zero values were removed as were rows without purchase category groups. Purchases over € 50 000 were excluded from the analysis, as the focus is more on small value purchases. Relevant information was translated from Dutch to English.

In addition, members of the operational procurement teams were interviewed to gain insight into their experiences and views on sustainable procurement. These individuals have direct experience in the procurement process. The interviews were semi-structured. Semi-structured interviews use an interview frame with pre-selected themes and possibly some key questions. This method allowed the thesis researcher some flexibility as questions might vary slightly between interviewees depending on their background and the flow of the conversation. (Saunders et al. 2016, 391) The interview questions were designed to obtain information on procurement practices, sustainability initiatives used in procurement, and potential sustainability improvements.

In total, six interviews with the operational procurement team and procurement manager were conducted in July and August 2023. Three of these interviews were conducted in English by the thesis researcher and two in Dutch by a Dutch speaking student assistant. Some of these interviews were in person while others were online in Teams. All interviews were audio-recorded and transcribed. Dutch interviews were translated into English by a translation software. Table 1 provides information about the interviews. The interview questions are presented in Appendix 1.

Table 1. Interview information.

Interviewee	Length of interview	Reference in text
Operational procurement 1	30 min	I1
Operational procurement 2	18 min	I2
Operational procurement 3	36 min	I3
Operational procurement 4	22 min	I4
Operational procurement 5	19 min	I5
Operational procurement 6	18 min	I6

Furthermore, to gain insight into the role of the internal customer, a short questionnaire was sent to selected individuals who had made purchases. Because internal customers have significant role at the start of the procurement process, they have major responsibility in the sustainability of the purchases. Therefore, it is important to engage with internal customers who have direct involvement in purchasing decisions. The purpose of the survey was to explore their perceptions, behaviours, and preferences regarding sustainable procurement. The questionnaire was developed based on the insights from interviews with operational procurement professionals and literature. Both closed-ended and open-ended question types were used. Different response scales were structured depending on the question. The survey questions are shown in Appendix 2.

A survey was determined to be the most suitable data collection method for collecting information from internal customers because of the large sample size. The questionnaire was sent to 192 individuals who make purchases in the purchasing categories under consideration. Purposive sampling was used to select the participants for the survey to guarantee that the participants had relevant experience in the categories under consideration. A reminder was distributed by email to the entire sample, since responses were anonymous.

### 3.3 Data analysis

The spend data was used to assess the sustainability of UT's operational purchases. The methodology for identifying sustainability impact described by Bauer (2009, 13) was used as an inspiration. This methodology involves the identification of product groups with high public procurement value, identifying a group of products with substantial environmental impact, and identifying product groups with potential for environmental improvements. The European Commission recommends a similar approach to determine which products or services to prioritise. The environmental impact, budgetary importance, and potential to influence the market are factors that should be considered. (European Commission 2016) Figure 6 below illustrates the spend analysis process steps.

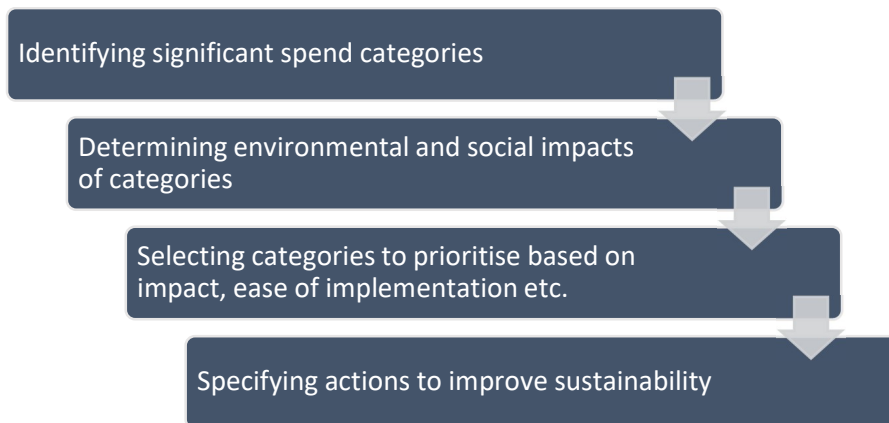


Figure 6. The analysis of spend (adapted from Bauer 2009, 13).

Upon preliminary analysis, the highest spend groups were identified and selected for further analysis. Similar to Bauer's (2009) methodology, a hot spot analysis described by O'Brien (2023, 224) for determining potential sustainability impacts was used as a guidance. An analysis was conducted to determine products or services which potentially have significant sustainability issues. This analysis was used as a basis for prioritising sustainability implementation efforts. After identifying the most significant spend categories, the further analysis included determining the sustainability impact of the products or services in these categories. At first, the researcher gathered possible environmental and social sustainability impacts for each category. University of Oxford has done similar categorisations of sustainability impacts for multiple categories (University of Oxford 2016). These were used as a source material and complemented with additional insights from the spending data. The findings were discussed with the SEE Programme Manager to validate results and gather additional information.

When analysing the sustainability impact of the purchasing categories, the insights of the spend data were taken into account where appropriate. Otherwise, the sustainability impact is based on generalisations. The generalisations are approximations that might not perfectly capture the nuances of each purchase category. The products inside a purchase category might not have the same functionalities or purposes. Therefore, there are products inside a purchase category that are completely different, and the sustainability impacts might be completely different as well. It is difficult to know what kind of product is in questions as there are no full descriptions available.

Interviews were recorded and transcribed for analysis. The interview transcripts were analysed using qualitative content analysis. Qualitative content analysis involves formulating categories from the data (Schreier 2012). The coding was conducted with the help of ATLAS.ti software. Inductive approach was applied when analysing interview data which involves open coding, creating categories and abstraction (Elo & Kyngäs 2008). First, the data was read through, and segments were labelled with descriptive codes according to the themes of the interview framework. Then, codes were grouped into categories. Created categories were grouped into broader categories to reduce the number of categories.

The questionnaire was distributed using Qualtrics software. The survey yielded 29 finished responses. Upon closer inspection, 27 responses were usable for analysis. Therefore, the response rate was 14 %. Survey responses were analysed in Microsoft Excel to turn data into insights. Responses to open-ended questions were analysed by content analysis. Coding categories were derived from the textual data. Findings are presented using multiple graphs and charts to illustrate the data.

### 3.4 Reliability and validity

This study attempted to increase reliability by describing the data collection and data analysis processes, providing the reader with a clear understanding of how the study was conducted (Saunders et al. 2016). To increase the reliability of the study, interviews were audio recorded and direct quotes were included in the empirical part of the study that reveal the interviewees' direct thoughts. The interview and survey questions are presented in the appendices.

Validity has been attempted to be increased by using multiple methods and data sources. A mixed method approach has increased the validity of this study. Findings can be validated by comparing results from both quantitative and qualitative data, supporting the same conclusion and strengthening the study's validity. (Hurmerinta-Peltomäki & Nummela 2006)

### 3.5 Case introduction

The case organisation is a public higher education institute in the Netherlands. The University of Twente (UT) was founded in 1961 and is one of the youngest universities in the country. The university offers a wide range of bachelor's, master's, and doctoral programmes. The university has a strong focus on technology and engineering but also offers study programmes in business administration, psychology, and communication.

Sustainability is of paramount importance at the UT. Sustainability was included in the organisation's strategy, vision, and mission in 2019. UT is committed to sustainability and has set ambitious goals to reduce its environmental impact and promote social equity. UT's sustainability goals are based on the United Nations Sustainable Development Goals. Sustainability is managed through the Sustainability, Energy & Environment (SEE) programme. UT's commitment to sustainability is reflected in its campus operations, education, and research.

For operational management of the organisation, UT focuses on the environmental sustainability dimension. The environmental goals deal with reducing greenhouse gas emissions, avoiding environmental pollution, reducing the organisation's impact on land use change, deforestation, and scarcity of natural resources, and emphasising the importance of preserving and protecting biodiversity. The university has developed ten themes sustainability efforts are based on. The themes are energy, water, waste, food and drinks, travel and mobility, biodiversity, procurement and purchasing, buildings, events, and finances.

The procurement of goods, services and works is handled by different processes at the case organisation. Operational procurement is critical in supporting academic and administrative functions by ensuring that necessary resources are available when needed. The operational function is divided into back-office and front-office. The back-office handles orders larger than €50 000 and up to €215 000. The front office handles orders up to €50 000. The front office also acts as the first point of contact for internal customers about orders and resolves daily issues with customers and suppliers. The tactical function is responsible for orders exceeding European tender thresholds. It is also responsible for the management of procurement contracts. The procurement functions are supported by information management which provides support in the P2P system and by providing reports.



## 4 Empirical study

This chapter presents the results of the empirical study. First, sustainability impacts for each purchasing category are presented based on the spend data. Second, the results of the interviews are presented. Third, the results from the survey to internal customers are presented. Lastly, the different data collection methods are brought together by a case analysis.

### 4.1 Spend data: Sustainability impacts of operational purchases

The first step of the sustainability analysis of operational off-contract purchases was to pick categories for more in-depth analysis. This was done by identifying the most significant spend categories. Figure 7 below shows the distribution of spend across six of the largest categories.

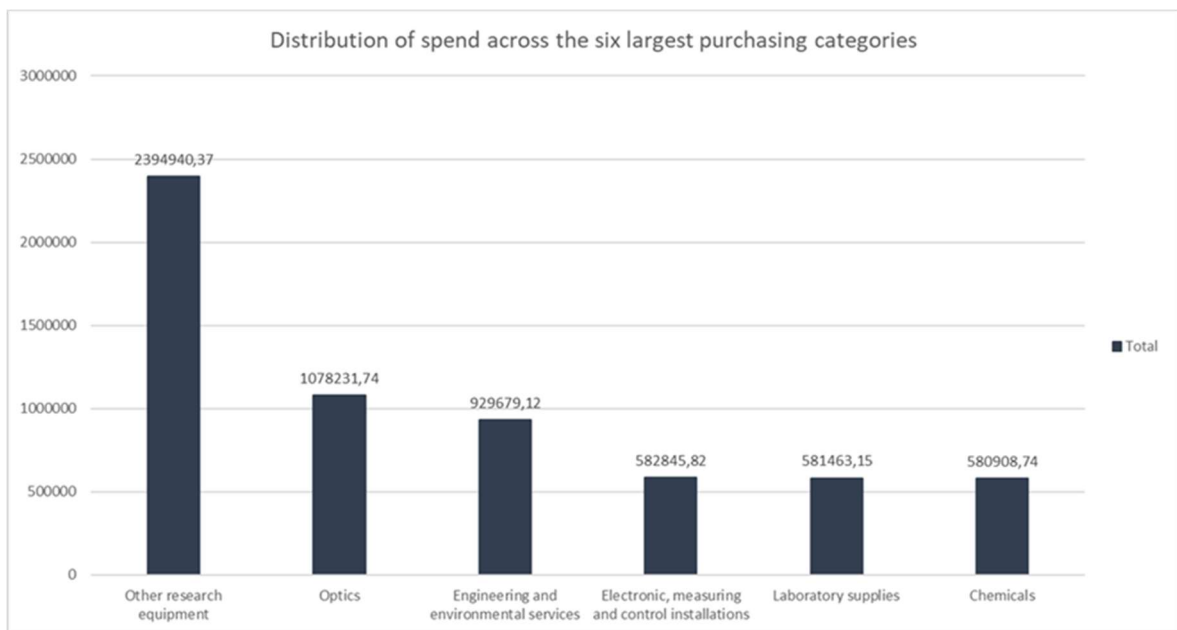


Figure 7. Distribution of expenditure across the six largest purchasing categories.

The spend analysis revealed that the most significant spend categories were (1) other research equipment, (2) optics, (3) engineering and environmental services, (4) electronic, measuring and control installations, (5) laboratory supplies, and (6) chemicals. Figure 8

below shows the total spend by ten organisational units which had the most spend in these categories.



Figure 8. Total expenditure by ten organisational units.

As can be seen from Figure 8, TNW is the organisation with by far the most spend. TNW is the Faculty of Science and Technology with research focusing on nanotechnology, biomedical engineering, clinical technology, sustainable energy technology and smart devices.

The second step included determining sustainability impacts for these purchasing categories. Sustainability impacts were gathered into tables categorising environmental and social impacts. These tables do not represent exhaustive lists of all sustainability impacts associated with these purchasing categories. It is impossible to assess the sustainability of these purchases in great detail because there are no full product or service descriptions available in the data and the purchasing categories include a wide variety of products and services. The identified sustainability impacts should be seen as factors that should be taken into account when making purchases. These findings can also be used to prioritise sustainable procurement efforts.

Assessing environmental and social sustainability impacts of products and services is a very complex task. There are no widely accepted sustainability standards or criteria for assessing

or measuring an organisation's sustainability progress. In order to ensure a streamlined assessment and practicality, the sustainability impact of products and services sustainability impacts were assessed based on some common sustainability indicators. The analysis of sustainability impacts of purchases was mostly based on the following indicators (European Commission 2016; European Commission 2021):

- Materials used to make the product/carrying out the service
- Production process used to make the product
- Energy and water consumption during use/carrying out the service
- Durability/lifespan of the product
- Waste generation and opportunities for recycling
- Packaging of the product
- Transportation of the product or service supplier staff
- Social and ethical considerations such as employee safety and human rights.

By concentrating on these indicators, a range of environmental and social sustainability issues are addressed, ensuring a comprehensive perspective on sustainability impacts of the purchases. Many of the sustainability impacts apply to multiple purchasing categories. However, the sustainability impacts of services are slightly different than of products. For services, the impacts are heavily related to the energy and materials used and waste generation in carrying out the service as well as working conditions of employees.

Next, the possible sustainability impacts are presented per purchasing category starting from the category with the lowest spend. Some key numbers for each category are presented in Appendix 3.

#### 4.1.1 Chemicals

This category includes different kinds of chemicals needed for research. Chemicals, such as reagents, catalysts, and solvents are often used in laboratories (Royal Society of Chemistry

2022). Table 2 highlights the potential sustainability impacts identified for this category of materials.

Table 2. Potential sustainability impacts of chemicals (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Environmental sustainability risks	<ul style="list-style-type: none"> <li>• May contain hazardous substances</li> <li>• Energy use of storage equipment e.g., refrigerators</li> <li>• Transportation: small volume orders, shipping from outside of Europe</li> <li>• Disposal of chemical waste: water usage</li> </ul>
Social sustainability risks	<ul style="list-style-type: none"> <li>• May contain hazardous materials for human health and safety: transport, storage, disposal</li> <li>• International manufacturing supply chains: ethical considerations</li> </ul>

The chemical industry is known to be highly energy intensive and to produce large-scale greenhouse gases (O'Brien 2023, 233). The production of chemicals often involves energy intensive processes. Some chemicals may be hazardous for the environment and human health and safety. Improper handling of hazardous chemicals can pose risks for the individuals working with these materials. (Ozben & Fragão-Marques 2023) International supply chain issues are applicable for chemicals as there may be various stages of production, transportation, and distribution.

A total of 806 chemical orders were made. Chemicals were ordered from 106 different suppliers who are mostly located in Europe. Most orders came from Dutch suppliers followed by Germany and Belgium. The order sizes are small which contributes to many sustainability impacts. Small volume orders contribute to higher transportation emissions and increased packaging waste.

#### 4.1.2 Laboratory supplies

This is a category of products needed for various laboratory work and experiments. Example products include test and sample tubes, pipets, glass bottles, petri dishes, experimental models (mice), skin punches, syringes, needles, cleaning products, and gloves. Table 3 shows an overview of potential sustainability impacts for laboratory supplies.

Table 3. Potential sustainability impacts of laboratory supplies (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Environmental sustainability risks	<ul style="list-style-type: none"> <li>• May contain hazardous materials</li> <li>• May be disposables</li> <li>• May contain single-use plastic</li> <li>• May be delivered in excessive packaging</li> <li>• Transportation: small volume orders</li> </ul>
Social sustainability risks	<ul style="list-style-type: none"> <li>• International manufacturing supply chains: ethical considerations; employee safety, human rights</li> <li>• May contain hazardous materials</li> </ul>

A total of 1220 orders belong to the category laboratory supplies. Laboratory supplies were ordered from 83 different suppliers. Most of these suppliers were located in Europe with one supplier located in the United States. Measured by the number of orders, most of the orders came from Dutch suppliers. Laboratory supplies are made from various materials, such as glass and plastic (Ongaro et al. 2022). Laboratory supplies may contain a high amount of single use plastics. Products including pipette tips, filter bottles, tubes, and gloves contain plastics, occasionally different types of plastics in combination (Royal Society of Chemistry 2022). Many laboratory supplies are disposables due to their specific use for experiments and tests. Disposables and single-use components can result in increased waste generation (Ongaro et al 2022).

The median order size is 174,75 EUR, highlighting the small size of the orders in this category. Packaging waste is a significant concern in many industries. Many products are

packaged with an inner and an outer plastic bag, or with a cardboard box that is taped together with a lot of plastic adhesive tape, making it harder to separate materials for recycling (Zhang et al. 2023). These impacts are further emphasised when ordering small quantities and making purchases often. Small volume orders increase the number of emissions associated with transportation. International supply chain risks such as ethical concerns may be applicable for laboratory supplies as well even though most orders came from European suppliers.

#### 4.1.3 Electronic, measuring and control installations

This category includes installations and setups and electrical maintenance and modifications. A total of 62 orders were made from 17 different suppliers who are all located in the Netherlands. Table 4 lists the potential sustainability impacts associated with these kinds of services.

Table 4. Potential sustainability impacts of electronic, measuring and control installations (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Environmental sustainability risks	<ul style="list-style-type: none"> <li>• Resource intensive production: electronic components</li> <li>• Travel impact of supplier staff (mode and frequency)</li> <li>• Water and energy used carrying out the service</li> <li>• Waste generated in carrying out the service: electronic waste</li> <li>• Planned obsolescence: electronics that are not upgradable</li> </ul>
Social sustainability risks	<ul style="list-style-type: none"> <li>• International manufacturing supply chains: manufacturing of electronic components</li> <li>• Lack of diversity and inclusion</li> </ul>

The sustainability impacts include similar elements as in the previous category. A factor that needs to be considered in this particular category is electronics. Electronic products and electrical products are associated with many environmental impacts due to the materials used in their manufacturing, their energy usage, and difficulties connected with their disposal at the end of their lifecycle (European Commission 2016).

A potential environmental sustainability impact for the services in this category include the impact of the travel by the supplier staff to the location. The impact depends on the transportation mode and frequency of the travel. Some works may require no visits at all while others may involve multiple visits. Other environmental impacts are related to carrying out the service. Associated impacts to carrying out these services are water and energy usage and waste generation. Carrying out the services may also contribute to electronic waste. Planned obsolescence is present in this category as well and can lead to electronic waste.

There can be potential for social sustainability risks even though all of these services were purchased from Dutch suppliers. Social issues may be present, such as lack of diversity and inclusion (Hofmann et al. 2014). In addition, the manufacturing of electronic components can be associated with labour and human rights violations in some regions.

#### 4.1.4 Engineering and environmental services

This category includes outsourced services such as consulting for building and renovation works. A total of 169 orders were placed that belong into this category. All of these orders came from the Netherlands from 39 different suppliers. Table 5 presents potential sustainability impacts related to this category.

Table 5. Potential sustainability impacts of engineering and environmental services (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Environmental sustainability risks	<ul style="list-style-type: none"> <li>• Travel impact of supplier staff (mode and frequency)</li> <li>• Water and energy used in carrying out the service</li> <li>• Waste generated in carrying out the service</li> </ul>
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Social sustainability risks	<ul style="list-style-type: none"> <li>• Noncompliance with regulations</li> <li>• Safe physical and mental working environment</li> <li>• Lack of diversity and inclusion</li> </ul>
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The sustainability impacts of services are different than products. Services can consume resources such as energy and water even though not involving physical materials. Waste can also be created while carrying out the service. For example, construction projects generate all kinds of waste, and some professional services may produce paper waste. The impact of travel by supplier workers to the location is one potential environmental impact related to the services in this category. Impact depends on the form of transportation and the frequency of travel.

There can be potential for social sustainability risks even though all of these services were purchased from Dutch suppliers. Possible issues that suppliers might have can be related to non-compliance with regulations related to employee rights, safety, and well-being (Hofmann et al. 2014). Suppliers may also have lack of diversity and inclusion, which is an essential factor of social sustainability.

#### 4.1.5 Optics

Optics represents a group of optomechanical components. Looking at the invoice descriptions of the orders, this category includes products such as optical lenses, optical rails, lens mounts, fibre components, microscopy illumination sources, optical filters, and laboratory supplies such as laser safety glasses and optical cleaning tissues. Table 6 presents an overview of potential impacts.

Table 6. Potential sustainability impacts of optometry products (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).



Environmental sustainability risks	<ul style="list-style-type: none"> <li>• May contain hazardous or other materials</li> <li>• May be delivered in excessive packaging</li> <li>• Energy usage of equipment</li> <li>• Water usage of instruments (cooling)</li> <li>• Transportation: shipping from outside of Europe</li> <li>• Difficult to repair (sending back to supplier)</li> <li>• Planned obsolescence</li> </ul>
Social sustainability risks	<ul style="list-style-type: none"> <li>• May contain hazardous materials for human health and safety</li> <li>• International manufacturing supply chain (employee safety, human rights, etc.)</li> </ul>

Optomechanical components may contain a combination of materials that can be challenging to recycle. Some materials might be hazardous which poses challenges for recycling and human health and safety.

Long distance transportation can result in increased carbon emissions, especially when shipping from outside of Europe. The use of excessive packaging is also a sustainability risk that should be noted. Planned obsolescence is a strategy to encourage product replacement by designing products with a limited lifespan, making them difficult to repair, or emphasising aesthetic features that fade quickly. This can lead to increased consumption and waste generation which has environmental implications. (Guiltinan 2009)

A total of 603 orders belongs into this category. Items belonging into this purchasing category were purchased from 51 different suppliers based in 11 different countries. Even though most of the optics orders were from Dutch or German suppliers, the possibility of international manufacturing supply chains cannot be overlooked. International supply chains may involve concerns related to human rights and labour conditions, as well as the environment.

#### 4.1.6 Other research equipment

This is a challenging category to analyse because the range of products is vast. This category includes products that could probably be categorised into the other purchasing categories. This category includes both products and services such as electronic items, laboratory items and consulting. Example products in this category include air pressure regulators, welding electrodes, seal rings, needles, syringes, microfluidic tubings and stainless steel. Table 7 presents the environmental and social impacts these kinds of products could potentially have.

A total of 622 orders were placed that belong to this category. The items belonging in this category were ordered from 189 different suppliers from 16 different countries. Measured by spend, most orders came from the Netherlands, followed by Germany, France, United Kingdom, and the United States.

Table 7. Potential sustainability impacts of other research equipment (adapted from University of Oxford 2016 and based on discussion with the SEE Manager).

Environmental sustainability risks	<ul style="list-style-type: none"> <li>• Transportation: small volume orders, shipping from outside of Europe</li> <li>• May be delivered in excessive packaging</li> <li>• May be disposables: laboratory products</li> <li>• May contain single use plastic: laboratory products</li> <li>• Resource intensive production: electronic components</li> </ul>
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	<ul style="list-style-type: none"> <li>• May contain materials that are challenging to recycle: electronics (metals)</li> <li>• Planned obsolescence</li> </ul>
Social sustainability risks	<ul style="list-style-type: none"> <li>• International manufacturing supply chain issues: electronic components (employee safety, human rights etc.)</li> </ul>

Since the range of products that belong into this category is huge, the sustainability impact assessment is difficult. Each type of product in this category may have distinct sustainability impacts. Electronic and electrical products have a significant environmental impact attributed to the materials involved in their production, their energy consumption during use, and the challenges associated with their disposal at the end of their lifecycle (European Commission 2016). Laboratory items may raise concerns for single-use plastics, potential for re-use, and chemical waste.

It is widely recognised that firm supply chains can have sustainability issues related to them. The products in this category can have long supply chains which present risks to sustainability. Issues connected to international supply chains include social issues which are related to working conditions and compensation and ethical business conduct issues that are concerned with the ethical behaviour of a firm (Hofmann et al. 2014).

Since the variety of products in this category is vast and each type of product in this category may have distinct sustainability impacts, we can look at other things that emerge from the data. The items belonging in this category were ordered from multiple suppliers located in 16 different countries. Measured by spend, most orders came from the Netherlands, followed by Germany, France, United Kingdom, and the United States. The order sizes are relatively small. Even though most orders are coming from close by, the environmental impact of transportation and packaging of these orders in small volumes and frequently can be notable.

#### 4.2 Interviews: Procurement process and sustainability

This section describes the results of the interviews and concentrates on the operational purchaser's experiences and views regarding sustainable procurement. The structure follows

the interview structure. First, the operational procurement process is described. Second, sustainability practices, challenges and opportunities in operational procurement are illustrated. Lastly, sustainable procurement competencies and advising are discussed. This section will give an overview of the current procurement process and operational purchasers' role in sustainable procurement.

#### 4.2.1 Operational procurement process at the case organisation

The first interview theme concerned the current process and practices of the case organisation. The interviewees described how the process is organised currently and if they are experiencing any problems with it. The process starts with the internal customer placing an order in the P2P system Proactis. If the order is under €50 000, the front-office handles the order and if the order is above that, the back-office handles the order. Before placing the order with the supplier, the team needs to check if the order has all the required information such as price and supplier information.

The key actors of the process are the internal customer who places the order, the operational purchaser who checks the order, and the supplier. The internal customer is usually an assistant to a researcher who makes purchases for them on their behalf. The back-office frequently cooperates with tactical procurement and sometimes with the sustainability department regarding tenders.

The procurement process is smooth when internal customers purchase from preferred suppliers. When an order is placed for a supplier that is not a contract supplier, the operational purchaser needs to contact the internal customer and ask them to switch to a contracted option. They usually look for an alternative from contract suppliers and present that to the customer:

*“We check if what they buy is possible to buy with one of our contract suppliers... we will reach out to the end user and connect with them to make sure that they buy it in the right place.” (I4)*

The interviewees experienced that internal customers are sometimes irritated by this interference in their order. Internal customers are supposed to place orders with contract suppliers, but obviously this does not always happen, and the operational procurement team

needs to advise them to do so. Interviewee 4 thought maverick buying happens because the internal customer did not know of the existing contracts, or they could not find the product on the ordering site. To Interviewee 3's experience, internal customer's do not purchase from preferred suppliers because they can get the item cheaper or faster from somewhere else or they have had a bad experience with the contract supplier option.

The interviewees' responses revealed that most of the problems related to the procurement process have to do with combination of the internal customer not correctly filling out the order and the system itself. The interviewees described that if something is not correct on the order, the whole order needs to be cancelled and a new one needs to be created. This results in more work for both the customer who placed the order and the operational purchaser who checks the order.

#### 4.2.2 Sustainability in operational procurement: practices, barriers and opportunities

The second interview theme dealt with how sustainability could be integrated into the procurement process. The inclusion of sustainability goals into procurement is driven by the organisation. Many of the interviewees were aware that sustainability is mentioned in the strategy of the organisation. The interviewees also mentioned that the procurement manager is a significant party in advocating for sustainability in procurement processes.

On an individual level, the interviewees showed a sense of awareness that being sustainable is inevitable and how everyone must contribute to it:

*“Ultimately, it's also an objective that you have to, for a long time to come, and we'd all like that world to become a bit cleaner.” (I6)*

The interviewees described some strategies they are currently using to make purchases more sustainable, but these activities are related to purchases from contract suppliers. Consolidation of orders was mentioned as one of the methods:

*“So sometimes they (internal customers) order five products for €6, then we're going to ask them ‘can you combine the order for us?’ ... That's really the only thing we do.” (I3)*

*“We can assemble the different orders from before we'll expect the whole week and then send it in one order.” (I2)*

There were mixed experiences regarding how easy it is to notice consolidation opportunities. According to Interviewee 3, it is not easy because it is not a build in feature in the system:

*“You really have to be focused on that because it doesn't give you an alert or something. You really have to look for it.” (I3)*

Another method or tool that was mentioned was a green button giving the internal customer sustainable product option in the P2P system:

*“And we had an option in this package that if someone is filling their shopping basket, that they have the possibility to use a sort of green button. To more or less change the items which are more sustainable and make an option for that one so that we reduce or we improve.” (I1)*

These strategies are difficult to implement for orders outside of contracts because there are so many suppliers and technically it is difficult to implement in the P2P system. The interviewees agreed that it is indeed difficult to incorporate sustainability into operational purchases which are purchased outside of contract suppliers. When asked about the barriers to sustainable procurement in operational purchases, the most mentioned challenge was related to the internal customer. The interviewees described a lack of control over the process:

*“Why is it difficult? Because it depends on the supplier. It depends on the buyer. We don't have control for that.” (I3)*

*“It's a little bit difficult because we see a lot of requests made by credit cards. So we don't have any influence on that process.” (I1)*

Internal customers buy what they want, use their own preferred suppliers, and want to receive the goods fast. Operational procurement cannot influence the supplier to for example, use environmentally friendly shipping options either. Interviewee 2 thought that internal customers are largely ignoring sustainability considerations when making purchases:

*“The person who ordered the products, there's only one thing that they want and then that is that the product they have ordered, they want it as soon as*

*possible. And sustainability, they don't really care. They only want the product.” (I2)*

In addition, one interviewee mentioned the lack of sustainable suppliers as a barrier to sustainable procurement. Despite expressing that integrating sustainability factors into the operational procurement process is challenging, the interviewees expressed a sense of hope that it could be done. More importantly, many expressed their willingness to do more than they currently do. To make operational procurement more sustainable, many of the interviewees highlighted the role of the internal customer:

*“But our customers also need to take a bit more responsibility.” (I6)*

*“I guess, the person who ordered stuff and I guess they already must know that we are working on a sustainability process, and they have to accept it. And the conclusion is that they sometimes must wait a little bit longer than usual.” (I2)*

Interviewees also recognised that it takes time to create awareness and acceptance around sustainability. Advising customers was seen as a strategy to improving sustainability. Other suggestions to better incorporate sustainability into the process included consolidating orders to one supplier, purchasing from local suppliers, placing bigger orders, raising issues to colleagues and collaboration, and developing Proactis.

#### 4.2.3 Giving advice about sustainability

The procurement team recognises that they do not have much control of what the internal customer buys and therefore they cannot much influence the sustainability of the purchases. The procurement function has a goal to have operational procurement professionals to have an advising role in sustainable procurement. As the operational procurement acts as the first point of contact for customer requests and questions, it seems natural to add this role to their responsibilities. Also, the team already gives advice related to purchases.

Communication was regarded as an important competence. Operational procurement professionals serve as the initial point of contact to customer inquiries, requests, and complaints. Staying calm and friendly were also perceived as important behaviours because customers might become irritated when they do not get what they want. In addition to communication skills, the procurement professional in operational procurement needs to

have organisational skills, because the job requires handling a lot of data and emails. One interviewee expressed that because the workload is significant, they need to constantly be on top of everything.

In order to give advice about sustainability, operational procurement professionals would need some new competencies. For competencies in order to advise internal customers about sustainability, interviewees thought they would need knowledge about sustainability. They need to know the sustainability impacts of products so that they can offer better alternatives to customers. This quote represents the interviewees' views on needed advisory competencies:

*“We need to have the knowledge. We need to know what the impacts are. We need to be up to date within, say you want to buy something overseas, how much impact does that have on the environment. And we need to know the effects.” (I4)*

Interviewees also indicated that they need to be alert for the situations where sustainability of the purchases could be improved. In order to give advice, communication skills were also highlighted. Some interviewees thought they have enough information about sustainability already, but some recognised a lack of sustainability related skills in their skill set. Sustainability is still a relatively new thing at the department. Even though the operational procurement professionals already give some advice to the internal customers, it is a new responsibility that takes time to get into.

Possible challenges relating to advising were also discussed. Interestingly, one of the interviewees thought that advising internal customers about sustainability should not be a part of their responsibilities, at least at first:

*“That's not our task, I think, we just control the orders... Not at first. We can just remind them.” (I3)*

Interviewees saw that operational purchases are not worth the time because of the low value of these purchases. They also expressed that there is little time to execute this. The time spent looking for sustainable alternatives was also questioned. Further, looking for sustainable alternatives is not always successful for interviewees because they cannot find a good alternative or the customer needs something specific.



How the internal customer responds to being given advice may also be a challenge. Some interviewees described that the customer might become irritated when procurement intervenes in their purchases. Further, internal customers' willingness to purchase more sustainably was questioned. One interviewee thought that internal customers do not care enough about sustainability yet. Ultimately, the customer is the one who decides what gets purchased.

Interviewees also mentioned that there is not enough knowledge to advice yet. Regarding this challenge, some of the interviewees mentioned that they should work together with the sustainability department. Cooperation with the sustainability department has been more common within the tactical procurement and tendering.

Across the interviews, the interviewees highlighted that the internal customer should take some responsibility over the sustainability of the purchase. The interviewees suggested some methods how sustainability awareness could be improved:

*“Maybe good communication on the web pages of procurement or emails by direction.” (I2)*

*“Some people who are buying, they have to come together in a meeting. I think that's the best, easy one. And talking about what we are busy with, what we are doing and why we are doing it.” (I3)*

The organisation is offering possibilities for improving the employees' competencies. Online courses are offered to procurement employees on various subjects. Interviewees thought that there could be sustainability related trainings as well but none of them had further knowledge about the contents of these courses. The procurement department is at the early steps of sustainability integration in operational procurement, and they know that employees need to be trained for sustainable procurement. Currently, they are working on competencies and planning how to make procurement professionals better advisers. Opinions towards training were mainly positive among the interviewees. There is willingness and eagerness to improve the sustainability of operational purchases by the operational procurement professionals.

### 4.3 Survey: Internal customers' views on sustainable procurement

This chapter presents the results of the survey. Multiple charts and figures are used to present the results. Internal customers were surveyed to gain more understanding of their role in procurement decision-making. Internal customers are the individuals who make orders in the case organisation. There are two kinds of internal customers. One is an individual who purchases goods for their own use and the other is an assistant who purchases on behalf of other individuals. They make the requisition based on the requirements of the end user and they are the one who has contact with the procurement department regarding orders. Table 8 provides background information about the respondents. A majority (70 %) belong to the organisation unit TNW. This was also the largest spender overall across the purchasing categories (Figure 9). Respondents purchase a wide range of different products. 33 % of the survey respondents purchase goods for themselves, and about 66 % respondents purchase for someone else. A majority of respondents (66,6 %) make purchase requests daily or weekly.

Table 8. Background information about survey respondents.

Q1. Organisation		Q2. Purchased category *	
TNW	70,0 %	Other research equipment	27,5 %
ET	3,7 %	Optics	13,0 %
EEMCS	7,4 %	Laboratory supplies	27,5 %
LISA	3,7 %	Chemicals	17,4 %
CES	7,4 %	Other	14,5 %
CFM	3,7 %		
Other	3,7 %		
Q3. Origin of purchase need		Q4. Frequency of making purchases	
Myself	33,3 %	Daily	37,0 %
Someone else	66,7 %	Weekly	29,6 %
		Monthly	25,9 %
		Quarterly	7,4 %
		Rarely	0,0 %

\* Respondents could pick multiple answer options

To get an idea what internal customers base their purchasing decision to and how important sustainability factors are for them, the survey respondents were asked to rate how important each factor is in their purchasing decision when purchasing a small value product (Figure 9).

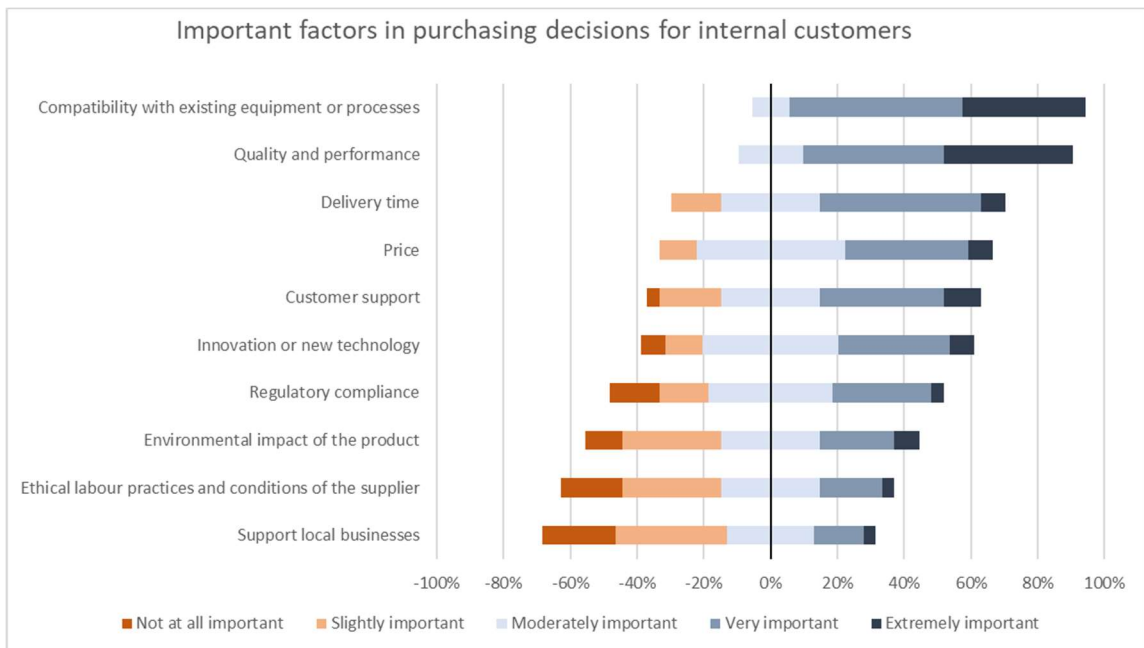


Figure 9. Important factors in purchasing decisions for internal customers.

As can be seen from the chart above, the most important factors in purchasing decisions are compatibility with existing equipment or processes, quality and performance, and delivery time. Supporting local businesses, environmental impact of the product and ethical considerations were rated as the least important factors. This suggests that internal customers do not base their purchasing decisions on sustainability considerations. This might be due to some barriers that they are experiencing. Barriers and challenges in considering sustainability factors in purchasing decisions are presented in Figure 10.

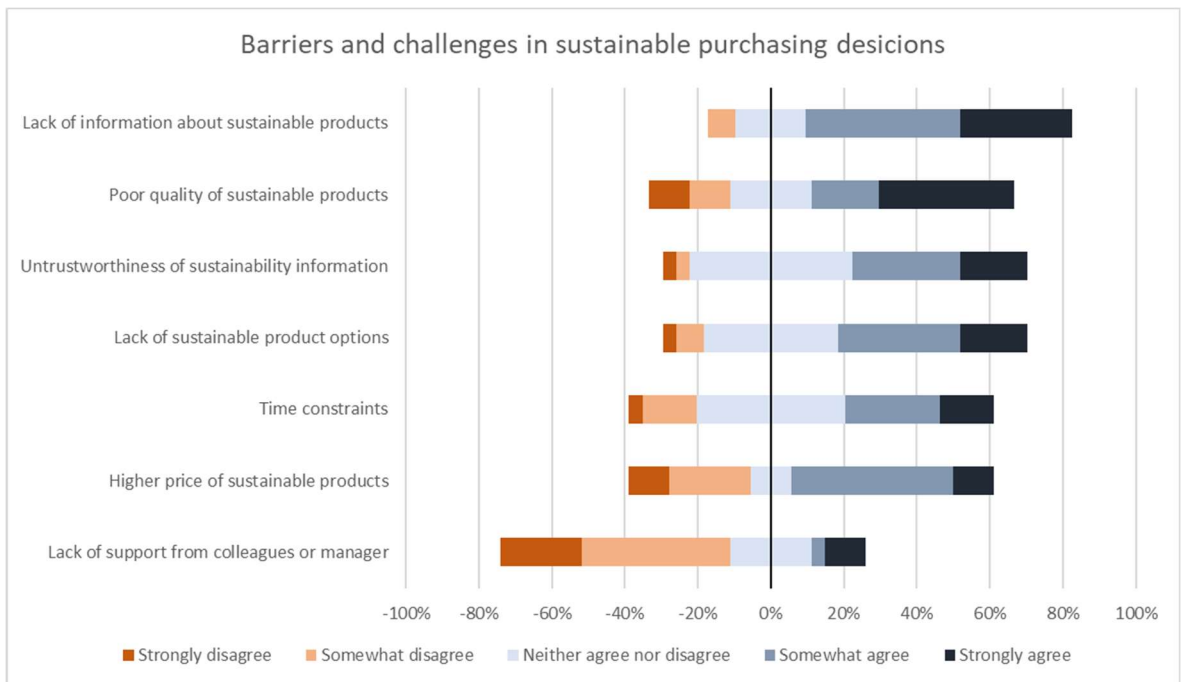


Figure 10. Barriers and challenges in sustainable purchasing for internal customers.

Lack of information is the most significant barrier for internal customers to purchase more sustainable products, followed by the perception that sustainable products are of poorer quality than traditional products. Lack of support from colleagues or managers is rated the lowest. High price of sustainable products is often cited as one of the most significant barriers in sustainable procurement but in this survey, it was not among the most important barriers.

Respondents could also elaborate on any challenges they have encountered. One respondent points out that they simply do not have a choice to choose a sustainable option in the category they are purchasing. Another highlights their role in the decision-making process saying that it is not their decision what is purchased. Relating to the lack of information and time constraints, one respondent says that they have little time to inform themselves and that this should be the task of the procurement department. Further, some of the respondents find the definition of sustainability challenging and that there is lack of information what sustainability actually means in products.

Even though internal customers experience barriers in sustainable procurement, there is willingness to purchase more sustainable products (Figure 11).

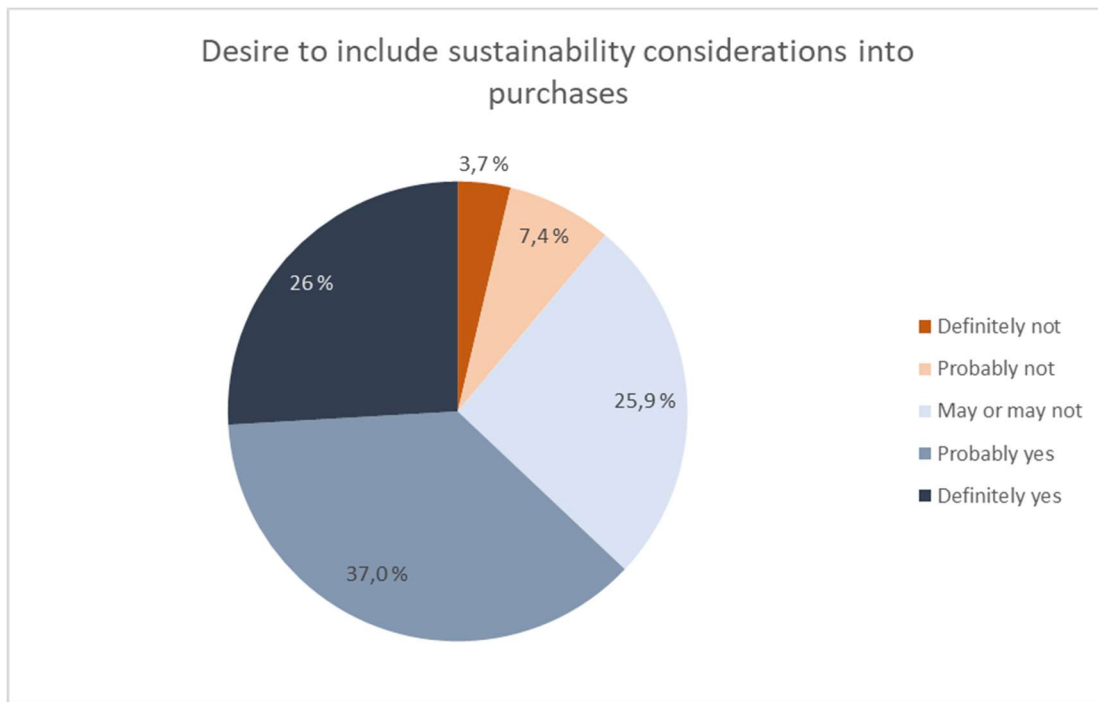


Figure 11. Internal customers' desire to include sustainability considerations into purchases.

The pie chart above shows that the largest group of respondents (37 %) said that they are probably willing to include sustainability considerations into their purchases. 26 % of respondents definitely want to include sustainability considerations into purchases. However, about 25 % of responses were neutral. A minority of participants (3,7 %) indicated that they do not want to include sustainability considerations into purchases. Some of the interviewed operational procurement professional thought that internal customers do not care about sustainability and not want to purchase more sustainably. It is apparent from this figure that there is willingness to consider sustainability in purchases. Procurement may have a harder time trying to convince the customers who do not want to take sustainability into account in their purchases. They may respond negatively into efforts to being pushed towards more sustainable choices.

To get an idea how often internal customers currently engage with the procurement department regarding their small-value purchases, they were asked to indicate how often they have some consultation with procurement (Figure 12).

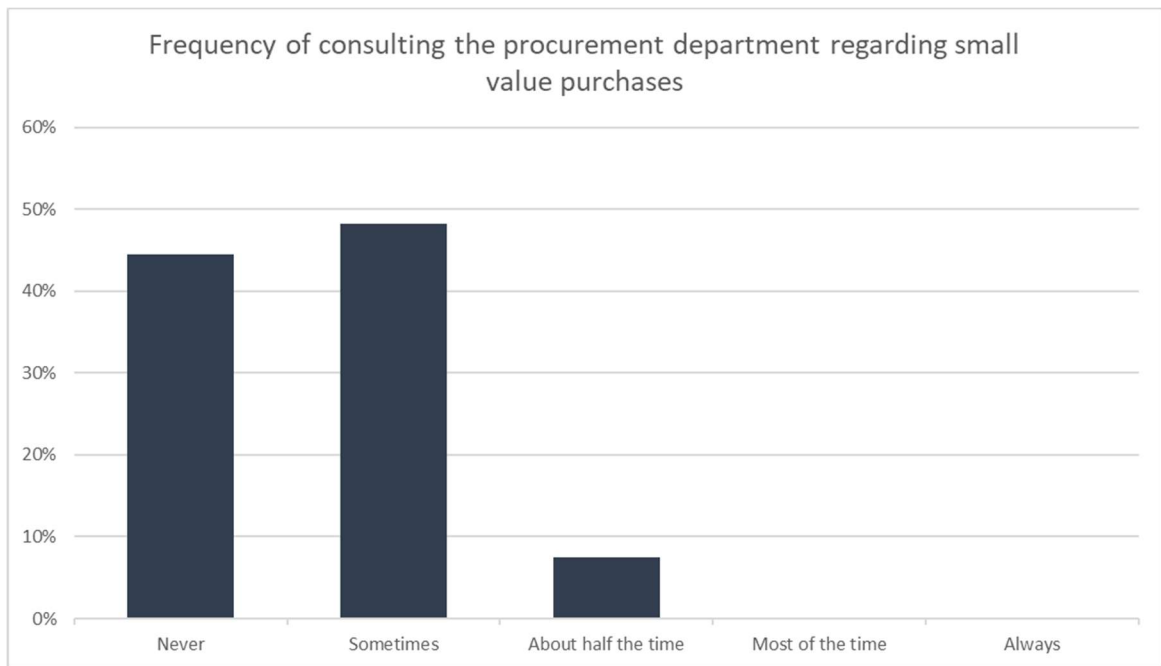


Figure 12. Frequency of consulting procurement regarding small value purchases.

As can be seen from Figure 12, internal customers do not often involve the procurement department when making purchases of under 50.000. 44,4% of respondents never consult procurement, and 48,2 % of respondents approach procurement occasionally. Only a minority of participants (7,4 %) consult procurement about half the time they make small-value purchases.

Internal customers' views regarding receiving advice about sustainable purchasing were explored. First, survey respondents were asked what kind of advice or support would be beneficial for them. Categorized responses are presented in Figure 13.



Figure 13. Types of advice and support internal customers need in sustainable procurement.

Five themes emerged from the analysis. Internal customers would like to receive information about sustainable options and sustainable suppliers, and support in recognising sustainable options. Lack of information was revealed as the main barrier for internal customers to include sustainability considerations in their purchasing decisions. These results suggest that internal customers need more information about sustainable options and then they need to be guided towards these options. Some respondents indicated that they would benefit from information about sustainability and how to recognise what is sustainable. Others needed information about sustainable options and where to find these. A couple of respondents wrote that they would benefit from clear indicators guiding them towards sustainable options. These indicators could display the environmental and social sustainability impacts of the products on the website. Two respondents wrote that they would benefit from guidelines and being informed of these guidelines, for instance, concerning preferred suppliers. Consolidation of orders was also mentioned.

To get an idea which would be the most efficient ways of giving advice about sustainable purchasing, internal customers were given different methods and channels of communication from which they were asked to pick the best options for them (Figure 14).

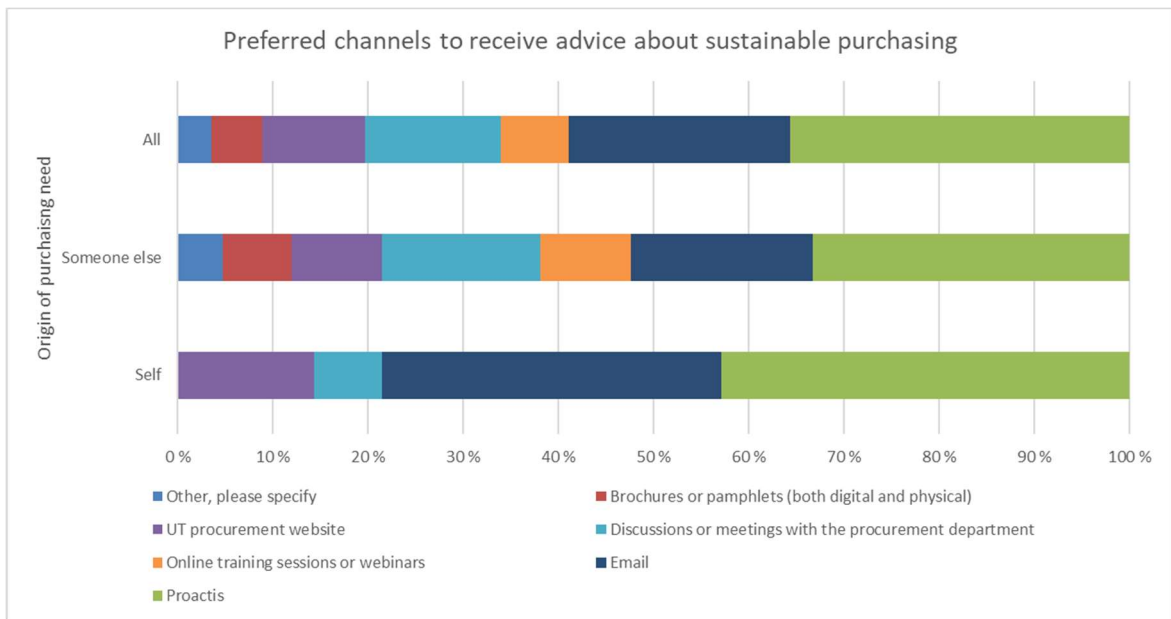


Figure 14. Internal customers' preferred channels or methods of communication about sustainable purchasing.

As can be seen from Figure 14, Internal customers would like to receive advice about sustainable purchasing inside the P2P system Proactis or by email. This is the case in both purchaser groups. The least wanted options are brochures and online trainings. On one hand, internal customers seem to want personal contact and on the other hand, the contact needs to be efficient. This is further supported by the finding that customers do not often include consultation with procurement when making purchases. Operational purchases are usually made on an ad hoc basis, so customers want that the process is as quick as possible. They might not spend much time researching options so alternatives would need to be presented to them in an efficient way. Those who purchase for someone else are more open to online trainings or webinars than those who purchase for themselves. Individuals purchasing for themselves also do not care about brochures.

One of the respondents suggested that occasionally a member of the procurement team should work in the same building as the internal customers. This way the actors could be in closer cooperation with each other and build closer relationships and understanding of the working ways of each other.

Survey respondents could write their suggestions for improving sustainability in operational procurement. Categorized responses are presented in Figure 15.



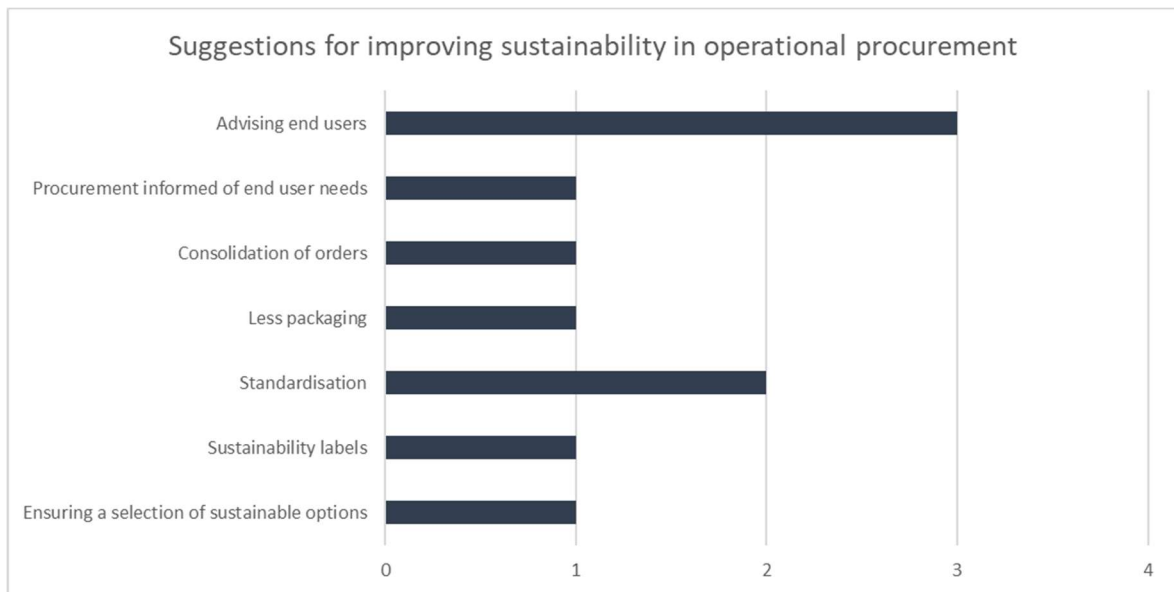


Figure 15. Internal customers' suggestions for improving sustainability in operational procurement.

The survey respondents gave various suggestions. A few respondents wrote that informing the end user about sustainable options would be a good strategy. One respondent wrote that procurement professionals should be more aware of what kinds of products internal customers buy so would understand their needs better. Consolidation of orders was mentioned as a good strategy as well as less packaging. These two are connected as consolidation of orders could decrease the need of packaging. Some respondents mentioned standardisation of products, for instance, having a certain laptop or smartphone for all employees. By aggregating demand, standardisation could achieve cost optimisation and better terms with suppliers. One answer highlighted having a system where sustainable options would be clearly labelled. Another respondent was concerned of the selection of product options and suggested that procurement should ensure that there is ample selection of sustainable options.

#### 4.4 Case analysis

The initial problem setting that was examined in this study was that in the case organisation, sustainability is not taken into account in operational procurement of off-contract purchases.

Sustainability efforts have been concentrated on tactical procurement where sustainability criteria are included in tenders. In operational purchases, contracts or preferred suppliers have been established for different product categories and users are encouraged to order from these suppliers. While the sustainability performance of operational goods is easier to manage through contracts, there can still be a significant number of purchases that are purchased outside of these agreements.

It was evident across the examined purchasing categories that the case organisation makes many small-volume orders. Procurement is also dispersed across multiple organisations and many individuals make purchases. Purchases were made to a wide range of suppliers. The analysis of sustainability impacts of the selected categories revealed that most the suppliers are located in the Netherlands. This was rather a surprising finding and the spend data could not tell if sustainability reasons were behind this. The survey responses revealed that internal customers do not value sustainability considerations as highly as other factors in their purchasing decisions. However, the findings suggest that internal customers want to receive their orders fast which could explain the high number of Dutch suppliers.

The procurement process is driven by the internal customer. Figure 16 illustrates the procurement process of operational goods which are purchased off-contract.



Figure 16. Operational procurement process of off-contract purchases (modified from van Weele 2014, 8).

Currently, procurement has limited control over these initial steps of the process. This is a challenge for sustainability if internal customers lack the awareness or guidance to consider sustainability in their purchasing decisions. To procurement's experiences, internal customers buy what they want, they need it fast and ultimately, they do not think about sustainability considerations. The survey responses showed that internal customers base their purchasing decisions on many factors and in the case of the case organisation,

sustainability factors were the least important factors. The most important factors for internal customers in their purchases are the product's compatibility with existing equipment or processes, quality and performance of the product, and delivery time. Sustainability considerations such as environmental impact of the product and purchasing from local suppliers were the least important factors. However, contrary to the purchasers' beliefs, internal customers show willingness to consider sustainability in their purchases: 26 % of respondents definitely want to include sustainability considerations into purchases and 37 % probably.

For procurement, the biggest challenge is the lack of control. For internal customers, the biggest challenge is the lack of information. They feel they do not have sufficient information to consider sustainability factors in their purchases. Currently, internal customers do not value sustainability factors as important as other factors in their purchasing decisions. This is further supported by the finding that internal customers would like to have more information about sustainable options and guidance towards these options.

Procurement has not developed any concrete goals for sustainable procurement in operational procurement. Despite lacking concrete goals, the operational purchasers at the case organisation showed motivation towards sustainable procurement. They recognised that sustainability is an important issue and are working towards sustainable procurement. They have their own initiatives in working with suppliers, improving the P2P system, and developing the competencies of purchasers.

The operational purchasers have been in a service role to internal clients. Wanting to have more impact, a new procurement vision outlines that procurement strives for a partner role in procurement. In line with this vision, the procurement organisation is keen to develop their operational purchasers into sustainability advisors. They already advise related to purchases and ordering. Currently, operational purchasers are advising customers to choose a contract option, but they would need to have more depth to effectively influence the user. Internal customers value product compatibility with existing equipment or processes, quality and performance of the product, and delivery time. At the same time, they expressed desire for more information about sustainable products and suppliers and guidance towards sustainable alternatives. A challenge for operational purchasers is that they need to be able to find and recognise sustainable products. Then, they need to convince the internal customer to choose the alternative instead. What makes advising internal customers about

sustainability challenging is how the internal customer might respond to it. Some internal customers indicated that they do not want to consider sustainability in their purchases. Procurement may have a harder time trying to advise internal customers who do not want to consider sustainability.

Some of the interviewees also raised an important concern. They questioned whether advising internal customers about sustainability is the operational purchasers' task. They called for the internal customer to take responsibility on the sustainability of their purchases. Furthermore, they questioned whether these small purchases are worth it and whether sustainability efforts should be aimed to higher value purchases. Operational spend consists of small value purchases which are not seen as important as bigger purchases. Resources are limited and purchasers need to make a decision on which purchases to concentrate sustainability efforts on.

## Discussion and conclusions

This chapter discusses the findings of the present study and reflects in the context of previous research. Moreover, the chapter answers the research questions, discusses the theoretical and practical implications, and discusses the limitations of the study and suggestions for future research.

### 4.5 Discussion of main findings

Operational procurement deals with the purchasing of goods and services needed in the daily operations of organisations. This process is often driven by internal customers. The case demonstrated that procurement may have a lack of control over the sustainability performance of the procurement process when internal customers make the purchasing decisions while procurement professionals offer administrative support.

Through the analysis of operational spend, significant spend categories were identified and potential sustainability risks for these categories were determined. The analysis of the spend categories provides concrete examples and insights into operative purchases and their sustainability impacts. Operational purchases can have many negative environmental and social sustainability impacts that span across the purchase's lifecycle. Many of these are similar across categories. While not forming opinions which categories have the most sustainability impacts or which impacts are more significant than others, this analysis provided a picture of the case organisations off-contract spend and evidence on the need for integrating sustainability considerations into operational purchases. Operational purchases can quickly add up to significant environmental and social effects (Haake & Seuring 2009).

Maverick buying is an important issue in operational purchases. It has been recognised that maverick buying has many disadvantages for organisations such as hindering organisations from achieving their sustainability goals (Thai 2008, 434). Therefore, organisations should aim to steer away from maverick buying and establish frame agreements for operative purchases. Many sustainability risks could be avoided by having contracts in place. For instance, contract clauses can be included to ensure that purchased goods include sustainability criteria. Of course, it is not worthwhile to establish contracts for every

transaction. Organisations will have purchases that are small, low-value, or one-off for which contracting is not a good option. For these purchases, other methods that take sustainability considerations into account need to be utilised.

For improving the procurement process of operative goods, various strategies are suggested in literature and many of these are beneficial for achieving sustainability objectives as well. Examples of such strategies include keeping a catalogue of approved suppliers, volume bundling of orders, and consolidation of orders (Johnson et al. 2011; European Commission 2016; Baily et al. 2015; Thai 2008). However, some of these might prove difficult to implement to one-off purchases which are usually purchased from a large number of suppliers. Suggestions for improving the sustainability of operational low value procurement came up in interviews and survey as well. These practices address some of the sustainability impacts associated with operational purchases (Table 9).

Table 9. Sustainability practices in operational procurement.

<b>Use of preferred suppliers</b>
<b>Use of eco-labels</b>
<b>Local purchasing</b>
<b>Bulk purchasing</b>
<b>Consolidation of orders</b>
<b>Standardisation of products</b>
<b>Advising internal customers</b>

On one hand, operational purchases should be handled by internal customers through e-procurement systems without much interference from procurement. On the other hand, sustainable procurement is better managed by central procurement structures (Brammer & Walker 2009; Leal Filho et al. 2019). While decentralisation fosters user autonomy and speed of the process, it does not necessarily prioritise sustainability considerations. The challenge lies in combining these two aspects: ensuring process efficiency and procurement having control over the process. Some strategies are needed to consider sustainability and guide the internal customers to make sustainable decisions while maintaining process efficiency. For sustainable procurement of operational goods, the right procurement structure seems to be something in between of a decentralised and centralised approaches.

Purchasing contracts are not the only strategy to sustainable procurement in operational procurement. In order to use other methods, the purchasing decisions of internal customers need to be influenced. The initial phases determine the sustainable outcome of the purchase (Berry 2011, 71). Therefore, more emphasis needs to be put on the initial stages of the procurement process. According to Berry (2011, 124) important considerations at the initial phase of the procurement process include determining if the purchase is actually necessary and if the needed product could be repaired or upgraded, shared with others, or hired instead of purchasing. Promoting sustainable consumption is essential. Internal customer's resistance to involve the procurement function more deeply in specification can be addressed by persuasion and showing the benefits of a controlled process, and if needed, the adoption of a more coercive approach (Cox et al. 2005b).

The case demonstrated a lack of specific goals for sustainable procurement which makes sustainability efforts uncoordinated and poorly communicated. Without defined goals, it is difficult for operational purchasers and internal customers to understand the targets and expectations related to sustainability. A study by Young et al. (2016) demonstrated that organisations with a clear sustainability strategy were more successful in sustainable procurement implementation. For operational procurement activities to be directed towards more sustainable performance, it is crucial to establish clear and measurable sustainability objectives.

Sustainable procurement of operational purchases is not easy. In addition to various characteristics of low value purchases hindering the integration sustainability considerations, this study found that internal customers can also experience various barriers to purchasing more sustainable products, including a lack of information about sustainable product options, concerns about the poor quality of sustainable products, limited availability of sustainable products, and doubts about the trustworthiness of sustainability information. This finding is consistent with that of Gleim et al. (2013) who reported that perceived poor quality of greener products, trust, and lack of expertise were among the most frequently noted barriers for consumers in green purchasing. Lack of sustainable product options could be explained by a lack of knowledge about sustainability because they have not actively searched for sustainable options, or the customer's need is very specific and there simply are no sustainable options available in that product category.

There might be individuals who do not see the advantages of sustainability practices in procurement, as demonstrated by the case. Some internal customers indicated that they do not want to consider sustainability in their purchases. A fundamental shift is necessary to integrate sustainability into procurement (Meehan & Bryde 2011). Authors have noted that resistance to change is a notable barrier to sustainable procurement (Brammer & Walker 2009; Shaikh & Channa 2022). Because the internal customer has a significant responsibility in the process, these challenges should be addressed so that customers have every opportunity to make sustainable decisions.

Operational purchasers also may be hesitant to include sustainability in small value purchases thinking that efforts are better to be guided to bigger purchases. This has been noted by Haake & Seuring (2009) who acknowledged that organisations prioritise sustainability efforts to strategic items. However, Boström et al. (2015) suggest that even though it might not seem cost effective for an individual purchaser to address risks in less significant purchases, there are still valuable opportunities to do so. The topic of transaction costs is pronounced in the context of operational procurement. Small purchases have a tendency to consume a relatively higher amount of purchasing resources compared to larger purchases (Parikh & Joshi 2005; Balaeva et al. 2022). This poses a challenge in efficiently utilising procurement resources when dealing with low-value transactions.

The procurement vision of the organisation indicates a strategic shift in the role of the procurement department from being customer-focused to becoming more of a partner in the procurement process. This necessitates a more proactive and collaborative approach with internal customers. This also means that the role of the operational purchaser, which has traditionally been seen as an administrative task (Sollish & Semanik 2012, 241), is going to change. The proactive role necessitates that purchasers are proactive, collaborative, and understand customer needs. Prior studies have noted the importance of individuals in sustainable procurement adoption (Neessen et al. 2021; Grandia 2015; Behravesch et al. 2022; Tchokogué et al. 2018). This study further corroborates these findings by suggesting that sustainable procurement necessitates proactive, competent, and motivated purchasers who influence the procurement process and drive sustainability initiatives. Procurement professionals can play an important role in championing sustainable procurement and ensuring that sustainability objectives are pursued throughout the procurement process. But due to the low value of the transactions, getting fully into an advising role and advising



customers with every purchase is not going to be cost efficient. Purchasers have to spend resources advising and persuading customers, which adds to the transaction costs associated with integrating sustainability into small purchases. Therefore, internal customers need to be provided with the appropriate support to make sustainable decisions on their own in a cost-effective way.

Opinions towards the advising role of operational purchasers were mainly positive across stakeholders in the case organisation. Some interviewees questioned whether advising internal customers about sustainability is the operational purchasers' task suggesting that users need to take on responsibility of the sustainability performance. In the context of circular purchasing, Neessen et al. (2021) highlight sharing the responsibility of sustainability adoption in procurement between procurement and budget holders. This suggests that the responsibility of sustainable procurement should be a shared responsibility between procurement and internal customers. Authors further concur that cooperation between departments is crucial in sustainable procurement (Shaikh & Channa 2022; Scheider & Wallenburg 2012). Procurement is one link in the sustainable operations of an organisation and can contribute to sustainable development in significant ways, but it can't do it alone. Other processes need to take sustainability into account as well. For instance, sustainable laboratory practices complement sustainable procurement of laboratory supplies.

In line with the partnership vision and the strategic shift in the role of the purchasers that it necessitates, purchasers would need a diverse set of competencies. According to research, there are a number of competencies that become more important to procurement professionals when they deal with sustainability-related challenges. They encompass technical knowledge of sustainable procurement practices, foundational knowledge and understanding of sustainability principles in procurement, competencies for communicating with others about sustainable procurement, and competencies related to attitudes and behaviour toward sustainable procurement (Schulze et al. 2019). In this study, soft competencies, such as communication, were highlighted over procurement specific competencies perhaps because operational procurement is in frequent contact with internal customers. Communication skills are frequently mentioned in the top of the competence requirements for procurement professionals (Giunipero & Percy 2000; Bals et al. 2019). With this partnership role and increased focus on sustainability, purchasers are going to need sustainability-related competencies as well.

While the case organisation offers trainings for procurement professionals, sustainability-related trainings were not utilised by the employees, or they were not aware of the availability of such trainings. Training is important as insufficient training can limit sustainable procurement implementation (AlNuaimi, & Khan 2019; Lukacs de Pereny Martens & Schwarz 2022).

#### 4.6 Answers to the research questions

To answer the main research question, the sub-questions are answered first. The first sub-research question was “How can the operational procurement process be improved to incorporate sustainability objectives?” Contract purchasing is encouraged but sustainability factors can still be included in the procurement process even if not all purchases can be covered by formal contracts. The whole procurement process should include sustainability considerations. Especially the first stages are critical in determining the sustainability of the purchase. In order to minimise administrative load and guarantee timely acquisition of goods and services, the process should be streamlined and efficient.

Internal customers have an active role in the process, but they may lack the necessary knowledge to consider sustainability factors in their purchasing decisions or are resistant to procurement’s involvement in their purchases. Organisations need to develop guidelines that encourage the internal customer to consider sustainability. The guidance should concentrate on the initial phases of the procurement process and provide users the needed information and tools to make sustainable purchasing decisions. In addition, sustainable procurement practices, such as use of eco-labels, and local purchasing, need to be applied. This way procurement can effectively address operational efficiency and enhancing sustainability.

The second sub-research question was “What competencies do operational purchasing personnel need to effectively advice on sustainability matters?” Operational procurement professionals who handle low-value purchases are typically in an administrative support role responsible for processing the purchase requests made by internal customers while the internal customer has an active role because they initiate the purchase. To change this and to have an impact on the sustainability of the product or service, operational procurement professionals should take on a more proactive role in sustainable procurement.

Sustainable procurement competencies should not be a separate skill set but integrated into existing procurement competence schemes as sustainability considerations need to be an integral part of the procurement process. Procurement professionals advising internal customers about sustainability need to employ a wide range of competencies, ranging from more technical skills to interpersonal competencies. Operational purchasers advising internal customers should have understanding of sustainability concepts and issues. In addition, they need specific knowledge about sustainable products and suppliers. They need to assess the environmental and social impacts of products and suppliers. Moreover, they need to know where to find information about sustainable products.

Knowledge about sustainability and sustainable products is not enough. Especially effective communication skills will be important to deliver advice and influence the user. Operational purchasers need to be able to explain the sustainability impacts of purchases to the customer. They need to be skilled listeners and understand the needs of the customer to offer right advice. Some internal customers may need more persuasion than others. Operational purchasers need to be able to influence and convince the customer to choose a sustainable option. To do sustainable procurement, purchasers need to be committed and motivated.

Finally, the main research question was “How can sustainability objectives be achieved in operational procurement activities?” Procurement needs to take control of the process. The integration of sustainability objectives into operational procurement necessitates adjustments in the process as well as shifts in the mindsets of individuals working with the process. Sustainability should be developed in a collaborative manner. Internal customers need to take responsibility for their purchases, but procurement needs to provide the guidelines to do so. Procurement needs to develop clear and actionable objectives for sustainability and guidelines for incorporating sustainability into operational procurement. Focusing on the first stage of the procurement process, the needs assessment is essential for sustainability performance. In addition, sustainable procurement practices such as consolidation, bulk purchasing, and eco-labels are important for addressing various sustainability impacts associated with operational purchases.

It should be noted that too much emphasis should not be put on advising internal customers by operational purchasers. Even though this approach provides an important lever, the policies and guidelines set by the central procurement unit should have higher significance. Operational purchasers need to be able to advice on sustainability as sustainability will

inevitability be a part of procurement. While operational purchasers play an important role in guiding internal customers toward sustainable choices, relying solely on their advisory capacity is not going to be cost effective. Centralised policies and guidelines ensure a standardised and cohesive approach to sustainable procurement across the organisation. Nevertheless, individuals working with the process need to be competent and motivated to drive sustainability in the process.

#### 4.7 Theoretical implications

This thesis has combined the concept of sustainability and low-value purchases that are purchased outside of purchasing agreements. Through a case study, this study has investigated one public organisation's operational off-contract purchases with the aim to provide recommendations of ways to make these purchases more sustainable. The study extends the discussion on sustainable procurement of operational goods which has been underrepresented in academia (Haake & Seuring 2009; Boström et al. 2015).

This study contributes to the body of knowledge by reinforcing the notion that operational purchases are challenging to manage (Barry et al. 1996; Cox et al. 2005b). Even more so when attempting to integrate sustainability considerations into the process. The findings in this study suggest that operational procurement, which is often characterised by low-value, ad-hoc transactions, presents specific challenges for sustainable procurement implementation. The diversity of operational purchases and the decentralised structure of procurement add to these challenges. While not all purchases may be subject to formal contracts, sustainability considerations can still be integrated into the procurement process.

Process efficiency is recommended for handling small purchases, and this entails internal customers making purchases independently. However, internal customers may not think about strategic implications of their purchases. This process does not work for sustainable procurement. In order to achieve sustainable procurement objectives, the integration of sustainable procurement practises suitable for operational procurement are necessary. Sustainable procurement should cover the whole procurement process. Especially the initial phase of the procurement process is of significant importance.

Moreover, this study extends the discussion on procurement competencies by suggesting that the role of the purchaser is changing to a more strategic one when doing sustainable procurement. It is moving beyond typical transactional duties and taking a more comprehensive approach. As organisations increasingly prioritise sustainability, purchasers can play a central role in driving the integration of sustainable practices into the procurement process and achieving sustainability objectives. Building competencies beyond traditional transactional duties among operational procurement professionals is essential in order to function in this proactive role.

## 4.8 Implications for the case organisation

After discussing the findings from the case study and reflecting them Operational purchases may not seem significant when examined separately but when added up, they can have significant impact on the environment and society. Organisations need to recognise the impact of operative purchases and work to align them with broader sustainability goals. These recommendations aim to guide the case organisation in improving the sustainability performance of their operational off-contract purchases. These suggestions are also meant to aid other public organisations dealing with similar challenges in their operational procurement activities. First, recommendations are given based on the sustainability impacts identified for some purchasing categories that are more specific to the case organisation. Then, some more general recommendations are discussed.

### 4.8.1 Recommendations for operational purchases

A sizable portion of off-contract operational spend consists of supplies and equipment for research. These products can have many negative sustainability effects on the environment and society. Across the purchasing categories, many orders are made, purchases are made to many suppliers who are spread across the world, and order values are relatively small. To address the sustainability impacts of the largest spend categories, several actions can be taken.

Purchases should be moved to strategically managed spend, i.e., contracts and preferred suppliers where appropriate. The high number of maverick spend could imply that customers

should be more firmly encouraged to utilise the contract options. Maverick buying is not only harmful for sustainability performance but can lead to increased costs and compliance issues. When preferred suppliers are available, internal customers should be guided to choose them. Contracts are a powerful way to maintain that sustainability objectives are met. To do this effectively, operational purchasers need to convince the user about the positive change they are making by choosing the contract option. Procurement should also make sure that there are enough contract options and that these meet the users' needs. Moreover, choosing the preferred option should be made easy for the internal customer. This necessitates that preferred options are easily communicated and recognised.

Bulk purchasing and consolidation of orders are effective strategies for streamlining the procurement process and contributing to reduced packaging waste and emissions from transportation. These practices would be especially suited to supplies that are needed in larger quantities or have consistent demand across departments. Transportation emissions can also be reduced by buying from local suppliers, which was done to a great degree in examined categories but should be further encouraged.

To lessen the environmental impact of equipment that can be use a high amount of energy such as some optomechanical products, energy efficient equipment should be prioritised. In case of electronics which were present is some of the analysed categories, options that are reusable, rechargeable, recyclable should be chosen. Energy labels can be used to identify energy efficient options. Certifications can be utilised in identifying more sustainable options. Laboratory supplies can contain a significant amount of single use plastic which contributes to plastic waste. To lessen this impact, supplies made from reusable or recycled materials should be chosen where possible. For chemicals, there might be greener alternatives that with lower environmental impact or reduced toxicity.

In terms of social sustainability, the impacts can be less visible and consequently more challenging to detect and manage. Suppliers should be evaluated and selected based on their commitment to ethical practices. Factors that should be considered include fair labour practices, compliance to international labour standards, and worker rights. Moreover, diversity and inclusion should be encouraged. Suppliers that comply with health and safety standards should be prioritised. Choosing suppliers who align with recognised social sustainability standards ensures compliance with ethical principles. Looking for products with a certification or standard that specifically address social sustainability issues is

advised. In addition, local purchasing supports local suppliers and manufacturers and contributes to the well-being of the community by fostering economic development. Standardisation of products to screened suppliers could be a solution to guide spending towards more socially sustainable options.

The key lies in creating more awareness and encouraging sustainable buying behaviours. Internal customers should be encouraged to think about their purchasing decisions and the impact their purchases have. Aligning sustainability practises with the units where the purchases are used could provide more impact and facilitate sustainability integration in the organisation. For instance, sustainable laboratory practices could be complemented with sustainable procurement practices of laboratory supplies, if laboratories have such guidelines in place. Collaboration between departments and other managerial suggestions are discussed in the next sub-chapter.

#### 4.8.2 Managerial implications

These recommendations are aimed at improving the alignment of sustainability objectives and operational procurement. Figure 17 outlines these actions, and they are further discussed below.

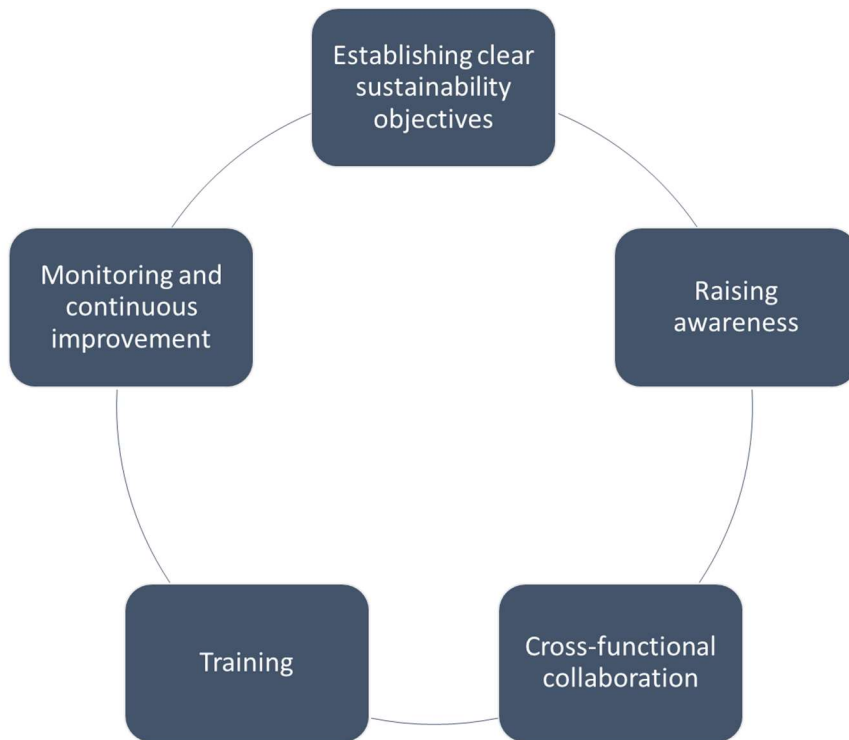


Figure 17. Recommendations for sustainable procurement.

The establishment of clear and actionable sustainability objectives serves as a fundamental step in aligning procurement practices with broader environmental and social goals. Sustainable procurement needs to be aligned with the organisation's goals and values. Moreover, objectives need to be translated into more concrete goals. These goals may include reducing emissions, waste prevention, increasing the use of recycled materials, or supporting local suppliers. Sustainability objectives will give direction to operational purchasers and provide them with a framework within which they make informed decisions.

Sustainability awareness needs to be enhanced all across the organisation. Knowledge and expertise need to be improved not only among procurement professionals but also the internal customers and users. Internal customers need to be educated about the implications of their purchasing decisions and encouraged to make sustainable purchasing decisions. Due to the decentralised nature of purchasing, a sustainable procurement guide could provide users with the knowledge to make sustainable purchasing decisions. Advising needs to be primarily through established procedures and guidelines. As a central procurement unit, procurement is responsible for setting the strategy in sustainable procurement. It needs to develop clear sustainability policies, guidelines, and criteria that all units should follow.



Purchasing categories can have different sustainability implications. Procurement could create purchasing guidelines for each important category. These individual guidelines would outline sustainability impacts associated with products or services in these categories, what actions should be taken to include sustainability considerations in purchases and where to purchase these products or services. These guidelines could be created together with users and other staff that have deeper knowledge of the products, so procurement understands what kinds of products are purchased and understands the needs of the user. These guidelines would answer the internal customer's need for sustainability-related information and provide a framework for making sustainable purchasing decisions.

The advantages of e-procurement have already been identified in operational procurement. The system is already utilised in guiding customers towards sustainable contract options through the green button. The utilisation of e-procurement may be more challenging for off-contract purchases because the product numbers or other information is not in the system. However, it is encouraged to investigate the potential of the P2P system in sustainable procurement further. Internal customers' preferred channels of communication imply the need for specific, personal, and efficient advice. E-procurement solutions can facilitate the efficient process that is required and aid in achieving sustainability goals.

Cross-functional collaboration establishes a holistic approach to sustainable procurement. Procurement should work together with the sustainability department in spreading awareness about sustainability and training procurement professionals in sustainability issues. Operational procurement currently has limited cooperation with the sustainability department. There can also be other individuals across the organisation working with sustainability. Identifying these people and coordinating with them to spread awareness about sustainable purchasing practices is also encouraged. These people work within research units and closely with people who make purchases and understand the needs of the users. They can influence their buying behaviours more directly than procurement. Organisations need individuals who are committed to sustainability. At the broader organisational level, it is essential that the importance of sustainability is recognised. Organisational change may be required to establish sustainable procurement practices. Sustainability is something the whole organisation should work towards. Procurement has an important role in achieving the sustainability goals of an organisation, but it cannot do it

all by itself. All stakeholders should be aware of their role in achieving the sustainability goals of the organisation.

Employees involved in the procurement process need to have the appropriate skills and competencies to do sustainable procurement. Organisations should implement training programmes to improve stakeholders' understanding of sustainability and sustainable procurement. Operational purchasers should receive training on how to assess the sustainability of products, services, and suppliers. They need to be equipped with the right competencies to be able to communicate effectively, understand internal customer needs, and advise internal customers regarding sustainable purchasing. Educating stakeholders will further raise awareness about sustainable procurement practices.

Monitoring and continuous improvement are necessary for assessing that objectives are achieved and continually updated. In order to track progress towards sustainability objectives, setting up metrics for success and reporting progress on a regular basis are essential. This could involve measuring and tracking the environmental impact of procurement. Monitoring facilitates the identification of areas for improvement and aids in determining where to focus efforts.

#### 4.9 Limitations and recommendations for future research

The studied case is expected to be a representative example in its industry, however possible limitations should be noted. Multiple cases can provide a more comprehensive view and generalisable results. Interview sample including also other relevant stakeholders could provide more insights. Moreover, a low response rate to the survey may limit the generalisability of the findings.

The sustainability risks determined for each purchasing categories do not present a thorough picture of the sustainability impacts related to these categories as the data does not provide complete product or service descriptions and the impacts were not systematically measured. The listed impacts are based on potential impacts. Furthermore, spend data for analysing the sustainability of purchases was used only from 2022 and thus reflects only one year's purchases. To uncover underlying trends, data from multiple years could be analysed. As an institute of higher education, the research and development related purchases are expected

to remain as a significant spend category which makes the results more generalisable. Moreover, spend data was analysed from a year after the COVID-19 pandemic so it should give a more reliable and accurate picture of the spend.

The improper question setting of survey question asking about what category respondent purchases prohibited the cross tabulation and analysis of data. Survey respondents indicated that they purchase many different items and materials. Insight into the specific categories could not be gathered properly which prohibited thorough analysis.

This thesis concentrated mainly on sustainable procurement of products. Some services were included in the sustainability impact analysis but later it was decided that product categories would be easier to concentrate on. It was not specified during the interviews to talk about products or services specifically, but the interviewees described more situations involving products rather than services. This might imply that the inclusion of sustainability considerations into service purchases is more challenging than into product purchases. The sustainability impacts and therefore the procurement of services is somewhat different than of products requiring different sustainable procurement approaches. Future research could concentrate more on the sustainable procurement of services.

Attention should be paid to operational purchases. Organisations have adopted sustainability criteria to be included in tenders but do not know how to include sustainability considerations into smaller purchases. Hopefully this thesis encourages organisations to examine their low-value purchases and more research is done in different organisations across different industries. More research is needed into operative purchases in the public sector.

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## Appendix 1. Interview frame

### **Opening:**

(Ask if interviewee received information participant sheet and read it. Do they have questions about it? Ask consent for the record. Introduce the interview setting and structure of the interview.)

1. What are your role and responsibilities within the operational procurement?
2. How long have you been working in the operational procurement team?

### **1. Current process and practices**

3. Please describe the procurement process of operational off-contract (outside of preferred suppliers) purchases step by step.

- Any differences between different products/services?

4. Please describe the key actors involved in the procurement process.

- Are there any challenges working with them? Other relevant parties who affect procurement decisions?

### **2. Process development**

5. How can you take sustainability into account in your daily job tasks currently?

6. What are the motives to consider sustainability in operational procurement?

7. What challenges do you face in incorporating sustainability in operational procurement?

8. What improvements or changes would you suggest to better incorporate sustainability into the procurement process?

- Any specific strategies, tools, methods?

### **3. Competencies (= knowledge, skills, abilities that allow to function well in a job)**

9. What do you think are most essential competencies for you to do your job?

10. What competencies do you think are essential for you to advise internal customers about sustainability?

11. Do you currently have any involvement in advising internal customers on sustainability matters? Or do you discuss sustainability with them?

12. What do you think would be the biggest challenges in advising internal customers about sustainability?

13. What does the organisation currently do in terms of improving your competencies?

**Closing:**

14. Anything else you feel like needs to be discussed?



## Appendix 2. Questionnaire

# Sustainable procurement at UT

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The purpose of this survey is to gather your insights and opinions regarding sustainability in operational procurement. The following questions ask you to share your experiences and views regarding making purchases and sustainability. Your feedback is crucial in understanding the internal customer's perspective and role in sustainable procurement decision-making.

Your answers will be anonymous and used only for the purpose of this thesis. The survey will take you approximately 5-10 minutes to complete. You are free to skip any question and you can withdraw at any time. However, once you have submitted your response, removing anonymous survey responses is not possible. You will not be able to be identified in any ensuing reports or publications.

Thank you for your valuable contribution to this thesis!

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Q1. Which organisation within the UT do you belong to?

- TNW (1)
  - BMS (2)
  - NANO (3)
  - ET (4)
  - EEMCS (5)
  - LISA (6)
  - DLAB (7)
  - CES (8)
  - CFM (9)
  - FIP (10)
  - PREU (11)
  - ITC (12)
  - Other, please specify (13)
-

Q2. Which category do you purchase?

- Other research equipment (Onderzoeksapparatuur overig) (1)
- Optics (Optica) (2)
- Laboratory supplies (Laboratoriumbenodigdheden) (3)
- Chemicals (Chemicaliën) (4)
- Other, please specify (5)
- 

Q3. Do you primarily purchase products for yourself or for someone else?

- Myself (1)
- Someone else (2)

Q4. How frequently do you make purchases?

- Daily (1)
- Weekly (2)
- Monthly (3)
- Quarterly (4)
- Rarely (5)

Q5. You need to purchase a small-value (under €50.000) product. Which factors are important in the purchase decision? Please rate the importance of these factors in your purchasing decision.

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Price (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delivery time (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quality and performance (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Ethical labour practices and conditions of the supplier (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental impact of the product (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Customer support (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulatory compliance (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compatibility with existing equipment or processes (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation or new technology (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support local businesses (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q6. Would you like to incorporate sustainability considerations into purchases?

- Definitely not (1)
- Probably not (2)
- May or may not (3)
- Probably yes (4)
- Definitely yes (5)

Q7. There are various barriers and challenges purchasers and end users can encounter when attempting to incorporate sustainability considerations into purchasing decisions. Do the below factors act as challenges and barriers to you?

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Higher price of sustainable products (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor quality of sustainable products (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of sustainable product options (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of information about sustainable products (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time constraints (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of support from colleagues or manager (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Untrustworthiness of sustainability information (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q8. Please elaborate on any of the challenges you've encountered.

---

In UT's strategy, sustainability is gaining momentum. To achieve the strategic goals related to sustainability, the procurement department is keen to support the internal customer with sustainable purchasing decisions.

Q9. When making small-value (under €50.000) transactions, how often do you involve some consultation with the procurement department?

- Never (1)
- Sometimes (2)
- About half the time (3)
- Most of the time (4)
- Always (5)

Q10. What kind of support or advice would be useful to you related to sustainable purchasing?

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Q11. What channels or methods of communication would you prefer to receive advice about sustainable purchasing?

- Email (1)
- Online training sessions or webinars (2)
- Discussions or meetings with the procurement department (3)
- UT procurement website (4)
- Proactis (5)
- Brochures or pamphlets (both digital and physical) (6)
- Other, please specify (7)

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Q12. What suggestions do you have for improving sustainability in operational procurement?

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Appendix 3. Key numbers<sup>5</sup> from spend data

Chemicals	
Number of orders	806
Number of suppliers	106
Number of supplier locations (country)	15
Number of line items	1363
Average order size (EUR)	1337,757
Average number of line items per order	1,76799
Median order size (EUR)	345

Laboratory supplies	
Number of orders	1220
Number of suppliers	83
Number of supplier locations	9
Number of line items	2168
Average order size (EUR)	883,7965
Average number of line items per order	1,777049
Median order size (EUR)	174,75

Electronic, measuring and control installations	
Number of orders	62
Number of suppliers	17
Number of supplier locations (country)	1
Number of line items	78
Average order size (EUR)	17390,83
Average number of line items per order	1,258065
Median order size (EUR)	4950,50

Engineering and environmental services	
Number of orders	169

Number of suppliers	39
Number of supplier locations (country)	1
Number of line items	191
Average order size (EUR)	6380,069
Average number of line items per order	1,130178
Median order size (EUR)	3550,48

Optics	
Number of orders	603
Number of suppliers	51
Different supplier locations (country)	11
Number of line items	1642
Average order size (EUR)	1788,112
Average number of line items per order	2,723051
Median order size (EUR)	358,04

Other reserach equipment	
Number of orders	622
Number of suppliers	189
Number of supplier locations (country)	16
Number of line items	1213
Average order size (EUR)	3850,386
Average number of line items per order	1,950161
Median order size (EUR)	582