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Implementing Circular Public Procurement: the Case of Textiles in the City of Oslo

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Abstract

Public procurements are globally recognized as key to achieving more sustainable consumption and production patterns, not only because of the potential to reduce environmental impact from public services themselves but also due to the potential to incentivise the development of new markets and solutions that can be used in the private sector as well (Alhola et al., 2019; UNEP, n.d.).

One approach to addressing more sustainable consumption and production patterns is implementing circular economy principles (Geissdoerfer et al., 2017). As the largest municipality of Norway, the City of Oslo has developed high ambitions for circular public procurement, with textiles as one of several prioritised categories due to textiles' large environmental impact during their lifecycles.

In this thesis I therefore investigate activities connected to textile consumption in the City of Oslo's health sector in the light of practice theory, where these activities are analysed in terms of the practice elements materials, competence and meanings (Shove et al., 2012). The purpose is to gain an understanding of whether and how these activities can be affected for a more successful implementation of circular public procurement. The investigation is carried out using a mixed-methods approach, where the qualitative strategy is prioritised as the main method. I used interviews, a quantitative data set and documents as data sources.

The findings suggest that when implementing circular economy principles, it can be useful to broaden the focus on public procurement to a greater involvement of the use-phase. With this, users of goods and services become more central actors, and their practices are therefore relevant sites for intervention, in addition to the tendering process, which already receives attention in circular public procurement guidelines and research.

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List of abbreviations

EMS	Environmental management system
PSS	Product-service-system
SDG	Sustainable development goal
UKE	Agency for Development and Competence, City of Oslo
UNEP	United Nations Environmental Programme

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1. Introduction

1.1. Introduction

Despite being a country with a high Human Development Index score, Norway does not perform equally well on other sustainability parameters. The Sustainable Development Goal (SDG) Index measures a country's positive and negative effects on other countries. Among 163 countries, Norway finds itself at the 146th position. The Norwegian score is mostly reduced due to various negative environmental and social impacts embodied into trade (Sustainable Development Solutions Network, 2022, p. 32).

One of the SDGs addressing such impacts is SDG 12, "Responsible consumption and production", which sets targets to combat unsustainable consumption patterns. One such target is to conduct "public procurement practices that are sustainable, in accordance with national policies and priorities" (United Nations, n.d.). Public procurements are thus globally recognized as key to achieving more sustainable consumption and production patterns, not only because of the potential to reduce environmental impact from public services themselves but also due to the potential to incentivise the development of new markets and solutions that can be used in the private sector as well (Alhola et al., 2019; UNEP, n.d.). One approach to addressing more sustainable consumption and production patterns is implementing circular economy principles (Geissdoerfer et al., 2017). Circular public procurements are highlighted as a tool for achieving a more circular economy, particularly in the European Union (EU) (European Commission, 2020a; Kristensen et al., 2021).

Norway has both political goals and legal requirements for the use of public procurements as a tool for environmental objectives (Anskaffelsesloven, 2016; DFØ, 2021a). However, a revision report of sustainable public procurement in Norway emphasizes that even though regulation and a vast offering of guidance and tools are in place, implementation is lagging behind (MAPS, 2020).

As the largest municipality of Norway, the City of Oslo has developed high ambitions for circular public procurement. Therefore, the City of Oslo is a case that can be used for investigating how a municipality can contribute towards a more circular economy through their procurement of goods and services, and, through this, contribute to sustainable development. This thesis will investigate activities connected to textile consumption in the City of Oslo's health sector in the light of practice theory, where these activities are analysed in terms of the practice elements materials,

competence and meanings. The purpose is to gain an understanding of whether and how these activities can be affected for a more successful implementation of circular public procurement.

1.2. Problem statement and research question

In recent years, circular economy has increasingly been viewed as a way of using public procurement to reach environmental goals (Alhola et al., 2019). However, according to several evaluations, results are insufficient (MAPS, 2020; Norwegian Ministry of Local Government and Modernisation & Norwegian Ministry of Foreign Affairs, 2021; Riksrevisjonen, 2022). In the City of Oslo, the work on circular public procurement has seen a rapid development. The municipality's central procurement body, which is located as a unit in the Agency for Development and Competence (UKE), is moving towards taking a role in changing procurement behaviour not only in the central procurement organisation itself but also for decentralised purchasers and end-users of the products (Department of Finance, 2022a). Decentralised purchasers and end-users are referred to together as "users" in this thesis.

One of the prioritised categories for circular public procurement in the EU, Norway and the City of Oslo, is textiles (Bymiljøetaten, 2019; DFØ, 2021a; European Commission, 2017b). However, in-depth knowledge about actual textile consumption behaviour in the municipality is limited (Gilleberg, 2021). Studies of circular public procurement indicate that a greater emphasis on implementation, and a larger degree of involvement of decentralised purchasers and end-users might be a success factor for realising the benefits of circular procurement (Grandia, 2016; Kristensen et al., 2021; Nordic Council of Ministers, 2022). I therefore assume that, for the case of the City of Oslo's textile procurements, the lack of knowledge about textile consumption patterns makes designing interventions for a successful implementation of circular public procurement challenging. The research question is therefore:

In the context of public procurement, how can knowledge about user practices contribute towards implementing circular economy principles in the consumption of textiles in the City of Oslo's health sector?

1.3. Purpose of the research

Activities connected to textile consumption in the health sector of the City of Oslo will be analysed through the lens of practice theory, with the aim of identifying opportunities for a more circular textile consumption. The products and the activities connected to ordering, managing and using the products, will be seen in connection to how the products are procured, for which policy,

tender documents and other documents guiding the use of the framework agreements are the sources of data. In accordance with the research question, the analysis attempts to arrive at conclusions that may guide further interventions in these practices across the tendering and contract management, ordering and user levels, which can be carried out for a more circular textile consumption in the City of Oslo, according to the circular economy principles illustrated in Figure 3. The results can be useful both for further research, and for practitioners within the field of sustainable, circular and/or green public procurement. Even though the case is textiles in the health sector in a Norwegian municipality, the findings can be relevant for other categories of goods and services consumed by public, but also private organisations, from the local to the global scale.

1.4. Structure of the thesis

This thesis contains five chapters. Chapter one provides an introduction to the topic and problem statement and has laid out the purpose of the research as well as definitions of central terms. In chapter 2, I present the theoretical framework and background for the research. I give a brief introduction to sustainability and circular economy in general and move on to public procurement as a tool for reaching societal goals. I touch on circular public procurement of textiles for a context closer to the specific case chosen and describe how product-service-system business models are often viewed as beneficial in this context. Then, I describe how the City of Oslo in particular works with circular economy principles in public procurement before providing a literature review on the topic. The following section concerns social practice theory, organisations, and change, which are the theoretical concepts used in the analysis. Chapter 3 describes the research methods for the thesis. In chapter 4, the analysis and discussion of findings from the research is presented. Finally, I write up the conclusions in chapter 5, summarising the analysis and discussion of findings, as well as suggesting topic for further research on implementation of circular economy principles in public procurement.

1.5 Definition of central terms

In this section, I define the central terms employed in this thesis, to facilitate the reader's understanding of my field of research. As the case involves a Norwegian municipality, I found it necessary to create my own set of terminology for some of the administrative and organisational terms that are specific to the City of Oslo or the Norwegian municipal sector. As far as I know, there are no official translations for some of these terms. I have therefore both described the meaning of these terms, and provided the Norwegian translation, to avoid any confusion later. In addition to administrative and organisational terms, there are terms that describe specific roles in public procurement and consumption of goods and services.

Table 1: Definitions and translations of central terms

Term	Norwegian translation	Definition
Organisation	Virksomhet	A general organisational unit in the City of Oslo
Local service unit	Tjenestested	An organisational unit where services for the citizens are produced
City Council	Byråd	The highest decision-making body in the City of Oslo
Provisions	(Politiske) føringer	Goals or content from political strategies, which provide guidance for the work of the City of Oslo as an administrative organisation.
Governing documents	Styringsdokumenter	Documents that give provisions (see separate definition) for the work of the City of Oslo as an administrative organisation.
Call for tender	Anbud	A call for competition made by a contracting authority (see separate definition).
Contracting authorities	Oppdragsgiver	The public authority publishing a call for tender (see separate definition).
Centralised procurer	Sentralisert innkjøper	Employee working with procurement in a centralised procurement unit, carrying out procurement activities on behalf of other organisational units.
Decentralised purchasers (user)	Desentralisert bestiller	Employee making orders from central framework agreements managed by a centralised procurement unit. In the context of this thesis, this role is often held by the facility managers (see separate definition).
End-users (user)	Sluttbruker	The user of a product or service. In the context of this thesis, this role is held by healthcare workers (see separate definition).
Facility manager	Husøkonom	In the context of this thesis, the facility manager is a general term used for employees that manage a local

		service unit's supporting function, such as cleaning and supply of textiles. This could be with or without formal education in the field.
Healthcare workers	Ansatte i helsektoren	Employees with healthcare tasks, such as nurses, health care assistants, physical therapists etc.

2. Theoretical framework and background

2.1. Sustainability and circular economy

The United Nations define sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987, p. 41). The concept of sustainability is usually seen as involving three pillars: the social, environmental, and economic pillars. These are intertwined and affect each other (Geissdoerfer et al., 2017; Purvis et al., 2019). Circular economy is often described as an approach to operationalise sustainable development. The concept is defined in well over a hundred different ways in academic literature, but most definitions involve the core principle of three “Rs”, that is to reduce, reuse and recycle physical resources, and for some in that preferred order according to the waste hierarchy, illustrated in Figure 1 (Corvellec et al., 2022; Reike et al., 2018). The EU defines circular economy as:

an economic system whereby the value of products, materials and other resources in the economy is maintained for as long as possible, enhancing their efficient use in production and consumption, thereby reducing the environmental impact of their use, minimising waste and the release of hazardous substances at all stages of their life cycle, including through the application of the waste hierarchy (Regulation 2020/852, p. 26).

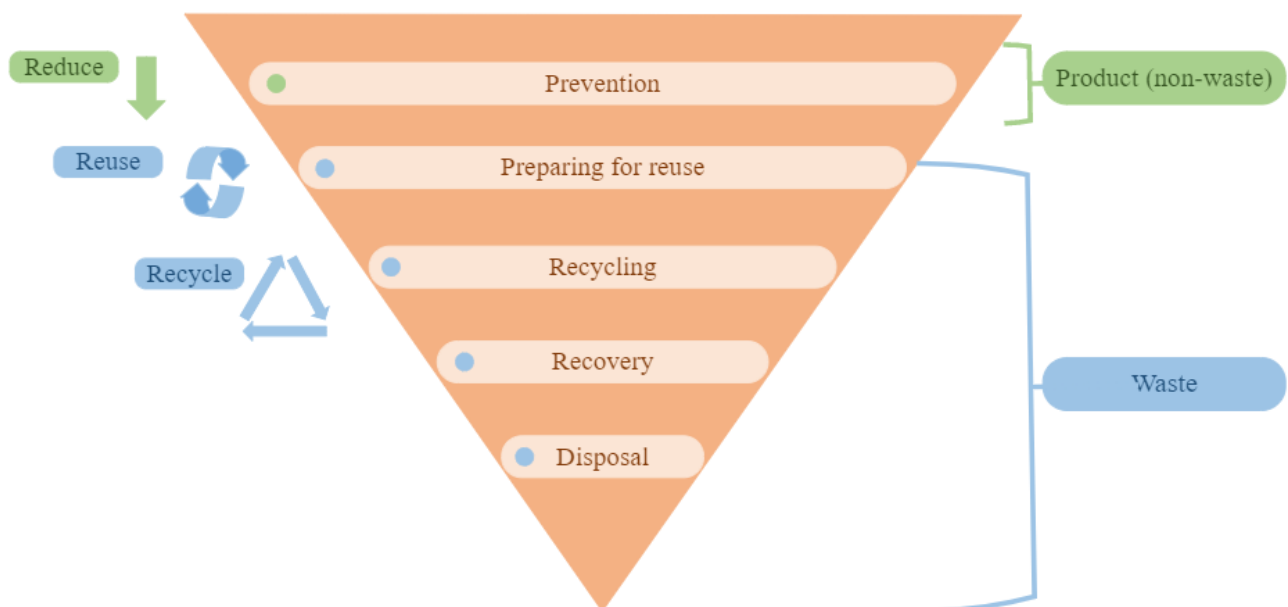


Figure 1: The waste hierarchy, adopted by me from the European Commission (n.d.)

Sustainability, sustainable development and circular economy as concepts, and the relation between these, are defined in various ways by different actors (Geissdoerfer et al., 2017; Kirchherr et al., 2017). The City of Oslo has several provisions given in various official documents, giving a direction for its work with circular economy in general and, more specifically, within public procurement. However, the City of Oslo seems not to explicitly adhere to any particular definition of circular economy.

Other concepts akin to circular public procurement are particularly sustainable public procurement, and green public procurement. Sustainable public procurement can be seen as public procurement that takes the three environmental, social and economic pillars of sustainability into account. Green public procurement can be seen as a term that can be applied when primarily environmental aspects are taken into account (Alhola et al., 2019). I will draw on literature from all these three approaches to sustainability in public procurement, as elements of both sustainable public procurement and green public procurement are relevant for circular public procurement.

1. Public procurement as a tool to reach societal goals

A fundamental argument for having services provided by the public sector is that these services cannot be provided in the desired manner by the private sector, since the market for these services do not fulfil basic criteria for functioning markets. Various forms of market failure, as well as other considerations like for instance the coverage of certain societally desirable services to all citizens, constitute the arguments for public service provision (Fiva et al., 2014). The next basic consideration in public service provision is the strategic decision of whether to keep the service provision integrated in the public organisation, or to outsource the task to one or several non-profit or market suppliers.

Outsourcing is defined by Barthelemy (2003, p. 87) as “turning over all or part of an organizational activity to an outside vendor”. In their review of Norwegian research on public procurement, Similä and Langseth (2021) write that there should ideally be continuous research on the topic of whether to organise public service activities in-house or outsource them, as this is a topic of political interest. In the context of this context of this thesis, it useful to view public service provision as divided into core activities and supporting functions. Both can be outsourced, and this outsourcing must occur through public procurement (Jensen et al., 2018). The case used in this thesis is a case where the supporting function of providing clean textiles is outsourced for the majority of the City of Oslo’s health care services. The arguments used for outsourcing an activity are most commonly increased cost efficiency and/or increased quality of the service provision (Christensen et al., 2014). The public sector has more tools at hand for managing integrated than

outsourced services. For outsourcing, available management tools are linked to competition in the market. Integrated services, on the other hand, can be managed directly by other managerial tools (Jensen et al., 2018). Barthelemy (2003) presents similar arguments when explaining how losing control over the outsourced activity is one of the challenges that firms often encounter when outsourcing their activities.

Once the decision to outsource an activity is made, public procurement becomes necessary. Public procurement is defined by the OECD (n.d.) as “the purchase by governments and state-owned enterprises of goods, services and works”. Public procurement is regulated in Norway through The Norwegian Public Procurement Act, for which the main purpose is to “encourage the effective use of the society’s resources” (Anskaffelsesloven, 2016, § 1) (my translation).

While public procurements are essential for the public sector to perform their core activities, public procurements are also recognised as a tool to reach various societal goals, such as environmental objectives or the promotion of universal design (DFØ, 2021a; The Ministry of Trade, Industry and Fishery, 2019). Public purchasing power works as a tool to reach other societal goals in two main ways; drive markets in a desired direction and reduce negative impact or create additional positive impacts from public service provision (UNEP, 2018). Among the societal goals that public procurement can encourage, the development of a more circular economy has recently been highlighted (European Commission, 2020a; Kristensen et al., 2021; Xu et al., 2022). The EU defines circular public procurement as:

the process by which public authorities purchase works, goods or services that seek to contribute to closed energy and material loops within supply chains, whilst minimising, and in the best case avoiding, negative environmental impacts and waste creation across their whole life-cycle (European Commission, 2017b, p. 5)

According to a literature review from 2000 to 2020 of green and sustainable public procurements, circular public procurement is a relatively “new field in both academia and practice” (Sönnichsen & Clement, 2020, p. 2). The available literature and empirical evidence about enhancing circularity through public procurement processes in the reviewed period is therefore limited. As such, it is not surprising that Similä and Langseth (2021), in a review of research on public procurement in Norway, question the use of public procurement as a tool to achieve societal goals by calling for more research that investigates the actual impact of this approach.

The tools at hand when using public procurement to reach societal goals gain their transformative power from the incentives they provide to the potential suppliers in the market for

the given goods or services. The contracting authority can use various types of requirements: specifications, award criteria, selection criteria and contract clauses. Firstly, the tender must include a description of the needs that are to be covered by the procurement. It is often necessary to also specify certain requirements for the goods and/or services to be procured. Here, environmental requirements can be used, for instance that the product must be made from recycled material. The award criteria are criteria that are evaluated by the contracting authority, and the supplier(s) with the best performance here are awarded the contract. A circular economy award criteria could for instance be the estimated lifespan of the product. Furthermore, the weighing of the award criteria is crucial for this tool's capacity for incentivising the suppliers. Before awarding the contract, however, the contracting authority must make sure the selection criteria are met. The selection criteria make sure the suppliers that compete for the contract have sufficient competence and capacity to deliver the given goods and/or service according to the contract. Lastly, the contract clauses regulate the delivery of the goods and/or services throughout the contract period (DFØ, 2021b).

The Norwegian Public Procurement Act defines how these types of requirements for a public procurement can be used. Article 5 states that the contracting authority can use requirements and criteria to ensure that contracts are carried out in a manner that supports concern for the environment (Anskaffelsesloven, 2016). This article has been a driver of environmental concern through public procurement. What this entails in practice, and what the ambition level is, however, open to interpretation, according to the Nordic Council of Ministers (2022).

Furthermore, results seem to be lacking. The Norwegian Voluntary National Review's report on progress on the SDGs shows that progress on SGD 12 is particularly lacking (Norwegian Ministry of Local Government and Modernisation & Norwegian Ministry of Foreign Affairs, 2021). The report's civil society evaluation of goal achievement emphasises the need to make public procurement more sustainable. Furthermore, the Office of the Auditor General of Norway (Riksrevisjonen) has researched how contracting authorities take environmental considerations when designing their procurements. The resulting report states that Norwegian authorities have not succeeded in minimising environmental impact and encouraging climate friendly solutions through public procurement (Office of the Auditor General of Norway, 2022).

The procurement law in Norway is currently under revision with the goal of making environmental considerations more widespread in public procurement, to contribute to the green transition of the Norwegian society. The Ministry of Trade, Industry and Fishery has proposed three

options for changes in the regulation for public procurement, which all concern how the tender process will consider environmental concerns to a larger degree than what is currently required by law. The Ministry does however mention that alternative measures to the proposed alternatives concerning the tender process could be informational, economic, or organisational. However, the effect of such measures has not been investigated, according to the Ministry (The Ministry of Trade, Industry and Fishery, 2022).

Framework agreements are contracts that specify the conditions for all contracts, or purchases, made between the buyer and the supplier during the framework agreement period. One of the main purposes of framework agreements in public procurement is to achieve more cost effective procurements, by centralising the resource-intensive procurement process (Kommunal- og moderniseringsdepartementet, 2015). The State's Procurement Centre (Statens Innkjøpscenter) is, much like UKE in the City of Oslo, establishing common framework agreements for all state agencies, and for municipalities that choose to use them. In addition to arguments of economic efficiency, another central argument for such framework agreements is that this structure enables taking the lead when it comes to using public procurements for sustainability purposes. In their category strategy for office equipment The State's Procurement Centre writes that more shared framework agreements for the state agencies require more communication with the agencies to ensure the expected benefits (DFØ, 2022). As such, while on the one hand, framework agreements are effective in terms of reducing costs and intensifying market power, on the other hand the distance from the centralised procurer to the users of the framework agreements' goods and/or services increases. This might make implementation, also in terms of social and environmental goals, more challenging.

2.1 Circular public procurement of textiles

According to the Ellen McArthur Foundation (2022), public procurement accounts for 15-20 percent of global gross domestic product. Public and private businesses' consumption of textiles accounts for 12 percent of the total textile consumption in Norway (PlanMiljø & Østfoldforskning, 2020). Nevertheless, public procurement can be an important driver in the textile market. This is because public buyers are large consumers that are relatively few and are politically governed, and their procurement can therefore be directed by a common political agenda. As such, public buyers' have a larger market power than millions of individual private consumers or even thousands of private business consumers with no common agenda as consumers. Thus, public buyers are important actors in the demand for circular economy in value chains for products and services (Klein et al., 2022).

The case of textiles is chosen because it is a prioritised category for circular economy in public procurements in the EU (European Commission, 2020a), nationally in Norway (DFØ, 2021a) and locally in the City of Oslo (Bymiljøetaten, 2019). The textile industry is known for high risk of violations of human and worker rights in production of the goods (Appelbaum & Lichenstein, 2016; Beyer & Arnold, 2020), and textiles have a large environmental footprint throughout their life cycles (European Parliament, 2019). The textile industry represents the fourth largest contributor to Norway's consumption-based environmental footprint, after housing, transportation and food (DFØ, 2021a). Therefore, textiles are one of the key product value chains prioritised by the EU in their Circular Economy Action Plan, which is relevant for Norway through the European Economic Area agreement.

2.2 Product-service system business models

One of the general business model types most often proposed for circular economy and specifically for circular public procurement (European Commission, 2017b; UNEP, 2018), are product-service system (PSS) business models (Kjaer et al., 2019). In the Norwegian action plan to increase the proportion of green public procurements and green innovation, one of the three “specific measures” to be taken within the textile category, is to “demand circular business models, including rental” (DFØ, 2021a, p. 62). A circular business model is one that supports the main principles of the circular economy such as the three Rs (Lüdeke-Freund et al., 2019). In PSS business models, the value proposition is to offer the customer integrated products and services to cover their needs, rather than selling only the product itself. This could for instance be selling the utility of mobility, rather than selling a car. A PSS can be product-, use-, or result-oriented, depending on the nature of the combination of products and services (Tukker, 2004; Yang et al., 2018). The core argument for this business model in a circular economy is the assumption that with ownership of the product follows an incentive to create value from the entire product life cycle, rather than exclusively from delivery of a product (Yang et al., 2018). In their recommended criteria for green public procurement of textiles, the EU recommends moving from procurement of textile products to procurement of textile services (European Commission, 2017a). In a use-oriented PSS, like rental and cleaning of health textiles, the sustainability argument is that the producer should have the incentive to for instance provide more durable products to avoid the cost of frequent repairs or replacement of products, thus contributing to reducing consumption.

The framework agreement for laundry services for textiles in the health sector of the City of Oslo (from now on referred to as “the framework agreement”), which is being investigated in this thesis provides clean textiles for the health sector as a service. However, certain local service units

also own their own textile products that are being washed by the supplier. Some local service units have an integrated laundry service, with a self-owned stock of textiles. It is therefore relevant to explore the differences between these different models of covering the need for textiles. The sampled interviewees allow for this.

Liedtke et al. (2015) connect theory on PSSs and practice theory, by drawing on the insight by Tukker (2004). Tukker (2004) argues that there is more potential for a sustainable outcome in 'functional results'. A PSS must integrate technological (material) changes in use patterns. Still, these PSSs are harder to distribute. Liedtke et al. (2015) argue that practice theory is useful for the purpose of integrating technological changes in the use patterns. They then go on to link this to the concept of social innovation, which is a deliberate attempt to reconfigure social practices, similar to the ideas of Strengers and Maller (2015) about interventions for change of practices, discussed in section 2.7.5. Conclusions by Mylan (2015) resembles insights from Liedtke et al. (2015) and Strengers and Maller (2015). Mylan (2015) views PSSs and sustainability from a sociology of consumption and practice theory perspective. In her conclusions, she argues that PSSs should be seen as transforming, and not merely meeting, consumer needs. These needs, she writes, exist in a particular practical and cultural context, and are not stable. With the introduction of new products and infrastructures, needs and practices evolve together, like in successful PSSs (Mylan, 2015).

Furthermore, already in the early 2000s, Mont (2002) argued that successful implementation of PSSs for sustainability purposes necessitates a change in the infrastructure of our societies, and in human structures and organisational designs. For PSSs to be sustainable, the focus must be on developing system solutions, where products, services, a supporting infrastructure and networks are designed to minimise environmental impacts of the system. One implication of this is that consumers must be more involved and active, as well as educated by the producers/sellers of the PSS (Mont, 2002). This is recognisable in Mylan (2015), who, over a decade later, pointed out that changes in consumption resulting from PSSs have still received less attention than changes in production.

Tukker (2015) finds in his literature review of PSS that product-oriented PSS does not significantly reduce resource consumption, as consumption systems remain largely the same, but perhaps with some environmental benefits from improved maintenance of products. The lack of environmental gain here is because the producers' incentive remains to sell as many products as possible. Use-oriented PSS, such as renting, were found to lead to poorer treatment of products by end-users, since they did not own the product, leading to higher environmental impact. However,

these conclusions are arrived at primarily for private consumption, and the results are therefore not necessarily transferrable to the public consumption setting.

2.3 Circular public procurement in the City of Oslo

The case is chosen not because it necessarily is a particularly severe case in terms of circular economy performance, but because of the abovementioned high political priority of textiles. Furthermore, the availability of a data set for healthcare textiles in the City of Oslo enabled a narrowing down on this sector, rather than including all textile consumption in the administration of the City of Oslo. In general, it is difficult to tell whether the consumption data set shows a relatively good or bad case, as no comparable cases are available. Still, the relative severity of this case is of limited importance, considering that efforts to curb resource consumption need to encompass all inefficient resource use, and not only the worst cases. Furthermore, the case enables an exemplification of the role of practices that is relevant to more categories and other public administrations.

Specifically for the City of Oslo, both the Climate Strategy towards 2030 (Oslo kommune, 2020) and the Consumption Strategy (Bymiljøetaten, 2019) highlight the use of public procurements as a tool for reducing material consumption from the municipality's own activities. Implementing the procurement strategy within all administrative entities is one of the key action points from the climate strategy.

The purchasing unit in UKE (this unit is from now on only referred to as UKE), is the central purchasing body in the City of Oslo and is responsible for the City's overarching framework agreements with various suppliers of goods and services. UKE also has the role as the advisory entity on public procurement for the other agencies in the municipal administration. Figure 2 illustrates UKE's role in public procurement in the City of Oslo.

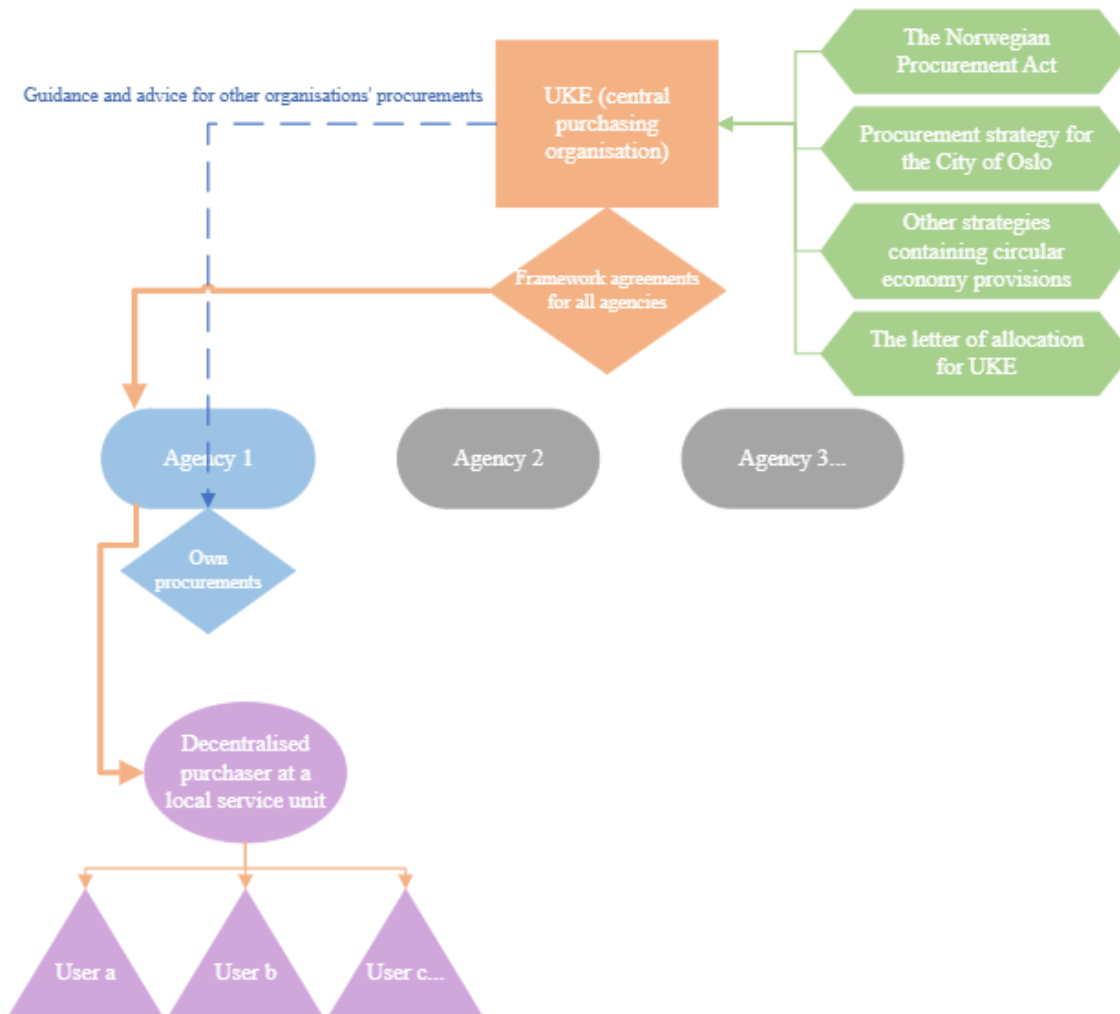


Figure 2: My own illustration of UKE's role as the central purchasing organisation in the City of Oslo.

The procurement strategy for 2010-2012 primarily dealt with issues concerning compliance with public procurement law, organising the procurement work and following up contract clauses. With the procurement strategy for 2013-2016, the focus on following up contracts to ensure social and environmental responsibility increased. Nevertheless, the strategy suggested no specific environmental or social measures, other than having the agencies describe their activities to ensure societal responsibility in their local procurement plans (Byrådsavdeling for finans, 2013). Circular economy is mentioned for the first time in the procurement strategy of 2017 (Byrådsavdeling for finans, 2017). This procurement strategy contains more explicit and clear provisions for what circular economy entails for the work within public procurement.

However, the focus on circularity was not immediately reflected in the letter of allocation for UKE. The letter of allocation is sent from the Department of Finance annually and is a central

management document that describes what the agency is meant to focus on. As such the letter of allocation for UKE is also telling for the development of using the municipality's procurements as a tool for implementing circular economy principles.

Circular economy is first mentioned in the letter of allocation for 2020 (Department of Finance, 2020). A separate section on circular economy and sustainable consumption appears from 2021 (Department of Finance, 2021). In the letter of allocation for 2022, this was expanded with a new role for UKE as a "prime mover"¹ for sustainable consumption through procurements, by offering guidance and advice to the other administrative entities in the municipality (Department of Finance, 2022a). A new impact goal appeared in the letter of allocation for 2023, stating that "the City of Oslo is a sustainable and responsible consumer" (p. 10). With the impact goals follows output goals. One of these output goals was that "UKE has contributed to the municipalities' reduction of purchasing new, and rather increasing repairs, redesign, buying used and reuse within the prioritised product categories" (Department of Finance, 2022b, p. 11). Furthermore, from 2023, one of the activities UKE should report on is to "guide the municipality's agencies towards circular consumption patterns, including maintenance, repairs, redesign, reuse, co-use and materials recovery, through the agencies' purchasing behaviour on the common framework agreements" (Bymiljøetaten, 2022, p. 11).

UKE also states that "experience shows that to enter framework agreements or make requirements in procurements is not in itself enough to change purchasing behaviour/-routines" (Utviklings- og kompetansetaten, 2023). As such, there is a shift in the agency's mission. Earlier, UKE's mission was to facilitate for the existing consumption patterns and using the framework agreements to make this consumption more environmentally friendly. From 2022/23, there is a desire for the framework agreements and connected guidance and advice to more actively change consumption patterns.

What circular economy in public procurement means in the City of Oslo can be extracted from its various political documents that set provisions for management of the municipal administration. UKE has merged the many provisions these political documents give on the area of circular economy and public procurement together, resulting in a hierarchical visualisation of general measures to be taken for a more circular consumption, seen in Figure 3. This figure is inspired by the waste hierarchy, as seen in Figure 1, and as such, the more effective circular economy measures are found at the top of the pyramid, and then the less effective measures towards

¹ «Pådriver» in Norwegian

the bottom. Here, the idea of the three Rs (Reike et al., 2018) is also recognisable, but these are merged with the political provisions given for circular economy in the City of Oslo. A central document is the consumption strategy for Oslo, where the words reduce, share and replace are repeated as a framework (Bymiljøetaten, 2019). Furthermore, the hierarchy of circular consumption in Figure 3 is designed specifically as measures to be taken in the context of the consumption of the municipal administration. These categories are closer to a conception of circular economy activities that involve not only the products themselves, but also the stakeholders involved in their life cycles. Because of this, and the fact that this is the framework used by UKE in the City of Oslo, these are the circular economy principles I will relate to in my research.

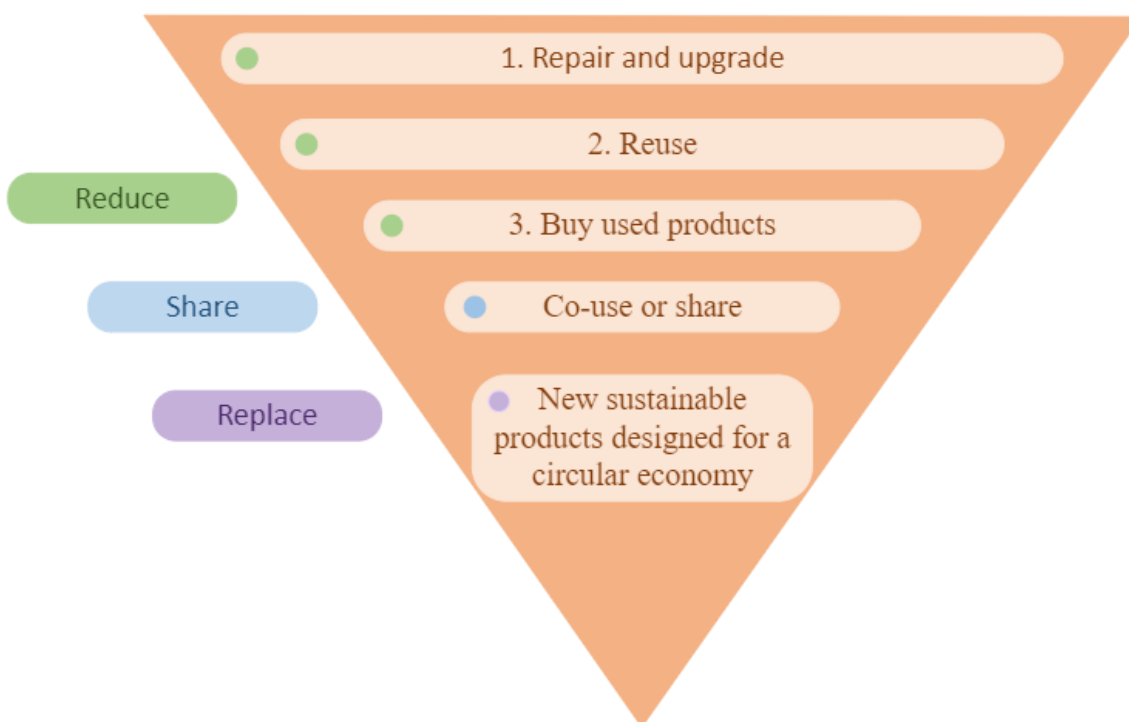


Figure 3: Hierarchy of circular consumption in the City of Oslo, showing circular economy principles to be implemented in public procurement (my own illustration, adapted from UKE, City of Oslo).

2.4 Implementing circular public procurement

Despite the limited existing literature and empirical evidence on how to enhance circular economy in public procurement processes, many initiatives exist on how to theoretically implement circular economy in public procurement. UNEP (2018) presents two main pillars for the uptake of circularity in public procurement. One is the promotion of circular supply chains through “circular” criteria in tenders for goods and services. The other pillar is the promotion of circular business models, such as PSSs. Furthermore, UNEP (2018) briefly recommends a few measures to take that

are interesting in the context of this thesis. One of these recommendations is to engage in systemic thinking, with inclusion of all stakeholders in the value chain. Another is the role of monitoring and supporting systems to measure results and impacts, where UNEP (2018) advises procurers to include contract clauses for reporting on impacts during the contract period. Similarly, in their publication on good practice and guidance for public procurement for a circular economy, the European Commission (2017b) devotes attention to the use phase and contract management. This focus however is limited to a short introduction to various models for encouraging the supplier to take responsibility for the product after the use phase, without mentioning the role of the end-users. The Ellen McArthur Foundation, which works to facilitate a transition to a circular economy, published a circular public procurement framework for cities early in 2022 (Ellen McArthur Foundation, 2022). This framework's content is in many ways similar to those of UNEP (2018) and European Commission (2017b). One section that stands out, however, is the section on reviewing the organisations' assets. Here, Ellen McArthur Foundation (2022) encourages cities to keep an updated inventory overview, and informs that this may involve changes in how stocks of products are managed in the organisations.

The above-mentioned guidelines and frameworks for circular public procurement have in common that most attention is given to the tender process, with the use of circularity requirements in the tender documents and contracts. This could for instance be requirements for availability of spare parts for products in the tender. If, however, spare parts are never ordered by the end-users of the products when needed, for various reasons, this requirement will arguably not contribute to increased circularity. Like guidelines and frameworks for circular public procurement, studies on the topic often also focus on policy and the tender process (Alhola et al., 2019; Tátrai & Diófási-Kovács, 2021). In his literature review on circular public procurement, Morales (2021) finds that most research on the topic consists of case studies with a focus on the planning and tender processes, rather than on implementation. Several studies particularly highlight the importance of pre-procurement consultation between the public contracting authority and market actors as part of the tender process (Alhola et al., 2019; Rainville, 2021; Sönnichsen & Clement, 2020). Furthermore, circular public procurement research is almost exclusively carried out from the public procurer's (responsible for planning and tendering, and often contract management) point of view, rather than the user perspective (Malacina et al., 2022).

A recent report from the Nordic Council of Ministers (2022) discusses climate accounting in public procurements in the Nordic region. For Norway, the report states that monitoring is challenging for several reasons. One of these reasons is that since a large portion of public

procurements in Norway are based on framework agreements, decision-making with environmental effects often take place at the placement of the specific orders by decentralised purchasers, and not only in the tendering phase of the framework agreement. Another reason for difficulty in monitoring is that it is unclear who has responsibility for implementation of environmental concern in the contract period.

Kristensen et al. (2021) apply practice theory, in combination with learning theory, in their study of circular public procurement in Danish municipalities. One finding is that public procurement policies of the municipalities in the study was not considered by the interviewees to have a great influence on practice, because these policies contain general guidelines rather than specific guidelines on how to achieve circular public procurement. A challenge on the user-level identified in the research by Kristensen et al. (2021) is that there are expectations towards end-users' involvement in setting demands for circular public procurement, but that these end-users do not necessarily have the knowledge required to do so. The researchers also explain that there might be a widening gap between public procurement policies and practice, as the policies have not been updated for many years, while practice has continued to evolve. The central procurement department's influence on actual purchasing among decentralised purchasers is limited by both physical and cultural organisational distance. This is also what is realised in the point made by The State's Procurement Centre about the necessity of communication with decentralised purchasers when centralising procurements with framework agreements (DFØ, 2022). Kristensen et al. (2021) state that "circular public procurement cannot be confined to just a procurement department as it requires collaboration internally across departments and externally with partners in the supply chain" (p. 1). These identified issues are recognisable from the institutional organisational theory point of view, with its emphasis on how organisational change does not occur with a simple top-down approach (see section 2.7) (Christensen et al., 2015).

Kristensen et al. (2021) are not unique in suggesting a broader involvement of end-users for circular economy outcomes. Some of the literature on PSSs, which is more thoroughly treated in section 2.4, concerns how consumers (here: end-users) should be involved for such business models to actually contribute to more sustainable production and consumption patterns (Mont, 2002; Mylan, 2015). Knot and Luiten (2006) argue that "complex product-service systems have to be developed" (p. 263) for sustainable development of product and consumption. They write that this has certain implications for the design process. One of these implications is that research on users becomes particularly important. Additionally, users should not simply be researched, but be co-developers and testers of solutions, Knot and Luiten (2006) write, since users' daily practices are

central. This is in line with Sahakian and Wilhite (2014), who highlight the necessity of ‘communities of practice’ for sustainability changes (see section 2.7.5).

Going back to public procurement specifically, Kristensen et al. (2021) recognise that circular public procurement does not only concern purchasing new products, but also rethinking the needs of the end-user and for instance repairing or redesigning products, as part of a wider circular system perspective. These activities go beyond the central procurement department. However, the authors do not present any suggestions as to exactly how this can be done, which might be connected to the mentioned limitation of the study to centralised purchasers. Kristensen et al. (2021) specifically mention that one limitation is a lack of respondents among decentralised purchasers and end-users. This limits the study’s possibility to describe more about their practices, which are deemed relevant when purchasing decision-making is decentralised. They recommend further research to carry out in-depth investigations of procurement practices and to include among other aspects these roles.

Even though a considerable amount of research emphasise benefits from public procurement, such as circular economy objectives, Malacina et al. (2022) argue in their practice-based review of how value is captured in public procurement that the interpretation of value in circular public procurement research is still mostly focused on economic value creation. Along similar lines, Qazi and Appolloni (2022) conclude in their review of barriers and enablers towards circular procurement management that key performance indicators of public procurers should be changed, but without suggesting how this might be done. Malacina et al. (2022), however, propose that public procurers’ performance should be evaluated according to the value they create for various stakeholders. In their conclusion, they highlight that user value components should receive more attention in public procurement, and therefore call for a case study from the user perspective to uncover other value components and supporting public procurement practices. Among the user-related means of creating value in public procurement that they identify is end-user-engagement practices and information-sharing practices with the user. They also identify product life cycle-oriented procurement practices, that are “related to implementing the life-cycle targets of procured products/services” (Malacina et al., 2022, p. 9).

Since the life cycle perspective is central in circular economy theory, attention to all phases of a products’ life cycle is important. However, the contract of a public procurement often does not fully formally regulate the use phase. As such, it can be understood that there are more actors involved in the consumer behaviour of an organisation than the procurers, particularly when

procurements are organised as larger framework agreements managed by a central procurement body and used by other agencies. While Malacina et al. (2022) clearly establishes the need for more research from the user perspective in public procurement, I also wish to include decentralised purchasers as a separate and, in the identified circular public procurement research, overlooked stakeholder. The decentralised purchaser has behaviour that possibly also mediates organisational factors and circular public procurement outcome. Framework agreements are used by employees with the role of *ordering* (decentralised purchasers) goods and services, and the goods and services ordered are used by *end-users*. Therefore, procurers, decentralised purchasers and end-users are three different roles, even though one person sometimes can possess several of these roles, depending on the structure of the public organisation in question. The decentralised purchaser role is to a larger degree relevant as a separate stakeholder within large public organisations with a widespread use of common framework agreements and decentralised purchasing decision making, such as in the City of Oslo. My contribution will therefore be to delve deeper into the practices existing within these roles, using the case of textile consumption in the City of Oslo. Figure 4 illustrates my conception of four different levels of public procurement activity, and their interconnectedness.

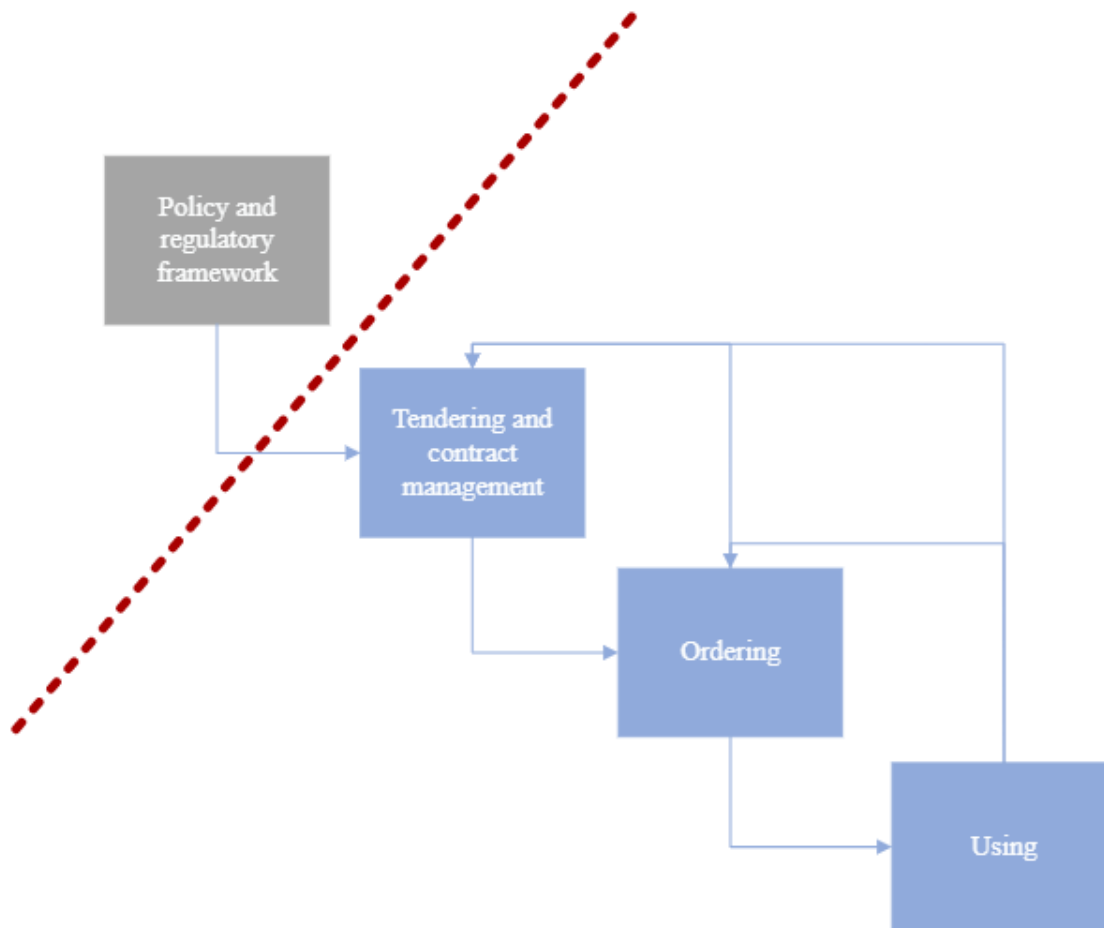


Figure 4: Four levels of public procurement activity (my own illustration), when using framework agreements. The dotted red line illustrates the limitation of the scope of this thesis.

Against this backdrop, activity at the ordering and using level of the consumption of textile products should be of interest, as called for by Kristensen et al. (2021) too. Currently, the level of knowledge about textile consumption practice in the City of Oslo is low. At the policy and tendering levels, however, documents do give some insight. Furthermore, knowledge about volumes and types of textiles consumed can be obtained from the municipality's procurement analysis database. This is data from invoices to the municipality. However, this data is of such a quality that it cannot provide a clear and comprehensive picture of textile consumption in the City of Oslo (Gilleberg, 2021). Information about consumption practices at the ordering and using levels is not automatically generated, like that of invoices, and must therefore be sought through contact with those carrying out these activities. With the assumption in my research that changing internal practices necessitates understanding the practices, practice theory is a suitable theoretical approach.

2.5 Social practice theory, organisations, and change

2.5.1 Theory on public organisations

Organisation theory for the public sector seeks to explain decision-making in formal public organisations (Christensen et al., 2015). Different perspectives on public organisations can be categorised as either instrumental or institutional. Instrumental perspectives view the organisation as a tool for the leader, while institutional approaches take the role of organisations' own culture, values and norms in decision-making into account (Christensen et al., 2007). Christensen et al. (2015) present three overarching perspectives on organisation theory for the public sector: the instrumental, the cultural and the myth perspectives.

The instrumental perspective on organisations views the organisations as shaped by and responding rationally to goals as given from the (political) leaders. However, the instrumental perspective is limited when it comes to explaining how organisations change, as it is observed that organisations do not simply change in perfect accordance with changing demands from their external environment or from political leaders (Christensen et al., 2015). This is where the institutional perspectives of culture and myth can be useful, according to Christensen et al. (2015). The cultural perspective highlights that public organisations can have distinct identities and opinions about what constitutes relevant problems and what good solutions to these are. The myth perspective explains that organisations are institutionalised through adapting to their external environment's conception of correct and modern form of organising. As such, behaviour gradually changes through political initiative, but the organisations' institutions create important opportunities and barriers to actual behaviour in public organisations (Christensen et al., 2015).

Practice theory is another institutional approach to organisation studies (Schulz et al., 2019). It originates within sociology (Gherardi, 2019), and well-known authors in the social sciences such as Bourdieu, Giddens and Foucault are often looked upon as practice theorists (Perera et al., 2018; Reckwitz, 2002; Schmidt, 2018). Practice theory saw a resurgence in popularity within the social sciences from the 2000s (Strengers & Maller, 2015). Practice theory is now used in work and organisation studies (Gherardi, 2000; Klein et al., 2020; Klein et al., 2021; Klein et al., 2022; Nicolini, 2012) and in consumption studies (Corsini et al., 2019; Gram-Hanssen, 2010; Hargreaves, 2011; Warde, 2014), which are both relevant fields for the topic of this thesis, namely consumption in organisations.

2.5.2 Practice theory

The so-called "practice turn" in the social sciences took place partly due to dissatisfaction

with the until then, but also perhaps still, dominant ways of understanding how social life's stability or change is created. Strengers and Maller (2015) explain that there are three dominant understandings of social life and sites of intervention. One is the approach of behavioural economics, which is concerned with the individual's behaviour, as motivated by social norms in their surroundings. Another is the general approach where people or organisations' behaviour is viewed as motivated by rational economic action based on individual interest, and as such, relevant interventions to affect social life revolves around market mechanisms. The third dominant approach is the technological approach where technologies are viewed as scripting social life, and therefore the design of technologies become the relevant method for intervening in social life.

Behavioural economics and the technological approach both view change as an outcome of external structural forces, whether that be social norms or technological innovations, while rational economic action has it that outcomes of individual agency accumulate to form social life. For long, the debate between these views of conceptualising social change divided social theory into two camps of structure versus agency (Corsini et al., 2019; Hargreaves, 2011; Schmidt, 2018; Shove et al., 2012). Here, consumption is seen as either a result of individual interests or of culture (Warde, 2014).

Practice theory offers an alternative interpretation to consumption either as a result of individual economic interest or of culture, which have been the dominant approaches to consumption studies. Practice theory in empirical consumption studies has particularly been used to research sustainability issues, according to Warde (2014). Furthermore, in their paper on the use of practice theory in sustainable consumption research, Corsini et al. (2019) identify the potential for applying practice theory in the field of circular economy specifically.

Anthony Giddens' structuration theory is commonly viewed as a theory that reconciles agency and structure, and as one of the theories from which practice theory has emerged. Giddens states that structure and agency are interrelated and affect each other in the shaping of social life (Shove et al., 2012). Practice theory places practices and their development at the centre of analysis of social life (Strengers & Maller, 2015). With this, practice theory aims to reconcile agency and structure and bridge technical and behavioural strategies for change in organisations.

Nevertheless, one unified practice theory does not exist, according to Nicolini (2012). However, variations of practice theory share the idea that behaviour is collectively produced and reproduced, more than it is an individual effort. A practice is simply explained "the organised activities of multiple people" (Higgs, 2012, p. 13). A more commonly cited definition explaining

the concept further is that of Reckwitz (2002, p. 249), which describes that a practice is “a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, knowhow, states of emotion and motivational knowledge”. The social world is built of practices, which are neither exclusively made up from the actions of rational individual actors, nor by social structures superposed on the individual (Corsini et al., 2019). Even though individuals are the carriers of practice, it is the practice itself, and not the individuals carrying them out, that are the units of analysis (Hargreaves, 2011; Reckwitz, 2002).

Shove and Pantzar (2005) emphasise that buying a product is only one dimension of consumption, whereas the concept of practices can give further insight into consumption as a whole. Warde et al. (2017) uses the phrase *ordinary consumption* about consumption that holds close to no symbolic meaning. Consumption should be viewed as something that occurs in a practice, instead of as purchasing acts, as phrased by Warde et al. (2017). In a similar fashion, Mylan (2015) writes that people are *practitioners* more than they are *consumers*, where consumption is an instrument used in the performance of another, often day-to-day practice. Consumption seen from a practice theory point of view is therefore less conscious than what other approaches, such as the cultural approach to consumption emphasising phenomena like lifestyle, identity and taste as determinants of consumption patterns, would have it. With such an approach, according to Warde et al. (2017), practice theory can reveal hidden determinants of consumption patterns. Practice theory can help us understand how meaning is created, and by understanding the structures of a practice, opportunities for change can be identified (Gram-Hanssen, 2010), so that intervention can be designed.

However, exactly what the material and social elements that make up the structure of a practice is, is debated amongst practice theorists (Strengers & Maller, 2015). Due to this, it is argued that practice theory is actually less of one unified theory, than an approach (Gram-Hanssen, 2011). Nevertheless, in general, it can be said that the structure of a practice as entity consists of various elements (Gram-Hanssen, 2010). Here Shove and Pantzar’s (2005) elements of *competences*, *meanings*, and *materials* is a commonly cited version (Strengers & Maller, 2015; Warde et al., 2017), and is therefore chosen for this thesis.

Competences and meanings are the social elements of practices. Competences refer to techniques, skills and knowledge about how to do something, through practical or theoretical know-how (Shove et al., 2012). The meanings element covers sub-elements like ideas, aspirations,

emotions, and motivation. Meanings can be for instance symbolic images or social expectations. Meanings as an element helps situate a practice in a particular context of time and space (Shove et al., 2012). This element is useful for understanding how people performing practices make sense of their practices. As an example, in a study on energy consumption practices during power outages, Wethal (2020) finds that meaning-making in these instances revolved around for instance identity-building in rural areas and the sense of achievement when managing without electricity.

Finally, materials are the physical things in the world, including objects, infrastructure, and bodies (Shove et al., 2012). Shove (2016) distinguishes between materials that are actively part of a practice as they are manipulated or mobilised (object materials), materials that are indirectly engaged with in a practice as infrastructural elements (infrastructural materials), and materials that are consumed in the course of a practice (resource materials). Which category a material is part of, is decided not by what material this is, but the material's positioning within the given practice, which can also change (Shove, 2016). It is possible to view textiles in all three of these different material roles. For instance, the practice of laundering a garment involves the textile as an object material. The use of a textile product due to its specific characteristics, such as for instance waterproof properties, means the textile product is an infrastructural material that enables for instance the practice of hiking. Lastly, a textile can be a resource material, like using a towel to wipe a surface dry, where the drying capacity of the towel is consumed until the towel dries up again. The practice elements and examples of their contents are illustrated in Figure 5.

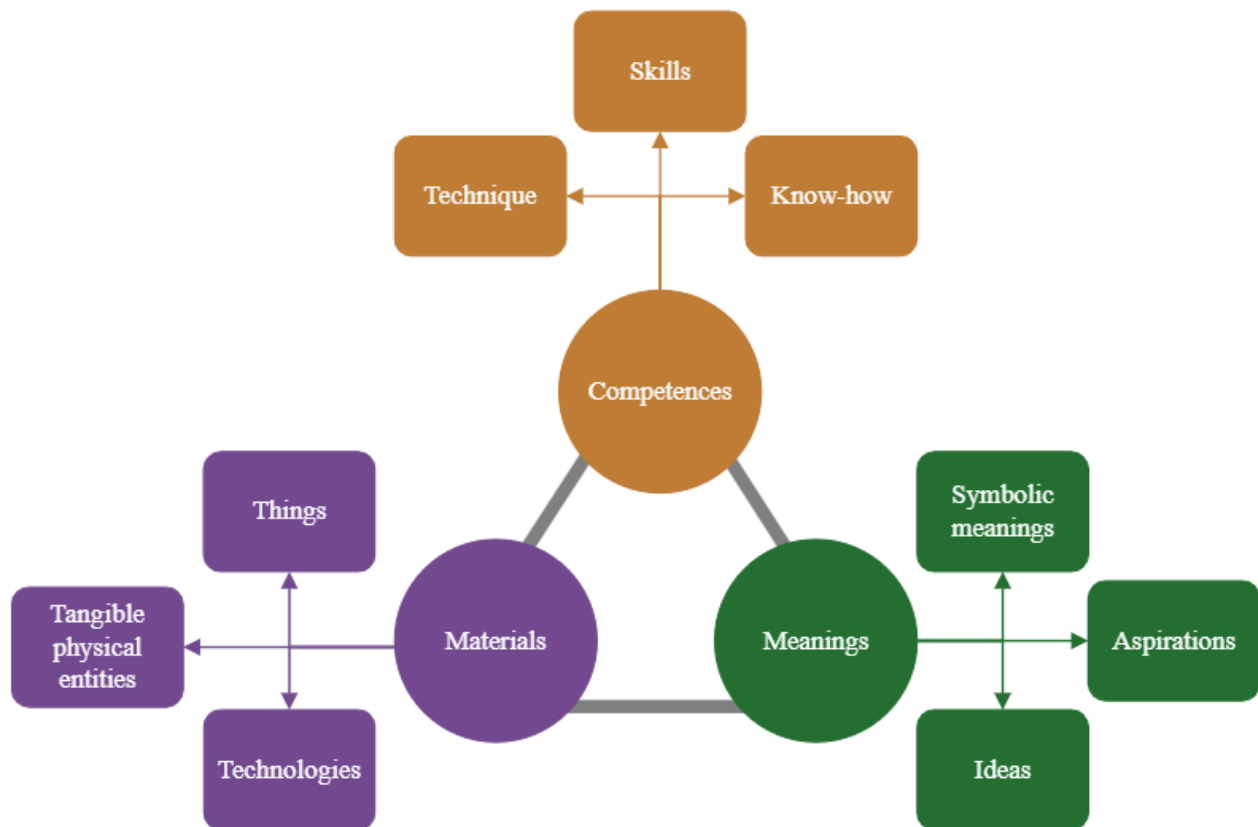


Figure 5: Practice elements, inspired by Shove et al. (2012, p. 15).

Practice theory can be useful for understanding how social practices are, but, perhaps more importantly, how social change comes about (Halkier et al., 2011). In fact, Gherardi (2019) argues that one of the main purposes of studying practices is to change them (Gherardi, 2019). The making and breaking of the links between the meanings, competences and materials elements is what causes practices to emerge, persist and disappear. Figure 6 illustrates this, with proto-practices as potential practices as the elements exist but separately, practices as where the links between elements have been made and ex-practices where the links between the elements are broken. Change and stability can be analysed by focusing on these links, and therefore prioritising neither agency nor structure, Shove et al. (2012) suggest. Furthermore, the elements shape each other. For instance, the way an object (material) is designed, can cause a change in the skills needed (competence) to properly use the object in a practice.

Still, Warde (2014) cautions against viewing the entire social field in terms of interlinked practices. In fact, he writes that attempting to write an account of whole social systems based only on practices and their elements becomes a “fiendishly difficult task” (p. 296). Warde (2014) sees a

tendency seen in the application of practice theory of leaning too far towards an account of human agency as a driver of practices and change in practices. Doing this involves a risk of ignoring the impact of structure. It is important to also place emphasis on the institutions that produce shared understandings, such as norms or given standards, because shared understandings impact how humans practice. Consequentially, Warde (2014) calls for combining practice theory with an illumination of the systemic conditions around practices. I believe that this makes consumption in organisations, and not only among persons with individual agency, particularly interesting.

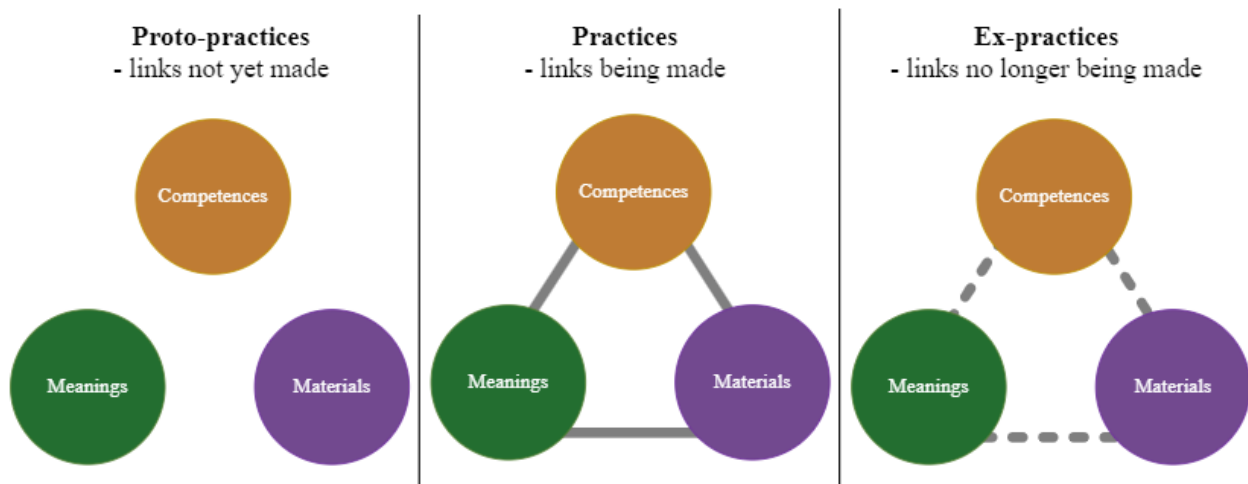


Figure 6: Proto-practices, practices and ex-practice, adapted from Shove et al. (2012).

2.5.3 Circular economy and consumption in organisations

I have searched for literature about consumption and circular economy in organisations, with moderate success. However, literature does exist about drivers of sustainable consumption at the workplace. In general, the theory about organisations and what determines an organisation's behaviour can be looked at to try to understand the topic of consumption in organisations. Some research on consumption in organisations is about the workplace as a learning arena for sustainable consumption (Muster, 2011), and therefore is focused on consumption for private purposes, rather than consumption necessary to produce the organisation's goods and/or services. However, a key take-away from Muster (2011) is the attention to the arenas where people are not primarily acting as consumers, as relevant when wanting to change unsustainable consumption patterns.

Two main and competing approaches to sustainable workplace consumption are the organisational culture approach and the individual pro-environmental behaviour approach (Süßbauer & Schäfer, 2019). Here, the agency versus structure-debate is recognisable again.

Temminck et al. (2015) write about organisations motivating employees towards more sustainable behaviour in the workplace setting. They explain that earlier research on the topic has shown that measures like rewards and/or penalties for sustainable behaviours has been viewed by employees as an ineffective way to drive behavioural change. Therefore, Temminck et al. (2015) propose using organisational citizen behaviour, which is the informal performance of individual voluntary behaviour going beyond one's job description without any promised awards. This is behaviour that is not formalised by the organisation. The study, focusing on how individual and organisational traits determine environmental behaviour, shows that an organisation that shows support for environmental issues promotes employees' environmental behaviour in the workplace setting. Thus, an example provided by the authors of an effort that can be taken is to give information about employees' environmental efforts in newsletters.

Hobson et al. (2021) write that research on the degree to which consumer's knowledge impact their environmental consumption behaviour shows that having information often explains little about actual action taken by consumers. In a similar vein, Clarke (2008) provides an account of the development of consumption theory, and explains how it has been questioned that people, when they receive certain information, act upon this information in their consumption. The criticism revolves around three assumptions which they question. One is the assumption that people can be sure of their consumption's consequences, another is that people are able to modify their consumption when informed about these consequences, and the third that people gladly accept personal responsibility for "global problems" from consumption, such as resource depletion and climate change. Clarke (2008) then points to practice theory, which has shown that consumption is more a form of routinised and socially determined behaviour, and as such, individual choice plays a minor role in explaining consumption patterns.

I regard the concept of *consumption work* as a helpful perspective in the discussion on drivers of consumption patterns, despite that this concept seems to have been employed mostly in private individuals or households as consumers, rather than employees or organisations as consumers (Hobson et al., 2021; Wheeler & Glucksmann, 2016). Wheeler and Glucksmann (2016, p. 37) define consumption work as work that is "necessary for the purchase, use, re-use and disposal of consumption goods and services". Hobson et al. (2021) argue that the role of the consumer receives too little attention in circular economy literature, and that the new forms of consumption proposed to implement circular economy principles necessitates a reconfiguring of consumption work. A repairable product, for instance, requires the consumer to spend time repairing, learning new skills, or organising professional repair. This leads the authors to critically question how the

labour is shifted towards the consumer with more circular business models, and what implications this has for the successfulness of proposed circular economy strategies, like PSSs.

Qualitative studies such as Hargreaves (2011) have not succeeded in confirming that environmental awareness among employees is strongly related to their motivation to take part in “greening” their workplaces. Süßbauer and Schäfer (2019) argue that a reason for this is that behaviour with environmental impact is part of everyday workplace routines, and thus not actively reflected upon as actions with environmental impact. At its core, this argument has similarities to Clarke (2008), who argues that individual choice is less important for consumption choices. This contrasts with the research by Temminck et al. (2015), and has consequences for how interventions for changing consumption patterns in organisations should be designed.

2.5.4 Practice theory in the organizational setting

Specifically for organisations, instead of looking at organisational phenomena as a direct result of a detailed plan, practice theory views them as a “fluid scene that unfolds in front of us in terms of multiple practices carried out at the same time” (Nicolini, 2012, p. 9). As such, organisations are both the sites of these unfolding multiple practices, and their ways of working are a result of these practices (Nicolini, 2012). One of the particular characteristics of practice theory, is the strong presence of people’s agency in practice theory, where the *homo practicus* is understood as a body and mind that carries with it and carries out practices. This gives room for initiative and creativity in the performance of practice, which again enables social systems to be made and unmade through practice (Nicolini, 2012). Deliberately making and unmaking social systems through practices may however require active intervention.

Practice theory significantly differs from other institutional perspectives on organisations, like the cultural or myth perspective of Christensen et al. (2015), in its inclusion of material aspects of life. As such, consumption is not just seen as a consequence of culture, but also of the material (Warde et al., 2017). This is a particularly important notion in science and technology studies, which have similarities to practice theory (Shove et al., 2012). In STS, the design of technology is often viewed as creating particular behavioural responses, or “scripting” them (Warde et al., 2017). Splitter et al. (2018) describe various studies that show the role of materiality in organisational practices. For instance, one study shows how in a restaurant chain, practices revolved around the particular design of the menu. Furthermore, Splitter et al. (2018, p. 12) suggest that “(f)uture studies could go beyond that, however, by applying the theory to a study of the co-constitution of arrangements and practices within organization”. In my research, I am interested in doing this, by

investigating not only how material artefacts can shape organisational practice, but how that organisational practice, too, determines how material artefacts are used.

2.5.5 Practice theory framework for circular economy implementation: intervention for change

A study by Klein et al. (2021) on implementation of circular economy in public organisations argues in favour of taking social elements in organisations into account, since various social elements in the organisations were found to be crucial for the transition to circularity. More specifically for public procurement, Klein et al. (2021) argues that public procurement should be viewed as one element in a broader circular initiative in public organisations, rather than an isolated activity carried out with more attention on environmental sustainability. Schulz et al. (2019) also explain how circular economy as an approach to more sustainable production and consumption patterns has been criticised for lacking socio-political aspects of consumption, and that circular economy research is missing frameworks that enables an assessment of the social dimension of circular economy implementation. Taking an institutional perspective, more specifically a practice theory perspective, allows for this, argues Schulz et al. (2019). The ‘prime mover’ approach the central procurement unit UKE in the City of Oslo has adopted in order to enhance circular public procurement is therefore interesting to explore through such a theoretical lens.

Practices may also change from the outside, for instance with the introduction of a new law (Gherardi, 2019). External institutions, like a law, can affect what the materials involved in the practice are like, as well as their competences and meanings. To exemplify this, the practice of consuming soft drinks has arguably changed in the EU with paper straws replacing the previously more commonly used plastic straws. This replacement was a legal necessity due to the directive on the reduction of the impact of certain plastic products on the environment (Directive 2019/904). Policy and the regulatory framework and tendering in Figure 3 illustrates this.

An important notion in practice theory is that individual practices exist in wider systems of many practices. Practices can depend on, be governed or regulated by other practices (Strengers & Maller, 2015). This perspective is important in order to understand how change in practices for implementation of circular economy principles can occur through intervention. Several practice theory scholars discuss strategies for change. In their chapter in the book on the implications practice theory has on intervention for sustainability, edited by Strengers and Maller (2015), Spurling and McMeekin (2015) suggest three ways of intervening in practices: re-crafting, substituting and interlocking. Re-crafting practices means to change one or several of the elements

of meanings, competences, and materials that the practice consist of, to reduce the resource-intensity of the practice. Substituting practices involves changing to an alternative practice with entirely different meanings, competences and materials, which still meet the same end goals as the original practice.

Lastly, intervention through interlocking is different from re-crafting and substitution practices, by viewing practices less as a given. It involves being aware of how practices interlock in wider systems of practices and seek change through questioning the very need that practices are aiming at fulfilling (Strengers & Maller, 2015). This system focus is shared with Sahakian and Wilhite (2014), who emphasises that practices should be seen as systems, not siloes. With intervention through interlocking, change can follow in multiple interconnected practices (Strengers & Maller, 2015). Similarly, how loose or tight the coupling of elements within one practices is, also affects how easily a practice can be changed, according to Mylan (2015). In a practice where elements are loosely coupled, the elements are not dependent on each other, and change in one element can be sufficient for change in the overall practice. The opposite goes for tightly coupled practices, where elements are strongly dependent on each other.

Sahakian and Wilhite (2014) suggest that actors seeking to orchestrate change in practices should identify elements that are already changing and direct their efforts at strengthening this change. This could happen by an upscaling from smaller to larger projects, but also by connecting 'communities of practice' to facilitate learning across these. They emphasise the concept of 'social learning', and the importance of communicating a 'learning proposition' (what is to be learned), and opportunity to engage in a 'community of practice'. Translated to the policy context, Sahakian and Wilhite (2014) recommend that policies provide a learning proposition that is meaningful to people in their everyday lives, as policies often do not do this. Demonstration projects are positive for creating an opportunity to engage in a community of practice, and to create a story to introduce new members in the community of practice, as a form of competence transfer (Sahakian & Wilhite, 2014).

Corsini et al. (2019) point out the need to go from a conceptional practice theory to operationalising practice theory for the use in case studies, as is done with the case of textile consumption in this thesis. Information about the material of the flow of textiles in the City of Oslo is, to my current knowledge, either non-existing, or, at best, not gathered and organized from the various sources that might hold information about this. My ambition is to use the three elements of a practice for a deeper understanding of how the City of Oslo functions as a consumer of textiles today, and analyse how such an understanding of the City of Oslo as a consumer can contribute to

the implementation of circular economy principles through public procurement.

3. Research design and methodology

This chapter will account for the research design and method used for this thesis. I address case study as the chosen research strategy and present the sampling, data collection and analysis methods. Finally, I discuss the validity of the research, along with ethical considerations. Overall, the research process has been characterized by a high degree of iteration.

Ensuring trustworthiness has been important during the work with this thesis, and throughout this chapter I will comment on to implications of my choices on the trustworthiness criteria of credibility, transferability, dependability and confirmability (Bryman, 2016, p. 44). Credibility concerns believability of the findings. Transferability and dependability are about whether findings are applicable to other contexts and other times, respectively. Confirmability is concerned with whether the researcher lets their values influence the research (Bryman, 2016, p. 44).

3.1 Case study

I chose case study as my research method. A case study allow for an in-depth exploration of one particular setting (Bryman, 2016, p. 10), not meant to generalise, but to provide insight. Here, the insight sought is how user practice can contribute to circular public procurement implementation. A case study, according to Yin (2003), is appropriate for investigating a “contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 13). Case studies are suitable for a research design that involve “how”-research questions seeking explanatory answers, as opposed to research questions seeking exploratory or descriptive answers. How-questions seeking explanatory answers can also use experiments as research strategy, according to Yin (2003). However, this requires that the relevant behaviour researched can be manipulated. In my research, the practices researched cannot be manipulated in a laboratory experimental setting with the systematic and controlled effort this takes. Furthermore, case studies can also be similar to histories as a research strategy. A key difference between case studies and histories as research strategies is the strength of the case study when it involves a combination of data sources, like documents, artefacts and interviews. In this thesis, three data sources are employed: interviews, a quantitative data set and documents. These data sources should be combined in a triangulating fashion in the data analysis, Yin (2003) writes. As such, the case study as a method covers research design, data collection and data analysis (Yin, 2003). The case in this thesis is what Bryman (2016, pp. 62-63) calls an exemplifying case, as opposed to a critical or extreme case, for instance. An exemplifying case is one that is an example

of a broader category of cases. Here, this broader category is consumption practices in the public sector.

A case study does not necessarily mean only qualitative data sources, even though case studies can be confused with only involving qualitative research, according to Yin (2003). However, within this case study, I have used quantitative case-specific data. Therefore, this case study can also be described as using a mixed-methods research strategy (Bryman, 2016, p. 635). Bryman (2016, pp. 638-640) explains different rationales for using a mixed-methods research design and categorises ways in which qualitative and quantitative research strategies can be combined to one research design. The combination can be done in various ways in terms of priority and sequence of the two research strategies. In this framework, the mixed method approach I employ is the concurrent approach, where the qualitative strategy is prioritised as the main method.

The research method also contains elements of action research. Lune and Berg (2012, p. 260) describe this method as one “where the goal of the research is not simply research for the sake of research or theory but is an effort at creating a positive social change”. Underlying values of action research include the “democratisation of knowledge production and use”, and “appreciation of the capacity of humans to reflect, learn and change” (p. 260-261). However, the research method used is not fully an action research method, as the scope of the master’s thesis does not allow for such an extensively participatory approach, where the stakeholders (here: public procurers, facility managers and end-users) contribute in, for instance, formulation the research questions (Lune & Berg, 2012 , p. 265). Lune and Berg (2012) state that principles followed in action research may be applied selectively in any type of research project, as done in this thesis. The research question has arisen from the realisation among my colleagues and me in our work with circular public procurement that a more thorough user involvement might be a key to successful implementation of circular economy principles in the consumption of various goods and services in the City of Oslo. As research on this topic is very limited, the master’s thesis seemed a unique opportunity to treat this from an academic approach with the thoroughness this allows for.

3.2 Data sources and sampling

I wished to collect data on how health textiles are used, and therefore chose to interview employees who are decision-makers in the use phase of the textiles’ life cycles. Sampling of interviewees was primarily carried out using data from the supplier of textiles and laundry for the health sector in the City of Oslo. The data contains detailed information on workwear that is or has been in use in the health sector by the City of Oslo since 2014, what local service unit it is owned or

rented by, and how many times the garment has been washed. Using either qualitative or quantitative data to enable sampling for the other approach, is one of the main ways of combining qualitative and quantitative data in mixed methods research, according to Bryman (2016 p. 641). While such a data set enabled random sampling, I used it for purposive sampling, since the data set gives the opportunity to use extreme case sampling (Bryman, 2016, p. 409), by targeting interesting cases in a more precise manner. I compared the percentage of the total amount of discarded textiles, with the percentage of the total amount of textiles in use, for the 73 local service units represented in the data set. Based on the differences between these two percentages, I identified the three service units with a particularly low number of discarded textiles, and three with a particularly high number of discarded textiles, relative to their total use of textiles. A potential error here which impacts the credibility of the research, though only to a limited degree, is that it is not given that a local service unit's number of textiles in use perfectly represents their actual need of textiles.

I wanted to conduct interviews with relevant actors connected to the sampled local service units. Sampling criteria for interviewees was therefore 1) interesting case 2) having a role relevant in the management of textiles. As such, there are several levels of sampling involved, which according to Bryman (2016, p. 408) is “particularly relevant to the consideration of sampling in qualitative research based on single-case study [...] designs”. A list of contact persons from each local service unit using the framework agreement was provided by UKE, and as such getting in touch with the facility managers was straightforward. However, one of the three sampled facility managers from a local service unit with a relatively low number of discarded textiles never replied to my emails and phone calls and is therefore not included in the research. Therefore, service units with a relatively low number of discarded textiles are slightly poorer represented than the opposite group.

For the end-user level, I had no list of employees at the sampled service unit. Therefore, I used an element of snowball sampling (Bryman, 2016, p. 409), and requested from the facility managers that accepted the interview invitation that they contribute to finding interviewees at the end-user level. This was less straightforward, as the end-users of healthcare textiles are mostly not working in an office, with calendars to book meetings, and also have to prioritise their daily healthcare tasks before contributing in an interview. I was therefore told by several facility managers that the sampling had to be done once I was there physically at the service unit, and we would see who was by chance available at that time. Consequently, I failed at sampling interviewees at the end-user level at all local service units, which reduces the transferability of the research. The particular setting of the healthcare sector also had consequences for data collection, as

described in section 3.3.

Furthermore, I used opportunistic sampling. Bryman (2016, p. 409) describes this sampling approach as an approach where the researcher takes advantage of unforeseen opportunities to collect data. Interviewee D1 and G1 were sampled this way, based on specific traits of their local service units' textile consumption. I happened upon these two through tips from my colleagues. Interviewee D1 was interviewed because of their local service unit's recent decision to purchase automated workwear distribution solution for textiles. The interview sparked an interest in me to investigate how these automated workwear solutions have worked in organisations that have used them over time, but unfortunately, none of my requests for interviews with such organisations were successful. Furthermore, two expert interviews were conducted, despite that I did not originally plan for this. The expert H1 has been working with laundry and textiles services for many years and has taught the subject textile management for students in facility management. H1 was mentioned by several of the other interviewees, and as literature on the subject is very limited, I decided to conduct an interview with them to access potentially interesting general information about the subject. Experts I1 and I2 work with environmental management systems in the City of Oslo, and as this became a topic in several interviews, I wanted to explore this further. The iterative approach to this research project thus allowed me to adopt the process and further explore topics that emerged during the primary data collection and analysis (Bryman, 2016, p. 379). In total, I carried out 16 interviews, with 18 interviewees, as can be seen from Table 2.

Lastly on sampling, tender documents, other documents guiding the use of the framework agreement and information from the City of Oslo's intranet has been used as a background for the interviews, and to inform the analysis. These textual sources were sampled according to my previous knowledge about relevant documents and were used with the permission of UKE, and provides useful contextual information for the interviews. This use of multiple sources of data, both within interviews as a data source, and with secondary quantitative and qualitative data, is a way of increasing the credibility of the research.

Table 2: Data sources used for the thesis.

Data source	Contents
Consumption data set	Discarded textiles, data per individual garment <ul style="list-style-type: none"> - Product type - Garment size - Owned/rented

	<ul style="list-style-type: none"> - Times washed - Date for last time washed - Registered on customer (local service unit) - Date for registration on the customer - Date for first registration" <p>Wasted textiles, data per individual garment</p> <ul style="list-style-type: none"> - The same data as for discarded textiles <p>Textiles in use, data per individual garment</p> <ul style="list-style-type: none"> - The same data as for discarded textiles
Interviews	<p>Roles of interviewees:</p> <ul style="list-style-type: none"> - Decentralised purchasers and manager of textile products and services: facility managers (or similar roles) (A1, B1, C1, E1, F1) - End-users of textiles: healthcare workers (A2, E1, E2, E3, F2, F3, F4, F5) - Advisor in procurement process for an automated workwear distribution solution (D1) - Textile laundry system experts (G1, H1) - Environmental management system experts (I1, I2)
Framework agreement for laundry services for textiles in the health sector of the City of Oslo and related documents	<ul style="list-style-type: none"> - <i>The framework agreement for laundry services for textiles in the health sector of the City of Oslo</i> ("the framework agreement") consists of several tender documents, that, most importantly for this thesis, contains the following: award criteria, specifications, contract clauses (see Table 3). - The letter of orientation for the framework agreement - The City of Oslo intranet webpage for the framework agreement - The supplier's self-service portal at nortekstil.no/minside, as it was when visited 13.12.2022

3.3 Data collection, coding and analysis

Several data collection methods that can be used within practice theory, according to Warde

et al. (2017). Ethnography is proposed as the main method for studying practices by Schatzki (2012). However, ethnography poses significant time constraints, rendering this method inapplicable for this thesis. Several studies using practice theory has employed interviews as the data collection method. For instance, Gram-Hanssen (2010) uses qualitative in-depth interviews in their study of standby consumption of electricity in households. In their research on green consumption practices among young environmentalists, Perera et al. (2018), too, use in-depth interviews, while Shove and Pantzar (2005) use both interviews and analysis of textual sources in their study of the practice of Nordic walking. Schulz et al. (2019) propose various ways of collecting data on practices: observation, interviews or diary methods where interviewees document their practices themselves. I believed observation was not suitable since the practices I wanted to investigate occur over a longer time period during the use phase of textiles. Diary methods are not suitable either, primarily due to time constraints for interviewees. I considered interviews the most suitable data collection method since these allow interviewees to provide information about the past and thoughts about the future. Interviews are also relatively time effective compared to alternative methods, which was important as I wanted to collect data from professionals with tight schedules.

All interviews were semi-structured, with interview guides developed before the interviews (see Appendix 1). In this way I would be sure to cover the themes needed, but also create flexibility, so that new themes could emerge (Bryman, 2016, p. 468). The interview guide included questions for background information, such as the interviewee's role, the average number of employees using uniforms on a daily basis, what textiles are in use at the local service unit, and whether they are rented or owned, and whether the laundry is integrated or outsourced. Then, questions regarding practices were asked. I posed questions about both current practices and about desired practices for the future, in an attempt to uncover what interviewees are dissatisfied with, and as such, hopefully also uncover important meanings. I also asked whether there had been any changes in textiles management over time at the service unit. I attempted to increase the dependability of data from the interviewees by asking questions about the same themes twice but with different wording (Berg, 2001). Furthermore, the interview guide allowed me to triangulate data in order to increase the credibility (Bryman, 2016, p. 386). I expected the various interviewees to present some of the same information, and therefore asked them similar questions and compared their answers. However, the interviewees' subjective perceptions were as important as any absolute truth, so any inconsistencies between interviewees are interesting in themselves as they reflect individual perceptions.

All interviews were carried out in Norwegian. Thus, all quotes from respondents are translated by me from Norwegian to English. This involves credibility issues, as meaning can get

lost in translation. Still, all quotes are placed in a context, to avoid ambiguities and therefore allow for a higher credibility.

Even though I intended to conduct one-on-one interviews, two of the interviews became group interviews. At local service unit F, two interviewees had very limited time and both wanted to be interviewed. As an ethical consideration, I thought it was important to respect their time constraints and wish for inclusion, and spontaneously organised the group interview. The expert interview with I1 and I2 was carried out as a group interview upon the wish of the experts themselves, as they believed this would allow for a more complete picture of the topic. I accepted this as this interview was not supposed to be compared to the interviews with facility managers or end-users.

The interview guides for facility managers and end-users were developed with practice theory and the elements of meanings, material, and competence in mind. To uncover their meanings I asked questions about whether they like their uniform, and what the ideal uniform is, and paid attention to meanings arising when asking questions about material and competence as well. I wanted to be careful about making up meanings by directly asking if any specific factors were important to them when it comes to textile management. For competence I asked questions about routines for treatment of damaged textiles, and whether and how the interviewee believe that they have an impact on the lifespan of the textiles. Concerning materiality, I asked questions about the physical aspects of the textiles and the infrastructure for textile management at the given local service unit.

As for the practicalities, the mobile app Nettskjema-diktafon and, for back-up, the recorder on my laptop, were used for recording the interviews. The back-up recording was deleted as soon as the recording from Nettskjema-diktafon was safely transferred to Nettskjema.no. Recordings from Nettskjema-diktafon app are encrypted and cannot be listened to from the mobile device. While I was taking notes during the interviews, the recordings secured that all relevant information was noted since both asking questions and taking good notes during the interviews can be challenging. This ensured a higher degree of credibility. Sound recordings of interviews are categorized as red data, which is sensitive data that needs to be handled with care. Recordings and interview notes were, however, anonymised by using a shrambling key. The shrambling key was stored separately from the data recordings and notes, and audio files from Nettskjema.no will be deleted as soon as this thesis project has been completed and assessed. All data has been stored on my NMBU OneDrive.

I coded the interview data according to the practice elements meanings, materials and competences as developed by Shove et al. (2012). I organised the data by colour coding the various practice elements. Additionally, I used an excel sheet to note down the various themes that appeared within the meanings, materials and competences categories, as a way of keeping track of their relative importance and ensure confirmability of the findings. The analysis consisted of seeing the qualitative data in connection with quantitative data and sampled documents. This was then related to my literature review on the topics of circular economy, public procurement, public organisations, consumption, and practice theory. Simple non-statistical analyses were carried out using the quantitative data. This was done to guide collection and analysis of the qualitative data from interviews and documents.

3.4 Ethical considerations

Certain ethical issues should also be addressed. Firstly, in my analysis and discussion I kept the participants anonymous, in line with the no harm-to-participants principle (Bryman, 2016, p. 127), so that interviewees would not feel at risk when conveying information about their routines or their opinions about aspects concerning their place of work. Interviewees were anonymised using a letter for their place of work, and a number according to the sequences in which they were interviewed. It is, however, perhaps easier to identify some of the participants, since they are sampled due to their specific role, which might be held only by them. All interviewees, including the more ad-hoc interviews with end-users, were informed about this prior to the interviews in a written document, before giving their signature of consent.

Conducting research in my own work setting in the municipal administration in UKE also presents ethical and confirmability issues. My own professional involvement in the work that is at the centre of my research is one of these. This means I had to clarify my two roles whenever I made a request for information or carry out interviews. I had to pay extra attention to confirmability, since I work with circular economy in public procurement, and therefore inevitably already have opinions related to this topic. Thus, I had to be particularly careful when collecting and analysing the data, not to let my own opinions influence the results. A thorough literature review on the topics relevant for the research question has been helpful to establish a starting point for data collection and analysis based on research rather than my own conceptions.

4. Analysis and discussion of findings

In this chapter, the meanings, materials, and competences involved in the consumption of textiles in the City of Oslo's health sector is analysed. This is done by viewing these practice elements in relation to the secondary data from documents and the consumption data from the current supplier of laundry and rental of health textiles. From this, certain themes have emerged, that contribute to answering how knowledge about practices can contribute towards implementing circular economy principles in the consumption of textiles in the City of Oslo's health sector. I begin by carrying out a simple analysis of what happens to the uniform textiles, combining the consumption data from the supplier and data from the interviews. This provides a background for further discussion related to the research question. I then go on to show how investigating consumption through the lens of practice theory helps establishing a wider systems perspective on the implementation of circular economy principles through public procurement. Then, I discuss implications of this for the levels of public procurement activity illustrated in Figure 4: tendering, ordering and using. At the tendering level, I first write about the discussion on whether to outsource or keep supporting functions integrated in the organisation. I then move on to discuss the tender document contents, and how these are related to circular economy principles derived from the hierarchy of circular consumption (Figure 2). For the ordering and using level, I discuss the issue of responsibility for the use phase of products' life cycles, before looking into three concrete potential interventions for change in textile consumption practices in the City of Oslo's health sector, based on the analysed data. The discussion of the findings can also be of relevance for other product and service categories, in various sectors and organisation types where needs are covered through public procurement.

4.1 Textiles in their use-phase

I argue that quantitative consumption data per se can be considered a material part of a social practice, when actively used as material input to inform decision making in tendering, ordering and use of products and services. In the following, I present simple analyses that I have carried out using the data set from the supplier. To be clear, the purpose of this exercise is not to provide a full analysis of all aspects of these data, as that will be beyond the scope of the research question, but rather to show aspects of textile consumption practices in the City of Oslo's health sector relevant to the following discussion in this chapter.

4.1.1 The framework agreement

Currently, the City of Oslo has a framework agreement with one supplier for rental and

laundry of health care textiles. This framework agreement is managed by UKE. It includes both other healthcare textiles such as bed linen and towels, and workwear for healthcare workers. I focused on workwear for healthcare workers, as this is where detailed consumption data exists, because these products are chipped by the supplier. However, I also asked questions in the interviews about other healthcare textiles in the interviews, as these too constitute a large volume of textiles, and are part of a very similar laundry system as that used for healthcare workwear. The framework agreement was signed in 2020 and can last until 2024. The requirements and contract clauses of the framework agreement regulates the relationship between the supplier and the City of Oslo as contracting authority. However, each individual local service unit sign their own local agreement with the supplier which specifies the specific types and number of textiles to be rented and cleaned. Workwear stocks are registered at one local service unit, while other healthcare textiles are part of a common pool that is shared between service units.

4.1.2 Brief presentation of consumption data and interview data

The data set contains information on individual pieces of workwear for 86 of the different local service units in the City of Oslo's health sector. The data is produced from tags in each garment, which are automatically registered when the garment arrives at the laundry. The data set shows products in use and discarded products for the period 2014 to October 2022, and wasted products for the period April to October 2022. A product is counted as wasted when it has not been registered at the laundry for over six months. This means that wasted and discard products come in two different categories. The local service units receive an invoice for wasted products from the supplier, since these products are owned by the supplier. Products discarded by the facility managers or healthcare workers are not registered as discarded, but as wasted, by the supplier. Wasted products are not overlapping with the data for discarded products, as the supplier states that if a wasted product should appear in the laundry again, it is put back in the use cycle again. About 80 percent of the products in use are owned by the supplier and rented out to the local service units, while the remaining 20 percent are owned by the local service units themselves. The data for discarded and wasted products are only for the rented products, as the supplier avoids discarding their customers' products and cannot charge their customers for losing products that are self-owned. While the aim of this thesis is not to provide precise statistical information about the consumption data for the textiles, the data is rather used in the analysis to illustrate the rich possibilities that lie in having access to such data. This is in line with the recommendation by the Ellen McArthur Foundation (n.d.) of keeping an inventory overview.

The data from the interviews was coded according to the practice elements meanings,

material and competence. Within these, various themes appeared. As a background for the discussion in this chapter, I have illustrated the analysis of the interview data in Figure 7.

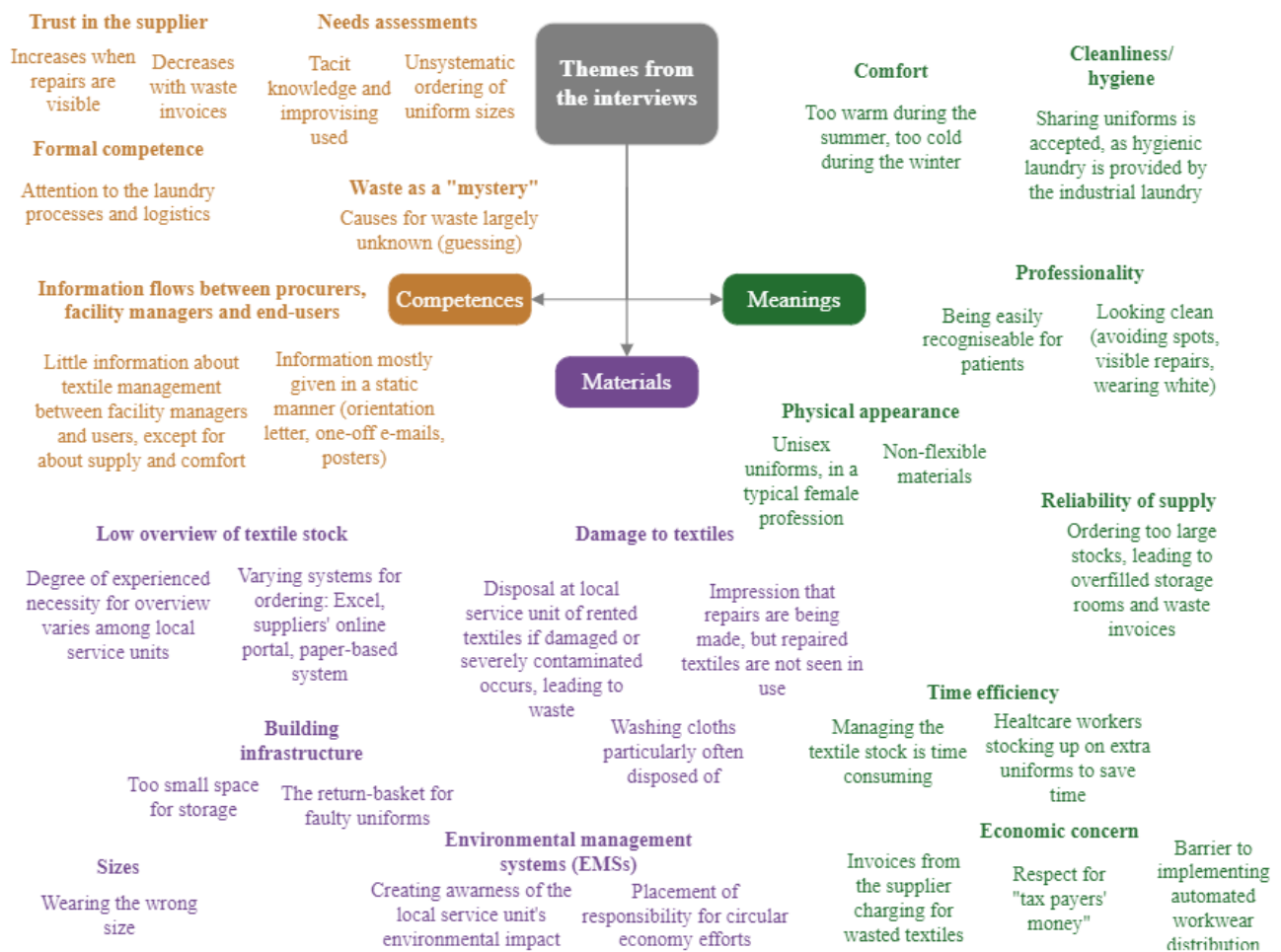


Figure 7: Themes from the interviews with facility managers and healthcare workers on the use of textiles in the City of Oslo's health sector.

4.1.3 When are products discarded or wasted?

Klepp et al. (2020) have developed a theory of clothing lifespans, where lifespans are seen as a combination of the number of years, wears and users. Earlier, it has been common to understand clothing lifespans in years, that is, the time a piece of clothing is owned by one user (Laitala & Klepp, 2020). With the data set I use in this thesis, it is possible to measure lifespan of products in use both in number of years, and in number of wears, giving a richer picture of the lifespan than years alone. Number of users is impossible to measure, but is most likely very high, as these garments are shared between all users at the same local service unit. The data set does not, however, provide data on the date for discarding, and therefore, number of years is impossible to

fully measure for discarded textiles, as only the starting point of the products' lifespans are known.

Ideally, I would use the consumption data normatively to identify the impact of an intervention, by observing change over time. In this case, it is not possible to single out any specific intervention, but I wish to point out that this form of comparison over time is highly relevant for practitioners with access to such consumption data in the future. Another method that can produce useful insight is comparison with a similar case. I have not, however, been able to find any comparable studies, so such a comparison is impossible for this case. With the unavailability of comparison over time or with a similar case, I have had to relate the empirical data to the values that I would expect to see, given certain conditions.

The supplier states in an e-mail that the minimum expected number of wash cycles for the uniforms before being worn out are 150 times. If a product is not wasted or destroyed, it should ideally never be discarded before having been washed 150 times, and this is therefore one of the expected numbers against which the empirical data is seen. Given that the uniforms are washed after every use, I assume that the earlier a product's lifespan started, the more times it should have been washed. For instance, a product inserted in 2014 should have been washed considerably more times than a product inserted in 2019. Thus, this functions as another expectation, but without any concrete threshold as with number of times washed.

In table 3, data relevant in the consideration of these expectation is presented. The column for wasted products is an estimation based on wasted products only during the period April 2022 to October 2022. My assumption is that the same amount of waste occurs throughout the entire period from 2014 to 2022. What the data set is missing, is the date of disposal, which could have provided an easier way of uncovering whether disposal is happening as relatively isolated incidents, or in a more routinised manner over time. Table 3 shows that close to 100 percent of the discarded products are discarded before reaching the 150 expected times washed, and that close to 80 percent of the products are discarded before reaching half of the expected times they can be washed. Figure 7 depicts this dispersion more clearly, where it is also evident that most discarded products are washed only a few or no times. Overall, this means that very few discarded products have been used to their full potential. This low use intensity represents an environmental burden that could have been avoided if the reasons behind it were known and acted upon, which is where practice theory can provide insight, as shown in following sections of this chapter.

Figure 8 shows that for wasted products, too, waste typically occurs long before the expected number of wash cycles is reached. As the number of wasted products are over 3 000 only

in a period of half a year, and discarded products are close to 16 000 over 9 years, it seem that waste is a much larger circular economy issue than discarding. Unfortunately, waste is also more challenging to trace than discarding. Discarding is done knowingly by the supplier as this is registered, while waste are lost products. For the local service units, waste is also a larger economic issue, since the supplier can charge them for the wasted products. It must also be kept in mind that these data sets are only for uniforms, while there exists no such consumption data for other textile products like bed linens and towels. In the following section, insight from the interviews is presented to shed light on the practices that may explain the numbers seen in Table 3, Figure 7 and Figure 8.

Table 3: Overview of consumption data from the supplier of rental and laundry of healthcare textiles in the City of Oslo's health sector.

Product inserted in year	Number of products still in use in October 2022	Mean for times washed for uniforms in use in October 2022	Estimated waste	Number of discarded products from given year	% of total products (without wasted products) from given year discarded	% of discarded products washed < 150 times	% of discarded products washed < 75 times
2014	3 855	43	-	147	4 %	99 %	73 %
2015	2 203	61	-	105	5 %	79 %	48 %
2016	29 573	78	-	2 978	9 %	99 %	40 %
2017	18 012	52	-	3 935	18 %	100 %	56 %
2018	7 540	37	-	914	11 %	100 %	92 %
2019	17 786	43	-	2 178	11 %	100 %	100 %
2020	21 719	33	-	3 160	13 %	100 %	100 %
2021	26 003	15	-	2 009	7 %	100 %	100 %
2022	13 556	5	-	280	2 %	100 %	100 %

SUM	140 247	41	59 431	15 706	10,1 %	99,6 %	76,5 %
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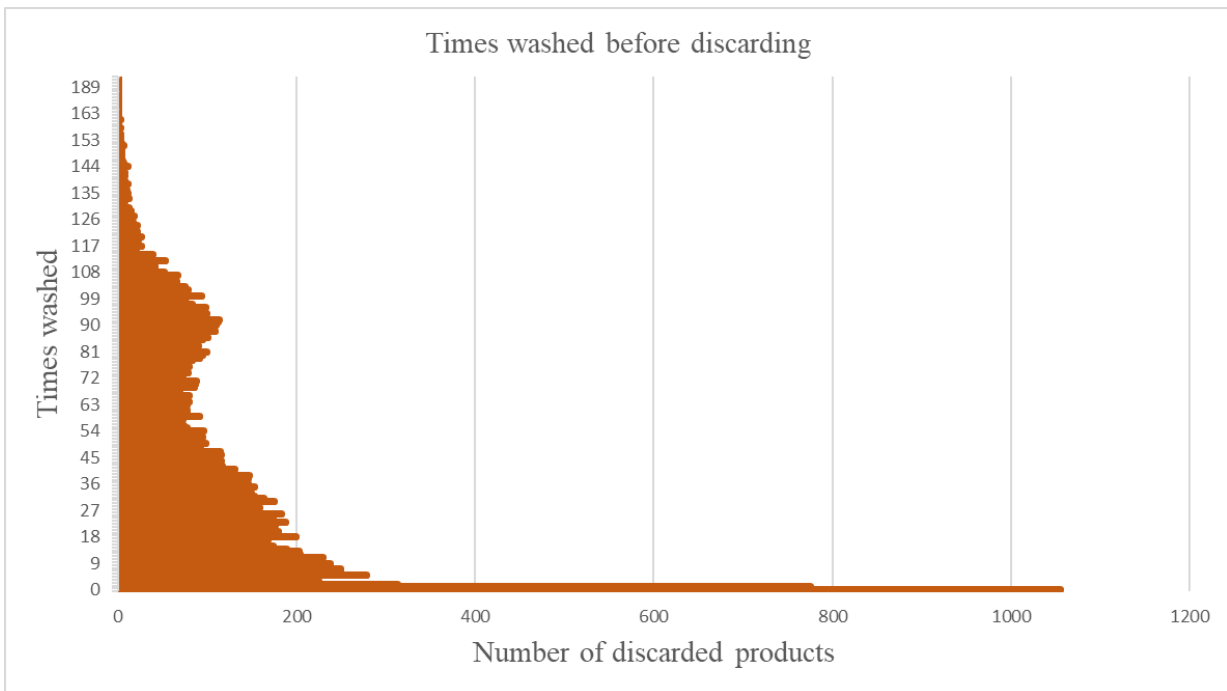


Figure 8: Number of times the garments have been washed before discarding.

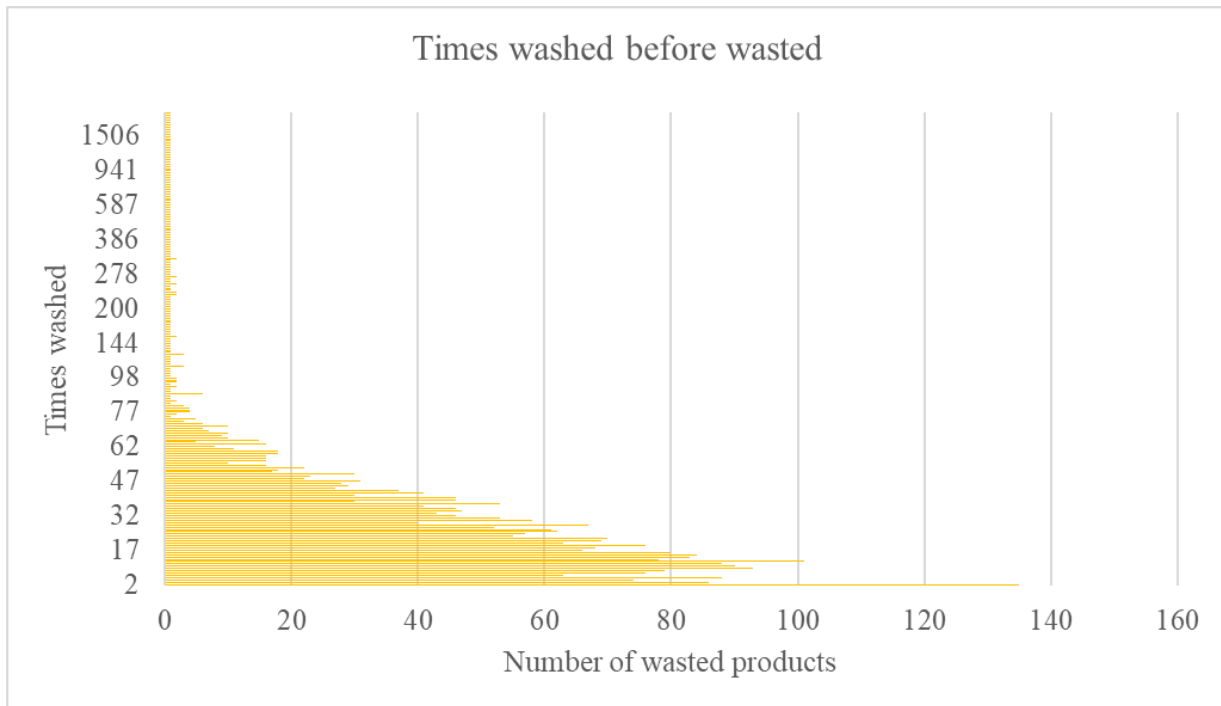


Figure 9: Number of times the garments have been washed before wasted.

4.1.4 Why are products discarded and wasted?

Since it seems from Table 3, Figure 8 and Figure 9 that products are not discarded or wasted as a result of being worn out (number of wash cycles), it becomes important to ask what other reasons can cause the discarding and wasting of non-intensively used uniforms. Some of these reasons may lie with the supplier and have not been researched in this thesis, apart from the discussion on product-service-systems in section 4.3.2.

One of the topics covered by the interview guide was damage to textiles, which I regarded as one potential factor for discarding and wasting non-intensively used uniforms. When asked about this, facility managers and users alike reported the same types of damage to the textiles. Damages were holes and tears, and spots from first and foremost ink, but also other substances such as food. Holes and tears were reported to be caused by accidents, rather than a consequence of low product quality. Furthermore, healthcare workers F2 and F3 talked a lot about the uniforms' pockets. They both experienced that the pockets on the uniforms are often torn from all the heavy equipment they carry with them. Because of this, they wanted more and stronger pockets. F2 said that when a pocket gets torn during the workday, they discard the piece in the closest residual waste bin. When picking up a clean uniform with a half-torn pocket, F3 usually rip it off completely, and then at the end of the day, puts the broken uniform in the basket for laundry. When asked what they do with

uniform pieces that are torn or contaminated during the working day, F4 said that “I discard it if it is torn. What is it supposed to be used for?”. Healthcare worker F4 reflected on how their own discarding of uniform pieces eventually leads to missing uniforms, and then, while laughing, says that there should be a place to put uniforms for reuse or repair. Discarding by healthcare workers in residual waste bins is a practice that leads to waste. While waste was a topic of great concern based on economic inefficiency among facility managers, awareness of waste as an issue was only mentioned by one healthcare worker, showing that both competences and meanings related to waste vary between these roles.

Comfort as a material element was also uncovered as a potential driver of discarding and wasting of products. In the case of local service unit E, the comfort element was the driver of a large-scale replacement of pants, rather than elements like function or physical appearance. Other interviews showed that issues such as ordering of a too large stock for fear of not having security of supply, which was an important meaning, and having too many of the wrong sizes, probably has led to discarding after deregistering at the supplier’s laundry. Facility manager A1 said that they will receive too much of certain sizes, which after a while leads to waste reports from the supplier, since the unused sizes are never handed in for cleaning at the laundry. However, they do not want to hand in too many uniforms for deregistering with the supplier again either, as registering uniforms is costly, should they need more again. Facility manager A1 believed the supplier should be better at regulating the sizes of the uniforms they deliver to the local service unit, and thus places the responsibility for providing the right sizes, and competence regarding this, with the supplier. I also detected that some damage to the textiles was intentionally caused by the users, and comfort was the central meaning here, too. Several interviewees mentioned various techniques used by healthcare workers to adapt the uniforms to their sizes and body shapes, rather than choosing a different size. For instance, some cut open the side of the pants for the waist to be wider, or to access the rubber band and tie knots on it for a narrower waist.

A material element with potential impact on use-intensity of the uniforms, is the size and physical infrastructure of storage rooms for the textile stocks. Several facility managers complained and showed me how overfilled shelves in the storage rooms, combined with healthcare workers in a rush, resulted in large numbers of uniforms falling to the floor. As hygiene is the most central meaning tied to textile consumption, it is not surprising then that these uniforms must be washed, even though they have not actually been used. As such, one could expect that uniforms were worn out from being washed more times than originally necessary. However, at this point, too many washes do not seem to impact discarding and waste, as the reason for wasted textiles does not seem

to be wear and tear on the textiles from the laundry process, according to the interviews. The data for products in use shows that only 0,6 percent of the products are washed more than 150 times, which might indicate that washing does eventually lead to textiles being worn out. However, if textiles being worn out around the expected lifespan (150 times washed) was an important reason for discarded textiles, the data for discarded products should have shown a tendency of an increasing number of products towards or even above 150 times washed. Rather, the data shows the opposite. Avoiding unnecessary washing is therefore a measure to be taken together with other measures, as this, over a long time, naturally will lead to wear that leads to disposal of a product. Avoiding unnecessary washing can therefore extend the lifespan of the products, but perhaps beyond the four-year framework agreement period. Furthermore, the mess in storage rooms could impact waste, without this being possible to quantify at this point, as this is part of the lack of proper overview of the stocks at the local service units.

Overall, reasons for discarding and waste are varied, and it is difficult to detect reasons that account for all the discarding and waste seen in the consumption data. Interviews with facility managers shows that few efforts are made regularly to avoid waste, and that reasons are connected to what I have termed “a sense of mystery” to them. Both textile management expert interviewees (G1 and H1) tended to talk in detail about laundry practices. When asked directly about disposal of and wasted textiles, answers were less detailed. Both had ideas about possible causes of waste but expressed that these ideas were nothing more than hypotheses. Some facility managers manually look for textiles in places like lockers when waste invoices are received, to decrease the economic burden. This low competence when it comes to reasons behind textile waste, also seems to lead to scepticism towards the supplier, as facility managers experienced a lack of possibility to control the claims. Nevertheless, the “why”-question does not seem impossible to answer, given that practices can be uncovered through empirical inquiry, and opportunities of change can therefore be identified, like Gram-Hanssen (2011) proposes.

4.2 A system perspective

To follow up the points made by Kristensen et al. (2021), I argue that the concept of circular public procurement could be broadened to include users of the goods and services procured, if the largest circular effects at the top of the hierarchy of circular consumption (Figure 2) are to be achieved. Treating consumption more holistically, including not just the purchasing of products and services, but the use, too, becomes increasingly important to consider when pursuing circularity by involving the entire life cycle of a product/service. It is not just what is bought that matters, but what systems purchases are part of, and how these systems can effectively interplay with existing

practices in public organisations. Considering the argument by Warde et al. (2017) that consumption should be viewed as something that occurs in a practice, instead of as purchase acts. This resonates well with the identified need to include decentralised purchasers and users in research on how to successfully use circular public procurement as a tool to reach sustainability goals, as a product's life cycle includes not only the production and the buying, but also the using and discarding phases, over which users have an influence (Kristensen et al., 2021).

It might be useful to view consumption of textiles in the healthcare sector as a system, which is linked to other systems, and as such recognising practices as systems, not siloes, as Sahakian and Wilhite (2014) put it. Through carrying out a limited number of interviews I have revealed some aspects of healthcare textile consumption practices in the City of Oslo. The meanings, materiality and competences tied to everyday professional activities that involve textile consumption have implications for circularity in the use- and end-of-life phases of the textiles' life cycles. The details obtained from the interviews are rich and are summarized in Figure 6. Perhaps because the details from only a part the City of Oslo's health sector are rich and varied, I cannot claim that this provides the full picture of textile consumption practices. As a starting point, Nicolini's (2012) view of organisations as multiple practices carried out simultaneously can be helpful in making sense of the collected data. From the interviews with facility managers and healthcare workers, it is evident that there is not one common textile consumption practice in the City of Oslo's health sector.

Regarding the difficulty of establishing one or even several distinct practices of textile consumption, it can also be discussed whether it is possible to talk about textile consumption practices, or if consumption of textiles should rather be viewed as an element in carrying out other practices. This view supports the argument by Mylan (2015) that consumption is not a practice in itself, but a factor which is part of and enabling other everyday practices. In this case, the everyday practices are the various practices in the jobs of facility managers and healthcare workers, such as supplying the local service unit with enough textiles at the right time as a support function or showering a patient as a core activity. Therefore, using practice theory illuminates the activities that take place outside the central procurement department (UKE) in the use- and end-of-life phases of products, and the importance these activities can have when implementing circular economy principles through public procurement.

Many of the practice elements that emerged in the interviews are interlinked to such a degree that they are challenging to describe separate from one another. This in itself is an interesting

finding, as the tightness versus looseness of coupling of practice elements is relevant for opportunities for change (Mylan, 2015). Cleanliness, for instance, is a meaning that is tightly coupled to many other practice elements. For instance, cleanliness is coupled to material elements such as the properties of the textile's materials and the fit of the uniforms, and to comfort as a meaning. While the uniforms are experienced by users as too warm due to the polyester contents, they are at the same time not warm enough, depending on the season and/or the tasks at hand for the healthcare worker. The need for warmer clothing goes for home healthcare workers, where several interviewees expressed that they wanted jackets and woollen thermal underwear supplied by their employer. "Now, people are using their private clothing for warmth, and what purpose do the uniforms have [for hygiene] then?", said F4. F4 has solved this by buying private clothing that they only use at work, together with the uniform. This private clothing is then washed privately, and without the control of hygiene standards used for health textiles at an industrial laundry. F4 also see that some of their colleagues use privately owned pants, since the uniform pants do not fit. Here, it is also important to understand that cleanliness as a meaning is not only important in terms of hygiene and contamination, but also in a symbolic manner. For instance, E3 said that they sometimes have to change uniforms during a shift, if they get spots on their uniforms. Healthcare workers change uniforms even though a spot might be an uncontaminated one, such as from food, as it is important that they as health personnel must *appear* clean. Furthermore, B1 said that at their local service unit, blue scrub tops have been replaced with white scrub tops, as the white ones look cleaner.

Another tightly coupled element is the meaning of reliability of supply of textiles. Supply of clean textiles is a crucial hygiene factor, and from the interviews it seems like a factor that cannot be subjected to compromise in healthcare services. Facility manager F1 informs that when their local service unit started using the framework agreement for rental and laundry of uniforms, they were afraid of being short on uniforms. They therefore ordered far too many uniforms, which led to an overfilled and chaotic storage room. This was solved after about half a year, by sending back hundreds of uniforms for deregistration by the supplier. Similar stories were told in other facility manager interviews.

The facility managers and healthcare workers both experience time constraints, which makes time efficiency a defining meaning of practices that involve textile consumption. One of facility manager A1s main wishes for textile management for the future, was to have more time available for keeping an overview of the textiles. Alternatively, that the supplier automatically would take out faulty textiles at the laundry, such as those with stains and broken rubber bands.

Some interviewees reported that it is a problem that users take more uniforms than needed for one day. They believe this is done to save time. Healthcare worker E3 reported that they do this themselves and are forced to do so due to time constraints during changing. As such time efficiency as a meaning is tightly coupled with reliability of supply, both at a facility management and individual user-level. The stocking up on extra uniforms in healthcare workers' lockers is mentioned by several facility managers as problematic, as it can lead to waste, should the uniform be left in the locker, and leads to the need for other healthcare workers to also stock up. Then, facility managers must make larger orders, since it looks as if there is a shortage on uniforms. Thus, textile consumption is larger than it would have needed to be, which is both costly, and increases the likelihood of waste, if no one makes sure to keep a steady rotation of which uniforms are actually used.

Economic concern is another meaning emerging from the interviews. Facility managers expressed economic concern in connection with the invoices from the supplier for wasted textiles. Furthermore, some mentioned that the main barrier to implementing automated dispensers which they believed would help reducing disposal and waste, was the cost of these dispensers. Respecting "taxpayers' money" is another example of economic concern that was expressed in interviews.

Certainly, the way textiles are managed is different at the various local service units. There are differences in terms of how an overview is kept, how waste is dealt with and what and how information flows between facility managers and end-users. «Often, it all depends on one person, and if that one person with all the knowledge is gone, you are in a terrible position», said facility manager D1. Another example is A1, who improvises solutions for retrieving lost uniforms when waste reports arrive from the supplier, by for instance manually looking through users' lockers. As such, both individually held and tacit knowledge constitute important competence elements in practices that involve textile consumption.

Identifying various elements of practices that involve textile consumption, and assessing the tight or looseness in coupling, is interesting seen in relation to the circular economy objectives which the City of Oslo seek to achieve. The difficulty of top-down planning for organisational change that institutional organisational theory emphasises (Christensen et al., 2015) must be recognised when designing interventions. As the revealed elements of practices like hygiene, reliability of supply and economic concern are tightly coupled to other healthcare performances, their prevalence is non-negotiable when discussing possible interventions for change towards more circular solutions. Hygiene, reliability of supply and economic concern at a local service unit level therefore need to be taken in consideration as a specific organisational setting, when designing

interventions for implementing circular economy principles.

The interviewees were asked questions seeking descriptive answers about textile management, but also broader normative questions on a system level. For instance, both facility managers and healthcare workers were asked about what they believed to be the best possible management of the textiles to ensure a long lifespan. Facility manager A1 gave an answer with details around specific issues, such as healthcare workers doing individual adjustments on the uniforms for them to fit better. A1 also emphasized that it is time consuming to manage the textile stock, particularly regarding waste and waste invoices. Facility manager E1 quickly responded that they did not believe they could impact the length of the lifespan of the products, as washing, which E1 viewed as the most important factor regarding lifespan length, is done by the supplier. Healthcare workers interviewed carried no particular opinions on the topic of textile management for a long lifetime. I also asked interviewees about if they believed any factors enables or hinders a sustainable management of textiles, such as time pressure, logistics, certain aspects of their duties, or priorities that must be made. In general, the interviewees' answers to these more normative questions were rather descriptive of their experiences with textile management and use at their local service units, perhaps again reflecting that these practices are of such a mundane sort that they are not thought of at a systemic or strategic level by all facility managers, and certainly not by the healthcare workers.

4.3 Implications for the tendering level of public procurement activity

4.3.1 Outsourcing or integrating supporting services

I also asked facility managers about their preferences on owning versus renting the textile products. This led several interviewees to the topic of whether to integrate or outsource the laundry service. It is outside the scope of this thesis to evaluate whether integrated or outsourced textile provision in the City of Oslo's health sector is the most preferable option regarding circular economy objectives. However, as integration or outsourcing is a fundamental question before public procurement comes into play, and since the topic occurred in several interviews, it deserves some attention.

Facility manager B1 believed that integrated laundry services at the local service unit is economically inefficient, as this requires more personnel, more electricity, and larger buildings. This is in line with the typical cost-efficiency arguments for outsourcing (Christensen et al., 2014). At local service unit B, one position has been cut, as they were able to outsource the tasks to the textile and laundry supplier, which turned out to be more cost efficient. Facility manager B1 particularly emphasised the fact that they have taken the initiative to get the supplier to organise the

delivery of textiles in a manner specifically designed for their local service unit. This increases the efficiency of the service, and also functions as a measure taken to avoid losing control of the outsourced activity, which is one of the dangers of outsourcing according to Barthelemy (2003).

On the other hand, the interviews with the textile laundry system experts pointed rewards from the point of view of circular economy, resulting from having an integrated laundry service. For instance, local service unit G both owns their products and runs their own laundry. This allows G1 to follow up on user errors more closely. Every week, they get an overview from the laundry of various artifacts that have not been removed from pockets before laundry, which can lead to destruction of the textile products. The users responsible for this are then reminded to avoid this error. This is an example of how there are more managerial tools available with integrated services, as was pointed out by Jensen et al. (2018). Still, local service unit G also experienced issues regarding waste, and G1 viewed this as mysterious, like the local service units using the framework agreement for outsourced laundry services.

The issue of outsourcing is also tied to the issue of responsibility for circular economy principles. The supplier is responsible for providing the service according to the tender and contract, and the centralised procurer, in this case in UKE, must ensure to design the contract in a manner that makes the supplier act in the desired way. This requires a great effort in the tendering phase and is particularly challenging when designing a common solution for a vast array of local service units with different systems and practices. A facility manager who is responsible for the laundry service and textile management does perhaps have stronger incentives and opportunities to intervene in practices at their own local service unit, than what an external supplier has. E1 said that they wished for an evaluation of whether to integrate or outsource the laundry service. One of the reasons behind this wish for E1 is that they believed a self-owned laundry stock and integrated laundry service allowed for better management of the provision of clean textiles. According to the two basic arguments for outsourcing an activity, which is cost-efficiency and/or better quality (Christensen et al., 2014), this then calls for keeping this activity integrated in the municipality. F1, on the other hand, expressed a desire for the supplier to handle even more of the textile management at the local service unit, by also placing the clean textiles at the right place at the premises and thereby solving some of the issue of physical chaos in storage rooms, providing better quality services. This can also be viewed in relation to the use of a PSS business model to cover the need for clean textiles, and the questions this involves regarding the concept of consumption work by Wheeler and Glucksmann (2016). What F1 expressed here, is a desire for more of the consumption work to be carried out by the supplier.

Furthermore, when a new contract must be entered into every fourth year, this can have consequences for the opportunities of learning (discussed in section 4.4.4) and creating new practices in the organisation. Finally, from a strategic and political point of view, another aspect of integrating laundry services concerns the resulting loss of public organisations as a powerful market actor that can encourage circular economy development in this market. After all, the market impact of public procurements is one the main arguments for spending resources implementing circular economy in public procurements, along with the reduction of resource intensity of public service provision.

4.3.2 Focusing on the more effective circular economy measures

This thesis is not an evaluation of the circular economy performance of this framework agreement, and as the ambitions of the City of Oslo in circular public procurement have developed significantly since the tender was published in 2019, a thorough analysis measuring the tender content against current goals would be unfair. However, I still find it relevant to briefly assess what potential the current framework agreement holds for circular economy implementation, as this provides the context for the practices investigated. I have extracted what I considered the most circular economy relevant criteria and requirements from the framework agreement tender documents. These are listed in Table 4. The tender documents for the framework agreement do not include any direct requirements that can be regarded as measures taken falling within the more effective categories of the circular consumption hierarchy (Figure 3). The higher-impact categories of the circular consumption hierarchy, that is repair and upgrade, reuse, buy used products or co-use and share, all have one characteristic in common, which is that they are tightly connected to activities that occur during the use phase.

The specifications and contract clauses for the textile products involved basic environmental sustainability criteria concerning the textile materials used. These requirements contribute at the lowest level of the hierarchy of circular consumption (Figure 3). For impacts at higher levels of the consumption hierarchy, there are few direct measures taken in the framework agreement's criteria and requirements. Some of the specifications for the textile rental and laundry service also delineate to a certain degree the allocation of responsibility for textile management between the local service units and the supplier (Reference number 2, 7 and 8), which is actualised in the discussion in section 4.4.1. Comfort as a meaning is also considered in the tender documents, as seen both in Reference number 9 and 15, but not explicitly seen in relation to sustainability or circular economy.

Table 4: Framework agreement criteria and requirements

Criterion/requirement (all translated by me)	Criterion/requirement type	Reference number
“The textiles must fulfil the requirements for Oeko-Tex® Standard 100.”	Specifications	1
“On the initiative of the supplier, worn-out textiles are to be replaced with the same type of textiles.”		2
“For organisations with delivery multiple times a week, delivery is not to happen in succeeding days.”		3
“All rented textiles should be washed and dried/treated according to standards in ‘Infection prevention for laundries that treat textiles for health institutions’”		4
“Textiles with an unsatisfactory cleaning result are to be taken in return by the supplier without further costs.”		7
“Damage to the textiles during the laundry process is the tenderer’s responsibility and cost. (In the cases where the Contracting authority own the textiles, it is the Contracting authority’s responsibility to ensure these textiles can sustain laundry according to the standards demanded in this tender).”		8
“Work wear for the home healthcare service must be suitable for use year-round, and look less institutional”		9
<ol style="list-style-type: none"> 1. The supplier must describe how the users easily and intuitively can use the self-service portal: <ul style="list-style-type: none"> - Overview of textiles included in the framework agreement - Easy and intuitive way of choosing textiles for ordering - Possibility to carry out new orders - Description of how the user can change a wrong order - Overview of textile stock - Overview of order history - Overview of waste and disposal 2. The supplier must describe their system for following up textiles at the laundry, in transport (to/from delivery address), at institutions. It must be described if chip/barcodes or similar are used and what information can be read from these. 	Award criteria	10
“Ability to deliver sustainable materials in pants documented through the brand Tencel® or likewise”	Award criteria	11
“The supplier guarantees that the agreement’s environmental requirements are fulfilled, as well as environmental law. The supplier must actively work to reduce environmental impact from fulfilling the agreement.”	Contract clause	12
“The supplier must gradually during the contract period increase phasing in of pants in sustainable materials like Tencel® or likewise. The amount must be at least 50 % of the total stock two years after the contract begins.”		13

“The Contracting authority wants the supplier, during the contract period, to provide information about new alternatives within sustainable and recycled materials, which can be used as an alternative to the current assortment.”		14
“The work by the home healthcare service throughout the seasons means that the textiles should breathe well, as the employees are physically active in their work both indoors and outdoors. The garments must therefore be suitable for such use.”		15

4.3.2.1 Repair and upgrade

One central topic covered in the interviews, was repairs, which involves various practice elements. Damages to elements of the textiles, such as pockets, other seams, and rubber waistbands. I call this damage, rather than wear, as the garment’s main components are still intact. For damages, it seems repairs could have been used more. I therefore wanted to get an understanding of what repairs are made, if the systems for textile management at the local service units allows for this, and what attitudes facility managers and users have towards repairs. Do they experience that repairs are taking place, and do they contribute to this practice themselves?

Repairs do occur, and a system for this partly exists. A material element impacting how textiles are managed is an orange basket for faulty uniforms, provided by the supplier, and then the local service unit is refunded for these. At local service unit A, facility manager A1 said that uniforms with stains, that have been washed with paper in the pockets, have holes or are torn, are placed in the orange basket. A1 must fill out a form with information about the faulty products and believes that this is cumbersome. They wondered if the supplier ever read the forms, and thereby showed a lack of confidence in the overall system for textile management. At local service unit E, the healthcare worker E2 believed that the orange basket is where faulty uniforms should be placed, and that “they will then be sent to be repaired”. When asked if there is any information about whether products placed in the orange basket will be repaired, E2 answered that “No, it says that if something is wrong with your uniform you can place it here”. Healthcare worker A2 answered very similarly to this. E2 said that they sometimes see that the stretch bands on uniform pants have been replaced, and they believe this is positive, as it shows that the supplier is following up on the cases of complaint on faulty products. Here, it seems trust in the supplier increases when the users can observe themselves that products are repaired.

When asked about their opinion on wearing repaired uniforms, healthcare worker F4 said that “We must be professional, too. We should express that it is acceptable to wear, what is it called, reused uniforms, but then it should be more than one [repaired uniform], [repairs would be

acceptable] if half of the uniforms were like this [repaired]”. F4 went on to say that smaller and less visible repairs would be acceptable to them. Healthcare workers E3 and C2 did not notice any repaired textiles, but if they did, they would be positive towards this. E3 did, however, make a reservation regarding the service units where there are patients that comment on what the healthcare workers are wearing. In connection to this, E3 emphasized how the uniforms represent the healthcare workers’ professionalism. F4, too, mentioned that the patients will ask if there is a spot on their uniform, and how they can have unclean uniforms when entering their home, and adds that “We are, after all, representing the municipality”. Another interviewee, F5, stated that they did not mind repaired uniforms, and that the patients did not care earlier, when they had different versions of their uniforms. What matters, F5 said, is that the healthcare workers “look sort of presentable”. These comments indicate a strong importance of professionalism as a meaning in textile consumption practices.

At local service unit G, where they own and clean textiles in-house, some repairs, like seams and torn pockets, are repaired. This is necessary, according to facility manager G1, as “some employees want to wear garments that are so tight they get torn. They want to squeeze into the smallest size possible. Do not ask me why”. They then said that this is very hard to communicate to the employees, since body shape and size is a delicate topic, and it is easy to offend colleagues if you tell them to pick a larger garment size. Here, the meaning of physical appearance appears again, but also, in the facility managers’ practice, the meaning of professionalism, by not commenting on colleagues’ bodies.

Attitudes towards repairs were mostly positive among the interviewees, but it was evident from the interviews that neither facility managers nor users had given much thought to repairs before the interview. For instance, some interviewees thought that garments placed in the return-to-supplier-basket for faulty garments, were always repaired, but had never seen repaired uniforms themselves, seemingly without having questioned this. This underpins the practice theoretic view that practices are routinized behaviour rather than active consumer choices (Reckwitz, 2002). The textiles are there for healthcare workers to use, and are reflected upon mostly when they, as materials, create challenges for the healthcare workers in their work-related practices, by for instance not keeping them warm enough.

Choice of repair over disposal must first and foremost be made by the supplier, as most textiles are owned by them. UKE can, however, influence this, based on the contract clause obliging the supplier to collaborate with the City of Oslo on environmental efforts (Table 4, nr. 12).

However, if practices are not in place at the local service units that ensures that textile products eligible for repair are collected for this, repairs cannot take place. Furthermore, repairs are most likely a question of cost, too, as, according to expert interviewee H1, repairs taking over 15 minutes to do, are most often considered not worth it by the product owner. This means that more time-consuming repairs must be paid for by customers, which are the local service units, if this is demanded. Here, it is useful that a positive attitude towards repairs already exist.

4.3.2.2 Reuse, Buy used products and Co-use and share

Co-use and sharing could contribute to realizing the circular economy benefits of using an PSS business model to cover the needs for textiles. It might be argued that the framework agreement in itself, as it includes rental of textiles, falls within the co-use and sharing categories in the consumption hierarchy in Figure 3. The co-use involved here does not necessarily reduce resource consumption, as this would require that products with a spare capacity for use, were used, so that the use derived from each product over their life cycle is increased. Nevertheless, a PSS can potentially lead to sharing over time, or reusing across different customers. This resonates with what Mylan (2015) writes about PSS as not merely meeting consumer needs, but actively transforming what those needs are. If one local service unit no longer needs one functioning product anymore, the supplier should in theory have the economic incentive to use this product to cover another customer's need, rather than paying to produce a new product to cover this other customer's need. After all, the need for textile products is closely linked to the meaning reliability of supply, which is identified as particularly important for facility managers and healthcare workers alike, and, as discussed in previous sections, drives consumption patterns that are not in line with circular economy principles.

A benefit of renting is that the variation over time in sizes among the employees would perhaps not be an environmental burden, as uniforms could easily be switched around between different customers. Thus, if the facility managers took a more active role in regularly taking out sizes that are less used and sending these back to the supplier in exchange for other useful sizes, the garments could be more intensively used, and some disposal and waste could be eliminated. This does, however, require that the supplier does not discard the used garments. I would like to mention here that the data collected for this thesis does not show whether the supplier discards the garments returned due to their being the wrong sizes, but rather having too many of certain sizes leads to unnecessary washing and, accordingly, waste invoices for the local service units. However, it is not unlikely that garments in a good condition that are deregistered from the local service units by the supplier due to inconvenient sizes are discarded by the supplier, considering the low use-intensity

for most discarded products. The framework agreement could therefore have included requirements for how the supplier handles deregistered textiles. This could for instance be different options for the different reasons for deregistration, since, as an example, a large stain makes the garment less reusable than if the garment is part of a stock where there are too many of a certain size.

4.4 Implications for the ordering and use level of public procurement activity

4.4.1 The issue of responsibility

A central question arising with a PSS model to cover the need for clean healthcare textiles, is whose responsibility circularity is. To what extent do the facility managers and users have an impact on the lifespan of a product and whose responsibility do they experience this to be, if experienced as relevant at all? As briefly mentioned by the report by Nordic Council of Ministers (2022), with the use of framework agreements, it is in general unclear whose responsibility implementation of environmental concern in the contract period is.

Apparently, simply owning the product is an insufficient incentive for the supplier to avoid early disposal, and as such represents a contrast to the basic assumption behind PSS as a more sustainable business model than simply selling products (Yang et al., 2018). Otherwise, the consumption data should not have shown such widespread early disposal. This thesis has been limited to the user-side, and therefore only assumptions can be made for the supplier-side. I therefore want to avoid speculations about this, and rather look at the consumer side in the following discussion, which is also less researched than the production side, according to Mylan (2015).

Despite it being the central theme of the thesis, environmental or circular economy concerns were rarely mentioned by the interviewees, and only briefly so when mentioned at all. This is perhaps the first cue that circular economy efforts are not regarded as a responsibility of the facility managers or the healthcare workers. As one interviewee put it: “it is not my job” (F4). While the facility managers were engaged in management of textiles, healthcare workers demonstrated in interviews that this is not a topic given much thought. There are also limited information flows between facility managers and healthcare workers about textile management, and competence about this is therefore varied at the healthcare worker level. Healthcare worker E3 said that there is little information coming from the management about how to treat workwear. At local service unit C, another healthcare worker said the same as E3 about information, but added that “We are all adults, so we should automatically know things like this [how to treat textiles at work]”. The same sense of obviousness regarding how to manage textiles at work was seen from most other interviews with

healthcare workers. Here, the point made by Süßbauer and Schäfer (2019) that employees' workplace routines are not actively reflected upon as actions with environmental impact, becomes relevant. The meanings that textile consumption is imbued with, like cleanliness and time and cost efficiency, are meanings I assume are generally important in the professions of the facility managers and healthcare workers interviewed.

Yet another element from practice theory that can be helpful in order to understand the differences in experienced responsibility for management of textiles in a resource efficient manner is connected to what type of material role the textiles have in the work practices of facility managers and healthcare workers. Healthcare workers relate to textiles as a resource material, where the cleanliness of the textiles is the material property that is consumed during practices where they deliver healthcare services. Facility managers, on the other hand, relate to textiles as an object material in some of their practices, since a part of their internal service provision for the local service unit directly involves supplying these textiles. Taking on more responsibility for consumption work for the healthcare workers would entail a change in the textiles' material role from resource material to object material.

Within the quality award criterion for the framework agreement, the tenderer was asked to describe its self-service portal for users of the framework agreement (Nr. 10, Table 4). Each framework agreement has its own webpage at the City of Oslo's intranet for employees, with information about how to use the agreement. The intranet webpage also links to a webpage run by Nor Tekstil, at nortekstil.no/minside (13.12.2022), which is their solution for a self-service portal as required in the tender. This page guides the user to the supplier's workwear portal (arbeidstoyportal.nortekstil.no, 13.12.2022). Here, new workers can be added, removed, changes of size can be registered, and complaints about faulty products can be submitted. As such, the supplier provides a system for textile stock management, which could be an infrastructure material in textile management practices. The required data and online portal of the supplier indirectly facilitates for knowledge about one's own consumption patterns, but the opportunities seem to be used to a very limited degree. Interviews show that facility managers interviewed have not demanded this information that the supplier is contractually required to have, and only some of them see such information as useful. For some interviewees, this was a question of responsibility, where they see the supplier as responsible for all matters concerning the stock of textiles.

The orientation letter, however, describes what agents have what responsibilities regarding management of the various elements of the contract with the supplier. UKE as the central procurement organisation is to manage the contract on a general basis, with specific attention to

requirements about environmental and social factors. The decentralised purchaser at the local service units is responsible for controlling that deliveries are correct according to their own orders. Furthermore, the orientation letter explicitly also says that it is “the local service unit’s responsibility to avoid waste and unnecessary replacement of garments, as production and consumption of clothing has a great environmental impact” (p. 3). Still, when asked directly about how they know how to use the framework agreement for rental and laundry of health textiles, only two facility managers mentioned the orientation letter.

When asked what an employee should do if they believe a uniform piece is worn out, facility manager E1 said that this is something they expect employees to evaluate themselves. If an employee thinks a uniform piece is worn out, they should place it in the orange basket for returns and deregistering with the supplier, E1 explained. E1 believed that after the orange baskets have been introduced it is easier to phase out textiles that they believe themselves is too worn out to wear, and that this is a good thing. However, one of the framework agreement specifications says that this is the responsibility of the supplier. This functions as yet another example of how it is unclear who carry what responsibilities and thus how the consumption work involved in managing and using textiles should be distributed.

With this, neither the provisions from the orientation seem to actively impact textile consumption practices in their current form, as a rather static source of information with little relevance for daily work. As with the results of Kristensen et al. (2021), it seems that the very general level of guidelines for how to achieve circularity through public procurement is a topic to be looked into for future framework agreements as well. The guiding documents give a direction for the procurers, but only to a very limited degree for facility managers and users. This reflects the observation in the report by Nordic Council of Ministers (2022) about unclear placement of responsibility for following up environmental provisions in framework agreements.

The possibility for a detailed overview of the textile stock can perhaps be utilised to a greater extent, by both facility managers and by the supplier. The new competence that applying consumption data can develop, is also a form of re-crafting textile consumption practices for lower resource intensity. In theory, as the current practices for monitoring textile consumption are loosely coupled to other practice elements in the healthcare sector, this should be possible. One issue could be that time is already a limited resource, and as such, it could be beneficial if the data was shared in a format that is easily comprehensible. This could also make facility managers’ road towards answering questions about wasted textiles, shorter. More systematic use of data can relieve them of time spent having to manually look for lost products, with which facility managers A1 and G1 for

instance were struggling with. Making use of this information could contribute to a reconfiguring of practice. Data as a material element could support elements such as the meaning of economic efficiency and professionalism for facility managers, and together form a practice with closer monitoring of textile consumption, which now is mostly a proto practice.

Availability of the right sizes and reliability of supply as central meanings can call for placing more responsibility with the supplier for designing a stock according to the sizes and number of garments needed at the individual local service unit. Then, facility managers could lean on the competence of the supplier. However, measures must then be taken to prevent the supplier from seeking to maximise profits by renting out more garments than what is actually needed, like Tukker (2015) warns about for product-oriented PSSs. Furthermore, Mont (2002) argues that for the successfulness of a PSS model in circular economy terms, suppliers should educate the users of their products and services. In framework agreements like the one researched in this thesis, the tender can be designed to include requirements for the supplier to take on such a role more actively.

In summary, specific guidelines for the use of the framework agreement do not currently involve directions for how to operate in the most environmentally effective manner together with the supplier. Other and more active sources of disseminating information about responsibility could therefore be considered. Furthermore, information might not be effective in itself, and accepting responsibility once information has been received is not straightforward, as argued by Clarke (2008). The use of targets and reporting on these in an environmental management system (EMS) might be useful here, as discussed in the follow section (4.4.2).

4.4.2 Intervention for change: Environmental management systems

There seems to be a certain potential in environmental management systems, as this as an institution can more firmly place the responsibility for circularity with specific units and roles in the organisation. An environmental management system is a tool for systematically managing the environmental impacts of an organisation's activities. C1 believes that the textiles are treated less well by employees, as they are not their personal belongings. "You are not thinking of the next person, right. Suddenly, a size Large pants is a size Small pants [referring to when users tie the pants' rubber bands in at the waist for a narrower waist], and this again is costly, right". On inquiry of whether this could be changed in some way, C1 started talking about the service units' recent Environmental Lighthouse certification process. This is very similar to a section of the interview with facility manager G1. Here, G1 mentioned that their local service unit is currently undergoing an EMS certification process. In this process, they have assigned responsibility for environmental measures to an employee in each section of the service unit, who must follow up on the measures

agreed upon. “It is to think that it is just as much my [the employees’] responsibility to take care of the things we have [at the local service unit]”, G1 said, and followed up with “You should treat it as your own. Would you have done this at home?”.

As the topic of environmental management systems appeared in several interviews, I saw the need to interview respondents I1 and I2 [from now on only referred to as the EMS experts], who are working with the Eco-Lighthouse Certification in the City of Oslo. The EMS experts informed me that in 2003, the City of Oslo decided that all agencies would adopt environmental management with revision and reporting. The Norwegian certification scheme Eco-Lighthouse is used by the District Administrations² and for individual organisational units. The City Council later decided that environmental management should be strengthened and used to place emphasis on a sustainable and reduced material consumption and actively strengthen circular solutions (Bymiljøetaten, 2019). As such, using these systems for reducing consumption of textiles should also be relevant.

To be certified within the Eco-Lighthouse scheme, the organisation must fulfil basic common criteria, as well as sector-specific criteria. For home care services and nursing homes, there are separate sector specific criteria (Miljøfyrtårn, n.d.). There are no criteria connected with textiles, except for one for healthcare services regarding a specific type of bed protection products. However, the City of Oslo can influence the criteria through their partnership with the Eco-Lighthouse foundation. Once certified, a part of the scheme is environmental reporting, for which indicators are used. Some of these indicators are mandatory for service units in the same sector, while others are optional. The City of Oslo can implement provisions for common use of the otherwise optional indicators, if desired to retrieve management data. Furthermore, the City of Oslo have their own common indicators for all municipal organisations, that follow the provisions from official documents.

The EMS experts emphasize that the Eco-Lighthouse scheme is more than merely a reporting scheme. It is a broader environmental management system with defined management principles. These give provisions about involvement of employees and stakeholders in the work for reduction of the organisation’s environmental impact. In the common criteria for certification of municipal organisations, this is covered. The municipal common criteria set provide two criteria for procurement. One of these has to do with the tendering process, while the other concerns choices made when making orders within a framework agreement. Organisations must document procurement routines that involve a needs assessment before new orders are made, to reduce the amount bought where possible. They must also document that the organisations’ purchasers are

² «Bydeler» in Norwegian

familiar with the procurement routines and must give examples of use of the routines when they are recertified. Furthermore, there are common criteria about waste and reuse. As such, the purchasing and waste management phases of products' life cycles are covered, but use phase is overlooked, just like in the focus on tendering in circular public procurement practice and research. As I have argued for employing a systems perspective in the implementation of circular economy principles through public procurements, and remembering that Klein et al. (2021) has argued that procurements should be viewed as one of several elements in a wider circular economy initiative in public organisations, connecting procurement more explicitly to environmental management can be a sound approach.

Facility managers G1 and H1 mentioned that the certification process for their EMSs increased their awareness of the environmental impact of the local service unit's consumption of textiles. Furthermore, local service unit C had recently had their EMS certified and had considered the patients' personal clothing in connection with this. C1 expressed that it could be relevant to include workwear and other healthcare textiles in this system somehow. The expert interview with H1 showed that their EMS only to a very limited degree encompassed textile management, but that there is interest into exploring further how management of textiles can be integrated in and perhaps driven by EMS reporting. This year, they have started to register disposal of textiles. However, they have only started gathering the products destined for discarding and do not yet know what to do about them. H1 was surprised to see that there is less discarding than they initially expected. Their expectations were based on knowledge about new orders, where the service units order new textiles when they experience a shrinking stock. H1 therefore suspected that waste occurs, which can account for the experienced gap between large new orders and low volumes of discarded products. They do not know what causes this waste, but H1 thinks it is discarded by the end-users, and this is not registered anywhere. Connected to this, H1 said that "we can document what we buy, but we need goals for reduction". Such goals could be implemented through an EMS.

In this regard, the recommendations by Qazi and Appolloni (2022) and Malacina et al. (2022) on new key performance indicators for public procurers could be picked up. However, I propose to expand this to decentralised purchasers, not tied to contract management, but rather as a part of the (for several units) already existing EMS used at the local service units. Malacina et al. (2022) suggest that end-user engagement and information-sharing with end-users can be a means of creating more value from public procurement. As facility managers as decentralised purchasers operate closer to the end-user in the organisation, this could also be the relevant organisational level to carry out such activities, which can then be followed up and incentivized by being integrated in the EMS of the organisation.

Changing how practices interlock is the most complex way of intervening for sustainability change that Spurling et al. (2013) propose. Sahakian and Wilhite (2014) suggest targeting elements of practices that are already undergoing change and amplifying this change in a desired direction. At some local service units, EMSs that are being established or are in use, means that the organisations are actively making efforts for a lower environmental impact. These can therefore be a vehicle for following up measures taken. The Eco-Lighthouse EMS, which is the system most organisations in the City of Oslo are expected to use, currently does not necessarily involve mandatory direct criteria, indicators and targets for textile management. Such criteria, indicators and targets could be developed. Still, environmental meanings might also be under development simply by having such a system with constant environmental improvement in place, despite there being no specific measures for textiles in the system yet. An example is the interview with C1 where attention to environmental impact from textiles had been increased during the certification process, even though textiles had not been a great focus in this process.

The EMS experts interviewed suggested using the workplace's working environment committee³, as this institution is "an important actor, to ensure commitment among the union representative, the safety representative and the management". They also introduced the idea of including provisions for textile management in the letters of allocation for the health services. This is yet another way of making institutions affect practices. When it comes to the development of criteria, indicators and targets, the availability of data to measure these represents an opportunity. Having common indicators across the local service units can perhaps be beneficial, if easy comparison can be an incentive for facility managers to work for a better performance. Combined with a platform for knowledge sharing between employees with a facility manager role, as missed by respondent G1, effective measures taken by one unit, or mistakes made, can be shared across the units.

4.4.3 Intervention for change: Technological interventions

A material element that became a theme in several interviews, and therefore also led me to interview D1 about this specifically, was automated workwear distribution solution. An automated workwear distribution solution is a dispenser of workwear in the form of an electronic locker, where garments are retrieved by end-users using for instance an access card. Introducing a new technology can be a way of carrying out what Spurling et al. (2013) calls re-crafting of practices. If successfully implemented, this technology can potentially reduce the resource intensity of the textile consumption practices, without considerably changing meanings or competence elements of the

³ «Arbeidsmiljøutvalg» (AMU) in Norwegian

practices. Technologies can also lead to new behavioural responses, according to Shove et al. (2012). Local service unit D is an example of a local service unit that could have been used as a demonstration project, like Sahakian and Wilhite (2014) proposes, as they are currently implementing this automated workwear distribution solution, with the purpose of reducing costs from waste. As such, the use of the automated workwear distribution solution is imbued with meaning from the beginning. Combined with the insight the quantitative data can give, this could serve as an example of a practice element that is already changing, which is where Sahakian and Wilhite (2014) write that efforts at change should be directed, through upscaling from smaller to larger projects. In fact, local service unit D had themselves been inspired by another public healthcare agency outside the City of Oslo, as they learned from them that great cost savings could be made with introducing this technology.

With an automated workwear distribution solution, what textiles are used are registered, and the issue of responsibility can therefore also be addressed through this technology. It is also possible to have a designated locker for clothes that need repairs, provided by the supplier. The facility manager can set a limit on for instance two uniform pieces per person, so that uniforms must be handed in before new pieces can be taken out. Local service unit D saw the need for this functionality as there were complaints from the users that their sizes were missing, which they understood was due to workers stocking up on their preferred sizes. This is a self-reinforced practice, where workers stock up on their sizes because others also do so, and they fear having to wear the wrong size the following day at work. “The lockers place the responsibility with the workers”, D1 says. Furthermore, the software, which includes a mobile app, gives notifications to the facility manager when sizes are missing. According to D1, other hospitals that have started using these electronic dispenser lockers have managed to reduce their workwear stocks by 50 percent, while still covering the real needs for uniforms.

However, B1 believed that there are challenges involved with the automated workwear distribution solution, such as costs for running them, but quickly added that costs could perhaps be saved as fewer working hours would be needed to keep the uniform storage room in order, and as the cost of waste would be lower. B1 saw further challenges with this technology, such as access cards not working, or substitutes not having access. When asked if such challenges could be overcome by for instance having some spare uniforms outside the lockers for emergencies, B1 said that “Then there would be no point in having the lockers, as people would not be bothered with using them”. This shows that the materials that technological solutions represent must be connected to competences, and the use of the technological solutions must have some meaning, for the

technology to be accepted among the users. New meanings can perhaps be created. Realising that hygiene and economic efficiency are among the most important meanings tied to textile consumption, interventions can be focused on satisfying these, too. This could for instance be by emphasizing how a lower consumption is less costly at the same time as it does not have to be a compromise regarding neither hygiene nor safety of delivery.

Another potential benefit of widespread use of electronic dispensers could be that textile management would become more standardised across local service units. If systems for textile management were more standardised, this could perhaps also make learning across local service units easier, thus re-crafting the competence element, from more individually held or tacit knowledge, to explicit knowledge held by the organisation.

4.4.4 Intervention for change: facilitating for learning

Learning can be used as an intervention for change in practices. Sahakian and Wilhite (2014) argues for communicating a “learning proposition”, that is meaningful to people in their everyday life, for successfully using learning to change practices. My idea at the outset was to identify local service units with a relatively high and a relatively low consumption of uniforms. This was how interviewees were sampled. At the local service units investigated, I was unable to find patterns that indicated an unambiguous good or bad practice, in connection with their respective consumption levels. Nevertheless, the differences between practices at various service units opens for a possibility of learning across these. In the following, I provide a few examples of this.

As mentioned in the theoretical framework, Mont (2002) argues that the establishment of networks can be an organisational design element that help PSS business models achieve lower resource consumption. G1 used to meet frequently with facility managers at other local service units for healthcare, to discuss various matters, such as textile management. They do not meet anymore. When asked about whether this makes a difference, G1 expressed a desire to have this exchange of experiences with others in their role, and said that “The mistakes one makes, should not have to be repeated by another”. They expressed a desire to have more contact with employees with similar roles in textile management at other service units. Another facility manager said that similar local service units had been contacting their local service unit for inspiration on how to organise textile management. Based on this, there can be potential for orchestrating learning among facility managers for intervening in practices that lead to early disposal of garments and waste, in a community of practice. The emphasis in the learning proposition should be based on what is of relevance to the practitioners in their work practices that consumption practices are dependent upon.

A starting point can therefore be the meanings users' and facility managers' work practices are imbued with, for instance hygiene, time- and cost efficiency.

Several facility managers gave emphasis to the importance of the physical infrastructure of the local service unit buildings, when asked about factors that influence management of textiles. For instance, unused textiles that end up on the floor because of overstocked storage rooms, cannot be used before they are washed again, due to hygiene. With overstocked storage rooms, healthcare workers in a rush end up pushing uniform pieces off the shelves when looking for their preferred size or type. As such, the meaning of time efficiency is tied to the material element of physical infrastructure. While other respondents report that a limited storage capacity is a challenge, facility manager E1 had a different take. They experienced limited storage capacity as hindering a build-up of textiles, which again is positive for avoiding too large stocks and resulting waste. This is also made possible by the fact that healthcare workers have a routine where they notify their facility manager if they see that there is a risk of being short of any type of textile soon, and they also give notice if they see that there are too many textiles on the shelves. This requires certain competence among the healthcare workers, as well as a common understanding that managing the textile stocks is the responsibility of some healthcare workers as well, as they are closer to the materials. In this way, they are never short on textiles, according to E1. While reliability of supply of textiles overall did not seem to worry E1, they said that there is uncertainty tied to crises, and that here, they rely on the framework agreement to cover an emergency stock from the supplier. Once again, this shows a more explicit placement of responsibility in the system of textile provision, this time between the supplier and the facility manager. Thus, this is an example of how the same challenges for a more resource effective textile management is solved in different ways by organising competences, materials and meanings differently, which gives opportunities to learn across local service units.

Measuring improvement is also relevant to the question of responsibility. Without knowing the status quo, it is difficult to set goals and to act towards reaching that goal. The local service units have very different ways of keeping an overview over their textile stocks, despite the existing digital webpage solution from the supplier. It might for instance be possible to learn from local service unit C, where competition among the sections for correct management of patients' own textiles has led to improvement.

Such opportunities for learning across local service units could also benefit the tendering process, if procurement officers facilitate for the sharing of this knowledge. Learning could occur across the tendering, ordering and management and using levels in Figure 2. With this, learning could also decrease the physical and cultural organisational distance that was seen in the case of

circular public procurement in Danish municipalities presented by Kristensen et al. (2021), and which also seems to be present in the City of Oslo. Learning could perhaps also decrease the identified dependency that textile management has on individual facility managers' competence and interest, and rather strengthen textile management so that it supports circular economy principles. As such, the framework agreements operate as an external institution that changes practices from the outside, like Gherardi (2019) explains. Recognising the interplay between human agency and institutions this way also follows up on the recommendation by Warde (2014) to pay attention to institutions when using a practice theory approach to consumption. One of the points made by Warde (2014) here is that institutions contribute to producing shared understanding. I regard the production of shared understandings particularly relevant after learning from the analysis of interviews through a practice theory lens that a responsibility vacuum does exist. Agency and structure cocreate actual practice, and this practice ultimately produces physical end-results that are either more or less in line with circular economy principles.

5. Summary and conclusions

This thesis has sought to answer the research question of, in the context of public

procurement, how knowledge about user practices can contribute towards implementing circular economy principles in the consumption of textiles in the City of Oslo's health sector. The City of Oslo has developed strong ambitions for the use of public procurement for circular economy purposes, with textiles as one of the prioritised product categories, and I therefore considered it an interesting case for this thesis.

Practice theory offers an alternative to interpreting consumption either as a result of individual economic interest or as a result of culture. I therefore considered practice theory a useful theoretical lens to apply to consumption in public organisations. Furthermore, instead of viewing consumption more narrowly as the moment of buying of the product, practice theory can give insight into decisions made in the use-phase of goods and services, which is important in the lifecycle focus of circular economy.

Using practice theory to analyse consumption of textiles in the City of Oslo's health sector has uncovered very specific practice elements, and some of their interconnectedness. It is particularly helpful for understanding consumption in public organisations as systems. For other products and/or services, and other sectors than the public health sector, systems of practices will most likely look very different from what this case shows. Thus, the challenges outlined in this thesis are probably more relevant for the procurement of goods and services that are dispersed among a large number of users, such as through framework agreements, rather than in one-off procurements of one or a few products. Nevertheless, the general findings can provide useful elements in the design of efforts to use public consumption as a tool to enhance circular economy.

In connection with this, implementation of circular economy principles in public consumption must recognise the importance of whole lifecycles of products, by being coordinated across all levels of the organisation. Practices relevant for the use-phase of goods and services are made at the user level. There is in particular a need to more explicitly distribute the responsibility for consumption work in the use-phase of procured goods and services across various actors in the public organisation and between the contracting authority and the supplier. Furthermore, observing and involving decentralised purchasers and end-users to a higher degree is more resource intensive during the tendering, but may lead to a service more fit for the system of practices that already exist and is non-negotiable for these users.

Specific interventions at the user level have been discussed. The technological intervention of automated workwear dispensers has been presented as an example of reconfiguring practices through the material element. Here, I suggest that it could be important to carry out such a

reconfiguring with high alertness to existing practices for successful implementation. Internally in the organisation, circular economy principles through procurement may involve the employment of other organisational tools than tendering and contract management in the traditional sense, such as incorporating textile management and use in the EMSs of the local service units or facilitating for learning between organisational units and levels. This can be a way of bringing the system perspective into the implementation of circular economy principles through public procurement in a complex organisation. I have also pointed towards the effects that strategic choices can have, such as what mechanisms are at play when outsourcing versus integrating a service, and when choosing to cover material needs as a service through PSS business models.

With most consumption research revolving around the private consumer, this thesis has contributed to the field by investigating consumption in organisations. Future research can investigate to what degree public procurement officers take practices and user involvement into account, and barriers and opportunities involved with doing so, as well as how to expand the conception of value in circular public procurement from economic value to user value as also called for by Malacina et al. (2022).

6. References

Alhola, K., Ryding, S. O., Salmenperä, H. & Busch, N. J. (2019). Exploiting the potential of public procurement: Opportunities for circular economy. *Journal of Industrial Ecology*, 23 (1): 96-

109. Available at:

https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.12770?casa_token=O9CLPI3IFZMAA AAA:POjBpW1Ys4uH1ctE6H1boUZPpBt_wuh5xXQrdvU-ZLpOhuaH2gwDSc2uPQkapswTcluqtD1fd7p3oFA

Anskaffelsesloven. (2016). *Lov om offentlige anskaffelser*: Lovdata. Available at:

<https://lovdata.no/dokument/NL/lov/2016-06-17-73>

Barthelemy, J. (2003). The seven deadly sins of outsourcing. *Academy of Management Perspectives*, 17 (2): 87-98. Available at:

<https://journals.aom.org/doi/abs/10.5465/ame.2003.10025203>

Berg, B. & Lune, H. (2001). *Qualitative research methods for the social sciences*. (4th ed). Allyn & Bacon.

Brundtland, G. H. (1987). *Report of the World Commission on Environment and Development: Our Common Future*. Available at:

<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford: Oxford University Press.

Bymiljøetaten. (2019). *Framtidens Forbruk – Strategi for bærekraftig og redusert forbruk 2019–2030*. Available at: <https://www.klimaoslo.no/wp-content/uploads/sites/88/2019/11/Framtidens-forbruk.pdf>

Bymiljøetaten. (2022). *Tiltaksliste – plast, urbant landbruk, bærekraftig og redusert forbruk og bærekraftig mat 2023-2026*. Available at:

<https://www.oslo.kommune.no/getfile.php/13463206-1663756426/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Budsjett%2C%20regnskap%20og%20rapportering/Budsjett%202023/Budsjettforslag%202023/Vedlegg%208%20-%20Tiltaksliste%20plast%2C%20urbant%20landbruk%2C%20b%20C%20A6rekraftig%20og%20redusert%20forbruk%20og%20b%20C%20A6rekraftig%20mat%202023-2026.pdf>

Byrådsavdeling for finans. (2013). *Strategi for Oslo kommunes anskaffelser for perioden 2013-2016*. Available at:

https://anskaffelser.no/sites/default/files/strategi_for_oslo_kommunes_anskaffelser_for_perioden_2013-2016.pdf

Byrådsavdeling for finans. (2017). *Oslo kommunes anskaffelsesstrategi*. Available at:

<https://www.oslo.kommune.no/getfile.php/13254871-1510047808/Tjenester%20og%20tilbud/Politikk%20og%20administrasjon/Anskaffelser/An>

skaffelsesstrategi%202017%20-.pdf

- Christensen, T., Lægreid, P., Roness, P. G. & Røvik, K. A. (2007). *Organization Theory and the Public Sector: Instrument, culture and myth*. Routledge.
- Christensen, T., Egeberg, M., Lægreid, P. & Aars, J. (2014). *Forvaltning og politikk*. Oslo: Universitetsforlaget.
- Christensen, T., Egeberg, M., Lægreid, P., Roness, P. G. & Røvik, K. A. (2015). *Organisasjonsteori for offentlig sektor Oslo*. (3rd ed.). Oslo: Universitetsforlaget.
- Clarke, N. (2008). From ethical consumerism to political consumption. *Geography compass*, 2 (6): 1870-1884. Available at: https://compass.onlinelibrary.wiley.com/doi/abs/10.1111/j.1749-8198.2008.00170.x?casa_token=S3Sbe6LjAdQAAAAA:cTHJWXLWbDPte9vIxFzWEXTnJGmbT2ggub-aBLboxePxCu0wo3-jSir5d0lA6ila5oRaIU6S69RBgeM
- Corsini, F., Laurenti, R., Meinherz, F., Appio, F. P. & Mora, L. (2019). The advent of practice theories in research on sustainable consumption: Past, current and future directions of the field. *Sustainability*, 11 (2). Available at: <https://www.mdpi.com/393612>
- Corvellec, H., Stowell, A. F. & Johansson, N. (2022). Critiques of the circular economy. *Journal of Industrial Ecology*, 26 (2): 421-432. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.13187>
- Department of Finance. (2018). *Tildelingsbrev 2019*. Available at: <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/budsjett-regnskap-og-rapportering/tildelingsbrev/#gref>
- Department of Finance. (2020). *Tildelingsbrev 2020*. Available at: <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/budsjett-regnskap-og-rapportering/tildelingsbrev/#gref>
- Department of Finance. (2021). *Tildelingsbrev 2021*. Available at: <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/budsjett-regnskap-og-rapportering/tildelingsbrev/#gref>
- Department of Finance. (2022a). *Tildelingsbrev 2022*. Available at: <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/budsjett-regnskap-og-rapportering/tildelingsbrev/#gref>
- Department of Finance. (2022b). *Tildelingsbrev 2023*. Available at: <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/budsjett-regnskap-og-rapportering/tildelingsbrev/#gref>
- DFØ. (2021a). *Action plan to increase the proportion of green public procurements and green*

innovation. Available at: https://anskaffelser.no/sites/default/files/2022-04/DFO_Handlingsplan_2021_Print%20Engelsk_NS_F31.pdf

DFØ. (2021b). *Anskaffelsesprosessen steg for steg*. Available at:

<https://anskaffelser.no/anskaffelsesprosessen/anskaffelsesprosessen-steg-steg/avklare-behov-og-forberede-konkurransen/spesifikasjoner-krav-kriterier-og-kontraktsvilkar>

DFØ. (2022). *Kategoristrategi for kontorområdet*. Available at: <https://anskaffelser.no/statens-innkjopssenter/kategoristrategier/kategoristrategi-kontorområdet-2022-2032>

Directive 2019/904. *Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment*.

Available at: <https://eur-lex.europa.eu/eli/dir/2019/904/oj>

Ellen McArthur Foundation. (2022). *Circular public procurement: a framework for cities*. Available at: <https://emf.gitbook.io/circular-procurement-for-cities/> (accessed: 1. June 2022).

European Commission. (2017a). *EU green public procurement criteria for textiles products and services*. Available at:

https://ec.europa.eu/environment/gpp/pdf/200406_JRC120265_eu_green_public_procurement_criteria_for_textile_products_and_services_guidance_document.pdf

European Commission. (2017b). *Public procurement for a circular economy*. Available at:

https://ec.europa.eu/environment/gpp/pdf/Public_procurement_circular_economy_brochure.pdf

European Commission. (2020a). *A new Circular Economy Action Plan - For a cleaner and more competitive Europe*. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>

Regulation 2020/852. *Regulation (EU) No 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088*.

Regulation 2020/852. *Regulation (EU) No 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088*.

European Commission. (n.d.). *Waste Framework Directive*. Available at:

https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en (accessed: 16th April 2023).

European Parliament. (2019). *Environmental impact of the textile and clothing industry*. Available at:

[https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI\(2019\)633143_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf)

Fiva, J. H., Hagen, T. P. & Sørensen, R. J. (2014). *Kommunal organisering*. Oslo:

Universitetsforlaget.

- Geissdoerfer, M., Savaget, P., Bocken, N. M. & Hultink, E. J. (2017). The Circular Economy—A new sustainability paradigm? *Journal of cleaner production*, 143: 757-768. Available at: https://www.sciencedirect.com/science/article/pii/S0959652616321023?casa_token=hIudzp45IIUAAAAA:-sjG_z_n9EsicAyO_O4Q53JDXJwU-tSQcNc64DGPQZ_6XL__Y2c0wlXtDk5jdqhvnlxyUyd_yg
- Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organizations. *Organization*, 7 (2): 211-223. Available: https://journals.sagepub.com/doi/pdf/10.1177/135050840072001?casa_token=nZGbEKNIiYUAAAAA:L6MDPMiaR26jbSjE3600CMGlyOGX16mzDNBTNUYJBIsYCKkXFtx3jZ8357_I1lvbTQpCCI49ZB1U
- Gherardi, S. (2019). *How to conduct a practice-based study: Problems and methods*. Cheltenham: Edward Elgar Publishing.
- Gilleberg, S. J. (2021). *Tekstilhåndtering i Oslo kommune. Forbruk og muligheter - Analyse av klesforbruk og en beregning av potensiell klimaeffekt ved økt utsortering av tekstiler fra husholdning og kommunale virksomheter* (Master thess). Norwegian University of Life Sciences (NMBU), Ås.
- Gram-Hanssen, K. (2011). Understanding change and continuity in residential energy consumption. *Journal of consumer culture*, 11 (1): 61-78. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1469540510391725?casa_token=vc9jlGhWUs8AAAAA:0jUiyFsHG_s_78P-ExEC-GZfFhjL_CQXjffZq-axtLCX7iVuzE4cPiYCjaWQFg3MLlsuSPIVDJyEX
- Gram-Hanssen, K. (2010). Standby consumption in households analyzed with a practice theory approach. *Journal of Industrial Ecology*, 14 (1): 150-165. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1530-9290.2009.00194.x?casa_token=2oOYNX2C79cAAAAA:M0BCzK9mOMz9pWRgO3qFL_dgtFBzk4M787Xbw5OP01_KO9872B_g6sKC_lsHAUmrfb7MG9-X9z1BYJI
- Grandia, J. (2016). Finding the missing link: Examining the mediating role of sustainable public procurement behaviour. *Journal of Cleaner Production*, 124: 183-190. Available at: https://www.sciencedirect.com/science/article/pii/S0959652616300142?casa_token=-HslIfq5p-4AAAAA:ERABpAo3QF33LMdFrjUGURS6P6IojNtr4YvUWhNu1oFDAmT7qlGoZQmRkzJ_xnLGLFxx8zufA

- Halkier, B., Katz-Gerro, T. & Martens, L. (2011). Applying practice theory to the study of consumption: Theoretical and methodological considerations. *Journal of consumer culture*, 11 (1): 3-13. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1469540510391765?casa_token=55RDSrwwO OgAAAAA:TmlLYK1B3mCMw-_ansv2eTL9kwYbEpyX_XRd_tRJevtLwKiTUCv4DO1r2nQsH_ZTtE9pEI50p197
- Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of consumer culture*, 11 (1): 79-99. Available at: <https://journals.sagepub.com/doi/10.1177/1469540510390500>
- Higgs, J. (2012). *Practice-based education : perspectives and strategies*. Rotterdam: Sense Publishers
- Hobson, K., Holmes, H., Welch, D., Wheeler, K. & Wieser, H. (2021). Consumption Work in the circular economy: A research agenda. *Journal of Cleaner Production*. Available at: https://www.sciencedirect.com/science/article/pii/S0959652621031607?casa_token=CIktn7 HMFruAAAAA:9Ky_jZlIXaMA6QGuig1k4EcVYVToasryRqXKGRhuiXUWV8QLk1SB mNY2u2J5dqNQUBmlehvjJg
- Jensen, B., Antonsen, S., Berg Erichsen, A., Voldnes, F., Schade, S. M. & Høin, G. (2018). Kommersialisering av fellesgodene: Virkninger på skatteinntekter, lønn og samfunnsøkonomiske kostnader. Available at: <https://brage.inn.no/inn-xmlui/handle/11250/2570157>
- Kirchherr, J., Reike, D. & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, conservation and recycling*, 127: 221-232. Available at: <https://www.sciencedirect.com/science/article/pii/S0921344917302835>
- Kjaer, L. L., Pigosso, D. C., Niero, M., Bech, N. M. & McAloone, T. C. (2019). Product/service-systems for a circular economy: the route to decoupling economic growth from resource consumption? *Journal of Industrial Ecology*, 23 (1): 22-35. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.12747?casa_token=DTrpCfbWksoAAAA:dOoiaXUYYx1uP2Nx1v9sd-TOsJFh73QEnNxJHshylzCFJQWclAH1RbPqJgCdZglgsg3-n2idLw0UVM
- Klein, N., Ramos, T. B. & Deutz, P. (2020). Circular economy practices and strategies in public sector organizations: An integrative review. *Sustainability*. Available at: https://www.researchgate.net/publication/341534540_Circular_Economy_Practices_and_Strategies_in_Public_Sector_Organizations_An_Integrative_Review

- Klein, N., Ramos, T. B. & Deutz, P. (2021). Factors and strategies for circularity implementation in the public sector: An organisational change management approach for sustainability. *Corporate Social Responsibility and Environmental Management*, 29 (3): 509-523. Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.2215>
- Klein, N., Ramos, T. B. & Deutz, P. (2022). Advancing the Circular Economy in Public Sector Organisations: Employees' Perspectives on Practices. *Circular Economy and Sustainability*, 2 (2): 759-781. Available at: <https://link.springer.com/article/10.1007/s43615-021-00044-x>
- Klepp, I. G., Laitala, K. & Wiedemann, S. (2020). Clothing lifespans: what should be measured and how. *Sustainability*. Available at: <https://www.mdpi.com/787188>
- Knot, M. & Luiten, H. (2006). User involvement in the development of sustainable product-service systems: The Case of the Personal Mobility System 'Mitka'. *User Behavior and Technology Development*. Available at: https://link.springer.com/content/pdf/10.1007/978-1-4020-5196-8_26.pdf
- Kommunal- og moderniseringsdepartementet. (2015). *Samordning av statlige innkjøp - Etablering av statens innkjøpssenter*. Available at: https://www.regjeringen.no/contentassets/efb33fdff5f44d56928aa2b85e83afc1/samordning_av_statlige_innkjop.pdf
- Kristensen, H. S., Mosgaard, M. A. & Remmen, A. (2021). Circular public procurement practices in Danish municipalities. *Journal of Cleaner Production*. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S095965262035006X>
- Laitala, K. & Klepp, I. G. (2020). What affects garment lifespans? International clothing practices based on a wardrobe survey in China, Germany, Japan, the UK, and the USA. *Sustainability*. Available at: <https://www.mdpi.com/2071-1050/12/21/9151>
- Liedtke, C., Baedeker, C., Hasselkuß, M., Rohn, H. & Grinewitschus, V. (2015). User-integrated innovation in Sustainable LivingLabs: An experimental infrastructure for researching and developing sustainable product service systems. *Journal of Cleaner Production*, 97: 106-116. Available at: https://www.sciencedirect.com/science/article/pii/S0959652614004338?casa_token=ZLPreUEkmBUAAAAA:LxF7gEl-PU5ZMe4hKNyeQ3CWPRPbnh_YXA9GNHIUNc9-q4vrIFSuCbWqYTTln1jriy8fi0vj-S01
- Lune, H. & Berg, B. L. (2012). *Qualitative research methods for the social sciences*: Pearson.
- Lüdeke-Freund, F., Gold, S. & Bocken, N. M. (2019). A review and typology of circular economy business model patterns. *Journal of Industrial Ecology*, 23 (1): 36-61. Available at:

https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.12763?casa_token=SBIx5u1_V6kAAA:AA:TWaU6vOvLoMWdZYxn_43vQg_72BWU_agzZ9zQjti6_MVl4FZcfrGqUKJBdEgfP6mVn1g7hTMzWbXfNYqw

Malacina, I., Karttunen, E., Jääskeläinen, A., Lintukangas, K., Heikkilä, J. & Kähkönen, A.-K.

(2022). Capturing the value creation in public procurement: A practice-based view. *Journal of Purchasing and Supply Management*. Available at:

<https://www.sciencedirect.com/science/article/pii/S1478409221000844>

MAPS. (2020). *Sustainable public procurement in Norway*. Available at:

<https://www.mapsinitiative.org/assessments/MAPS%20Norway%20SPP.pdf>

Miljøfyrtårn. (n.d.). *Sertifiseringskriterier*. Available at:

<https://www.miljofyrtarn.no/virkosomhet/sertifiseringskriterier/> (accessed: 2nd March 2023).

Mont, O. K. (2002). Clarifying the concept of product–service system. *Journal of cleaner production*, 10 (3): 237-245. Available at:

https://www.sciencedirect.com/science/article/pii/S0959652601000397?casa_token=XU7_6Gh7WHoAAAAA:zOmDJ-

[IYL4qOzmJ7PtzkwDfHfWJ8cZgpXFicfijVduQlLIcXALsGrIid6qBC6on3xYh_bqUP4Z](https://www.sciencedirect.com/science/article/pii/S0959652601000397?casa_token=XU7_6Gh7WHoAAAAA:zOmDJ-IYL4qOzmJ7PtzkwDfHfWJ8cZgpXFicfijVduQlLIcXALsGrIid6qBC6on3xYh_bqUP4Z)

Morales, A. H. (2021). *Circular Economy and Public Procurement: Dialogues, Paradoxes and Innovation*. Available at: https://vbn.aau.dk/ws/files/470869913/phd_AHM_e_pdf.pdf

Muster, V. (2011). Companies promoting sustainable consumption of employees. *Journal of consumer policy*, 34: 161-174. Available at:

https://idp.springer.com/authorize/casa?redirect_uri=https://link.springer.com/article/10.1007/s10603-010-9143-

[4&casa_token=pLdZZHhcUU0AAAAA:Ki7og4opURnlo5ZUHO1IzPMce5ybestuF9ci2lWslgQgGTiplr4gzvJiSJdbXWOUkuW0SP0v5ZjKKKVR0JA](https://idp.springer.com/authorize/casa?redirect_uri=https://link.springer.com/article/10.1007/s10603-010-9143-4&casa_token=pLdZZHhcUU0AAAAA:Ki7og4opURnlo5ZUHO1IzPMce5ybestuF9ci2lWslgQgGTiplr4gzvJiSJdbXWOUkuW0SP0v5ZjKKKVR0JA)

Mylan, J. (2015). Understanding the diffusion of Sustainable Product-Service Systems: Insights

from the sociology of consumption and practice theory. *Journal of Cleaner Production*, 97:

13-20. Available at: <https://www.sciencedirect.com/science/article/pii/S0959652614000791>

Nicolini, D. (2012). *Practice theory, work, and organization: An introduction*. Oxford: Oxford University Press. Available at:

https://www.academia.edu/download/30531908/OUP_intro.pdf

Nordic Council of Ministers. (2022). *Climate Accounting in Public Procurements: Status in the*

Nordic Countries. Available at: <https://www.norden.org/en/publication/climate-accounting-public-procurements>

- Norwegian Ministry of Local Government and Modernisation & Norwegian Ministry of Foreign Affairs. (2021). *Voluntary National Review 2021 Norway*. Available at: <https://www.regjeringen.no/contentassets/cca592d5137845ff92874e9a78bdadea/no/pdfs/voluntary-national-review-2021.pdf>
- The Ministry of Trade, Industry and Fishery (2019). *Smartere innkjøp – effektive og profesjonelle offentlige anskaffelser* (Meld. St. 22 (2018-2019)). Available at: <https://www.regjeringen.no/contentassets/2d7006f67c374cbdab5d4d6ba7198ebd/no/pdfs/stm201820190022000dddpdfs.pdf>
- The Ministry of Trade, Industry and Fishery (2022). *Høringsnotat: Forslag til endring av forskrift om offentlige anskaffelser § 7-9, forsyningsforskriften § 7-9 og konsesjonskontraktforskriften § 7-6*. Available at: <https://www.regjeringen.no/contentassets/c4273886e0eb4d0cae52571717c277bf/horingsnotat.pdf>
- OECD. (n.d.). *Public procurement*. Available at: <https://www.oecd.org/gov/public-procurement/> (accessed: 27th April 2023).
- Office of the Auditor General of Norway. (2022). *Riksrevisjonens undersøkelse av grønne offentlige anskaffelser*. Available at: <https://www.riksrevisjonen.no/globalassets/rapporter/no-2021-2022/gronne-offentlige-anskaffelser.pdf>
- Oslo kommune. (2020). *Klimastrategi for Oslo mot 2030*. Available at: https://www.klimaoslo.no/wp-content/uploads/sites/88/2020/09/Klimastrategi2030_langversjon_web_enkeltside.pdf
- Perera, C., Auger, P. & Klein, J. (2018). Green consumption practices among young environmentalists: A practice theory perspective. *Journal of business ethics*, 152 (3): 843-864. Available at: https://idp.springer.com/authorize/casa?redirect_uri=https://link.springer.com/article/10.1007/s10551-016-3376-3&casa_token=O8OxqRPaQFsAAAAA:B4SOZ2UghyZ08N2Cgp2IbpIeJay6dzgxT9BOiE1PuxLsvOvxhM5IYbarF_mabDZ8I7t0Qn4qNqUspUY5GLs
- PlanMiljø & Østfoldforskning. (2020). *Kartlegging av brukte tekstiler og tekstilavfall i Norge*. Available at: <https://norsus.no/publikasjon/kartlegging-av-brukte-tekstiler-og-tekstilavfall-i-norge/>
- Purvis, B., Mao, Y. & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability science*, 14 (3): 681-695. Available at:

<https://link.springer.com/article/10.1007/s11625-018-0627-5>

Qazi, A. A. & Appolloni, A. (2022). A systematic review on barriers and enablers toward circular procurement management. *Sustainable Production and Consumption*, 33: 343-359.

Available at:

https://www.sciencedirect.com/science/article/pii/S2352550922001877?casa_token=b7TmBDhs3ukAAAAA:Tu2a5JHi4lSovUenaRzMBJ13wHS4vJ3ai8RctVtmljBj1q80RP9L89yQIMCy7LbUsUNgqfPR_OQt

Rainville, A. (2021). Stimulating a more Circular Economy through Public Procurement: Roles and dynamics of intermediation. *Research Policy*. Available at:

https://www.sciencedirect.com/science/article/pii/S0048733320302675?casa_token=ZYr7g0xR8JIAAAAA:RhZaJ_SlfTwa0QHT1VVSLcWgkdm_mz2GZLa65QKZqsruAqK7Wcx3PjMUvRM9GQiQWf6sSYFNMg

Reckwitz, A. (2002). Toward a theory of social practices: A development in culturalist theorizing.

European journal of social theory, 5 (2): 243-263. Available at:

https://journals.sagepub.com/doi/pdf/10.1177/13684310222225432?casa_token=vrLWgDuQRVUAAAAA:wXrTXUFbCxJrt1WFLQBi7fHZTeRoAnJvAVrfVqkRM4iCEiMTL1NhBxB8Lyj4B0y1abtqQGTZhGT-

Reike, D., Vermeulen, W. J. & Witjes, S. (2018). The circular economy: new or refurbished as CE 3.0?—exploring controversies in the conceptualization of the circular economy through a focus on history and resource value retention options. *Resources, Conservation and Recycling*, 135: 246-264. Available at:

<https://www.sciencedirect.com/science/article/pii/S0921344917302756>

Sahakian, M. & Wilhite, H. (2014). Making practice theory practicable: Towards more sustainable forms of consumption. *Journal of Consumer Culture*, 14 (1): 25-44. Available at:

<https://journals.sagepub.com/doi/abs/10.1177/1469540513505607?journalCode=joca>

Schatzki, T. R. (2012). A primer on practices: Theory and research. *Practice-based education*.

Available at: <https://brill.com/downloadpdf/book/edcoll/9789462091283/BP000003.pdf>

Schmidt, K. (2018). *Practice theory: A critique*. Available at:

<https://www.researchgate.net/profile/Kjeld->

[Schmidt/publication/323178780_Practice_theory_A_critique/links/5a84cc1a0f7e9b2c3f5024dd/Practice-theory-A-critique.pdf](https://www.researchgate.net/publication/323178780_Practice_theory_A_critique/links/5a84cc1a0f7e9b2c3f5024dd/Practice-theory-A-critique.pdf)

Schulz, C., Hjaltadóttir, R. E. & Hild, P. (2019). Practising circles: Studying institutional change and circular economy practices. *Journal of Cleaner Production*. Available:

<https://www.sciencedirect.com/science/article/pii/S0959652619326095>

- Shove, E. & Pantzar, M. (2005). Consumers, producers and practices: Understanding the invention and reinvention of Nordic walking. *Journal of consumer culture*, 5 (1): 43-64. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1469540505049846?casa_token=SuRQS49aMuYAAAAA:qUf0MLfpnkIS5RPe6RVJVwLkuUY7p5rXedvvgjMI3Rukdj0NbBG_xhf1S1asLz4kUfcHD0W6Zft1
- Shove, E., Pantzar, M. & Watson, M. (2012). *The dynamics of social practice: Everyday life and how it changes*. Newbury Park: Sage Publications Ltd.
- Shove, E. (2016). Matters of practice. *The nexus of practices*. Available at: https://eprints.lancs.ac.uk/id/eprint/84415/1/11_Ch11_Shove.pdf
- Similä, J. O. & Langseth, M. (2021). *Offentlige anskaffelser i Norge: forskningen gjennom to tiår*. Available at: <https://press.nordicopenaccess.no/index.php/noasp/catalog/view/128/653/4762>
- Splitter, V., Loscher, G. & Seidl, D. (2018). Theodor Schatzki's theory and its implications for Organization Studies. In Clegg, S. & Pina e Cunha, M. (eds.), *Management, Organizations and Contemporary Social Theory*. New York: Routledge.
- Spurling, N., McMeekin, A., Shove, E., Southerton, D. & Welch, D. (2013). Interventions in practice: re-framing policy approaches to consumer behaviour. Available at: <https://eprints.lancs.ac.uk/id/eprint/85608/>
- Strengers, Y. & Maller, C. (2016). *Social practices, intervention and sustainability*. New York: Routledge.
- Sustainable Development Solutions Network. (2022). *Sustainable Development Report - Spillover score Norway*. Available at: <https://dashboards.sdgindex.org/map/spillovers> (accessed: 15. May 2022).
- Süßbauer, E. & Schäfer, M. (2019). Corporate strategies for greening the workplace: Findings from sustainability-oriented companies in Germany. *Journal of Cleaner Production*, 226: 564-577. Available at: https://www.sciencedirect.com/science/article/pii/S0959652619310777?casa_token=flpEiS9B2OUAAAAA:QEr7q0bkrRdCQyYL0N7APcmw7Z9i4ZGxKgEkDrnweb4_HbWdCzEfObxihCEJc9M6_L0WyTJO4w
- Sönnichsen, S. D. & Clement, J. (2020). Review of green and sustainable public procurement: Towards circular public procurement. *Journal of cleaner production*. Available at: https://www.sciencedirect.com/science/article/pii/S0959652619337710?casa_token=t2U09Nxez28AAAAA:pqggkSiWk4akuzKqosYGQchjkZ4RD5qS_FzSvaiDgguwTVljfhBTi_6TQ

HGF2ZMqpk6mKlBivw

- Tátrai, T. & Diófási-Kovács, O. (2021). *European green deal—the way to circular public procurement*. Available at: <https://link.springer.com/article/10.1007/s12027-021-00678-2>
- Temminck, E., Mearns, K. & Fruhen, L. (2015). Motivating employees towards sustainable behaviour. *Business Strategy and the Environment*, 24 (6): 402-412. Available at: https://onlinelibrary.wiley.com/doi/pdf/10.1002/bse.1827?casa_token=L34Sb9C_VREAAA_AA:acrDvB_ANPzGs2tAlnMm1SJ-_K5W0GZdkMC9zcnqpOGORvRzICl8X0ferAiOKY9QnU6VEX3dMUF7yU
- Tukker, A. (2004). Eight types of product–service system: eight ways to sustainability? Experiences from SusProNet. *Business strategy and the environment*, 13 (4): 246-260. Available at: https://onlinelibrary.wiley.com/doi/pdf/10.1002/bse.414?casa_token=IlndXbSfIKAAAAAA:Xw_gMaIwn0xqB99cZJ755UsH4f0PyRl81yavL9esOjDhqx6bVkrKwZ9GGIVMVkwkr5b egte6NgPSv0E
- Tukker, A. (2015). Product services for a resource-efficient and circular economy—a review. *Journal of cleaner production*, 97: 76-91. Available at: https://www.sciencedirect.com/science/article/pii/S0959652613008135?casa_token=_4VySg6pYoMAAAAA:s4ZhPVc7bH2_aKydM3ZQZMoWdwmLbSxU_SwFFj0RPELkxqMWVKFKrnm4OB5LeoifYCjMoL271w
- UNEP. (2018). *Building circularity into our economies through sustainable procurement*. Available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/26599/circularity_procurement.pdf?sequence=1&isAllowed=y
- UNEP. (n.d.). *Sustainable Public Procurement*. Available at: <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/sustainable-public-procurement> (accessed: 5th November 2022).
- United Nations. (n.d.). *Ensure sustainable consumption and production patterns*. Available at: <https://sdgs.un.org/goals/goal12> (accessed: 15. May 2022).
- Utviklings- og kompetanseetaten. (2023). *Vil du være med å gjøre Oslo kommunes forbruk av møbler mer sirkulært og bærekraftig?* Available at: <https://www.finn.no/job/fulltime/ad.html?finnkode=287531530> (accessed: 27th January 2023).
- Warde, A. (2014). After taste: Culture, consumption and theories of practice. *Journal of Consumer Culture*, 14 (3): 279-303. Available at:

<https://journals.sagepub.com/doi/pdf/10.1177/1469540514547828>

- Warde, A., Welch, D. & Paddock, J. (2017). Studying consumption through the lens of practice. In *Routledge handbook on consumption*, pp. 25-35: Routledge.
- Wethal, U. (2020). Practices, provision and protest: Power outages in rural Norwegian households. *Consumption, Sustainability and Everyday Life*. Available at:
https://link.springer.com/chapter/10.1007/978-3-031-11069-6_6
- Wheeler, K. & Glucksmann, M. (2016). Economies of Recycling, ‘Consumption Work’ and Divisions of Labour in Sweden and England. *Sociological Research online*. Available at:
https://journals.sagepub.com/doi/pdf/10.5153/sro.2841?casa_token=mlAVNqyoYeUAAAAA:Y7BjDlp1qD4AAG-ixUADz94uwlsUu6a28T0OY942AwmV91Yu6MVxAVpURkpACEWz4lz2e4Ad-aT5
- Xu, L., Jia, F., Yan, F. & Chen, L. (2022). Circular procurement: A systematic literature review. *Journal of Cleaner Production*. Available at:
https://www.sciencedirect.com/science/article/pii/S0959652622024398?casa_token=cjFDYxOJFX8AAAAA:aSPmmEuQl_D8p7QSFutzXS4QAdnp0YeS1G6WqXLQsSmbFDemtEaBheI8irpWSMR0886BR7YoLw
- Yang, M., Smart, P., Kumar, M., Jolly, M. & Evans, S. (2018). Product-service systems business models for circular supply chains. *Production Planning & Control*, 29 (6): 498-508.
 Available at:
<https://www.tandfonline.com/doi/pdf/10.1080/09537287.2018.1449247?needAccess=true&role=button>
- Yin, R. K. (2003). *Case study research: Design and methods* (4th ed.). Thousand Oaks: Sage Publications Ltd.

Appendix 1: Interview Guides

The following interview guides were originally used in Norwegian. The questions are translated into English.

Sluttbrukere på tjenestesteder	End-users at local service units
Rolle	Role
1. Hva er stillingen din?	1. What is your position?
2. Hvor lenge har du jobbet her, i denne stillingen?	2. For how long have you been working here in this position?
Tekstiler og tekstilhåndtering	Textiles and textile management
3. Kan du beskrive hvordan du kler deg for jobb? Hvilke plagg bruker du, og hvor får du disse fra?	3. Please describe how you get dressed for work. What garments do you use, and where do you retrieve these?
4. Hvilke øvrige tekstiler håndterer du i løpet av din arbeidsdag? (F.eks. laken, håndklær, kluter)	4. What other textiles do you use during your workday (for instance sheets, towels, washing cloths)?
5. Hvordan ville det perfekte arbeidsantrekket ha vært for deg?	5. What is your ideal workwear like?
6. Hva mener du om arbeidsklærne dine? Er det plagg du liker bedre enn andre, og hvorfor? Er arbeidsklærne dine nyttige når du utfører jobben din?	6. What do you think about your workwear? Are there garments you like more than others, and why? Is your workwear useful to you when performing your tasks?
7. Dersom du kunne velge, ville du ha foretrukket personlige arbeidsklær tilknyttet hver enkelt ansatt, eller en felles beholdning av arbeidsklær for hele arbeidsplassen?	7. If you could choose, would you prefer personal workwear for every single employee, or a common pool of workwear for the entire local service unit?
8. Hva er etter din mening den best mulige håndteringen av arbeidsklærne og andre tekstiler for at disse skal vare så lenge som mulig?	8. In your opinion, what is the best way of ensuring that workwear and other textiles gets as long lifespans as possible?
9. Kan du vise eller beskrive hva du gjør med arbeidsklærne ved	9. Would you please show or describe to me what you do with your workwear at the end of

slutten av en arbeidsdag? Hvor legger du klærne etter bruk?	the workday? Where do you place the garments after use?
10. Hender det at du skifter hele eller deler av arbeidsantrekket ditt i løpet av en dag? I hvilke tilfeller er dette, og hvor legger du klærne?	10. Do you ever change parts of or your entire uniform during the workday? If so, when, and where to you place the used garments?
11. Hvor henter du ut rene arbeidsklær og øvrige tekstiler?	11. From where do you retrieve clean workwear and other textiles?
12. Hva gjør du med arbeidsklær og øvrige tekstiler du henter ut som du ikke kan bruke fordi de er: a. Urene b. Ødelagte ?	12. What do you do with workwear that you retrieve but cannot use because they are: a. Not clean b. Damaged ?
13. Kan du vise eller beskrive hva du gjør og tekstiler som blir ødelagte under bruk?	13. Would you please show me what you do with textiles that are damaged during your use?
14. Kan du beskrive hva du vet om hvordan arbeidsklær og øvrige tekstiler blir behandlet når du er ferdig med å bruke dem på jobb?	15. Would you please describe what you know about how workwear and other textiles are treated when you are done using them at work?
15. Finnes det noen informasjon som spres om hvordan tekstiler skal håndteres?	16. Do you receive any information about how textiles are to be managed?
16. Har noen av rutinene for håndtering av tekstiler endret seg på noe punkt?	17. Have the routines for management of textiles changed at any point?
17. Hva muliggjør og hindrer en håndtering av tekstilene som bidrar til bærekraftig forbruk? (F.eks. tidspress, logistikk,	18. What enables or hinders a management of textiles that contribute to sustainable consumption? (For instance, time constraints, logistics, the nature of the tasks at work, priorities)

forhold ved arbeidsoppgavene, prioriteringer)	
18. Kunne det ha blitt benyttet arbeidsklær og øvrige tekstiler på din arbeidsplass som f.eks. har vært reparert etter å ha fått en rift, eller farget i en annen farge etter å ha fått en flekk?	18. Could it be possible to use workwear and other textiles at your local service unit that for instance had been repaired after being damaged, or that had been recoloured to cover a stain?
Annet	Other
19. Er det annet du ønsker å legge til rundt det vi har pratet om?	19. Is there anything else you would like to add?

Desentraliserte innkjøpere/husøkonomer på tjenestesteder	Decentralised purchasers/facility managers at local service units
Rolle	Role
1. Hva er stillingen din?	1. What is your position?
2. Hvor lenge har du jobbet her, i denne stillingen?	2. For how long have you been working here in this position?
3. Hva slags arbeidsoppgaver har du tilknyttet tekstiler?	3. What tasks do you have that are connected to textiles?
Bakgrunnsinformasjon	Background information
4. Hva slags tekstiler brukes på dette arbeidsstedet?	4. What types of textiles are used at this local service unit?
5. Hvor mange ansatte er det på arbeidsstedet (personer, stillinger)?	5. How many employees are there at this local service unit (employees, full positions)?
6. Når startet dere å benytte samkjøpsavtalen? Hvor lenge har dere sammenhengende benyttet en slik avtale, inkludert eventuelle tidligere avtaler? Hvordan vet du	6. When did the local service unit start using the framework agreement? For how long have you used such an agreement, including earlier agreements? How do you know how to use the framework agreement?

hvordan du skal bruke rammeavtalen?	
Tekstiler og tekstilhåndtering	Tekstiles and textile management
7. Hva er etter din mening den best mulige håndteringen av tekstilene deres for at disse skal vare så lenge som mulig?	7. In your opinion, what is the best way of ensuring that workwear and other textiles gets as long lifespans as possible?
8. Kan du vise meg eller forklare hvordan dere holder oversikt over deres tekstilbeholdning?	8. Would you please show or describe to me how you keep an overview of your textile stock?
9. Hvilke av dine arbeidsoppgaver påvirker tekstilenes varighet?	9. Which of your tasks affect the lifespans of the textiles?
10. Når bestilles det nye arbeidsklær for de ansatte her? Når bestilles det øvrige tekstiler?	10. When are new workwear and other textiles ordered?
11. Hva behøver du å vite for å kunne bestille tekstiler til ditt arbeidssted?	11. What do you need to know for ordering textiles?
12. Hvordan estimerer dere mengden tekstiler som behøves?	12. How do you estimate the number of textiles needed?
13. Har dere tekstiler på lager? Hvordan lagres disse?	13. Do you store textiles? If yes, how?
14. Hva er ditt inntrykk av hvor fornøyde de ansatte er med sine arbeidsklær? Er arbeidsklærne deres nyttige i arbeidshverdagen?	14. What is your impression of how satisfied the end-users are with their workwear? Do they consider their workwear useful during their workday?
15. Hva gjør dere med tekstiler dere henter ut som du ikke kan bruke lenger fordi de er: <ul style="list-style-type: none"> a. Urene b. Ødelagte 	15. What do you do with textiles that you retrieve but cannot use because they are: <ul style="list-style-type: none"> a. Not clean b. Damaged ?

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16. Hva slags kontakt har dere med leverandøren om bærekraftig bruk av tekstiler?	16. What contact do you have with the supplier regarding sustainable use of textiles?
17. Har du noen preferanse rundt at dere som virksomhet eier eller leier tekstilene dere bruker? Er det noen forskjell på pasient- og flattøy og arbeidsklær her?	17. Do you have any preferences regarding owning or renting textiles? Is there a difference between other textiles and workwear here?
18. Dersom du kunne velge, ville du ha valgt at dere benytter personlige arbeidsklær tilknyttet hver enkelt ansatt, eller en felles beholdning av arbeidsklær for hele arbeidsplassen?	18. If you could choose, would you prefer personal workwear for every single employee, or a common pool of workwear for the entire local service unit?
19. Har rutinene for håndtering av tekstiler på arbeidsplassen endret seg på noe punkt?	19. Have the routines for management of textiles changed at any point?
20. Hvordan ønsker du å bestille/håndtere tekstiler i fremtiden, for å øke bærekraftigheten?	20. How would you like to order and manage textiles in the future, to increase sustainability?
21. Hva muliggjør og hindrer en håndtering av tekstilene som bidrar til bærekraftig forbruk? (F.eks. tidspress, logistikk, forhold ved arbeidsoppgavene, prioriteringer)	21. What enables or hinders a management of textiles that contribute to sustainable consumption? (For instance, time constraints, logistics, the nature of the tasks at work, priorities)
22. Kunne det ha blitt benyttet arbeidsklær og øvrige tekstiler på din arbeidsplass som f.eks. har vært reparert etter å ha fått en rift, eller farget i en annen farge etter å ha fått en flekk?	22. Could it be possible to use workwear and other textiles at your local service unit that for instance had been repaired after being damaged, or that had been recoloured to cover a stain?

Kontaktpersoner	Contact information
23. Har du navn og kontaktinformasjon til kollegaer som bruker arbeidsklær og håndterer øvrige tekstiler på ditt arbeidssted? Jeg ønsker å kontakte disse for intervjuer.	23. Could you please provide names and contact information to colleagues that use workwear and manage other textiles at your local service unit? I would like to interview them.
Annet	Other
24. Er det annet du ønsker å legge til rundt det vi har pratet om?	24. Is there anything else you would like to add?

Vaskeritjenesteeksperter	Textile laundry system experts
Rolle	Role
1. Hva er stillingen din?	1. What is your position?
2. Hvor lenge har du jobbet her, i denne stillingen?	2. For how long have you been working here in this position?
3. Hva slags arbeidsoppgaver har du tilknyttet tekstiler?	3. What tasks do you have that are connected to textiles?
Bakgrunnsinformasjon	Background information
4. Hva slags tekstiler brukes på dette arbeidsstedet?	4. What types of textiles are used at this local service unit?
5. Hvor mange ansatte er det på arbeidsstedet (personer, stillinger)?	5. How many employees are there at this local service unit (employees, full positions)?
Tekstiler og tekstilhåndtering	Tekstiles and textile management
6. Hva er etter din mening den best mulige håndteringen av tekstilene deres for at disse skal vare så lenge som mulig?	6. In your opinion, what is the best way of ensuring that workwear and other textiles gets as long lifespans as possible?

7. Kan du vise meg eller forklare hvordan dere holder oversikt over deres tekstilbeholdning?	7. Would you please show or describe to me how you keep an overview of your textile stock?
8. Hvilke av dine arbeidsoppgaver påvirker tekstilenes varighet?	8. Which of your tasks affect the lifespans of the textiles?
9. Når bestilles det nye arbeidsklær for de ansatte her? Når bestilles det øvrige tekstiler?	9. When are new workwear and other textiles ordered?
10. Hva behøver du å vite for å kunne bestille tekstiler til ditt arbeidssted?	10. What do you need to know for ordering textiles?
11. Hvordan estimerer dere mengden tekstiler som behøves? Hva avgjør dette?	11. How do you estimate the number of textiles needed?
12. Har dere arbeidsklær på lager? Hvordan lagres disse?	12. Do you store textiles? If yes, how?
13. Hva er ditt inntrykk av hvor fornøyde de ansatte er med sine arbeidsklær? Er arbeidsklærne deres nyttige i arbeidshverdagen?	13. What is your impression of how satisfied the end-users are with their workwear? Do they consider their workwear useful during their workday?
14. Hva gjør dere med tekstiler dere henter ut som du ikke kan bruke lenger fordi de er: a. Urene b. Ødelagte ?	14. What do you do with workwear that you retrieve but cannot use because they are: a. Not clean b. Damaged ?
15. Har du noen preferanse rundt at dere som virksomhet eier eller leier tekstilene dere bruker? Er det noen forskjell på pasient- og flattøy og arbeidsklær her?	15. Do you have any preferences regarding owning or renting textiles? Is there a difference between other textiles and workwear here?
16. Dersom du kunne velge, ville du ha valgt at dere benytter personlige arbeidsklær	16. If you could choose, would you prefer personal workwear for every

tilknyttet hver enkelt ansatt, eller en felles beholdning av arbeidsklær for hele arbeidsplassen?	single employee, or a common pool of workwear for the entire local service unit?
17. Har rutinene for håndtering av tekstiler på arbeidsplassen endret seg på noe punkt?	17. Have the routines for management of textiles changed at any point?
18. Hvordan ønsker du å bestille/håndtere tekstiler i fremtiden, for å øke bærekraftigheten?	18. How would you like to order and manage textiles in the future, to increase sustainability?
19. Hva muliggjør og hindrer en håndtering av tekstilene som bidrar til bærekraftig forbruk? (F.eks. tidspress, logistikk, forhold ved arbeidsoppgavene, prioriteringer)	19. What enables or hinders a management of textiles that contribute to sustainable consumption? (For instance, time constraints, logistics, the nature of the tasks at work, priorities)
20. Kunne det ha blitt benyttet arbeidsklær og øvrige tekstiler på din arbeidsplass som f.eks. har vært reparert etter å ha fått en rift, eller farget i en annen farge etter å ha fått en flekk?	20. Could it be possible to use workwear and other textiles at your local service unit that for instance had been repaired after being damaged, or that had been recoloured to cover a stain?
Annet	Other
21. Er det annet du ønsker å legge til rundt det vi har pratet om?	21. Is there anything else you would like to add?

Rådgiver i anskaffelse av automatiserte løsninger for arbeidsklær	Advisor in procurement process for an automated workwear distribution solution
Rolle	Role
1. Hva er stillingen din?	1. What is your position?

2. Hvor lenge har du jobbet her, i denne stillingen?	2. For how long have you been working here in this position?
3. Hva slags arbeidsoppgaver har du tilknyttet tekstiler?	3. What tasks do you have that are connected to textiles?
Bakgrunnsinformasjon	Background information
4. Hva slags tekstiler brukes på dette arbeidsstedet?	4. What types of textiles are used at this local service unit?
5. Hvor mange ansatte er det på arbeidsstedet (personer, stillinger)?	5. How many employees are there at this local service unit (employees, full positions)?
6. Hva utløste behovet for automatisert løsning for arbeidsklær?	6. Why did you need to procure an automated workwear distribution solution?
Tekstiler og tekstilhåndtering	Textiles and textile management
7. Hva er etter din mening den best mulige håndteringen av tekstilene deres for at disse skal vare så lenge som mulig?	7. In your opinion, what is the best way of ensuring that workwear and other textiles gets as long lifespans as possible?
8. Kan du vise meg eller forklare hvordan dere inntil nå har holdt oversikt over deres tekstilbeholdning?	8. Would you please show or describe to me how you keep an overview of your textile stock?
9. Hvordan estimerer dere mengden tekstiler som behøves? Hva avgjør dette?	9. How do you estimate the number of textiles needed?
10. Hva er ditt inntrykk av hvor fornøyde de ansatte er med sine arbeidsklær? Er arbeidsklærne deres nyttige i arbeidshverdagen?	10. What is your impression of how satisfied the end-users are with their workwear? Do they consider their workwear useful during their workday?
11. Hva har dere inntil nå gjort med arbeidsklær som hentes ut og som ikke kan brukes lenger fordi de er: a. Urene	11. What have you, up until now, done with workwear that you retrieve but cannot use because they are: a. Not clean

b. Ødelagte ?	b. Damaged ?
12. Har du noen preferanse rundt at dere som virksomhet eier eller leier tekstilene dere bruker? Er det noen forskjell på pasient- og flattøy og arbeidsklær her?	12. Do you have any preferences regarding owning or renting textiles? Is there a difference between other textiles and workwear here?
13. Dersom du kunne velge, ville du ha valgt at dere benytter personlige arbeidsklær tilknyttet hver enkelt ansatt, eller en felles beholdning av arbeidsklær for hele arbeidsplassen?	13. If you could choose, would you prefer personal workwear for every single employee, or a common pool of workwear for the entire local service unit?
14. Hvordan ønsker du å bestille/håndtere tekstiler i fremtiden, for å øke bærekraftigheten?	14. How would you like to order and manage textiles in the future, to increase sustainability?
15. Hva muliggjør og hindrer en håndtering av tekstilene som bidrar til bærekraftig forbruk? (F.eks. tidspress, logistikk, forhold ved arbeidsoppgavene, prioriteringer)	15. What enables or hinders a management of textiles that contribute to sustainable consumption? (For instance, time constraints, logistics, the nature of the tasks at work, priorities)
Annet	Other
16. Er det annet du ønsker å legge til rundt det vi har pratet om?	16. Is there anything else you would like to add?

Miljøledelsesekspert	Environmental management system experts
Rolle	Role
1. Hva er stillingene deres?	1. What are your positions?
2. Hvor lenge har dere jobbet her, i disse stillingene?	2. For how long have you been working here in these positions?

Miljøstyringssystemer i Oslo kommune	Environmental management systems in the City of Oslo
3. Hvordan brukes miljøstyringssystemer i Oslo kommune? Hva med i helsesektoren spesifikt?	3. How are environmental management systems used in the City of Oslo? What about in the health sector specifically?
4. Hvordan påvirker miljøstyring bestillinger og håndtering av materiell i Oslo kommune? Hva med i helsesektoren spesifikt?	4. How does environmental management affect ordering and management of products in the City of Oslo? What about in the health sector specifically?
5. Kjenner dere til om bestilling og/eller håndtering av tekstiler påvirkes av miljøstyring i Oslo kommunes helsesektor?	5. Are you aware of whether ordering and/or management of textiles are affected by environmental management in the City of Oslo's health sector?
6. Hvordan mener dere miljøstyringssystemer best mulig kan legge til rette for et mer sirkulært forbruk av tekstiler, gjerne spesifikt i helsesektoren?	6. How do you consider that environmental management systems could contribute to a more circular consumption of textiles, perhaps also in the health sector specifically?
Annet	Other
7. Er det annet dere ønsker å legge til rundt det vi har pratet om?	7. Is there anything else you would like to add?



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